

TOSHIBA

ASIC
DATA BOOK

TC200G/E SERIES

MACROCELLS
(Non-linear Delay Models)

1997

ASIC Data Book

TC200G/E SERIES MACROCELLS (Non-linear Delay Models)

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Preface

This databook was written for logic and system designers who wish to use the TC200G/E Series Gate Array From Toshiba Corporation.

TC200G/E Series Gate Array databook consist of the volumes listed below.

This databook contains the specifications for each cell in the Verilog-HDL sign-off libraries (for use with Verilog-XL, VCS, etc.) and VHDL sign-off libraries (for use with VITAL), including the number of grids used, load and drive characteristics, function, schematic symbol, and parameters used to compute propagation delay.

TC200/E SERIES Data Book Set

Delay Model	Non-linear Delay Model	Linear Delay Model	Cataloged Cell Type
Sign-Off	Customer	Toshiba VLCAD	
Title	TC200G/E SERIES MACROCELLS (Non-linear Delay Model)	TC200G/E SERIES MACROCELLS	<ul style="list-style-type: none"> • Internal Macrocells • I/O Macrocells
	GATE ARRAY/EMBEDDED ARRAY MACROFUNCTIONS		<ul style="list-style-type: none"> • Macrofunctions • 74HC Compatible Macrofunctions
	TC200G/E • TC203G/ESERIE MEGACELLS MEGAFUNCTIONS (Non-linear Delay Model)	TC200G/E • TC203G/E SERIE MEGACELLS MEGAFUNCTIONS	<ul style="list-style-type: none"> • Megacells • Megafunctions

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Manual Organization

This manual is organized as follows:

Chapter 1: Fundamentals

- **Master Line-up**

This section describes part numbers of TC200G/E Series usable gates, and the number of I/O slots.

- **Functional Index**

All the cells available, both internal and I/O macrocells, are arranged by their functions for quick reference.

- **Drive Options for Internal Macrocells**

This section describes types of macrocells that are typical macrocells, clock drivers.

- **Drive Options for I/O Macrocells**

This section describes types of I/O macrocells that are input buffers, output buffers and bidirectional buffers.

- **How to Find Target Input Buffer**

- **How to Find Target Output Buffer**

- **How to Find Target Bidirectional buffer**

Every macrocell has a type name that denotes its generic function. This section describes the macrocell naming conventions so that you can find target macrocells quickly.

- **Oscillator Cell**

This section describes the notation for configuring crystal oscillator circuit using oscillator cells.

- **DC Characteristics**

This section describes the characteristics for currents of output buffers and threshold voltage of input buffers, and pull-up, pull-down transistor DC characteristics.

- **Input Capacitance Values for I/O Buffers**
- **Power and Ground Lines**
This section describes power and ground lines.
- **Delay Estimation**
This section describes how to calculate propagation delays, capacitance loading with estimated wire length, factors in variation of propagation delay, and characteristics with the temperature, supply voltage and processing tolerance.
- **Reading Data Sheets**
This section gives a brief description about how to read the cell catalog in chapter 2 and 3.

Chapter 2: Internal Macrocells

This section is primarily a catalog of the internal macrocells, together with an alphabetical index.

Chapter 3: I/O Macrocells

This section is primarily a catalog of the I/O macrocells, together with an alphabetical index.



Chapter 1

Fundamentals

Master Line-up

This section describes part numbers of TC200G/E Series usable gates and the number of I/O slots.

TC200G GATE ARRAY

Double-Layer Metal		Triple-Layer Metal		Raw Gates	Max I/O Pads ²⁾			Maximum I/O Slots ⁴⁾
Part number	Usable Gate ¹⁾	Part number	Usable Gate ¹⁾		Wire Bonding	TAB		
						QTP • QFP-P [TAB]	QFP-P [TAB]	
TC200G42	404,000	TC200G92	704,000	1,154,200	512 ³⁾	776 ³⁾	—	1,036
TC200G40	288,000	TC200G90	503,000	824,180	432 ³⁾	656 ³⁾	—	876
TC200G36	228,000	TC200G86	398,000	652,256	384 ³⁾	584 ³⁾	—	780
TC200G32	175,000	TC200G82	306,000	501,184	336 ³⁾	512 ³⁾	—	684
TC200G24	125,000	TC200G74	218,000	329,840	272 ³⁾	416 ³⁾	556 ³⁾	556
TC200G20	98,000	TC200G70	170,000	257,560	240	368 ³⁾	492 ³⁾	492
TC200G16	82,000	TC200G66	142,000	194,684	208	320 ³⁾	428 ³⁾	428
TC200G14	67,000	TC200G64	117,000	159,840	192	292 ³⁾	388 ³⁾	388
TC200G12	56,000	TC200G62	98,000	134,244	176	268 ³⁾	356 ³⁾	356
TC200G10	47,000	TC200G60	81,000	110,880	160	244	324 ³⁾	324
TC200G08	39,000	TC200G58	67,000	92,168	144	220	296 ³⁾	296
TC200G06	31,000	TC200G56	53,000	68,526	128	192	256	256
TC200G04	22,000	TC200G54	38,000	44,916	104	156	208	208
TC200G02	13,000	TC200G52	22,000	26,100	80	120	160	160

Notes

1. Actual usable gates depend on cell types used and circuit configuration on the system.
2. Additional I/O pads may be configured as VDD/VSS.
3. I/O signals presently limited to 256 by tester capability.
4. Actual usable I/O slots depend on I/O macrocell types and locations used.

TC200E EMBEDDED ARRAY

Double-Layer Metal		Triple-Layer Metal		Raw Gates	Max I/O Pads ²⁾			Maximum I/O Slots ⁴⁾
Part number	Usable Gate ¹⁾	Part number	Usable Gate ¹⁾		Wire Bonding	TAB		
						QTP • QFP-P [TAB]	QFP-P [TAB]	
TC200E020	13,000			26,100	80	120	160	160
TC200E040	22,000			44,916	104	156	208	208
TC200E060	31,000			68,526	128	192	256 ³⁾	256
TC200E080	39,000	TC200E580	67,000	92,168	144	220	296 ³⁾	296
TC200E100	47,000	TC200E600	81,000	110,880	160	244	324 ³⁾	324
TC200E120	56,000	TC200E620	98,000	134,244	176	268 ³⁾	356 ³⁾	356
TC200E140	67,000	TC200E640	117,000	159,840	192	292 ³⁾	388 ³⁾	388
TC200E160	82,000	TC200E660	142,000	194,648	208	320 ³⁾	428 ³⁾	428
TC200E180	86,000	TC200E680	149,000	225,280	224	344 ³⁾	460 ³⁾	460
TC200E200	98,000	TC200E700	170,000	257,560	240	368 ³⁾	492 ³⁾	492
TC200E220	111,000	TC200E720	193,000	292,584	256 ³⁾	392 ³⁾	524 ³⁾	524
TC200E240	125,000	TC200E740	218,000	329,840	272 ³⁾	416 ³⁾	556 ³⁾	556
TC200E260	140,000	TC200E760	244,000	369,328	288 ³⁾	440 ³⁾	—	588
TC200E280	144,000	TC200E780	251,000	411,048	304 ³⁾	464 ³⁾	—	620
TC200E300	159,000	TC200E800	278,000	455,000	320 ³⁾	488 ³⁾	—	652
TC200E320	175,000	TC200E820	306,000	501,184	336 ³⁾	512 ³⁾	—	684
TC200E340	201,000	TC200E840	350,000	574,236	360 ³⁾	548 ³⁾	—	732
TC200E360	228,000	TC200E860	398,000	652,256	384 ³⁾	584 ³⁾	—	780
TC200E380	257,000	TC200E880	448,000	735,244	408 ³⁾	620 ³⁾	—	828
TC200E400	288,000	TC200E900	503,000	824,180	432 ³⁾	656 ³⁾	—	876
TC200E420*	404,000	TC200E920*	704,000	1,154,200	512 ³⁾	776 ³⁾	—	1,036

- Notes
1. Actual usable gates depend on cell types used and circuit configuration on the system.
 2. Additional I/O pads may be configured as VDD/VSS.
 3. I/O signals presently limited to 256 by tester capability.
 4. Actual usable I/O slots depend on I/O macrocell types and locations used.

* : Under development

Functional Index

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CELL NAME	FUNCTION	PAGE
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Note: 'x' can be substituted by characteristics, for example, input type, pull-up and pull-down, etc. on I/O. Please see "How to Find Target Input Buffer" on page 1-17, "How to Find Target Output Buffer" on page 1-20 and "How to Find Target Bidirectional Buffer" on page 1-23".

Drive Options for Internal Macrocells

This section describes types of macrocells that are typical macrocells, clock drivers.

Typical Macrocells

The complete set of internal macrocells available for our previous gate array series is usable in the TC200G/E designs. Like our previous series, the TC200G/E macrocells are available with two drive options: standard drive and power (double) drive.

The form for internal macrocell type names is:

<base_name> <drive>

Where:

<base_name>=denotes the generic function of a macrocell.

<drive> =Null (i.e, no letter) for standard drive types; "P" for power-drive types.

Example:

ND2 Standard-drive 2-input NAND gate

ND2P Power-drive 2-input NAND gate

Use power drive types with heavy output load. However, be sure not to overuse power drive cells because they require a greater load drive capability of standard drive type cell.

Clock Driver

Four types of internal buffers are available to buffer heavily loaded internal signals — IDR4, IDR8, IDR16, and IDR24. These buffers use large-geometry transistors in I/O slot regions to provide high fan-out on-chip drive capability. Use the appropriate one consistent with your needs.

Drive Options for I/O Macrocells

I/O buffer lines include input, output, and bidirectional types. The paragraphs that follow discuss drive options available for I/O buffers.

Input Buffer

- Standard type: This type is effective in reducing noise.
- High-speed type: Use high-speed (or high-drive) input buffers to accommodate your critical path needs. High-speed options are available for part of the input buffers. Cell names have a suffix of “H”.
 - Example:
 - IBUFN (Standard type)
 - IBUFNH (High-speed type)

Output Buffer

- **Standard type:** Standard drive types offer a drive capability that stands between comparable high-speed and slew-rate-control types.
- **High-speed type:** Use high-speed(or high-drive)types to accommodate your critical path needs. High-speed options are available for output buffers with drive capability of no less than 4 mA. The cell name has a qualifier of “H” in it.
- **Slew rate type:** Use output buffers with internal slew rate control circuit to minimize unwanted voltage transients. Slew rate control options are available for output buffers with drive capability of no less than 4 mA. The cell name has a qualifier of “R” in it.
- **Example:**
 - B4 (Standard type)
 - B4H (High-speed type)
 - B4R (Slew rate type)

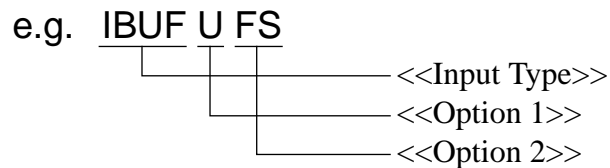
Bidirectional Buffer

Bidirectional buffers contain various type which combine input buffers and output buffers described above.

How to Find Target Input Buffer

This section describes the input buffer naming conventions so that you can find target input buffers quickly.

Naming standard Drive Input Buffer



<<Input Type>>

IBUF:	CMOS level
IBUFN:	CMOS level inverted
IBUFNH:	CMOS level inverted high speed
TLCHTH:	LVTTL level high speed
TLCHN:	LVTTL level inverted
TLCHNH:	LVTTL level inverted high speed
SMTC:	SCHMITT TRIGGER CMOS level
SMTT:	SCHMITT TRIGGER LVTTL level
IPCI:	PCI local bus output buffer

<<Option 1>>
 null: no option
 D: pull-down resistor
 U: pull-up resistor

<<Option 2>>
 null: normal
 FS: failsafe input

Naming High Drive Input Buffers

e.g. DRV SC 4 U FS

— Clock Driver (Fixed)
 — <<Input Type>>
 — <<Drive Strength>>
 — <<Option 1>>
 — <<Option 2>>

<<Input Type>>
 T: LVTTL Level
 C: CMOS Level
 SC: SCHMITT TRIGGER CMOS level

<<Drive Strength>>
 4: equal 'IDRV4'
 8: equal 'IDRV8'
 16: equal 'IDRV16'

<<Option 1>>
 null: without pull resistance
 D: pull-down resistor
 U: pull-up resistor

<<Option 2>>
 null: normal
 FS: failsafe input

Usable Input Buffer Configuration

Table 1-1

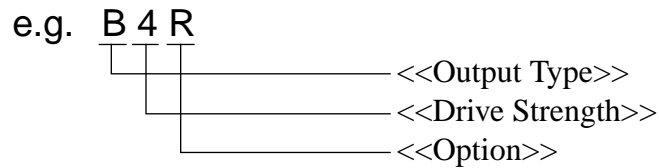
Usable Input Buffer Configuration

Without Pull Resistance	With Pull-down	With Pull-up	Page
IBUF	IBUFD	IBUFU	3 - 258
IBUFFS	IBUFDfs	—	3 - 261
IBUFN	IBUFND	IBUFNU	3 - 264
IBUFNFS	IBUFNDfs	—	3 - 267
IBUFNH	IBUFNHd	IBUFNHU	3 - 270
IBUFNHFS	IBUFNHdfs	—	3 - 273
SMTC	SMTCD	SMTCU	3 - 278
SMTCFS	SMTCDfs	—	3 - 281
TLCHTH	TLCHTHd	TLCHTHU	3 - 302
TLCHTHFS	TLCHTHdfs	—	3 - 305
TLCHN	TLCHND	TLCHNU	3 - 290
TLCHNFS	TLCHNDfs	—	3 - 293
TLCHNH	TLCHNHd	TLCHNHU	3 - 296
TLCHNHFS	TLCHNHdfs	—	3 - 299
SMTT	SMTTD	SMTTU	3 - 284
SMTTFS	SMTTDfs	—	3 - 287
IPCI	IPCID	IPCIU	3 - 276
DRVC4	DRVC4D	DRVC4U	3 - 213
DRVC4FS	DRVC4Dfs	—	3 - 216
DRVC8	DRVC8D	DRVC8U	3 - 219
DRVC8FS	DRVC8Dfs	—	3 - 222
DRVC16	DRVC16D	DRVC16U	3 - 225
DRVC16FS	DRVC16Dfs	—	3 - 228
DRVSC4	DRVSC4D	DRVSC4U	3 - 231
DRVSC8	DRVSC8D	DRVSC8U	3 - 234
DRVSC16	DRVSC16D	DRVSC16U	3 - 237
DRVT4	DRVT4D	DRVT4U	3 - 240
DRVT4FS	DRVT4Dfs	—	3 - 243
DRVT8	DRVT8D	DRVT8U	3 - 246
DRVT8FS	DRVT8Dfs	—	3 - 249
DRVT16	DRVT16D	DRVT16U	3 - 252
DRVT16FS	DRVT16Dfs	—	3 - 255

How to Find Target Output Buffer

This section describes the output buffer naming conventions so that you can find target output buffers quickly.

Naming Two-state Output Buffer



<<Output Type>>

B: unidirectional output buffer (Fixed)

<<Drive Strength>>

2: 2 mA drive

4: 4 mA drive

8: 8 mA drive

16: 16mA drive

24: 24mA drive

PCI: PCI local bus output buffer

<<Option>>

null: no option
 H: high-speed type
 R: slew rate type

Usable Two-state Output Configuration

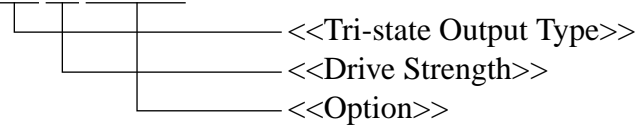
Table 1-2

Usable Output Buffer Configuration

Standard Type	High-speed Type	Slew Rate Type	Drive(mA)	Page
B2	—	—	2	3 - 185
B4	B4H	B4R	4	3 - 187
B8	B8H	B8R	8	3 - 193
B16	B16H	B16R	16	3 - 199
B24	B24H	B24R	24	3 - 205
BPCI	—	—	—	3 - 211

Naming Tri-state Output Buffer

e.g. BT 4 ODFS



<<Tri-state Output Type>>

BT: tri-state output buffer (Fixed)

<<Drive Strength>>

2: 2 mA drive
 4: 4 mA drive
 8: 8 mA drive
 16: 16 mA drive
 24: 24 mA drive
 PCI: PCI local bus output buffer

<<Option>>

null: no option
 H: high-speed type
 R: slew rate type
 ODFS: open drain, failsafe

Usable Tri-State Output Buffer Configuration

Table 1-3

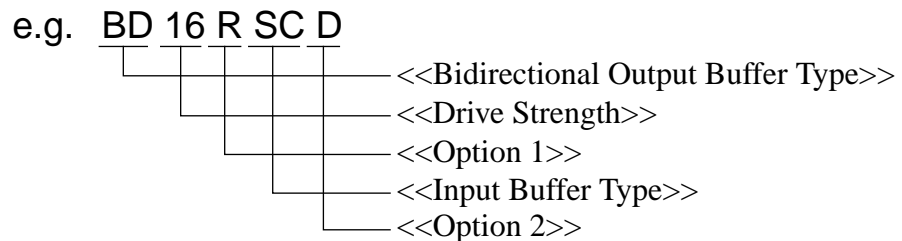
Usable Tri-State Output Buffer Configuration

Standard	High-speed	Slew Rate	Open Drain Failsafe	Page
BT2	—	—	BT2ODFS	3 - 89 ~ 94
BT4	BT4H	BT4R	BT4ODFS	3 - 95 ~ 118
BT8	BT8H	BT8R	BT8ODFS	3 - 119 ~ 139
BT16	BT16H	BT16R	BT16ODFS	3 - 140 ~ 160
BT24	BT24H	BT24R	BT24ODFS	3 - 161 ~ 181
BTPCI	—	—	—	3 - 182

How to Find Target Bidirectional Buffer

This section describes the bidirectional buffer naming conventions so that you can find target bidirectional buffers quickly.

Naming Bidirectional Output Buffer



<<Bidirectional Output Buffer Type>>

BD: bidirectional output buffer (Fixed)

<<Drive Strength>>

2: 2 mA drive

4: 4 mA drive

8: 8 mA drive

16: 16 mA drive

24: 24 mA drive

PCI: PCI local bus input output buffer

<<Input Buffer Type>>

C:	CMOS level
CN:	CMOS level inverted
CNH:	CMOS level inverted high-speed
TH:	LVTTL level high speed
TN:	LVTTL level inverted
TNH:	LVTTL level inverted high-speed
SC:	schmitt trigger CMOS level
ST:	schmitt trigger LVTTL level

<<Option 1>>

null:	no option
H:	high-speed type
R:	slew rate control type

<<Option 2>>

null:	no option
U:	with pull-up
D:	with pull-down
ODFS:	open drain, failsafe

Usable Bidirectional Output Buffer Configuration

Table 1-4 CMOS Input Type

	C	C D	C U	C ODFS	H C	H C D	H C U	R C	R C D	R C U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

Table 1-5 CMOS Input with Inverted Type

	CN	CN D	CN U	CN ODFS	H CN	H CN D	H CN U	R CN	R CN D	R CN U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

	CNH	CNH D	CNH U	CNH ODFS	H CNH	H CNH D	H CNH U	R CNH	R CNH D	R CNH U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

Table 1-6 CMOS SCHMITT TRIGGER Input Type

	SC	SC D	SC U	SC ODFS	H SC	H SC D	H SC U	R SC	R SC D	R SC U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

Table 1-7 LVTTTL Input Type

	TH	TH D	TH U	TH ODFS	H TH	H TH D	H TH U	R TH	R TH D	R TH U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

Table 1-8 LVTTTL Input with Inverted Type

	TN	TN D	TN U	TN ODFS	H TN	H TN D	H TN U	R TN	R TN D	R TN U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

	TNH	TNH D	TNH U	TNH ODFS	H TNH	H TNH D	H TNH U	R TNH	R TNH D	R TNH U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

Table 1-9 LVTTTL SCHMITT TRIGGER Input Type

	ST	ST D	ST U	ST ODFS	H ST	H ST D	H ST U	R ST	R ST D	R ST U	Drive (mA)	Page
BD2	●	●	●	●	—	—	—	—	—	—	2	3 - 1 ~ 9
BD4	●	●	●	●	●	●	●	●	●	●	4	3 - 10 ~ 28
BD8	●	●	●	●	●	●	●	●	●	●	8	3 - 29 ~ 47
BD16	●	●	●	●	●	●	●	●	●	●	16	3 - 48 ~ 66
BD24	●	●	●	●	●	●	●	●	●	●	24	3 - 67 ~ 85

Table 1-10**Special Type**

Standard	with Pull-down	with Pull-up	Page
BDPCI	BDPCID	BDPCIU	3 - 86

Oscillator Cells

This section describes the notation for configuring crystal oscillator circuit using oscillator cells.

Naming Oscillator Cell

- Standard Type

OSC4D (oscillator with stop control)

OSC6D (oscillator with stop control)

- Cornered Type

OSCX05 (corner oscillator with feedback resistor)

OSCX30 (corner oscillator with feedback resistor)

How to Find Target Oscillator Cells

The following table shows the availability of the oscillator cells. Use the appropriate oscillator cells with your need. When appropriate oscillator cells are not used, power dissipation may increase, and the oscillator cells might not behave.

Table 1-11

Oscillator Specifications

	Frequency (MHz)	Stop Control	Feedback Resistor	I/O counts	Page
OSC4D		●	—		
OSC6D		●	—		
OSCX05		●	●	*	
OSCX30		●	●	*	

* : Restricted to pre-determined I/O Slot locations

Notes on Crystal Oscillator

- When designing a system using a crystal oscillator, the unstable period which is found on oscillation starting time or oscillation stopping time should be taken into account.
- During logic simulation, specify the CMOS level to the Z output of the oscillator cell.
- Since the Z output of the oscillator cell is to drive the load on the LSI tester probe head, be aware of the propagation delays for the Z to ZI path.
- Since the oscillator cell is susceptible to current noise from another signal, its input and output pin should be placed between VDD and VSS pins as shown on Figure 1-1 on page 1-30 and Figure 1-2 on page 1-32
- Make the lengths of the wires between parts as short as possible, and do not allow the wires to cross.

Oscillator Application Note

Figure 1-1 and Figure 1-2 show examples of application circuits with OSC4D and OSCX05, respectively. Table 1-12, Table 1-13, Table 1-14 and Table 1-15 give the recommended circuit parameters and electrical characteristics for each of those oscillator cells. The external CR and electric characteristics depend on the type of a crystal oscillator used and the soldering states of the devices on the PC board. Contact the crystal oscillator supplier for details.

Figure 1-1

An example of application circuit (OSC4D)

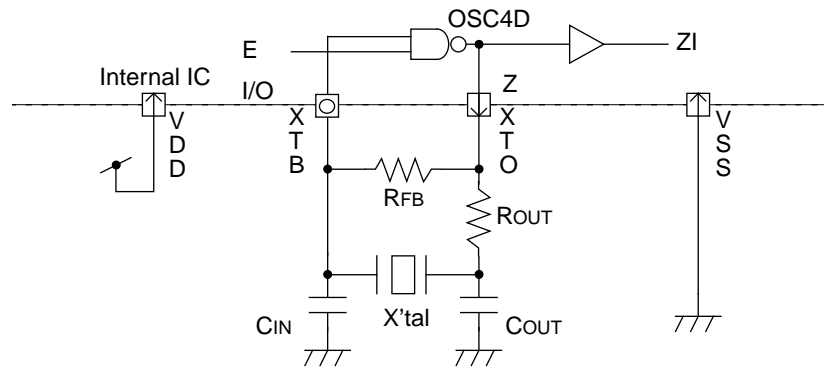


Table 1-12 Recommended Oscillation Condition

Cell Name	Parameter	Symbol	Recommended value		Unit
OSC4D	<crystal oscillator>				
	frequency	f			
	crystal impedance	CI			
	feedback resistor	RFB			
	output resistor	ROUT			
	external condenser	CIN, COUT			
OSC6D	<crystal oscillator>				
	frequency	f			
	crystal impedance	CI			
	feedback resistor	RFB			
	output resistor	ROUT			
	external condenser	CIN, COUT			

Table 1-13 Electrical specification (VSS=0V, VDD=3.3V, Typ.)

Cell Name	Parameter	Symbol	Condition	Typ.	Unit
OSC4D	oscillation starting voltage	VSTA	f =		
			f =		
	oscillation holding voltage	VHOLD	f =		
			f =		
supply current	IDD	f =			
		f =			
	oscillation starting time	TSTA			
OSC6D	oscillation starting voltage	VSTA	f =		
			f =		
	oscillation holding voltage	VHOLD	f =		
			f =		
supply current	IDD	f =			
		f =			
	oscillation starting time	TSTA			



Please contact Toshiba DesignCenter for the values in shadowed columns.

Figure 1-2 An example of application circuit (OSCX05)

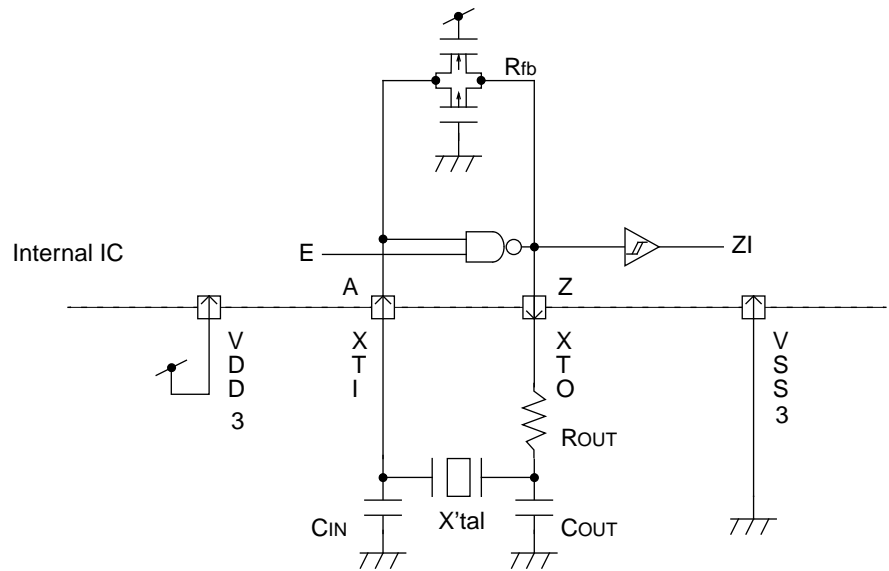



Table 1-14 Recommended Oscillation Condition

Cell Name	Parameter	Symbol	Recommended value		Unit
OSCX05	<crystal oscillator>				
	frequency	f			
	crystal impedance	CI			
	output resistor	ROUT			
	external condenser	CIN, COUT			
OSCX30	<crystal oscillator>				
	frequency	f			
	crystal impedance	CI			
	output resistor	ROUT			
	external condenser	CIN, COUT			

Table 1-15 Electrical specification (VSS=0V, VDD=3.3V, Typ.)

Cell Name	Parameter	Symbol	Condition	Typ.	Unit
OSCX05	oscillation starting voltage	VSTA	f =32kHz		
	oscillation holding voltage	VHOLD			
	supply current	IDD			
	oscillation starting time	TSTA			
OSC6D	oscillation starting voltage	VSTA	f =10MHz		
	oscillation holding voltage	VHOLD			
	supply current	IDD			
	oscillation starting time	TSTA			

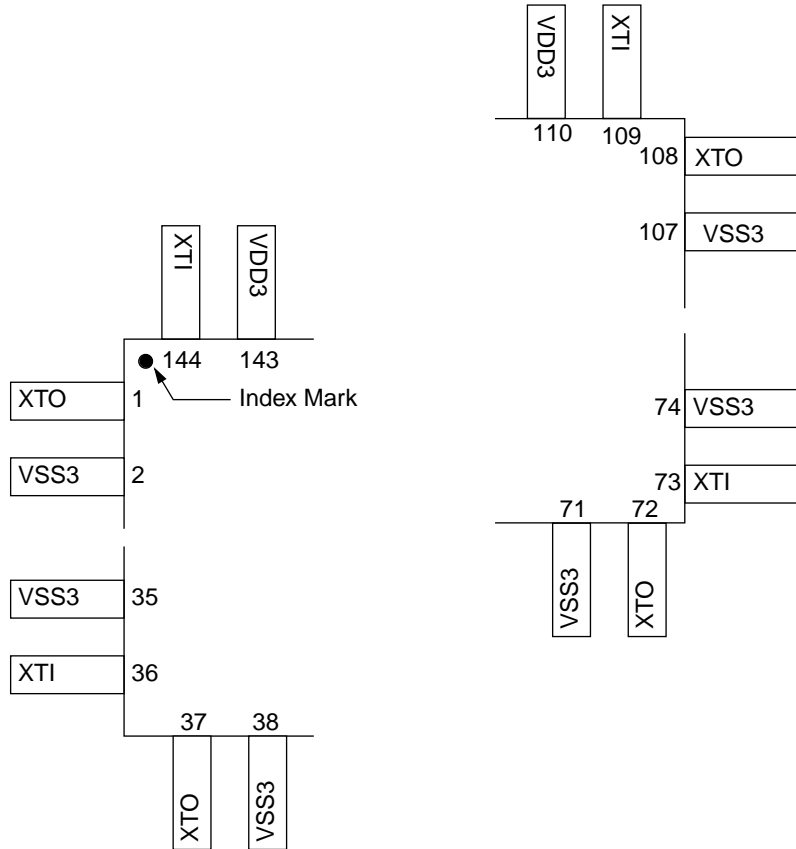
 Please contact Toshiba DesignCenter for the values in shadowed columns.

Corner Oscillator Cell

The pin locations of OSCX05 and OSCX30 which are the corner oscillator cells are fixed at the corner of the package. Some packages may allow no package lead for the corner oscillator. Contact your Design Center for package leads allowed for the corner oscillator. Figure 1-3 shows the pins on the 144-pin flat package (LFP144) reserved for these cornered oscillator cells.

Figure 1-3

Pin Assignment Example of a Cornered Oscillator (LFP144 face up)



DC Characteristics

This section describes the characteristics for currents of output buffers and threshold voltage of input buffers, and pull-up, pull-down transistor DC characteristics.

Output Characteristics

Figure 1-4 shows V_{OH} - I_{OH} characteristics. Figure 1-5 shows V_{OL} - I_{OL} characteristics.

Figure 1-4

VOH-IoH CHARACTERISTICS (VDD=3.3V, Ta=25°C, typ.)

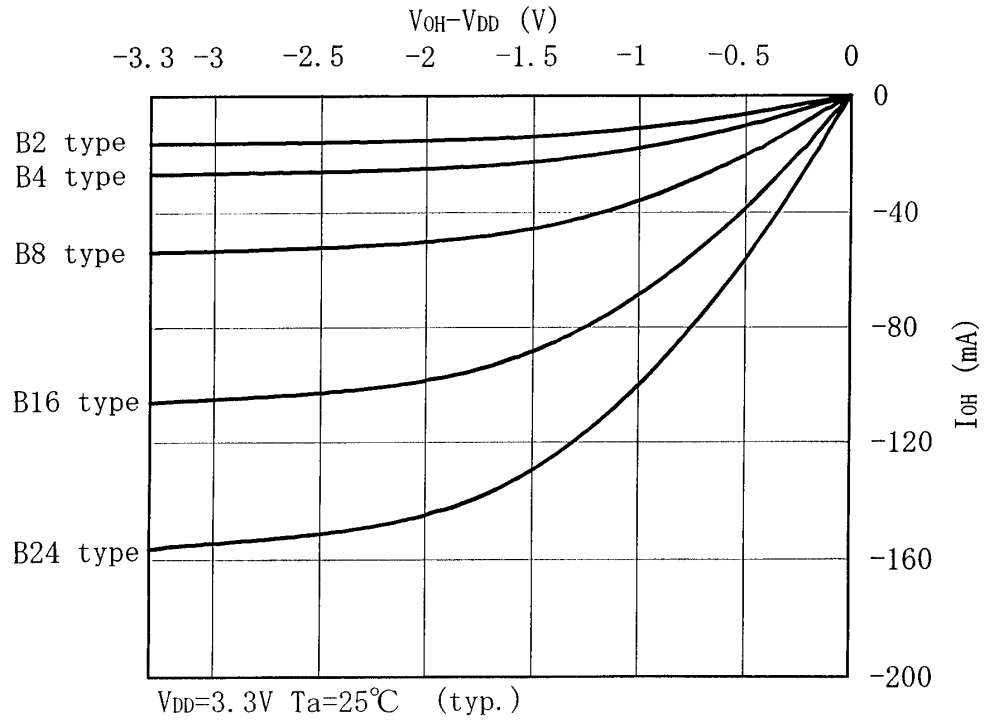
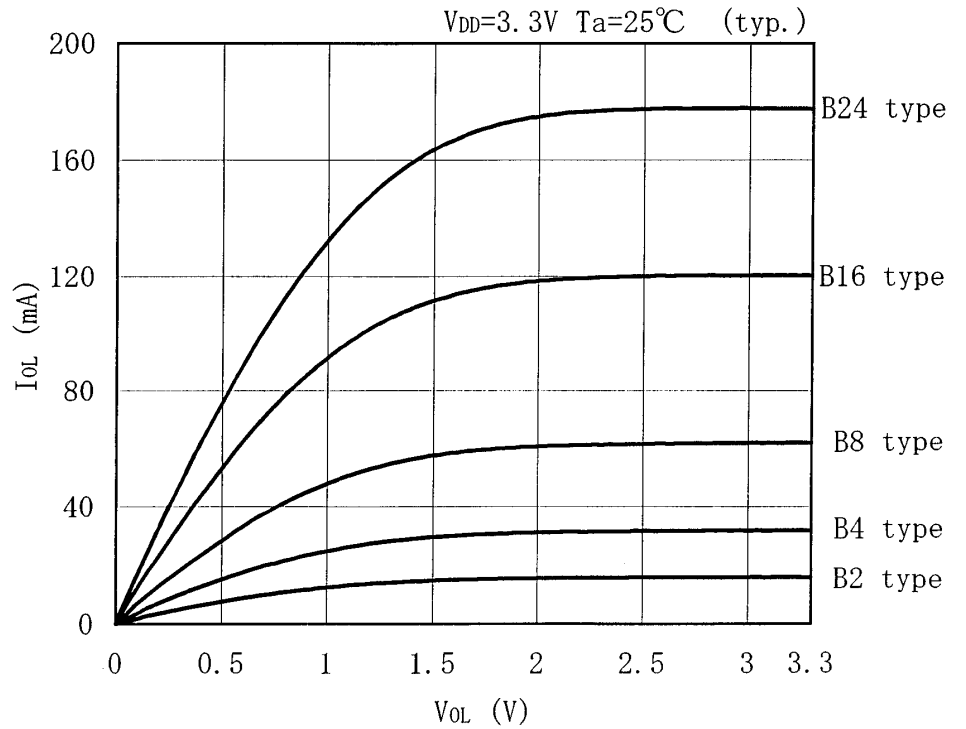


Figure 1-5

VoL-IoL CHARACTERISTICS (VDD=3.3V, Ta=25°C, typ.)



Threshold Characteristics

Figure 1-6 and Figure 1-7 show CMOS level threshold characteristics. Figure 1-8 and Figure 1-9 show LVTTL level threshold characteristics.

Figure 1-6

CMOS level threshold characteristics

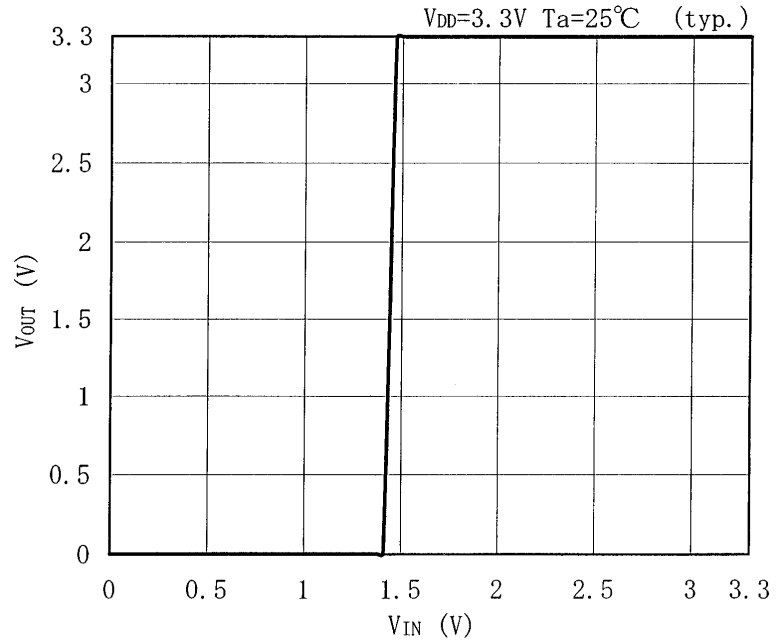


Figure 1-7

SCHMITT TRIGGER CMOS level threshold characteristics

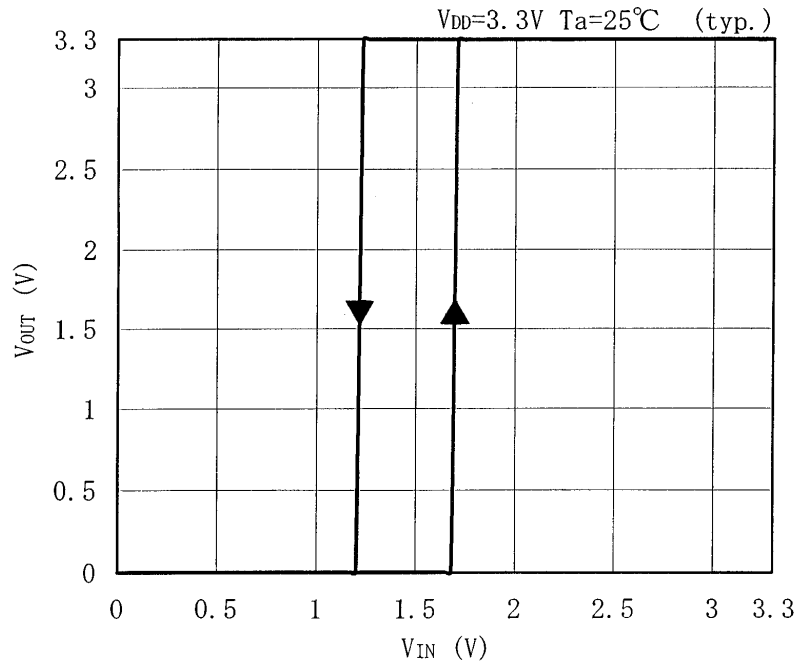


Figure 1-8

LVTTTL level threshold characteristics

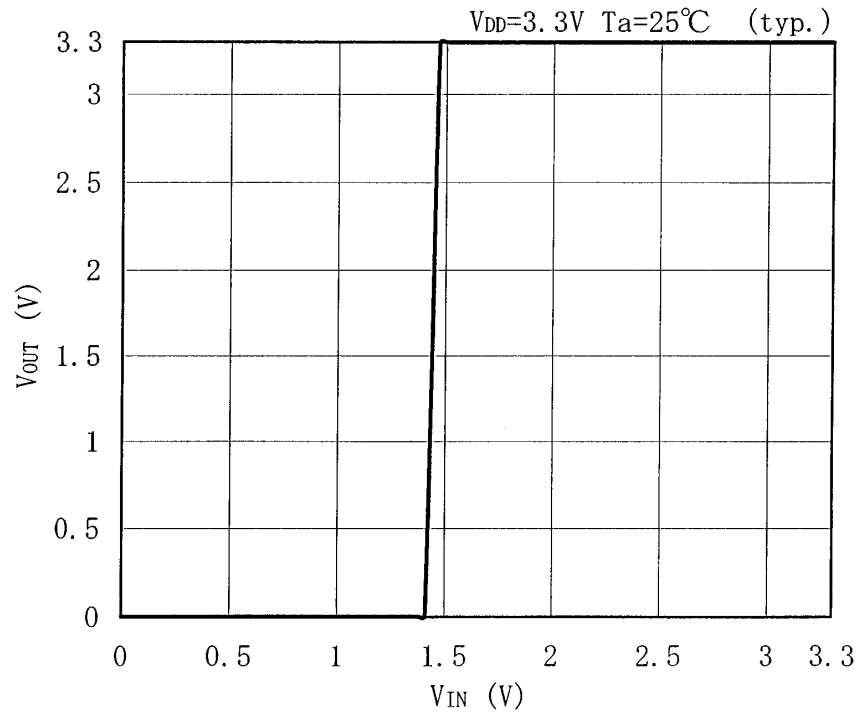
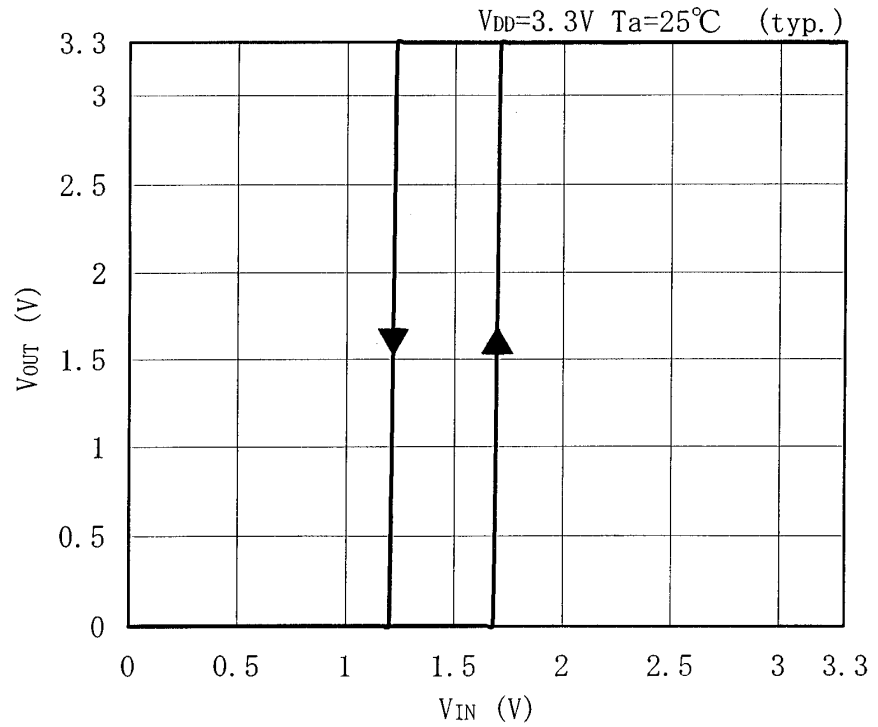


Figure 1-9

SCHMITT TRIGGER LVTTTL level threshold characteristics



Pull-Up, Pull- Down Characteristics

Figure 1-10 shows pull-up transistor DC characteristics. Figure 1-11 shows pull-down transistor DC characteristics.

Figure 1-10

Pull-up transistor DC characteristics (VDD=3.3V, Ta=25°C, typ.)

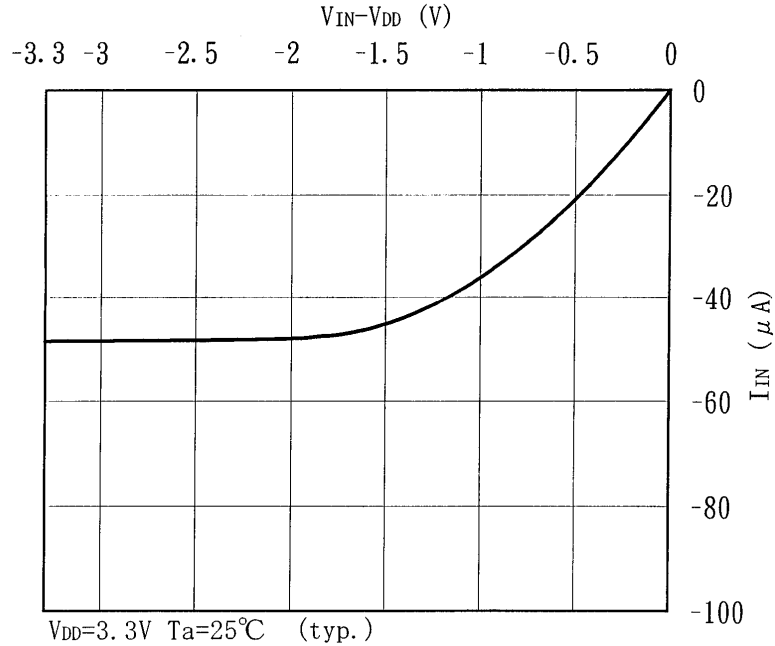
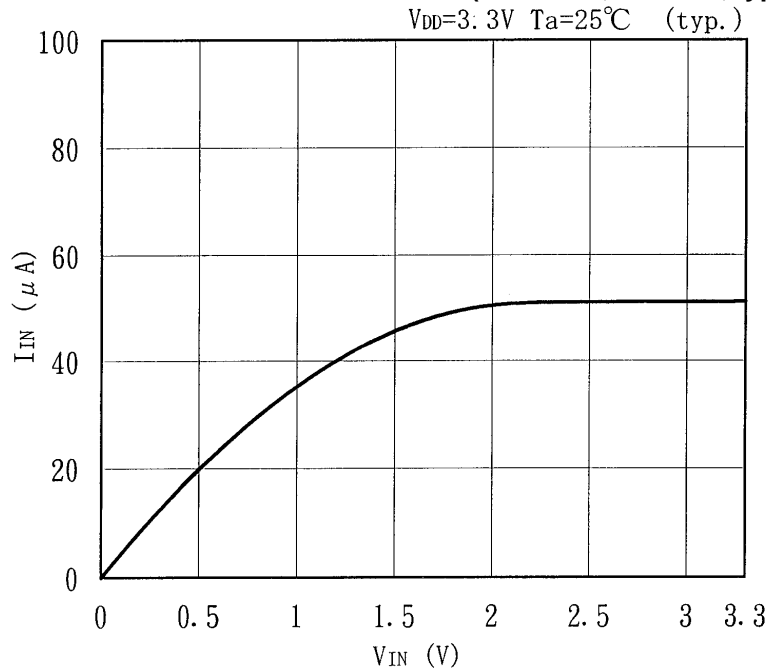


Figure 1-11

Pull-down transistor DC characteristics (VDD=3.3V, Ta=25°C, typ.)



Input Capacitance Values for I/O Buffers

This section gives the input capacitances associated with the input pins of input buffers and the output pins of tri-state output buffers in the high-impedance state. Input capacitance values are used to calculate I/O delays

Table 1-16

Input Capacitance Values for I/O Buffers

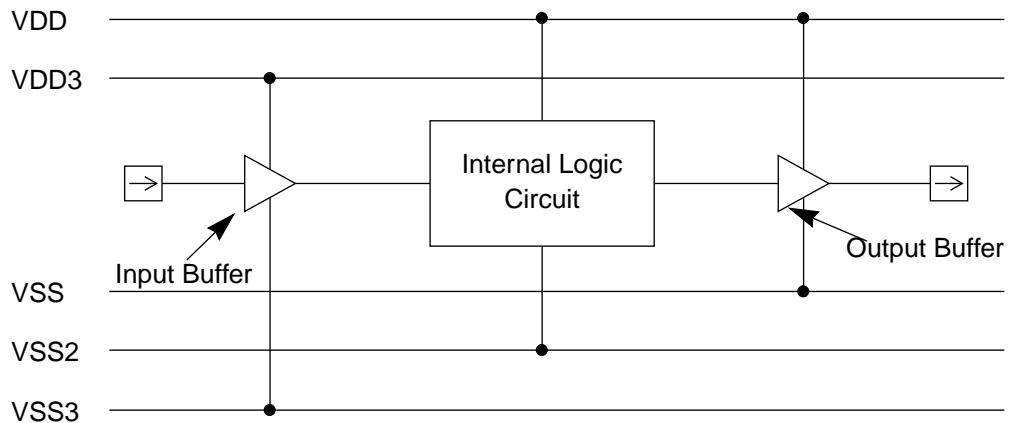
Type	Cell Name	Pin Name	Capacitance (pF)
Input buffers	DRVC4x, DRVC8x, DRVC16x DRVSC4x, DRVSC8x, DRVSC16x DRVT4x, DRCT8x, DRVT16x IBUFx, IBUFNx, IBUFNHx SMTCx, SMTTx TLCHNx, TLCHNHx, TLCHTHx IPC1x	A	5.56
	DRVC4xFS, DRVC8xFS, DRVC16xFS DRVT4xFS, DRVT8xFS, DRVT16xFS IBUFxFS, IBUFNxFS, IBUFNHxFS SMTCxFS, SMTTxFS TLCHNxFS, TLCHNHxFS, TLCHTHxFS	A	2.78
Tri-state output Buffers	BT2, BT4, BT4H, BT4R, BT8, BT8H, BT8R, BT16, BT16H, BT16R, BTPCI	Z	5.56
	BT24, BT24H, BT24R	Z	9.13
	BT2ODFS, BT4ODFS, BT8ODFS, BT16ODFS	Z	2.78
	BT24ODFS	Z	3.56
Bidirectional Biffers	BD2x, BD4x, BD4Hx, BD4Rx, BD8x, BD8Hx, BD8Rx, BD16x, BD16Hx, BD16Rx, BDPCIx	IO	5.56
	BD24x, BD24Hx, BD24Rx	IO	9.13
	BD2xODFS, BD4xODFS, BD8xODFS, BD16xODFS	IO	2.78
	BD24xODFS	IO	3.56

The Power and Ground Lines

The TC200G/E series has three types of VSS buses and two types of VDD buses. The positions of standard power of these power lines are fixed depending on combination of a package and master chip. Some additional power pins are required under the condition of input buffers, output buffers or simultaneous switchings. Please contact Toshiba Design Center for the details.

Figure 1-12

Power Supply Lines



- VDD : a power bus for external output buffers and internal macrocells
- VDD3 : a power bus for external input buffers
- VSS : a ground bus for external output buffers
- VSS2 : a ground bus for internal macrocells
- VSS3 : a ground bus for external input buffers

Delay Estimation

As feature sizes shrink, timing accuracy plays a more critical role in the success of deep-submicron ASIC technologies. You must use as accurate timing estimations as possible in the early stage of the design to minimize design iterations involved in complex designs. To this end, the accuracy of the libraries and the delay equation was enhanced for the release of our sign-off verification systems, Verilog-XL Sign-off (VSO) System and VITAL Sign-off System. The advanced technical features for delay prediction include Non-linear Delay Models (NLDMs) and State-Dependent Path Delays (SDPDs).

The NLDMs and SDPDs combine to realize sign-off-accuracy simulation that is “very close” to Spice results and representative of actual silicon.

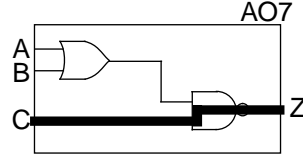
State-Dependent Path Delays (SDPDs)

The new modeling methodology uses state-dependent path delays (SDPDs), which describe pin-to-pin delays whose validity is conditioned by other pins. This feature is illustrated below in Figure 1-13, where input A is at logic 1, and when input C makes a 0-to-1 transition, output Z goes low. The signal flows indicated by bold paths show that the C-to-Z timing arc is conditioned by the state at input B.

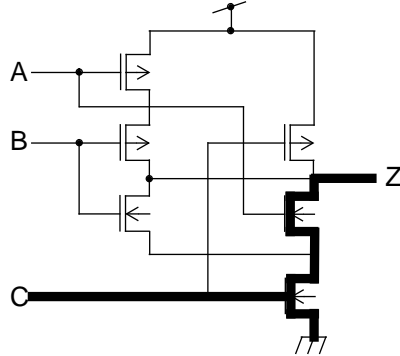
Figure 1-13

State-Dependent Path Delays (SDPDs)

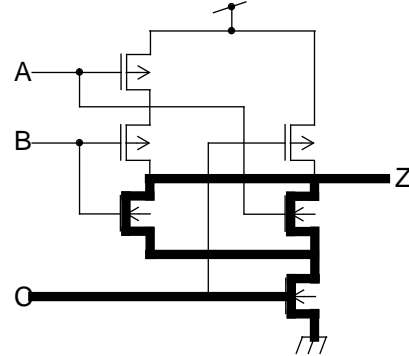
Gate-Level Network



Transistor-Level Network



A	1
B	0
C	0-1
Z	1-0
C-to-Z Delay: 0.38 ns	



A	1
B	1
C	0-1
Z	1-0
C-to-Z Delay: 0.31 ns	

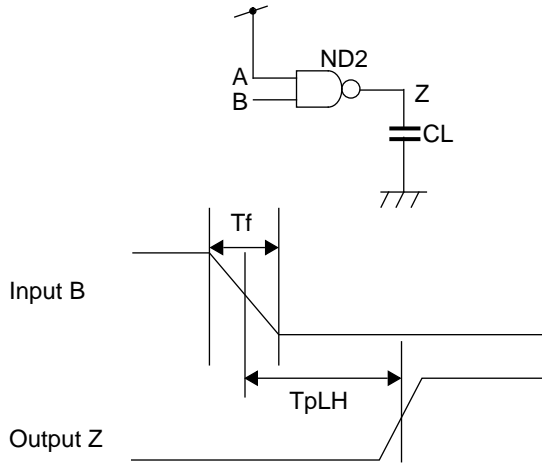
TC200G/E Series
Load=5.0 LU
Input Slew=0.38 ns

Non-linear Delay Model

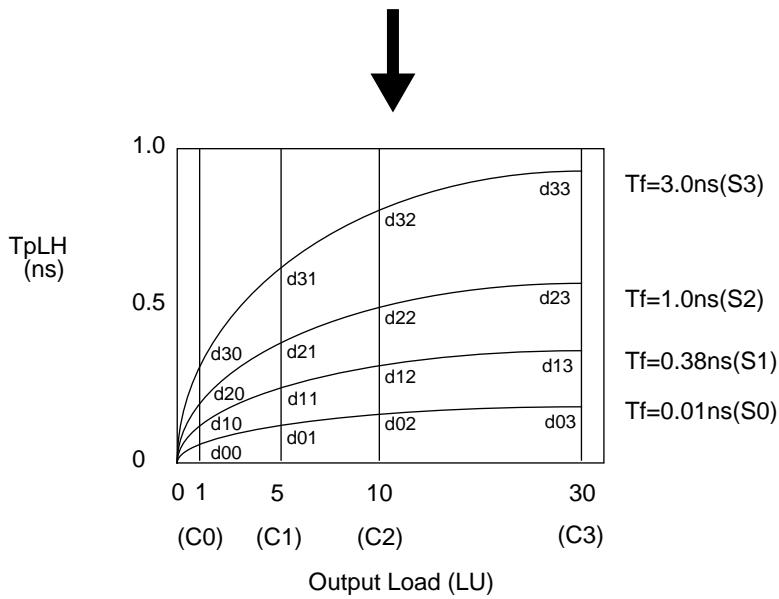
In the deep-submicron world, the traditional linear scaling of the fanout time estimates are not accurate enough. Wire delays are beginning to dominate designs, and the traditional method can not accurately model interconnect wires.

The new delay estimation method interprets the input wave as a slope, based on table lookup and interpolation. Figure 1-14 illustrates the procedures Toshiba uses to extract delay table data. This example shows the steps for creating a lookup table for the rise delay of a 2-input NAND gate.

Figure 1-14 Extracting Delay Table Data for an 2-input NAND Gate



Delay extraction is performed with the input transition time of input B and the output load of CL set at four different points each.



Tf: input transition time

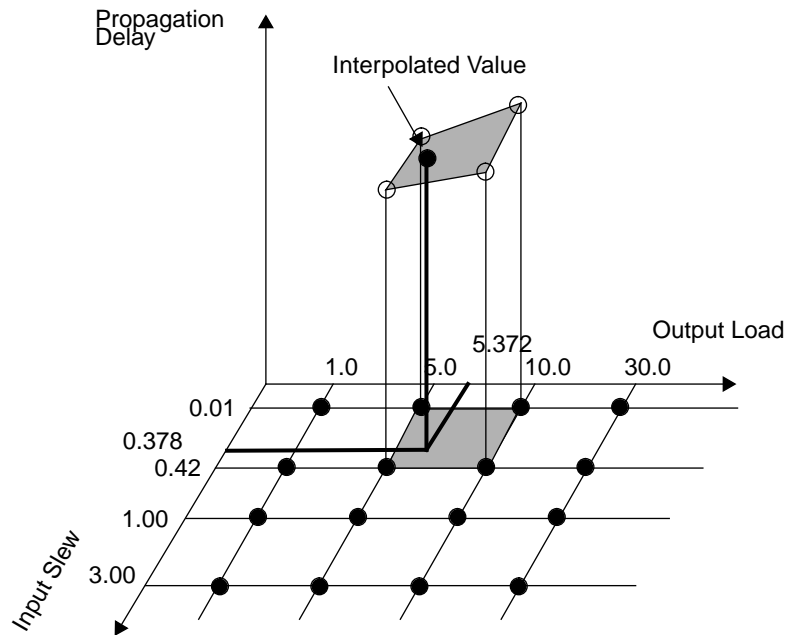
	C0	C1	C2	C3
S0	d00	d01	d02	d03
S1	d10	d11	d12	d13
S2	d20	d21	d22	d23
S3	d30	d31	d32	d33

Four-by-four points of the delay curves are translated into a look-up table.

Figure 1-15 illustrates by example how the macrocell propagation delay is computed using the new delay modeling method.

Figure 1-15

Table Lookup and Interpolation



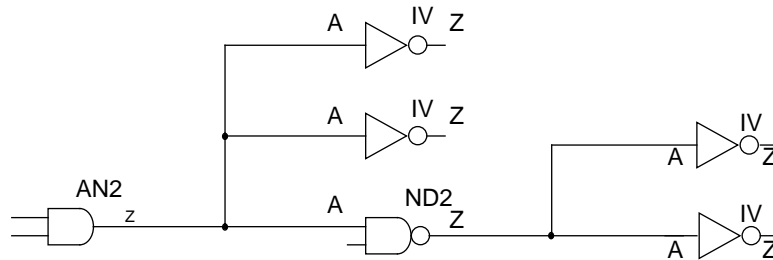
This technique uses a two-dimensional table indexed by output load and input slew rate. The output load is either estimated using library-defined wire load models or back-annotated from the physical layout of a design. The slew rate (or the transition time) of a gate's input pin is computed by evaluating the output delay of the previous gate. Assuming the output load is 5.372 LU, and the input slew rate is 0.378 ns, four bounding-table values (or corner values in the figure) are found by examining the index values. The delay value is then determined by "interpolating" between these four points. In Figure 1-15, the black dots represent points that are defined in the lookup table in the technology library.

Non-linear Delay Calculation Example

The following example illustrates the process to determine the fall delay across the A-to-Z timing arc of the NAND cell (ND2) in Figure 1-16.

Figure 1-16

Non-linear Delay Calculation Example



If you have a need to calculate a macrocell’s propagation delay manually, use the following steps.

1. Calculate the total capacitive load on the ND2’s output pin.

- a. Determine the total fanout load. It represents the sum of loading units of the driven macrocell input pins. Input loading unit numbers are listed in the “INPUT LOAD” section of each macrocell data sheet. Fanout load associated with the ND2’s output pin is calculated as:

$$\text{Fanout} = 1.0 + 1.0 = 2.0(\text{LU})$$

* Remember to include the INPUT CAPACITANCE value for tri-state drivers.

- b. Determine the estimated wire load (EWL), referring to an appropriate equation in Table 1-17, Table 1-18, Table 1-19 and Table 1-20. If a design is implemented using array TC200G10, it is calculated as:

$$\begin{aligned} \text{EWL} &= 1.349 \times 2 + 0.674 \\ &= 3.372 (\text{LU}) \end{aligned}$$

Therefore, the total capacitive load (C_{total}) on the ND2’s output pin is:

$$C_{\text{total}}(\text{ND2}) = 2.0 + 3.372 = 5.372 (\text{LU})$$

2. Calculate the slew rate (or transition time) of the ND2's A input.

- a. Calculate the capacitive load on the AN2's output pin, using the sequence shown at step 1.

$$\begin{aligned} C_{\text{total}}(\text{AN2}) &= \text{fanout} + \text{EWL} \\ &= (1.0 + 1.0 + 1.03) + (1.349 \times 3 + 0.674) \\ &= 7.751 \text{ (LU)} \end{aligned}$$

- b. The equation for calculating the input slew rate (Slew) is:

$$\begin{aligned} \text{Slew}(\text{ND2}) &= \text{FACTOR}(\text{AN2}) \times C_{\text{total}}(\text{AN2}) \\ &\quad + \text{CONSTANT}(\text{AN2}) \end{aligned}$$

FACTOR and CONSTANT parameters are defined, for each timing arc and transition, in the SLEW FACTOR sections in each library cell data sheet. When the ND2's output rises, the driving output of the previous-stage AN2 falls. Obtain the FACTOR and CONSTANT parameters, taking care to use the figures of corresponding output conditions(s). Referring to the AN2 page, Slew(ND2) is calculated as:

$$\begin{aligned} \text{Slew}(\text{ND2}) &= 0.0397 \times 7.751 + 0.07 \\ &= 0.378 \text{ (ns)} \end{aligned}$$

3. Referring to the PATH DELAY section of the ND2 page, choose four neighboring points for interpolation.

The new delay estimation method uses a 4×4 lookup table indexed by output load and input slew rate. Use these two values to index into ND2's rise path delay table. Four bounding-table values (or corner values in Figure 1-15) used for interpolation are found by examining the index values.

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.09
0.38	0.11	0.26	0.43	1.12
1.00	0.13	0.30	0.49	1.17
3.00	0.15	0.37	0.60	1.35

4. Interpolate the bounding-table values.

Use the capacitive-load and slew-rate values computed at step 1 and step 2 to choose a table cell from the following interpolation matrix, where C0 to C3 are the capacitance index values in the x-axis, and S0 to S3 are the slew-rate index values in the y-axis in the PATH DELAY table.

	C0	C1	C2	C3
S0	d ₀₀ cell 00	d ₀₁ cell 01	d ₀₂ cell 02	d ₀₃ cell 03
S1	d ₁₀ cell 10	d ₁₁ cell 11	d ₁₂ cell 12	d ₁₃ cell 13
S2	d ₂₀ cell 20	d ₂₁ cell 21	d ₂₂ cell 22	d ₂₃ cell 23
S3	d ₃₀ cell 30	d ₃₁ cell 31	d ₃₂ cell 32	d ₃₃ cell 33

*S0,S1,S2,S3: Input Slew
C0,C1,C2,C3: Output Load

Cell Selection

cell 00 (s≤S1, c≤C1) cell 01 (s≤S1, C1<c≤C2) cell 02 (s≤S1, C2<c)
 cell 10 (S1<s≤S2, c≤C1) cell 11 (S1<s≤S2, C1<c≤C2) cell 12 (S1<s≤S2, C2<c)
 cell 20 (S2<s, c≤C1) cell 21 (S2<s, C1<c≤C2) cell 22 (S2<s, C2<c)

s=Slew, c=C total

The interpolation equation for cell_(ij) is:

$$\text{Propagation Delay } d = (X_{ij} \times s \times c + Y_{ij} \times s + Z_{ij} \times c + W_{ij}) / V_{ij}$$

where:

$$\begin{aligned} X_{ij} &= + d_{ij} && - d_{i,j+1} && - d_{i+1,j} && + d_{i+1,j+1} \\ Y_{ij} &= -C_{j+1} \times d_{ij} && + C_j \times d_{i,j+1} && + C_{j+1} \times d_{i+1,j} && - C_j \times d_{i+1,j+1} \\ Z_{ij} &= -S_{i+1} \times d_{ij} && + S_{i+1} \times d_{i,j+1} && + S_i \times d_{i+1,j} && - S_i \times d_{i+1,j+1} \\ W_{ij} &= + S_{i+1} \times C_{j+1} \times d_{ij} && - S_{i+1} \times C_j \times d_{i,j+1} && - S_i \times C_{j+1} \times d_{i+1,j} && + S_i \times C_j \times d_{i+1,j+1} \\ V_{ij} &= (S_{i+1} - S_i) (C_{j+1} - C_j) \end{aligned}$$

The output-load/input-slew condition in our example rises into cell(01). Using the above equation, the rise delay (TpLH) across the A-to-Z timing arc of the ND2 in Figure 1-16 is computed as follows:

$$\begin{aligned} X_{01} &= d_{01} - d_{02} - d_{11} + d_{12} \\ &= 0.23 - 0.40 - 0.26 + 0.43 = 0 \end{aligned}$$

$$\begin{aligned} Y_{01} &= -(C_2 \times d_{01}) + (C_1 \times d_{02}) + (C_2 \times d_{11}) - (C_1 \times d_{12}) \\ &= -(10.00 \times 0.23) + (5.00 \times 0.40) + (10.00 \times 0.26) - \\ &\quad (5.00 \times 0.43) \\ &= 0.15 \end{aligned}$$

$$\begin{aligned} Z_{01} &= -(S_1 \times d_{01}) + (S_1 \times d_{02}) + (S_0 \times d_{11}) - (S_0 \times d_{12}) \\ &= -(0.38 \times 0.23) + (0.38 \times 0.40) + (0.01 \times 0.26) \\ &\quad - (0.01 \times 0.43) \\ &= 0.063 \end{aligned}$$

$$\begin{aligned} W_{01} &= (S_1 \times C_2 \times d_{01}) - (S_1 \times C_1 \times d_{02}) - (S_0 \times C_2 \times d_{11}) \\ &\quad + (S_0 \times C_1 \times d_{12}) \\ &= (0.38 \times 10.00 \times 0.23) - (0.38 \times 5.00 \times 0.40) \\ &\quad - (0.01 \times 10.00 \times 0.26) + (0.01 \times 5.00 \times 0.43) \\ &= 0.11 \end{aligned}$$

$$\begin{aligned} V_{01} &= (S_1 - S_0)(C_2 - C_1) \\ &= (0.38 - 0.01) \times (10.00 - 5.00) \\ &= 1.85 \end{aligned}$$

Therefore,

$$\begin{aligned} d &= \{(X_{01} \times s \times c) + (Y_{01} \times s) + (Z_{01} \times c) + W_{01}\} \div V_{01} \\ &= \{(0 \times 0.378 \times 5.372) + (0.15 \times 0.378) + (0.063 \times 5.372) \\ &\quad + 0.11\} \div 1.85 \\ &= 0.27 \text{ (ns)} \end{aligned}$$

Figure 1-17 ND2 Data Sheet

TC200G SERIES
DATA SHEET

ND2	ND2	2/2																										
CONDITION: VDD=3.3V, Ta=25°C, Typ.																												
<table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align: center;">PATH CONDITION</td> <td colspan="3" style="text-align: center;">SLEW FACTOR</td> </tr> <tr> <td style="border: 1px solid black;">PATH</td> <td style="border: 1px solid black;">CONDITION</td> <td colspan="3" style="border: 1px solid black;">FUNCTION</td> <td style="border: 1px solid black;">PIN NAME</td> <td style="border: 1px solid black;">FACTOR (ns/LU)</td> <td colspan="2" style="border: 1px solid black;">CONSTANT (ns)</td> </tr> <tr> <td style="border: 1px solid black;">A->Z</td> <td style="border: 1px solid black;">---</td> <td colspan="3" style="border: 1px solid black;">RISE</td> <td style="border: 1px solid black;">Z</td> <td style="border: 1px solid black;">0.0997</td> <td colspan="2" style="border: 1px solid black;">0.16</td> </tr> </table>			PATH CONDITION					SLEW FACTOR			PATH	CONDITION	FUNCTION			PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)		A->Z	---	RISE			Z	0.0997	0.16	
PATH CONDITION					SLEW FACTOR																							
PATH	CONDITION	FUNCTION			PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)																					
A->Z	---	RISE			Z	0.0997	0.16																					
PATH DELAY (ns)																												
LOAD (LU)	1.00	5.00	10.00	30.00																								
SLEW (ns)	0.01	0.09	0.23	0.40	1.09																							
	0.38	0.11	0.26	0.43	1.12																							
	1.00	0.13	0.30	0.49	1.17																							
	3.00	0.15	0.37	0.60	1.35																							

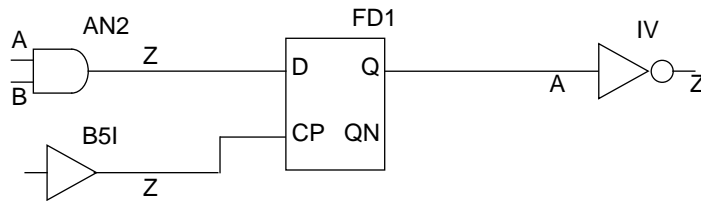
											----------------	-----------	----------	--	--	-------------	----------------	---------------	--		PATH CONDITION					SLEW FACTOR					PATH	CONDITION	FUNCTION			PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)			A->Z	---	FALL			Z	0.0654	0.10				
PATH DELAY (ns)																																																				
LOAD (LU)	1.00	5.00	10.00	30.00																																																
SLEW (ns)	0.01	0.09	0.24	0.43	1.17																																															
	0.38	0.15	0.32	0.51	1.25																																															
	1.00	0.21	0.42	0.63	1.39																																															
	3.00	0.32	0.62	0.90	1.79																																															

Non-linear Setup/Hold Time Calculation Example

The following example illustrates the process to determine the setup time on the D input of the FD1 flip-flop in Figure 1-18.

Figure 1-18

Non-linear Setup/Hold Time Calculation Example



1. Calculate the input slew rates (or transition times) of the data (D) and clock (CP) pins of the FD1, using the steps discussed in the previous section.

CP input: $Slew_{up} = 0.185$ (ns)

D input: $Slew_{up} = 0.383$ (ns)

D input: $Slew_{dn} = 0.190$ (ns)

2. Referring to the SETUP section of the FD1 page, choose four neighboring points for interpolation.

The setup/hold estimation method uses a 4×4 lookup table indexed by clock and data slew rates. There are two lookup tables, depending on the data values. Use the clock and data slew rate values to index into the FD1's setup time tables. Four bounding-table values used for interpolation are found by examining the index values.

3. Interpolate the bounding-table values for these two cases, D=High and D=Low, using the equation shown in the previous section.

In our example, setup(H) and setup(L) are calculated to be as follows:

setup(H) = 0.38 (ns)

setup(L) = 0.37 (ns)

4. Use the larger value of the two as the setup time.

Figure 1-19

FD1 Data Sheet

TC200G SERIES
DATA SHEET

FD1	FD1	3/4									
CONDITION:VDD=3.3V, Ta=25°C, Typ.											
TIMING CONDITION											
DATA	CLOCK	CONDITION									
D	CP	---									
ITEM	CLOCK	DATA	WAVE_FORM								
SETUP	POSEDGE	HIGH									
HOLD	POSEDGE	HIGH									
SETUP (ns)		HOLD (ns)									
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00							
DATA SLEW (ns)	0.01	0.352	0.334	0.305	0.209						
	0.38	0.388	0.370	0.339	0.241						
	1.00	0.448	0.429	0.397	0.295						
	3.00	0.641	0.620	0.584	0.468						
CLOCK SLEW (ns)		0.01		0.38		1.00		3.00			
DATA SLEW (ns)		0.01		0.291		0.323		0.377		0.551	
		0.38		0.257		0.289		0.343		0.517	
		1.00		0.200		0.232		0.286		0.460	
		3.00		0.016		0.048		0.102		0.276	
TIMING CONDITION											
DATA	CLOCK	CONDITION									
D	CP	---									
ITEM	CLOCK	DATA	WAVE_FORM								
SETUP	POSEDGE	LOW									
HOLD	POSEDGE	LOW									
SETUP (ns)		HOLD (ns)									
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00							
DATA SLEW (ns)	0.01	0.368	0.336	0.282	0.107						
	0.38	0.402	0.369	0.315	0.141						
	1.00	0.458	0.426	0.372	0.198						
	3.00	0.641	0.609	0.555	0.382						
CLOCK SLEW (ns)		0.01		0.38		1.00		3.00			
DATA SLEW (ns)		0.01		0.305		0.322		0.352		0.447	
		0.38		0.269		0.287		0.318		0.416	
		1.00		0.209		0.228		0.260		0.362	
		3.00		0.016		0.038		0.074		0.190	

Estimated Wiring Load Table

Table 1-17

TC200G Series (Double-layer Metal)

Double-layer metal	
Part Number	EWL (LU)
TC200G42	$2.056 \times \text{WAY} + 1.028$
TC200G40	$1.935 \times \text{WAY} + 0.968$
TC200G36	$1.855 \times \text{WAY} + 0.928$
TC200G32	$1.769 \times \text{WAY} + 0.885$
TC200G24	$1.641 \times \text{WAY} + 0.821$
TC200G20	$1.570 \times \text{WAY} + 0.785$
TC200G16	$1.493 \times \text{WAY} + 0.746$
TC200G14	$1.440 \times \text{WAY} + 0.720$
TC200G12	$1.396 \times \text{WAY} + 0.698$
TC200G10	$1.349 \times \text{WAY} + 0.674$
TC200G08	$1.305 \times \text{WAY} + 0.652$
TC200G06	$1.237 \times \text{WAY} + 0.618$
TC200G04	$1.146 \times \text{WAY} + 0.573$
TC200G02	$1.040 \times \text{WAY} + 0.520$



Note: "WAY" stands for the number of branches into which the output pin forks.

Table 1-18

TC200G Series (Triple-layer Metal)

Triple-layer metal	
Part Number	EWL (LU)
TC200G92	$1.966 \times \text{WAY} + 0.983$
TC200G90	$1.851 \times \text{WAY} + 0.925$
TC200G86	$1.774 \times \text{WAY} + 0.887$
TC200G82	$1.692 \times \text{WAY} + 0.846$
TC200G74	$1.570 \times \text{WAY} + 0.785$
TC200G70	$1.501 \times \text{WAY} + 0.751$
TC200G66	$1.427 \times \text{WAY} + 0.714$
TC200G64	$1.378 \times \text{WAY} + 0.689$
TC200G62	$1.335 \times \text{WAY} + 0.668$
TC200G60	$1.290 \times \text{WAY} + 0.645$
TC200G58	$1.248 \times \text{WAY} + 0.624$
TC200G56	$1.183 \times \text{WAY} + 0.591$
TC200G54	$1.096 \times \text{WAY} + 0.548$
TC200G52	$0.994 \times \text{WAY} + 0.497$



Note: "WAY" stands for the number of branches into which the output pin forks.

Table 1-19

TC200E Series (Double-layer Metal)

Double-layer metal	
Part Number	EWL (LU)
TC200E020	$1.040 \times \text{WAY} + 0.520$
TC200E040	$1.146 \times \text{WAY} + 0.573$
TC200E060	$1.237 \times \text{WAY} + 0.618$
TC200E080	$1.305 \times \text{WAY} + 0.652$
TC200E100	$1.349 \times \text{WAY} + 0.674$
TC200E120	$1.396 \times \text{WAY} + 0.698$
TC200E140	$1.440 \times \text{WAY} + 0.720$
TC200E160	$1.493 \times \text{WAY} + 0.746$
TC200E180	$1.532 \times \text{WAY} + 0.766$
TC200E200	$1.570 \times \text{WAY} + 0.785$
TC200E220	$1.606 \times \text{WAY} + 0.803$
TC200E240	$1.641 \times \text{WAY} + 0.821$
TC200E260	$1.675 \times \text{WAY} + 0.837$
TC200E280	$1.707 \times \text{WAY} + 0.854$
TC200E300	$1.739 \times \text{WAY} + 0.869$
TC200E320	$1.769 \times \text{WAY} + 0.885$
TC200E340	$1.813 \times \text{WAY} + 0.907$
TC200E360	$1.855 \times \text{WAY} + 0.928$
TC200E380	$1.896 \times \text{WAY} + 0.948$
TC200E400	$1.935 \times \text{WAY} + 0.968$
*TC200E420	$2.056 \times \text{WAY} + 1.028$

* : Under development



Note: "WAY" stands for the number of branches into which the output pin forks.

Table 1-20

TC200E Series (Triple-layer Metal)

Triple-layer metal	
Part Number	EWL (LU)
TC200E580	$1.248 \times \text{WAY} + 0.624$
TC200E600	$1.290 \times \text{WAY} + 0.645$
TC200E620	$1.335 \times \text{WAY} + 0.668$
TC200E640	$1.378 \times \text{WAY} + 0.689$
TC200E660	$1.427 \times \text{WAY} + 0.714$
TC200E680	$1.465 \times \text{WAY} + 0.733$
TC200E700	$1.501 \times \text{WAY} + 0.751$
TC200E720	$1.536 \times \text{WAY} + 0.768$
TC200E740	$1.570 \times \text{WAY} + 0.785$
TC200E760	$1.602 \times \text{WAY} + 0.801$
TC200E780	$1.633 \times \text{WAY} + 0.816$
TC200E800	$1.663 \times \text{WAY} + 0.832$
TC200E820	$1.692 \times \text{WAY} + 0.846$
TC200E840	$1.734 \times \text{WAY} + 0.867$
TC200E860	$1.774 \times \text{WAY} + 0.887$
TC200E880	$1.813 \times \text{WAY} + 0.907$
TC200E900	$1.851 \times \text{WAY} + 0.925$
*TC200E920	$1.966 \times \text{WAY} + 0.983$

* : Under development



Note: "WAY" stands for the number of branches into which the output pin forks.

Variations in Propagation Delays

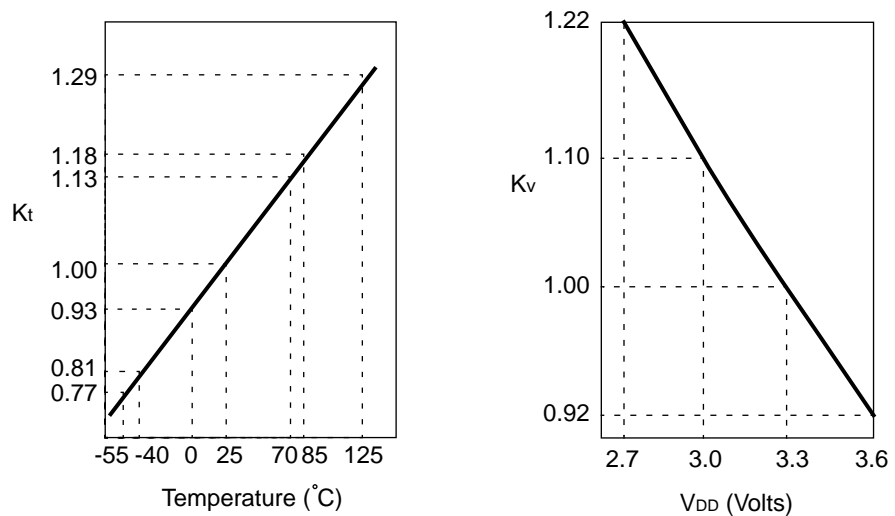
The previous subsections explained how to determine propagation delays under the “nominal” (typical) condition. The nominal condition represents a 3.3V power supply, 25 temperature, and nominal process model.

Once the nominal delay is calculated, the best- and worst-case analyses should be made. the best- and worst-case propagation delays of a macrocell are determined by multiplying its nominal delay by appropriate factors called K-factors(Kf).

Process variation could decrease or increase delays. Thus, a multiplier factor called K_p is used to estimate the effect of best- and worst-case processing. Junction Multipliers for K_t and K_v are shown in Figure 1-20.

Figure 1-20

Propagation Delay as a Function of Temperature and as a Function on Supply Voltage



The formula for calculating the overall K-factor (Kf) is:

$$K_p \times K_t \times K_v$$

The typical-case, best-case, and worst-case Kf factors are shown in Table 1-21 and Table 1-22.

The “commercial” operating conditions are defined below:

Worst-case commercial: 70 °C, 2.7V

Best-case commercial: 0 °C, 3.6V

It is probable that the supply voltage and junction temperature differ from these standards. The user can calculate K-factors for operating conditions other than the standard ones in a similar manner.

Table 1-21

TC200G Series Maximum Delay Factor (Kf)

VDD	Kf (Ta=0 °C~70°C)		
	Best-case	Typical-case	Worst-case
3.3V±0.3V	0.51	1.00	1.68
3.0V±0.3V	0.56	(1.10)	1.86

Table 1-22

TC200E Series Maximum Delay Factor (Kf)

VDD	Kf (Ta=0 °C~70°C)		
	Best-case	Typical-case	Worst-case
3.3V±0.3V	0.51	1.00	1.74
3.0V±0.3V	0.56	(1.10)	1.93

Reading Data Sheets

Macrocell “ND2” is given as an example.

(1) CELL NAME:

Macrocell name.

‘x’ can be substituted by characteristics, for example, pull-up, pull-down, open-drain, high-speed and slew-rate, etc. on I/O macrocells. Please see “CELL NAME” of data sheet for more details.

(2) FUNCTION:

Function of macrocells.

(3) CELL COUNT:

Numbers of gates and I/O slots used by the macrocell.

(4) LOGIC SYMBOL:

Logic symbol of macrocell.

(5) TRUTH TABLE

Truth table which shows the state of I/O. X indicates the state of “Do not care” and Hz is “High impedance”.

(6) Verilog-HDL DESCRIPTION

(7) VHDL DESCRIPTION

(8) ELECTROMIGRATION:

To avoid potential electromigration problems, the maximum load that an macrocell output can drive is specified, based on its switching speed. The “ELECTROMIGRATION” table lists the maximum values of the load (in LU) times the switching frequency (in MHz). The following examples illustrate the way to calculate the maximum output drive using the switching frequency (f) as a basis:

$$\text{When } f=10 \text{ MHz: } 6880 \div 10 = 688$$

$$\text{When } f=100 \text{ MHz: } 6880 \div 100 = 69$$



Notes: *The maximum load a macrocell output can drive is determined as the smaller of this result and the OUTPUT DRIVE value.*

(9) INPUT LOAD:

Load capacitance of macrocell input in LU unit. It is also a factor of delay calculation.

(10) OUTPUT DRIVE:

Load drive capability of macrocell output in units of LU.

(11) PATH CONDITION

This table shows the conditions when the validity of pin-to-pin delays are conditioned by other pins.

PATH: shows a module path. Since more than one source may have a module path to the same destination, each source (or input) pin is listed for each destination (or output) pin.

CONDITION: shows the Boolean equation when the validity of the path delay is state-dependent. Examples of Boolean equations are given below:

$$\sim B$$

$$\sim A | B \& \sim C$$

$$A \& \sim B$$

The tilde character (\sim) denotes negation or NOT.

FUNCTION: There may be delay values independently for each of the four output transitions.

IO LEVEL: Output buffer propagation delay is a function of buffer type, capacitive load, and type of device being driven. When driving CMOS chips, output buffer propagation delays are measured from their inception to the time at which the signal achieves the CMOS threshold of 1.5 volts. When driving LVTTTL chips, the delays are measured from their inception to the time at which the signal achieves the LVTTTL threshold of 1.5 volts.

(12) SLEW FACTOR

This table shows parameters used to calculate the input slew rate (or transition time). Input slew rate is determined by the following equation:

$$(\text{Input slew rate}) = \text{FACTOR} \times \text{output_load} + \text{CONSTANT}$$

(13) PATH DELAY

This is a lookup table indexed by output loads and input slew rates. The total propagation delay is computed by interpolating table values.



Notes: (1) *For I/O macrocells, following values are shown in chapter “DC Characteristics” table on page 1-34: output current, threshold voltage, and pull-up/pull-down transistor characteristic.*

(2) *Pad capacitance is shown in ‘INPUT CAPACITANCE’ table on input buffer and a state of output buffer is ‘Hz’.*

(3) *‘TRUTH TABLE’ and ‘AC CHARACTERISTICS’ of input buffer are not included in Data Sheet of bidirectional buffer. Please see Data Sheet of same type macrocell.*

Figure 1-21

Example of Macrocell Data Sheet



Chapter 2

Internal Macrocells

Alphanumeric Index

CELL NAME	FUNCTION	PAGE
AN2	2-INPUT AND	2 - 1
AN2P		3
AN3	3-INPUT AND	5
AN3P		8
AN4	4-INPUT AND	11
AN4P		14
AO1	2-INPUT AND into 3-INPUT NOR	17
AO1P		22
AO2	2-WIDE 2-INPUT AND into 2-INPUT NOR	27
AO2P		34
AO3	2-INPUT OR into 3-INPUT NAND	41
AO3P		46
AO4	2-WIDE 2-INPUT OR into 2-INPUT NAND	51
AO4P		58
AO5	INVERTING 2 of 3 MAJORITY GATE	65
AO5P		69
AO6	2-INPUT AND into 2-INPUT NOR	73
AO6P		77

CELL NAME	FUNCTION	PAGE
AO7	2-INPUT OR into 2-INPUT NAND	2 - 81
AO7P		85
BTS4	TRI-STATE INTERNAL BUFFER (HIGH ENABLE)	89
BTS4P		92
BTS5	TRI-STATE INTERNAL INVERTING BUFFER (HIGH ENABLE)	95
BTS5P		98
B2I	INVERTER into 3 PARALLEL INVERTERS	101
B2IP		103
B3I	2 PARALLEL INVERTERS into 2 PARALLEL INVERTERS	105
B3IP		107
B4I	4 PARALLEL INVERTERS	109
B4IP		111
B5I	3 PARALLEL INVERTERS	113
B5IP		115
D24GL	2 TO 4 DECODER (GATED OUTPUTS ACTIVE LOW)	117
D24GLP		124
D24L	2 TO 4 DECODER (OUTPUT ACTIVE LOW)	131
D24LP		136
EN	2-INPUT EXCLUSIVE NOR	141
ENP		144
EN3	3-INPUT EXCLUSIVE NOR	147
EN3P		154
EO	2-INPUT EXCLUSIVE OR	161
EOP		164
EON1	2-INPUT OR and 2-INPUT NAND into 2-INPUT NAND	167
EON1P		174
EO1	2-INPUT AND and 2-INPUT NOR into 2-INPUT NOR	181
EO1P		188
EO3	3-INPUT EXCLUSIVE OR	195
EO3P		202

CELL NAME	FUNCTION	PAGE	
FA1	FULL ADDER	2 - 209	
FA1P		219	
FA1A		229	
FA1AP		239	
FD1	D-TYPE FLIP FLOP	249	
FD1P		253	
FD1SF		with Independent two-phase SCAN clock	257
FD1SFP			267
FD1S		with common single-phase SCAN clock	277
FD1SP			283
FD2		with CLEAR	289
FD2P			295
FD2SF		with Independent two-phase SCAN clock with CLEAR	301
FD2SFP			314
FD2S		with common single-phase SCAN clock with CLEAR	327
FD2SP			335
FD3		with CLEAR and PRESET	343
FD3P			351
FD3SF		with Independent two-phase SCAN clock with CLEAR and PRESET	359
FD3SFP			374
FD3S		with common single-phase SCAN clock with CLEAR and PRESET	389
FD3SP			399
FD4		with PRESET	409
FD4P			415
FD4SF		with Independent two-phase SCAN clock with PRESET	421
FD4SFP			434
FD4S		with common single-phase SCAN clock with PRESET	447
FD4SP			455
FJK1	J-K FLIP FLOP	463	

CELL NAME	FUNCTION	PAGE
FJK1P		2 - 467
FJK2	with CLEAR	471
FJK2P		477
FJK3	with CLEAR and PRESET	483
FJK3P		491
FT2	TOGGLE FLIP FLOP with CLEAR	499
FT2P		504
FT4	with PRESET	509
FT4P		514
HA1	HALF ADDER	519
HA1P		523
IDRV4	INTERNAL CLOCK DRIVER (equal 4mA DRIVER)	527
IDRV8	(equal 8mA DRIVER)	529
IDRV16	(equal 16mA DRIVER)	531
IDRV24	(equal 24mA DRIVER)	533
IV	INVERTER	535
IVP		537
IVA	with PARALLEL Pch TRANSISTORS	539
IVAP		541
IVDA	INVERTER into INVERTER	543
IVDAP		545
LD1	D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	547
LD1P		552
LD2	(LOW ENABLE)	557
LD2P		562
LD3	D-TYPE TRANSPARENT LATCH with CLEAR (HIGH ENABLE)	567
LD3P		574
LD4	(LOW ENABLE)	581
LD4P		588
LS1	D-TYPE TRANSPARENT LATCH with SCAN TESTINPUT	595

CELL NAME	FUNCTION	PAGE
LS1P		2 - 609
LS2		623
LS2P		650
LSR1	SR-LATCH with SEPARATE GATE SD and RD	677
LSR1P		683
LSR2	SR-LATCH with COMMON GATE SD and RD	689
LSR2P		694
MUX21H	2 TO 1 MULTIPLEXER	699
MUX21HP		702
MUX21L	2 TO 1 INVERTING MULTIPLEXER	705
MUX21LP		708
MUX41	4 TO 1 MULTIPLEXER	711
MUX41P		718
MUX81	8 TO 1 MULTIPLEXER	725
MUX81P		742
ND2	2-INPUT NAND	759
ND2P		761
ND3	3-INPUT NAND	763
ND3P		766
ND4	4-INPUT NAND	769
ND4P		772
ND5	5-INPUT NAND	775
ND5P		779
ND6	6-INPUT NAND	783
ND6P		787
ND8	8-INPUT NAND	791
ND8P		796
NR2	2-INPUT NOR	801
NR2P		803
NR3	3-INPUT NOR	805

CELL NAME	FUNCTION	PAGE
NR3P		2 - 808
NR4	4-INPUT NOR	811
NR4P		814
NR5	5-INPUT NOR	817
NR5P		821
NR6	6-INPUT NOR	825
NR6P		829
NR8	8-INPUT NOR	833
NR8P		838
OR2	2-INPUT OR	843
OR2P		845
OR3	3-INPUT OR	847
OR3P		850
OR4	4-INPUT OR	853
OR4P		856
PDI	INTERNAL PULL-DOWN for PREVENTING BUS FLOATING	859
PUI	INTERNAL PULL-UP for PREVENTING BUS FLOATING	861
YCAN2	CLOCK BUFFER with 2-INPUT AND	863
YCAN2P		865
YCBUF	CLOCK BUFFER	867
YCBUFP		869
YCOR2	CLOCK BUFFER with 2-INPUT OR	871
YCOR2P		873
YD24GH	2 TO 4 DECODER (GATED OUTPUTS ACTIVE HIGH)	875
YD24GHP		882
YD24H	(OUTPUTS ACTIVE HIGH)	889
YD24HP		894
YDLY1	DELAY BUFFER	899
YDLY1P		901
YDLY2		903

CELL NAME	FUNCTION	PAGE
YDLY2P		905
YDLY3		907
YDLY3P		909
YFD1	D-TYPE FLIP FLOP	911
YFD2	with CLEAR	915
YFD3	with CLEAR and PRESET	921
YFD4	with PRESET	930
YLD1	D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	936
YLD14B	QUAD D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	941
YLD2	D-TYPE TRANSPARENT LATCH (LOW ENABLE)	957
YLD24B	QUAD D-TYPE TRANSPARENT LATCH (LOW ENABLE)	962
YMUX24H	QUAD 2 TO 1 MULTIPLEXER	978
YMUX24HP		987
YMUX24L	(INVERTED OUTPUT)	996
YMUX24LP		1005



Internal Macrocell Data Sheets

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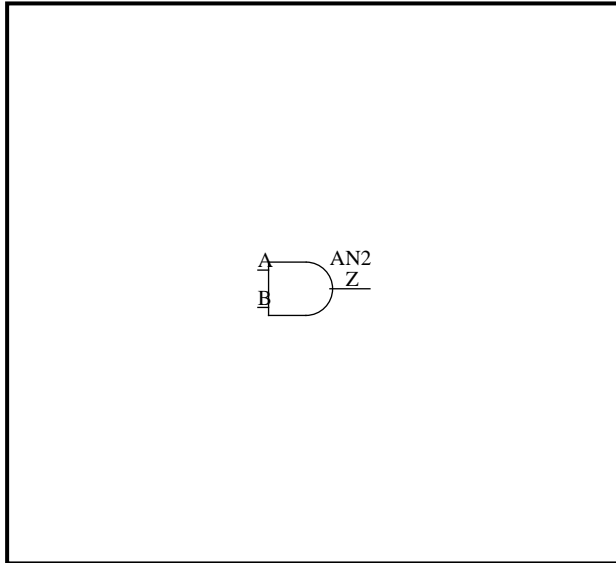
TC200G SERIES

DATA SHEET

AN2	AN2	1/2
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AN2	2-INPUT AND	GATE 2	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	L
H	L	L
H	H	H

Verilog-HDL DESCRIPTION

```
AN2 inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:AN2
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.08
B	1.09

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	45.6

TC200G SERIES

DATA SHEET

AN2

AN2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0939	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.31	0.48	1.12
0.38	0.24	0.38	0.54	1.18
1.00	0.31	0.45	0.61	1.26
3.00	0.46	0.61	0.77	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0397	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.28	0.39	0.85
0.38	0.20	0.30	0.42	0.88
1.00	0.24	0.35	0.47	0.93
3.00	0.31	0.43	0.55	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0939	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.49	1.13
0.38	0.24	0.38	0.54	1.18
1.00	0.29	0.43	0.60	1.24
3.00	0.40	0.54	0.71	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0397	0.07

PATH DELAY (ns)

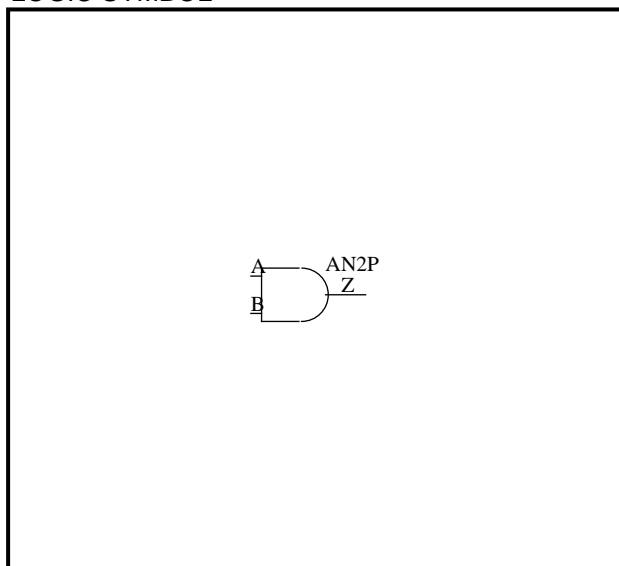
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.31	0.43	0.89
0.38	0.23	0.34	0.46	0.91
1.00	0.29	0.40	0.52	0.98
3.00	0.40	0.53	0.65	1.12

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TC200G SERIES
DATA SHEET

AN2P		AN2P		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AN2P	2-INPUT AND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	L
H	L	L
H	H	H

Verilog-HDL DESCRIPTION

```
AN2P inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:AN2P
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.01
B	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	82.1

TC200G SERIES

DATA SHEET

AN2P

AN2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0546	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.27	0.37	0.74
0.38	0.26	0.35	0.45	0.82
1.00	0.35	0.43	0.53	0.90
3.00	0.54	0.62	0.72	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0203	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.26	0.33	0.58
0.38	0.22	0.28	0.36	0.61
1.00	0.27	0.34	0.41	0.67
3.00	0.36	0.44	0.51	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0546	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.38	0.76
0.38	0.25	0.34	0.44	0.81
1.00	0.32	0.41	0.50	0.88
3.00	0.45	0.54	0.64	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0203	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.29	0.36	0.62
0.38	0.24	0.32	0.39	0.64
1.00	0.31	0.38	0.45	0.71
3.00	0.44	0.52	0.60	0.87

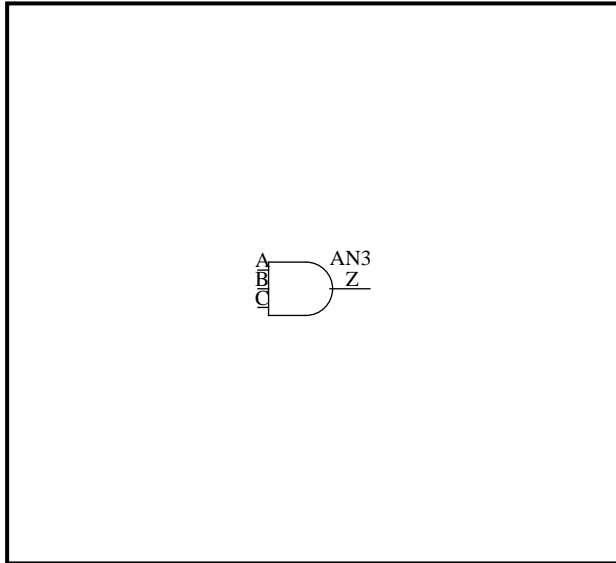
TC200G SERIES

DATA SHEET

AN3		AN3		1/3
-----	--	-----	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AN3	3-INPUT AND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	L
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	H

Verilog-HDL DESCRIPTION

```
AN3 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AN3
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.06
B	1.02
C	0.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	46.0

TC200G SERIES

DATA SHEET

AN3

AN3

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0957	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.55	1.22
0.38	0.31	0.45	0.63	1.29
1.00	0.40	0.55	0.72	1.39
3.00	0.64	0.79	0.97	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0362	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.28	0.40	0.82
0.38	0.21	0.31	0.43	0.85
1.00	0.24	0.35	0.46	0.89
3.00	0.26	0.38	0.50	0.93

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0957	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.40	0.58	1.24
0.38	0.31	0.46	0.63	1.30
1.00	0.40	0.55	0.72	1.39
3.00	0.61	0.76	0.93	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0362	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.32	0.43	0.86
0.38	0.24	0.35	0.46	0.89
1.00	0.28	0.39	0.51	0.94
3.00	0.35	0.47	0.59	1.02

TC200G SERIES

DATA SHEET

AN3

AN3

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0957	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.42	0.59	1.25
0.38	0.31	0.45	0.62	1.29
1.00	0.35	0.50	0.67	1.34
3.00	0.45	0.61	0.78	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0362	0.07

PATH DELAY (ns)

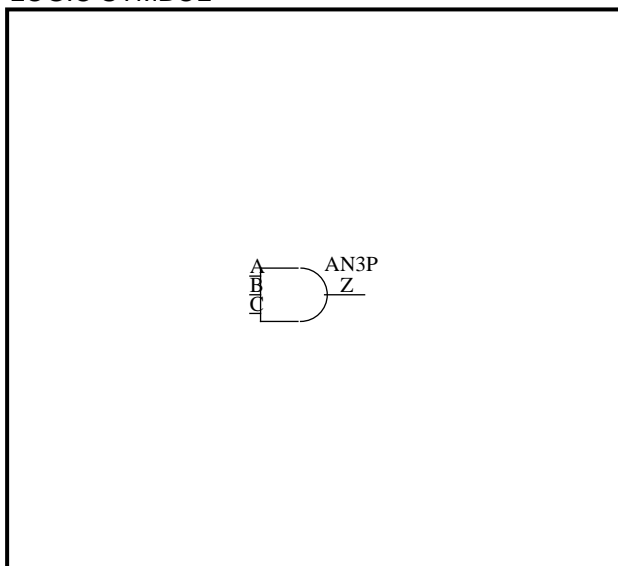
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.35	0.46	0.90
0.38	0.26	0.37	0.49	0.92
1.00	0.32	0.44	0.55	0.99
3.00	0.45	0.58	0.70	1.13

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TC200G SERIES
DATA SHEET

AN3P		AN3P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AN3P	3-INPUT AND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	L
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	H

Verilog-HDL DESCRIPTION

```
AN3P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AN3P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.08
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	78.5

TC200G SERIES

DATA SHEET

AN3P

AN3P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0541	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.35	0.45	0.83
0.38	0.34	0.43	0.53	0.91
1.00	0.45	0.54	0.64	1.02
3.00	0.72	0.81	0.91	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.28	0.36	0.64
0.38	0.23	0.31	0.39	0.67
1.00	0.28	0.35	0.43	0.72
3.00	0.32	0.41	0.49	0.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0541	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.38	0.48	0.86
0.38	0.34	0.43	0.53	0.91
1.00	0.44	0.53	0.63	1.01
3.00	0.67	0.76	0.86	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.68
0.38	0.26	0.34	0.42	0.71
1.00	0.31	0.39	0.47	0.76
3.00	0.39	0.48	0.57	0.87

TC200G SERIES

DATA SHEET

AN3P

AN3P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0541	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.39	0.49	0.87
0.38	0.34	0.43	0.53	0.91
1.00	0.39	0.48	0.58	0.96
3.00	0.52	0.61	0.72	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.71
0.38	0.27	0.36	0.44	0.73
1.00	0.34	0.42	0.51	0.80
3.00	0.46	0.56	0.65	0.95

Rev.1.01.10

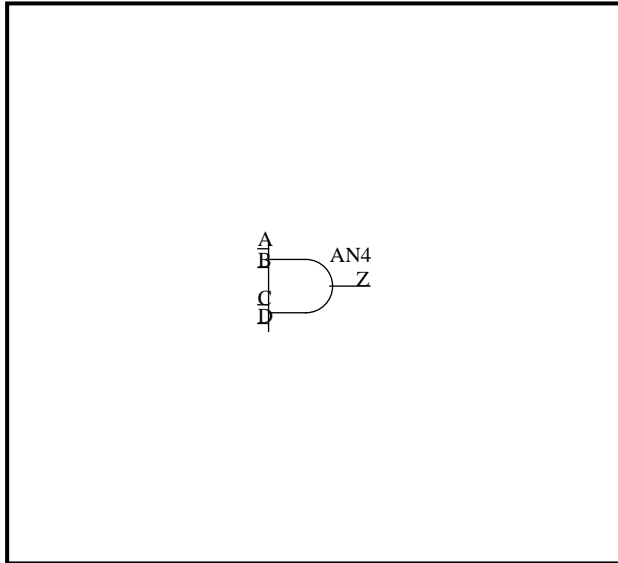
TC200G SERIES

DATA SHEET

AN4		AN4		1/3
-----	--	-----	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AN4	4-INPUT AND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
H	H	H	H	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
AN4 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AN4
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	1.04
C	0.98
D	1.08

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	46.4

TC200G SERIES

DATA SHEET

AN4

AN4

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0928	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.43	0.60	1.25
0.38	0.35	0.50	0.67	1.32
1.00	0.45	0.60	0.78	1.43
3.00	0.74	0.89	1.06	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0370	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.29	0.40	0.84
0.38	0.22	0.32	0.44	0.87
1.00	0.24	0.35	0.47	0.90
3.00	0.23	0.35	0.47	0.92

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0928	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.46	0.63	1.28
0.38	0.37	0.52	0.69	1.34
1.00	0.46	0.61	0.79	1.44
3.00	0.73	0.88	1.05	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0370	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.33	0.44	0.88
0.38	0.25	0.35	0.47	0.91
1.00	0.28	0.40	0.51	0.95
3.00	0.31	0.43	0.56	1.01

Rev.1.01.10

TC200G SERIES

DATA SHEET

AN4

AN4

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0928	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.49	0.67	1.32
0.38	0.38	0.53	0.70	1.35
1.00	0.45	0.60	0.77	1.42
3.00	0.64	0.80	0.97	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0370	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.37	0.49	0.93
0.38	0.28	0.39	0.51	0.95
1.00	0.33	0.45	0.57	1.01
3.00	0.41	0.55	0.67	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0928	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.68	1.33
0.38	0.39	0.54	0.71	1.36
1.00	0.43	0.58	0.76	1.41
3.00	0.56	0.72	0.90	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0370	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.39	0.52	0.96
0.38	0.30	0.41	0.54	0.98
1.00	0.36	0.48	0.60	1.04
3.00	0.47	0.60	0.73	1.19

Rev.1.01.10

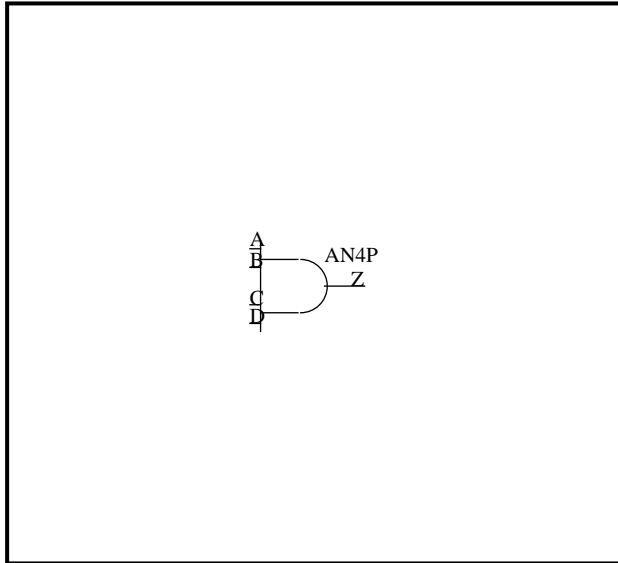
TC200G SERIES

DATA SHEET

AN4P	AN4P	1/3
------	------	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AN4P	4-INPUT AND	GATE 3	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
H	H	H	H	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
AN4P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AN4P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,D	1.06
B,C	1.01

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	78.4

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TC200G SERIES

DATA SHEET

AN4P

AN4P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0539	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.39	0.50	0.89
0.38	0.38	0.47	0.58	0.96
1.00	0.50	0.59	0.69	1.08
3.00	0.81	0.90	1.00	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0237	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.27	0.35	0.64
0.38	0.23	0.31	0.39	0.67
1.00	0.27	0.35	0.43	0.72
3.00	0.28	0.37	0.46	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0539	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.43	0.54	0.92
0.38	0.39	0.49	0.59	0.98
1.00	0.50	0.59	0.69	1.08
3.00	0.78	0.87	0.97	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0237	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.67
0.38	0.26	0.34	0.42	0.70
1.00	0.30	0.39	0.47	0.76
3.00	0.35	0.44	0.53	0.83

TC200G SERIES

DATA SHEET

AN4P

AN4P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0539	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.46	0.57	0.95
0.38	0.41	0.50	0.60	0.99
1.00	0.47	0.56	0.67	1.06
3.00	0.67	0.76	0.87	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0237	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.35	0.43	0.72
0.38	0.29	0.37	0.45	0.75
1.00	0.35	0.43	0.52	0.81
3.00	0.45	0.54	0.63	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0539	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.47	0.58	0.96
0.38	0.41	0.50	0.61	0.99
1.00	0.45	0.54	0.65	1.04
3.00	0.59	0.68	0.79	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0237	0.09

PATH DELAY (ns)

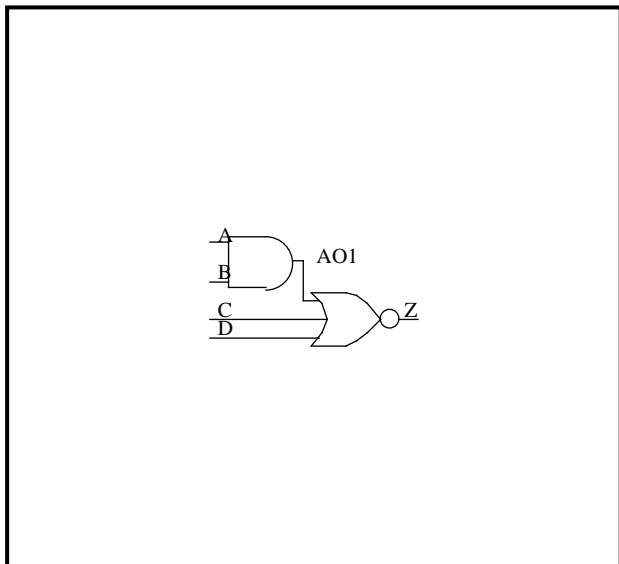
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.34	0.43	0.72
0.38	0.28	0.37	0.45	0.75
1.00	0.34	0.43	0.51	0.81
3.00	0.46	0.55	0.65	0.95

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TC200G SERIES
DATA SHEET

AO1		AO1		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO1	2-INPUT AND into 3-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
L	H	L	L	H
H	L	L	L	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
AO1 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO1
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.08
B	1.05
C	0.98
D	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	14.5

TC200G SERIES

DATA SHEET

AO1

AO1

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.74	1.23	3.17
0.38	0.36	0.75	1.23	3.18
1.00	0.44	0.81	1.29	3.21
3.00	0.69	1.08	1.54	3.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.18	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.20	0.48	0.76	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.67	1.16	3.11
0.38	0.30	0.68	1.17	3.12
1.00	0.37	0.75	1.22	3.15
3.00	0.58	0.99	1.46	3.34

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.24	0.57	0.88	1.79

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TC200G SERIES

DATA SHEET

AO1

AO1

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.77	1.26	3.21
0.38	0.36	0.76	1.25	3.20
1.00	0.39	0.77	1.25	3.19
3.00	0.56	0.94	1.40	3.27

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.31	0.79
0.38	0.16	0.27	0.40	0.88
1.00	0.20	0.36	0.51	1.02
3.00	0.20	0.46	0.70	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.85	1.34	3.28
0.38	0.44	0.84	1.33	3.28
1.00	0.46	0.85	1.33	3.27
3.00	0.64	1.01	1.47	3.34

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.20	0.32	0.81
0.38	0.17	0.28	0.41	0.89
1.00	0.22	0.37	0.52	1.04
3.00	0.23	0.48	0.72	1.39

TC200G SERIES

DATA SHEET

AO1

AO1

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.67	1.08	2.70
0.38	0.33	0.66	1.07	2.70
1.00	0.37	0.69	1.09	2.71
3.00	0.55	0.88	1.27	2.84

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.20	0.32	0.80
0.38	0.17	0.28	0.41	0.89
1.00	0.22	0.37	0.52	1.03
3.00	0.24	0.49	0.72	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	A&~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.80	1.28	3.23
0.38	0.38	0.78	1.27	3.22
1.00	0.37	0.76	1.24	3.18
3.00	0.49	0.86	1.31	3.17

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	A&~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.20	0.32	0.80
0.38	0.16	0.28	0.40	0.89
1.00	0.20	0.37	0.52	1.03
3.00	0.22	0.48	0.71	1.39

TC200G SERIES

DATA SHEET

AO1

AO1

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.87	1.36	3.30
0.38	0.45	0.85	1.34	3.30
1.00	0.44	0.83	1.32	3.26
3.00	0.56	0.93	1.38	3.24

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.21	0.33	0.82
0.38	0.17	0.29	0.42	0.90
1.00	0.23	0.38	0.53	1.05
3.00	0.26	0.50	0.73	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2784	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.69	1.10	2.72
0.38	0.34	0.67	1.09	2.71
1.00	0.34	0.66	1.07	2.68
3.00	0.45	0.77	1.15	2.70

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0656	0.13

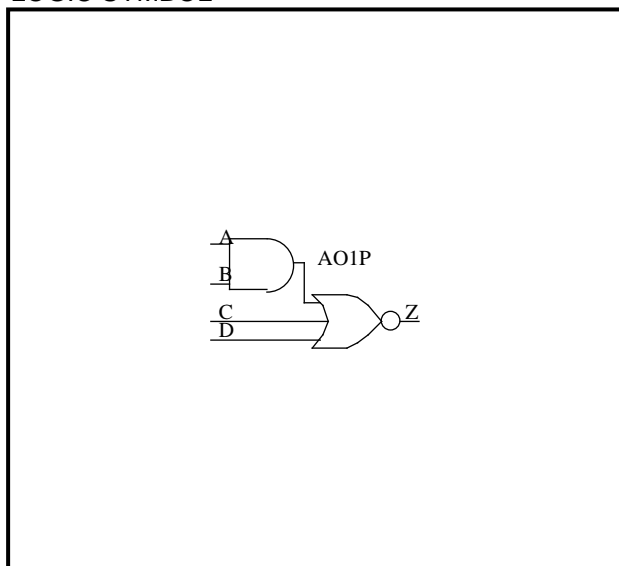
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.21	0.33	0.81
0.38	0.17	0.29	0.41	0.90
1.00	0.23	0.38	0.53	1.04
3.00	0.27	0.51	0.74	1.40

TC200G SERIES
DATA SHEET

AO1P		AO1P		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO1P	2-INPUT AND into 3-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
L	H	L	L	H
H	L	L	L	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
AO1P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO1P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,C	2.08
B	2.16
D	1.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	27.9

TC200G SERIES

DATA SHEET

AO1P

AO1P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.45	0.71	1.72
0.38	0.26	0.46	0.72	1.74
1.00	0.34	0.54	0.78	1.78
3.00	0.55	0.78	1.03	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.16	0.25	0.61
0.38	0.16	0.24	0.34	0.70
1.00	0.19	0.31	0.43	0.83
3.00	0.18	0.38	0.57	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.53	0.78	1.80
0.38	0.33	0.53	0.78	1.80
1.00	0.41	0.61	0.85	1.84
3.00	0.66	0.87	1.12	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.18	0.27	0.62
0.38	0.15	0.23	0.32	0.69
1.00	0.18	0.29	0.39	0.77
3.00	0.15	0.31	0.48	0.97

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO1P

AO1P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.64	0.89	1.91
0.38	0.41	0.62	0.88	1.90
1.00	0.43	0.63	0.88	1.89
3.00	0.60	0.80	1.04	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.14	0.20	0.43
0.38	0.15	0.21	0.28	0.52
1.00	0.19	0.28	0.37	0.65
3.00	0.19	0.34	0.48	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.56	0.82	1.83
0.38	0.33	0.54	0.80	1.82
1.00	0.35	0.55	0.81	1.81
3.00	0.52	0.73	0.97	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.12	0.18	0.42
0.38	0.14	0.20	0.27	0.51
1.00	0.17	0.27	0.36	0.63
3.00	0.15	0.31	0.46	0.89

TC200G SERIES

DATA SHEET

AO1P

AO1P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.49	0.70	1.54
0.38	0.30	0.47	0.69	1.54
1.00	0.34	0.50	0.71	1.55
3.00	0.51	0.69	0.90	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.13	0.19	0.43
0.38	0.15	0.21	0.28	0.52
1.00	0.20	0.28	0.37	0.65
3.00	0.20	0.34	0.49	0.91

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	A&~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.66	0.91	1.93
0.38	0.42	0.63	0.89	1.91
1.00	0.41	0.62	0.87	1.88
3.00	0.54	0.73	0.97	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	A&~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.14	0.20	0.44
0.38	0.16	0.22	0.28	0.53
1.00	0.20	0.29	0.38	0.65
3.00	0.21	0.36	0.50	0.92

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TC200G SERIES

DATA SHEET

AO1P

AO1P

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.58	0.84	1.85
0.38	0.34	0.55	0.81	1.84
1.00	0.34	0.54	0.79	1.80
3.00	0.46	0.67	0.90	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.13	0.19	0.43
0.38	0.14	0.20	0.27	0.52
1.00	0.18	0.27	0.36	0.64
3.00	0.17	0.33	0.47	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1458	0.49

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.51	0.72	1.56
0.38	0.31	0.49	0.70	1.55
1.00	0.31	0.48	0.69	1.52
3.00	0.42	0.60	0.80	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~A&~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0305	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.14	0.20	0.44
0.38	0.16	0.22	0.28	0.52
1.00	0.20	0.29	0.38	0.65
3.00	0.23	0.37	0.51	0.92

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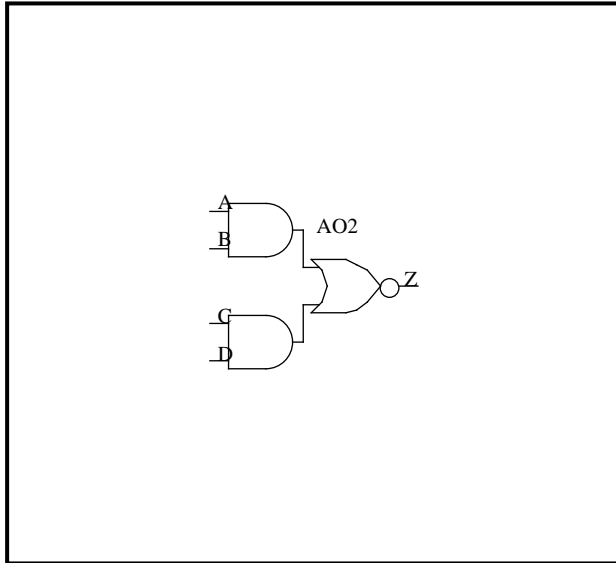
TC200G SERIES

DATA SHEET

AO2	AO2	1/7
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO2	2-WIDE 2-INPUT AND into 2-INPUT NOR	GATE 2	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	H	H	L
L	H	H	H	L
H	L	H	H	L
H	H	L	L	L
H	H	L	H	L
H	H	H	L	L
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
AO2 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO2
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	1.08
C	1.00
D	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	19.5

TC200G SERIES

DATA SHEET

AO2

AO2

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.50	0.85	2.25
0.38	0.23	0.51	0.86	2.27
1.00	0.29	0.57	0.92	2.31
3.00	0.45	0.77	1.13	2.50

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.27	0.59	0.89	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.53	0.86	2.21
0.38	0.27	0.54	0.88	2.23
1.00	0.33	0.61	0.93	2.27
3.00	0.49	0.80	1.14	2.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.28	0.46	1.20
0.38	0.20	0.36	0.55	1.29
1.00	0.25	0.46	0.67	1.43
3.00	0.32	0.62	0.91	1.81

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TC200G SERIES

DATA SHEET

AO2

AO2

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.39	0.65	1.73
0.38	0.19	0.41	0.67	1.75
1.00	0.24	0.46	0.73	1.79
3.00	0.34	0.62	0.91	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.30	0.61	0.90	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.55	0.90	2.30
0.38	0.28	0.56	0.91	2.31
1.00	0.35	0.62	0.96	2.35
3.00	0.54	0.84	1.19	2.55

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.17	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.22	0.50	0.76	1.61

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO2

AO2

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.58	0.92	2.26
0.38	0.32	0.59	0.93	2.27
1.00	0.39	0.65	0.98	2.31
3.00	0.58	0.87	1.20	2.51

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.29	0.48	1.22
0.38	0.19	0.35	0.54	1.28
1.00	0.24	0.42	0.62	1.37
3.00	0.26	0.53	0.79	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.43	0.69	1.77
0.38	0.23	0.44	0.71	1.78
1.00	0.28	0.50	0.77	1.83
3.00	0.43	0.69	0.97	2.04

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.17	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.24	0.51	0.77	1.61

TC200G SERIES

DATA SHEET

AO2

AO2

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.62	0.96	2.30
0.38	0.34	0.62	0.96	2.30
1.00	0.35	0.62	0.95	2.29
3.00	0.43	0.70	1.02	2.31

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.32	0.51	1.25
0.38	0.22	0.38	0.57	1.31
1.00	0.27	0.45	0.65	1.40
3.00	0.33	0.58	0.83	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.57	0.91	2.25
0.38	0.29	0.57	0.90	2.25
1.00	0.30	0.57	0.90	2.23
3.00	0.38	0.65	0.97	2.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.49	1.23
0.38	0.20	0.36	0.55	1.29
1.00	0.25	0.43	0.63	1.38
3.00	0.30	0.56	0.81	1.64

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TC200G SERIES

DATA SHEET

AO2

AO2

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.45	0.71	1.72
0.38	0.25	0.46	0.71	1.73
1.00	0.26	0.47	0.73	1.74
3.00	0.34	0.56	0.82	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.32	0.50	1.24
0.38	0.21	0.37	0.56	1.30
1.00	0.27	0.45	0.64	1.39
3.00	0.34	0.59	0.84	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.60	0.95	2.35
0.38	0.31	0.60	0.96	2.36
1.00	0.32	0.60	0.95	2.34
3.00	0.37	0.67	1.01	2.37

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.31	0.50	1.24
0.38	0.23	0.39	0.58	1.32
1.00	0.30	0.49	0.70	1.46
3.00	0.40	0.68	0.96	1.85

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO2

AO2

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.55	0.90	2.30
0.38	0.26	0.55	0.90	2.31
1.00	0.27	0.55	0.90	2.29
3.00	0.32	0.61	0.96	2.32

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.29	0.48	1.22
0.38	0.21	0.37	0.56	1.30
1.00	0.27	0.47	0.68	1.44
3.00	0.36	0.65	0.94	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2017	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.44	0.71	1.78
0.38	0.22	0.45	0.72	1.80
1.00	0.24	0.46	0.74	1.81
3.00	0.29	0.54	0.82	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.49	1.23
0.38	0.22	0.38	0.57	1.31
1.00	0.30	0.49	0.70	1.45
3.00	0.41	0.69	0.97	1.85

Rev.1.01.10

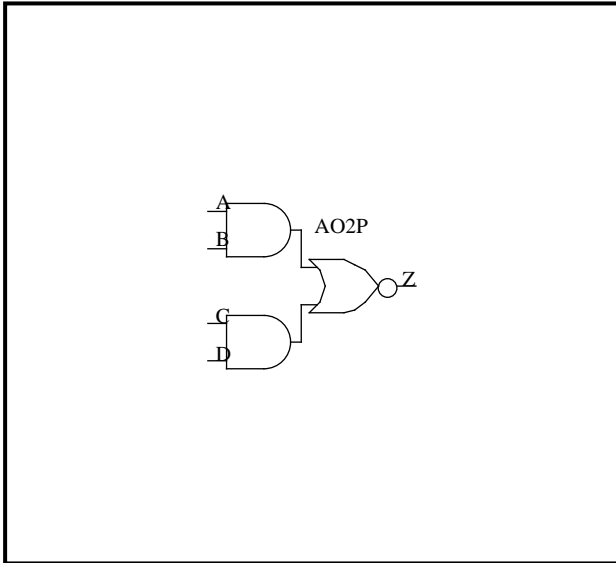
TC200G SERIES

DATA SHEET

AO2P		AO2P		1/7
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO2P	2-WIDE 2-INPUT AND into 2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	H	H	L
L	H	H	H	L
H	L	H	H	L
H	H	L	L	L
H	H	L	H	L
H	H	H	L	L
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
AO2P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO2P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.00
B,D	2.15
C	2.16

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	37.8

TC200G SERIES

DATA SHEET

AO2P

AO2P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.33	0.51	1.21
0.38	0.20	0.34	0.52	1.23
1.00	0.26	0.41	0.58	1.28
3.00	0.41	0.59	0.79	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.17	0.26	0.63
0.38	0.16	0.24	0.34	0.72
1.00	0.19	0.32	0.44	0.85
3.00	0.22	0.41	0.59	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.56	1.27
0.38	0.26	0.40	0.58	1.29
1.00	0.32	0.46	0.64	1.33
3.00	0.48	0.65	0.84	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.19	0.28	0.65
0.38	0.18	0.26	0.36	0.74
1.00	0.23	0.34	0.46	0.87
3.00	0.27	0.45	0.62	1.16

TC200G SERIES

DATA SHEET

AO2P

AO2P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.27	0.41	0.98
0.38	0.17	0.29	0.43	1.00
1.00	0.22	0.34	0.49	1.05
3.00	0.33	0.49	0.66	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.17	0.26	0.63
0.38	0.15	0.24	0.34	0.71
1.00	0.20	0.32	0.44	0.85
3.00	0.24	0.43	0.61	1.15

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.56	1.27
0.38	0.25	0.39	0.57	1.28
1.00	0.32	0.46	0.64	1.33
3.00	0.51	0.68	0.86	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.27	0.65
0.38	0.16	0.24	0.33	0.71
1.00	0.19	0.29	0.40	0.79
3.00	0.18	0.34	0.50	1.00

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO2P

AO2P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.44	0.62	1.33
0.38	0.31	0.45	0.63	1.34
1.00	0.37	0.52	0.69	1.38
3.00	0.58	0.74	0.91	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.20	0.30	0.67
0.38	0.18	0.26	0.35	0.73
1.00	0.21	0.31	0.42	0.81
3.00	0.22	0.37	0.53	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.31	0.46	1.02
0.38	0.21	0.33	0.47	1.04
1.00	0.27	0.39	0.53	1.09
3.00	0.43	0.57	0.73	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.27	0.65
0.38	0.15	0.24	0.33	0.71
1.00	0.19	0.29	0.40	0.79
3.00	0.20	0.35	0.51	1.01

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO2P

AO2P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.49	0.66	1.37
0.38	0.33	0.48	0.66	1.37
1.00	0.34	0.48	0.65	1.35
3.00	0.41	0.56	0.73	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.23	0.33	0.70
0.38	0.20	0.28	0.38	0.76
1.00	0.25	0.35	0.45	0.84
3.00	0.30	0.44	0.59	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.61	1.32
0.38	0.28	0.42	0.60	1.31
1.00	0.28	0.42	0.60	1.30
3.00	0.36	0.50	0.68	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.21	0.31	0.68
0.38	0.18	0.26	0.36	0.74
1.00	0.22	0.32	0.43	0.82
3.00	0.26	0.41	0.56	1.04

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO2P

AO2P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.34	0.48	1.01
0.38	0.23	0.34	0.48	1.01
1.00	0.25	0.36	0.49	1.02
3.00	0.32	0.44	0.58	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.23	0.32	0.69
0.38	0.20	0.28	0.37	0.75
1.00	0.25	0.34	0.45	0.84
3.00	0.31	0.45	0.59	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.61	1.32
0.38	0.28	0.43	0.61	1.32
1.00	0.28	0.43	0.60	1.31
3.00	0.33	0.48	0.66	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.22	0.31	0.69
0.38	0.21	0.29	0.39	0.77
1.00	0.27	0.38	0.50	0.90
3.00	0.37	0.52	0.69	1.21

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO2P

AO2P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.56	1.26
0.38	0.23	0.37	0.55	1.27
1.00	0.23	0.37	0.55	1.25
3.00	0.27	0.42	0.60	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.20	0.29	0.67
0.38	0.19	0.27	0.37	0.75
1.00	0.24	0.36	0.48	0.88
3.00	0.32	0.49	0.66	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1014	0.31

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.31	0.44	0.97
0.38	0.19	0.31	0.44	0.98
1.00	0.20	0.32	0.45	0.99
3.00	0.24	0.37	0.52	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0319	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.21	0.31	0.68
0.38	0.21	0.29	0.39	0.76
1.00	0.27	0.38	0.50	0.89
3.00	0.38	0.54	0.70	1.22

Rev.1.01.10

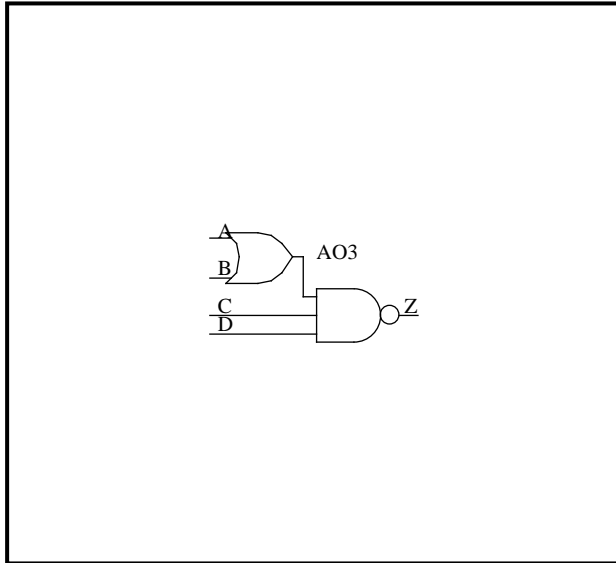
TC200G SERIES

DATA SHEET

AO3	AO3	1/5
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO3	2-INPUT OR into 3-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	H	H	H	L
H	L	H	H	L
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
AO3 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO3
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.05
B	1.08
C	0.98
D	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	19.4

TC200G SERIES

DATA SHEET

AO3

AO3

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.21	0.46	0.77	2.01
1.00	0.24	0.51	0.82	2.05
3.00	0.31	0.63	0.97	2.22

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.38	0.66	1.77
0.38	0.23	0.46	0.74	1.86
1.00	0.30	0.58	0.87	2.00
3.00	0.43	0.81	1.19	2.42

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.01
0.38	0.21	0.47	0.78	2.02
1.00	0.21	0.47	0.78	2.02
3.00	0.20	0.49	0.81	2.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.41	0.68	1.80
0.38	0.26	0.49	0.77	1.88
1.00	0.34	0.61	0.90	2.02
3.00	0.51	0.86	1.23	2.45

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO3

AO3

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.31	0.48	1.16
0.38	0.19	0.33	0.51	1.19
1.00	0.22	0.38	0.56	1.24
3.00	0.25	0.45	0.67	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.37	0.61	1.54
0.38	0.24	0.44	0.67	1.60
1.00	0.32	0.53	0.78	1.71
3.00	0.47	0.75	1.04	2.05

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.29	0.47	1.15
0.38	0.18	0.32	0.49	1.18
1.00	0.20	0.36	0.55	1.23
3.00	0.21	0.42	0.64	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.43	0.71	1.82
0.38	0.25	0.48	0.76	1.88
1.00	0.32	0.56	0.84	1.96
3.00	0.47	0.76	1.08	2.23

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO3

AO3

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.30	0.48	1.16
0.38	0.19	0.33	0.50	1.19
1.00	0.21	0.37	0.56	1.24
3.00	0.22	0.43	0.65	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.46	0.74	1.85
0.38	0.28	0.51	0.79	1.91
1.00	0.35	0.59	0.87	1.99
3.00	0.51	0.80	1.11	2.26

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.33	0.50	1.19
0.38	0.21	0.35	0.52	1.21
1.00	0.25	0.40	0.58	1.26
3.00	0.30	0.50	0.71	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.39	0.62	1.55
0.38	0.24	0.43	0.67	1.60
1.00	0.29	0.50	0.73	1.67
3.00	0.40	0.65	0.92	1.89

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TC200G SERIES

DATA SHEET

AO3

AO3

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.31	0.49	1.17
0.38	0.19	0.34	0.51	1.20
1.00	0.22	0.38	0.57	1.25
3.00	0.25	0.46	0.68	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.44	0.72	1.83
0.38	0.25	0.48	0.76	1.88
1.00	0.30	0.53	0.81	1.93
3.00	0.40	0.67	0.97	2.10

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.50	1.19
0.38	0.20	0.35	0.52	1.21
1.00	0.23	0.39	0.58	1.26
3.00	0.26	0.47	0.69	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1000	0.19

PATH DELAY (ns)

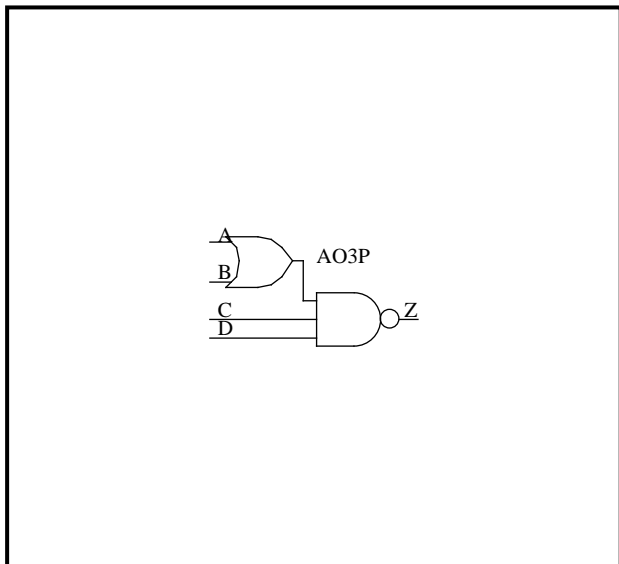
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.47	0.75	1.86
0.38	0.28	0.51	0.79	1.91
1.00	0.33	0.56	0.84	1.96
3.00	0.44	0.71	1.00	2.13

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TC200G SERIES
DATA SHEET

AO3P		AO3P		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO3P	2-INPUT OR into 3-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	H	H	H	L
H	L	H	H	L
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
AO3P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO3P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	2.17
C	2.05
D	1.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	38.0

TC200G SERIES

DATA SHEET

AO3P

AO3P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.29	0.44	1.06
0.38	0.18	0.31	0.46	1.09
1.00	0.20	0.34	0.51	1.13
3.00	0.25	0.42	0.62	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.26	0.41	1.01
0.38	0.21	0.34	0.50	1.10
1.00	0.27	0.44	0.62	1.24
3.00	0.40	0.64	0.87	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.31	0.46	1.08
0.38	0.18	0.31	0.47	1.09
1.00	0.18	0.31	0.47	1.09
3.00	0.14	0.30	0.48	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.29	0.44	1.04
0.38	0.24	0.37	0.52	1.12
1.00	0.32	0.48	0.65	1.26
3.00	0.49	0.70	0.92	1.65

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO3P

AO3P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.22	0.31	0.65
0.38	0.17	0.25	0.33	0.68
1.00	0.20	0.28	0.38	0.74
3.00	0.22	0.33	0.45	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.27	0.40	0.89
0.38	0.23	0.33	0.46	0.96
1.00	0.29	0.41	0.55	1.06
3.00	0.44	0.60	0.76	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.21	0.29	0.64
0.38	0.16	0.23	0.32	0.66
1.00	0.17	0.26	0.36	0.72
3.00	0.16	0.28	0.41	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.31	0.46	1.06
0.38	0.23	0.36	0.51	1.11
1.00	0.29	0.43	0.58	1.19
3.00	0.43	0.60	0.78	1.43

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO3P

AO3P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.22	0.31	0.65
0.38	0.17	0.24	0.33	0.67
1.00	0.18	0.27	0.37	0.73
3.00	0.18	0.29	0.42	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.34	0.49	1.10
0.38	0.26	0.39	0.54	1.15
1.00	0.33	0.46	0.62	1.22
3.00	0.48	0.64	0.82	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.24	0.33	0.67
0.38	0.19	0.26	0.35	0.70
1.00	0.22	0.31	0.40	0.76
3.00	0.26	0.37	0.49	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.29	0.41	0.91
0.38	0.23	0.33	0.46	0.95
1.00	0.27	0.39	0.52	1.02
3.00	0.37	0.51	0.67	1.21

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TC200G SERIES

DATA SHEET

AO3P

AO3P

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.22	0.31	0.66
0.38	0.17	0.25	0.34	0.68
1.00	0.19	0.28	0.38	0.74
3.00	0.20	0.31	0.44	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.32	0.47	1.08
0.38	0.24	0.36	0.51	1.12
1.00	0.28	0.41	0.56	1.16
3.00	0.37	0.53	0.70	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.23	0.32	0.67
0.38	0.18	0.26	0.35	0.69
1.00	0.20	0.29	0.39	0.75
3.00	0.22	0.33	0.45	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0537	0.21

PATH DELAY (ns)

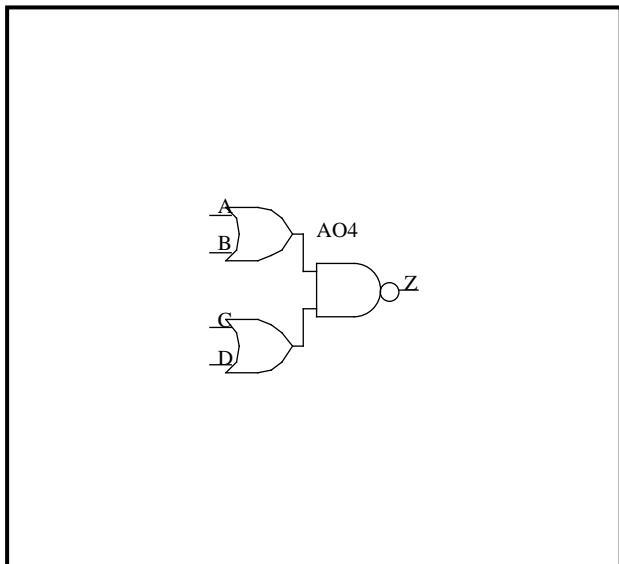
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.50	1.11
0.38	0.27	0.39	0.55	1.15
1.00	0.31	0.44	0.59	1.20
3.00	0.41	0.56	0.73	1.35

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TC200G SERIES
DATA SHEET

AO4		AO4		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO4	2-WIDE 2-INPUT OR into 2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
L	L	L	H	H
L	L	H	L	H
L	L	H	H	H
L	H	L	L	H
H	L	L	L	H
H	H	L	L	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
AO4 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO4
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	1.08
C	1.00
D	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	20.2

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TC200G SERIES

DATA SHEET

AO4

AO4

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.74	1.98
0.38	0.20	0.45	0.76	2.00
1.00	0.25	0.51	0.81	2.04
3.00	0.38	0.68	1.01	2.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.24	0.41	1.10
0.38	0.17	0.32	0.50	1.19
1.00	0.22	0.42	0.62	1.33
3.00	0.27	0.58	0.87	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.00
0.38	0.22	0.47	0.78	2.02
1.00	0.27	0.53	0.83	2.06
3.00	0.38	0.68	1.01	2.25

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.30	0.51	1.33
0.38	0.21	0.39	0.60	1.42
1.00	0.28	0.50	0.72	1.56
3.00	0.38	0.70	1.00	1.97

TC200G SERIES

DATA SHEET

AO4

AO4

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.20	0.45	0.76	2.00
1.00	0.25	0.51	0.81	2.04
3.00	0.35	0.66	0.99	2.23

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.30	0.51	1.38
0.38	0.19	0.38	0.60	1.47
1.00	0.25	0.49	0.73	1.61
3.00	0.34	0.69	1.01	2.02

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.00
0.38	0.20	0.46	0.77	2.01
1.00	0.22	0.47	0.78	2.01
3.00	0.28	0.55	0.86	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.43	1.12
0.38	0.19	0.34	0.51	1.20
1.00	0.24	0.44	0.64	1.35
3.00	0.33	0.62	0.90	1.75

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TC200G SERIES

DATA SHEET

AO4

AO4

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.48	0.79	2.03
0.38	0.23	0.48	0.79	2.03
1.00	0.24	0.49	0.80	2.03
3.00	0.27	0.55	0.86	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.32	0.53	1.35
0.38	0.23	0.41	0.61	1.44
1.00	0.31	0.52	0.74	1.58
3.00	0.44	0.74	1.04	1.99

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.01
0.38	0.21	0.46	0.77	2.01
1.00	0.21	0.47	0.78	2.01
3.00	0.24	0.52	0.84	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.32	0.54	1.40
0.38	0.21	0.40	0.62	1.49
1.00	0.28	0.51	0.75	1.63
3.00	0.41	0.73	1.04	2.05

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TC200G SERIES

DATA SHEET

AO4

AO4

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.57	0.88	2.12
0.38	0.31	0.56	0.88	2.11
1.00	0.34	0.58	0.89	2.11
3.00	0.44	0.69	0.99	2.18

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.26	0.42	1.05
0.38	0.19	0.33	0.49	1.12
1.00	0.24	0.40	0.58	1.22
3.00	0.29	0.53	0.76	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.55	0.86	2.09
0.38	0.29	0.54	0.85	2.09
1.00	0.31	0.55	0.86	2.09
3.00	0.40	0.65	0.95	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.33	0.53	1.36
0.38	0.21	0.38	0.58	1.41
1.00	0.25	0.44	0.65	1.48
3.00	0.29	0.55	0.81	1.69

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO4

AO4

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CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.57	0.88	2.11
0.38	0.31	0.56	0.87	2.11
1.00	0.33	0.57	0.88	2.11
3.00	0.42	0.67	0.97	2.17

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.35	0.56	1.38
0.38	0.23	0.40	0.61	1.43
1.00	0.28	0.46	0.67	1.50
3.00	0.33	0.58	0.83	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.55	0.86	2.10
0.38	0.31	0.56	0.87	2.11
1.00	0.37	0.62	0.92	2.15
3.00	0.56	0.82	1.13	2.35

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.27	0.44	1.11
0.38	0.19	0.33	0.51	1.18
1.00	0.24	0.41	0.60	1.29
3.00	0.28	0.53	0.79	1.58

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO4

AO4

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.53	0.84	2.07
0.38	0.28	0.54	0.85	2.08
1.00	0.34	0.59	0.90	2.12
3.00	0.51	0.79	1.10	2.32

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.33	0.54	1.41
0.38	0.20	0.38	0.60	1.47
1.00	0.24	0.44	0.67	1.54
3.00	0.27	0.55	0.83	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.55	0.86	2.10
0.38	0.30	0.56	0.87	2.10
1.00	0.36	0.61	0.92	2.14
3.00	0.54	0.81	1.12	2.33

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0775	0.17

PATH DELAY (ns)

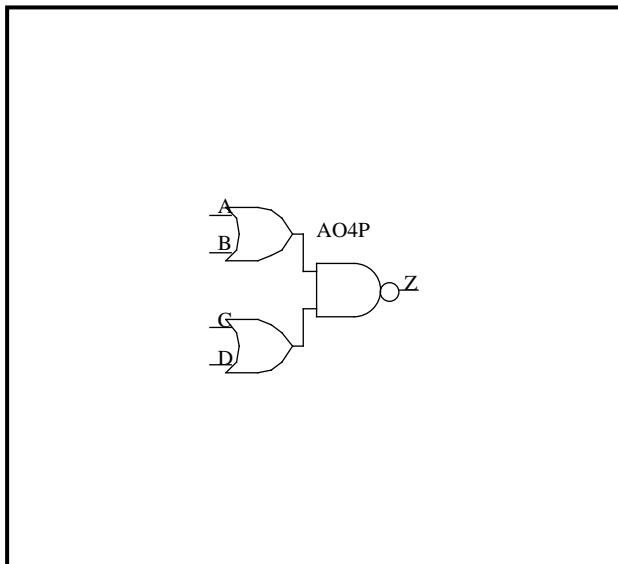
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.35	0.57	1.44
0.38	0.23	0.40	0.62	1.49
1.00	0.27	0.47	0.69	1.57
3.00	0.32	0.58	0.86	1.79

Rev.1.01.10

TC200G SERIES
DATA SHEET

AO4P		AO4P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO4P	2-WIDE 2-INPUT OR into 2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
L	L	L	H	H
L	L	H	L	H
L	L	H	H	H
L	H	L	L	H
H	L	L	L	H
H	H	L	L	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
AO4P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:AO4P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	2.17
C	1.98
D	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	39.1

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TC200G SERIES

DATA SHEET

AO4P

AO4P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.28	0.44	1.06
0.38	0.17	0.30	0.46	1.08
1.00	0.21	0.35	0.51	1.12
3.00	0.32	0.48	0.67	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.17	0.27	0.66
0.38	0.16	0.25	0.36	0.75
1.00	0.21	0.34	0.47	0.89
3.00	0.26	0.46	0.65	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.30	0.46	1.08
0.38	0.19	0.32	0.48	1.10
1.00	0.23	0.37	0.53	1.14
3.00	0.31	0.48	0.66	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.23	0.35	0.83
0.38	0.21	0.32	0.44	0.91
1.00	0.28	0.41	0.56	1.06
3.00	0.39	0.58	0.78	1.41

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO4P

AO4P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.28	0.44	1.06
0.38	0.17	0.30	0.46	1.08
1.00	0.21	0.35	0.51	1.12
3.00	0.28	0.46	0.64	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.21	0.33	0.80
0.38	0.18	0.29	0.41	0.89
1.00	0.23	0.38	0.53	1.03
3.00	0.32	0.53	0.74	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.31	0.46	1.08
0.38	0.17	0.30	0.46	1.09
1.00	0.18	0.31	0.47	1.09
3.00	0.21	0.36	0.53	1.15

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.19	0.29	0.68
0.38	0.18	0.27	0.37	0.77
1.00	0.24	0.36	0.49	0.91
3.00	0.33	0.51	0.69	1.25

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO4P

AO4P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.33	0.48	1.10
0.38	0.19	0.33	0.49	1.11
1.00	0.20	0.33	0.49	1.11
3.00	0.20	0.35	0.53	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.25	0.37	0.85
0.38	0.23	0.34	0.46	0.93
1.00	0.31	0.44	0.58	1.08
3.00	0.46	0.64	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.31	0.46	1.08
0.38	0.17	0.31	0.46	1.09
1.00	0.18	0.31	0.47	1.09
3.00	0.18	0.33	0.50	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.23	0.35	0.83
0.38	0.20	0.31	0.43	0.91
1.00	0.27	0.41	0.55	1.05
3.00	0.40	0.59	0.79	1.41

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TC200G SERIES

DATA SHEET

AO4P

AO4P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.42	0.57	1.19
0.38	0.28	0.41	0.57	1.19
1.00	0.30	0.43	0.58	1.19
3.00	0.39	0.52	0.68	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.22	0.31	0.67
0.38	0.19	0.27	0.37	0.74
1.00	0.24	0.34	0.44	0.83
3.00	0.30	0.43	0.58	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.39	0.55	1.17
0.38	0.26	0.39	0.54	1.17
1.00	0.27	0.40	0.55	1.17
3.00	0.34	0.47	0.63	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.26	0.38	0.86
0.38	0.21	0.31	0.43	0.90
1.00	0.25	0.36	0.48	0.97
3.00	0.29	0.45	0.61	1.15

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TC200G SERIES

DATA SHEET

AO4P

AO4P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.57	1.19
0.38	0.28	0.41	0.56	1.19
1.00	0.29	0.42	0.57	1.19
3.00	0.36	0.50	0.65	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.29	0.41	0.88
0.38	0.23	0.33	0.45	0.93
1.00	0.28	0.38	0.51	0.99
3.00	0.34	0.48	0.64	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.40	0.55	1.17
0.38	0.28	0.41	0.56	1.18
1.00	0.34	0.47	0.62	1.23
3.00	0.52	0.66	0.82	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.20	0.29	0.66
0.38	0.18	0.26	0.35	0.72
1.00	0.22	0.32	0.43	0.81
3.00	0.24	0.39	0.55	1.03

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO4P

AO4P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.53	1.15
0.38	0.26	0.38	0.54	1.16
1.00	0.31	0.44	0.60	1.20
3.00	0.47	0.62	0.78	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.24	0.36	0.83
0.38	0.19	0.29	0.41	0.89
1.00	0.22	0.34	0.46	0.95
3.00	0.24	0.40	0.57	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.39	0.55	1.17
0.38	0.28	0.40	0.56	1.18
1.00	0.33	0.46	0.62	1.22
3.00	0.49	0.64	0.80	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0420	0.20

PATH DELAY (ns)

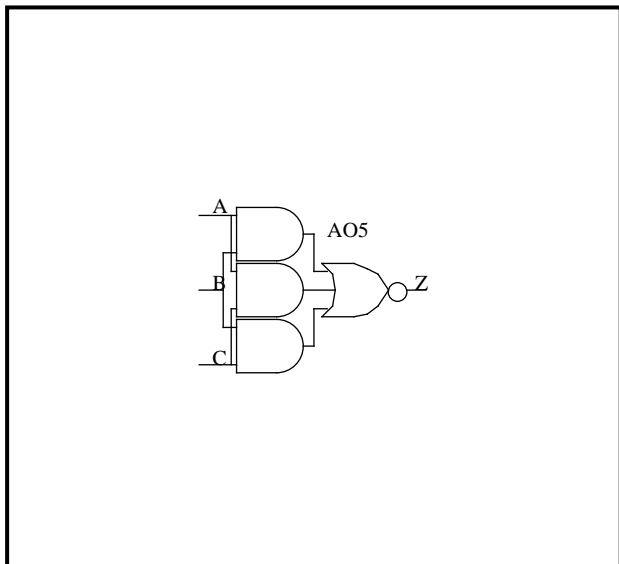
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.26	0.38	0.86
0.38	0.21	0.31	0.43	0.91
1.00	0.25	0.36	0.49	0.97
3.00	0.29	0.44	0.60	1.15

Rev.1.01.10

TC200G SERIES
DATA SHEET

AO5		AO5		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO5	INVERTING 2 of 3 MAJORITY GATE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	H
L	H	L	H
H	L	L	H
ALL OTHER COMBINATIONS			L

Verilog-HDL DESCRIPTION

```
AO5 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AO5
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.98
B	1.97
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	18.0

TC200G SERIES

DATA SHEET

AO5

AO5

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1896	0.78

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.61	0.91	2.09
0.38	0.37	0.62	0.92	2.10
1.00	0.42	0.67	0.96	2.14
3.00	0.58	0.84	1.15	2.32

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0739	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.54	1.28
0.38	0.29	0.44	0.63	1.37
1.00	0.37	0.56	0.76	1.51
3.00	0.49	0.76	1.03	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1896	0.78

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.60	0.91	2.15
0.38	0.36	0.61	0.93	2.18
1.00	0.41	0.66	0.97	2.21
3.00	0.57	0.84	1.16	2.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0739	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.51	1.20
0.38	0.27	0.42	0.59	1.29
1.00	0.35	0.53	0.72	1.43
3.00	0.45	0.71	0.98	1.81

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO5

AO5

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1896	0.78

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.73	1.06	2.37
0.38	0.45	0.72	1.05	2.37
1.00	0.50	0.77	1.09	2.41
3.00	0.70	0.97	1.30	2.59

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0739	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.36	0.54	1.28
0.38	0.26	0.42	0.60	1.34
1.00	0.32	0.49	0.69	1.44
3.00	0.37	0.61	0.87	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1896	0.78

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.60	0.90	2.14
0.38	0.34	0.59	0.90	2.14
1.00	0.34	0.60	0.91	2.14
3.00	0.39	0.65	0.97	2.18

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0739	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.40	0.61	1.44
0.38	0.31	0.49	0.69	1.52
1.00	0.41	0.61	0.83	1.66
3.00	0.58	0.85	1.14	2.08

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TC200G SERIES

DATA SHEET

AO5

AO5

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1896	0.78

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.70	1.02	2.34
0.38	0.42	0.69	1.02	2.33
1.00	0.43	0.69	1.02	2.32
3.00	0.53	0.78	1.10	2.36

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0739	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.34	0.51	1.21
0.38	0.25	0.40	0.57	1.27
1.00	0.31	0.47	0.65	1.36
3.00	0.38	0.60	0.83	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1896	0.78

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.60	0.89	2.07
0.38	0.36	0.60	0.89	2.07
1.00	0.37	0.61	0.90	2.07
3.00	0.45	0.69	0.98	2.12

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0739	0.29

PATH DELAY (ns)

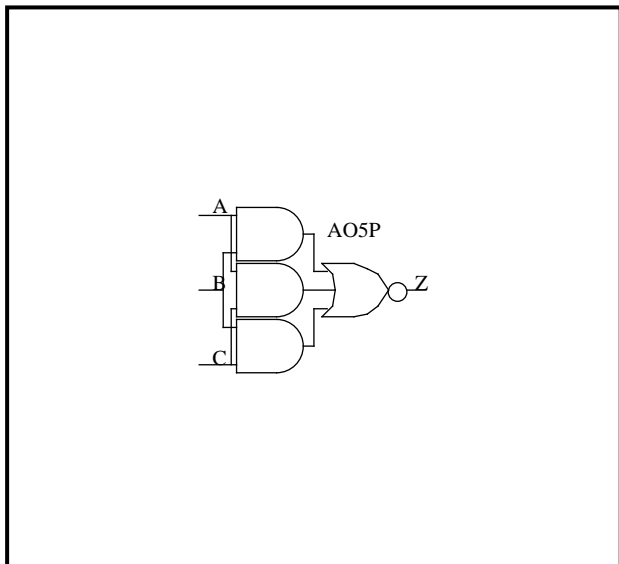
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.40	0.61	1.43
0.38	0.28	0.45	0.66	1.48
1.00	0.33	0.51	0.72	1.55
3.00	0.41	0.64	0.89	1.77

Rev.1.01.10

TC200G SERIES
DATA SHEET

AO5P		AO5P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO5P	INVERTING 2 of 3 MAJORITY GATE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	H
L	H	L	H
H	L	L	H
ALL OTHER COMBINATIONS			L

Verilog-HDL DESCRIPTION

```
AO5P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AO5P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	4.14
B	3.97
C	2.19

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	30.2

TC200G SERIES

DATA SHEET

AO5P

AO5P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1114	0.85

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.47	0.63	1.25
0.38	0.34	0.47	0.63	1.26
1.00	0.39	0.52	0.68	1.30
3.00	0.55	0.69	0.86	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0432	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.24	0.34	0.70
0.38	0.25	0.33	0.42	0.79
1.00	0.33	0.43	0.54	0.92
3.00	0.42	0.57	0.73	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1114	0.85

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.59	1.21
0.38	0.31	0.44	0.60	1.23
1.00	0.36	0.49	0.65	1.27
3.00	0.50	0.65	0.82	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0432	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.24	0.34	0.70
0.38	0.25	0.33	0.42	0.78
1.00	0.32	0.43	0.54	0.92
3.00	0.41	0.57	0.73	1.24

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO5P

AO5P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1114	0.85

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.62	0.82	1.58
0.38	0.45	0.61	0.80	1.57
1.00	0.50	0.66	0.85	1.61
3.00	0.72	0.88	1.07	1.82

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0432	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.24	0.33	0.69
0.38	0.23	0.30	0.39	0.76
1.00	0.27	0.37	0.47	0.84
3.00	0.29	0.43	0.58	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1114	0.85

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.42	0.58	1.19
0.38	0.29	0.41	0.57	1.20
1.00	0.29	0.42	0.58	1.20
3.00	0.30	0.44	0.61	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0432	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.33	0.46	0.94
0.38	0.32	0.42	0.54	1.03
1.00	0.41	0.53	0.67	1.17
3.00	0.59	0.76	0.94	1.54

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TC200G SERIES

DATA SHEET

AO5P

AO5P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1114	0.85

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.60	0.79	1.55
0.38	0.43	0.58	0.78	1.54
1.00	0.43	0.58	0.77	1.53
3.00	0.53	0.68	0.86	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0432	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.25	0.34	0.71
0.38	0.23	0.31	0.40	0.77
1.00	0.29	0.38	0.48	0.85
3.00	0.35	0.47	0.61	1.07

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1114	0.85

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.46	0.62	1.24
0.38	0.33	0.46	0.62	1.24
1.00	0.34	0.47	0.62	1.24
3.00	0.41	0.54	0.70	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0432	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.34	0.46	0.94
0.38	0.28	0.38	0.50	0.99
1.00	0.33	0.43	0.56	1.05
3.00	0.40	0.54	0.69	1.23

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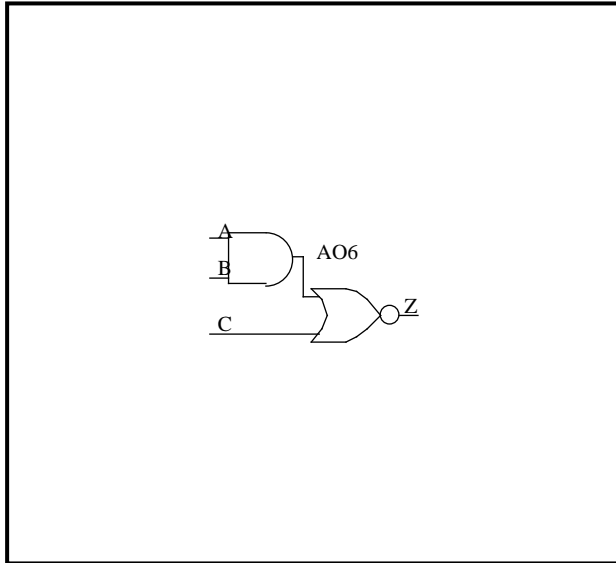
TC200G SERIES

DATA SHEET

AO6	AO6	1/4
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO6	2-INPUT AND into 2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	H	L	H
H	L	L	H
ALL OTHER COMBINATIONS			L

Verilog-HDL DESCRIPTION

```
AO6 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AO6
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.03
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	20.1

TC200G SERIES

DATA SHEET

AO6

AO6

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.53	0.87	2.22
0.38	0.27	0.54	0.88	2.24
1.00	0.34	0.61	0.94	2.28
3.00	0.53	0.82	1.16	2.48

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.17	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.22	0.50	0.76	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.48	0.82	2.17
0.38	0.23	0.50	0.84	2.19
1.00	0.28	0.56	0.89	2.24
3.00	0.43	0.75	1.10	2.43

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.27	0.59	0.89	1.79

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO6

AO6

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.52	0.86	2.22
0.38	0.24	0.52	0.86	2.22
1.00	0.26	0.53	0.86	2.20
3.00	0.37	0.64	0.97	2.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.29	0.74
0.38	0.14	0.25	0.37	0.83
1.00	0.19	0.34	0.49	0.97
3.00	0.21	0.45	0.67	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.57	0.91	2.27
0.38	0.29	0.57	0.91	2.27
1.00	0.31	0.58	0.91	2.26
3.00	0.42	0.69	1.01	2.31

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.19	0.30	0.76
0.38	0.16	0.27	0.39	0.84
1.00	0.21	0.35	0.50	0.98
3.00	0.24	0.47	0.69	1.33

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO6

AO6

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.42	0.67	1.70
0.38	0.21	0.42	0.68	1.71
1.00	0.24	0.44	0.70	1.72
3.00	0.33	0.56	0.82	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.12

PATH DELAY (ns)

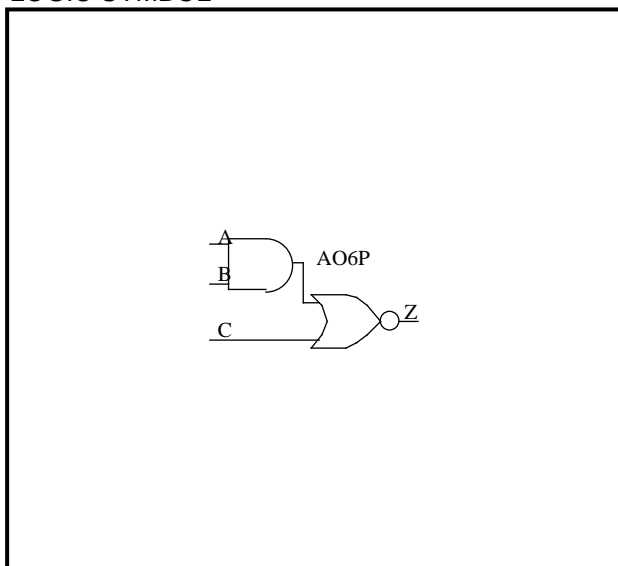
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.18	0.30	0.75
0.38	0.16	0.26	0.38	0.84
1.00	0.21	0.35	0.50	0.98
3.00	0.25	0.48	0.70	1.33

Rev.1.01.10

TC200G SERIES
DATA SHEET

AO6P		AO6P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO6P	2-INPUT AND into 2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	H	L	H
H	L	L	H
ALL OTHER COMBINATIONS			L

Verilog-HDL DESCRIPTION

```
AO6P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AO6P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.11
B	2.03
C	1.96

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	39.3

TC200G SERIES

DATA SHEET

AO6P

AO6P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1001	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.54	1.24
0.38	0.24	0.38	0.55	1.25
1.00	0.31	0.45	0.62	1.30
3.00	0.50	0.66	0.84	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.18	0.27	0.64
0.38	0.15	0.23	0.33	0.70
1.00	0.18	0.29	0.40	0.79
3.00	0.17	0.33	0.50	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1001	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.19
0.38	0.19	0.33	0.51	1.21
1.00	0.25	0.39	0.57	1.25
3.00	0.40	0.57	0.77	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.16	0.26	0.63
0.38	0.15	0.24	0.34	0.71
1.00	0.19	0.31	0.44	0.84
3.00	0.21	0.40	0.59	1.14

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TC200G SERIES

DATA SHEET

AO6P

AO6P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1001	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.54	1.24
0.38	0.21	0.36	0.54	1.24
1.00	0.23	0.37	0.54	1.23
3.00	0.31	0.46	0.63	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.15	0.22	0.50
0.38	0.15	0.22	0.30	0.58
1.00	0.19	0.29	0.39	0.71
3.00	0.23	0.38	0.54	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1001	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.42	0.60	1.29
0.38	0.27	0.41	0.59	1.29
1.00	0.28	0.42	0.59	1.28
3.00	0.37	0.51	0.69	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.23	0.51
0.38	0.17	0.24	0.31	0.60
1.00	0.22	0.31	0.41	0.73
3.00	0.27	0.41	0.56	1.01

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO6P

AO6P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1001	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.30	0.44	0.97
0.38	0.19	0.30	0.44	0.97
1.00	0.21	0.32	0.46	0.99
3.00	0.29	0.41	0.56	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.15	0.23	0.50
0.38	0.17	0.23	0.31	0.59
1.00	0.22	0.31	0.41	0.72
3.00	0.28	0.42	0.57	1.01

Rev.1.01.10

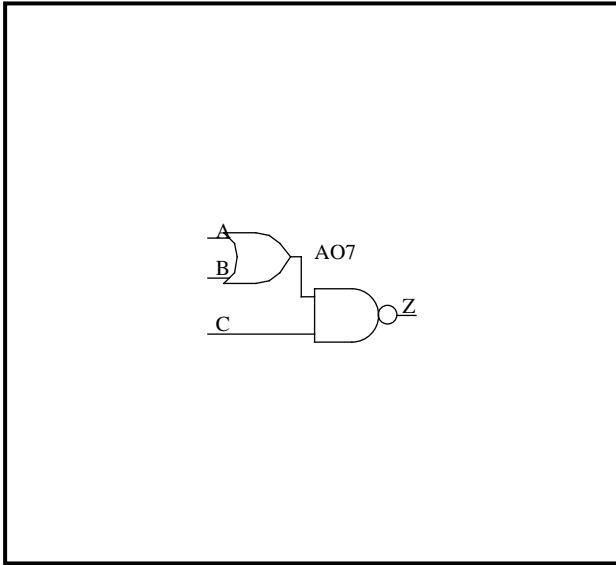
TC200G SERIES

DATA SHEET

AO7	AO7	1/4
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO7	2-INPUT OR into 2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	H	H	L
H	L	H	L
H	H	H	L
ALL OTHER COMBINATIONS			H

Verilog-HDL DESCRIPTION

```
AO7 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AO7
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.08
B	1.03
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	21.6

TC200G SERIES

DATA SHEET

AO7

AO7

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.01
0.38	0.21	0.46	0.77	2.01
1.00	0.22	0.47	0.78	2.01
3.00	0.25	0.53	0.84	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0726	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.30	0.50	1.32
0.38	0.21	0.38	0.59	1.40
1.00	0.27	0.49	0.72	1.55
3.00	0.39	0.70	1.00	1.96

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.20	0.45	0.76	2.00
1.00	0.25	0.51	0.82	2.04
3.00	0.36	0.66	0.99	2.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0726	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.28	0.48	1.30
0.38	0.19	0.36	0.57	1.39
1.00	0.24	0.47	0.70	1.53
3.00	0.32	0.66	0.97	1.94

TC200G SERIES

DATA SHEET

AO7

AO7

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.08
0.38	0.18	0.31	0.47	1.11
1.00	0.22	0.36	0.53	1.17
3.00	0.30	0.47	0.67	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0726	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.25	0.40	1.02
0.38	0.18	0.31	0.47	1.09
1.00	0.23	0.39	0.56	1.19
3.00	0.30	0.53	0.75	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.08
0.38	0.17	0.31	0.47	1.11
1.00	0.20	0.35	0.52	1.16
3.00	0.26	0.45	0.65	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0726	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.33	0.53	1.35
0.38	0.21	0.37	0.58	1.40
1.00	0.26	0.44	0.65	1.47
3.00	0.34	0.58	0.82	1.69

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO7

AO7

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1783	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.08
0.38	0.17	0.31	0.47	1.11
1.00	0.20	0.35	0.52	1.16
3.00	0.26	0.45	0.65	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0726	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.33	0.53	1.35
0.38	0.21	0.37	0.58	1.40
1.00	0.26	0.44	0.65	1.47
3.00	0.34	0.58	0.82	1.69

Rev.1.01.10

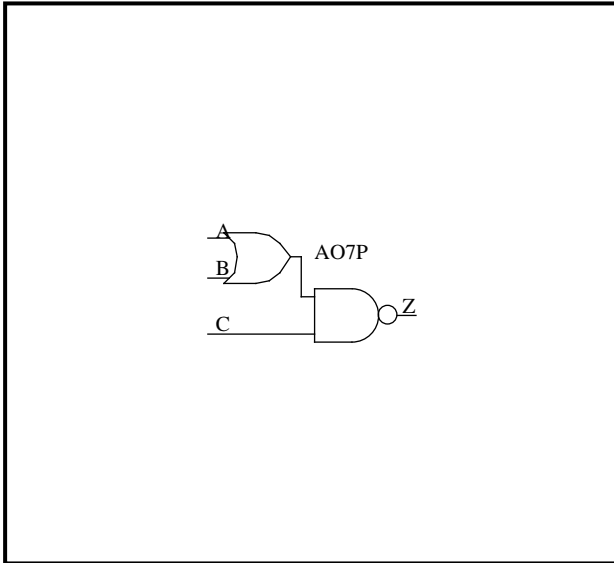
TC200G SERIES

DATA SHEET

AO7P		AO7P		1/4
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
AO7P	2-INPUT OR into 2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	H	H	L
H	L	H	L
H	H	H	L
ALL OTHER COMBINATIONS			H

Verilog-HDL DESCRIPTION

```
AO7P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:AO7P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.11
B	2.03
C	1.96

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	42.7

TC200G SERIES

DATA SHEET

AO7P

AO7P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.30	0.46	1.08
0.38	0.17	0.30	0.46	1.08
1.00	0.18	0.31	0.47	1.09
3.00	0.20	0.35	0.52	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0376	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.21	0.31	0.74
0.38	0.19	0.28	0.40	0.83
1.00	0.25	0.37	0.51	0.97
3.00	0.35	0.54	0.73	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.05
0.38	0.17	0.30	0.45	1.07
1.00	0.21	0.35	0.51	1.12
3.00	0.30	0.47	0.66	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0376	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.18	0.29	0.72
0.38	0.17	0.26	0.38	0.81
1.00	0.21	0.35	0.49	0.95
3.00	0.28	0.48	0.68	1.28

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO7P

AO7P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.25	0.34	0.74
0.38	0.19	0.27	0.37	0.76
1.00	0.23	0.32	0.42	0.82
3.00	0.33	0.44	0.56	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0376	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.26	0.60
0.38	0.17	0.24	0.33	0.66
1.00	0.21	0.31	0.41	0.76
3.00	0.27	0.41	0.55	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.24	0.34	0.73
0.38	0.18	0.27	0.36	0.76
1.00	0.22	0.31	0.42	0.81
3.00	0.30	0.41	0.54	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0376	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.24	0.34	0.77
0.38	0.20	0.28	0.39	0.83
1.00	0.24	0.34	0.46	0.90
3.00	0.31	0.45	0.60	1.10

Rev.1.01.10

TC200G SERIES

DATA SHEET

AO7P

AO7P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0890	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.23	0.33	0.72
0.38	0.17	0.25	0.35	0.74
1.00	0.21	0.30	0.40	0.80
3.00	0.29	0.40	0.53	0.96

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0376	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.21	0.32	0.75
0.38	0.17	0.26	0.37	0.80
1.00	0.21	0.32	0.44	0.87
3.00	0.27	0.41	0.57	1.07

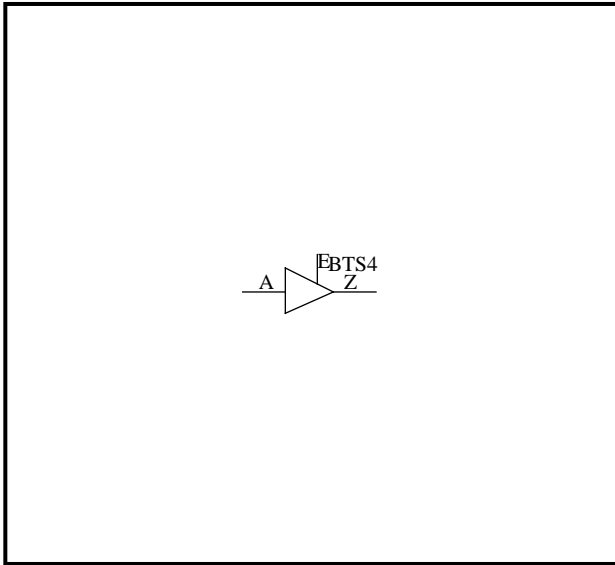
Rev.1.01.10

TC200G SERIES

DATA SHEET

BTS4		BTS4		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BTS4	TRI-STATE INTERNAL BUFFER (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
E	A	Z
H	L	L
H	H	H
L	X	HZ

Verilog-HDL DESCRIPTION

```
BTS4 inst(Z,A,E);
```

VHDL DESCRIPTION

```
inst:BTS4
port map(Z,A,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT CAPACITANCE

(LU)

PIN NAME	Z
Cin	0.79

INPUT LOAD

(LU)

PIN NAME	TYPICAL
A	2.17
E	2.04

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	45.2

TC200G SERIES

DATA SHEET

BTS4

BTS4

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0944	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.17	0.31	0.47	1.13
0.38	0.21	0.35	0.52	1.17
1.00	0.25	0.40	0.56	1.23
3.00	0.32	0.48	0.66	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0399	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.23	0.34	0.47	0.94
0.38	0.23	0.34	0.46	0.93
1.00	0.27	0.38	0.51	0.98
3.00	0.38	0.51	0.65	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	1-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0399	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.12	0.12	0.12	0.12
0.38	0.16	0.16	0.16	0.16
1.00	0.21	0.21	0.21	0.21
3.00	0.31	0.31	0.31	0.31

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	0-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0944	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.19	0.19	0.19	0.19
0.38	0.22	0.22	0.22	0.22
1.00	0.27	0.27	0.27	0.27
3.00	0.40	0.40	0.40	0.40

TC200G SERIES

DATA SHEET

BTS4

BTS4

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-1

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0944	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.14	0.28	0.44	1.10
0.38	0.20	0.34	0.50	1.16
1.00	0.26	0.40	0.57	1.22
3.00	0.37	0.53	0.71	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-0

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0399	0.08

PATH DELAY (ns)

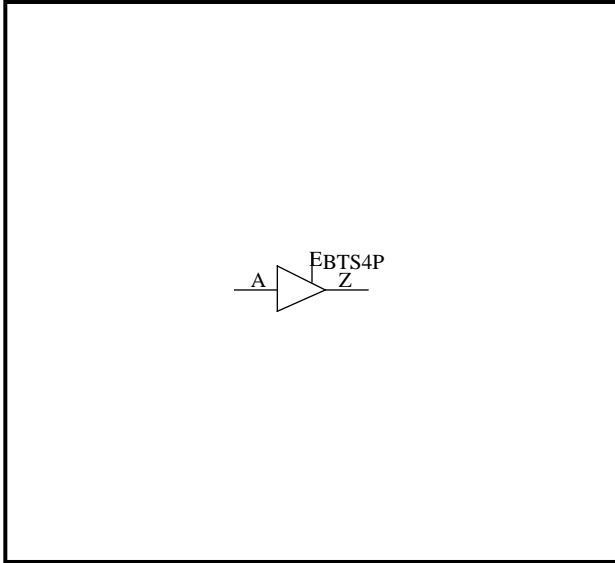
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.26	0.37	0.50	0.97
0.38	0.31	0.43	0.55	1.02
1.00	0.37	0.48	0.61	1.08
3.00	0.46	0.57	0.70	1.17

TC200G SERIES

DATA SHEET

BTS4P		BTS4P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BTS4P	TRI-STATE INTERNAL BUFFER (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
E	A	Z
H	L	L
H	H	H
L	X	HZ

Verilog-HDL DESCRIPTION

```
BTS4P inst(Z,A,E);
```

VHDL DESCRIPTION

```
inst:BTS4P
port map(Z,A,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT CAPACITANCE

(LU)

PIN NAME	Z
Cin	0.79

INPUT LOAD

(LU)

PIN NAME	TYPICAL
A	2.14
E	2.05

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	85.4

TC200G SERIES

DATA SHEET

BTS4P

BTS4P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0462	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.16	0.24	0.33	0.65
0.38	0.22	0.29	0.38	0.70
1.00	0.27	0.35	0.43	0.76
3.00	0.37	0.45	0.55	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.24	0.32	0.40	0.70
0.38	0.24	0.32	0.40	0.69
1.00	0.28	0.36	0.44	0.74
3.00	0.39	0.48	0.57	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	1-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.16	0.16	0.16	0.16
0.38	0.19	0.19	0.19	0.19
1.00	0.25	0.25	0.25	0.25
3.00	0.37	0.37	0.37	0.37

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	0-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0462	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.21	0.21	0.21	0.21
0.38	0.24	0.24	0.24	0.24
1.00	0.29	0.29	0.29	0.29
3.00	0.41	0.41	0.41	0.41

TC200G SERIES

DATA SHEET

BTS4P

BTS4P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-1

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0462	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.14	0.22	0.30	0.63
0.38	0.20	0.28	0.37	0.69
1.00	0.27	0.35	0.44	0.77
3.00	0.39	0.49	0.59	0.93

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-0

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.10

PATH DELAY (ns)

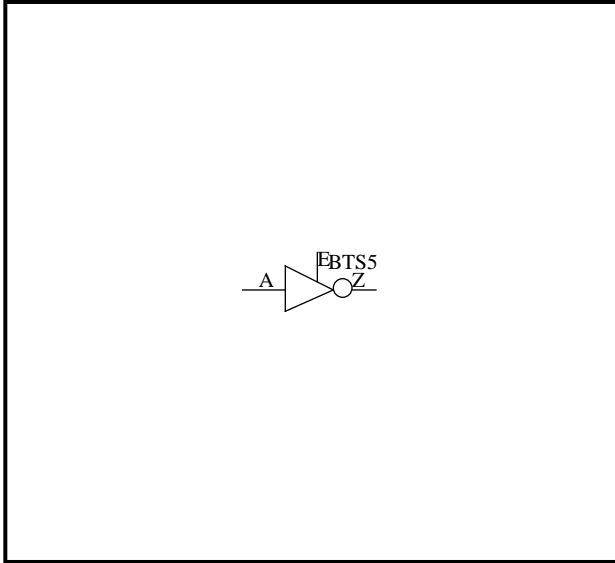
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.27	0.34	0.43	0.72
0.38	0.32	0.40	0.48	0.78
1.00	0.37	0.45	0.53	0.83
3.00	0.45	0.53	0.62	0.91

TC200G SERIES

DATA SHEET

BTS5		BTS5		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BTS5	TRI-STATE INTERNAL INVERTING BUFFER (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
E	A	Z
H	L	H
H	H	L
L	X	HZ

Verilog-HDL DESCRIPTION

```
BTS5 inst(Z,A,E);
```

VHDL DESCRIPTION

```
inst:BTS5
port map(Z,A,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT CAPACITANCE

(LU)

PIN NAME	Z
Cin	0.79

INPUT LOAD

(LU)

PIN NAME	TYPICAL
A	0.99
E	1.48

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	39.0

TC200G SERIES

DATA SHEET

BTS5

BTS5

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0901	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.31	0.45	0.60	1.21
0.38	0.34	0.48	0.63	1.25
1.00	0.41	0.54	0.70	1.31
3.00	0.54	0.68	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0662	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.26	0.41	0.60	1.34
0.38	0.33	0.49	0.67	1.41
1.00	0.40	0.55	0.74	1.48
3.00	0.52	0.67	0.86	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	1-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0662	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.12	0.12	0.12	0.12
0.38	0.16	0.16	0.16	0.16
1.00	0.21	0.21	0.21	0.21
3.00	0.31	0.31	0.31	0.31

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	0-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0901	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.00	0.00	0.00	0.00
0.38	0.05	0.05	0.05	0.05
1.00	0.14	0.14	0.14	0.14
3.00	0.41	0.41	0.41	0.41

TC200G SERIES

DATA SHEET

BTS5

BTS5

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-1

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0901	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.14	0.27	0.43	1.04
0.38	0.21	0.34	0.49	1.10
1.00	0.26	0.40	0.56	1.17
3.00	0.38	0.54	0.70	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-0

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0662	0.08

PATH DELAY (ns)

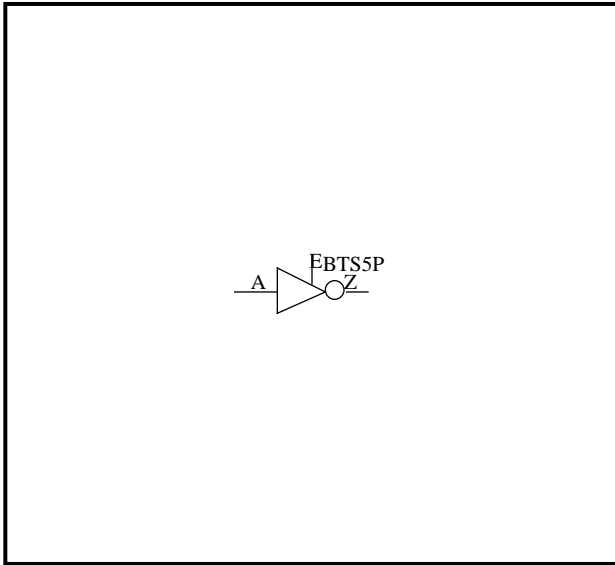
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.10	0.25	0.44	1.18
0.38	0.14	0.30	0.49	1.23
1.00	0.14	0.35	0.56	1.32
3.00	0.01	0.35	0.65	1.54

TC200G SERIES

DATA SHEET

BTS5P		BTS5P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BTS5P	TRI-STATE INTERNAL INVERTING BUFFER (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
E	A	Z
H	L	H
H	H	L
L	X	HZ

Verilog-HDL DESCRIPTION

```
BTS5P inst(Z,A,E);
```

VHDL DESCRIPTION

```
inst:BTS5P
port map(Z,A,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT CAPACITANCE

(LU)

PIN NAME	Z
Cin	0.79

INPUT LOAD

(LU)

PIN NAME	TYPICAL
A	0.99
E	1.95

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	67.8

TC200G SERIES

DATA SHEET

BTS5P

BTS5P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0451	0.07

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.29	0.37	0.46	0.77
0.38	0.33	0.41	0.49	0.81
1.00	0.39	0.47	0.55	0.87
3.00	0.52	0.60	0.69	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.26	0.37	0.50	0.99
0.38	0.34	0.44	0.57	1.07
1.00	0.40	0.51	0.64	1.14
3.00	0.52	0.63	0.76	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	1-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.16	0.16	0.16	0.16
0.38	0.19	0.19	0.19	0.19
1.00	0.25	0.25	0.25	0.25
3.00	0.37	0.37	0.37	0.37

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	0-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0451	0.07

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.00	0.00	0.00	0.00
0.38	0.05	0.05	0.05	0.05
1.00	0.14	0.14	0.14	0.14
3.00	0.41	0.41	0.41	0.41

TC200G SERIES

DATA SHEET

BTS5P

BTS5P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-1

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0451	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.13	0.20	0.28	0.60
0.38	0.19	0.27	0.35	0.67
1.00	0.25	0.34	0.42	0.74
3.00	0.37	0.48	0.57	0.91

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-0

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.09

PATH DELAY (ns)

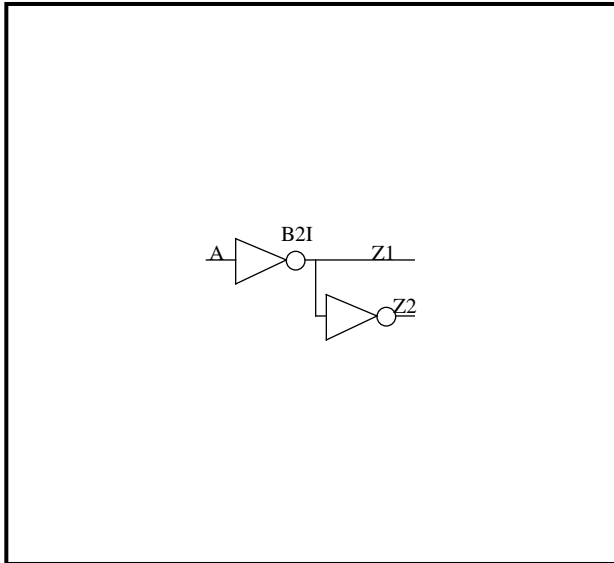
LOAD (LU) SLEW (ns)	1.79	5.79	10.79	30.79
0.01	0.08	0.19	0.32	0.82
0.38	0.11	0.22	0.35	0.85
1.00	0.09	0.24	0.39	0.90
3.00	-0.08	0.15	0.36	1.01

TC200G SERIES

DATA SHEET

B2I		B2I		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B2I	INVERTER into 3 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT	
A	Z1	Z2
L	H	L
H	L	H

Verilog-HDL DESCRIPTION

```
B2I inst(Z1,Z2,A);
```

VHDL DESCRIPTION

```
inst:B2I
port map(Z1,Z2,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1	Z2
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z1	Z2
DRIVE	36.9	95.5

TC200G SERIES

DATA SHEET

B2I

B2I

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0976	0.47

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.34	0.51	1.17
0.38	0.23	0.37	0.53	1.20
1.00	0.28	0.42	0.60	1.26
3.00	0.39	0.57	0.76	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0397	0.24

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.24	0.35	0.81
0.38	0.21	0.32	0.44	0.90
1.00	0.30	0.43	0.56	1.04
3.00	0.43	0.62	0.81	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0341	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.10	0.16	0.38
0.38	0.07	0.12	0.18	0.41
1.00	0.08	0.14	0.22	0.46
3.00	0.09	0.18	0.27	0.57

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0151	0.10

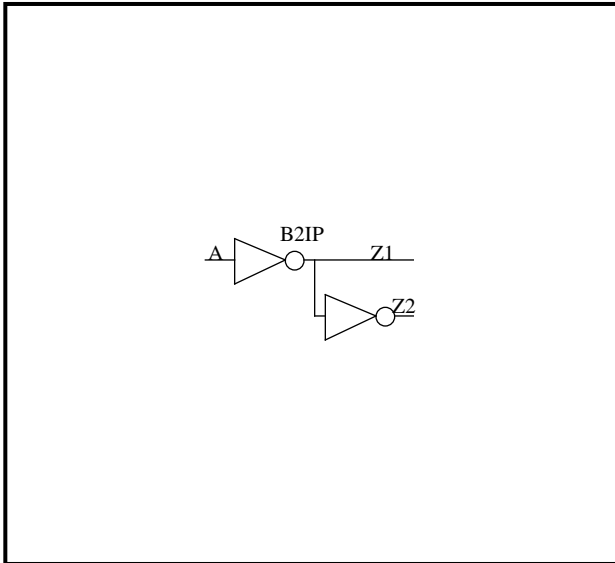
PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.08	0.12	0.31
0.38	0.09	0.14	0.20	0.40
1.00	0.12	0.20	0.28	0.52
3.00	0.16	0.29	0.41	0.76

TC200G SERIES

DATA SHEET

B2IP		B2IP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B2IP	INVERTER into 3 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT	
A	Z1	Z2
L	H	L
H	L	H

Verilog-HDL DESCRIPTION

```
B2IP inst(Z1,Z2,A);
```

VHDL DESCRIPTION

```
inst:B2IP
port map(Z1,Z2,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1	Z2
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.15

OUTPUT DRIVE

(LU)

PIN NAME	Z1	Z2
DRIVE	75.0	169.6

TC200G SERIES

DATA SHEET

B2IP

B2IP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0450	0.42

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.22	0.30	0.61
0.38	0.19	0.25	0.33	0.64
1.00	0.23	0.30	0.38	0.70
3.00	0.31	0.40	0.50	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0230	0.29

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.20	0.27	0.54
0.38	0.22	0.28	0.35	0.62
1.00	0.29	0.37	0.45	0.75
3.00	0.41	0.52	0.64	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0169	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.07	0.10	0.23
0.38	0.06	0.09	0.12	0.25
1.00	0.08	0.12	0.16	0.30
3.00	0.12	0.17	0.23	0.40

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0072	0.10

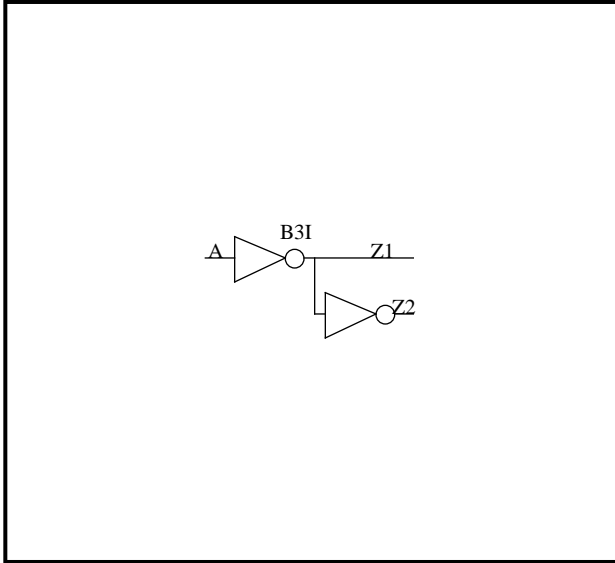
PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.05	0.07	0.16
0.38	0.06	0.10	0.13	0.24
1.00	0.07	0.12	0.17	0.31
3.00	0.07	0.14	0.22	0.44

TC200G SERIES

DATA SHEET

B3I		B3I		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B3I	2 PARALLEL INVERTERS into 2 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT	
A	Z1	Z2
L	H	L
H	L	H

Verilog-HDL DESCRIPTION

```
B3I inst(Z1,Z2,A);
```

VHDL DESCRIPTION

```
inst:B3I
port map(Z1,Z2,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1,Z2
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z1	Z2
DRIVE	77.4	68.5

TC200G SERIES

DATA SHEET

B3I

B3I

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0444	0.20

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.15	0.23	0.54
0.38	0.11	0.18	0.26	0.57
1.00	0.14	0.22	0.31	0.63
3.00	0.19	0.30	0.41	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0231	0.15

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.13	0.20	0.47
0.38	0.13	0.20	0.27	0.55
1.00	0.17	0.27	0.36	0.68
3.00	0.25	0.38	0.52	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0541	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.13	0.23	0.59
0.38	0.08	0.16	0.25	0.62
1.00	0.10	0.20	0.30	0.68
3.00	0.15	0.28	0.40	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0225	0.09

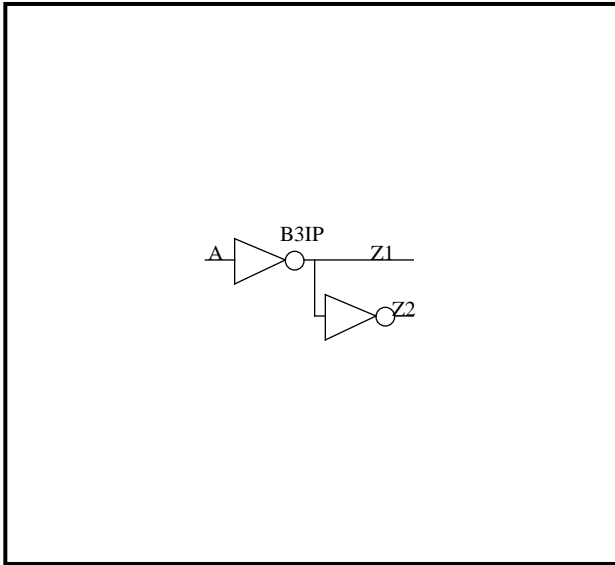
PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.09	0.16	0.43
0.38	0.08	0.16	0.24	0.52
1.00	0.10	0.21	0.31	0.64
3.00	0.11	0.28	0.43	0.88

TC200G SERIES

DATA SHEET

B3IP		B3IP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B3IP	2 PARALLEL INVERTERS into 2 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT	
A	Z1	Z2
L	H	L
H	L	H

Verilog-HDL DESCRIPTION

```
B3IP inst(Z1,Z2,A);
```

VHDL DESCRIPTION

```
inst:B3IP
port map(Z1,Z2,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1,Z2
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	4.12

OUTPUT DRIVE

(LU)

PIN NAME	Z1	Z2
DRIVE	142.6	122.6

TC200G SERIES

DATA SHEET

B3IP

B3IP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0213	0.21

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.11	0.15	0.31
0.38	0.10	0.14	0.18	0.34
1.00	0.13	0.17	0.22	0.39
3.00	0.18	0.23	0.30	0.51

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0113	0.15

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.09	0.13	0.27
0.38	0.12	0.16	0.20	0.35
1.00	0.16	0.21	0.27	0.45
3.00	0.23	0.30	0.38	0.64

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0262	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.09	0.13	0.32
0.38	0.06	0.11	0.16	0.34
1.00	0.08	0.14	0.20	0.40
3.00	0.13	0.20	0.28	0.52

PATH CONDITION

PATH	CONDITION	FUNCTION
Z1->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0108	0.10

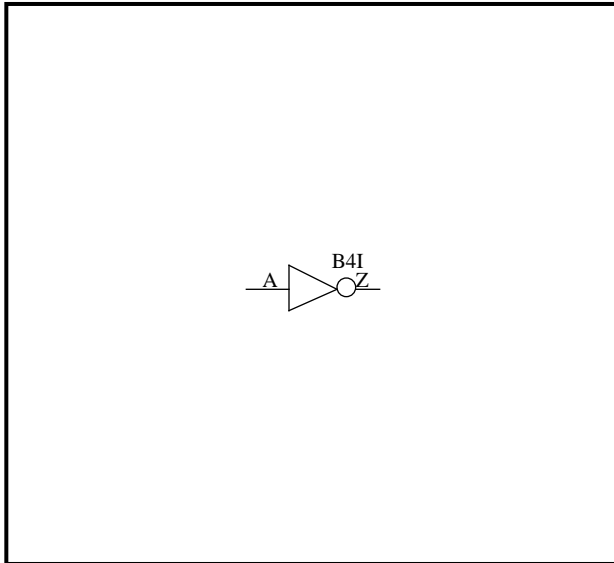
PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.06	0.09	0.23
0.38	0.07	0.11	0.16	0.31
1.00	0.08	0.15	0.21	0.40
3.00	0.08	0.18	0.28	0.57

TC200G SERIES

DATA SHEET

B4I		B4I		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B4I	4 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
B4I inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B4I
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	4.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	132.2

TC200G SERIES

DATA SHEET

B4I

B4I

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0211	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.08	0.12	0.27
0.38	0.06	0.10	0.14	0.30
1.00	0.07	0.12	0.17	0.35
3.00	0.10	0.17	0.24	0.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0109	0.09

PATH DELAY (ns)

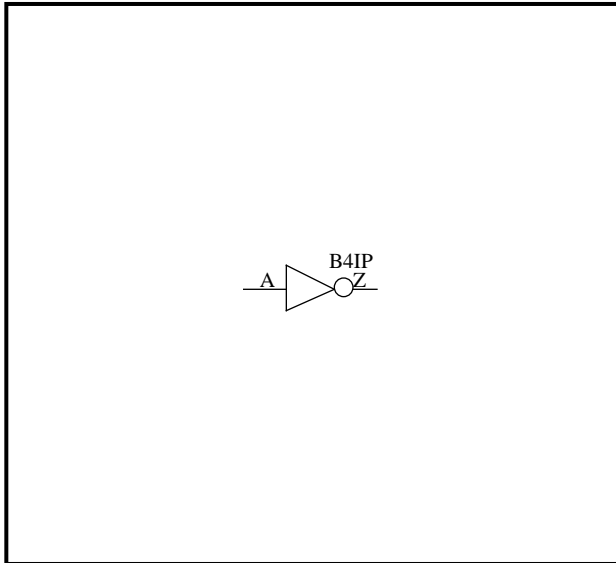
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.06	0.10	0.23
0.38	0.07	0.11	0.16	0.31
1.00	0.09	0.15	0.22	0.41
3.00	0.11	0.20	0.30	0.58

TC200G SERIES

DATA SHEET

B4IP		B4IP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B4IP	4 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
B4IP inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B4IP
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	8.05

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	219.1

TC200G SERIES

DATA SHEET

B4IP

B4IP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0100	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.05	0.08	0.15
0.38	0.05	0.07	0.10	0.18
1.00	0.06	0.09	0.12	0.22
3.00	0.09	0.13	0.17	0.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0056	0.09

PATH DELAY (ns)

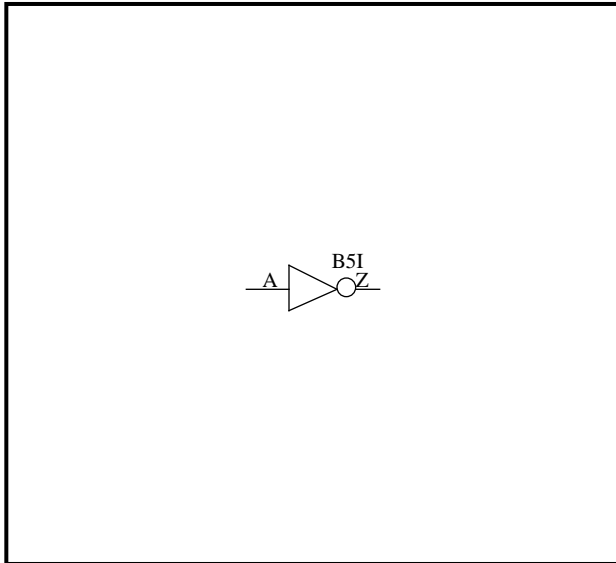
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.04	0.06	0.13
0.38	0.06	0.09	0.11	0.20
1.00	0.08	0.11	0.15	0.27
3.00	0.09	0.15	0.20	0.38

TC200G SERIES

DATA SHEET

B5I		B5I		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B5I	3 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
B5I inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B5I
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	109.3

TC200G SERIES

DATA SHEET

B5I

B5I

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0282	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.09	0.14	0.35
0.38	0.07	0.11	0.17	0.38
1.00	0.09	0.15	0.21	0.43
3.00	0.12	0.21	0.29	0.57

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0136	0.10

PATH DELAY (ns)

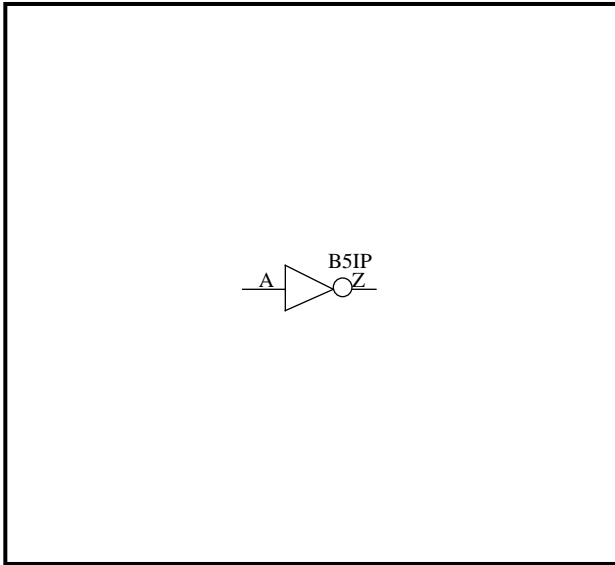
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.07	0.11	0.28
0.38	0.08	0.13	0.19	0.37
1.00	0.10	0.18	0.25	0.48
3.00	0.12	0.24	0.35	0.68

TC200G SERIES

DATA SHEET

B5IP		B5IP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B5IP	3 PARALLEL INVERTERS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
B5IP inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B5IP
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	6.04

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	178.8

TC200G SERIES

DATA SHEET

B5IP

B5IP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0136	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.06	0.09	0.19
0.38	0.05	0.08	0.11	0.22
1.00	0.07	0.10	0.14	0.27
3.00	0.09	0.14	0.19	0.36

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0073	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.05	0.07	0.16
0.38	0.06	0.10	0.13	0.24
1.00	0.08	0.13	0.17	0.32
3.00	0.10	0.17	0.24	0.45

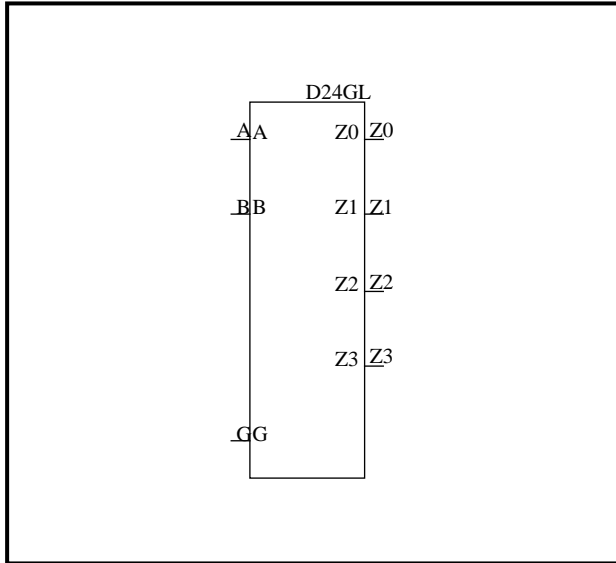
TC200G SERIES

DATA SHEET

D24GL	D24GL	1/7
-------	-------	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
D24GL	2 TO 4 DECODER (GATED OUTPUTS ACTIVE LOW)	GATE 7	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT			
G	A	B	Z0	Z1	Z2	Z3
L	X	X	H	H	H	H
H	L	L	L	H	H	H
H	H	L	H	L	H	H
H	L	H	H	H	L	H
H	H	H	H	H	H	L

Verilog-HDL DESCRIPTION

```
D24GL inst(Z0,Z1,Z2,Z3,A,B,G);
```

VHDL DESCRIPTION

```
inst:D24GL
port map(Z0,Z1,Z2,Z3,A,B,G);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.42
B	3.47
G	4.21

OUTPUT DRIVE

(LU)

PIN NAME	Z0,Z1	Z2	Z3
DRIVE	28.0	28.4	29.5

TC200G SERIES

DATA SHEET

D24GL

D24GL

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1001	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.36	0.53	1.21
0.38	0.29	0.43	0.60	1.29
1.00	0.35	0.49	0.67	1.35
3.00	0.44	0.59	0.77	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1115	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.62	0.94	2.18
0.38	0.39	0.65	0.97	2.21
1.00	0.46	0.72	1.04	2.28
3.00	0.61	0.87	1.19	2.43

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1001	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.27	0.44	1.12
0.38	0.15	0.30	0.47	1.15
1.00	0.16	0.33	0.52	1.21
3.00	0.13	0.35	0.59	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1115	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.44	0.75	1.99
0.38	0.26	0.50	0.81	2.05
1.00	0.33	0.61	0.92	2.16
3.00	0.53	0.86	1.22	2.51

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TC200G SERIES

DATA SHEET

D24GL

D24GL

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.36	0.53	1.22
0.38	0.29	0.43	0.61	1.29
1.00	0.35	0.50	0.67	1.36
3.00	0.45	0.60	0.78	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1062	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.60	0.90	2.09
0.38	0.39	0.63	0.93	2.12
1.00	0.45	0.70	1.00	2.19
3.00	0.61	0.85	1.15	2.34

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0999	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.27	0.44	1.12
0.38	0.15	0.30	0.47	1.15
1.00	0.17	0.34	0.52	1.21
3.00	0.18	0.39	0.62	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0909	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.37	0.63	1.66
0.38	0.22	0.43	0.69	1.72
1.00	0.29	0.53	0.79	1.82
3.00	0.45	0.75	1.06	2.15

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TC200G SERIES

DATA SHEET

D24GL

D24GL

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1001	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.50	1.19
0.38	0.26	0.40	0.58	1.26
1.00	0.32	0.46	0.64	1.32
3.00	0.40	0.56	0.74	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1115	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.60	0.91	2.15
0.38	0.36	0.63	0.94	2.18
1.00	0.43	0.69	1.01	2.25
3.00	0.58	0.85	1.16	2.41

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1001	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.50	1.19
0.38	0.26	0.40	0.58	1.26
1.00	0.32	0.46	0.64	1.32
3.00	0.40	0.56	0.74	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1115	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.60	0.91	2.15
0.38	0.37	0.63	0.94	2.18
1.00	0.43	0.70	1.01	2.25
3.00	0.59	0.85	1.17	2.41

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TC200G SERIES

DATA SHEET

D24GL

D24GL

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.10
0.38	0.13	0.28	0.45	1.13
1.00	0.13	0.31	0.50	1.19
3.00	0.08	0.32	0.56	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1062	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.40	0.69	1.88
0.38	0.23	0.48	0.78	1.96
1.00	0.32	0.60	0.91	2.10
3.00	0.53	0.89	1.26	2.53

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0999	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.24	0.42	1.10
0.38	0.13	0.27	0.45	1.13
1.00	0.14	0.31	0.50	1.19
3.00	0.11	0.34	0.58	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0909	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.35	0.60	1.63
0.38	0.21	0.43	0.68	1.71
1.00	0.29	0.55	0.82	1.85
3.00	0.48	0.81	1.15	2.27

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TC200G SERIES

DATA SHEET

D24GL

D24GL

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1001	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.30	0.47	1.15
0.38	0.18	0.32	0.49	1.17
1.00	0.20	0.36	0.55	1.22
3.00	0.20	0.42	0.64	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1115	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.48	0.80	2.04
0.38	0.26	0.52	0.83	2.07
1.00	0.30	0.56	0.87	2.11
3.00	0.39	0.68	1.01	2.25

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1001	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.30	0.47	1.15
0.38	0.18	0.32	0.50	1.17
1.00	0.20	0.37	0.55	1.23
3.00	0.21	0.42	0.64	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1115	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.48	0.79	2.03
0.38	0.26	0.52	0.83	2.07
1.00	0.30	0.56	0.87	2.11
3.00	0.40	0.69	1.01	2.25

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TC200G SERIES

DATA SHEET

D24GL

D24GL

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.47	1.15
0.38	0.18	0.32	0.49	1.17
1.00	0.20	0.37	0.55	1.23
3.00	0.22	0.43	0.65	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1062	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.46	0.75	1.94
0.38	0.24	0.49	0.79	1.97
1.00	0.28	0.52	0.82	2.01
3.00	0.36	0.64	0.95	2.13

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0999	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.30	0.47	1.15
0.38	0.18	0.32	0.49	1.17
1.00	0.21	0.37	0.55	1.23
3.00	0.26	0.46	0.67	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0909	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.39	0.65	1.68
0.38	0.22	0.43	0.69	1.72
1.00	0.26	0.48	0.74	1.76
3.00	0.33	0.60	0.88	1.92

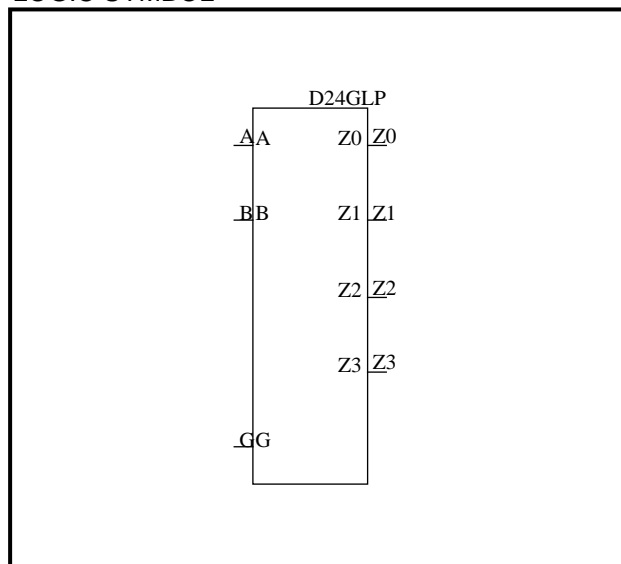
Rev.1.01.10

TC200G SERIES

DATA SHEET

D24GLP		D24GLP		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
D24GLP	2 TO 4 DECODER (GATED OUTPUTS ACTIVE LOW)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		13	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT			
G	A	B	Z0	Z1	Z2	Z3
L	X	X	H	H	H	H
H	L	L	L	H	H	H
H	H	L	H	L	H	H
H	L	H	H	H	L	H
H	H	H	H	H	H	L

Verilog-HDL DESCRIPTION

```
D24GLP inst(Z0,Z1,Z2,Z3,A,B,G);
```

VHDL DESCRIPTION

```
inst:D24GLP
port map(Z0,Z1,Z2,Z3,A,B,G);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.77
B	5.59
G	8.76

OUTPUT DRIVE

(LU)

PIN NAME	Z0	Z1	Z2	Z3
DRIVE	52.4	53.2	53.1	50.6

TC200G SERIES

DATA SHEET

D24GLP

D24GLP

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0566	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.42	0.76
0.38	0.33	0.41	0.50	0.85
1.00	0.42	0.50	0.59	0.93
3.00	0.55	0.64	0.73	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0572	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.54	0.71	1.35
0.38	0.43	0.57	0.73	1.38
1.00	0.50	0.64	0.81	1.45
3.00	0.68	0.82	0.99	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0551	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.17	0.25	0.58
0.38	0.12	0.20	0.28	0.60
1.00	0.13	0.22	0.31	0.66
3.00	0.08	0.20	0.33	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0572	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.29	0.45	1.07
0.38	0.21	0.34	0.49	1.11
1.00	0.26	0.41	0.57	1.19
3.00	0.41	0.58	0.76	1.44

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TC200G SERIES

DATA SHEET

D24GLP

D24GLP

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0547	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.32	0.40	0.73
0.38	0.32	0.40	0.48	0.81
1.00	0.41	0.49	0.57	0.90
3.00	0.55	0.63	0.72	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0553	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.54	0.69	1.31
0.38	0.43	0.56	0.72	1.34
1.00	0.51	0.64	0.80	1.41
3.00	0.69	0.82	0.98	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0547	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.17	0.26	0.58
0.38	0.12	0.20	0.28	0.60
1.00	0.13	0.22	0.32	0.66
3.00	0.09	0.21	0.35	0.77

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0543	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.28	0.43	1.03
0.38	0.20	0.32	0.48	1.08
1.00	0.25	0.39	0.55	1.15
3.00	0.38	0.55	0.73	1.38

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TC200G SERIES

DATA SHEET

D24GLP

D24GLP

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0566	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.30	0.40	0.79
0.38	0.29	0.38	0.48	0.87
1.00	0.37	0.46	0.56	0.96
3.00	0.50	0.59	0.70	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0572	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.52	0.69	1.33
0.38	0.40	0.55	0.72	1.36
1.00	0.48	0.63	0.79	1.44
3.00	0.65	0.81	0.98	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0551	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.29	0.39	0.78
0.38	0.29	0.37	0.48	0.86
1.00	0.37	0.46	0.56	0.95
3.00	0.50	0.59	0.69	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0572	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.52	0.69	1.33
0.38	0.40	0.55	0.72	1.36
1.00	0.48	0.63	0.80	1.44
3.00	0.66	0.81	0.98	1.62

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TC200G SERIES

DATA SHEET

D24GLP

D24GLP

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0547	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.17	0.26	0.65
0.38	0.11	0.19	0.29	0.68
1.00	0.11	0.22	0.33	0.73
3.00	0.05	0.20	0.35	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0553	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.25	0.40	1.02
0.38	0.20	0.33	0.48	1.10
1.00	0.27	0.43	0.61	1.24
3.00	0.45	0.67	0.89	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0547	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.17	0.26	0.65
0.38	0.11	0.19	0.29	0.68
1.00	0.11	0.22	0.33	0.73
3.00	0.05	0.20	0.35	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0543	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.25	0.40	1.00
0.38	0.19	0.32	0.48	1.08
1.00	0.26	0.43	0.60	1.22
3.00	0.44	0.66	0.87	1.60

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TC200G SERIES

DATA SHEET

D24GLP

D24GLP

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0566	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.20	0.29	0.64
0.38	0.15	0.23	0.32	0.66
1.00	0.16	0.25	0.36	0.72
3.00	0.14	0.26	0.40	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0572	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.48	1.12
0.38	0.21	0.35	0.51	1.15
1.00	0.25	0.39	0.56	1.19
3.00	0.34	0.51	0.69	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0551	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.19	0.27	0.60
0.38	0.14	0.21	0.30	0.62
1.00	0.15	0.24	0.34	0.68
3.00	0.12	0.24	0.37	0.79

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0572	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.31	0.47	1.11
0.38	0.21	0.35	0.51	1.14
1.00	0.25	0.39	0.55	1.19
3.00	0.35	0.51	0.69	1.34

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TC200G SERIES

DATA SHEET

D24GLP

D24GLP

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0547	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.27	0.59
0.38	0.13	0.21	0.29	0.61
1.00	0.14	0.23	0.33	0.67
3.00	0.12	0.24	0.36	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0553	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.30	0.46	1.07
0.38	0.21	0.33	0.49	1.11
1.00	0.24	0.38	0.53	1.15
3.00	0.34	0.49	0.67	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0547	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.19	0.27	0.60
0.38	0.14	0.21	0.30	0.62
1.00	0.15	0.24	0.34	0.68
3.00	0.13	0.25	0.38	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0543	0.17

PATH DELAY (ns)

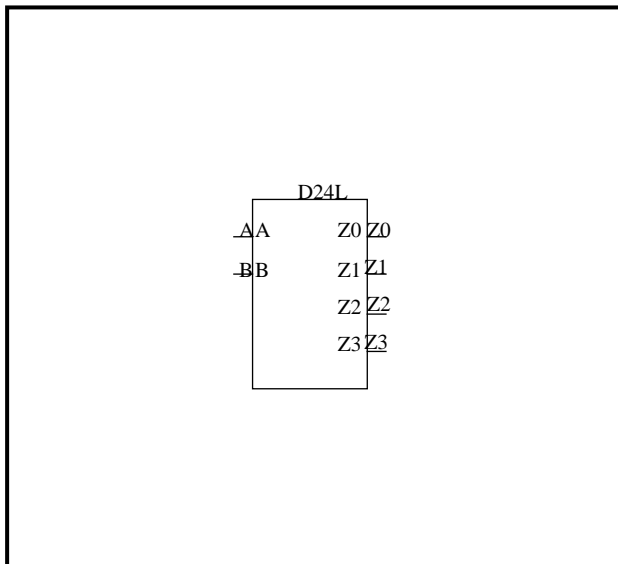
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.29	0.44	1.04
0.38	0.20	0.32	0.48	1.08
1.00	0.24	0.37	0.52	1.12
3.00	0.32	0.48	0.65	1.26

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TC200G SERIES
DATA SHEET

D24L		D24L		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
D24L	2 TO 4 DECODER (OUTPUT ACTIVE LOW)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT			
A	B	Z0	Z1	Z2	Z3
L	L	L	H	H	H
H	L	H	L	H	H
L	H	H	H	L	H
H	H	H	H	H	L

Verilog-HDL DESCRIPTION

```
D24L inst(Z0,Z1,Z2,Z3,A,B);
```

VHDL DESCRIPTION

```
inst:D24L
port map(Z0,Z1,Z2,Z3,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.08
B	3.17

OUTPUT DRIVE

(LU)

PIN NAME	Z0	Z1	Z2	Z3
DRIVE	39.3	42.3	39.0	36.4

TC200G SERIES

DATA SHEET

D24L

D24L

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0971	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.32	0.49	1.16
0.38	0.24	0.39	0.56	1.23
1.00	0.31	0.45	0.62	1.30
3.00	0.41	0.56	0.73	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0577	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.56	1.22
0.38	0.27	0.42	0.59	1.25
1.00	0.33	0.48	0.65	1.32
3.00	0.46	0.62	0.80	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0862	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.21	0.36	0.96
0.38	0.10	0.24	0.39	0.99
1.00	0.12	0.28	0.44	1.05
3.00	0.14	0.35	0.55	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0587	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.22	0.39	1.06
0.38	0.15	0.30	0.47	1.14
1.00	0.20	0.40	0.59	1.28
3.00	0.31	0.60	0.86	1.68

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TC200G SERIES

DATA SHEET

D24L

D24L

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0971	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.32	0.49	1.16
0.38	0.24	0.39	0.56	1.23
1.00	0.31	0.45	0.62	1.30
3.00	0.41	0.56	0.73	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0588	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.39	0.56	1.24
0.38	0.27	0.42	0.60	1.27
1.00	0.33	0.49	0.66	1.34
3.00	0.46	0.63	0.81	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0967	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.07
0.38	0.11	0.26	0.43	1.10
1.00	0.14	0.30	0.48	1.15
3.00	0.17	0.39	0.61	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0584	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.22	0.39	1.06
0.38	0.15	0.30	0.47	1.14
1.00	0.20	0.40	0.59	1.29
3.00	0.30	0.59	0.86	1.68

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TC200G SERIES

DATA SHEET

D24L

D24L

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0971	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.32	0.47	1.07
0.38	0.27	0.39	0.55	1.14
1.00	0.33	0.46	0.61	1.21
3.00	0.45	0.58	0.74	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0577	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.39	0.56	1.22
0.38	0.27	0.42	0.59	1.25
1.00	0.33	0.48	0.65	1.31
3.00	0.46	0.62	0.79	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0862	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.32	0.47	1.05
0.38	0.27	0.39	0.54	1.13
1.00	0.33	0.46	0.61	1.20
3.00	0.45	0.58	0.74	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0587	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.39	0.56	1.23
0.38	0.28	0.42	0.59	1.26
1.00	0.34	0.48	0.65	1.33
3.00	0.47	0.62	0.79	1.47

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TC200G SERIES

DATA SHEET

D24L

D24L

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0971	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.23	0.39	1.00
0.38	0.13	0.26	0.41	1.02
1.00	0.16	0.31	0.47	1.08
3.00	0.22	0.41	0.61	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0588	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.23	0.40	1.06
0.38	0.14	0.29	0.45	1.12
1.00	0.18	0.36	0.54	1.21
3.00	0.24	0.49	0.73	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0967	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.23	0.38	1.00
0.38	0.13	0.26	0.41	1.02
1.00	0.16	0.31	0.47	1.08
3.00	0.22	0.41	0.61	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0584	0.09

PATH DELAY (ns)

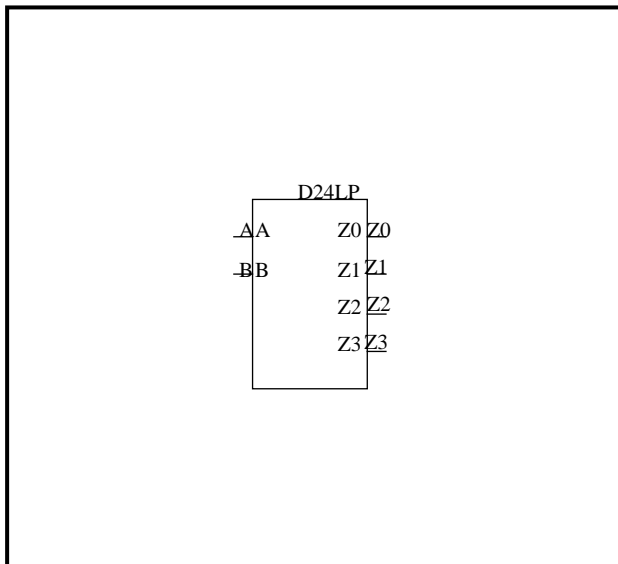
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.23	0.40	1.07
0.38	0.14	0.29	0.46	1.13
1.00	0.18	0.36	0.54	1.22
3.00	0.24	0.49	0.73	1.49

Rev.1.01.10

TC200G SERIES
DATA SHEET

D24LP		D24LP		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
D24LP	2 TO 4 DECODER (OUTPUT ACTIVE LOW)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT			
A	B	Z0	Z1	Z2	Z3
L	L	L	H	H	H
H	L	H	L	H	H
L	H	H	H	L	H
H	H	H	H	H	L

Verilog-HDL DESCRIPTION

```
D24LP inst(Z0,Z1,Z2,Z3,A,B);
```

VHDL DESCRIPTION

```
inst:D24LP
port map(Z0,Z1,Z2,Z3,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.10
B	5.36

OUTPUT DRIVE

(LU)

PIN NAME	Z0	Z1	Z2	Z3
DRIVE	77.1	74.1	79.1	75.6

TC200G SERIES

DATA SHEET

D24LP

D24LP

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0480	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.29	0.38	0.72
0.38	0.30	0.38	0.46	0.81
1.00	0.39	0.47	0.56	0.90
3.00	0.55	0.63	0.72	1.07

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0309	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.38	0.48	0.85
0.38	0.32	0.41	0.51	0.88
1.00	0.39	0.48	0.58	0.96
3.00	0.54	0.64	0.74	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0450	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.23	0.54
0.38	0.10	0.17	0.25	0.57
1.00	0.12	0.21	0.30	0.63
3.00	0.14	0.26	0.38	0.77

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0306	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.24	0.60
0.38	0.13	0.22	0.31	0.67
1.00	0.17	0.28	0.40	0.78
3.00	0.25	0.42	0.57	1.06

Rev.1.01.10

TC200G SERIES

DATA SHEET

D24LP

D24LP

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0423	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.27	0.35	0.65
0.38	0.29	0.36	0.44	0.73
1.00	0.38	0.45	0.53	0.83
3.00	0.54	0.61	0.70	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0295	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.37	0.47	0.83
0.38	0.32	0.40	0.50	0.86
1.00	0.39	0.48	0.57	0.93
3.00	0.54	0.63	0.73	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0424	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.14	0.21	0.51
0.38	0.10	0.16	0.24	0.53
1.00	0.12	0.20	0.28	0.60
3.00	0.14	0.25	0.36	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0287	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.23	0.58
0.38	0.12	0.21	0.30	0.64
1.00	0.17	0.27	0.38	0.75
3.00	0.24	0.40	0.55	1.02

Rev.1.01.10

TC200G SERIES

DATA SHEET

D24LP

D24LP

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0480	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.29	0.37	0.68
0.38	0.30	0.37	0.45	0.77
1.00	0.38	0.46	0.54	0.86
3.00	0.54	0.62	0.71	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0309	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.37	0.47	0.85
0.38	0.31	0.40	0.50	0.88
1.00	0.38	0.47	0.58	0.95
3.00	0.53	0.63	0.73	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0450	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.29	0.38	0.70
0.38	0.30	0.37	0.46	0.78
1.00	0.39	0.46	0.55	0.87
3.00	0.55	0.63	0.71	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0306	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.47	0.85
0.38	0.32	0.41	0.51	0.88
1.00	0.39	0.48	0.58	0.95
3.00	0.54	0.63	0.73	1.11

Rev.1.01.10

TC200G SERIES

DATA SHEET

D24LP

D24LP

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0423	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.14	0.22	0.52
0.38	0.10	0.17	0.25	0.55
1.00	0.12	0.20	0.29	0.61
3.00	0.14	0.25	0.37	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0295	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.24	0.58
0.38	0.13	0.21	0.30	0.65
1.00	0.17	0.28	0.39	0.76
3.00	0.25	0.41	0.56	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0424	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.14	0.22	0.52
0.38	0.10	0.17	0.25	0.55
1.00	0.12	0.20	0.29	0.61
3.00	0.14	0.26	0.37	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0287	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.23	0.58
0.38	0.13	0.21	0.30	0.65
1.00	0.17	0.28	0.39	0.76
3.00	0.25	0.41	0.56	1.03

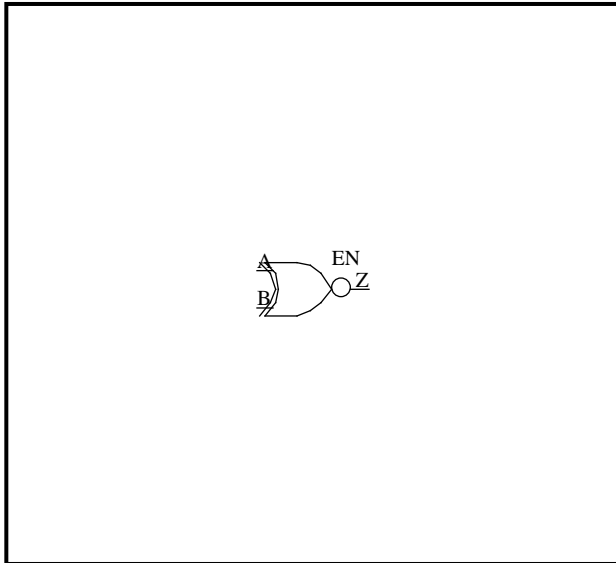
Rev.1.01.10

TC200G SERIES

DATA SHEET

EN		EN		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EN	2-INPUT EXCLUSIVE NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	H
L	H	L
H	L	L
H	H	H

Verilog-HDL DESCRIPTION

```
EN inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:EN
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	0.98
B	2.11

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	44.6

TC200G SERIES

DATA SHEET

EN

EN

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0961	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.42	0.59	1.26
0.38	0.34	0.50	0.67	1.34
1.00	0.43	0.58	0.76	1.43
3.00	0.59	0.74	0.92	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0389	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.47	0.61	1.09
0.38	0.36	0.50	0.64	1.12
1.00	0.43	0.58	0.72	1.20
3.00	0.59	0.75	0.89	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0961	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.53	0.70	1.37
0.38	0.42	0.56	0.73	1.40
1.00	0.48	0.62	0.80	1.47
3.00	0.61	0.75	0.92	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0389	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.47	0.61	1.08
0.38	0.42	0.55	0.68	1.15
1.00	0.48	0.61	0.74	1.22
3.00	0.58	0.71	0.85	1.32

TC200G SERIES

DATA SHEET

EN

EN

3/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0961	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.33	0.49	1.16
0.38	0.26	0.40	0.57	1.24
1.00	0.32	0.46	0.63	1.30
3.00	0.41	0.56	0.73	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0389	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.48	0.95
0.38	0.26	0.38	0.51	0.98
1.00	0.32	0.45	0.58	1.05
3.00	0.46	0.59	0.73	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0961	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.44	0.61	1.28
0.38	0.33	0.47	0.65	1.32
1.00	0.39	0.54	0.71	1.37
3.00	0.51	0.66	0.83	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0389	0.12

PATH DELAY (ns)

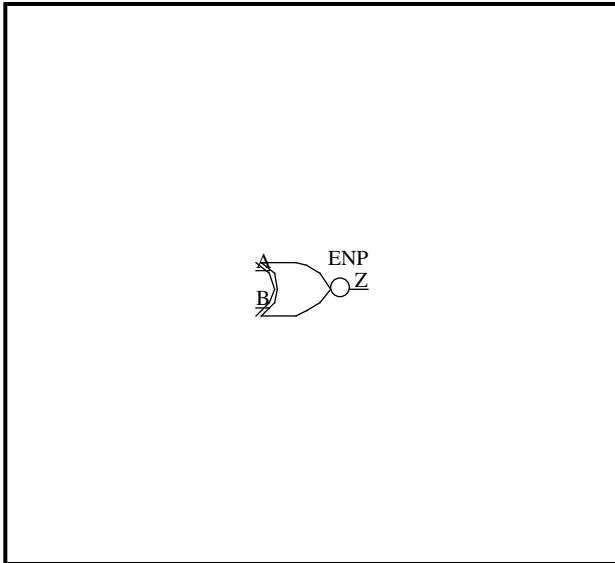
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.35	0.48	0.96
0.38	0.30	0.43	0.56	1.04
1.00	0.41	0.53	0.66	1.14
3.00	0.52	0.64	0.78	1.25

TC200G SERIES

DATA SHEET

ENP		ENP		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ENP	2-INPUT EXCLUSIVE NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	H
L	H	L
H	L	L
H	H	H

Verilog-HDL DESCRIPTION

```
ENP inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:ENP
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	0.98
B	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	89.9

TC200G SERIES

DATA SHEET

ENP

ENP

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.34	0.43	0.77
0.38	0.34	0.42	0.51	0.85
1.00	0.44	0.52	0.61	0.95
3.00	0.61	0.70	0.79	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.41	0.50	0.78
0.38	0.36	0.45	0.54	0.82
1.00	0.43	0.52	0.61	0.89
3.00	0.60	0.70	0.79	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.46	0.55	0.89
0.38	0.42	0.50	0.59	0.92
1.00	0.48	0.56	0.65	0.98
3.00	0.61	0.69	0.78	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.43	0.51	0.79
0.38	0.42	0.50	0.59	0.86
1.00	0.48	0.56	0.65	0.92
3.00	0.59	0.67	0.76	1.03

TC200G SERIES

DATA SHEET

ENP

ENP

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.27	0.36	0.70
0.38	0.27	0.35	0.44	0.78
1.00	0.35	0.43	0.52	0.86
3.00	0.49	0.57	0.66	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.66
0.38	0.26	0.34	0.42	0.69
1.00	0.32	0.41	0.49	0.76
3.00	0.47	0.56	0.65	0.93

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.45	0.78
0.38	0.31	0.39	0.48	0.82
1.00	0.37	0.45	0.54	0.88
3.00	0.49	0.57	0.66	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.12

PATH DELAY (ns)

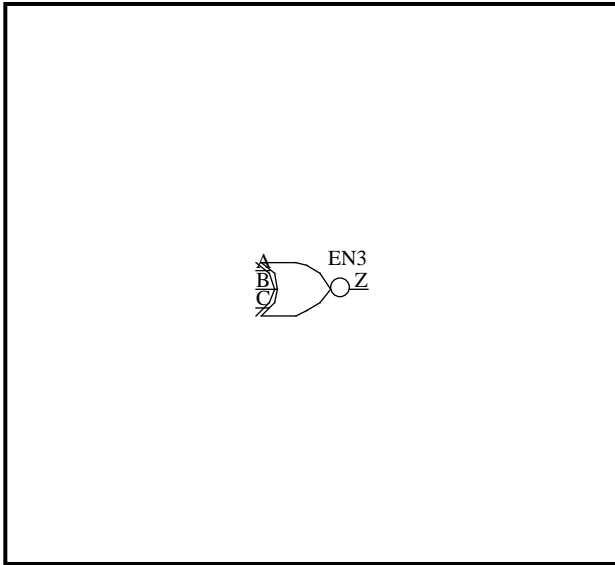
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.28	0.37	0.64
0.38	0.28	0.37	0.45	0.73
1.00	0.40	0.49	0.57	0.84
3.00	0.52	0.60	0.68	0.95

TC200G SERIES

DATA SHEET

EN3		EN3		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EN3	3-INPUT EXCLUSIVE NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	L
L	H	L	L
L	H	H	H
H	L	L	L
H	L	H	H
H	H	L	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
EN3 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:EN3
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	3.30
C	2.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	48.8

TC200G SERIES

DATA SHEET

EN3

EN3

2/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.85	1.01	1.62
0.38	0.74	0.88	1.04	1.65
1.00	0.81	0.96	1.12	1.72
3.00	0.99	1.13	1.30	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.77	0.92	1.41
0.38	0.70	0.85	1.01	1.49
1.00	0.80	0.96	1.11	1.60
3.00	0.99	1.14	1.30	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.57	0.73	1.34
0.38	0.51	0.65	0.81	1.42
1.00	0.61	0.76	0.92	1.53
3.00	0.82	0.97	1.13	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.66	0.82	1.31
0.38	0.53	0.69	0.85	1.34
1.00	0.60	0.77	0.92	1.42
3.00	0.79	0.96	1.12	1.63

TC200G SERIES

DATA SHEET

EN3

EN3

3/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.56	0.73	1.33
0.38	0.50	0.65	0.81	1.41
1.00	0.61	0.75	0.91	1.52
3.00	0.82	0.96	1.12	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.65	0.81	1.30
0.38	0.52	0.68	0.84	1.33
1.00	0.60	0.76	0.92	1.41
3.00	0.78	0.95	1.12	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.72	0.86	1.02	1.63
0.38	0.75	0.89	1.05	1.66
1.00	0.82	0.97	1.13	1.74
3.00	1.00	1.15	1.31	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.77	0.92	1.41
0.38	0.70	0.85	1.01	1.49
1.00	0.80	0.96	1.11	1.60
3.00	0.99	1.15	1.30	1.79

TC200G SERIES

DATA SHEET

EN3

EN3

4/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.57	0.73	1.34
0.38	0.46	0.60	0.76	1.37
1.00	0.52	0.67	0.83	1.43
3.00	0.66	0.80	0.96	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.48	0.63	1.12
0.38	0.40	0.56	0.71	1.20
1.00	0.54	0.69	0.85	1.33
3.00	0.69	0.85	1.00	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.47	0.64	1.24
0.38	0.41	0.55	0.72	1.32
1.00	0.49	0.64	0.80	1.41
3.00	0.62	0.76	0.92	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.57	0.72	1.21
0.38	0.44	0.59	0.74	1.23
1.00	0.51	0.66	0.81	1.30
3.00	0.68	0.84	0.99	1.49

TC200G SERIES

DATA SHEET

EN3

EN3

5/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.50	0.66	1.27
0.38	0.43	0.58	0.74	1.35
1.00	0.52	0.67	0.83	1.44
3.00	0.67	0.82	0.98	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.54	0.69	1.17
0.38	0.41	0.56	0.71	1.19
1.00	0.48	0.63	0.78	1.26
3.00	0.64	0.80	0.95	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.61	0.77	1.38
0.38	0.49	0.63	0.80	1.41
1.00	0.55	0.70	0.86	1.47
3.00	0.69	0.83	0.99	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.60	1.09
0.38	0.39	0.54	0.69	1.18
1.00	0.53	0.68	0.83	1.31
3.00	0.67	0.82	0.97	1.45

TC200G SERIES

DATA SHEET

EN3

EN3

6/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.62	1.22
0.38	0.34	0.49	0.65	1.25
1.00	0.40	0.54	0.71	1.31
3.00	0.52	0.66	0.82	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.35	0.49	0.97
0.38	0.30	0.44	0.58	1.06
1.00	0.43	0.57	0.71	1.17
3.00	0.55	0.69	0.82	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.34	0.50	1.10
0.38	0.27	0.42	0.58	1.18
1.00	0.34	0.49	0.65	1.25
3.00	0.46	0.59	0.75	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.36	0.49	0.96
0.38	0.26	0.39	0.53	1.00
1.00	0.32	0.46	0.60	1.07
3.00	0.47	0.62	0.76	1.23

TC200G SERIES

DATA SHEET

EN3

EN3

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.51	1.12
0.38	0.28	0.43	0.59	1.20
1.00	0.36	0.50	0.66	1.27
3.00	0.49	0.63	0.79	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.49	0.95
0.38	0.26	0.39	0.52	0.99
1.00	0.32	0.45	0.59	1.05
3.00	0.47	0.60	0.74	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.47	0.63	1.24
0.38	0.35	0.50	0.66	1.27
1.00	0.41	0.56	0.72	1.33
3.00	0.53	0.67	0.83	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.16

PATH DELAY (ns)

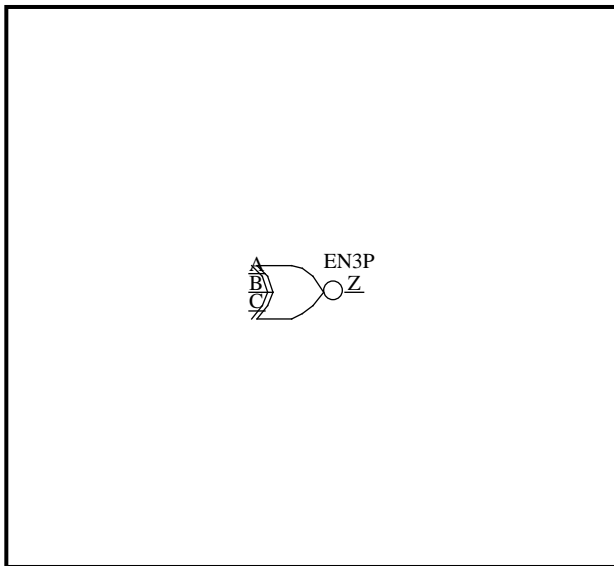
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.49	0.96
0.38	0.30	0.43	0.57	1.05
1.00	0.42	0.56	0.69	1.16
3.00	0.54	0.67	0.80	1.27

TC200G SERIES

DATA SHEET

EN3P		EN3P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EN3P	3-INPUT EXCLUSIVE NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	L
L	H	L	L
L	H	H	H
H	L	L	L
H	L	H	H
H	H	L	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
EN3P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:EN3P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	3.30
C	2.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	84.4

TC200G SERIES

DATA SHEET

EN3P

EN3P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.82	0.92	1.27
0.38	0.77	0.85	0.95	1.30
1.00	0.84	0.93	1.03	1.38
3.00	1.02	1.11	1.21	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.74	0.84	1.17
0.38	0.72	0.82	0.93	1.25
1.00	0.82	0.93	1.03	1.36
3.00	1.00	1.11	1.22	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.64	0.99
0.38	0.54	0.62	0.72	1.08
1.00	0.64	0.73	0.83	1.18
3.00	0.86	0.95	1.05	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.63	0.74	1.07
0.38	0.55	0.66	0.77	1.10
1.00	0.62	0.73	0.84	1.17
3.00	0.82	0.93	1.04	1.38

TC200G SERIES

DATA SHEET

EN3P

EN3P

3/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.53	0.63	0.98
0.38	0.53	0.62	0.71	1.07
1.00	0.63	0.72	0.82	1.17
3.00	0.85	0.94	1.04	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.62	0.73	1.06
0.38	0.54	0.65	0.76	1.09
1.00	0.62	0.73	0.83	1.17
3.00	0.81	0.92	1.04	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.84	0.94	1.29
0.38	0.78	0.87	0.97	1.32
1.00	0.86	0.94	1.04	1.40
3.00	1.04	1.12	1.22	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.74	0.84	1.17
0.38	0.72	0.82	0.93	1.25
1.00	0.82	0.93	1.03	1.36
3.00	1.01	1.12	1.22	1.55

TC200G SERIES

DATA SHEET

EN3P

EN3P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.64	0.99
0.38	0.49	0.57	0.67	1.02
1.00	0.55	0.64	0.73	1.08
3.00	0.68	0.77	0.87	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.45	0.55	0.88
0.38	0.42	0.52	0.63	0.96
1.00	0.56	0.66	0.76	1.09
3.00	0.73	0.83	0.94	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.45	0.55	0.90
0.38	0.44	0.53	0.63	0.98
1.00	0.53	0.62	0.72	1.07
3.00	0.68	0.76	0.86	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.54	0.64	0.97
0.38	0.46	0.56	0.67	0.99
1.00	0.53	0.63	0.74	1.06
3.00	0.70	0.81	0.92	1.24

TC200G SERIES

DATA SHEET

EN3P

EN3P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.47	0.57	0.93
0.38	0.47	0.56	0.65	1.01
1.00	0.57	0.65	0.75	1.10
3.00	0.73	0.82	0.92	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.51	0.61	0.93
0.38	0.43	0.53	0.64	0.96
1.00	0.50	0.60	0.70	1.02
3.00	0.67	0.77	0.87	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.58	0.68	1.03
0.38	0.52	0.61	0.71	1.06
1.00	0.58	0.67	0.77	1.12
3.00	0.72	0.80	0.90	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.42	0.52	0.85
0.38	0.40	0.51	0.61	0.93
1.00	0.54	0.65	0.75	1.07
3.00	0.70	0.80	0.90	1.22

TC200G SERIES

DATA SHEET

EN3P

EN3P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.42	0.52	0.87
0.38	0.37	0.46	0.56	0.91
1.00	0.43	0.51	0.61	0.96
3.00	0.54	0.63	0.73	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.32	0.42	0.73
0.38	0.30	0.40	0.50	0.82
1.00	0.45	0.55	0.65	0.96
3.00	0.61	0.71	0.80	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.41	0.76
0.38	0.31	0.39	0.49	0.84
1.00	0.39	0.48	0.58	0.93
3.00	0.55	0.64	0.73	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.43	0.74
0.38	0.27	0.37	0.46	0.77
1.00	0.34	0.43	0.53	0.84
3.00	0.49	0.59	0.69	1.01

TC200G SERIES

DATA SHEET

EN3P

EN3P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.42	0.78
0.38	0.32	0.41	0.51	0.86
1.00	0.41	0.50	0.59	0.95
3.00	0.59	0.67	0.76	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.33	0.42	0.73
0.38	0.27	0.36	0.46	0.76
1.00	0.33	0.43	0.52	0.83
3.00	0.48	0.58	0.68	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0465	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.54	0.89
0.38	0.39	0.47	0.57	0.93
1.00	0.44	0.53	0.63	0.98
3.00	0.56	0.65	0.75	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0241	0.16

PATH DELAY (ns)

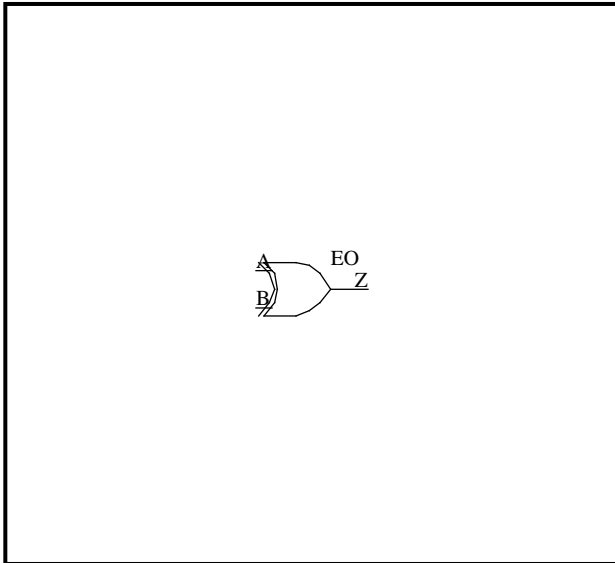
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.31	0.41	0.73
0.38	0.30	0.40	0.50	0.81
1.00	0.45	0.55	0.64	0.95
3.00	0.60	0.69	0.78	1.08

TC200G SERIES

DATA SHEET

EO		EO		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EO	2-INPUT EXCLUSIVE OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	L

Verilog-HDL DESCRIPTION

```
EO inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:EO
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	0.98
B	2.11

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	45.1

TC200G SERIES

DATA SHEET

EO

EO

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0940	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.52	0.69	1.35
0.38	0.41	0.56	0.73	1.39
1.00	0.47	0.62	0.79	1.45
3.00	0.60	0.75	0.92	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0400	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.48	0.62	1.10
0.38	0.42	0.55	0.69	1.17
1.00	0.48	0.62	0.75	1.23
3.00	0.59	0.72	0.86	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0940	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.42	0.59	1.25
0.38	0.35	0.49	0.67	1.33
1.00	0.43	0.58	0.75	1.41
3.00	0.59	0.74	0.91	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0400	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.47	0.61	1.10
0.38	0.36	0.50	0.64	1.14
1.00	0.44	0.58	0.72	1.21
3.00	0.60	0.75	0.90	1.40

TC200G SERIES

DATA SHEET

EO

EO

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0940	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.44	0.61	1.27
0.38	0.33	0.47	0.64	1.31
1.00	0.39	0.54	0.71	1.36
3.00	0.52	0.66	0.83	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0400	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.49	0.97
0.38	0.30	0.43	0.57	1.05
1.00	0.41	0.53	0.66	1.14
3.00	0.52	0.64	0.77	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0940	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.48	1.14
0.38	0.26	0.40	0.56	1.22
1.00	0.32	0.46	0.62	1.28
3.00	0.41	0.55	0.72	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0400	0.12

PATH DELAY (ns)

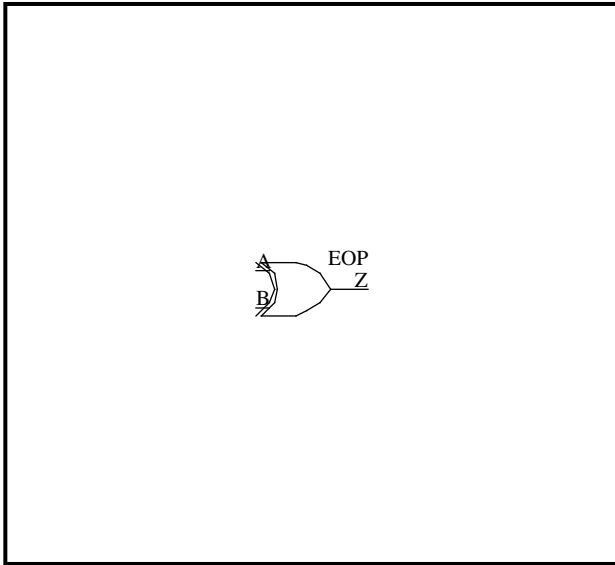
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.49	0.97
0.38	0.26	0.39	0.52	1.00
1.00	0.32	0.45	0.58	1.07
3.00	0.47	0.60	0.74	1.22

TC200G SERIES

DATA SHEET

EOP		EOP		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EOP	2-INPUT EXCLUSIVE OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	L

Verilog-HDL DESCRIPTION

```
EOP inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:EOP
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	0.98
B	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	90.0

TC200G SERIES

DATA SHEET

EOP

EOP

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.46	0.55	0.88
0.38	0.41	0.49	0.58	0.92
1.00	0.47	0.55	0.64	0.98
3.00	0.60	0.68	0.77	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.52	0.79
0.38	0.42	0.51	0.59	0.86
1.00	0.48	0.57	0.65	0.93
3.00	0.59	0.68	0.76	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.44	0.78
0.38	0.35	0.43	0.52	0.86
1.00	0.44	0.52	0.61	0.95
3.00	0.61	0.70	0.79	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.41	0.50	0.78
0.38	0.36	0.45	0.53	0.81
1.00	0.43	0.52	0.61	0.89
3.00	0.60	0.70	0.79	1.08

TC200G SERIES

DATA SHEET

EOP

EOP

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.45	0.79
0.38	0.31	0.40	0.49	0.82
1.00	0.37	0.45	0.54	0.88
3.00	0.49	0.57	0.66	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.29	0.38	0.65
0.38	0.29	0.37	0.45	0.72
1.00	0.41	0.49	0.57	0.84
3.00	0.52	0.60	0.68	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0466	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.27	0.36	0.69
0.38	0.27	0.35	0.44	0.77
1.00	0.35	0.43	0.52	0.85
3.00	0.49	0.57	0.65	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0210	0.11

PATH DELAY (ns)

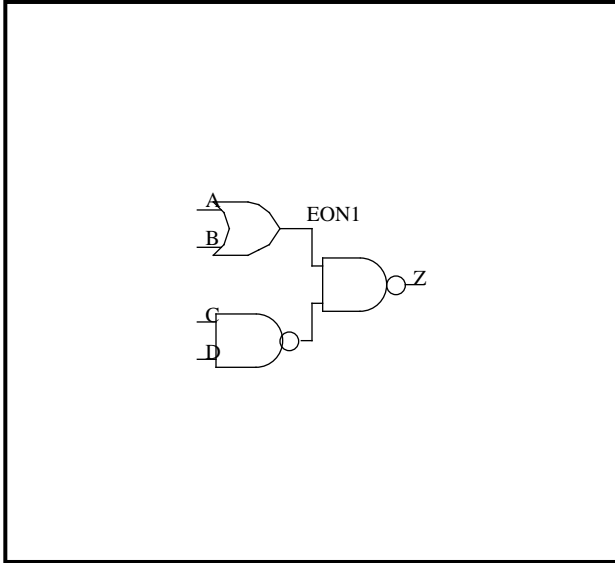
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.66
0.38	0.26	0.34	0.42	0.70
1.00	0.32	0.40	0.49	0.76
3.00	0.47	0.56	0.65	0.93

TC200G SERIES

DATA SHEET

EON1		EON1		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EON1	2-INPUT OR and 2-INPUT NAND into 2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
L	L	L	H	H
L	L	H	L	H
L	L	H	H	H
L	H	H	H	H
H	L	H	H	H
H	H	H	H	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
EON1 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:EON1
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.03
B	1.12
C	1.00
D	1.05

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	22.8

TC200G SERIES

DATA SHEET

EON1

EON1

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.20	0.45	0.77	2.00
1.00	0.25	0.51	0.82	2.04
3.00	0.36	0.66	0.99	2.23

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.29	0.49	1.33
0.38	0.19	0.37	0.58	1.42
1.00	0.25	0.48	0.71	1.56
3.00	0.33	0.67	0.98	1.97

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.20	0.45	0.77	2.00
1.00	0.25	0.51	0.82	2.04
3.00	0.36	0.66	0.99	2.23

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.29	0.49	1.33
0.38	0.19	0.37	0.58	1.42
1.00	0.25	0.48	0.71	1.56
3.00	0.33	0.67	0.98	1.97

TC200G SERIES

DATA SHEET

EON1

EON1

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.20	0.45	0.77	2.00
1.00	0.25	0.51	0.82	2.04
3.00	0.36	0.66	0.99	2.23

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.29	0.49	1.33
0.38	0.19	0.37	0.58	1.42
1.00	0.25	0.48	0.71	1.56
3.00	0.33	0.67	0.98	1.97

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.01
0.38	0.21	0.46	0.78	2.02
1.00	0.22	0.47	0.78	2.01
3.00	0.25	0.53	0.84	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.31	0.52	1.35
0.38	0.21	0.39	0.60	1.44
1.00	0.28	0.50	0.73	1.58
3.00	0.40	0.71	1.02	1.99

TC200G SERIES

DATA SHEET

EON1

EON1

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.01
0.38	0.21	0.46	0.78	2.02
1.00	0.22	0.47	0.78	2.01
3.00	0.25	0.53	0.84	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.31	0.52	1.35
0.38	0.21	0.39	0.60	1.44
1.00	0.28	0.50	0.73	1.58
3.00	0.40	0.71	1.02	1.99

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.46	0.77	2.01
0.38	0.21	0.46	0.78	2.02
1.00	0.22	0.47	0.78	2.01
3.00	0.25	0.53	0.84	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.31	0.52	1.35
0.38	0.21	0.39	0.60	1.44
1.00	0.28	0.50	0.73	1.58
3.00	0.40	0.71	1.02	1.99

TC200G SERIES

DATA SHEET

EON1

EON1

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.55	1.18
0.38	0.32	0.45	0.62	1.26
1.00	0.39	0.52	0.69	1.33
3.00	0.54	0.68	0.85	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.53	1.18
0.38	0.27	0.40	0.56	1.21
1.00	0.31	0.44	0.61	1.25
3.00	0.38	0.52	0.68	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.53	1.17
0.38	0.30	0.44	0.60	1.24
1.00	0.37	0.51	0.67	1.32
3.00	0.52	0.66	0.83	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.42	0.63	1.47
0.38	0.28	0.45	0.66	1.50
1.00	0.32	0.49	0.70	1.54
3.00	0.38	0.56	0.77	1.60

TC200G SERIES

DATA SHEET

EON1

EON1

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.54	1.18
0.38	0.32	0.45	0.61	1.25
1.00	0.38	0.52	0.69	1.33
3.00	0.53	0.68	0.84	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.45	0.66	1.49
0.38	0.30	0.48	0.69	1.52
1.00	0.34	0.51	0.72	1.56
3.00	0.41	0.58	0.79	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.40	0.56	1.20
0.38	0.31	0.45	0.61	1.25
1.00	0.37	0.51	0.67	1.31
3.00	0.48	0.62	0.79	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.41	0.57	1.21
0.38	0.30	0.44	0.60	1.24
1.00	0.36	0.49	0.66	1.30
3.00	0.48	0.62	0.79	1.43

TC200G SERIES

DATA SHEET

EON1

EON1

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.55	1.19
0.38	0.30	0.44	0.60	1.24
1.00	0.36	0.49	0.66	1.30
3.00	0.46	0.60	0.77	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.46	0.67	1.50
0.38	0.31	0.49	0.70	1.53
1.00	0.37	0.54	0.75	1.59
3.00	0.49	0.66	0.87	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.40	0.56	1.20
0.38	0.31	0.45	0.61	1.25
1.00	0.37	0.51	0.67	1.31
3.00	0.47	0.62	0.78	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0749	0.12

PATH DELAY (ns)

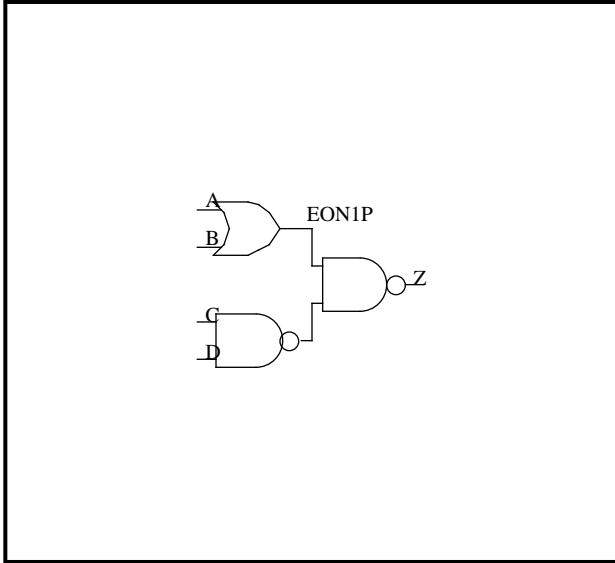
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.48	0.69	1.53
0.38	0.34	0.51	0.72	1.56
1.00	0.39	0.56	0.77	1.61
3.00	0.51	0.68	0.89	1.73

TC200G SERIES

DATA SHEET

EON1P		EON1P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EON1P	2-INPUT OR and 2-INPUT NAND into 2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
L	L	L	H	H
L	L	H	L	H
L	L	H	H	H
L	H	H	H	H
H	L	H	H	H
H	H	H	H	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
EON1P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:EON1P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.02
B	1.99
C	1.05
D	1.07

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	39.1

TC200G SERIES

DATA SHEET

EON1P

EON1P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.48	1.20
0.38	0.17	0.32	0.50	1.22
1.00	0.21	0.37	0.55	1.26
3.00	0.31	0.50	0.71	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.32	0.81
0.38	0.16	0.28	0.41	0.90
1.00	0.20	0.36	0.51	1.04
3.00	0.25	0.48	0.70	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.48	1.20
0.38	0.17	0.32	0.50	1.22
1.00	0.21	0.37	0.55	1.26
3.00	0.31	0.50	0.71	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.32	0.81
0.38	0.16	0.28	0.41	0.90
1.00	0.20	0.36	0.51	1.04
3.00	0.25	0.48	0.70	1.37

TC200G SERIES

DATA SHEET

EON1P

EON1P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.48	1.20
0.38	0.17	0.32	0.50	1.22
1.00	0.21	0.37	0.55	1.26
3.00	0.31	0.50	0.71	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.32	0.81
0.38	0.16	0.28	0.41	0.90
1.00	0.20	0.36	0.51	1.04
3.00	0.25	0.48	0.70	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.33	0.51	1.22
0.38	0.17	0.32	0.51	1.23
1.00	0.17	0.32	0.50	1.21
3.00	0.16	0.32	0.52	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.22	0.35	0.84
0.38	0.19	0.30	0.43	0.93
1.00	0.24	0.39	0.54	1.07
3.00	0.35	0.55	0.75	1.41

TC200G SERIES

DATA SHEET

EON1P

EON1P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.33	0.51	1.22
0.38	0.17	0.32	0.51	1.23
1.00	0.17	0.32	0.50	1.21
3.00	0.16	0.32	0.52	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.22	0.35	0.84
0.38	0.19	0.30	0.43	0.93
1.00	0.24	0.39	0.54	1.07
3.00	0.35	0.55	0.75	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.33	0.51	1.22
0.38	0.17	0.32	0.51	1.23
1.00	0.17	0.32	0.50	1.21
3.00	0.16	0.32	0.52	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.22	0.35	0.84
0.38	0.19	0.30	0.43	0.93
1.00	0.24	0.39	0.54	1.07
3.00	0.35	0.55	0.75	1.41

TC200G SERIES

DATA SHEET

EON1P

EON1P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.34	0.44	0.81
0.38	0.34	0.42	0.51	0.88
1.00	0.42	0.50	0.59	0.96
3.00	0.58	0.67	0.76	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.34	0.44	0.81
0.38	0.29	0.37	0.47	0.84
1.00	0.34	0.42	0.52	0.89
3.00	0.44	0.53	0.62	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.32	0.42	0.79
0.38	0.32	0.40	0.50	0.87
1.00	0.40	0.48	0.58	0.95
3.00	0.56	0.64	0.74	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.37	0.50	0.99
0.38	0.30	0.40	0.53	1.02
1.00	0.35	0.45	0.58	1.07
3.00	0.45	0.55	0.68	1.17

TC200G SERIES

DATA SHEET

EON1P

EON1P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.34	0.44	0.81
0.38	0.34	0.42	0.51	0.88
1.00	0.42	0.50	0.60	0.97
3.00	0.58	0.66	0.76	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.40	0.53	1.03
0.38	0.33	0.43	0.56	1.06
1.00	0.38	0.48	0.61	1.11
3.00	0.48	0.58	0.71	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.45	0.82
0.38	0.33	0.41	0.50	0.87
1.00	0.39	0.47	0.56	0.93
3.00	0.50	0.58	0.68	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.47	0.84
0.38	0.32	0.40	0.50	0.87
1.00	0.39	0.47	0.56	0.94
3.00	0.53	0.62	0.72	1.09

TC200G SERIES

DATA SHEET

EON1P

EON1P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.34	0.43	0.80
0.38	0.31	0.39	0.49	0.86
1.00	0.37	0.45	0.55	0.92
3.00	0.47	0.56	0.66	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.40	0.53	1.03
0.38	0.33	0.43	0.56	1.05
1.00	0.39	0.49	0.62	1.12
3.00	0.54	0.64	0.77	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1051	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.36	0.45	0.82
0.38	0.33	0.41	0.51	0.87
1.00	0.39	0.47	0.57	0.94
3.00	0.49	0.58	0.68	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0446	0.14

PATH DELAY (ns)

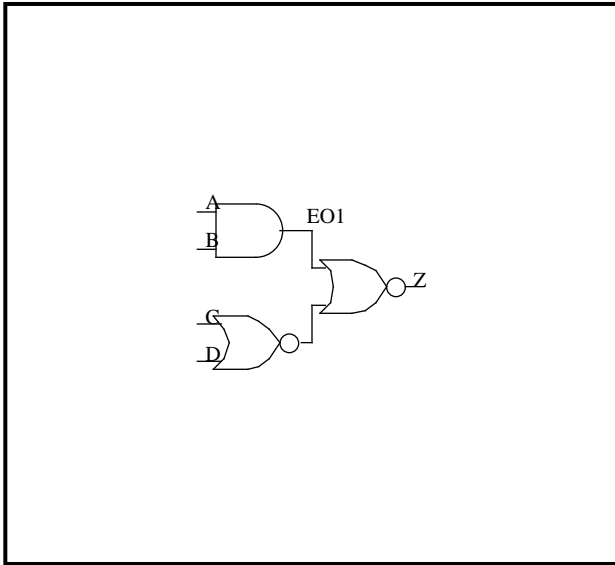
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.43	0.56	1.06
0.38	0.36	0.46	0.59	1.09
1.00	0.42	0.53	0.65	1.15
3.00	0.57	0.67	0.80	1.29

TC200G SERIES

DATA SHEET

EO1		EO1		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EO1	2-INPUT AND and 2-INPUT NOR into 2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	L
L	H	L	L	L
H	L	L	L	L
H	H	L	L	L
H	H	L	H	L
H	H	H	L	L
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
EO1 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:EO1
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.03
B	1.12
C	1.00
D	1.05

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	20.3

TC200G SERIES

DATA SHEET

EO1

EO1

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.48	0.82	2.18
0.38	0.23	0.50	0.84	2.20
1.00	0.28	0.56	0.89	2.24
3.00	0.44	0.75	1.10	2.43

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.27	0.59	0.89	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.48	0.82	2.18
0.38	0.23	0.50	0.84	2.20
1.00	0.28	0.56	0.89	2.24
3.00	0.44	0.75	1.10	2.43

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.27	0.59	0.89	1.79

TC200G SERIES

DATA SHEET

EO1

EO1

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&-C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.48	0.82	2.18
0.38	0.23	0.50	0.84	2.20
1.00	0.28	0.56	0.89	2.24
3.00	0.44	0.75	1.10	2.43

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&-C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.26	0.44	1.18
0.38	0.18	0.34	0.53	1.27
1.00	0.23	0.44	0.65	1.41
3.00	0.27	0.59	0.89	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.53	0.87	2.23
0.38	0.27	0.54	0.88	2.24
1.00	0.34	0.61	0.94	2.28
3.00	0.53	0.82	1.16	2.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.17	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.22	0.50	0.77	1.61

TC200G SERIES

DATA SHEET

EO1

EO1

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.53	0.87	2.23
0.38	0.27	0.54	0.88	2.24
1.00	0.34	0.61	0.94	2.28
3.00	0.53	0.82	1.16	2.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.17	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.22	0.50	0.77	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.53	0.87	2.23
0.38	0.27	0.54	0.88	2.24
1.00	0.34	0.61	0.94	2.28
3.00	0.53	0.82	1.16	2.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.17	0.33	0.52	1.26
1.00	0.21	0.40	0.60	1.35
3.00	0.22	0.50	0.77	1.61

TC200G SERIES

DATA SHEET

EO1

EO1

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.64	0.98	2.33
0.38	0.42	0.70	1.04	2.39
1.00	0.45	0.72	1.07	2.42
3.00	0.45	0.72	1.07	2.42

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.41	0.54	1.00
0.38	0.32	0.43	0.56	1.02
1.00	0.40	0.51	0.64	1.10
3.00	0.60	0.72	0.84	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.58	0.92	2.28
0.38	0.37	0.64	0.99	2.34
1.00	0.39	0.67	1.01	2.37
3.00	0.40	0.67	1.01	2.37

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.40	0.52	0.99
0.38	0.30	0.42	0.55	1.01
1.00	0.38	0.50	0.62	1.09
3.00	0.58	0.70	0.83	1.30

TC200G SERIES

DATA SHEET

EO1

EO1

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.48	0.74	1.77
0.38	0.33	0.54	0.80	1.83
1.00	0.36	0.57	0.83	1.86
3.00	0.36	0.58	0.84	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.41	0.53	1.00
0.38	0.32	0.43	0.55	1.02
1.00	0.39	0.51	0.63	1.10
3.00	0.60	0.71	0.84	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.65	0.99	2.34
0.38	0.43	0.71	1.05	2.41
1.00	0.47	0.75	1.09	2.45
3.00	0.52	0.80	1.14	2.49

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.44	0.56	1.03
0.38	0.32	0.43	0.56	1.02
1.00	0.36	0.48	0.60	1.07
3.00	0.50	0.62	0.75	1.22

TC200G SERIES

DATA SHEET

EO1

EO1

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.59	0.94	2.29
0.38	0.38	0.66	1.00	2.36
1.00	0.42	0.70	1.04	2.40
3.00	0.47	0.74	1.08	2.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.42	0.55	1.01
0.38	0.31	0.42	0.55	1.01
1.00	0.35	0.46	0.59	1.06
3.00	0.48	0.61	0.74	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1953	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.49	0.75	1.78
0.38	0.34	0.55	0.81	1.84
1.00	0.39	0.60	0.86	1.89
3.00	0.44	0.65	0.91	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0655	0.13

PATH DELAY (ns)

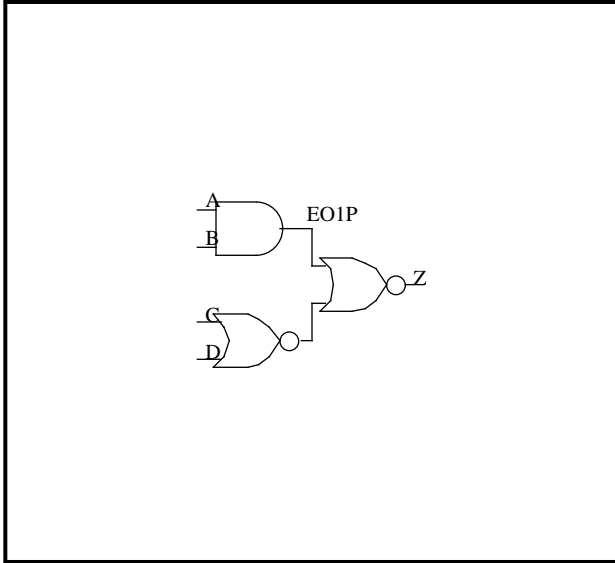
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.43	0.56	1.02
0.38	0.32	0.43	0.56	1.02
1.00	0.36	0.47	0.60	1.07
3.00	0.49	0.62	0.75	1.22

TC200G SERIES

DATA SHEET

EO1P		EO1P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EO1P	2-INPUT AND and 2-INPUT NOR into 2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	L
L	H	L	L	L
H	L	L	L	L
H	H	L	L	L
H	H	L	H	L
H	H	H	L	L
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
EO1P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:EO1P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.02
B	1.99
C	1.05
D	1.07

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	35.6

TC200G SERIES

DATA SHEET

EO1P

EO1P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.31	0.50	1.27
0.38	0.17	0.33	0.52	1.29
1.00	0.22	0.38	0.58	1.33
3.00	0.34	0.54	0.75	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.18	0.30	0.76
0.38	0.15	0.26	0.38	0.85
1.00	0.19	0.34	0.49	0.98
3.00	0.21	0.44	0.66	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.31	0.50	1.27
0.38	0.17	0.33	0.52	1.29
1.00	0.22	0.38	0.58	1.33
3.00	0.34	0.54	0.75	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.18	0.30	0.76
0.38	0.15	0.26	0.38	0.85
1.00	0.19	0.34	0.49	0.98
3.00	0.21	0.44	0.66	1.30

TC200G SERIES

DATA SHEET

EO1P

EO1P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&-C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.31	0.50	1.27
0.38	0.17	0.33	0.52	1.29
1.00	0.22	0.38	0.58	1.33
3.00	0.34	0.54	0.75	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&-C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.18	0.30	0.76
0.38	0.15	0.26	0.38	0.85
1.00	0.19	0.34	0.49	0.98
3.00	0.21	0.44	0.66	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.38	0.57	1.33
0.38	0.23	0.39	0.58	1.34
1.00	0.30	0.45	0.64	1.39
3.00	0.49	0.66	0.85	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.20	0.31	0.78
0.38	0.15	0.24	0.36	0.83
1.00	0.17	0.29	0.42	0.89
3.00	0.13	0.31	0.49	1.05

TC200G SERIES

DATA SHEET

EO1P

EO1P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.38	0.57	1.33
0.38	0.23	0.39	0.58	1.34
1.00	0.30	0.45	0.64	1.39
3.00	0.49	0.66	0.85	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C&~D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.20	0.31	0.78
0.38	0.15	0.24	0.36	0.83
1.00	0.17	0.29	0.42	0.89
3.00	0.13	0.31	0.49	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.38	0.57	1.33
0.38	0.23	0.39	0.58	1.34
1.00	0.30	0.45	0.64	1.39
3.00	0.49	0.66	0.85	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C&D	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.20	0.31	0.78
0.38	0.15	0.24	0.36	0.83
1.00	0.17	0.29	0.42	0.89
3.00	0.13	0.31	0.49	1.05

TC200G SERIES

DATA SHEET

EO1P

EO1P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.50	0.70	1.46
0.38	0.41	0.57	0.77	1.53
1.00	0.46	0.62	0.81	1.58
3.00	0.50	0.66	0.85	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.42	0.50	0.80
0.38	0.36	0.44	0.52	0.82
1.00	0.44	0.52	0.60	0.90
3.00	0.65	0.73	0.82	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.43	0.63	1.39
0.38	0.34	0.50	0.69	1.46
1.00	0.39	0.55	0.74	1.51
3.00	0.43	0.59	0.78	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.48	0.78
0.38	0.34	0.42	0.50	0.80
1.00	0.42	0.50	0.58	0.88
3.00	0.62	0.71	0.80	1.10

TC200G SERIES

DATA SHEET

EO1P

EO1P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.37	0.52	1.09
0.38	0.32	0.44	0.59	1.16
1.00	0.36	0.49	0.63	1.21
3.00	0.41	0.53	0.68	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~D&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.41	0.50	0.79
0.38	0.36	0.43	0.51	0.81
1.00	0.44	0.51	0.60	0.89
3.00	0.65	0.73	0.81	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.51	0.71	1.47
0.38	0.42	0.58	0.78	1.54
1.00	0.48	0.64	0.84	1.60
3.00	0.57	0.72	0.92	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.44	0.52	0.82
0.38	0.36	0.44	0.52	0.82
1.00	0.40	0.48	0.56	0.86
3.00	0.53	0.61	0.70	1.01

TC200G SERIES

DATA SHEET

EO1P

EO1P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.44	0.64	1.40
0.38	0.35	0.51	0.71	1.47
1.00	0.41	0.57	0.76	1.53
3.00	0.50	0.66	0.84	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.42	0.50	0.80
0.38	0.34	0.42	0.50	0.80
1.00	0.37	0.46	0.54	0.84
3.00	0.50	0.59	0.68	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1115	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.38	0.53	1.10
0.38	0.33	0.45	0.60	1.18
1.00	0.39	0.51	0.66	1.24
3.00	0.48	0.60	0.75	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	~C&~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0410	0.13

PATH DELAY (ns)

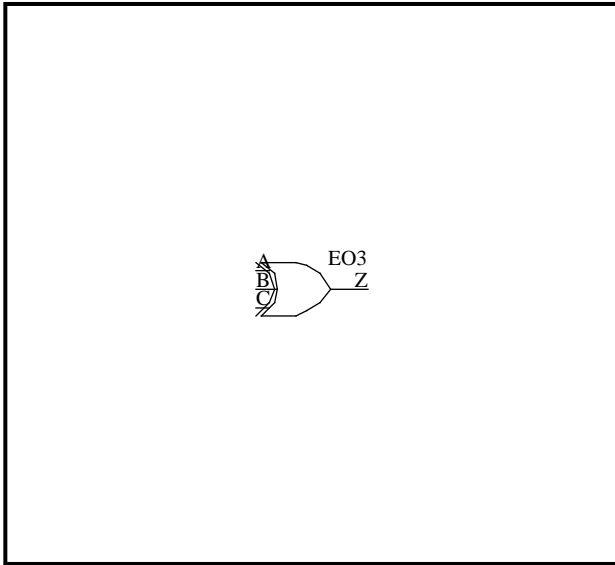
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.43	0.52	0.81
0.38	0.35	0.43	0.51	0.81
1.00	0.39	0.47	0.55	0.85
3.00	0.53	0.61	0.70	1.00

TC200G SERIES

DATA SHEET

EO3		EO3		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EO3	3-INPUT EXCLUSIVE OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	L
L	L	H	H
L	H	L	H
L	H	H	L
H	L	L	H
H	L	H	L
H	H	L	L
H	H	H	H

Verilog-HDL DESCRIPTION

```
EO3 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:EO3
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	3.30
C	2.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	48.9

TC200G SERIES

DATA SHEET

EO3

EO3

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.57	0.73	1.34
0.38	0.50	0.65	0.81	1.42
1.00	0.61	0.76	0.92	1.53
3.00	0.82	0.97	1.13	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.66	0.82	1.31
0.38	0.53	0.69	0.85	1.34
1.00	0.60	0.77	0.92	1.42
3.00	0.79	0.96	1.12	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.85	1.01	1.62
0.38	0.74	0.88	1.04	1.65
1.00	0.81	0.96	1.12	1.73
3.00	0.99	1.14	1.30	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.76	0.92	1.40
0.38	0.69	0.85	1.00	1.49
1.00	0.80	0.95	1.11	1.59
3.00	0.98	1.14	1.29	1.78

TC200G SERIES

DATA SHEET

EO3

EO3

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.86	1.02	1.63
0.38	0.75	0.89	1.05	1.66
1.00	0.82	0.97	1.13	1.74
3.00	1.00	1.15	1.31	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.77	0.92	1.41
0.38	0.70	0.86	1.01	1.50
1.00	0.80	0.96	1.11	1.60
3.00	0.99	1.15	1.30	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.57	0.73	1.33
0.38	0.50	0.65	0.81	1.42
1.00	0.61	0.75	0.91	1.52
3.00	0.82	0.96	1.12	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.65	0.81	1.30
0.38	0.52	0.68	0.84	1.33
1.00	0.59	0.76	0.92	1.41
3.00	0.78	0.95	1.12	1.62

TC200G SERIES

DATA SHEET

EO3

EO3

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.47	0.63	1.24
0.38	0.41	0.55	0.71	1.32
1.00	0.49	0.64	0.80	1.41
3.00	0.62	0.76	0.92	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.57	0.72	1.21
0.38	0.44	0.60	0.75	1.23
1.00	0.51	0.67	0.82	1.30
3.00	0.68	0.84	1.00	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.57	0.73	1.34
0.38	0.46	0.60	0.76	1.37
1.00	0.52	0.67	0.83	1.43
3.00	0.66	0.80	0.96	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.47	0.63	1.12
0.38	0.40	0.56	0.71	1.20
1.00	0.54	0.69	0.84	1.33
3.00	0.69	0.85	1.00	1.48

TC200G SERIES

DATA SHEET

EO3

EO3

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.60	0.77	1.37
0.38	0.49	0.63	0.80	1.40
1.00	0.55	0.70	0.86	1.47
3.00	0.69	0.83	0.99	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.61	1.09
0.38	0.39	0.54	0.70	1.18
1.00	0.53	0.68	0.83	1.31
3.00	0.67	0.82	0.97	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.50	0.66	1.27
0.38	0.43	0.58	0.74	1.35
1.00	0.52	0.67	0.83	1.44
3.00	0.67	0.81	0.98	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.54	0.69	1.17
0.38	0.41	0.56	0.71	1.19
1.00	0.48	0.63	0.78	1.26
3.00	0.64	0.80	0.95	1.44

TC200G SERIES

DATA SHEET

EO3

EO3

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.51	1.11
0.38	0.28	0.43	0.59	1.19
1.00	0.35	0.50	0.66	1.27
3.00	0.48	0.62	0.78	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.49	0.95
0.38	0.26	0.39	0.52	0.99
1.00	0.32	0.45	0.59	1.06
3.00	0.47	0.61	0.75	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.61	1.21
0.38	0.34	0.48	0.64	1.25
1.00	0.39	0.54	0.70	1.30
3.00	0.51	0.65	0.81	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.36	0.51	0.99
0.38	0.30	0.45	0.59	1.07
1.00	0.44	0.58	0.72	1.19
3.00	0.56	0.70	0.84	1.31

TC200G SERIES

DATA SHEET

EO3

EO3

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.46	0.62	1.23
0.38	0.35	0.49	0.65	1.26
1.00	0.40	0.55	0.71	1.32
3.00	0.52	0.66	0.82	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.35	0.49	0.97
0.38	0.30	0.44	0.58	1.05
1.00	0.43	0.57	0.70	1.17
3.00	0.55	0.68	0.82	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0841	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.36	0.52	1.12
0.38	0.29	0.44	0.60	1.21
1.00	0.37	0.51	0.67	1.28
3.00	0.51	0.65	0.81	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0375	0.13

PATH DELAY (ns)

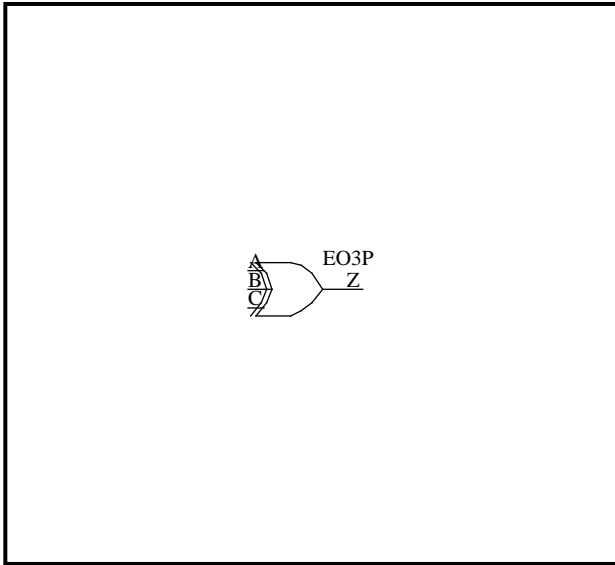
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.48	0.94
0.38	0.26	0.38	0.52	0.98
1.00	0.32	0.45	0.58	1.04
3.00	0.46	0.60	0.74	1.20

TC200G SERIES

DATA SHEET

EO3P		EO3P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
EO3P	3-INPUT EXCLUSIVE OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	L
L	L	H	H
L	H	L	H
L	H	H	L
H	L	L	H
H	L	H	L
H	H	L	L
H	H	H	H

Verilog-HDL DESCRIPTION

```
EO3P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:EO3P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	3.30
C	2.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	82.1

TC200G SERIES

DATA SHEET

EO3P

EO3P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.54	0.64	0.99
0.38	0.53	0.62	0.72	1.08
1.00	0.64	0.72	0.82	1.18
3.00	0.86	0.95	1.04	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.63	0.73	1.07
0.38	0.54	0.65	0.76	1.10
1.00	0.62	0.73	0.84	1.17
3.00	0.81	0.93	1.04	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.82	0.92	1.28
0.38	0.76	0.85	0.95	1.31
1.00	0.84	0.93	1.03	1.39
3.00	1.02	1.11	1.21	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.73	0.83	1.16
0.38	0.71	0.81	0.92	1.25
1.00	0.81	0.92	1.02	1.35
3.00	1.00	1.10	1.21	1.54

TC200G SERIES

DATA SHEET

EO3P

EO3P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.83	0.93	1.29
0.38	0.77	0.86	0.96	1.32
1.00	0.85	0.94	1.04	1.40
3.00	1.03	1.12	1.22	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.74	0.84	1.17
0.38	0.72	0.82	0.93	1.26
1.00	0.82	0.93	1.03	1.36
3.00	1.01	1.11	1.22	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.53	0.63	0.99
0.38	0.53	0.62	0.71	1.07
1.00	0.63	0.72	0.82	1.18
3.00	0.85	0.94	1.04	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.62	0.72	1.06
0.38	0.53	0.65	0.75	1.09
1.00	0.61	0.72	0.83	1.16
3.00	0.80	0.92	1.03	1.37

TC200G SERIES

DATA SHEET

EO3P

EO3P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.54	0.90
0.38	0.44	0.52	0.62	0.98
1.00	0.53	0.62	0.72	1.07
3.00	0.67	0.76	0.86	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.54	0.64	0.97
0.38	0.45	0.56	0.67	1.00
1.00	0.52	0.63	0.73	1.06
3.00	0.70	0.80	0.91	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.54	0.64	1.00
0.38	0.48	0.57	0.67	1.03
1.00	0.55	0.63	0.73	1.09
3.00	0.68	0.76	0.86	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.44	0.55	0.88
0.38	0.41	0.52	0.62	0.95
1.00	0.55	0.66	0.76	1.09
3.00	0.73	0.84	0.94	1.27

TC200G SERIES

DATA SHEET

EO3P

EO3P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.58	0.68	1.04
0.38	0.52	0.61	0.70	1.06
1.00	0.58	0.67	0.77	1.12
3.00	0.71	0.79	0.89	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.42	0.52	0.85
0.38	0.40	0.51	0.61	0.94
1.00	0.54	0.65	0.75	1.08
3.00	0.70	0.81	0.91	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.47	0.57	0.93
0.38	0.47	0.55	0.65	1.01
1.00	0.56	0.65	0.75	1.11
3.00	0.73	0.82	0.92	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.50	0.60	0.93
0.38	0.42	0.53	0.63	0.95
1.00	0.49	0.59	0.70	1.02
3.00	0.65	0.76	0.87	1.20

TC200G SERIES

DATA SHEET

EO3P

EO3P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.42	0.78
0.38	0.31	0.40	0.50	0.86
1.00	0.40	0.49	0.59	0.94
3.00	0.57	0.65	0.75	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.42	0.73
0.38	0.26	0.36	0.45	0.77
1.00	0.33	0.42	0.52	0.83
3.00	0.48	0.58	0.68	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.41	0.51	0.87
0.38	0.36	0.45	0.54	0.90
1.00	0.41	0.50	0.60	0.96
3.00	0.53	0.62	0.72	1.07

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.32	0.43	0.75
0.38	0.31	0.41	0.51	0.83
1.00	0.45	0.56	0.65	0.97
3.00	0.62	0.72	0.82	1.13

TC200G SERIES

DATA SHEET

EO3P

EO3P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.43	0.53	0.89
0.38	0.37	0.46	0.56	0.92
1.00	0.43	0.52	0.62	0.98
3.00	0.54	0.63	0.73	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.31	0.41	0.73
0.38	0.30	0.40	0.50	0.82
1.00	0.45	0.55	0.64	0.96
3.00	0.60	0.70	0.79	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0481	0.14

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.43	0.79
0.38	0.32	0.41	0.51	0.87
1.00	0.42	0.50	0.60	0.96
3.00	0.60	0.68	0.78	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0247	0.13

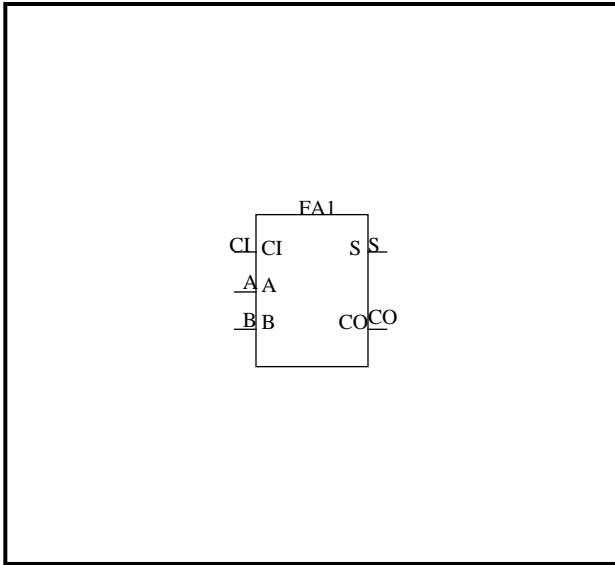
PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.41	0.72
0.38	0.26	0.36	0.45	0.76
1.00	0.33	0.42	0.51	0.82
3.00	0.47	0.57	0.67	0.98

TC200G SERIES

DATA SHEET

FA1		FA1		1/10
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FA1	FULL ADDER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CI	A	B	S	CO
L	L	L	L	L
L	L	H	H	L
L	H	L	H	L
L	H	H	L	H
H	L	L	H	L
H	L	H	L	H
H	H	L	L	H
H	H	H	H	H

Verilog-HDL DESCRIPTION

```
FA1 inst(S,CO,CI,A,B);
```

VHDL DESCRIPTION

```
inst:FA1
port map(S,CO,CI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	S,CO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CI	4.46
A	3.05
B	4.50

OUTPUT DRIVE

(LU)

PIN NAME	S	CO
DRIVE	43.0	46.3

TC200G SERIES

DATA SHEET

FA1

FA1

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0882	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.41	0.57	1.19
0.38	0.33	0.46	0.62	1.24
1.00	0.40	0.54	0.70	1.31
3.00	0.51	0.65	0.82	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0398	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.61	0.76	1.27
0.38	0.45	0.60	0.75	1.26
1.00	0.48	0.64	0.79	1.30
3.00	0.64	0.80	0.95	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0882	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.59	1.21
0.38	0.34	0.49	0.65	1.27
1.00	0.42	0.56	0.73	1.35
3.00	0.57	0.71	0.88	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0398	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.64	0.78	1.28
0.38	0.48	0.63	0.77	1.27
1.00	0.50	0.66	0.80	1.30
3.00	0.64	0.79	0.94	1.45

TC200G SERIES

DATA SHEET

FA1

FA1

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.76	0.94	1.63
0.38	0.68	0.83	1.01	1.70
1.00	0.74	0.90	1.08	1.77
3.00	0.85	1.00	1.18	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.79	0.93	1.43
0.38	0.68	0.83	0.97	1.46
1.00	0.74	0.89	1.03	1.53
3.00	0.87	1.02	1.16	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.70	0.85	1.03	1.72
0.38	0.74	0.89	1.06	1.75
1.00	0.80	0.95	1.13	1.81
3.00	0.93	1.08	1.26	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.81	0.94	1.43
0.38	0.74	0.88	1.01	1.50
1.00	0.81	0.94	1.08	1.56
3.00	0.91	1.05	1.18	1.67

TC200G SERIES

DATA SHEET

FA1

FA1

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.74	0.92	1.61
0.38	0.62	0.77	0.95	1.64
1.00	0.70	0.85	1.03	1.72
3.00	0.87	1.03	1.20	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.68	0.82	1.32
0.38	0.61	0.76	0.90	1.40
1.00	0.70	0.85	0.99	1.49
3.00	0.87	1.01	1.16	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.74	0.92	1.60
0.38	0.67	0.82	0.99	1.68
1.00	0.76	0.91	1.08	1.77
3.00	0.92	1.07	1.25	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.78	0.92	1.40
0.38	0.68	0.81	0.95	1.43
1.00	0.76	0.89	1.03	1.51
3.00	0.93	1.06	1.20	1.68

TC200G SERIES

DATA SHEET

FA1

FA1

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0882	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.40	0.55	1.16
0.38	0.36	0.49	0.64	1.25
1.00	0.46	0.59	0.75	1.35
3.00	0.65	0.79	0.94	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0398	0.18

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.53	0.68	1.19
0.38	0.37	0.52	0.67	1.19
1.00	0.40	0.56	0.71	1.22
3.00	0.51	0.67	0.82	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0882	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.41	0.57	1.19
0.38	0.33	0.47	0.63	1.24
1.00	0.39	0.53	0.69	1.31
3.00	0.49	0.63	0.80	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0398	0.18

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.65	0.79	1.29
0.38	0.50	0.65	0.80	1.29
1.00	0.57	0.72	0.86	1.36
3.00	0.79	0.94	1.09	1.60

TC200G SERIES

DATA SHEET

FA1

FA1

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.63	0.81	1.50
0.38	0.56	0.71	0.89	1.58
1.00	0.67	0.82	1.00	1.69
3.00	0.80	0.95	1.13	1.82

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.71	0.85	1.35
0.38	0.60	0.74	0.88	1.38
1.00	0.66	0.80	0.94	1.44
3.00	0.77	0.92	1.06	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.77	0.94	1.63
0.38	0.65	0.80	0.98	1.66
1.00	0.71	0.86	1.04	1.72
3.00	0.82	0.97	1.15	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.68	0.81	1.30
0.38	0.63	0.76	0.89	1.38
1.00	0.73	0.87	1.00	1.49
3.00	0.86	1.00	1.13	1.62

TC200G SERIES

DATA SHEET

FA1

FA1

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.64	0.82	1.51
0.38	0.51	0.67	0.85	1.54
1.00	0.58	0.73	0.91	1.60
3.00	0.74	0.89	1.07	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.59	0.74	1.23
0.38	0.52	0.67	0.81	1.31
1.00	0.58	0.73	0.87	1.37
3.00	0.68	0.82	0.97	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.66	0.83	1.52
0.38	0.58	0.73	0.91	1.59
1.00	0.64	0.79	0.97	1.65
3.00	0.73	0.88	1.06	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.68	0.82	1.30
0.38	0.58	0.71	0.85	1.34
1.00	0.65	0.78	0.92	1.40
3.00	0.80	0.94	1.07	1.56

TC200G SERIES

DATA SHEET

FA1

FA1

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0882	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.42	0.58	1.20
0.38	0.37	0.51	0.67	1.29
1.00	0.46	0.61	0.77	1.39
3.00	0.62	0.77	0.93	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0398	0.18

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.54	0.69	1.21
0.38	0.40	0.56	0.71	1.22
1.00	0.48	0.63	0.78	1.29
3.00	0.66	0.82	0.97	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0882	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.42	0.58	1.20
0.38	0.36	0.51	0.67	1.29
1.00	0.45	0.60	0.76	1.39
3.00	0.61	0.75	0.92	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0398	0.18

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.61	0.76	1.27
0.38	0.47	0.63	0.78	1.29
1.00	0.54	0.69	0.84	1.35
3.00	0.74	0.90	1.05	1.57

TC200G SERIES

DATA SHEET

FA1

FA1

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.51	1.19
0.38	0.27	0.41	0.59	1.27
1.00	0.33	0.48	0.65	1.33
3.00	0.43	0.58	0.76	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.36	0.49	0.97
0.38	0.26	0.39	0.52	1.00
1.00	0.33	0.45	0.58	1.06
3.00	0.47	0.60	0.73	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.63	1.32
0.38	0.34	0.49	0.66	1.35
1.00	0.40	0.55	0.72	1.41
3.00	0.52	0.67	0.85	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.49	0.98
0.38	0.31	0.44	0.58	1.07
1.00	0.42	0.54	0.68	1.16
3.00	0.53	0.66	0.80	1.28

TC200G SERIES

DATA SHEET

FA1

FA1

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.63	1.32
0.38	0.34	0.49	0.66	1.35
1.00	0.40	0.55	0.72	1.41
3.00	0.52	0.67	0.85	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.49	0.98
0.38	0.31	0.44	0.58	1.07
1.00	0.42	0.54	0.68	1.16
3.00	0.53	0.66	0.80	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.1000	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.51	1.19
0.38	0.27	0.41	0.59	1.27
1.00	0.33	0.48	0.65	1.33
3.00	0.43	0.58	0.76	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0400	0.13

PATH DELAY (ns)

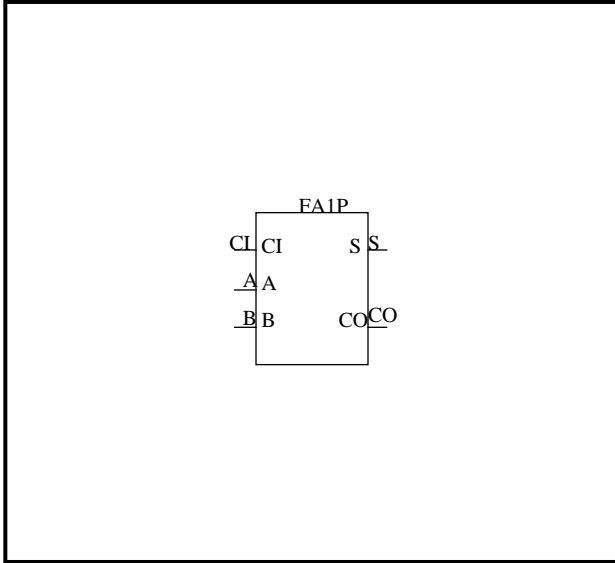
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.36	0.49	0.97
0.38	0.26	0.39	0.52	1.00
1.00	0.33	0.45	0.58	1.06
3.00	0.47	0.60	0.73	1.22

TC200G SERIES

DATA SHEET

FA1P		FA1P		1/10
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FA1P	FULL ADDER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CI	A	B	S	CO
L	L	L	L	L
L	L	H	H	L
L	H	L	H	L
L	H	H	L	H
H	L	L	H	L
H	L	H	L	H
H	H	L	L	H
H	H	H	H	H

Verilog-HDL DESCRIPTION

```
FA1P inst(S,CO,CI,A,B);
```

VHDL DESCRIPTION

```
inst:FA1P
port map(S,CO,CI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	S	CO
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CI	4.46
A	3.04
B	4.54

OUTPUT DRIVE

(LU)

PIN NAME	S	CO
DRIVE	85.8	93.2

TC200G SERIES

DATA SHEET

FA1P

FA1P

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0438	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.43	0.75
0.38	0.33	0.40	0.49	0.81
1.00	0.40	0.48	0.56	0.88
3.00	0.54	0.62	0.70	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0196	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.56	0.65	0.94
0.38	0.46	0.56	0.65	0.93
1.00	0.49	0.59	0.68	0.96
3.00	0.65	0.75	0.84	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0438	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.45	0.78
0.38	0.34	0.42	0.51	0.83
1.00	0.43	0.51	0.59	0.92
3.00	0.59	0.67	0.76	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0196	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.58	0.67	0.95
0.38	0.48	0.58	0.67	0.94
1.00	0.51	0.60	0.69	0.96
3.00	0.64	0.74	0.83	1.11

TC200G SERIES

DATA SHEET

FA1P

FA1P

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.70	0.80	1.15
0.38	0.69	0.77	0.87	1.23
1.00	0.75	0.84	0.93	1.29
3.00	0.86	0.94	1.04	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.75	0.85	1.14
0.38	0.69	0.79	0.88	1.18
1.00	0.75	0.85	0.94	1.24
3.00	0.88	0.98	1.07	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.79	0.88	1.24
0.38	0.74	0.82	0.92	1.27
1.00	0.80	0.89	0.98	1.33
3.00	0.93	1.02	1.11	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.77	0.86	1.14
0.38	0.75	0.84	0.93	1.21
1.00	0.82	0.90	0.99	1.28
3.00	0.92	1.01	1.10	1.38

TC200G SERIES

DATA SHEET

FA1P

FA1P

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.68	0.78	1.13
0.38	0.63	0.72	0.81	1.17
1.00	0.71	0.79	0.89	1.24
3.00	0.88	0.97	1.06	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.64	0.74	1.03
0.38	0.63	0.72	0.81	1.11
1.00	0.71	0.81	0.90	1.20
3.00	0.88	0.98	1.07	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.68	0.77	1.12
0.38	0.67	0.76	0.85	1.20
1.00	0.76	0.85	0.94	1.29
3.00	0.93	1.01	1.10	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.75	0.83	1.12
0.38	0.69	0.78	0.87	1.15
1.00	0.77	0.86	0.94	1.23
3.00	0.94	1.02	1.11	1.40

TC200G SERIES

DATA SHEET

FA1P

FA1P

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0438	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.43	0.75
0.38	0.36	0.43	0.52	0.84
1.00	0.47	0.55	0.63	0.95
3.00	0.69	0.77	0.85	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0196	0.18

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.49	0.58	0.86
0.38	0.39	0.48	0.57	0.85
1.00	0.42	0.51	0.60	0.88
3.00	0.53	0.63	0.72	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0438	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.45	0.77
0.38	0.34	0.42	0.51	0.83
1.00	0.40	0.49	0.58	0.91
3.00	0.53	0.61	0.70	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0196	0.18

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.61	0.69	0.97
0.38	0.52	0.61	0.70	0.97
1.00	0.58	0.67	0.76	1.03
3.00	0.81	0.91	1.00	1.28

TC200G SERIES

DATA SHEET

FA1P

FA1P

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.66	1.02
0.38	0.56	0.65	0.75	1.10
1.00	0.67	0.76	0.85	1.21
3.00	0.80	0.88	0.98	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.66	0.76	1.05
0.38	0.60	0.70	0.79	1.09
1.00	0.66	0.76	0.85	1.15
3.00	0.78	0.87	0.96	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&-CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.70	0.80	1.15
0.38	0.65	0.74	0.83	1.18
1.00	0.71	0.80	0.89	1.24
3.00	0.83	0.91	1.00	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&-CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.64	0.72	1.01
0.38	0.63	0.72	0.81	1.09
1.00	0.74	0.83	0.92	1.20
3.00	0.87	0.96	1.04	1.33

TC200G SERIES

DATA SHEET

FA1P

FA1P

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.58	0.67	1.03
0.38	0.52	0.61	0.71	1.06
1.00	0.59	0.68	0.77	1.13
3.00	0.75	0.83	0.93	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.56	0.65	0.95
0.38	0.54	0.64	0.73	1.03
1.00	0.60	0.70	0.79	1.09
3.00	0.70	0.79	0.89	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.60	0.69	1.04
0.38	0.59	0.67	0.77	1.12
1.00	0.65	0.73	0.83	1.18
3.00	0.74	0.83	0.92	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.65	0.74	1.02
0.38	0.59	0.68	0.77	1.05
1.00	0.66	0.75	0.83	1.12
3.00	0.81	0.90	0.99	1.27

TC200G SERIES

DATA SHEET

FA1P

FA1P

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0438	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.44	0.77
0.38	0.37	0.45	0.53	0.86
1.00	0.47	0.55	0.64	0.97
3.00	0.66	0.74	0.83	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0196	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.50	0.58	0.87
0.38	0.41	0.51	0.60	0.88
1.00	0.48	0.58	0.67	0.95
3.00	0.68	0.78	0.87	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0438	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.44	0.77
0.38	0.36	0.44	0.53	0.86
1.00	0.46	0.55	0.64	0.96
3.00	0.64	0.73	0.82	1.15

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0196	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.57	0.66	0.94
0.38	0.48	0.58	0.67	0.95
1.00	0.55	0.64	0.73	1.01
3.00	0.76	0.86	0.95	1.24

TC200G SERIES

DATA SHEET

FA1P

FA1P

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.39	0.74
0.38	0.29	0.37	0.47	0.82
1.00	0.37	0.45	0.55	0.90
3.00	0.52	0.60	0.70	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.41	0.69
0.38	0.27	0.36	0.44	0.72
1.00	0.33	0.42	0.51	0.79
3.00	0.48	0.57	0.66	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.47	0.82
0.38	0.32	0.41	0.50	0.85
1.00	0.38	0.46	0.56	0.91
3.00	0.49	0.58	0.67	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.30	0.39	0.68
0.38	0.30	0.39	0.48	0.77
1.00	0.43	0.52	0.60	0.89
3.00	0.57	0.66	0.74	1.03

TC200G SERIES

DATA SHEET

FA1P

FA1P

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.47	0.82
0.38	0.32	0.41	0.50	0.85
1.00	0.38	0.46	0.56	0.91
3.00	0.49	0.58	0.67	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.30	0.39	0.68
0.38	0.30	0.39	0.48	0.77
1.00	0.43	0.52	0.60	0.89
3.00	0.57	0.66	0.74	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0487	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.39	0.74
0.38	0.29	0.37	0.47	0.82
1.00	0.37	0.45	0.55	0.90
3.00	0.52	0.60	0.70	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0223	0.13

PATH DELAY (ns)

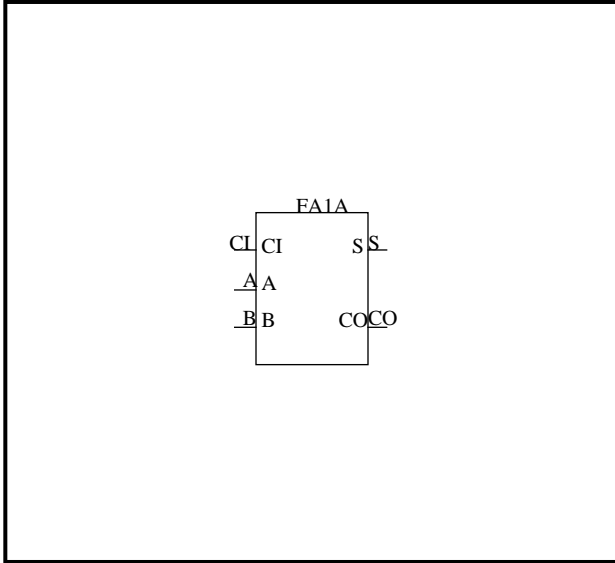
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.41	0.69
0.38	0.27	0.36	0.44	0.72
1.00	0.33	0.42	0.51	0.79
3.00	0.48	0.57	0.66	0.95

TC200G SERIES

DATA SHEET

FA1A		FA1A		1/10
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FA1A	FULL ADDER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CI	A	B	S	CO
L	L	L	L	L
L	L	H	H	L
L	H	L	H	L
L	H	H	L	H
H	L	L	H	L
H	L	H	L	H
H	H	L	L	H
H	H	H	H	H

Verilog-HDL DESCRIPTION

```
FA1A inst(S,CO,CI,A,B);
```

VHDL DESCRIPTION

```
inst:FA1A
port map(S,CO,CI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	S,CO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CI	2.21
A	0.99
B	2.08

OUTPUT DRIVE

(LU)

PIN NAME	S	CO
DRIVE	50.5	41.8

TC200G SERIES

DATA SHEET

FA1A

FA1A

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.1010	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.83	1.00	1.69
0.38	0.76	0.91	1.09	1.77
1.00	0.86	1.01	1.18	1.87
3.00	1.03	1.18	1.35	2.04

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0426	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.92	1.06	1.58
0.38	0.82	0.95	1.09	1.61
1.00	0.90	1.03	1.17	1.68
3.00	1.07	1.21	1.35	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.1010	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.87	1.02	1.20	1.89
0.38	0.94	1.10	1.28	1.97
1.00	1.01	1.16	1.34	2.03
3.00	1.12	1.27	1.45	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0426	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.97	1.11	1.62
0.38	0.86	1.00	1.14	1.65
1.00	0.93	1.06	1.21	1.72
3.00	1.05	1.19	1.34	1.85

TC200G SERIES

DATA SHEET

FA1A

FA1A

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.79	0.94	1.54
0.38	0.74	0.87	1.03	1.62
1.00	0.84	0.97	1.12	1.71
3.00	1.01	1.14	1.30	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.88	1.00	1.44
0.38	0.78	0.91	1.03	1.47
1.00	0.85	0.98	1.11	1.54
3.00	1.03	1.15	1.28	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.78	0.94	1.55
0.38	0.68	0.81	0.97	1.58
1.00	0.75	0.89	1.05	1.65
3.00	0.93	1.07	1.22	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.73	0.87	1.32
0.38	0.66	0.81	0.95	1.41
1.00	0.76	0.91	1.05	1.50
3.00	0.93	1.08	1.22	1.68

TC200G SERIES

DATA SHEET

FA1A

FA1A

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.94	1.09	1.69
0.38	0.84	0.97	1.13	1.72
1.00	0.90	1.04	1.19	1.78
3.00	1.03	1.16	1.32	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.78	0.91	1.04	1.48
0.38	0.86	0.99	1.12	1.56
1.00	0.92	1.05	1.18	1.62
3.00	1.03	1.16	1.29	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.80	0.96	1.56
0.38	0.74	0.87	1.03	1.63
1.00	0.80	0.94	1.10	1.70
3.00	0.91	1.05	1.21	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.72	0.86	1.00	1.45
0.38	0.75	0.89	1.03	1.48
1.00	0.81	0.96	1.09	1.54
3.00	0.94	1.09	1.22	1.67

TC200G SERIES

DATA SHEET

FA1A

FA1A

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.1010	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.75	0.92	1.60
0.38	0.68	0.83	1.00	1.68
1.00	0.75	0.89	1.07	1.74
3.00	0.87	1.02	1.19	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0426	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.45	0.59	1.09
0.38	0.35	0.49	0.62	1.12
1.00	0.42	0.56	0.70	1.20
3.00	0.57	0.72	0.86	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.1010	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.40	0.57	1.26
0.38	0.34	0.48	0.65	1.33
1.00	0.43	0.57	0.74	1.42
3.00	0.59	0.74	0.91	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0426	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.89	1.03	1.53
0.38	0.78	0.92	1.06	1.57
1.00	0.86	0.99	1.13	1.64
3.00	1.01	1.14	1.28	1.79

TC200G SERIES

DATA SHEET

FA1A

FA1A

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.72	0.87	1.46
0.38	0.66	0.79	0.95	1.54
1.00	0.72	0.85	1.01	1.60
3.00	0.81	0.94	1.10	1.69

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.81	0.94	1.38
0.38	0.70	0.84	0.96	1.40
1.00	0.78	0.91	1.04	1.48
3.00	0.97	1.10	1.23	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.72	0.88	1.48
0.38	0.60	0.74	0.90	1.50
1.00	0.68	0.81	0.97	1.57
3.00	0.87	1.01	1.16	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.66	0.79	1.25
0.38	0.58	0.73	0.87	1.33
1.00	0.64	0.79	0.93	1.39
3.00	0.73	0.88	1.02	1.48

TC200G SERIES

DATA SHEET

FA1A

FA1A

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.86	1.02	1.61
0.38	0.76	0.89	1.05	1.64
1.00	0.83	0.97	1.12	1.71
3.00	0.98	1.11	1.26	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.75	0.87	1.31
0.38	0.73	0.85	0.98	1.41
1.00	0.89	1.02	1.15	1.58
3.00	1.12	1.25	1.37	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.65	0.81	1.42
0.38	0.62	0.76	0.92	1.52
1.00	0.78	0.92	1.08	1.68
3.00	1.01	1.15	1.31	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.78	0.92	1.37
0.38	0.67	0.82	0.95	1.40
1.00	0.74	0.89	1.02	1.47
3.00	0.89	1.03	1.17	1.62

TC200G SERIES

DATA SHEET

FA1A

FA1A

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.1010	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.50	0.68	1.37
0.38	0.41	0.57	0.75	1.44
1.00	0.48	0.64	0.82	1.51
3.00	0.64	0.80	0.98	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0426	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.66	1.18
0.38	0.38	0.53	0.69	1.21
1.00	0.45	0.60	0.75	1.28
3.00	0.59	0.75	0.91	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.1010	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.49	0.67	1.36
0.38	0.41	0.56	0.74	1.44
1.00	0.48	0.64	0.82	1.51
3.00	0.64	0.80	0.98	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0426	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.66	1.18
0.38	0.38	0.53	0.68	1.21
1.00	0.45	0.60	0.75	1.28
3.00	0.59	0.75	0.91	1.44

TC200G SERIES

DATA SHEET

FA1A

FA1A

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.30	0.45	1.04
0.38	0.24	0.37	0.52	1.12
1.00	0.30	0.43	0.58	1.18
3.00	0.37	0.50	0.65	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.47	0.91
0.38	0.26	0.38	0.50	0.94
1.00	0.34	0.46	0.58	1.02
3.00	0.53	0.65	0.78	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.55	0.70	1.30
0.38	0.44	0.58	0.73	1.33
1.00	0.52	0.65	0.81	1.41
3.00	0.69	0.83	0.98	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.48	0.92
0.38	0.32	0.45	0.58	1.02
1.00	0.49	0.61	0.74	1.17
3.00	0.72	0.84	0.96	1.39

TC200G SERIES

DATA SHEET

FA1A

FA1A

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.55	0.70	1.30
0.38	0.44	0.58	0.73	1.33
1.00	0.52	0.65	0.81	1.41
3.00	0.69	0.83	0.98	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.48	0.92
0.38	0.32	0.45	0.58	1.02
1.00	0.49	0.61	0.74	1.17
3.00	0.72	0.84	0.96	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0844	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.30	0.45	1.04
0.38	0.24	0.37	0.52	1.12
1.00	0.30	0.43	0.58	1.18
3.00	0.36	0.49	0.65	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0351	0.11

PATH DELAY (ns)

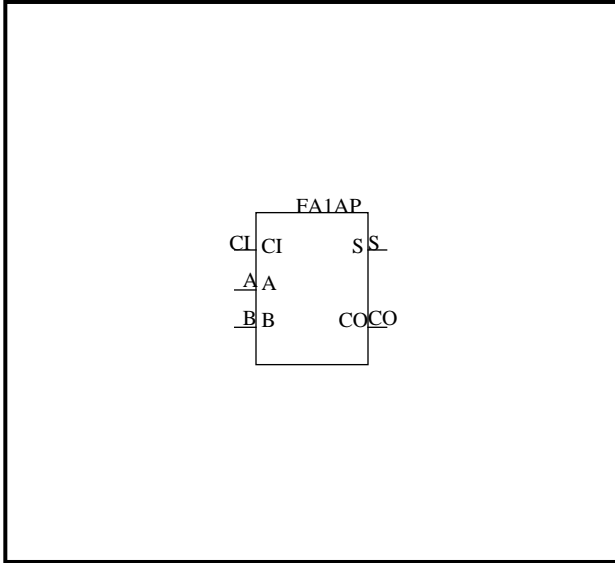
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.35	0.48	0.91
0.38	0.27	0.38	0.51	0.94
1.00	0.34	0.46	0.58	1.02
3.00	0.53	0.65	0.78	1.22

TC200G SERIES

DATA SHEET

FA1AP		FA1AP		1/10
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FA1AP	FULL ADDER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CI	A	B	S	CO
L	L	L	L	L
L	L	H	H	L
L	H	L	H	L
L	H	H	L	H
H	L	L	H	L
H	L	H	L	H
H	H	L	L	H
H	H	H	H	H

Verilog-HDL DESCRIPTION

```
FA1AP inst(S,CO,CI,A,B);
```

VHDL DESCRIPTION

```
inst:FA1AP
port map(S,CO,CI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	S	CO
ELECTRO MIGRATION DRIVE	12880.0	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CI	2.21
A	0.99
B	2.07

OUTPUT DRIVE

(LU)

PIN NAME	S	CO
DRIVE	92.3	75.8

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0559	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.84	0.94	1.31
0.38	0.83	0.92	1.02	1.40
1.00	0.93	1.02	1.12	1.49
3.00	1.11	1.20	1.29	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	B&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0249	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.89	0.99	1.30
0.38	0.83	0.92	1.02	1.33
1.00	0.91	1.00	1.09	1.41
3.00	1.09	1.18	1.27	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0559	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	0.97	1.07	1.45
0.38	0.96	1.05	1.15	1.53
1.00	1.03	1.11	1.21	1.59
3.00	1.14	1.23	1.33	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	~B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0249	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.92	1.01	1.33
0.38	0.86	0.95	1.04	1.36
1.00	0.92	1.02	1.11	1.42
3.00	1.05	1.14	1.24	1.55

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.73	0.82	1.14
0.38	0.74	0.82	0.90	1.22
1.00	0.83	0.91	1.00	1.32
3.00	1.01	1.09	1.17	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.83	0.92	1.19
0.38	0.78	0.86	0.95	1.22
1.00	0.85	0.94	1.03	1.30
3.00	1.03	1.11	1.20	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.72	0.81	1.13
0.38	0.67	0.75	0.84	1.17
1.00	0.75	0.83	0.91	1.24
3.00	0.92	1.00	1.09	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B&-CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.69	0.78	1.07
0.38	0.67	0.77	0.86	1.15
1.00	0.77	0.87	0.96	1.24
3.00	0.95	1.04	1.14	1.42

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.88	0.97	1.29
0.38	0.84	0.92	1.00	1.33
1.00	0.90	0.98	1.07	1.39
3.00	1.03	1.11	1.19	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.78	0.87	0.96	1.23
0.38	0.86	0.94	1.03	1.31
1.00	0.92	1.01	1.10	1.37
3.00	1.03	1.12	1.21	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~C	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.73	0.82	1.15
0.38	0.73	0.81	0.90	1.22
1.00	0.80	0.87	0.96	1.29
3.00	0.91	0.99	1.08	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B&~C	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.83	0.92	1.20
0.38	0.77	0.86	0.95	1.23
1.00	0.83	0.92	1.01	1.29
3.00	0.96	1.05	1.14	1.42

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0559	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.76	0.86	1.24
0.38	0.75	0.84	0.94	1.31
1.00	0.82	0.91	1.01	1.38
3.00	0.95	1.04	1.14	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0249	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.41	0.50	0.80
0.38	0.35	0.45	0.54	0.84
1.00	0.43	0.52	0.61	0.91
3.00	0.59	0.69	0.78	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0559	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.35	0.46	0.86
0.38	0.33	0.42	0.52	0.91
1.00	0.42	0.51	0.61	0.98
3.00	0.59	0.68	0.78	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0249	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.83	0.92	1.23
0.38	0.77	0.86	0.95	1.27
1.00	0.84	0.93	1.02	1.34
3.00	0.99	1.08	1.18	1.49

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.66	0.74	1.07
0.38	0.66	0.74	0.82	1.14
1.00	0.72	0.80	0.88	1.21
3.00	0.82	0.89	0.98	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.77	0.86	1.13
0.38	0.71	0.79	0.88	1.16
1.00	0.78	0.87	0.96	1.23
3.00	0.97	1.06	1.15	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&-CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.65	0.74	1.07
0.38	0.60	0.68	0.77	1.09
1.00	0.67	0.75	0.84	1.17
3.00	0.87	0.95	1.04	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A&-CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.61	0.70	0.99
0.38	0.60	0.69	0.78	1.07
1.00	0.66	0.75	0.85	1.13
3.00	0.75	0.85	0.94	1.23

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.79	0.88	1.20
0.38	0.75	0.83	0.91	1.24
1.00	0.82	0.90	0.98	1.31
3.00	0.96	1.04	1.12	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.70	0.79	1.06
0.38	0.72	0.81	0.89	1.17
1.00	0.89	0.98	1.07	1.34
3.00	1.13	1.22	1.31	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.58	0.67	1.00
0.38	0.61	0.69	0.78	1.10
1.00	0.78	0.86	0.95	1.27
3.00	1.02	1.10	1.18	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A&~CI	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.73	0.82	1.10
0.38	0.67	0.77	0.86	1.14
1.00	0.74	0.84	0.93	1.21
3.00	0.89	0.98	1.07	1.35

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0559	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.45	0.55	0.93
0.38	0.43	0.52	0.62	1.00
1.00	0.48	0.57	0.67	1.05
3.00	0.62	0.71	0.82	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0249	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.43	0.53	0.85
0.38	0.37	0.46	0.56	0.89
1.00	0.44	0.53	0.63	0.96
3.00	0.59	0.70	0.80	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0559	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.54	0.92
0.38	0.42	0.51	0.61	0.99
1.00	0.48	0.56	0.67	1.05
3.00	0.62	0.71	0.82	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->CO	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0249	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.43	0.53	0.85
0.38	0.37	0.46	0.56	0.89
1.00	0.44	0.53	0.63	0.96
3.00	0.59	0.70	0.80	1.13

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.25	0.34	0.66
0.38	0.26	0.33	0.42	0.74
1.00	0.33	0.41	0.50	0.82
3.00	0.45	0.53	0.62	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.67
0.38	0.28	0.36	0.44	0.70
1.00	0.35	0.43	0.51	0.77
3.00	0.52	0.61	0.69	0.96

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.48	0.57	0.90
0.38	0.44	0.52	0.61	0.93
1.00	0.53	0.60	0.69	1.01
3.00	0.73	0.80	0.89	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.41	0.68
0.38	0.33	0.41	0.50	0.77
1.00	0.50	0.58	0.67	0.94
3.00	0.77	0.85	0.93	1.19

TC200G SERIES

DATA SHEET

FA1AP

FA1AP

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.48	0.57	0.90
0.38	0.44	0.52	0.61	0.93
1.00	0.53	0.60	0.69	1.01
3.00	0.73	0.80	0.89	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.41	0.68
0.38	0.33	0.41	0.50	0.77
1.00	0.50	0.58	0.67	0.94
3.00	0.77	0.85	0.93	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0447	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.25	0.34	0.66
0.38	0.26	0.33	0.42	0.74
1.00	0.33	0.41	0.50	0.82
3.00	0.45	0.53	0.62	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
CI->S	~A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0204	0.14

PATH DELAY (ns)

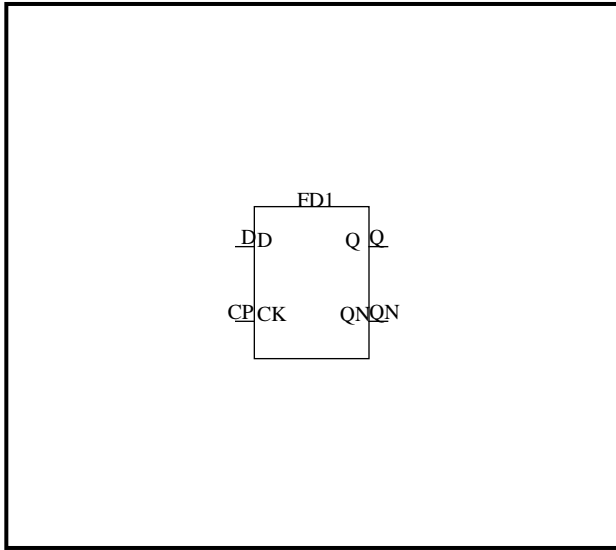
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.67
0.38	0.28	0.36	0.44	0.70
1.00	0.35	0.43	0.51	0.78
3.00	0.52	0.61	0.69	0.96

TC200G SERIES

DATA SHEET

FD1		FD1		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD1	D-TYPE FLIP FLOP	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
D	CP	Qn+1	QNn+1
L	Up	L	H
H	Up	H	L
X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
FD1 inst(Q,QN,D,CP);
```

VHDL DESCRIPTION

```
inst:FD1
port map(Q,QN,D,CP);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	42.5	44.6

TC200G SERIES

DATA SHEET

FD1

FD1

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1002	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.60	0.77	1.45
0.38	0.54	0.68	0.85	1.53
1.00	0.61	0.75	0.92	1.61
3.00	0.74	0.88	1.05	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0419	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.67	0.80	1.30
0.38	0.62	0.75	0.88	1.37
1.00	0.70	0.82	0.95	1.45
3.00	0.82	0.94	1.07	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0963	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.81	0.97	1.63
0.38	0.75	0.88	1.05	1.71
1.00	0.82	0.96	1.12	1.78
3.00	0.94	1.08	1.24	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.70	0.82	1.29
0.38	0.66	0.78	0.90	1.37
1.00	0.74	0.85	0.98	1.44
3.00	0.87	0.98	1.11	1.57

TC200G SERIES

DATA SHEET

FD1

FD1

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.352	0.334	0.305	0.209
0.38	0.388	0.370	0.339	0.241
1.00	0.448	0.429	0.397	0.295
3.00	0.641	0.620	0.584	0.468

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.291	0.323	0.377	0.551
0.38	0.257	0.289	0.343	0.517
1.00	0.200	0.232	0.286	0.460
3.00	0.016	0.048	0.102	0.276

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.368	0.336	0.282	0.107
0.38	0.402	0.369	0.315	0.141
1.00	0.458	0.426	0.372	0.198
3.00	0.641	0.609	0.555	0.382

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.305	0.322	0.352	0.447
0.38	0.269	0.287	0.318	0.416
1.00	0.209	0.228	0.260	0.362
3.00	0.016	0.038	0.074	0.190

TC200G SERIES

DATA SHEET

FD1

FD1

4/4

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

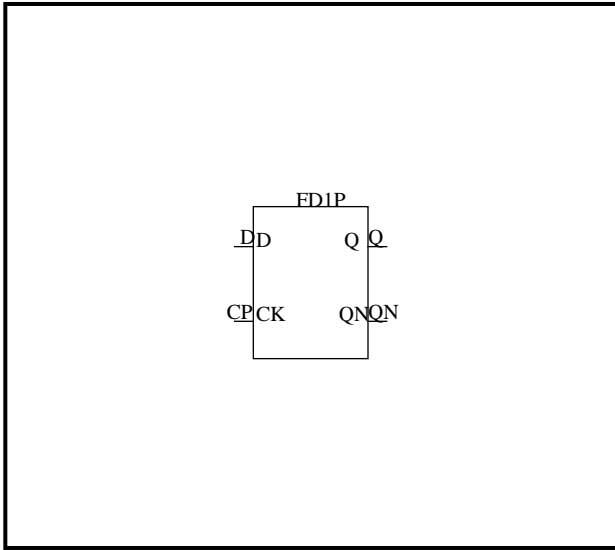
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.740

TC200G SERIES

DATA SHEET

FD1P		FD1P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD1P	D-TYPE FLIP FLOP	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
D	CP	Qn+1	QNn+1
L	Up	L	H
H	Up	H	L
X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
FD1P inst(Q,QN,D,CP);
```

VHDL DESCRIPTION

```
inst:FD1P
port map(Q,QN,D,CP);
```

ELECTRO MIGRATION

PIN NAME	Q	QN	(LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	12880.0	

INPUT LOAD

PIN NAME	LOAD (LU)
D,CP	0.99

OUTPUT DRIVE

PIN NAME	Q	QN	(LU)
DRIVE	86.5	97.7	

TC200G SERIES

DATA SHEET

FD1P

FD1P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0494	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.63	0.97
0.38	0.54	0.62	0.71	1.05
1.00	0.62	0.70	0.79	1.13
3.00	0.75	0.83	0.92	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0207	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.64	0.71	0.98
0.38	0.64	0.71	0.79	1.05
1.00	0.71	0.79	0.86	1.13
3.00	0.84	0.91	0.99	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0442	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.80	0.88	1.19
0.38	0.81	0.88	0.96	1.27
1.00	0.88	0.95	1.03	1.34
3.00	1.00	1.07	1.15	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.69	0.76	0.99
0.38	0.71	0.77	0.84	1.07
1.00	0.78	0.85	0.92	1.15
3.00	0.91	0.98	1.05	1.28

TC200G SERIES

DATA SHEET

FD1P

FD1P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.352	0.334	0.305	0.209
0.38	0.388	0.370	0.339	0.241
1.00	0.448	0.429	0.397	0.295
3.00	0.641	0.620	0.584	0.468

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.291	0.323	0.377	0.551
0.38	0.257	0.289	0.343	0.517
1.00	0.200	0.232	0.286	0.460
3.00	0.016	0.048	0.102	0.276

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.368	0.336	0.282	0.107
0.38	0.402	0.369	0.315	0.141
1.00	0.458	0.426	0.372	0.198
3.00	0.641	0.609	0.555	0.382

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.305	0.322	0.352	0.447
0.38	0.269	0.287	0.318	0.416
1.00	0.209	0.228	0.260	0.362
3.00	0.016	0.038	0.074	0.190

TC200G SERIES

DATA SHEET

FD1P

FD1P

4/4

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

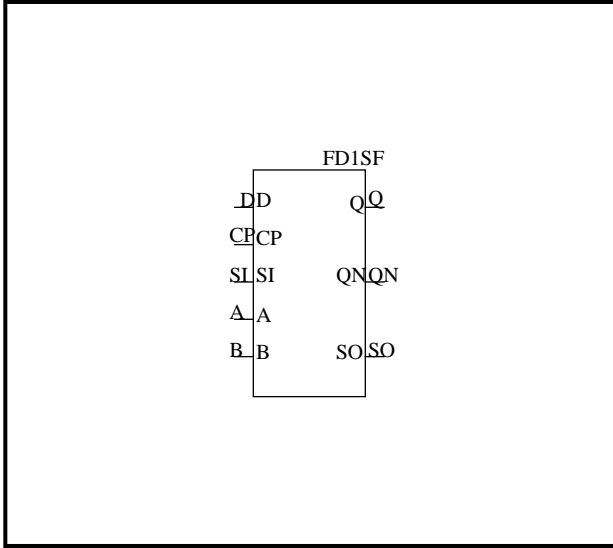
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.740

TC200G SERIES

DATA SHEET

FD1SF		FD1SF		1/10
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD1SF	D-TYPE FLIP FLOP with Independent two-phase SCAN clock	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT		
D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	L	X	X	X	SON
X	L	H	H	L	L	H	L
X	H	H	H	L	H	L	H
L	X	L	H	Up	L	H	L
H	X	L	H	Up	H	L	H
X	X	L	H	Dn	Qn	QNn	Qn

Verilog-HDL DESCRIPTION

```
FD1SF inst(Q,QN,SO,D,CP,SI,A,B);
```

VHDL DESCRIPTION

```
inst:FD1SF
port map(Q,QN,SO,D,CP,SI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
SI	0.82
A	2.31
B	2.15

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	42.4	43.5	43.8

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.65	0.82	1.48
0.38	0.54	0.68	0.84	1.51
1.00	0.61	0.75	0.91	1.58
3.00	0.79	0.92	1.09	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.70	0.82	1.28
0.38	0.63	0.73	0.85	1.32
1.00	0.69	0.80	0.92	1.38
3.00	0.83	0.94	1.06	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.56	0.72	1.39
0.38	0.51	0.65	0.81	1.48
1.00	0.64	0.78	0.94	1.60
3.00	0.77	0.91	1.07	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.55	0.67	1.13
0.38	0.53	0.63	0.75	1.22
1.00	0.63	0.74	0.85	1.32
3.00	0.81	0.91	1.03	1.49

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.58	0.76	1.44
0.38	0.53	0.67	0.85	1.53
1.00	0.66	0.81	0.98	1.67
3.00	0.79	0.94	1.11	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.60	0.73	1.23
0.38	0.55	0.68	0.81	1.31
1.00	0.66	0.78	0.92	1.41
3.00	0.83	0.96	1.09	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.74	0.90	1.57
0.38	0.68	0.82	0.99	1.65
1.00	0.79	0.93	1.09	1.75
3.00	0.96	1.10	1.27	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0402	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.67	0.80	1.27
0.38	0.65	0.76	0.89	1.36
1.00	0.78	0.90	1.02	1.49
3.00	0.92	1.03	1.15	1.62

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.61	1.26
0.38	0.41	0.54	0.70	1.35
1.00	0.51	0.65	0.81	1.46
3.00	0.63	0.77	0.93	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.41	0.53	0.99
0.38	0.37	0.47	0.59	1.06
1.00	0.43	0.54	0.66	1.13
3.00	0.53	0.65	0.77	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.62	0.80	1.49
0.38	0.56	0.70	0.88	1.56
1.00	0.63	0.78	0.95	1.64
3.00	0.77	0.92	1.09	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.67	0.81	1.30
0.38	0.63	0.75	0.88	1.38
1.00	0.70	0.82	0.96	1.45
3.00	0.83	0.95	1.09	1.58

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0964	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.93	1.11	1.79
0.38	0.84	1.00	1.19	1.87
1.00	0.91	1.08	1.26	1.94
3.00	1.04	1.20	1.39	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0402	0.20

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.90	1.05	1.57
0.38	0.82	0.97	1.12	1.64
1.00	0.90	1.05	1.20	1.72
3.00	1.04	1.19	1.34	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.03	1.16	1.32	1.99
0.38	1.10	1.24	1.40	2.06
1.00	1.18	1.31	1.48	2.14
3.00	1.32	1.45	1.62	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.09	1.19	1.31	1.78
0.38	1.17	1.27	1.39	1.85
1.00	1.24	1.34	1.46	1.93
3.00	1.37	1.47	1.59	2.06

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.55	0.72	1.41
0.38	0.44	0.58	0.76	1.44
1.00	0.51	0.65	0.83	1.51
3.00	0.63	0.77	0.95	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.58	0.71	1.21
0.38	0.46	0.58	0.71	1.21
1.00	0.51	0.63	0.77	1.26
3.00	0.63	0.76	0.90	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0964	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.72	0.89	1.55
0.38	0.58	0.72	0.89	1.55
1.00	0.64	0.77	0.94	1.60
3.00	0.77	0.91	1.08	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0402	0.20

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.64	0.76	1.23
0.38	0.56	0.68	0.80	1.27
1.00	0.63	0.75	0.87	1.34
3.00	0.76	0.88	1.00	1.47

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.48	0.64	1.31
0.38	0.38	0.52	0.68	1.35
1.00	0.43	0.57	0.73	1.39
3.00	0.52	0.66	0.83	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.47	0.59	1.06
0.38	0.38	0.48	0.60	1.07
1.00	0.43	0.53	0.65	1.12
3.00	0.53	0.64	0.76	1.23

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.331	0.313	0.284	0.190
0.38	0.368	0.350	0.320	0.223
1.00	0.432	0.413	0.381	0.279
3.00	0.636	0.614	0.578	0.460

CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.291	0.326	0.384	0.572
0.38	0.257	0.291	0.349	0.537
1.00	0.199	0.234	0.291	0.477
3.00	0.014	0.048	0.103	0.284

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.367	0.332	0.273	0.085
0.38	0.401	0.366	0.308	0.121
1.00	0.457	0.423	0.366	0.180
3.00	0.641	0.608	0.552	0.372

CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.324	0.341	0.370	0.464
0.38	0.286	0.304	0.334	0.431
1.00	0.223	0.242	0.274	0.375
3.00	0.021	0.042	0.079	0.196

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.370	0.375	0.385	0.416
0.38	0.403	0.414	0.434	0.497
1.00	0.458	0.480	0.516	0.634
3.00	0.638	0.692	0.782	1.073

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.189	0.150	0.083	-0.130
0.38	0.166	0.122	0.048	-0.189
1.00	0.127	0.075	-0.010	-0.287
3.00	0.000	-0.075	-0.200	-0.605

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.468	0.507	0.573	0.784
0.38	0.493	0.536	0.609	0.843
1.00	0.534	0.585	0.669	0.942
3.00	0.667	0.740	0.863	1.260

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.288	0.282	0.271	0.238
0.38	0.254	0.242	0.222	0.157
1.00	0.199	0.177	0.140	0.021
3.00	0.018	-0.035	-0.126	-0.417

TC200G SERIES

DATA SHEET

FD1SF

FD1SF

10/10

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	---

ITEM	WAVE_FORM
POSLIMIT	

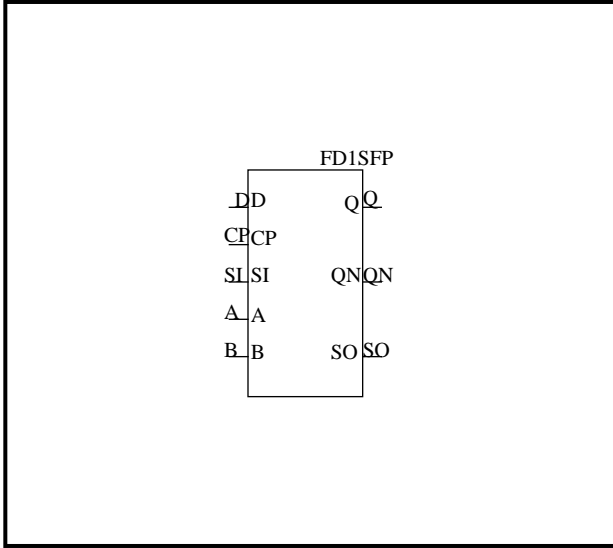
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD1SFP		FD1SFP		1/10
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD1SFP	D-TYPE FLIP FLOP with Independent two-phase SCAN clock	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		12	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT		
D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	L	X	X	X	SON
X	L	H	H	L	L	H	L
X	H	H	H	L	H	L	H
L	X	L	H	Up	L	H	L
H	X	L	H	Up	H	L	H
X	X	L	H	Dn	Qn	QNn	Qn

Verilog-HDL DESCRIPTION

```
FD1SFP inst(Q,QN,SO,D,CP,SI,A,B);
```

VHDL DESCRIPTION

```
inst:FD1SFP
port map(Q,QN,SO,D,CP,SI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	0.99
CP	1.00
SI	0.82
A	2.16
B	2.23

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	82.3	75.6	43.7

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.65	0.82	1.48
0.38	0.55	0.68	0.85	1.51
1.00	0.62	0.75	0.92	1.58
3.00	0.80	0.93	1.10	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.72	0.84	1.30
0.38	0.64	0.75	0.87	1.33
1.00	0.71	0.81	0.93	1.40
3.00	0.85	0.96	1.08	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.56	0.73	1.39
0.38	0.52	0.65	0.82	1.48
1.00	0.65	0.78	0.95	1.61
3.00	0.79	0.92	1.09	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.55	0.67	1.14
0.38	0.53	0.64	0.76	1.22
1.00	0.64	0.74	0.86	1.33
3.00	0.82	0.92	1.04	1.50

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0512	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.63	0.98
0.38	0.55	0.63	0.72	1.07
1.00	0.68	0.76	0.86	1.20
3.00	0.82	0.90	1.00	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0216	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.57	0.65	0.92
0.38	0.58	0.66	0.73	1.00
1.00	0.69	0.76	0.84	1.11
3.00	0.86	0.94	1.02	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0547	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.75	0.85	1.22
0.38	0.75	0.83	0.93	1.30
1.00	0.86	0.94	1.04	1.41
3.00	1.04	1.12	1.22	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0244	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.71	0.79	1.08
0.38	0.72	0.80	0.88	1.17
1.00	0.86	0.94	1.02	1.31
3.00	1.00	1.08	1.16	1.45

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.61	1.25
0.38	0.41	0.54	0.70	1.35
1.00	0.52	0.65	0.81	1.46
3.00	0.64	0.77	0.93	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.40	0.52	0.99
0.38	0.37	0.47	0.59	1.06
1.00	0.43	0.54	0.66	1.12
3.00	0.53	0.64	0.77	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0512	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.57	0.67	1.02
0.38	0.57	0.65	0.74	1.10
1.00	0.65	0.73	0.82	1.18
3.00	0.79	0.87	0.96	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0216	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	0.99
0.38	0.64	0.72	0.80	1.07
1.00	0.72	0.79	0.87	1.14
3.00	0.85	0.92	1.00	1.27

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0547	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.92	1.03	1.43
0.38	0.90	1.00	1.11	1.51
1.00	0.97	1.07	1.18	1.58
3.00	1.10	1.20	1.31	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0244	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.91	1.01	1.34
0.38	0.88	0.98	1.09	1.42
1.00	0.96	1.06	1.16	1.50
3.00	1.09	1.20	1.30	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.15	1.28	1.45	2.11
0.38	1.22	1.36	1.52	2.18
1.00	1.30	1.43	1.60	2.26
3.00	1.44	1.57	1.74	2.40

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.20	1.30	1.42	1.89
0.38	1.27	1.38	1.50	1.96
1.00	1.35	1.45	1.57	2.04
3.00	1.47	1.58	1.70	2.16

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0512	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.50	0.59	0.94
0.38	0.46	0.54	0.63	0.98
1.00	0.53	0.61	0.70	1.05
3.00	0.67	0.75	0.84	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0216	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.55	0.63	0.90
0.38	0.48	0.55	0.63	0.90
1.00	0.53	0.60	0.68	0.95
3.00	0.67	0.75	0.83	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0547	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.73	0.83	1.20
0.38	0.65	0.73	0.83	1.20
1.00	0.70	0.78	0.88	1.25
3.00	0.86	0.94	1.04	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0244	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.67	0.76	1.04
0.38	0.63	0.71	0.79	1.08
1.00	0.71	0.79	0.87	1.16
3.00	0.86	0.94	1.02	1.31

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0966	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.48	0.65	1.31
0.38	0.39	0.52	0.68	1.35
1.00	0.44	0.57	0.73	1.40
3.00	0.53	0.66	0.83	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.48	0.60	1.06
0.38	0.38	0.48	0.60	1.07
1.00	0.43	0.53	0.65	1.12
3.00	0.54	0.64	0.76	1.23

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.331	0.313	0.284	0.190
0.38	0.368	0.350	0.320	0.223
1.00	0.432	0.413	0.381	0.279
3.00	0.636	0.614	0.578	0.460

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.291	0.326	0.384	0.572
0.38	0.257	0.291	0.349	0.537
1.00	0.199	0.234	0.291	0.477
3.00	0.014	0.048	0.103	0.284

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.367	0.332	0.273	0.085
0.38	0.401	0.366	0.308	0.121
1.00	0.457	0.423	0.366	0.180
3.00	0.641	0.608	0.552	0.372

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.324	0.341	0.370	0.464
0.38	0.286	0.304	0.334	0.431
1.00	0.223	0.242	0.274	0.375
3.00	0.021	0.042	0.079	0.196

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.370	0.375	0.385	0.416
0.38	0.403	0.414	0.434	0.497
1.00	0.458	0.480	0.516	0.634
3.00	0.638	0.692	0.782	1.073

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.189	0.150	0.083	-0.130
0.38	0.166	0.122	0.048	-0.189
1.00	0.127	0.075	-0.010	-0.287
3.00	0.000	-0.075	-0.200	-0.605

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.468	0.507	0.573	0.784
0.38	0.493	0.536	0.609	0.843
1.00	0.534	0.585	0.669	0.942
3.00	0.667	0.740	0.863	1.260

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.288	0.282	0.271	0.238
0.38	0.254	0.242	0.222	0.157
1.00	0.199	0.177	0.140	0.021
3.00	0.018	-0.035	-0.126	-0.417

TC200G SERIES

DATA SHEET

FD1SFP

FD1SFP

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	---

ITEM	WAVE_FORM
POSLIMIT	

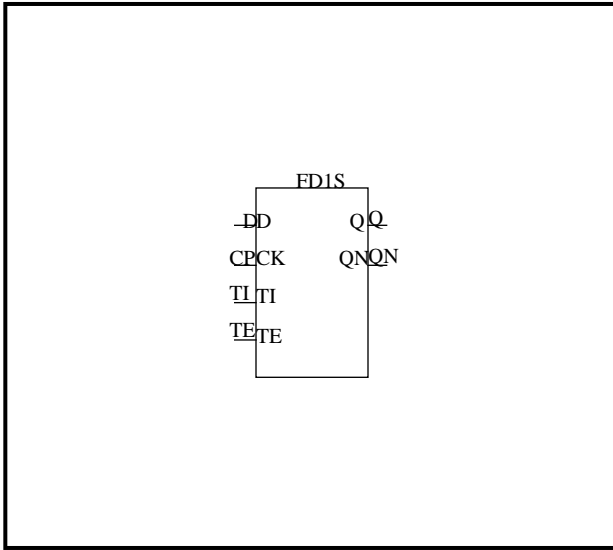
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD1S		FD1S		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD1S	D-TYPE FLIP FLOP with common single-phase SCAN clock	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
D	TI	TE	CP	Qn+1	QNn+1
L	X	L	Up	L	H
H	X	L	Up	H	L
X	L	H	Up	L	H
X	H	H	Up	H	L
X	X	X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
FD1S inst(Q,QN,D,CP,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD1S
port map(Q,QN,D,CP,TI,TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP,TI	0.99
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	42.5	44.6

TC200G SERIES

DATA SHEET

FD1S

FD1S

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.63	0.80	1.49
0.38	0.56	0.70	0.88	1.56
1.00	0.64	0.78	0.96	1.64
3.00	0.78	0.93	1.10	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0421	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.68	0.81	1.31
0.38	0.63	0.76	0.89	1.38
1.00	0.71	0.83	0.97	1.46
3.00	0.85	0.97	1.10	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0964	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.81	0.98	1.64
0.38	0.75	0.89	1.06	1.72
1.00	0.83	0.97	1.13	1.79
3.00	0.97	1.10	1.27	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.71	0.83	1.30
0.38	0.67	0.78	0.91	1.38
1.00	0.75	0.86	0.99	1.46
3.00	0.90	1.01	1.13	1.60

TC200G SERIES

DATA SHEET

FD1S

FD1S

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.408	0.390	0.359	0.260
0.38	0.453	0.434	0.403	0.300
1.00	0.528	0.508	0.475	0.367
3.00	0.770	0.747	0.708	0.583

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.121	0.154	0.210	0.390
0.38	0.082	0.116	0.171	0.350
1.00	0.018	0.051	0.105	0.281
3.00	-0.190	-0.159	-0.107	0.061

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.536	0.503	0.447	0.266
0.38	0.575	0.542	0.486	0.307
1.00	0.639	0.606	0.552	0.375
3.00	0.847	0.815	0.763	0.595

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.242	0.260	0.291	0.390
0.38	0.197	0.216	0.247	0.350
1.00	0.122	0.142	0.175	0.283
3.00	-0.120	-0.097	-0.058	0.067

TC200G SERIES

DATA SHEET

FD1S

FD1S

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.449	0.431	0.400	0.302
0.01	0.500	0.482	0.450	0.349
0.38	0.586	0.567	0.534	0.428
1.00	0.864	0.842	0.804	0.683
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.208	0.226	0.256	0.353
0.01	0.157	0.175	0.206	0.306
0.38	0.070	0.090	0.122	0.227
1.00	-0.208	-0.186	-0.148	-0.026
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.483	0.465	0.435	0.337
0.01	0.522	0.504	0.473	0.373
0.38	0.588	0.568	0.536	0.432
1.00	0.799	0.778	0.741	0.624
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.008	0.023	0.075	0.244
0.01	-0.031	-0.000	0.052	0.218
0.38	-0.069	-0.038	0.012	0.175
1.00	-0.190	-0.162	-0.115	0.037
3.00				

TC200G SERIES

DATA SHEET

FD1S

FD1S

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.665	0.634	0.582	0.414
0.38	0.688	0.657	0.605	0.439
1.00	0.725	0.695	0.645	0.481
3.00	0.847	0.818	0.771	0.618

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.171	0.190	0.220	0.319
0.38	0.132	0.151	0.182	0.284
1.00	0.067	0.086	0.119	0.224
3.00	-0.144	-0.122	-0.086	0.032

TC200G SERIES

DATA SHEET

FD1S

FD1S

6/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

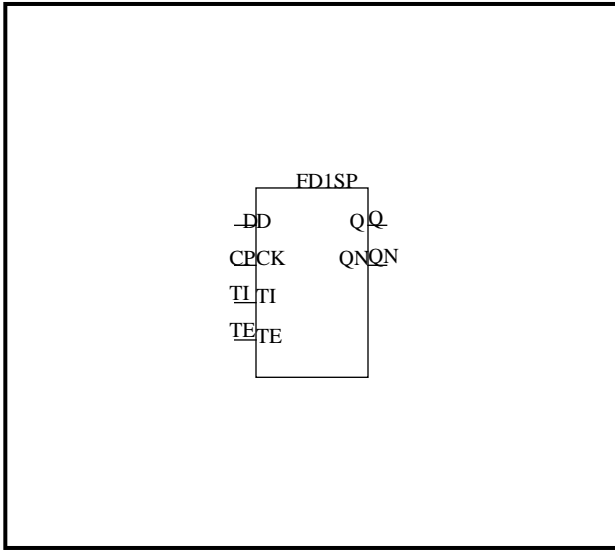
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

TC200G SERIES

DATA SHEET

FD1SP		FD1SP		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD1SP	D-TYPE FLIP FLOP with common single-phase SCAN clock	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
D	TI	TE	CP	Qn+1	QNn+1
L	X	L	Up	L	H
H	X	L	Up	H	L
X	L	H	Up	L	H
X	H	H	Up	H	L
X	X	X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
FD1SP inst(Q,QN,D,CP,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD1SP
port map(Q,QN,D,CP,TI,TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP,TI	0.99
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	77.0	97.7

TC200G SERIES

DATA SHEET

FD1SP

FD1SP

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0548	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.66	1.04
0.38	0.56	0.64	0.74	1.11
1.00	0.64	0.73	0.82	1.19
3.00	0.79	0.87	0.97	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0238	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.65	0.73	1.03
0.38	0.65	0.73	0.81	1.10
1.00	0.72	0.80	0.89	1.18
3.00	0.86	0.94	1.02	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0443	0.07

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.80	0.88	1.19
0.38	0.81	0.88	0.96	1.27
1.00	0.89	0.96	1.04	1.35
3.00	1.02	1.09	1.17	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.71	0.78	1.01
0.38	0.72	0.79	0.86	1.09
1.00	0.80	0.87	0.94	1.17
3.00	0.95	1.01	1.08	1.31

TC200G SERIES

DATA SHEET

FD1SP

FD1SP

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.408	0.390	0.359	0.260
0.38	0.453	0.434	0.403	0.300
1.00	0.528	0.508	0.475	0.367
3.00	0.770	0.747	0.708	0.583

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.121	0.154	0.210	0.390
0.38	0.082	0.116	0.171	0.350
1.00	0.018	0.051	0.105	0.281
3.00	-0.190	-0.159	-0.107	0.061

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.536	0.503	0.447	0.266
0.38	0.575	0.542	0.486	0.307
1.00	0.639	0.606	0.552	0.375
3.00	0.847	0.815	0.763	0.595

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.242	0.260	0.291	0.390
0.38	0.197	0.216	0.247	0.350
1.00	0.122	0.142	0.175	0.283
3.00	-0.120	-0.097	-0.058	0.067

TC200G SERIES

DATA SHEET

FD1SP

FD1SP

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.449	0.431	0.400	0.302
0.01	0.500	0.482	0.450	0.349
0.38	0.586	0.567	0.534	0.428
1.00	0.864	0.842	0.804	0.683
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.208	0.226	0.256	0.353
0.01	0.157	0.175	0.206	0.306
0.38	0.070	0.090	0.122	0.227
1.00	-0.208	-0.186	-0.148	-0.026
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.483	0.465	0.435	0.337
0.01	0.522	0.504	0.473	0.373
0.38	0.588	0.568	0.536	0.432
1.00	0.799	0.778	0.741	0.624
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.008	0.023	0.075	0.244
0.01	-0.031	-0.000	0.052	0.218
0.38	-0.069	-0.038	0.012	0.175
1.00	-0.190	-0.162	-0.115	0.037
3.00				

TC200G SERIES

DATA SHEET

FD1SP

FD1SP

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.665	0.634	0.582	0.414
0.38	0.688	0.657	0.605	0.439
1.00	0.725	0.695	0.645	0.481
3.00	0.847	0.818	0.771	0.618

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.171	0.190	0.220	0.319
0.38	0.132	0.151	0.182	0.284
1.00	0.067	0.086	0.119	0.224
3.00	-0.144	-0.122	-0.086	0.032

TC200G SERIES

DATA SHEET

FD1SP

FD1SP

6/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

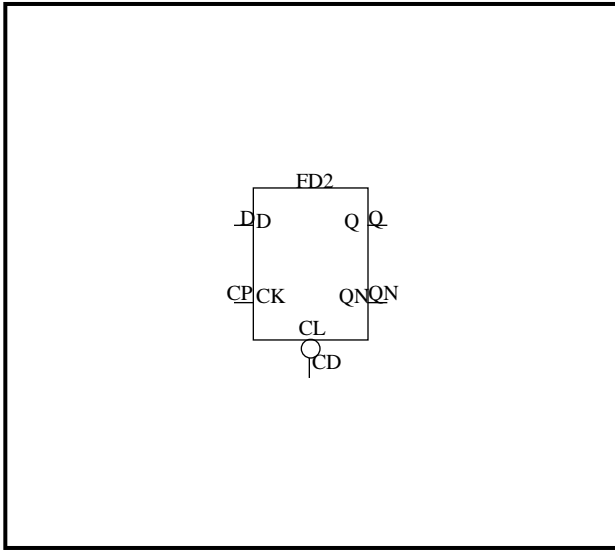
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

TC200G SERIES

DATA SHEET

FD2		FD2		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD2	D-TYPE FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	D	CP	Qn+1	QNn+1
L	X	X*	L	H
H	L	Up	L	H
H	H	Up	H	L
H	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FD2 inst(Q,QN,D,CP,CD);
```

VHDL DESCRIPTION

```
inst:FD2
port map(Q,QN,D,CP,CD);
```

ELECTRO MIGRATION

PIN NAME	Q	QN	(LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	12880.0	

INPUT LOAD

PIN NAME	LOAD (LU)
D	0.99
CP	1.00
CD	2.12

OUTPUT DRIVE

PIN NAME	Q (LU)	QN (LU)
DRIVE	42.6	51.2

TC200G SERIES

DATA SHEET

FD2

FD2

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0416	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.40	0.53	1.02
0.38	0.29	0.42	0.56	1.05
1.00	0.35	0.49	0.62	1.12
3.00	0.49	0.64	0.78	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0846	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.58	0.73	1.32
0.38	0.47	0.60	0.76	1.35
1.00	0.54	0.67	0.83	1.42
3.00	0.70	0.83	0.98	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0988	0.15

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.72	0.91	1.61
0.38	0.64	0.80	0.99	1.68
1.00	0.72	0.88	1.07	1.76
3.00	0.87	1.03	1.22	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0416	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.74	0.88	1.37
0.38	0.69	0.82	0.95	1.45
1.00	0.77	0.90	1.03	1.53
3.00	0.91	1.04	1.17	1.67

TC200G SERIES

DATA SHEET

FD2

FD2

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0846	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.85	1.00	1.60
0.38	0.81	0.93	1.08	1.67
1.00	0.88	1.01	1.16	1.75
3.00	1.03	1.15	1.30	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0341	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.79	0.90	1.31
0.38	0.76	0.87	0.98	1.39
1.00	0.84	0.95	1.06	1.47
3.00	0.99	1.10	1.21	1.62

TC200G SERIES

DATA SHEET

FD2

FD2

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.020	-0.060	-0.127	-0.342
0.38	-0.025	-0.065	-0.132	-0.347
1.00	-0.034	-0.074	-0.140	-0.354
3.00	-0.062	-0.101	-0.166	-0.378

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.677	0.717	0.783	0.999
0.38	0.682	0.722	0.788	1.003
1.00	0.690	0.730	0.796	1.010
3.00	0.718	0.757	0.822	1.034

TC200G SERIES

DATA SHEET

FD2

FD2

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.367	0.336	0.284	0.116
0.38	0.406	0.375	0.323	0.155
1.00	0.472	0.441	0.389	0.222
3.00	0.682	0.652	0.601	0.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.295	0.326	0.377	0.543
0.38	0.262	0.293	0.344	0.511
1.00	0.206	0.237	0.289	0.457
3.00	0.026	0.058	0.111	0.284

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.359	0.329	0.278	0.115
0.38	0.393	0.362	0.311	0.146
1.00	0.449	0.418	0.366	0.200
3.00	0.629	0.598	0.544	0.372

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.290	0.321	0.373	0.542
0.38	0.251	0.282	0.334	0.502
1.00	0.185	0.216	0.268	0.435
3.00	-0.027	0.004	0.055	0.219

TC200G SERIES

DATA SHEET

FD2

FD2

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

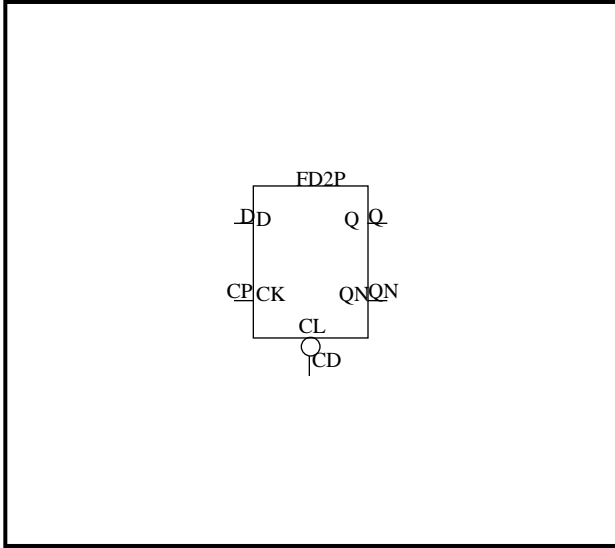
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD2P		FD2P		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD2P	D-TYPE FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	D	CP	Qn+1	QNn+1
L	X	X*	L	H
H	L	Up	L	H
H	H	Up	H	L
H	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FD2P inst(Q,QN,D,CP,CD);
```

VHDL DESCRIPTION

```
inst:FD2P
port map(Q,QN,D,CP,CD);
```

ELECTRO MIGRATION

PIN NAME	Q	QN	(LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	12880.0	

INPUT LOAD

PIN NAME	LOAD (LU)
D	0.99
CP	1.00
CD	2.12

OUTPUT DRIVE

PIN NAME	Q (LU)	QN (LU)
DRIVE	83.0	97.9

TC200G SERIES

DATA SHEET

FD2P

FD2P

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0182	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.32	0.39	0.63
0.38	0.27	0.34	0.42	0.66
1.00	0.34	0.41	0.49	0.73
3.00	0.48	0.57	0.65	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0444	0.07

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.55	0.63	0.95
0.38	0.50	0.58	0.66	0.97
1.00	0.58	0.65	0.73	1.05
3.00	0.76	0.83	0.91	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0546	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.65	0.75	1.13
0.38	0.64	0.73	0.83	1.21
1.00	0.72	0.81	0.91	1.29
3.00	0.87	0.96	1.06	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0182	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.68	0.75	0.99
0.38	0.69	0.76	0.83	1.07
1.00	0.76	0.84	0.91	1.15
3.00	0.91	0.98	1.05	1.29

TC200G SERIES

DATA SHEET

FD2P

FD2P

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0444	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.78	0.85	0.93	1.24
0.38	0.85	0.92	1.00	1.31
1.00	0.93	1.00	1.08	1.39
3.00	1.07	1.14	1.22	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0178	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.80	0.86	1.09
0.38	0.81	0.87	0.94	1.17
1.00	0.89	0.96	1.02	1.25
3.00	1.04	1.11	1.17	1.41

TC200G SERIES

DATA SHEET

FD2P

FD2P

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.020	-0.060	-0.127	-0.342
0.38	-0.025	-0.065	-0.132	-0.347
1.00	-0.034	-0.074	-0.140	-0.354
3.00	-0.062	-0.101	-0.166	-0.378

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.677	0.717	0.783	0.999
0.38	0.682	0.722	0.788	1.003
1.00	0.690	0.730	0.796	1.010
3.00	0.718	0.757	0.822	1.034

TC200G SERIES

DATA SHEET

FD2P

FD2P

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.367	0.336	0.284	0.116
0.38	0.406	0.375	0.323	0.155
1.00	0.472	0.441	0.389	0.222
3.00	0.682	0.652	0.601	0.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.295	0.326	0.377	0.543
0.38	0.262	0.293	0.344	0.511
1.00	0.206	0.237	0.289	0.457
3.00	0.026	0.058	0.111	0.284

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.359	0.329	0.278	0.115
0.38	0.393	0.362	0.311	0.146
1.00	0.449	0.418	0.366	0.200
3.00	0.629	0.598	0.544	0.372

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.290	0.321	0.373	0.542
0.38	0.251	0.282	0.334	0.502
1.00	0.185	0.216	0.268	0.435
3.00	-0.027	0.004	0.055	0.219

TC200G SERIES

DATA SHEET

FD2P

FD2P

6/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

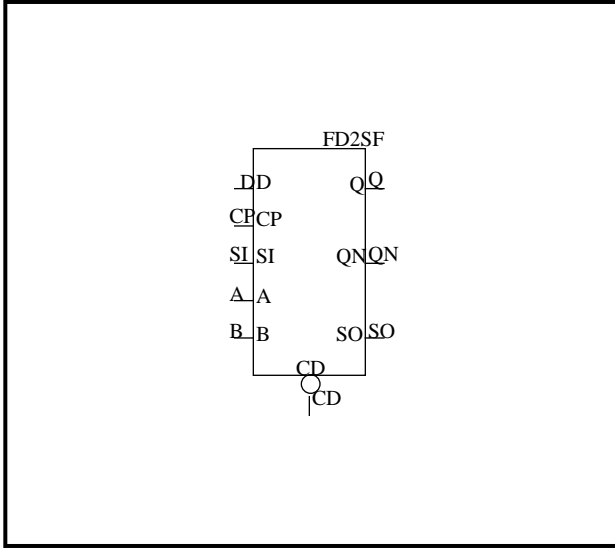
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD2SF		FD2SF		1/13
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD2SF	D-TYPE FLIP FLOP with Independent two-phase SCAN clock with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		12	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT		
CD	D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	X	L	X	X	X	SON
L	X	X	L	H	X*	L	H	L
H	X	L	H	H	L	L	H	L
H	X	H	H	H	L	H	L	H
H	L	X	L	H	Up	L	H	L
H	H	X	L	H	Up	H	L	H
H	X	X	L	H	Dn	Qn	QNn	Qn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FD2SF inst(Q,QN,SO,D,CP,CD,SI,A,B);
```

VHDL DESCRIPTION

```
inst:FD2SF
port map(Q,QN,SO,D,CP,CD,SI,
A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	1.02
CP	0.99
CD	2.18
SI	0.85
A	2.20
B	2.24

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	42.5	44.5	43.7

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

2/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.82	1.48
0.38	0.55	0.68	0.85	1.51
1.00	0.62	0.75	0.92	1.58
3.00	0.79	0.93	1.09	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.69	0.80	1.27
0.38	0.61	0.72	0.84	1.30
1.00	0.68	0.78	0.90	1.37
3.00	0.82	0.92	1.04	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.56	0.73	1.39
0.38	0.52	0.65	0.82	1.48
1.00	0.65	0.78	0.95	1.61
3.00	0.78	0.92	1.08	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.55	0.67	1.14
0.38	0.53	0.64	0.76	1.22
1.00	0.64	0.74	0.86	1.33
3.00	0.82	0.92	1.04	1.51

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

3/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.66	0.84	1.54
0.38	0.59	0.75	0.93	1.63
1.00	0.72	0.88	1.07	1.76
3.00	0.86	1.02	1.20	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0406	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.65	0.78	1.26
0.38	0.61	0.74	0.86	1.34
1.00	0.71	0.84	0.97	1.44
3.00	0.88	1.01	1.14	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0940	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.78	0.94	1.58
0.38	0.73	0.86	1.03	1.67
1.00	0.83	0.97	1.13	1.77
3.00	1.01	1.14	1.30	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0401	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.74	0.86	1.32
0.38	0.72	0.83	0.95	1.41
1.00	0.85	0.96	1.09	1.55
3.00	0.99	1.10	1.22	1.68

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

4/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.61	1.26
0.38	0.41	0.54	0.70	1.35
1.00	0.52	0.65	0.81	1.46
3.00	0.63	0.77	0.93	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.40	0.52	0.98
0.38	0.37	0.47	0.59	1.05
1.00	0.43	0.53	0.66	1.12
3.00	0.53	0.64	0.77	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0406	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.36	0.50	0.98
0.38	0.26	0.39	0.53	1.00
1.00	0.31	0.44	0.58	1.06
3.00	0.40	0.55	0.69	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0940	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.62	0.81	1.49
0.38	0.48	0.65	0.84	1.52
1.00	0.54	0.71	0.90	1.58
3.00	0.67	0.84	1.03	1.70

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

5/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.96	1.08	1.55
0.38	0.89	0.99	1.11	1.58
1.00	0.95	1.05	1.17	1.64
3.00	1.07	1.17	1.29	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1000	0.19

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.72	0.91	1.62
0.38	0.63	0.80	0.99	1.70
1.00	0.71	0.88	1.07	1.78
3.00	0.85	1.02	1.21	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0406	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.74	0.88	1.35
0.38	0.69	0.82	0.95	1.43
1.00	0.76	0.90	1.03	1.51
3.00	0.90	1.03	1.17	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0940	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.98	1.15	1.82
0.38	0.90	1.06	1.23	1.90
1.00	0.97	1.13	1.31	1.97
3.00	1.11	1.27	1.44	2.11

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

6/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0401	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.98	1.13	1.64
0.38	0.91	1.06	1.21	1.72
1.00	0.99	1.14	1.29	1.80
3.00	1.13	1.28	1.43	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.11	1.24	1.41	2.07
0.38	1.19	1.32	1.49	2.15
1.00	1.27	1.40	1.57	2.23
3.00	1.41	1.55	1.71	2.37

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.13	1.24	1.36	1.82
0.38	1.21	1.31	1.43	1.90
1.00	1.29	1.39	1.51	1.98
3.00	1.42	1.52	1.64	2.11

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1000	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.62	0.81	1.50
0.38	0.50	0.66	0.84	1.54
1.00	0.57	0.73	0.92	1.61
3.00	0.71	0.87	1.06	1.77

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

7/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0406	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.63	0.76	1.23
0.38	0.50	0.63	0.76	1.23
1.00	0.55	0.68	0.81	1.28
3.00	0.69	0.83	0.96	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0940	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.76	0.92	1.56
0.38	0.63	0.76	0.92	1.56
1.00	0.67	0.81	0.97	1.61
3.00	0.82	0.96	1.12	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0401	0.19

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.70	0.82	1.28
0.38	0.63	0.74	0.86	1.32
1.00	0.70	0.81	0.94	1.40
3.00	0.84	0.96	1.08	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.48	0.64	1.31
0.38	0.38	0.52	0.68	1.34
1.00	0.43	0.57	0.73	1.39
3.00	0.52	0.66	0.82	1.48

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

8/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.47	0.59	1.05
0.38	0.38	0.48	0.60	1.06
1.00	0.42	0.53	0.65	1.11
3.00	0.53	0.64	0.76	1.22

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

9/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D&-A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.039	-0.076	-0.139	-0.342
0.38	-0.044	-0.082	-0.145	-0.348
1.00	-0.054	-0.091	-0.154	-0.356
3.00	-0.085	-0.122	-0.184	-0.384

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D&-A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.693	0.731	0.794	0.999
0.38	0.699	0.736	0.800	1.004
1.00	0.709	0.746	0.809	1.013
3.00	0.741	0.778	0.840	1.040

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

10/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.342	0.323	0.290	0.186
0.38	0.380	0.360	0.327	0.219
1.00	0.443	0.422	0.387	0.275
3.00	0.648	0.624	0.583	0.454

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.283	0.318	0.377	0.565
0.38	0.250	0.285	0.343	0.530
1.00	0.194	0.229	0.286	0.472
3.00	0.014	0.048	0.103	0.284

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.371	0.336	0.278	0.090
0.38	0.404	0.369	0.312	0.125
1.00	0.460	0.426	0.368	0.183
3.00	0.641	0.608	0.552	0.372

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.312	0.332	0.365	0.472
0.38	0.274	0.295	0.329	0.438
1.00	0.212	0.233	0.268	0.382
3.00	0.009	0.033	0.073	0.202

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.386	0.392	0.402
	0.38	0.422	0.433	0.453
	1.00	0.483	0.504	0.539
	3.00	0.679	0.730	0.815

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.178	0.139	0.074
	0.38	0.152	0.109	0.038
	1.00	0.109	0.060	-0.023
	3.00	-0.029	-0.101	-0.221

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

12/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.740

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.720

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	CD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD2SF

FD2SF

13/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	CD

ITEM	WAVE_FORM
POSLIMIT	<p>The diagram shows three signals: SI, A, and Q. SI is a square wave. A is a square wave with a pulse width labeled $t_w(H)$. Q is a square wave that follows the transitions of A.</p>

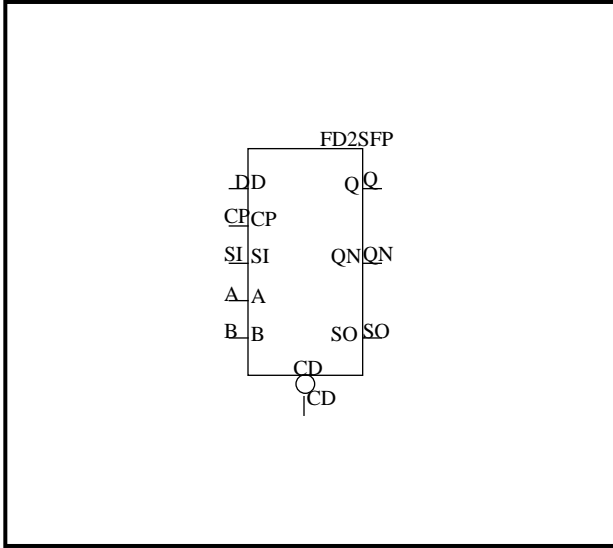
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
0.01 to 3.00	0.870

TC200G SERIES

DATA SHEET

FD2SFP		FD2SFP		1/13
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD2SFP	D-TYPE FLIP FLOP with Independent two-phase SCAN clock with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		13	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT		
CD	D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	X	L	X	X	X	SON
L	X	X	L	H	X*	L	H	L
H	X	L	H	H	L	L	H	L
H	X	H	H	H	L	H	L	H
H	L	X	L	H	Up	L	H	L
H	H	X	L	H	Up	H	L	H
H	X	X	L	H	Dn	Qn	QNn	Qn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FD2SFP inst(Q,QN,SO,D,CP,CD,SI,A,
            B);
```

VHDL DESCRIPTION

```
inst:FD2SFP
port map(Q,QN,SO,D,CP,CD,SI,
        A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	1.02
CP	0.99
CD	2.18
SI	0.85
A	2.20
B	2.15

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	77.2	86.0	43.7

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

2/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.65	0.82	1.48
0.38	0.54	0.68	0.84	1.51
1.00	0.61	0.75	0.91	1.58
3.00	0.79	0.93	1.09	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.69	0.81	1.27
0.38	0.62	0.72	0.84	1.30
1.00	0.68	0.78	0.90	1.37
3.00	0.82	0.92	1.04	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.55	0.72	1.38
0.38	0.51	0.64	0.81	1.47
1.00	0.64	0.78	0.94	1.60
3.00	0.78	0.91	1.07	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.55	0.67	1.14
0.38	0.53	0.64	0.76	1.22
1.00	0.64	0.74	0.86	1.32
3.00	0.82	0.92	1.04	1.50

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

3/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0545	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.61	0.71	1.09
0.38	0.61	0.70	0.80	1.18
1.00	0.75	0.84	0.94	1.32
3.00	0.89	0.97	1.07	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0237	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.58	0.66	0.96
0.38	0.58	0.66	0.75	1.04
1.00	0.68	0.76	0.85	1.14
3.00	0.86	0.94	1.03	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0479	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.75	0.84	1.17
0.38	0.77	0.84	0.92	1.25
1.00	0.87	0.94	1.03	1.36
3.00	1.04	1.11	1.20	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0210	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.80	0.87	1.12
0.38	0.82	0.89	0.96	1.21
1.00	0.96	1.02	1.10	1.35
3.00	1.09	1.16	1.23	1.49

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

4/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.60	1.25
0.38	0.40	0.54	0.70	1.35
1.00	0.51	0.64	0.81	1.45
3.00	0.63	0.76	0.93	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.40	0.52	0.99
0.38	0.37	0.47	0.59	1.06
1.00	0.43	0.54	0.66	1.12
3.00	0.53	0.64	0.77	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0237	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.42	0.71
0.38	0.28	0.36	0.45	0.74
1.00	0.35	0.43	0.52	0.81
3.00	0.49	0.59	0.68	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0479	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.64	0.74	1.11
0.38	0.58	0.67	0.77	1.14
1.00	0.65	0.74	0.85	1.21
3.00	0.84	0.93	1.04	1.40

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

5/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.99	1.09	1.21	1.68
0.38	1.01	1.12	1.24	1.70
1.00	1.09	1.19	1.31	1.78
3.00	1.27	1.37	1.49	1.96

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0545	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.63	0.73	1.11
0.38	0.62	0.71	0.81	1.19
1.00	0.71	0.79	0.89	1.27
3.00	0.85	0.94	1.03	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0237	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.66	0.74	1.04
0.38	0.66	0.74	0.82	1.12
1.00	0.73	0.82	0.90	1.19
3.00	0.87	0.95	1.03	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0479	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.93	1.03	1.38
0.38	0.92	1.01	1.10	1.46
1.00	1.00	1.08	1.18	1.54
3.00	1.13	1.22	1.31	1.67

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

6/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0210	0.21

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	0.99	1.08	1.37
0.38	0.97	1.06	1.16	1.45
1.00	1.05	1.15	1.24	1.53
3.00	1.20	1.29	1.38	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.22	1.35	1.52	2.18
0.38	1.30	1.43	1.60	2.26
1.00	1.38	1.51	1.68	2.34
3.00	1.52	1.65	1.82	2.48

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.20	1.30	1.42	1.89
0.38	1.27	1.38	1.50	1.96
1.00	1.35	1.46	1.58	2.04
3.00	1.48	1.59	1.71	2.17

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0545	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.57	0.67	1.05
0.38	0.53	0.61	0.71	1.09
1.00	0.62	0.71	0.81	1.18
3.00	0.82	0.91	1.01	1.39

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

7/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0237	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.56	0.64	0.94
0.38	0.48	0.56	0.64	0.94
1.00	0.52	0.60	0.69	0.98
3.00	0.63	0.72	0.81	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0479	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.73	0.82	1.15
0.38	0.66	0.73	0.82	1.15
1.00	0.71	0.78	0.86	1.19
3.00	0.84	0.91	1.00	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0210	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.76	0.83	1.09
0.38	0.73	0.80	0.87	1.13
1.00	0.83	0.90	0.97	1.22
3.00	1.05	1.12	1.19	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0967	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.48	0.64	1.31
0.38	0.38	0.51	0.68	1.34
1.00	0.43	0.57	0.73	1.39
3.00	0.52	0.66	0.82	1.48

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

8/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0399	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.47	0.59	1.06
0.38	0.38	0.48	0.60	1.06
1.00	0.43	0.53	0.65	1.11
3.00	0.53	0.64	0.76	1.22

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

9/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D&-A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.039	-0.076	-0.139	-0.342
0.38	-0.044	-0.082	-0.145	-0.348
1.00	-0.054	-0.091	-0.154	-0.356
3.00	-0.085	-0.122	-0.184	-0.384

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D&-A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.693	0.731	0.794	0.999
0.38	0.699	0.736	0.800	1.004
1.00	0.709	0.746	0.809	1.013
3.00	0.741	0.778	0.840	1.040

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

10/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.342	0.323	0.290	0.186
0.38	0.380	0.360	0.327	0.219
1.00	0.443	0.422	0.387	0.275
3.00	0.648	0.624	0.583	0.454

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.283	0.318	0.377	0.565
0.38	0.250	0.285	0.343	0.530
1.00	0.194	0.229	0.286	0.472
3.00	0.014	0.048	0.103	0.284

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.371	0.336	0.278	0.090
0.38	0.404	0.369	0.312	0.125
1.00	0.460	0.426	0.368	0.183
3.00	0.641	0.608	0.552	0.372

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.312	0.332	0.365	0.472
0.38	0.274	0.295	0.329	0.438
1.00	0.212	0.233	0.268	0.382
3.00	0.009	0.033	0.073	0.202

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

11/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.386	0.392	0.402	0.434
0.38	0.38	0.422	0.433	0.453	0.515
1.00	1.00	0.483	0.504	0.539	0.651
3.00	3.00	0.679	0.730	0.815	1.090

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.178	0.139	0.074	-0.134
0.38	0.38	0.152	0.109	0.038	-0.193
1.00	1.00	0.109	0.060	-0.023	-0.292
3.00	3.00	-0.029	-0.101	-0.221	-0.610

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.485	0.523	0.588	0.797
0.38	0.38	0.511	0.553	0.625	0.855
1.00	1.00	0.555	0.604	0.686	0.952
3.00	3.00	0.696	0.767	0.885	1.266

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.269	0.263	0.253	0.221
0.38	0.38	0.233	0.221	0.202	0.140
1.00	1.00	0.173	0.152	0.117	0.004
3.00	3.00	-0.022	-0.073	-0.159	-0.435

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

12/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.740

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.720

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	CD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD2SFP

FD2SFP

13/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	CD

ITEM	WAVE_FORM
POSLIMIT	<p>The diagram shows three signals: SI, A, and Q. SI is a square wave. A is a square wave with a pulse width labeled $t_w(H)$. Q is a square wave that follows A with a delay.</p>

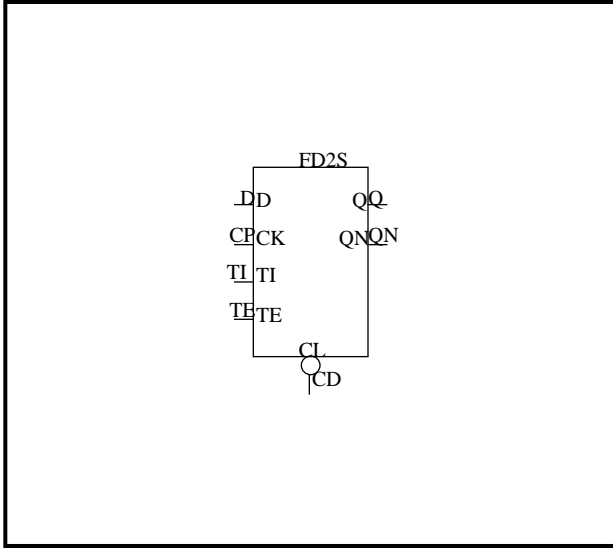
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD2S		FD2S		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD2S	D-TYPE FLIP FLOP with common single-phase SCAN clock with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT	
CD	D	TI	TE	CP	Qn+1	QNn+1
L	X	X	X	X*	L	H
H	L	X	L	Up	L	H
H	H	X	L	Up	H	L
H	X	L	H	Up	L	H
H	X	H	H	Up	H	L
H	X	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FD2S inst(Q,QN,D,CP,CD,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD2S
port map(Q,QN,D,CP,CD,TI,TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D, TI	0.99
CP	0.98
CD	2.26
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	47.3	48.1

TC200G SERIES

DATA SHEET

FD2S

FD2S

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0393	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.51	0.98
0.38	0.28	0.41	0.54	1.01
1.00	0.35	0.48	0.61	1.08
3.00	0.49	0.63	0.76	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.60	0.75	1.36
0.38	0.49	0.62	0.78	1.38
1.00	0.56	0.69	0.85	1.45
3.00	0.73	0.86	1.01	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0881	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.69	0.85	1.47
0.38	0.63	0.77	0.93	1.55
1.00	0.71	0.85	1.01	1.63
3.00	0.87	1.01	1.17	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0393	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.70	0.83	1.30
0.38	0.65	0.78	0.91	1.38
1.00	0.73	0.86	0.99	1.46
3.00	0.88	1.01	1.14	1.61

TC200G SERIES

DATA SHEET

FD2S

FD2S

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.84	0.99	1.59
0.38	0.79	0.91	1.06	1.66
1.00	0.87	0.99	1.14	1.74
3.00	1.02	1.14	1.30	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.82	0.95	1.42
0.38	0.78	0.90	1.02	1.49
1.00	0.87	0.98	1.11	1.58
3.00	1.03	1.14	1.27	1.74

TC200G SERIES

DATA SHEET

FD2S

FD2S

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.050	-0.090	-0.157	-0.372
0.38	-0.055	-0.095	-0.161	-0.376
1.00	-0.063	-0.103	-0.169	-0.384
3.00	-0.091	-0.130	-0.195	-0.407

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.706	0.745	0.812	1.028
0.38	0.711	0.750	0.817	1.032
1.00	0.719	0.759	0.825	1.039
3.00	0.747	0.786	0.852	1.063

TC200G SERIES

DATA SHEET

FD2S

FD2S

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.438	0.416	0.379	0.260
0.38	0.482	0.460	0.422	0.301
1.00	0.557	0.534	0.495	0.369
3.00	0.799	0.773	0.730	0.589

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.110	0.145	0.204	0.395
0.38	0.072	0.107	0.165	0.354
1.00	0.008	0.043	0.100	0.286
3.00	-0.197	-0.164	-0.109	0.067

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.548	0.512	0.452	0.260
0.38	0.585	0.550	0.491	0.300
1.00	0.649	0.614	0.556	0.369
3.00	0.852	0.820	0.765	0.589

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.220	0.241	0.277	0.394
0.38	0.175	0.197	0.234	0.353
1.00	0.099	0.122	0.161	0.286
3.00	-0.144	-0.118	-0.074	0.067

TC200G SERIES

DATA SHEET

FD2S

FD2S

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	CD&(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.479	0.457	0.420	0.302
0.01	0.530	0.507	0.470	0.349
0.38	0.616	0.593	0.554	0.428
1.00	0.893	0.867	0.823	0.683
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.179	0.200	0.237	0.353
0.01	0.127	0.149	0.187	0.306
0.38	0.041	0.064	0.103	0.227
1.00	-0.238	-0.211	-0.168	-0.026
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.512	0.490	0.454	0.337
0.01	0.551	0.529	0.492	0.373
0.38	0.617	0.594	0.556	0.432
1.00	0.828	0.803	0.761	0.624
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.008	0.025	0.081	0.262
0.01	-0.032	0.002	0.057	0.237
0.38	-0.071	-0.038	0.017	0.195
1.00	-0.197	-0.165	-0.111	0.061
3.00				

TC200G SERIES

DATA SHEET

FD2S

FD2S

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.665	0.632	0.576	0.396
0.38	0.688	0.655	0.600	0.420
1.00	0.727	0.694	0.639	0.461
3.00	0.852	0.820	0.767	0.595

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.142	0.164	0.201	0.319
0.38	0.103	0.125	0.163	0.284
1.00	0.038	0.061	0.099	0.224
3.00	-0.173	-0.148	-0.105	0.032

TC200G SERIES

DATA SHEET

FD2S

FD2S

8/8

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

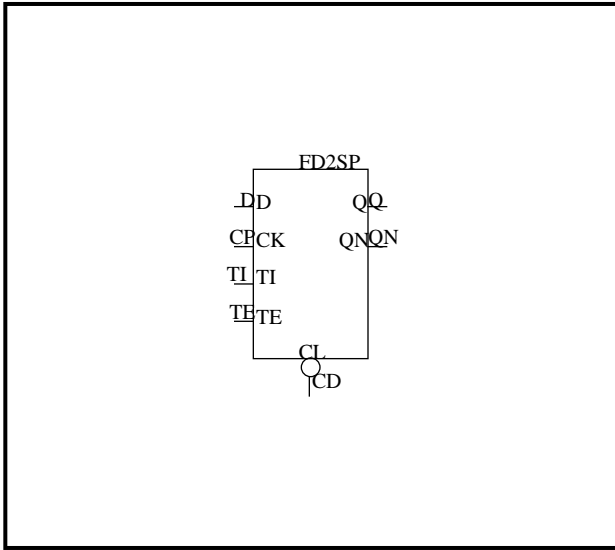
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD2SP		FD2SP		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD2SP	D-TYPE FLIP FLOP with common single-phase SCAN clock with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT	
CD	D	TI	TE	CP	Qn+1	QNn+1
L	X	X	X	X*	L	H
H	L	X	L	Up	L	H
H	H	X	L	Up	H	L
H	X	L	H	Up	L	H
H	X	H	H	Up	H	L
H	X	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FD2SP inst(Q,QN,D,CP,CD,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD2SP
port map(Q,QN,D,CP,CD,TI,TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D, TI	0.99
CP	0.98
CD	2.26
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	94.5	89.5

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0197	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.34	0.41	0.67
0.38	0.28	0.36	0.44	0.69
1.00	0.35	0.43	0.51	0.77
3.00	0.51	0.60	0.68	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0442	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.60	0.68	1.01
0.38	0.55	0.62	0.71	1.03
1.00	0.62	0.70	0.78	1.11
3.00	0.81	0.88	0.97	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0442	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.64	0.73	1.05
0.38	0.64	0.72	0.80	1.13
1.00	0.72	0.80	0.89	1.21
3.00	0.88	0.96	1.05	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0197	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.66	0.74	0.99
0.38	0.66	0.74	0.81	1.07
1.00	0.74	0.82	0.89	1.15
3.00	0.89	0.97	1.04	1.30

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0442	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.85	0.93	1.24
0.38	0.85	0.92	1.01	1.32
1.00	0.93	1.01	1.09	1.40
3.00	1.08	1.15	1.24	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0236	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.78	0.86	0.94	1.23
0.38	0.86	0.94	1.02	1.31
1.00	0.94	1.02	1.10	1.39
3.00	1.10	1.18	1.26	1.55

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	-0.050	-0.090	-0.157	-0.372
0.38	-0.055	-0.095	-0.161	-0.376
1.00	-0.063	-0.103	-0.169	-0.384
3.00	-0.091	-0.130	-0.195	-0.407

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.706	0.745	0.812	1.028
0.38	0.711	0.750	0.817	1.032
1.00	0.719	0.759	0.825	1.039
3.00	0.747	0.786	0.852	1.063

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.438	0.416	0.379	0.260
0.38	0.482	0.460	0.422	0.301
1.00	0.557	0.534	0.495	0.369
3.00	0.799	0.773	0.730	0.589

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.110	0.145	0.204	0.395
0.38	0.072	0.107	0.165	0.354
1.00	0.008	0.043	0.100	0.286
3.00	-0.197	-0.164	-0.109	0.067

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.548	0.512	0.452	0.260
0.38	0.585	0.550	0.491	0.300
1.00	0.649	0.614	0.556	0.369
3.00	0.852	0.820	0.765	0.589

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.220	0.241	0.277	0.394
0.38	0.175	0.197	0.234	0.353
1.00	0.099	0.122	0.161	0.286
3.00	-0.144	-0.118	-0.074	0.067

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	CD&(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.479	0.457	0.420	0.302
0.01	0.530	0.507	0.470	0.349
0.38	0.616	0.593	0.554	0.428
1.00	0.893	0.867	0.823	0.683
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.179	0.200	0.237	0.353
0.01	0.127	0.149	0.187	0.306
0.38	0.041	0.064	0.103	0.227
1.00	-0.238	-0.211	-0.168	-0.026
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.512	0.490	0.454	0.337
0.01	0.551	0.529	0.492	0.373
0.38	0.617	0.594	0.556	0.432
1.00	0.828	0.803	0.761	0.624
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.008	0.025	0.081	0.262
0.01	-0.032	0.002	0.057	0.237
0.38	-0.071	-0.038	0.017	0.195
1.00	-0.197	-0.165	-0.111	0.061
3.00				

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.665	0.632	0.576	0.396
0.38	0.688	0.655	0.600	0.420
1.00	0.727	0.694	0.639	0.461
3.00	0.852	0.820	0.767	0.595

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.142	0.164	0.201	0.319
0.38	0.103	0.125	0.163	0.284
1.00	0.038	0.061	0.099	0.224
3.00	-0.173	-0.148	-0.105	0.032

TC200G SERIES

DATA SHEET

FD2SP

FD2SP

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

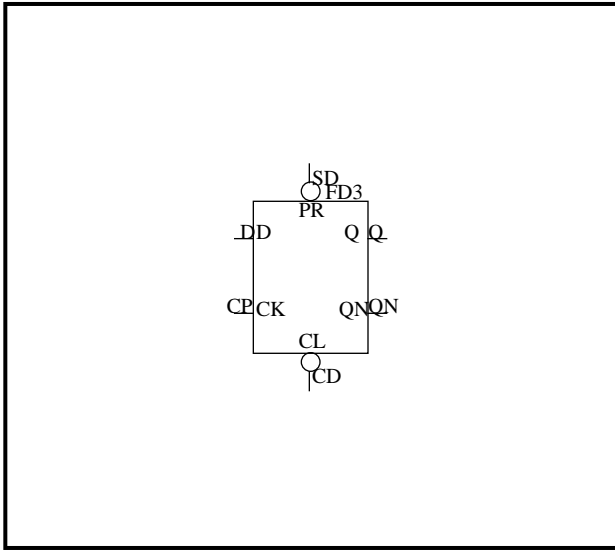
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD3		FD3		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD3	D-TYPE FLIP FLOP with CLEAR and PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
CD	SD	D	CP	Qn+1	QNn+1
L	H	X	X*	L	H
H	L	X	X*	H	L
L	L	X	X	L	L
H	H	L	Up	L	H
H	H	H	Up	H	L
H	H	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FD3 inst(Q,QN,D,CP,CD,SD);
```

VHDL DESCRIPTION

```
inst:FD3
port map(Q,QN,D,CP,CD,SD);
```

ELECTRO MIGRATION

PIN NAME	Q,QN	(LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	

INPUT LOAD

PIN NAME	LOAD	(LU)
D,CP	0.99	
CD	2.28	
SD	2.18	

OUTPUT DRIVE

PIN NAME	Q	QN	(LU)
DRIVE	47.0	48.3	

TC200G SERIES

DATA SHEET

FD3

FD3

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.50	1.10
0.38	0.27	0.40	0.55	1.15
1.00	0.33	0.46	0.62	1.22
3.00	0.45	0.59	0.75	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.45	0.59	1.08
0.38	0.34	0.48	0.62	1.10
1.00	0.42	0.55	0.69	1.18
3.00	0.58	0.73	0.87	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.37	0.51	1.00
0.38	0.28	0.40	0.53	1.03
1.00	0.34	0.47	0.60	1.10
3.00	0.48	0.62	0.76	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0860	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.36	0.52	1.12
0.38	0.28	0.41	0.57	1.17
1.00	0.34	0.47	0.63	1.23
3.00	0.46	0.60	0.76	1.37

TC200G SERIES

DATA SHEET

FD3

FD3

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.82	1.42
0.38	0.55	0.69	0.84	1.44
1.00	0.62	0.76	0.91	1.51
3.00	0.78	0.92	1.07	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0860	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.67	0.82	1.43
0.38	0.61	0.75	0.90	1.51
1.00	0.69	0.82	0.98	1.58
3.00	0.82	0.95	1.11	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.71	0.84	1.34
0.38	0.66	0.79	0.92	1.42
1.00	0.74	0.86	0.99	1.49
3.00	0.86	0.98	1.12	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.88	1.03	1.63
0.38	0.83	0.96	1.11	1.70
1.00	0.90	1.03	1.18	1.78
3.00	1.03	1.16	1.31	1.90

TC200G SERIES

DATA SHEET

FD3

FD3

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.80	0.92	1.39
0.38	0.76	0.87	1.00	1.47
1.00	0.84	0.95	1.08	1.54
3.00	0.96	1.08	1.20	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0860	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.71	0.86	1.46
0.38	0.60	0.73	0.89	1.48
1.00	0.68	0.81	0.97	1.56
3.00	0.86	0.99	1.14	1.73

TC200G SERIES

DATA SHEET

FD3

FD3

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.050	-0.085	-0.145	-0.336
0.38	-0.057	-0.093	-0.152	-0.343
1.00	-0.069	-0.105	-0.164	-0.356
3.00	-0.109	-0.144	-0.204	-0.395

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.706	0.741	0.800	0.992
0.38	0.713	0.748	0.808	1.000
1.00	0.725	0.760	0.820	1.012
3.00	0.764	0.800	0.859	1.052

TC200G SERIES

DATA SHEET

FD3

FD3

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.367	0.349	0.318	0.219
0.38	0.404	0.385	0.353	0.252
1.00	0.464	0.445	0.412	0.307
3.00	0.659	0.638	0.601	0.484

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.250	0.283	0.337	0.513
0.38	0.217	0.249	0.303	0.478
1.00	0.161	0.192	0.246	0.418
3.00	-0.020	0.010	0.061	0.225

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.407	0.375	0.320	0.144
0.38	0.441	0.408	0.354	0.180
1.00	0.497	0.465	0.411	0.239
3.00	0.677	0.646	0.595	0.431

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.290	0.308	0.338	0.435
0.38	0.254	0.272	0.303	0.402
1.00	0.193	0.212	0.244	0.348
3.00	-0.003	0.019	0.055	0.173

TC200G SERIES

DATA SHEET

FD3

FD3

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.131	0.098	0.042	-0.137
0.38	0.160	0.127	0.072	-0.105
1.00	0.207	0.175	0.121	-0.052
3.00	0.360	0.331	0.281	0.120

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.523	0.556	0.612	0.793
0.38	0.495	0.528	0.583	0.761
1.00	0.448	0.480	0.534	0.708
3.00	0.296	0.326	0.375	0.535

TC200G SERIES

DATA SHEET

FD3

FD3

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.730

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

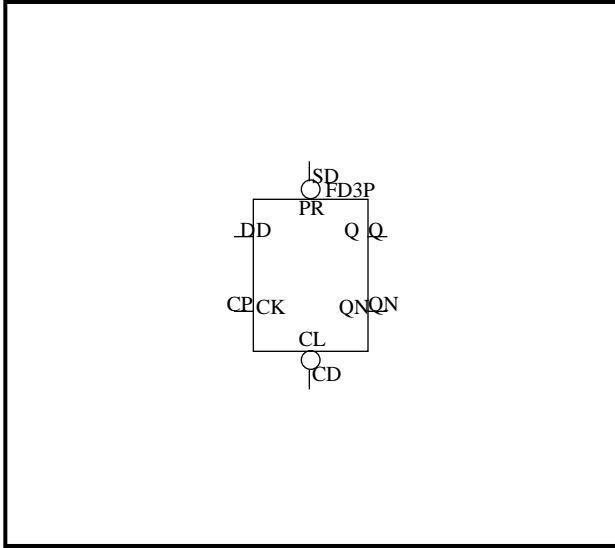
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.780

TC200G SERIES

DATA SHEET

FD3P		FD3P		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD3P	D-TYPE FLIP FLOP with CLEAR and PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
CD	SD	D	CP	Qn+1	QNn+1
L	H	X	X*	L	H
H	L	X	X*	H	L
L	L	X	X	L	L
H	H	L	Up	L	H
H	H	H	Up	H	L
H	H	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FD3P inst(Q,QN,D,CP,CD,SD);
```

VHDL DESCRIPTION

```
inst:FD3P
port map(Q,QN,D,CP,CD,SD);
```

ELECTRO MIGRATION

PIN NAME	Q	QN	(LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	12880.0	

INPUT LOAD

PIN NAME	LOAD (LU)
D,CP	0.99
CD	2.28
SD	2.18

OUTPUT DRIVE

PIN NAME	Q (LU)	QN (LU)
DRIVE	89.1	98.0

TC200G SERIES

DATA SHEET

FD3P

FD3P

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.30	0.38	0.70
0.38	0.28	0.35	0.43	0.75
1.00	0.35	0.42	0.51	0.82
3.00	0.49	0.57	0.66	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0179	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.40	0.48	0.74
0.38	0.34	0.43	0.51	0.76
1.00	0.42	0.50	0.58	0.84
3.00	0.59	0.68	0.77	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0238	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.42	0.71
0.38	0.28	0.36	0.44	0.74
1.00	0.35	0.43	0.51	0.81
3.00	0.50	0.59	0.68	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0441	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.71
0.38	0.28	0.36	0.44	0.76
1.00	0.35	0.43	0.51	0.83
3.00	0.49	0.57	0.66	0.98

TC200G SERIES

DATA SHEET

FD3P

FD3P

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.68	0.76	1.09
0.38	0.62	0.70	0.79	1.12
1.00	0.70	0.78	0.86	1.19
3.00	0.88	0.96	1.05	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0441	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.61	0.70	1.02
0.38	0.61	0.69	0.78	1.10
1.00	0.69	0.77	0.85	1.17
3.00	0.82	0.89	0.98	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0238	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.67	0.76	1.05
0.38	0.67	0.75	0.83	1.13
1.00	0.74	0.82	0.91	1.20
3.00	0.87	0.95	1.03	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.90	0.99	1.30
0.38	0.90	0.98	1.06	1.38
1.00	0.98	1.05	1.14	1.45
3.00	1.10	1.18	1.26	1.58

TC200G SERIES

DATA SHEET

FD3P

FD3P

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0179	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.81	0.88	1.11
0.38	0.82	0.89	0.96	1.19
1.00	0.90	0.97	1.03	1.27
3.00	1.02	1.09	1.16	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0441	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.73	0.81	1.13
0.38	0.68	0.75	0.84	1.16
1.00	0.76	0.84	0.92	1.24
3.00	0.95	1.03	1.11	1.43

TC200G SERIES

DATA SHEET

FD3P

FD3P

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.050	-0.085	-0.145	-0.336
0.38	-0.057	-0.093	-0.152	-0.343
1.00	-0.069	-0.105	-0.164	-0.356
3.00	-0.109	-0.144	-0.204	-0.395

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.706	0.741	0.800	0.992
0.38	0.713	0.748	0.808	1.000
1.00	0.725	0.760	0.820	1.012
3.00	0.764	0.800	0.859	1.052

TC200G SERIES

DATA SHEET

FD3P

FD3P

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.367	0.349	0.318	0.219
0.38	0.404	0.385	0.353	0.252
1.00	0.464	0.445	0.412	0.307
3.00	0.659	0.638	0.601	0.484

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.250	0.283	0.337	0.513
0.38	0.217	0.249	0.303	0.478
1.00	0.161	0.192	0.246	0.418
3.00	-0.020	0.010	0.061	0.225

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.407	0.375	0.320	0.144
0.38	0.441	0.408	0.354	0.180
1.00	0.497	0.465	0.411	0.239
3.00	0.677	0.646	0.595	0.431

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.290	0.308	0.338	0.435
0.38	0.254	0.272	0.303	0.402
1.00	0.193	0.212	0.244	0.348
3.00	-0.003	0.019	0.055	0.173

TC200G SERIES

DATA SHEET

FD3P

FD3P

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.131	0.098	0.042	-0.137
0.38	0.160	0.127	0.072	-0.105
1.00	0.207	0.175	0.121	-0.052
3.00	0.360	0.331	0.281	0.120

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.523	0.556	0.612	0.793
0.38	0.495	0.528	0.583	0.761
1.00	0.448	0.480	0.534	0.708
3.00	0.296	0.326	0.375	0.535

TC200G SERIES

DATA SHEET

FD3P

FD3P

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.730

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

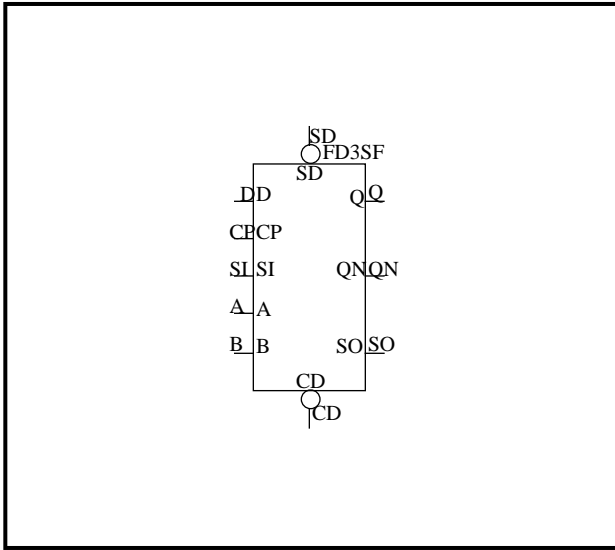
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.780

TC200G SERIES

DATA SHEET

FD3SF		FD3SF		1/15
CELL NAME	FUNCTION		CELL COUNT	CONDITION
FD3SF	D-TYPE FLIP FLOP with Independent two-phase SCAN clock with CLEAR and PRESET		GATE	I/O
			13	0
VDD=3.3V, Ta=25°C, Typ.				

LOGIC SYMBOL



TRUTH TABLE

INPUT							OUTPUT		
CD	SD	D	SI	A	B	CP	Qn+1	QNn+1	SO _{n+1}
X	X	X	X	X	L	X	X	X	SO _n
L	L	X	X	L	H	X	L	L	L
L	H	X	X	L	H	X*	L	H	L
H	L	X	X	L	H	X*	H	L	H
H	H	X	L	H	H	L	L	H	L
H	H	X	H	H	H	L	H	L	H
H	H	L	X	L	H	Up	L	H	L
H	H	H	X	L	H	Up	H	L	H
H	H	X	X	L	H	Dn	Qn	QNn	Qn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FD3SF inst(Q,QN,SO,D,CP,CD,SD,SI,
           A,B);
```

VHDL DESCRIPTION

```
inst:FD3SF
port map(Q,QN,SO,D,CP,CD,SD,
         SI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
CD,SD	2.28
SI	0.89
A	2.07
B	2.03

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	47.0	47.1	43.8

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

2/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.64	0.82	1.50
0.38	0.53	0.67	0.85	1.53
1.00	0.60	0.74	0.91	1.59
3.00	0.77	0.91	1.08	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.72	0.83	1.26
0.38	0.66	0.76	0.87	1.29
1.00	0.72	0.82	0.93	1.35
3.00	0.85	0.94	1.05	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.57	0.74	1.42
0.38	0.52	0.65	0.83	1.51
1.00	0.64	0.78	0.95	1.63
3.00	0.76	0.90	1.07	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.55	0.66	1.08
0.38	0.53	0.63	0.74	1.16
1.00	0.64	0.74	0.85	1.27
3.00	0.82	0.92	1.03	1.45

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

3/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0862	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.65	0.81	1.41
0.38	0.61	0.74	0.90	1.50
1.00	0.74	0.88	1.03	1.64
3.00	0.86	1.00	1.15	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.62	0.76	1.25
0.38	0.58	0.71	0.84	1.34
1.00	0.69	0.81	0.94	1.44
3.00	0.86	0.99	1.12	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.80	0.95	1.54
0.38	0.75	0.88	1.03	1.62
1.00	0.85	0.98	1.13	1.73
3.00	1.03	1.16	1.31	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0403	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.79	0.91	1.38
0.38	0.76	0.88	1.00	1.47
1.00	0.90	1.01	1.14	1.61
3.00	1.01	1.13	1.26	1.73

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

4/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.61	1.28
0.38	0.40	0.54	0.71	1.38
1.00	0.50	0.64	0.81	1.48
3.00	0.61	0.75	0.92	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.38	0.49	0.91
0.38	0.36	0.45	0.56	0.98
1.00	0.42	0.52	0.63	1.05
3.00	0.52	0.62	0.74	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.51	0.69	1.32
0.38	0.40	0.56	0.74	1.38
1.00	0.49	0.65	0.83	1.46
3.00	0.71	0.86	1.04	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0403	0.20

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.62	0.79	1.32
0.38	0.47	0.65	0.81	1.35
1.00	0.55	0.73	0.89	1.42
3.00	0.77	0.95	1.11	1.65

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

5/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.38	0.52	1.01
0.38	0.28	0.41	0.54	1.04
1.00	0.35	0.48	0.61	1.11
3.00	0.49	0.63	0.77	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0862	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.52	1.12
0.38	0.28	0.42	0.57	1.17
1.00	0.34	0.48	0.63	1.24
3.00	0.47	0.61	0.77	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.79	0.97	1.62
0.38	0.64	0.82	1.00	1.65
1.00	0.71	0.89	1.07	1.72
3.00	0.88	1.06	1.24	1.88

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.05	1.15	1.26	1.69
0.38	1.08	1.18	1.29	1.71
1.00	1.15	1.25	1.36	1.78
3.00	1.32	1.41	1.52	1.95

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

6/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0862	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.67	0.82	1.43
0.38	0.61	0.75	0.90	1.51
1.00	0.69	0.83	0.98	1.59
3.00	0.82	0.96	1.11	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.71	0.84	1.34
0.38	0.67	0.79	0.92	1.42
1.00	0.74	0.86	1.00	1.49
3.00	0.86	0.99	1.12	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	1.05	1.22	1.85
0.38	0.96	1.12	1.30	1.93
1.00	1.04	1.20	1.37	2.00
3.00	1.16	1.32	1.49	2.12

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0403	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.85	1.00	1.16	1.69
0.38	0.93	1.08	1.24	1.77
1.00	1.00	1.16	1.32	1.84
3.00	1.13	1.29	1.44	1.97

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

7/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.14	1.28	1.45	2.13
0.38	1.22	1.36	1.53	2.21
1.00	1.29	1.43	1.61	2.29
3.00	1.42	1.56	1.73	2.41

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.23	1.33	1.44	1.86
0.38	1.31	1.41	1.52	1.94
1.00	1.38	1.48	1.59	2.01
3.00	1.50	1.60	1.71	2.13

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0862	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.06	1.21	1.81
0.38	0.95	1.09	1.24	1.84
1.00	1.02	1.16	1.31	1.91
3.00	1.24	1.38	1.53	2.13

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.93	1.11	1.79
0.38	0.82	0.96	1.13	1.81
1.00	0.89	1.03	1.20	1.89
3.00	1.11	1.25	1.42	2.10

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

8/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0862	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.62	0.78	1.38
0.38	0.53	0.66	0.82	1.42
1.00	0.61	0.75	0.91	1.51
3.00	0.80	0.94	1.10	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.60	0.74	1.24
0.38	0.48	0.61	0.74	1.24
1.00	0.53	0.65	0.78	1.28
3.00	0.62	0.76	0.90	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0861	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.78	0.93	1.52
0.38	0.65	0.78	0.93	1.53
1.00	0.69	0.82	0.97	1.57
3.00	0.81	0.94	1.09	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0403	0.20

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.76	0.88	1.35
0.38	0.68	0.80	0.92	1.39
1.00	0.77	0.89	1.01	1.48
3.00	0.96	1.08	1.21	1.68

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

9/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.67	1.35
0.38	0.39	0.53	0.70	1.39
1.00	0.44	0.58	0.75	1.43
3.00	0.52	0.66	0.83	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.47	0.58	1.00
0.38	0.38	0.48	0.58	1.01
1.00	0.43	0.53	0.64	1.06
3.00	0.55	0.65	0.76	1.19

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

10/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.050	-0.085	-0.143	-0.331
0.38	-0.057	-0.092	-0.150	-0.339
1.00	-0.069	-0.104	-0.163	-0.351
3.00	-0.109	-0.144	-0.202	-0.390

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D&~A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.706	0.740	0.798	0.986
0.38	0.713	0.747	0.806	0.993
1.00	0.725	0.760	0.818	1.006
3.00	0.764	0.799	0.857	1.045

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

11/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.367	0.349	0.318	0.219
0.38	0.404	0.385	0.353	0.252
1.00	0.464	0.445	0.412	0.307
3.00	0.659	0.638	0.601	0.484

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.250	0.283	0.337	0.513
0.38	0.217	0.249	0.303	0.478
1.00	0.161	0.192	0.246	0.418
3.00	-0.020	0.010	0.061	0.225

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.407	0.375	0.320	0.144
0.38	0.441	0.408	0.354	0.180
1.00	0.497	0.465	0.411	0.239
3.00	0.677	0.646	0.595	0.431

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.290	0.308	0.338	0.435
0.38	0.254	0.272	0.303	0.402
1.00	0.193	0.212	0.244	0.348
3.00	-0.003	0.019	0.055	0.173

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

12/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&SD&~CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.432	0.441	0.455	0.499
0.38	0.38	0.477	0.490	0.512	0.583
1.00	1.00	0.551	0.572	0.608	0.724
3.00	3.00	0.790	0.838	0.918	1.178

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.170	0.131	0.065	-0.147
0.38	0.38	0.151	0.107	0.033	-0.204
1.00	1.00	0.118	0.066	-0.020	-0.300
3.00	3.00	0.012	-0.065	-0.194	-0.610

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&SD&~CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.485	0.525	0.592	0.810
0.38	0.38	0.506	0.551	0.626	0.866
1.00	1.00	0.543	0.595	0.681	0.961
3.00	3.00	0.662	0.736	0.862	1.266

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.222	0.214	0.201	0.156
0.38	0.38	0.178	0.165	0.143	0.072
1.00	1.00	0.104	0.083	0.047	-0.068
3.00	3.00	-0.134	-0.182	-0.263	-0.523

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

13/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.131	0.098	0.042	-0.137
0.38	0.160	0.127	0.072	-0.106
1.00	0.207	0.175	0.121	-0.054
3.00	0.360	0.330	0.279	0.115

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.523	0.556	0.612	0.793
0.38	0.495	0.528	0.583	0.762
1.00	0.448	0.480	0.534	0.710
3.00	0.296	0.326	0.377	0.542

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

14/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.810

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.930

TC200G SERIES

DATA SHEET

FD3SF

FD3SF

15/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	CD&SD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	CD&SD

ITEM	WAVE_FORM
POSLIMIT	

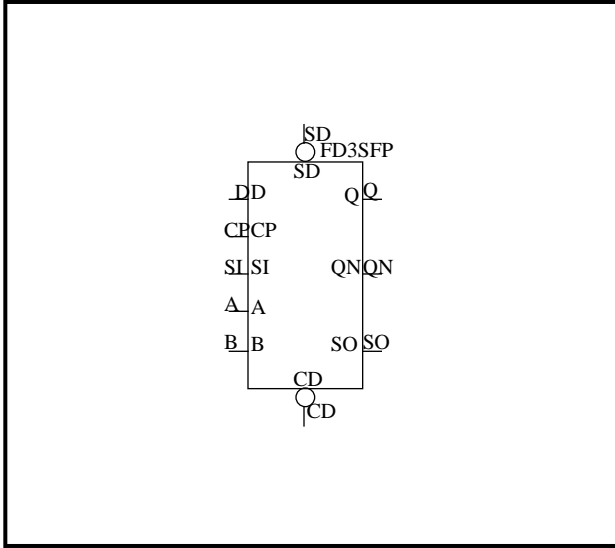
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD3SFP		FD3SFP		1/15
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD3SFP	D-TYPE FLIP FLOP with Independent two-phase SCAN clock with CLEAR and PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		14	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT							OUTPUT		
CD	SD	D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	X	X	L	X	X	X	SON
L	L	X	X	L	H	X	L	L	L
L	H	X	X	L	H	X*	L	H	L
H	L	X	X	L	H	X*	H	L	H
H	H	X	L	H	H	L	L	H	L
H	H	X	H	H	H	L	H	L	H
H	H	L	X	L	H	Up	L	H	L
H	H	H	X	L	H	Up	H	L	H
H	H	X	X	L	H	Dn	Qn	QNn	Qn

*: Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FD3SFP inst(Q,QN,SO,D,CP,CD,SD,
            SI,A,B);
```

VHDL DESCRIPTION

```
inst:FD3SFP
port map(Q,QN,SO,D,CP,CD,SD,
         SI,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
CD	2.28
SD	2.27
SI	0.92
A	2.10
B	2.02

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	87.7	90.5	42.6

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

2/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.65	0.82	1.50
0.38	0.54	0.68	0.85	1.53
1.00	0.61	0.75	0.92	1.60
3.00	0.79	0.92	1.09	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0400	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.76	0.88	1.34
0.38	0.69	0.79	0.91	1.38
1.00	0.75	0.85	0.97	1.44
3.00	0.88	0.99	1.11	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.57	0.74	1.42
0.38	0.53	0.66	0.83	1.51
1.00	0.66	0.80	0.96	1.64
3.00	0.79	0.92	1.09	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0400	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.56	0.68	1.14
0.38	0.54	0.64	0.76	1.23
1.00	0.65	0.75	0.87	1.33
3.00	0.83	0.94	1.06	1.52

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

3/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0464	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.61	0.70	1.03
0.38	0.63	0.70	0.79	1.12
1.00	0.76	0.84	0.93	1.26
3.00	0.90	0.97	1.06	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0226	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.67	0.95
0.38	0.59	0.67	0.75	1.03
1.00	0.69	0.77	0.85	1.14
3.00	0.87	0.95	1.03	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0432	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.83	0.91	1.22
0.38	0.83	0.91	0.99	1.31
1.00	0.94	1.01	1.10	1.41
3.00	1.12	1.19	1.28	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0213	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.82	0.89	1.14
0.38	0.84	0.91	0.98	1.23
1.00	0.98	1.05	1.12	1.37
3.00	1.11	1.18	1.25	1.50

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

4/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.62	1.28
0.38	0.41	0.55	0.71	1.38
1.00	0.52	0.66	0.82	1.49
3.00	0.64	0.77	0.94	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0400	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.39	0.51	0.97
0.38	0.36	0.47	0.58	1.05
1.00	0.42	0.53	0.65	1.12
3.00	0.52	0.64	0.77	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0432	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.46	0.57	0.91
0.38	0.43	0.52	0.62	0.97
1.00	0.53	0.62	0.72	1.06
3.00	0.77	0.86	0.95	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0213	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.54	0.64	0.96
0.38	0.46	0.57	0.67	0.98
1.00	0.53	0.64	0.75	1.06
3.00	0.75	0.86	0.97	1.28

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

5/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0226	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.70
0.38	0.28	0.36	0.44	0.72
1.00	0.35	0.43	0.51	0.80
3.00	0.49	0.58	0.67	0.96

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0464	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.40	0.73
0.38	0.28	0.36	0.45	0.78
1.00	0.35	0.43	0.52	0.85
3.00	0.49	0.57	0.67	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0432	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.81	0.92	1.28
0.38	0.74	0.84	0.95	1.31
1.00	0.81	0.91	1.02	1.38
3.00	1.00	1.10	1.20	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0400	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.20	1.30	1.42	1.88
0.38	1.22	1.33	1.45	1.91
1.00	1.30	1.40	1.52	1.98
3.00	1.48	1.58	1.70	2.17

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

6/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0464	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.62	0.71	1.04
0.38	0.62	0.70	0.78	1.11
1.00	0.70	0.77	0.86	1.19
3.00	0.82	0.90	0.99	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0226	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.67	0.75	1.03
0.38	0.67	0.75	0.83	1.11
1.00	0.74	0.82	0.90	1.18
3.00	0.87	0.94	1.02	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0432	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.98	1.07	1.17	1.52
0.38	1.06	1.15	1.25	1.60
1.00	1.13	1.22	1.32	1.67
3.00	1.25	1.34	1.44	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0213	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	0.99	1.09	1.38
0.38	0.97	1.07	1.17	1.46
1.00	1.05	1.15	1.24	1.54
3.00	1.18	1.27	1.37	1.67

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

7/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.26	1.40	1.56	2.24
0.38	1.34	1.47	1.64	2.32
1.00	1.41	1.55	1.72	2.40
3.00	1.54	1.68	1.85	2.52

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0400	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.37	1.48	1.60	2.06
0.38	1.45	1.56	1.68	2.14
1.00	1.53	1.63	1.75	2.21
3.00	1.65	1.75	1.87	2.33

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0464	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.01	1.09	1.18	1.51
0.38	1.04	1.12	1.21	1.54
1.00	1.11	1.18	1.27	1.60
3.00	1.33	1.41	1.50	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	1.00	1.17	1.84
0.38	0.88	1.02	1.19	1.87
1.00	0.95	1.09	1.26	1.94
3.00	1.17	1.31	1.48	2.16

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

8/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0464	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.58	0.67	1.00
0.38	0.54	0.62	0.71	1.04
1.00	0.63	0.71	0.80	1.13
3.00	0.84	0.92	1.01	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0226	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.56	0.64	0.93
0.38	0.49	0.57	0.65	0.93
1.00	0.53	0.61	0.69	0.97
3.00	0.64	0.72	0.81	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0432	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.80	0.89	1.20
0.38	0.73	0.81	0.89	1.20
1.00	0.78	0.85	0.93	1.25
3.00	0.91	0.99	1.07	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0213	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.79	0.86	1.11
0.38	0.75	0.82	0.90	1.15
1.00	0.85	0.92	0.99	1.24
3.00	1.06	1.13	1.21	1.46

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

9/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1005	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.67	1.35
0.38	0.40	0.54	0.71	1.39
1.00	0.45	0.59	0.76	1.44
3.00	0.54	0.68	0.85	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0400	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.48	0.60	1.06
0.38	0.39	0.49	0.61	1.07
1.00	0.44	0.54	0.66	1.12
3.00	0.54	0.65	0.77	1.23

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

10/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.050	-0.085	-0.143	-0.331
0.38	-0.057	-0.092	-0.150	-0.339
1.00	-0.069	-0.104	-0.163	-0.351
3.00	-0.109	-0.144	-0.202	-0.390

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D&~A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.706	0.740	0.798	0.986
0.38	0.713	0.747	0.806	0.993
1.00	0.725	0.760	0.818	1.006
3.00	0.764	0.799	0.857	1.045

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

11/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.367	0.349	0.318	0.219
0.38	0.404	0.385	0.353	0.252
1.00	0.464	0.445	0.412	0.307
3.00	0.659	0.638	0.601	0.484

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.250	0.283	0.337	0.513
0.38	0.217	0.249	0.303	0.478
1.00	0.161	0.192	0.246	0.418
3.00	-0.020	0.010	0.061	0.225

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.407	0.375	0.320	0.144
0.38	0.441	0.408	0.354	0.180
1.00	0.497	0.465	0.411	0.239
3.00	0.677	0.646	0.595	0.431

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.290	0.308	0.338	0.435
0.38	0.254	0.272	0.303	0.402
1.00	0.193	0.212	0.244	0.348
3.00	-0.003	0.019	0.055	0.173

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

12/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&SD&~CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.432	0.441	0.455	0.499
0.38	0.477	0.490	0.512	0.583
1.00	0.551	0.572	0.608	0.724
3.00	0.790	0.838	0.918	1.178

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.170	0.131	0.065	-0.147
0.38	0.151	0.107	0.033	-0.204
1.00	0.118	0.066	-0.020	-0.300
3.00	0.012	-0.065	-0.194	-0.610

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	CD&SD&~CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.485	0.525	0.592	0.810
0.38	0.506	0.551	0.626	0.866
1.00	0.543	0.595	0.681	0.961
3.00	0.662	0.736	0.862	1.266

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.222	0.214	0.201	0.156
0.38	0.178	0.165	0.143	0.072
1.00	0.104	0.083	0.047	-0.068
3.00	-0.134	-0.182	-0.263	-0.523

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

13/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.131	0.098	0.042	-0.137
0.38	0.160	0.127	0.072	-0.106
1.00	0.207	0.175	0.121	-0.054
3.00	0.360	0.330	0.279	0.115

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.523	0.556	0.612	0.793
0.38	0.495	0.528	0.583	0.762
1.00	0.448	0.480	0.534	0.710
3.00	0.296	0.326	0.377	0.542

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

14/15

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.810

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.930

TC200G SERIES

DATA SHEET

FD3SFP

FD3SFP

15/15

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	CD&SD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	CD&SD

ITEM	WAVE_FORM
POSLIMIT	

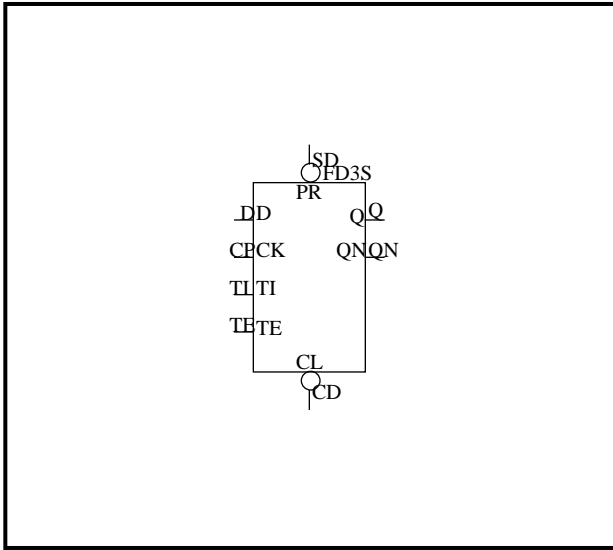
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD3S		FD3S		1/10
CELL NAME	FUNCTION		CELL COUNT	CONDITION
FD3S	D-TYPE FLIP FLOP with common single-phase SCAN clock with CLEAR and PRESET		GATE	I/O
			11	0
VDD=3.3V, Ta=25°C, Typ.				

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT	
CD	SD	D	TI	TE	CP	Qn+1	QNn+1
L	H	X	X	X	X*	L	H
H	L	X	X	X	X*	H	L
L	L	X	X	X	X	L	L
H	H	L	X	L	Up	L	H
H	H	H	X	L	Up	H	L
H	H	X	L	H	Up	L	H
H	H	X	H	H	Up	H	L
H	H	X	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FD3S inst(Q,QN,D,CP,CD,SD,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD3S
port map(Q,QN,D,CP,CD,SD,TI,
TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D, TI	0.99
CP	0.98
CD	2.28
SD	2.18
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	47.1	48.3

TC200G SERIES

DATA SHEET

FD3S

FD3S

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0862	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.51	1.11
0.38	0.27	0.41	0.56	1.16
1.00	0.34	0.47	0.62	1.23
3.00	0.46	0.60	0.75	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.46	0.60	1.08
0.38	0.35	0.49	0.63	1.11
1.00	0.42	0.56	0.70	1.19
3.00	0.59	0.74	0.88	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0428	0.82

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.00	0.00	0.01	0.50
0.38	0.00	0.00	0.06	0.70
1.00	0.11	0.72	0.90	1.12
3.00	0.80	0.78	0.80	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0861	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.36	0.52	1.12
0.38	0.28	0.41	0.57	1.17
1.00	0.34	0.48	0.63	1.23
3.00	0.46	0.60	0.76	1.38

TC200G SERIES

DATA SHEET

FD3S

FD3S

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0862	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	-0.21	-0.16	0.10	0.80
0.38	-0.20	0.13	0.38	1.11
1.00	0.78	0.79	0.86	1.47
3.00	0.56	0.66	0.93	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0861	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.68	0.84	1.44
0.38	0.63	0.76	0.92	1.52
1.00	0.71	0.84	1.00	1.61
3.00	0.87	1.00	1.16	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0428	0.82

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.71	0.84	1.34
0.38	0.66	0.79	0.92	1.42
1.00	0.74	0.87	1.00	1.49
3.00	0.89	1.01	1.15	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0862	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.88	1.03	1.63
0.38	0.83	0.96	1.11	1.71
1.00	0.91	1.04	1.19	1.79
3.00	1.06	1.19	1.34	1.93

TC200G SERIES

DATA SHEET

FD3S

FD3S

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0395	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.81	0.93	1.40
0.38	0.77	0.89	1.01	1.48
1.00	0.86	0.97	1.10	1.56
3.00	1.01	1.13	1.25	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0861	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.71	0.87	1.46
0.38	0.61	0.74	0.89	1.49
1.00	0.69	0.82	0.97	1.57
3.00	0.87	1.00	1.15	1.75

TC200G SERIES

DATA SHEET

FD3S

FD3S

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	-0.061	-0.101	-0.167	-0.383
0.38	-0.067	-0.107	-0.174	-0.389
1.00	-0.078	-0.118	-0.185	-0.399
3.00	-0.114	-0.153	-0.219	-0.431

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.718	0.758	0.825	1.040
0.38	0.725	0.764	0.831	1.046
1.00	0.735	0.775	0.841	1.055
3.00	0.771	0.810	0.875	1.086

TC200G SERIES

DATA SHEET

FD3S

FD3S

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.438	0.416	0.379	0.260
0.38	0.482	0.460	0.422	0.301
1.00	0.557	0.534	0.495	0.369
3.00	0.799	0.773	0.730	0.589

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.068	0.104	0.163	0.354
0.38	0.030	0.065	0.124	0.314
1.00	-0.035	-0.000	0.058	0.246
3.00	-0.243	-0.210	-0.154	0.026

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.588	0.553	0.493	0.302
0.38	0.627	0.592	0.533	0.342
1.00	0.691	0.656	0.598	0.410
3.00	0.899	0.866	0.810	0.630

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.220	0.241	0.277	0.394
0.38	0.175	0.197	0.234	0.353
1.00	0.099	0.122	0.161	0.286
3.00	-0.144	-0.118	-0.074	0.067

TC200G SERIES

DATA SHEET

FD3S

FD3S

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	CD&SD&(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.479	0.457	0.420	0.302
0.01	0.530	0.507	0.470	0.349
0.38	0.616	0.593	0.554	0.428
1.00	0.893	0.867	0.823	0.683
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.179	0.200	0.237	0.353
0.01	0.127	0.149	0.187	0.306
0.38	0.041	0.064	0.103	0.227
1.00	-0.238	-0.211	-0.168	-0.026
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.512	0.490	0.454	0.337
0.01	0.551	0.529	0.492	0.373
0.38	0.615	0.592	0.554	0.432
1.00	0.823	0.798	0.757	0.624
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.056	-0.023	0.033	0.214
0.01	-0.079	-0.046	0.010	0.189
0.38	-0.118	-0.085	-0.030	0.148
1.00	-0.243	-0.211	-0.158	0.015
3.00				

TC200G SERIES

DATA SHEET

FD3S

FD3S

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.710	0.677	0.622	0.443
0.01	0.734	0.701	0.646	0.467
0.38	0.773	0.740	0.685	0.509
1.00	0.899	0.868	0.814	0.642
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.142	0.164	0.201	0.319
0.01	0.104	0.126	0.163	0.284
0.38	0.039	0.062	0.101	0.224
1.00	-0.168	-0.143	-0.102	0.032
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.131	0.094	0.031	-0.172
0.01	0.159	0.122	0.059	-0.141
0.38	0.205	0.169	0.108	-0.089
1.00	0.354	0.320	0.263	0.079
3.00				

TC200G SERIES

DATA SHEET

FD3S

FD3S

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.523	0.561	0.624	0.829
0.01	0.495	0.533	0.596	0.798
0.38	0.450	0.486	0.547	0.745
1.00	0.302	0.336	0.393	0.576
3.00				

TC200G SERIES

DATA SHEET

FD3S

FD3S

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.730

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.790

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

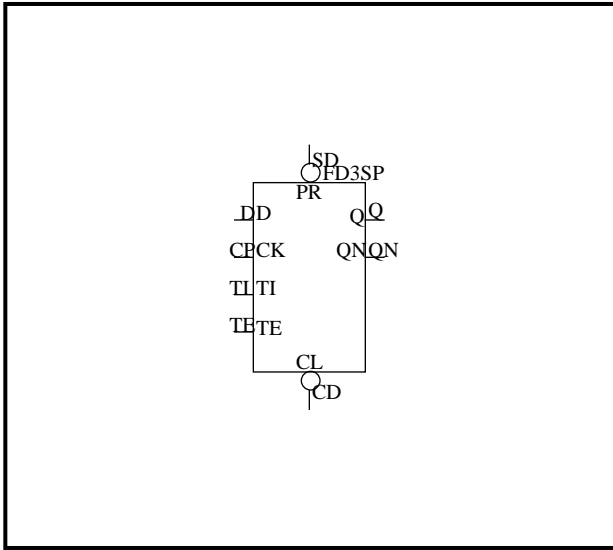
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.780

TC200G SERIES

DATA SHEET

FD3SP		FD3SP		1/10
CELL NAME	FUNCTION		CELL COUNT	CONDITION
FD3SP	D-TYPE FLIP FLOP with common single-phase SCAN clock with CLEAR and PRESET		GATE	I/O
			12	0
VDD=3.3V, Ta=25°C, Typ.				

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT	
CD	SD	D	TI	TE	CP	Qn+1	QNn+1
L	H	X	X	X	X*	L	H
H	L	X	X	X	X*	H	L
L	L	X	X	X	X	L	L
H	H	L	X	L	Up	L	H
H	H	H	X	L	Up	H	L
H	H	X	L	H	Up	L	H
H	H	X	H	H	Up	H	L
H	H	X	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FD3SP inst(Q,QN,D,CP,CD,SD,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD3SP
port map(Q,QN,D,CP,CD,SD,TI,
TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D, TI	0.99
CP	0.98
CD	2.28
SD	2.18
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	88.8	97.7

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

2/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.30	0.38	0.70
0.38	0.28	0.35	0.43	0.75
1.00	0.35	0.42	0.51	0.82
3.00	0.49	0.57	0.66	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.40	0.48	0.73
0.38	0.34	0.42	0.50	0.76
1.00	0.41	0.50	0.58	0.83
3.00	0.58	0.68	0.76	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0298	0.86

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	-0.00	-0.00	0.00	0.10
0.38	-0.00	0.00	0.01	0.42
1.00	0.20	0.57	0.72	0.97
3.00	0.72	0.71	0.73	0.93

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0441	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.71
0.38	0.28	0.36	0.44	0.76
1.00	0.35	0.42	0.51	0.83
3.00	0.49	0.57	0.66	0.98

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

3/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	-0.21	-0.19	-0.07	0.36
0.38	-0.09	0.15	0.31	0.77
1.00	0.80	0.79	0.82	1.16
3.00	0.63	0.82	0.95	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0441	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.71	1.04
0.38	0.63	0.71	0.79	1.11
1.00	0.71	0.79	0.88	1.20
3.00	0.87	0.95	1.04	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0298	0.86

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.67	0.75	1.05
0.38	0.67	0.75	0.83	1.13
1.00	0.75	0.83	0.91	1.21
3.00	0.90	0.98	1.06	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.90	0.98	1.30
0.38	0.90	0.98	1.06	1.38
1.00	0.98	1.06	1.14	1.46
3.00	1.13	1.21	1.29	1.61

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

4/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.83	0.90	1.13
0.38	0.84	0.91	0.97	1.21
1.00	0.92	0.99	1.06	1.29
3.00	1.08	1.15	1.22	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0441	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.72	0.81	1.13
0.38	0.67	0.75	0.83	1.15
1.00	0.75	0.83	0.91	1.23
3.00	0.94	1.02	1.11	1.43

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

5/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.061	-0.101	-0.167	-0.383
0.38	-0.067	-0.107	-0.174	-0.389
1.00	-0.078	-0.118	-0.185	-0.399
3.00	-0.114	-0.153	-0.219	-0.431

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&(~TE&D TE&T)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.718	0.758	0.825	1.040
0.38	0.725	0.764	0.831	1.046
1.00	0.735	0.775	0.841	1.055
3.00	0.771	0.810	0.875	1.086

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

6/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.438	0.416	0.379	0.260
0.38	0.482	0.460	0.422	0.301
1.00	0.557	0.534	0.495	0.369
3.00	0.799	0.773	0.730	0.589

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.068	0.104	0.163	0.354
0.38	0.030	0.065	0.124	0.314
1.00	-0.035	-0.000	0.058	0.246
3.00	-0.243	-0.210	-0.154	0.026

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD&~TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.588	0.553	0.493	0.302
0.38	0.627	0.592	0.533	0.342
1.00	0.691	0.656	0.598	0.410
3.00	0.899	0.866	0.810	0.630

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.220	0.241	0.277	0.394
0.38	0.175	0.197	0.234	0.353
1.00	0.099	0.122	0.161	0.286
3.00	-0.144	-0.118	-0.074	0.067

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

7/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	CD&SD&(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.479	0.457	0.420	0.302
0.01	0.530	0.507	0.470	0.349
0.38	0.616	0.593	0.554	0.428
1.00	0.893	0.867	0.823	0.683
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.179	0.200	0.237	0.353
0.01	0.127	0.149	0.187	0.306
0.38	0.041	0.064	0.103	0.227
1.00	-0.238	-0.211	-0.168	-0.026
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.512	0.490	0.454	0.337
0.01	0.551	0.529	0.492	0.373
0.38	0.615	0.592	0.554	0.432
1.00	0.823	0.798	0.757	0.624
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.056	-0.023	0.033	0.214
0.01	-0.079	-0.046	0.010	0.189
0.38	-0.118	-0.085	-0.030	0.148
1.00	-0.243	-0.211	-0.158	0.015
3.00				

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

8/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	CD&SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.710	0.677	0.622	0.443
0.01	0.734	0.701	0.646	0.467
0.38	0.773	0.740	0.685	0.509
1.00	0.899	0.868	0.814	0.642
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.142	0.164	0.201	0.319
0.01	0.104	0.126	0.163	0.284
0.38	0.039	0.062	0.101	0.224
1.00	-0.168	-0.143	-0.102	0.032
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.131	0.094	0.031	-0.172
0.01	0.159	0.122	0.059	-0.141
0.38	0.205	0.169	0.108	-0.089
1.00	0.354	0.320	0.263	0.079
3.00				

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

9/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.523	0.561	0.624	0.829
0.38	0.495	0.533	0.596	0.798
1.00	0.450	0.486	0.547	0.745
3.00	0.302	0.336	0.393	0.576

TC200G SERIES

DATA SHEET

FD3SP

FD3SP

10/10

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.730

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.790

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

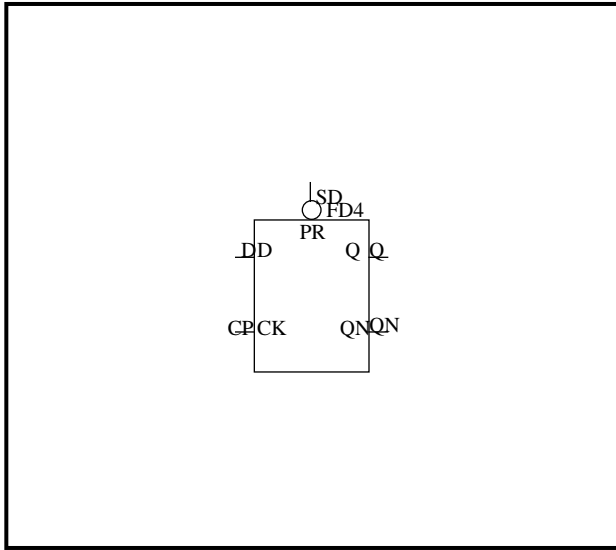
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.780

TC200G SERIES

DATA SHEET

FD4		FD4		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD4	D-TYPE FLIP FLOP with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
SD	D	CP	Qn+1	QNn+1
L	X	X*	H	L
H	L	Up	L	H
H	H	Up	H	L
H	X	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FD4 inst(Q,QN,D,CP,SD);
```

VHDL DESCRIPTION

```
inst:FD4
port map(Q,QN,D,CP,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
SD	2.23

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	46.1	45.9

TC200G SERIES

DATA SHEET

FD4

FD4

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0963	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.64	0.81	1.48
0.38	0.57	0.72	0.89	1.56
1.00	0.65	0.79	0.96	1.64
3.00	0.78	0.92	1.09	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0349	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.71	0.83	1.26
0.38	0.68	0.79	0.91	1.33
1.00	0.75	0.86	0.98	1.41
3.00	0.88	0.99	1.10	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0960	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.94	1.11	1.77
0.38	0.87	1.01	1.18	1.85
1.00	0.94	1.09	1.26	1.92
3.00	1.07	1.21	1.38	2.05

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0360	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.71	0.82	1.25
0.38	0.69	0.79	0.90	1.33
1.00	0.77	0.87	0.98	1.41
3.00	0.89	1.00	1.11	1.53

TC200G SERIES

DATA SHEET

FD4

FD4

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0963	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.68	0.85	1.51
0.38	0.57	0.71	0.88	1.54
1.00	0.65	0.79	0.95	1.62
3.00	0.82	0.96	1.12	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0360	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.56	1.01
0.38	0.33	0.47	0.59	1.03
1.00	0.41	0.54	0.67	1.11
3.00	0.58	0.72	0.85	1.29

TC200G SERIES

DATA SHEET

FD4

FD4

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.360	0.341	0.310	0.208
0.38	0.395	0.376	0.344	0.241
1.00	0.453	0.434	0.401	0.295
3.00	0.641	0.620	0.585	0.472

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.238	0.271	0.327	0.506
0.38	0.205	0.238	0.293	0.470
1.00	0.149	0.181	0.235	0.411
3.00	-0.032	-0.001	0.051	0.219

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.418	0.385	0.329	0.148
0.38	0.452	0.419	0.363	0.184
1.00	0.508	0.475	0.420	0.243
3.00	0.688	0.657	0.605	0.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.295	0.314	0.346	0.447
0.38	0.260	0.280	0.312	0.415
1.00	0.202	0.222	0.255	0.360
3.00	0.014	0.035	0.071	0.185

TC200G SERIES

DATA SHEET

FD4

FD4

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.161	0.127	0.072	-0.109
0.38	0.194	0.161	0.106	-0.072
1.00	0.250	0.218	0.163	-0.012
3.00	0.430	0.400	0.349	0.185

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.494	0.527	0.583	0.763
0.38	0.461	0.494	0.549	0.727
1.00	0.407	0.439	0.493	0.666
3.00	0.232	0.261	0.311	0.471

TC200G SERIES

DATA SHEET

FD4

FD4

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

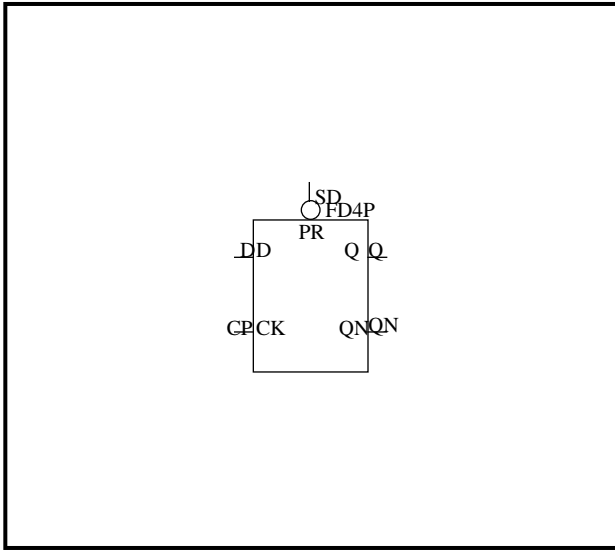
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD4P		FD4P		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD4P	D-TYPE FLIP FLOP with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
SD	D	CP	Qn+1	QNn+1
L	X	X*	H	L
H	L	Up	L	H
H	H	Up	H	L
H	X	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FD4P inst(Q,QN,D,CP,SD);
```

VHDL DESCRIPTION

```
inst:FD4P
port map(Q,QN,D,CP,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
SD	2.23

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	89.8	97.3

TC200G SERIES

DATA SHEET

FD4P

FD4P

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0494	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.57	0.66	1.01
0.38	0.57	0.65	0.74	1.09
1.00	0.65	0.73	0.82	1.16
3.00	0.78	0.86	0.95	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0181	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.69	0.76	1.00
0.38	0.69	0.76	0.84	1.08
1.00	0.77	0.84	0.91	1.15
3.00	0.89	0.96	1.03	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0445	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.94	1.03	1.35
0.38	0.94	1.02	1.11	1.43
1.00	1.02	1.09	1.18	1.50
3.00	1.14	1.22	1.30	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0179	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.73	0.80	1.03
0.38	0.74	0.81	0.88	1.10
1.00	0.82	0.89	0.95	1.18
3.00	0.95	1.01	1.08	1.31

TC200G SERIES

DATA SHEET

FD4P

FD4P

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0494	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.67	0.76	1.10
0.38	0.62	0.70	0.79	1.13
1.00	0.70	0.78	0.87	1.21
3.00	0.89	0.97	1.06	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0179	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.39	0.47	0.72
0.38	0.33	0.42	0.50	0.75
1.00	0.41	0.50	0.58	0.83
3.00	0.59	0.68	0.77	1.02

TC200G SERIES

DATA SHEET

FD4P

FD4P

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.360	0.341	0.310	0.208
0.38	0.395	0.376	0.344	0.241
1.00	0.453	0.434	0.401	0.295
3.00	0.641	0.620	0.585	0.472

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.238	0.271	0.327	0.506
0.38	0.205	0.238	0.293	0.470
1.00	0.149	0.181	0.235	0.411
3.00	-0.032	-0.001	0.051	0.219

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.418	0.385	0.329	0.148
0.38	0.452	0.419	0.363	0.184
1.00	0.508	0.475	0.420	0.243
3.00	0.688	0.657	0.605	0.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.295	0.314	0.346	0.447
0.38	0.260	0.280	0.312	0.415
1.00	0.202	0.222	0.255	0.360
3.00	0.014	0.035	0.071	0.185

TC200G SERIES

DATA SHEET

FD4P

FD4P

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.161	0.127	0.072	-0.109
0.38	0.194	0.161	0.106	-0.072
1.00	0.250	0.218	0.163	-0.012
3.00	0.430	0.400	0.349	0.185

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.494	0.527	0.583	0.763
0.38	0.461	0.494	0.549	0.727
1.00	0.407	0.439	0.493	0.666
3.00	0.232	0.261	0.311	0.471

TC200G SERIES

DATA SHEET

FD4P

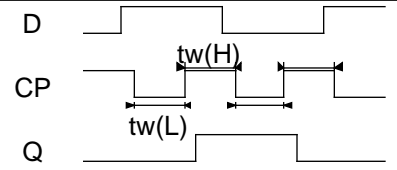
FD4P

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

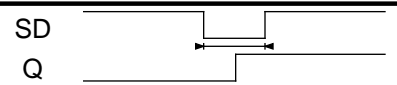
ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

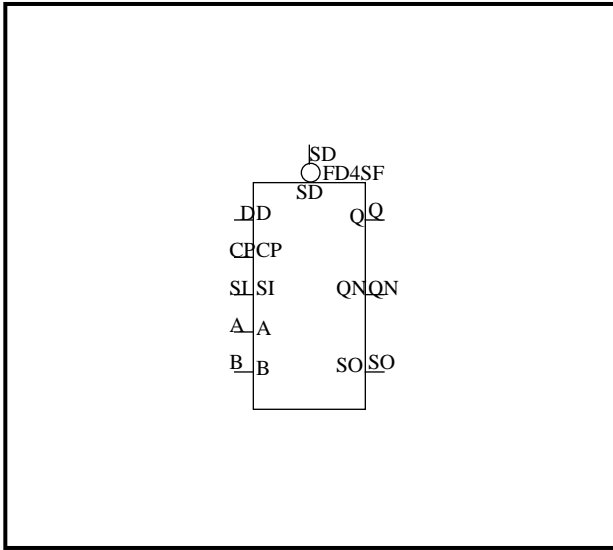
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD4SF		FD4SF		1/13
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD4SF	D-TYPE FLIP FLOP with Independent two-phase SCAN clock with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		12	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT		
SD	D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	X	L	X	X	X	SON
L	X	X	L	H	X*	H	L	H
H	X	L	H	H	L	L	H	L
H	X	H	H	H	L	H	L	H
H	L	X	L	H	Up	L	H	L
H	H	X	L	H	Up	H	L	H
H	X	X	L	H	Dn	Qn	QNn	Qn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FD4SF inst(Q,QN,SO,D,CP,SD,SI,A,B);
```

VHDL DESCRIPTION

```
inst:FD4SF
port map(Q,QN,SO,D,CP,SD,SI,
A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
SD	2.23
SI	0.92
A	2.10
B	2.02

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	46.0	44.0	43.8

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

2/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.64	0.81	1.49
0.38	0.53	0.67	0.84	1.52
1.00	0.59	0.73	0.90	1.59
3.00	0.76	0.90	1.07	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.75	0.86	1.28
0.38	0.68	0.78	0.89	1.32
1.00	0.74	0.84	0.95	1.37
3.00	0.87	0.97	1.08	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.57	0.74	1.42
0.38	0.52	0.66	0.83	1.51
1.00	0.64	0.78	0.95	1.64
3.00	0.76	0.90	1.07	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.55	0.66	1.08
0.38	0.54	0.63	0.74	1.17
1.00	0.64	0.74	0.85	1.27
3.00	0.83	0.93	1.04	1.46

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

3/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0964	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.61	0.78	1.45
0.38	0.56	0.70	0.87	1.54
1.00	0.69	0.83	1.00	1.67
3.00	0.81	0.95	1.12	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0351	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.61	0.72	1.15
0.38	0.58	0.69	0.81	1.23
1.00	0.69	0.80	0.91	1.34
3.00	0.87	0.98	1.10	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0959	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.70	0.84	1.01	1.68
0.38	0.78	0.92	1.09	1.76
1.00	0.88	1.03	1.20	1.87
3.00	1.07	1.22	1.39	2.05

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0392	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.70	0.82	1.27
0.38	0.68	0.79	0.91	1.36
1.00	0.81	0.92	1.04	1.49
3.00	0.93	1.04	1.16	1.61

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

4/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.44	0.61	1.28
0.38	0.40	0.54	0.70	1.37
1.00	0.50	0.64	0.81	1.48
3.00	0.61	0.75	0.92	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.38	0.49	0.91
0.38	0.36	0.45	0.56	0.98
1.00	0.42	0.52	0.63	1.05
3.00	0.52	0.62	0.74	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0964	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.64	0.81	1.48
0.38	0.58	0.72	0.89	1.56
1.00	0.65	0.80	0.97	1.64
3.00	0.78	0.93	1.10	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0351	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.71	0.83	1.25
0.38	0.68	0.79	0.91	1.33
1.00	0.76	0.86	0.98	1.41
3.00	0.88	0.99	1.10	1.53

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

5/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0959	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.96	1.14	1.33	2.03
0.38	1.04	1.21	1.41	2.11
1.00	1.11	1.29	1.48	2.18
3.00	1.23	1.41	1.60	2.30

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0392	0.19

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.90	1.05	1.55
0.38	0.84	0.98	1.13	1.63
1.00	0.91	1.06	1.21	1.71
3.00	1.04	1.19	1.33	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.06	1.19	1.37	2.05
0.38	1.13	1.27	1.44	2.13
1.00	1.21	1.35	1.52	2.20
3.00	1.34	1.48	1.65	2.33

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.29	1.39	1.50	1.92
0.38	1.37	1.47	1.58	2.00
1.00	1.44	1.54	1.65	2.07
3.00	1.56	1.66	1.77	2.19

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

6/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0964	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.85	1.00	1.16	1.83
0.38	0.88	1.02	1.19	1.86
1.00	0.95	1.10	1.26	1.93
3.00	1.17	1.31	1.48	2.14

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0392	0.19

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.60	0.76	1.27
0.38	0.46	0.63	0.79	1.30
1.00	0.54	0.71	0.86	1.38
3.00	0.74	0.92	1.08	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.93	1.10	1.78
0.38	0.82	0.96	1.13	1.81
1.00	0.89	1.03	1.20	1.88
3.00	1.10	1.24	1.41	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0964	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.58	0.75	1.42
0.38	0.48	0.62	0.79	1.46
1.00	0.55	0.69	0.86	1.53
3.00	0.68	0.83	1.00	1.67

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

7/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0351	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.59	0.70	1.13
0.38	0.48	0.59	0.71	1.13
1.00	0.53	0.64	0.76	1.18
3.00	0.66	0.79	0.91	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0959	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.82	0.99	1.66
0.38	0.68	0.83	1.00	1.66
1.00	0.73	0.88	1.05	1.71
3.00	0.89	1.03	1.20	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0392	0.19

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.67	0.79	1.24
0.38	0.60	0.71	0.83	1.28
1.00	0.67	0.78	0.90	1.35
3.00	0.81	0.92	1.04	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.49	0.66	1.35
0.38	0.39	0.53	0.70	1.38
1.00	0.44	0.58	0.75	1.43
3.00	0.52	0.66	0.83	1.51

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

8/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.47	0.58	1.00
0.38	0.38	0.48	0.58	1.01
1.00	0.43	0.53	0.64	1.06
3.00	0.55	0.65	0.76	1.19

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

9/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.360	0.341	0.310	0.208
0.38	0.395	0.376	0.344	0.241
1.00	0.453	0.434	0.401	0.295
3.00	0.641	0.620	0.585	0.472

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.238	0.271	0.327	0.506
0.38	0.205	0.238	0.293	0.470
1.00	0.149	0.181	0.235	0.411
3.00	-0.032	-0.001	0.051	0.219

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.418	0.385	0.329	0.148
0.38	0.452	0.419	0.363	0.184
1.00	0.508	0.475	0.420	0.243
3.00	0.688	0.657	0.605	0.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.295	0.314	0.346	0.447
0.38	0.260	0.280	0.312	0.415
1.00	0.202	0.222	0.255	0.360
3.00	0.014	0.035	0.071	0.185

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

10/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	SD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.399	0.407	0.420	0.464
0.38	0.432	0.446	0.469	0.544
1.00	0.488	0.511	0.551	0.679
3.00	0.667	0.722	0.815	1.114

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.165	0.124	0.054	-0.171
0.38	0.140	0.094	0.018	-0.229
1.00	0.097	0.045	-0.042	-0.324
3.00	-0.041	-0.114	-0.237	-0.634

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	SD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.502	0.543	0.613	0.839
0.38	0.530	0.575	0.651	0.895
1.00	0.578	0.629	0.714	0.988
3.00	0.732	0.801	0.916	1.290

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.258	0.250	0.236	0.193
0.38	0.225	0.211	0.187	0.112
1.00	0.169	0.145	0.105	-0.023
3.00	-0.012	-0.067	-0.159	-0.458

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

11/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.161	0.127	0.072	-0.109
0.38	0.193	0.160	0.105	-0.073
1.00	0.248	0.216	0.162	-0.013
3.00	0.425	0.394	0.343	0.179

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.494	0.527	0.583	0.763
0.38	0.461	0.494	0.550	0.728
1.00	0.407	0.439	0.494	0.669
3.00	0.232	0.262	0.313	0.477

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

12/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.890

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	SD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD4SF

FD4SF

13/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	SD

ITEM	WAVE_FORM
POSLIMIT	

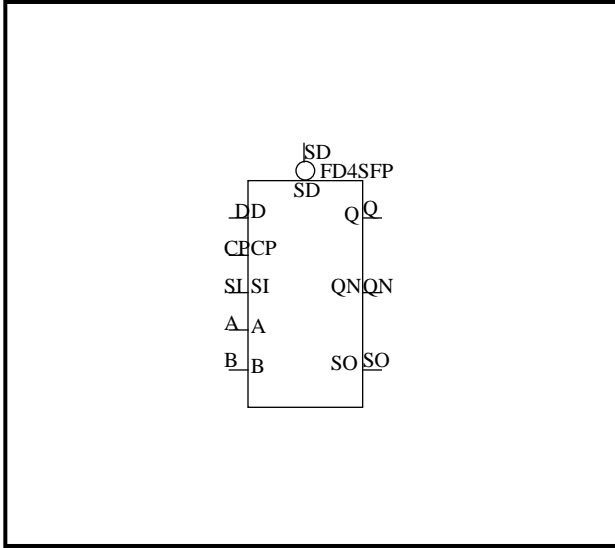
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD4SFP		FD4SFP		1/13
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD4SFP	D-TYPE FLIP FLOP with Independent two-phase SCAN clock with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		13	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT		
SD	D	SI	A	B	CP	Qn+1	QNn+1	SON+1
X	X	X	X	L	X	X	X	SON
L	X	X	L	H	X*	H	L	H
H	X	L	H	H	L	L	H	L
H	X	H	H	H	L	H	L	H
H	L	X	L	H	Up	L	H	L
H	H	X	L	H	Up	H	L	H
H	X	X	L	H	Dn	Qn	QNn	Qn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FD4SFP inst(Q,QN,SO,D,CP,SD,SI,A,
            B);
```

VHDL DESCRIPTION

```
inst:FD4SFP
port map(Q,QN,SO,D,CP,SD,SI,
         A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN,SO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,CP	0.99
SD	2.23
SI	0.92
A	2.08
B	2.03

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN	SO
DRIVE	82.5	87.9	43.8

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

2/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.63	0.80	1.49
0.38	0.52	0.66	0.84	1.52
1.00	0.59	0.73	0.90	1.59
3.00	0.76	0.90	1.07	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&-A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.75	0.86	1.28
0.38	0.68	0.78	0.89	1.31
1.00	0.74	0.84	0.95	1.37
3.00	0.87	0.97	1.08	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.57	0.74	1.42
0.38	0.52	0.66	0.83	1.51
1.00	0.64	0.78	0.95	1.64
3.00	0.76	0.90	1.07	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->SO	B&A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.55	0.66	1.08
0.38	0.54	0.63	0.74	1.17
1.00	0.64	0.74	0.85	1.27
3.00	0.83	0.93	1.04	1.46

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

3/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0548	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.56	0.66	1.03
0.38	0.56	0.65	0.74	1.12
1.00	0.70	0.78	0.88	1.25
3.00	0.82	0.90	1.00	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0188	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.65	0.90
0.38	0.59	0.66	0.73	0.98
1.00	0.69	0.77	0.84	1.09
3.00	0.88	0.95	1.03	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0482	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.85	0.94	1.28
0.38	0.85	0.93	1.02	1.36
1.00	0.96	1.04	1.13	1.47
3.00	1.14	1.22	1.31	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
A->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0198	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.73	0.80	1.04
0.38	0.75	0.82	0.89	1.13
1.00	0.89	0.96	1.03	1.26
3.00	1.01	1.08	1.15	1.38

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

4/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.44	0.61	1.28
0.38	0.40	0.54	0.70	1.37
1.00	0.50	0.64	0.81	1.48
3.00	0.61	0.75	0.92	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
B->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.38	0.49	0.91
0.38	0.36	0.45	0.56	0.98
1.00	0.42	0.52	0.63	1.05
3.00	0.52	0.62	0.74	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0548	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.58	0.67	1.05
0.38	0.57	0.66	0.75	1.13
1.00	0.65	0.74	0.83	1.20
3.00	0.78	0.87	0.96	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0188	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.68	0.76	1.00
0.38	0.69	0.76	0.83	1.08
1.00	0.76	0.84	0.91	1.15
3.00	0.88	0.96	1.03	1.28

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

5/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0482	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.03	1.12	1.23	1.60
0.38	1.10	1.20	1.31	1.68
1.00	1.18	1.27	1.38	1.76
3.00	1.30	1.40	1.50	1.88

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0198	0.24

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.92	1.01	1.29
0.38	0.90	1.00	1.09	1.37
1.00	0.98	1.07	1.17	1.45
3.00	1.10	1.20	1.29	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.18	1.32	1.49	2.17
0.38	1.26	1.40	1.57	2.25
1.00	1.33	1.47	1.64	2.33
3.00	1.46	1.60	1.77	2.45

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.41	1.51	1.62	2.04
0.38	1.49	1.59	1.70	2.12
1.00	1.56	1.66	1.77	2.19
3.00	1.68	1.78	1.89	2.31

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

6/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0548	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.01	1.10	1.47
0.38	0.95	1.04	1.13	1.51
1.00	1.02	1.10	1.20	1.57
3.00	1.24	1.33	1.42	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0198	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.52	0.63	0.93
0.38	0.44	0.55	0.65	0.95
1.00	0.52	0.63	0.73	1.03
3.00	0.73	0.85	0.95	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.98	1.15	1.83
0.38	0.87	1.01	1.18	1.86
1.00	0.94	1.08	1.25	1.93
3.00	1.15	1.29	1.47	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0548	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.53	0.62	1.00
0.38	0.48	0.57	0.66	1.04
1.00	0.56	0.65	0.74	1.11
3.00	0.71	0.80	0.89	1.27

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

7/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0188	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.56	0.63	0.88
0.38	0.49	0.56	0.64	0.88
1.00	0.54	0.61	0.68	0.93
3.00	0.68	0.76	0.84	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0482	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.83	0.92	1.26
0.38	0.75	0.83	0.92	1.26
1.00	0.80	0.88	0.97	1.31
3.00	0.98	1.06	1.15	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0198	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.70	0.77	1.01
0.38	0.67	0.74	0.81	1.05
1.00	0.75	0.82	0.89	1.13
3.00	0.91	0.98	1.05	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.1006	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.49	0.66	1.35
0.38	0.39	0.53	0.70	1.38
1.00	0.44	0.58	0.75	1.43
3.00	0.52	0.66	0.83	1.51

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

8/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SI->SO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
SO	0.0363	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.47	0.58	1.00
0.38	0.38	0.48	0.59	1.01
1.00	0.43	0.53	0.64	1.06
3.00	0.55	0.65	0.76	1.19

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

9/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.360	0.341	0.310	0.208
0.38	0.395	0.376	0.344	0.241
1.00	0.453	0.434	0.401	0.295
3.00	0.641	0.620	0.585	0.472

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.238	0.271	0.327	0.506
0.38	0.205	0.238	0.293	0.470
1.00	0.149	0.181	0.235	0.411
3.00	-0.032	-0.001	0.051	0.219

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.418	0.385	0.329	0.148
0.38	0.452	0.419	0.363	0.184
1.00	0.508	0.475	0.420	0.243
3.00	0.688	0.657	0.605	0.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.295	0.314	0.346	0.447
0.38	0.260	0.280	0.312	0.415
1.00	0.202	0.222	0.255	0.360
3.00	0.014	0.035	0.071	0.185

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

10/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	SD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.399	0.407	0.420	0.464
0.38	0.432	0.446	0.469	0.544
1.00	0.488	0.511	0.551	0.679
3.00	0.667	0.722	0.815	1.114

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.165	0.124	0.054	-0.171
0.38	0.140	0.094	0.018	-0.229
1.00	0.097	0.045	-0.042	-0.324
3.00	-0.041	-0.114	-0.237	-0.634

TIMING CONDITION

DATA	CLOCK	CONDITION
SI	A	SD&-CP

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.502	0.543	0.613	0.839
0.38	0.530	0.575	0.651	0.895
1.00	0.578	0.629	0.714	0.988
3.00	0.732	0.801	0.916	1.290

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.258	0.250	0.236	0.193
0.38	0.225	0.211	0.187	0.112
1.00	0.169	0.145	0.105	-0.023
3.00	-0.012	-0.067	-0.159	-0.458

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

11/13

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.161	0.127	0.072	-0.109
0.38	0.193	0.160	0.105	-0.073
1.00	0.248	0.216	0.162	-0.013
3.00	0.425	0.394	0.343	0.179

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D&~A

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.494	0.527	0.583	0.763
0.38	0.461	0.494	0.550	0.728
1.00	0.407	0.439	0.494	0.669
3.00	0.232	0.262	0.313	0.477

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

12/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.890

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
B	SD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD4SFP

FD4SFP

13/13

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
A	SD

ITEM	WAVE_FORM
POSLIMIT	<p>The diagram shows three signals: SI, A, and Q. SI is a square wave. A is a square wave with a pulse width labeled $t_w(H)$. Q is a square wave that follows A with a delay.</p>

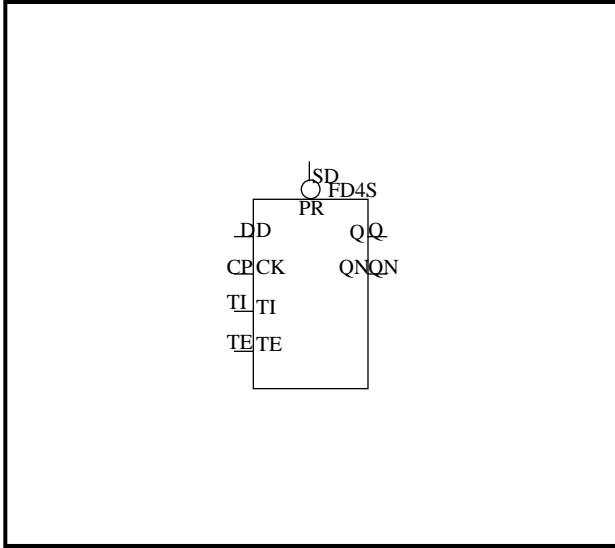
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

FD4S		FD4S		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD4S	D-TYPE FLIP FLOP with common single-phase SCAN clock with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT	
SD	D	TI	TE	CP	Qn+1	QNn+1
L	X	X	X	X*	H	L
H	L	X	L	Up	L	H
H	H	X	L	Up	H	L
H	X	L	H	Up	L	H
H	X	H	H	Up	H	L
H	X	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FD4S inst(Q,QN,D,CP,SD,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD4S
port map(Q,QN,D,CP,SD,TI,TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D, TI	0.99
CP	0.98
SD	2.23
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	46.1	46.0

TC200G SERIES

DATA SHEET

FD4S

FD4S

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0964	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.65	0.83	1.50
0.38	0.59	0.73	0.90	1.57
1.00	0.67	0.82	0.99	1.66
3.00	0.83	0.97	1.14	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0349	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.71	0.83	1.25
0.38	0.68	0.79	0.91	1.33
1.00	0.76	0.87	0.99	1.41
3.00	0.91	1.02	1.14	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0960	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.93	1.10	1.77
0.38	0.87	1.01	1.18	1.85
1.00	0.95	1.09	1.26	1.93
3.00	1.10	1.24	1.41	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0360	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.73	0.84	1.27
0.38	0.71	0.81	0.92	1.35
1.00	0.79	0.89	1.00	1.43
3.00	0.94	1.05	1.16	1.59

TC200G SERIES

DATA SHEET

FD4S

FD4S

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0964	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.68	0.85	1.51
0.38	0.57	0.71	0.88	1.54
1.00	0.64	0.79	0.95	1.62
3.00	0.82	0.96	1.12	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0360	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.56	1.01
0.38	0.33	0.47	0.59	1.03
1.00	0.41	0.54	0.67	1.11
3.00	0.58	0.72	0.85	1.29

TC200G SERIES

DATA SHEET

FD4S

FD4S

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.425	0.405	0.369	0.256
0.38	0.470	0.448	0.412	0.296
1.00	0.544	0.521	0.484	0.362
3.00	0.782	0.757	0.714	0.577

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.062	0.097	0.157	0.348
0.38	0.023	0.058	0.117	0.308
1.00	-0.041	-0.006	0.052	0.240
3.00	-0.249	-0.216	-0.160	0.020

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.595	0.559	0.499	0.307
0.38	0.633	0.598	0.539	0.347
1.00	0.698	0.663	0.604	0.416
3.00	0.905	0.872	0.816	0.635

HOLD (ns)				
CLOCK SLEW (ns) DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.231	0.252	0.287	0.401
0.38	0.186	0.208	0.244	0.361
1.00	0.113	0.135	0.173	0.295
3.00	-0.126	-0.100	-0.058	0.079

TC200G SERIES

DATA SHEET

FD4S

FD4S

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	SD&(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.467	0.446	0.411	0.297
0.01	0.518	0.496	0.460	0.343
0.38	0.602	0.580	0.542	0.421
1.00	0.876	0.850	0.808	0.671
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.190	0.211	0.246	0.360
0.01	0.139	0.161	0.197	0.314
0.38	0.054	0.077	0.114	0.236
1.00	-0.220	-0.195	-0.152	-0.015
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.501	0.479	0.443	0.326
0.01	0.538	0.516	0.480	0.362
0.38	0.602	0.579	0.542	0.421
1.00	0.806	0.782	0.742	0.613
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.073	-0.040	0.016	0.195
0.01	-0.096	-0.063	-0.008	0.171
0.38	-0.135	-0.102	-0.048	0.130
1.00	-0.261	-0.229	-0.176	-0.004
3.00				

TC200G SERIES

DATA SHEET

FD4S

FD4S

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.723	0.689	0.632	0.447
0.01	0.723	0.689	0.632	0.447
0.38	0.746	0.712	0.655	0.472
1.00	0.785	0.752	0.695	0.513
3.00	0.911	0.879	0.824	0.647

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.154	0.176	0.213	0.331
0.01	0.154	0.176	0.213	0.331
0.38	0.116	0.139	0.176	0.296
1.00	0.054	0.076	0.114	0.236
3.00	-0.149	-0.126	-0.085	0.044

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.156	0.119	0.057	-0.143
0.01	0.156	0.119	0.057	-0.143
0.38	0.189	0.152	0.091	-0.107
1.00	0.243	0.207	0.147	-0.048
3.00	0.418	0.384	0.327	0.144

TC200G SERIES

DATA SHEET

FD4S

FD4S

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.500	0.537	0.600	0.800
0.01	0.468	0.504	0.566	0.764
0.38	0.413	0.449	0.510	0.705
1.00	0.237	0.271	0.328	0.513
3.00				

TC200G SERIES

DATA SHEET

FD4S

FD4S

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.810

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

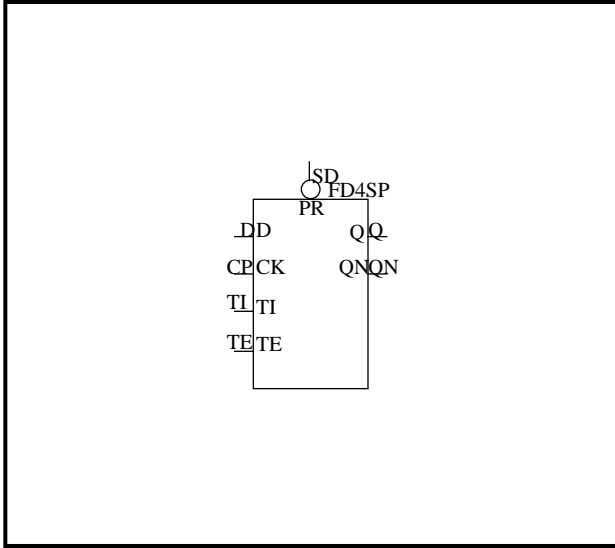
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FD4SP		FD4SP		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FD4SP	D-TYPE FLIP FLOP with common single-phase SCAN clock with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT	
SD	D	TI	TE	CP	Qn+1	QNn+1
L	X	X	X	X*	H	L
H	L	X	L	Up	L	H
H	H	X	L	Up	H	L
H	X	L	H	Up	L	H
H	X	H	H	Up	H	L
H	X	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FD4SP inst(Q,QN,D,CP,SD,TI,TE);
```

VHDL DESCRIPTION

```
inst:FD4SP
port map(Q,QN,D,CP,SD,TI,TE);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D, TI	0.99
CP	0.98
SD	2.23
TE	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	89.8	97.3

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0494	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.59	0.68	1.02
0.38	0.59	0.67	0.76	1.10
1.00	0.67	0.75	0.84	1.18
3.00	0.83	0.91	1.00	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0181	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.68	0.75	1.00
0.38	0.69	0.76	0.83	1.08
1.00	0.77	0.84	0.91	1.15
3.00	0.92	0.99	1.06	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0445	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.94	1.02	1.35
0.38	0.94	1.02	1.10	1.43
1.00	1.02	1.10	1.18	1.51
3.00	1.17	1.25	1.33	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0179	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.75	0.81	1.04
0.38	0.76	0.83	0.89	1.12
1.00	0.84	0.91	0.97	1.20
3.00	1.00	1.07	1.13	1.36

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0494	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.67	0.76	1.10
0.38	0.62	0.70	0.79	1.13
1.00	0.70	0.78	0.87	1.21
3.00	0.89	0.97	1.06	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0179	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.39	0.47	0.72
0.38	0.33	0.42	0.50	0.75
1.00	0.41	0.50	0.58	0.83
3.00	0.58	0.68	0.77	1.02

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.425	0.405	0.369	0.256
0.38	0.470	0.448	0.412	0.296
1.00	0.544	0.521	0.484	0.362
3.00	0.782	0.757	0.714	0.577

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.062	0.097	0.157	0.348
0.38	0.023	0.058	0.117	0.308
1.00	-0.041	-0.006	0.052	0.240
3.00	-0.249	-0.216	-0.160	0.020

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD&-TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.595	0.559	0.499	0.307
0.38	0.633	0.598	0.539	0.347
1.00	0.698	0.663	0.604	0.416
3.00	0.905	0.872	0.816	0.635

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.231	0.252	0.287	0.401
0.38	0.186	0.208	0.244	0.361
1.00	0.113	0.135	0.173	0.295
3.00	-0.126	-0.100	-0.058	0.079

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TE	CP	SD&(~D&TI D&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.467	0.446	0.411	0.297
0.01	0.518	0.496	0.460	0.343
0.38	0.602	0.580	0.542	0.421
1.00	0.876	0.850	0.808	0.671
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.190	0.211	0.246	0.360
0.01	0.139	0.161	0.197	0.314
0.38	0.054	0.077	0.114	0.236
1.00	-0.220	-0.195	-0.152	-0.015
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.501	0.479	0.443	0.326
0.01	0.538	0.516	0.480	0.362
0.38	0.602	0.579	0.542	0.421
1.00	0.806	0.782	0.742	0.613
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	-0.073	-0.040	0.016	0.195
0.01	-0.096	-0.063	-0.008	0.171
0.38	-0.135	-0.102	-0.048	0.130
1.00	-0.261	-0.229	-0.176	-0.004
3.00				

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
TI	CP	SD&TE

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.723	0.689	0.632	0.447
0.38	0.746	0.712	0.655	0.472
1.00	0.785	0.752	0.695	0.513
3.00	0.911	0.879	0.824	0.647

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.154	0.176	0.213	0.331
0.38	0.116	0.139	0.176	0.296
1.00	0.054	0.076	0.114	0.236
3.00	-0.149	-0.126	-0.085	0.044

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.156	0.119	0.057	-0.143
0.38	0.189	0.152	0.091	-0.107
1.00	0.243	0.207	0.147	-0.048
3.00	0.418	0.384	0.327	0.144

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	(~TE&~D TE&~TI)

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.500	0.537	0.600	0.800
0.38	0.468	0.504	0.566	0.764
1.00	0.413	0.449	0.510	0.705
3.00	0.237	0.271	0.328	0.513

TC200G SERIES

DATA SHEET

FD4SP

FD4SP

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.810

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

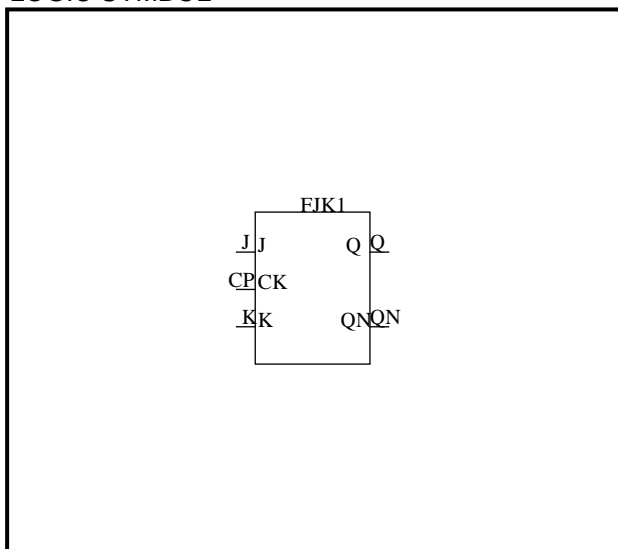
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

TC200G SERIES

DATA SHEET

FJK1		FJK1		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FJK1	J-K FLIP FLOP	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
J	K	CP	Qn+1	QNn+1
L	L	Up	Qn	QNn
L	H	Up	L	H
H	L	Up	H	L
H	H	Up	QNn	Qn
X	X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
FJK1 inst(Q,QN,J,K,CP);
```

VHDL DESCRIPTION

```
inst:FJK1
port map(Q,QN,J,K,CP);
```

ELECTRO MIGRATION

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
J	0.98
K	1.00
CP	1.01

OUTPUT DRIVE

PIN NAME	Q (LU)	QN (LU)
DRIVE	42.2	50.0

TC200G SERIES

DATA SHEET

FJK1

FJK1

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0982	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.66	0.84	1.54
0.38	0.57	0.74	0.92	1.62
1.00	0.65	0.81	1.00	1.70
3.00	0.78	0.95	1.13	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0417	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.74	1.27
0.38	0.52	0.67	0.82	1.35
1.00	0.60	0.75	0.90	1.43
3.00	0.74	0.90	1.05	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0858	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.72	0.88	1.49
0.38	0.66	0.80	0.95	1.57
1.00	0.74	0.88	1.04	1.65
3.00	0.89	1.02	1.18	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0345	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.75	0.87	1.29
0.38	0.71	0.83	0.94	1.37
1.00	0.79	0.90	1.02	1.45
3.00	0.92	1.04	1.16	1.58

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TC200G SERIES

DATA SHEET

FJK1

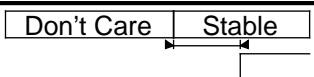
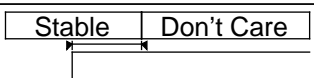
FJK1

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
J	CP	---

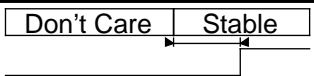
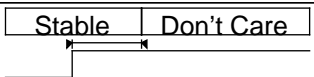
ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.549	0.514	0.456	0.267
0.38	0.585	0.550	0.492	0.304
1.00	0.645	0.611	0.553	0.366
3.00	0.840	0.806	0.749	0.565

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.109	0.143	0.202	0.390
0.38	0.072	0.107	0.165	0.353
1.00	0.011	0.046	0.104	0.290
3.00	-0.185	-0.151	-0.094	0.090

TIMING CONDITION

DATA	CLOCK	CONDITION
K	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.483	0.465	0.435	0.337
0.38	0.537	0.519	0.488	0.387
1.00	0.629	0.609	0.576	0.471
3.00	0.923	0.900	0.863	0.741

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.171	0.190	0.220	0.319
0.38	0.117	0.136	0.168	0.269
1.00	0.026	0.046	0.079	0.185
3.00	-0.267	-0.244	-0.207	-0.085

TC200G SERIES

DATA SHEET

FJK1

FJK1

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	<p>CP</p>
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

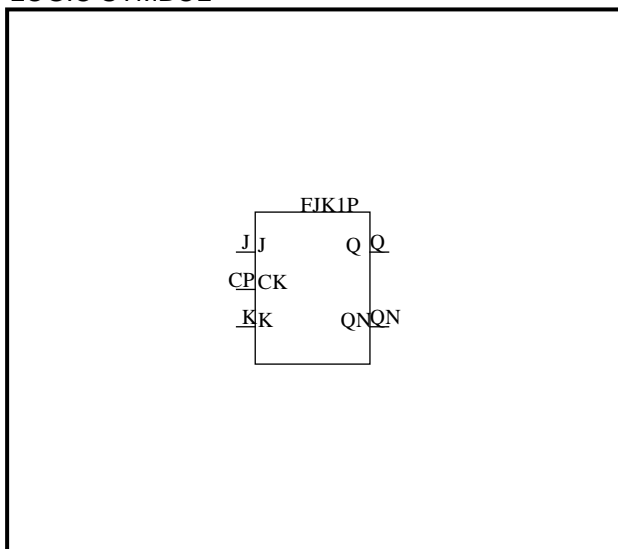
Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK1P		FJK1P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FJK1P	J-K FLIP FLOP	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
J	K	CP	Qn+1	QNn+1
L	L	Up	Qn	QNn
L	H	Up	L	H
H	L	Up	H	L
H	H	Up	QNn	Qn
X	X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
FJK1P inst(Q,QN,J,K,CP);
```

VHDL DESCRIPTION

```
inst:FJK1P
port map(Q,QN,J,K,CP);
```

ELECTRO MIGRATION

PIN NAME	Q	QN (LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

PIN NAME	LOAD (LU)
J	0.98
K	1.00
CP	1.01

OUTPUT DRIVE

PIN NAME	Q (LU)	QN (LU)
DRIVE	75.2	96.9

TC200G SERIES

DATA SHEET

FJK1P

FJK1P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.68	1.06
0.38	0.56	0.65	0.75	1.14
1.00	0.64	0.73	0.83	1.21
3.00	0.77	0.87	0.97	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0253	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.53	0.63	0.96
0.38	0.51	0.61	0.71	1.04
1.00	0.59	0.69	0.79	1.12
3.00	0.74	0.84	0.94	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0443	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.71	0.80	1.11
0.38	0.72	0.79	0.87	1.19
1.00	0.80	0.87	0.96	1.27
3.00	0.95	1.02	1.10	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0181	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.76	0.84	1.08
0.38	0.77	0.84	0.91	1.15
1.00	0.85	0.92	0.99	1.23
3.00	0.98	1.05	1.13	1.37

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK1P

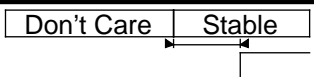
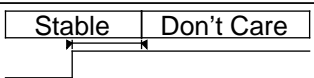
FJK1P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
J	CP	---

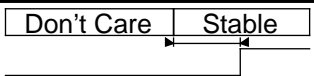
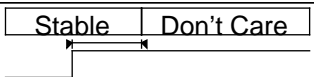
ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.549	0.514	0.456	0.267
0.38	0.585	0.550	0.492	0.304
1.00	0.645	0.611	0.553	0.366
3.00	0.840	0.806	0.749	0.565

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.109	0.143	0.202	0.390
0.38	0.072	0.107	0.165	0.353
1.00	0.011	0.046	0.104	0.290
3.00	-0.185	-0.151	-0.094	0.090

TIMING CONDITION

DATA	CLOCK	CONDITION
K	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.483	0.465	0.435	0.337
0.38	0.537	0.519	0.488	0.387
1.00	0.629	0.609	0.576	0.471
3.00	0.923	0.900	0.863	0.741

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.171	0.190	0.220	0.319
0.38	0.117	0.136	0.168	0.269
1.00	0.026	0.046	0.079	0.185
3.00	-0.267	-0.244	-0.207	-0.085

TC200G SERIES

DATA SHEET

FJK1P

FJK1P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	---

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.770

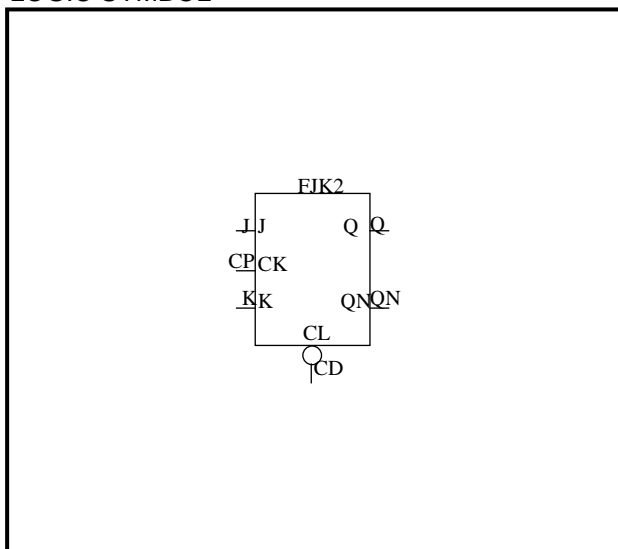
Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK2		FJK2		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FJK2	J-K FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		10	0	

LOGIC SYMBOL



TRUTH TABLE

CD	INPUT			OUTPUT	
	J	K	CP	Qn+1	QNn+1
L	X	X	X*	L	H
H	L	L	Up	Qn	QNn
H	L	H	Up	L	H
H	H	L	Up	H	L
H	H	H	Up	QNn	Qn
H	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FJK2 inst(Q,QN,J,K,CP,CD);
```

VHDL DESCRIPTION

```
inst:FJK2
port map(Q,QN,J,K,CP,CD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
J	0.98
K	0.99
CP	1.02
CD	2.26

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	44.8	42.5

TC200G SERIES

DATA SHEET

FJK2

FJK2

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0399	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.64	0.79	1.29
0.38	0.49	0.65	0.80	1.30
1.00	0.55	0.71	0.86	1.36
3.00	0.74	0.91	1.06	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1001	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.78	0.95	1.62
0.38	0.65	0.79	0.96	1.64
1.00	0.71	0.85	1.02	1.70
3.00	0.91	1.05	1.22	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0924	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.69	0.86	1.52
0.38	0.61	0.76	0.94	1.60
1.00	0.69	0.84	1.02	1.68
3.00	0.82	0.98	1.16	1.82

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0399	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.57	0.72	1.22
0.38	0.51	0.65	0.80	1.30
1.00	0.59	0.73	0.88	1.38
3.00	0.73	0.88	1.03	1.53

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK2

FJK2

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1001	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.71	0.88	1.57
0.38	0.65	0.79	0.96	1.64
1.00	0.73	0.87	1.04	1.72
3.00	0.88	1.02	1.19	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0420	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.81	0.94	1.44
0.38	0.76	0.88	1.02	1.51
1.00	0.84	0.96	1.10	1.59
3.00	0.98	1.10	1.23	1.73

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK2

FJK2

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.156	0.121	0.063	-0.125
0.38	0.192	0.157	0.099	-0.087
1.00	0.251	0.217	0.160	-0.024
3.00	0.442	0.410	0.355	0.179

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.500	0.535	0.594	0.782
0.38	0.465	0.499	0.557	0.744
1.00	0.405	0.439	0.497	0.681
3.00	0.213	0.246	0.301	0.477

TC200G SERIES

DATA SHEET

FJK2

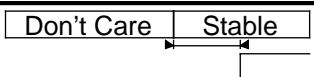
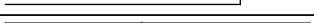
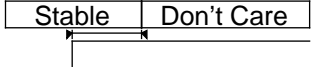

FJK2

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
J	CP	CD

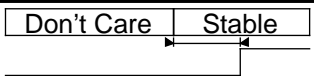

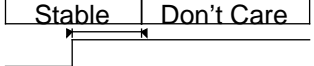

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP 
HOLD	POSEDGE	DCARE	J,K  CP 

SETUP (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.619	0.591	0.543	0.389	
0.38	0.655	0.627	0.579	0.425	
1.00	0.716	0.687	0.640	0.486	
3.00	0.911	0.883	0.836	0.683	

HOLD (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.038	0.066	0.113	0.265	
0.38	0.002	0.030	0.077	0.229	
1.00	-0.059	-0.031	0.016	0.168	
3.00	-0.255	-0.227	-0.179	-0.026	

TIMING CONDITION

DATA	CLOCK	CONDITION
K	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP 
HOLD	POSEDGE	DCARE	J,K  CP 

SETUP (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.525	0.496	0.449	0.297	
0.38	0.583	0.555	0.507	0.356	
1.00	0.680	0.652	0.605	0.454	
3.00	0.993	0.966	0.919	0.771	

HOLD (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.131	0.159	0.207	0.360	
0.38	0.073	0.101	0.149	0.302	
1.00	-0.024	0.004	0.051	0.203	
3.00	-0.338	-0.310	-0.264	-0.115	

TC200G SERIES

DATA SHEET

FJK2

FJK2

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.840

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.790

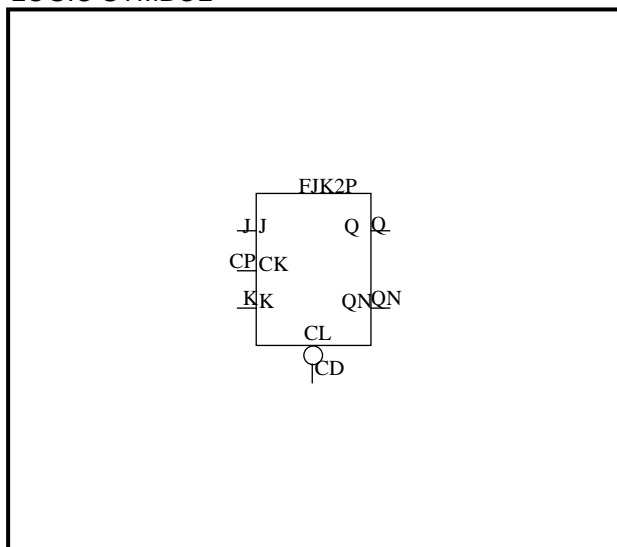
Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK2P		FJK2P		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FJK2P	J-K FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

CD	INPUT			OUTPUT	
	J	K	CP	Qn+1	QNn+1
L	X	X	X*	L	H
H	L	L	Up	Qn	QNn
H	L	H	Up	L	H
H	H	L	Up	H	L
H	H	H	Up	QNn	Qn
H	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FJK2P inst(Q,QN,J,K,CP,CD);
```

VHDL DESCRIPTION

```
inst:FJK2P
port map(Q,QN,J,K,CP,CD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
J	0.98
K	0.99
CP	1.02
CD	2.31

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	74.5	77.4

TC200G SERIES

DATA SHEET

FJK2P

FJK2P

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0256	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.59	0.70	1.04
0.38	0.50	0.61	0.71	1.05
1.00	0.56	0.67	0.77	1.11
3.00	0.75	0.87	0.98	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0546	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.72	0.80	0.90	1.27
0.38	0.73	0.81	0.91	1.28
1.00	0.79	0.87	0.97	1.34
3.00	1.00	1.08	1.18	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0539	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.65	0.76	1.15
0.38	0.63	0.72	0.83	1.23
1.00	0.71	0.80	0.91	1.30
3.00	0.85	0.94	1.05	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0256	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.54	0.64	0.97
0.38	0.52	0.62	0.72	1.05
1.00	0.60	0.70	0.80	1.13
3.00	0.75	0.85	0.95	1.28

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK2P

FJK2P

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0546	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.73	0.83	1.20
0.38	0.73	0.81	0.91	1.28
1.00	0.81	0.89	0.99	1.36
3.00	0.96	1.04	1.14	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0235	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.85	0.94	1.23
0.38	0.85	0.93	1.02	1.31
1.00	0.93	1.01	1.09	1.39
3.00	1.07	1.15	1.23	1.53

TC200G SERIES

DATA SHEET

FJK2P

FJK2P

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.156	0.121	0.063	-0.125
0.38	0.192	0.157	0.099	-0.087
1.00	0.251	0.217	0.160	-0.024
3.00	0.442	0.410	0.355	0.179

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.500	0.535	0.594	0.782
0.38	0.465	0.499	0.557	0.744
1.00	0.405	0.439	0.497	0.681
3.00	0.213	0.246	0.301	0.477

TC200G SERIES

DATA SHEET

FJK2P

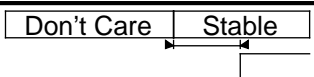
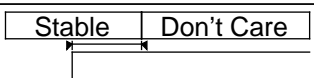
FJK2P

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
J	CP	CD

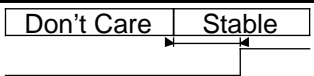
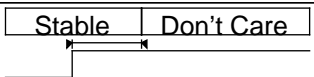
ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.619	0.591	0.543	0.389	
0.38	0.655	0.627	0.579	0.425	
1.00	0.716	0.687	0.640	0.486	
3.00	0.911	0.883	0.836	0.683	

HOLD (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.038	0.066	0.113	0.265	
0.38	0.002	0.030	0.077	0.229	
1.00	-0.059	-0.031	0.016	0.168	
3.00	-0.255	-0.227	-0.179	-0.026	

TIMING CONDITION

DATA	CLOCK	CONDITION
K	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.525	0.496	0.449	0.297	
0.38	0.583	0.555	0.507	0.356	
1.00	0.680	0.652	0.605	0.454	
3.00	0.993	0.966	0.919	0.771	

HOLD (ns)					
CLOCK SLEW (ns)	DATA SLEW (ns)				
	0.01	0.38	1.00	3.00	
0.01	0.131	0.159	0.207	0.360	
0.38	0.073	0.101	0.149	0.302	
1.00	-0.024	0.004	0.051	0.203	
3.00	-0.338	-0.310	-0.264	-0.115	

TC200G SERIES

DATA SHEET

FJK2P

FJK2P

6/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.840

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.790

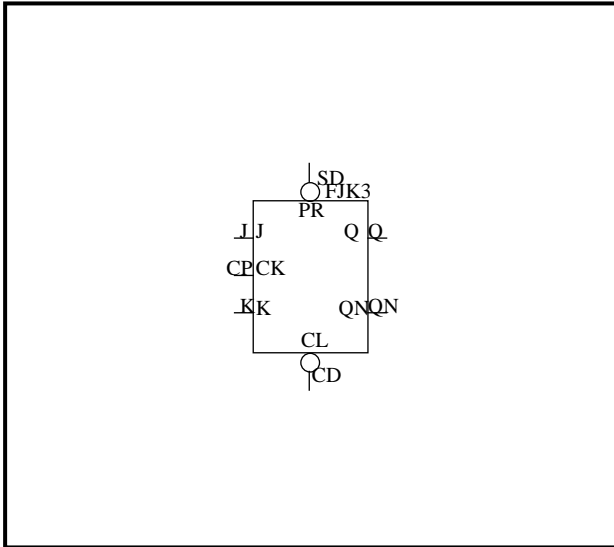
TC200G SERIES

DATA SHEET

FJK3		FJK3		1/8
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
FJK3	J-K FLIP FLOP with CLEAR and PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT	
CD	SD	J	K	CP	Qn+1	QNn+1
L	H	X	X	X*	L	H
H	L	X	X	X*	H	L
L	L	X	X	X	L	L
H	H	L	L	Up	Qn	QNn
H	H	L	H	Up	L	H
H	H	H	L	Up	H	L
H	H	H	H	Up	QNn	Qn
H	H	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FJK3 inst(Q,QN,J,K,CP,CD,SD);
```

VHDL DESCRIPTION

```
inst:FJK3
port map(Q,QN,J,K,CP,CD,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
J	0.99
K	0.98
CP	1.02
CD	2.20
SD	2.32

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	43.3	50.0

TC200G SERIES

DATA SHEET

FJK3

FJK3

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0837	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.58	1.18
0.38	0.34	0.48	0.64	1.24
1.00	0.42	0.56	0.71	1.31
3.00	0.57	0.71	0.87	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0364	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.57	0.71	1.17
0.38	0.44	0.58	0.72	1.18
1.00	0.50	0.64	0.78	1.24
3.00	0.69	0.84	0.98	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0399	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.33	0.46	0.93
0.38	0.25	0.36	0.48	0.96
1.00	0.30	0.42	0.54	1.01
3.00	0.39	0.52	0.65	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0961	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.54	1.21
0.38	0.29	0.44	0.61	1.28
1.00	0.38	0.53	0.70	1.37
3.00	0.56	0.71	0.89	1.56

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK3

FJK3

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0837	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.70	0.86	1.47
0.38	0.58	0.72	0.88	1.49
1.00	0.63	0.78	0.94	1.54
3.00	0.76	0.90	1.06	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0961	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.70	0.87	1.55
0.38	0.63	0.78	0.95	1.62
1.00	0.71	0.86	1.03	1.71
3.00	0.86	1.01	1.18	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0399	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.78	0.90	1.38
0.38	0.74	0.86	0.98	1.45
1.00	0.82	0.93	1.06	1.53
3.00	0.96	1.08	1.20	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0837	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.91	1.05	1.21	1.80
0.38	0.99	1.13	1.28	1.88
1.00	1.07	1.21	1.36	1.96
3.00	1.21	1.35	1.51	2.10

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK3

FJK3

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0364	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.87	1.00	1.45
0.38	0.83	0.95	1.08	1.53
1.00	0.91	1.03	1.16	1.61
3.00	1.06	1.18	1.31	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0961	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.84	1.01	1.68
0.38	0.70	0.85	1.02	1.69
1.00	0.76	0.91	1.08	1.75
3.00	0.97	1.11	1.28	1.98

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK3

FJK3

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.039	-0.077	-0.141	-0.349
0.38	-0.043	-0.081	-0.146	-0.353
1.00	-0.050	-0.089	-0.153	-0.360
3.00	-0.073	-0.112	-0.176	-0.384

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.693	0.731	0.796	1.003
0.38	0.697	0.736	0.800	1.008
1.00	0.705	0.743	0.808	1.015
3.00	0.730	0.768	0.832	1.040

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TC200G SERIES

DATA SHEET

FJK3

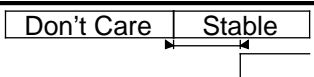
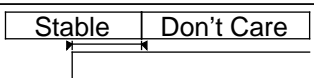
FJK3

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
J	CP	CD&SD

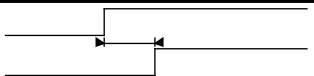
ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.560	0.529	0.476	0.308
0.38	0.618	0.587	0.535	0.367
1.00	0.717	0.686	0.634	0.467
3.00	1.034	1.004	0.953	0.788

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.097	0.128	0.180	0.348
0.38	0.038	0.069	0.121	0.289
1.00	-0.061	-0.030	0.022	0.189
3.00	-0.378	-0.348	-0.297	-0.132

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	SD  CP Q

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.057	0.021	-0.040	-0.236
0.38	0.108	0.072	0.012	-0.181
1.00	0.194	0.159	0.100	-0.089
3.00	0.471	0.439	0.384	0.208

TC200G SERIES

DATA SHEET

FJK3

FJK3

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.600	0.636	0.697	0.893
0.38	0.549	0.584	0.644	0.838
1.00	0.462	0.497	0.556	0.745
3.00	0.184	0.217	0.272	0.448

TIMING CONDITION

DATA	CLOCK	CONDITION
K	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.566	0.538	0.491	0.337
0.38	0.603	0.574	0.527	0.374
1.00	0.663	0.635	0.587	0.434
3.00	0.858	0.830	0.783	0.630

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.090	0.119	0.166	0.319
0.38	0.054	0.082	0.130	0.283
1.00	-0.007	0.022	0.069	0.222
3.00	-0.202	-0.174	-0.126	0.026

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TC200G SERIES

DATA SHEET

FJK3

FJK3

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.740

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD&CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.800

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

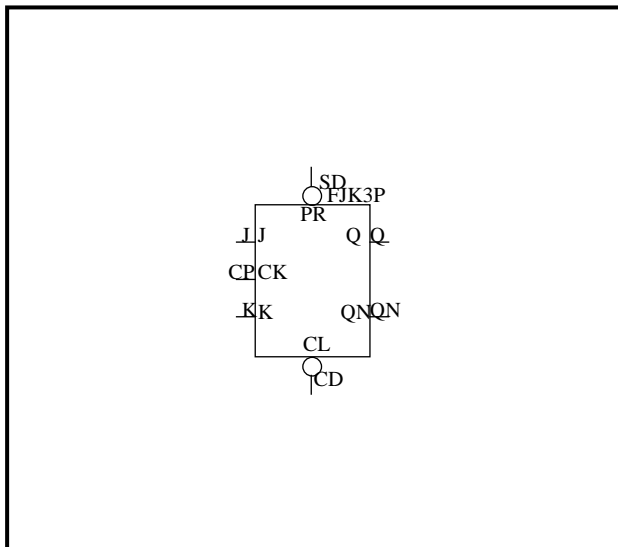
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.850

TC200G SERIES

DATA SHEET

FJK3P		FJK3P		1/8
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FJK3P	J-K FLIP FLOP with CLEAR and PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		12	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT	
CD	SD	J	K	CP	Qn+1	QNn+1
L	H	X	X	X*	L	H
H	L	X	X	X*	H	L
L	L	X	X	X	L	L
H	H	L	L	Up	Qn	QNn
H	H	L	H	Up	L	H
H	H	H	L	Up	H	L
H	H	H	H	Up	QNn	Qn
H	H	X	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
FJK3P inst(Q,QN,J,K,CP,CD,SD);
```

VHDL DESCRIPTION

```
inst:FJK3P
port map(Q,QN,J,K,CP,CD,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
J	1.00
K	0.98
CP	1.01
CD	2.35
SD	2.09

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	82.9	80.3

TC200G SERIES

DATA SHEET

FJK3P

FJK3P

2/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0543	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.39	0.49	0.88
0.38	0.36	0.45	0.55	0.93
1.00	0.44	0.52	0.63	1.01
3.00	0.60	0.70	0.80	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0205	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.51	0.61	0.90
0.38	0.42	0.53	0.62	0.91
1.00	0.49	0.59	0.68	0.98
3.00	0.69	0.80	0.89	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0182	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.32	0.39	0.63
0.38	0.27	0.35	0.42	0.66
1.00	0.35	0.42	0.49	0.74
3.00	0.50	0.58	0.66	0.91

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0547	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.32	0.42	0.79
0.38	0.28	0.37	0.47	0.84
1.00	0.35	0.43	0.53	0.91
3.00	0.48	0.57	0.67	1.05

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TC200G SERIES

DATA SHEET

FJK3P

FJK3P

3/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0543	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.78	0.88	1.27
0.38	0.71	0.80	0.91	1.30
1.00	0.78	0.87	0.98	1.36
3.00	0.96	1.06	1.16	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0547	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.63	0.73	1.10
0.38	0.62	0.71	0.81	1.18
1.00	0.70	0.79	0.89	1.27
3.00	0.85	0.94	1.04	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0182	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.68	0.75	1.00
0.38	0.69	0.76	0.83	1.07
1.00	0.77	0.84	0.91	1.15
3.00	0.91	0.98	1.05	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0543	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.94	1.03	1.13	1.51
0.38	1.02	1.11	1.21	1.59
1.00	1.10	1.19	1.29	1.67
3.00	1.24	1.33	1.43	1.81

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK3P

FJK3P

4/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0205	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.91	0.99	1.27
0.38	0.90	0.99	1.07	1.35
1.00	0.98	1.07	1.15	1.43
3.00	1.13	1.22	1.30	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0547	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.86	0.96	1.33
0.38	0.78	0.87	0.97	1.34
1.00	0.84	0.93	1.03	1.40
3.00	1.07	1.15	1.25	1.63

Rev.1.01.10

TC200G SERIES

DATA SHEET

FJK3P

FJK3P

5/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.039	-0.077	-0.141	-0.349
0.38	-0.043	-0.081	-0.146	-0.353
1.00	-0.050	-0.089	-0.153	-0.360
3.00	-0.073	-0.112	-0.176	-0.384

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.693	0.731	0.796	1.003
0.38	0.697	0.736	0.800	1.008
1.00	0.705	0.743	0.808	1.015
3.00	0.730	0.768	0.832	1.040

TC200G SERIES

DATA SHEET

FJK3P

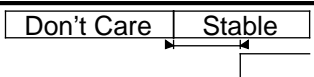
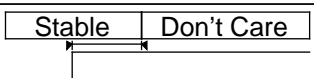
FJK3P

6/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
J	CP	CD&SD

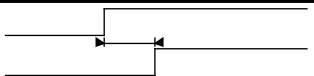
ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	J,K  CP
HOLD	POSEDGE	DCARE	J,K  CP

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.560	0.529	0.476	0.308
0.38	0.618	0.587	0.535	0.367
1.00	0.717	0.686	0.634	0.467
3.00	1.034	1.004	0.953	0.788

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.097	0.128	0.180	0.348
0.38	0.038	0.069	0.121	0.289
1.00	-0.061	-0.030	0.022	0.189
3.00	-0.378	-0.348	-0.297	-0.132

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	SD  CP Q

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.057	0.021	-0.040	-0.236
0.38	0.108	0.072	0.012	-0.181
1.00	0.194	0.159	0.100	-0.089
3.00	0.471	0.439	0.384	0.208

TC200G SERIES

DATA SHEET

FJK3P

FJK3P

7/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
	0.600	0.636	0.697	0.893
	0.38	0.549	0.584	0.644
	1.00	0.462	0.497	0.556
	3.00	0.184	0.217	0.272

TIMING CONDITION

DATA	CLOCK	CONDITION
K	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	DCARE	
HOLD	POSEDGE	DCARE	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
	0.566	0.538	0.491	0.337
	0.38	0.603	0.574	0.527
	1.00	0.663	0.635	0.587
	3.00	0.858	0.830	0.783

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
	0.090	0.119	0.166	0.319
	0.38	0.054	0.082	0.130
	1.00	-0.007	0.022	0.069
	3.00	-0.202	-0.174	-0.126

TC200G SERIES

DATA SHEET

FJK3P

FJK3P

8/8

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.740

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD&CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.800

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

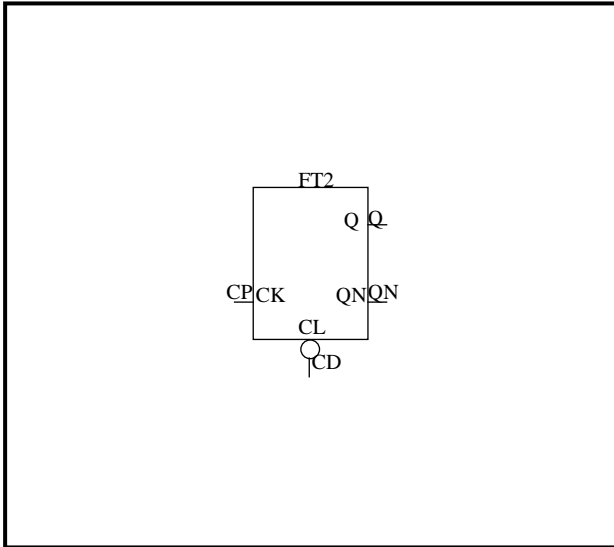
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.850

TC200G SERIES

DATA SHEET

FT2		FT2		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FT2	TOGGLE FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
CD	CP	Qn+1	QNn+1
L	X*	L	H
H	Up	QNn	Qn
H	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FT2 inst(Q,QN,CP,CD);
```

VHDL DESCRIPTION

```
inst:FT2
port map(Q,QN,CP,CD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CP	0.99
CD	2.17

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	47.3	48.8

TC200G SERIES

DATA SHEET

FT2

FT2

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0339	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.35	0.46	0.88
0.38	0.26	0.37	0.49	0.90
1.00	0.33	0.44	0.56	0.97
3.00	0.46	0.59	0.71	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.63	0.79	1.41
0.38	0.52	0.66	0.82	1.44
1.00	0.59	0.73	0.89	1.51
3.00	0.75	0.89	1.05	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0935	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.67	0.84	1.49
0.38	0.61	0.75	0.92	1.56
1.00	0.69	0.83	1.00	1.65
3.00	0.85	0.99	1.16	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0339	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.65	0.77	1.18
0.38	0.63	0.73	0.85	1.26
1.00	0.71	0.81	0.93	1.34
3.00	0.85	0.96	1.08	1.49

TC200G SERIES

DATA SHEET

FT2

FT2

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.70	0.83	0.98	1.59
0.38	0.78	0.91	1.06	1.67
1.00	0.86	0.99	1.14	1.75
3.00	1.01	1.13	1.29	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0356	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.80	0.92	1.35
0.38	0.77	0.88	1.00	1.43
1.00	0.85	0.97	1.08	1.52
3.00	1.01	1.13	1.24	1.68

Rev.1.01.10

TC200G SERIES

DATA SHEET

FT2

FT2

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.027	-0.067	-0.133	-0.349
0.38	-0.029	-0.069	-0.135	-0.350
1.00	-0.033	-0.072	-0.138	-0.351
3.00	-0.044	-0.083	-0.147	-0.355

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.681	0.721	0.788	1.003
0.38	0.684	0.723	0.790	1.004
1.00	0.687	0.727	0.793	1.006
3.00	0.700	0.738	0.802	1.010

Rev.1.01.10

TC200G SERIES

DATA SHEET

FT2

FT2

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.910

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.930

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

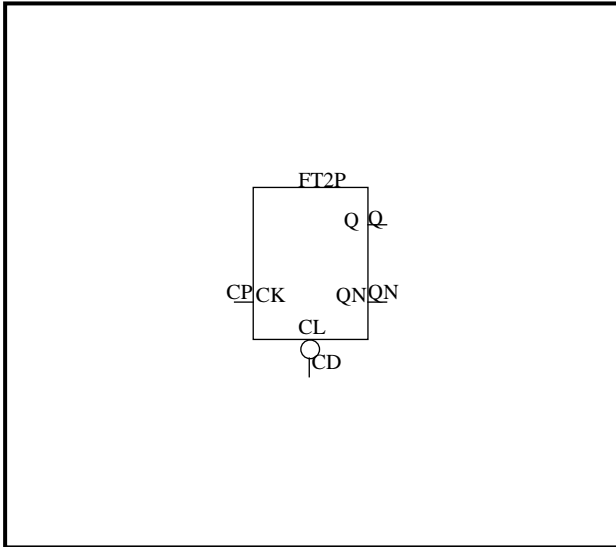
TC200G SERIES

DATA SHEET

FT2P		FT2P		1/5
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
FT2P	TOGGLE FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
CD	CP	Qn+1	QNn+1
L	X*	L	H
H	Up	QNn	Qn
H	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
FT2P inst(Q,QN,CP,CD);
```

VHDL DESCRIPTION

```
inst:FT2P
port map(Q,QN,CP,CD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CP	0.99
CD	2.17

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	82.9	97.6

Rev.1.01.10

TC200G SERIES

DATA SHEET

FT2P

FT2P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0182	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.32	0.39	0.63
0.38	0.27	0.34	0.42	0.66
1.00	0.34	0.41	0.49	0.73
3.00	0.48	0.57	0.65	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.72	1.04
0.38	0.58	0.66	0.75	1.07
1.00	0.66	0.73	0.82	1.15
3.00	0.84	0.92	1.00	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0546	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.73	1.11
0.38	0.62	0.71	0.81	1.19
1.00	0.71	0.80	0.90	1.27
3.00	0.87	0.96	1.06	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0182	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.63	0.70	0.94
0.38	0.64	0.71	0.78	1.02
1.00	0.72	0.79	0.86	1.10
3.00	0.87	0.94	1.01	1.25

Rev.1.01.10

TC200G SERIES

DATA SHEET

FT2P

FT2P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.83	0.91	1.23
0.38	0.84	0.91	0.99	1.30
1.00	0.92	0.99	1.07	1.39
3.00	1.07	1.14	1.22	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.83	0.90	1.14
0.38	0.84	0.91	0.98	1.22
1.00	0.92	0.99	1.06	1.30
3.00	1.08	1.15	1.22	1.46

TC200G SERIES

DATA SHEET

FT2P

FT2P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.027	-0.067	-0.133	-0.349
0.38	-0.029	-0.069	-0.135	-0.350
1.00	-0.033	-0.072	-0.138	-0.351
3.00	-0.044	-0.083	-0.147	-0.355

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.681	0.721	0.788	1.003
0.38	0.684	0.723	0.790	1.004
1.00	0.687	0.727	0.793	1.006
3.00	0.700	0.738	0.802	1.010

TC200G SERIES

DATA SHEET

FT2P

FT2P

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.910

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.930

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

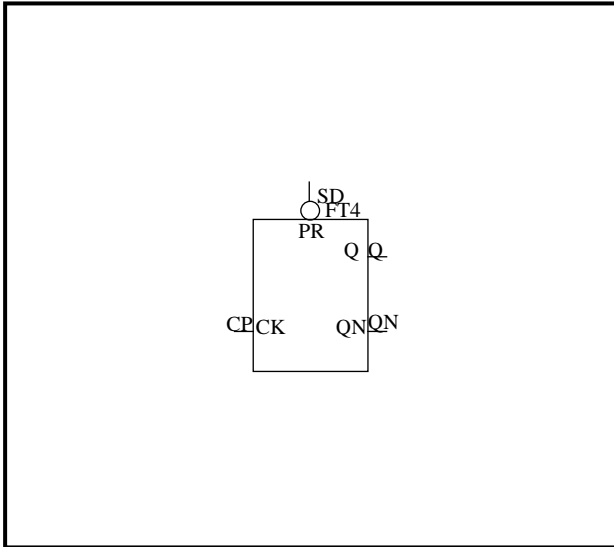
TC200G SERIES

DATA SHEET

FT4		FT4		1/5
-----	--	-----	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
FT4	TOGGLE FLIP FLOP with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
SD	CP	Qn+1	QNn+1
L	X*	H	L
H	Up	QNn	Qn
H	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FT4 inst(Q,QN,CP,SD);
```

VHDL DESCRIPTION

```
inst:FT4
port map(Q,QN,CP,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CP	0.99
SD	2.17

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	42.3	51.2

Rev.1.01.10

TC200G SERIES

DATA SHEET

FT4

FT4

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1002	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.62	0.79	1.47
0.38	0.55	0.70	0.87	1.55
1.00	0.64	0.78	0.95	1.63
3.00	0.80	0.94	1.11	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0423	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.69	0.82	1.32
0.38	0.65	0.77	0.90	1.40
1.00	0.73	0.85	0.98	1.48
3.00	0.88	1.00	1.13	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0838	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.93	1.08	1.67
0.38	0.87	1.01	1.16	1.75
1.00	0.95	1.09	1.24	1.84
3.00	1.10	1.24	1.39	1.98

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0339	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.76	0.88	1.30
0.38	0.73	0.84	0.96	1.38
1.00	0.82	0.93	1.04	1.46
3.00	0.97	1.08	1.20	1.62

TC200G SERIES

DATA SHEET

FT4

FT4

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1002	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.77	0.94	1.62
0.38	0.66	0.80	0.97	1.64
1.00	0.73	0.87	1.04	1.72
3.00	0.93	1.07	1.24	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0339	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.56	0.69	1.13
0.38	0.44	0.58	0.71	1.15
1.00	0.52	0.66	0.79	1.22
3.00	0.71	0.86	0.99	1.43

TC200G SERIES

DATA SHEET

FT4

FT4

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.156	0.118	0.055	-0.150
0.01	0.189	0.151	0.088	-0.114
0.38	0.243	0.206	0.144	-0.055
1.00	0.418	0.384	0.325	0.137
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.500	0.538	0.601	0.804
0.01	0.468	0.505	0.567	0.769
0.38	0.413	0.450	0.511	0.709
1.00	0.237	0.272	0.330	0.518
3.00				

TC200G SERIES

DATA SHEET

FT4

FT4

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	1.120

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.960

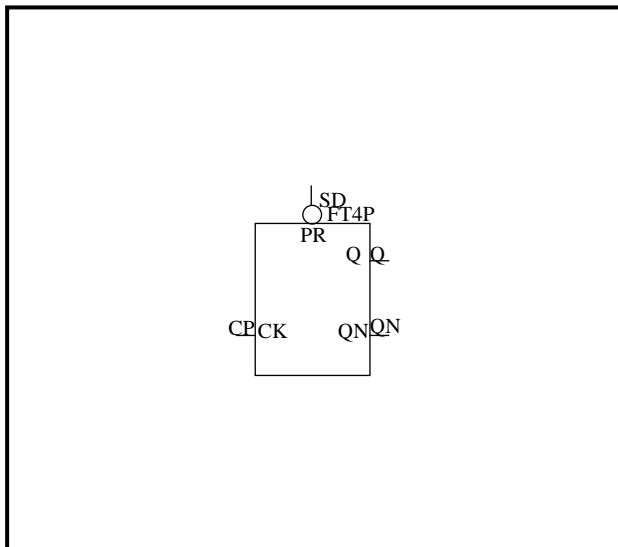
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.920

TC200G SERIES

DATA SHEET

FT4P		FT4P		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
FT4P	TOGGLE FLIP FLOP with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
SD	CP	Qn+1	QNn+1
L	X*	H	L
H	Up	QNn	Qn
H	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
FT4P inst(Q,QN,CP,SD);
```

VHDL DESCRIPTION

```
inst:FT4P
port map(Q,QN,CP,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
CP	0.99
SD	2.19

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	77.1	95.9

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TC200G SERIES

DATA SHEET

FT4P

FT4P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0549	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.55	0.65	1.02
0.38	0.55	0.63	0.73	1.10
1.00	0.64	0.72	0.82	1.19
3.00	0.79	0.88	0.97	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0238	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.65	0.73	1.03
0.38	0.65	0.73	0.81	1.11
1.00	0.73	0.81	0.90	1.19
3.00	0.88	0.96	1.04	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0444	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.92	1.00	1.32
0.38	0.92	1.00	1.08	1.40
1.00	1.00	1.08	1.16	1.48
3.00	1.15	1.22	1.31	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0185	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.77	0.84	1.09
0.38	0.77	0.85	0.92	1.17
1.00	0.86	0.93	1.01	1.25
3.00	1.02	1.09	1.16	1.41

TC200G SERIES

DATA SHEET

FT4P

FT4P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0549	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.77	0.87	1.24
0.38	0.72	0.80	0.90	1.27
1.00	0.79	0.87	0.97	1.34
3.00	1.02	1.10	1.20	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0185	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.51	0.60	0.87
0.38	0.44	0.54	0.62	0.89
1.00	0.51	0.61	0.70	0.97
3.00	0.72	0.83	0.92	1.19

TC200G SERIES

DATA SHEET

FT4P

FT4P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)					
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00	
DATA SLEW (ns)	0.01	0.156	0.118	0.055	-0.150
	0.38	0.189	0.151	0.088	-0.114
	1.00	0.243	0.206	0.144	-0.055
	3.00	0.418	0.384	0.325	0.137

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)					
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00	
DATA SLEW (ns)	0.01	0.500	0.538	0.601	0.804
	0.38	0.468	0.505	0.567	0.769
	1.00	0.413	0.450	0.511	0.709
	3.00	0.237	0.272	0.330	0.518

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TC200G SERIES

DATA SHEET

FT4P

FT4P

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	1.120

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

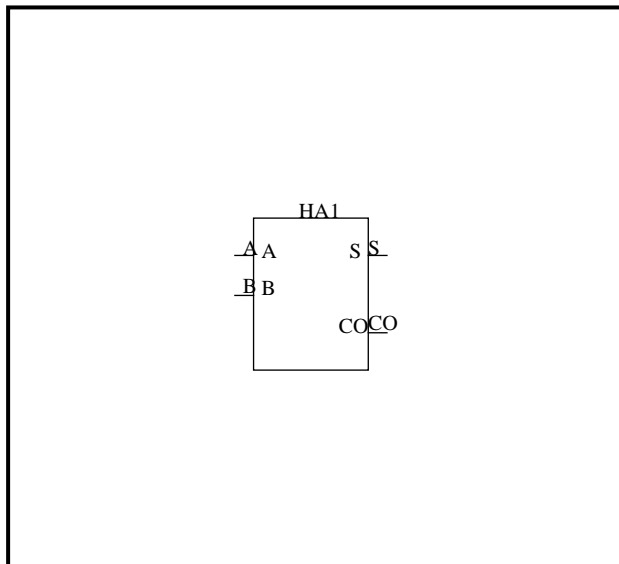
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.960

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.920

TC200G SERIES
DATA SHEET

HA1		HA1		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
HA1	HALF ADDER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	B	S	CO
L	L	L	L
H	L	H	L
L	H	H	L
H	H	L	H

Verilog-HDL DESCRIPTION

```
HA1 inst(S,CO,A,B);
```

VHDL DESCRIPTION

```
inst:HA1
port map(S,CO,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	S,CO
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.00
B	3.19

OUTPUT DRIVE

(LU)

PIN NAME	S	CO
DRIVE	47.6	48.7

TC200G SERIES

DATA SHEET

HA1

HA1

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0865	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.31	0.46	1.07
0.38	0.25	0.38	0.53	1.14
1.00	0.32	0.45	0.61	1.22
3.00	0.49	0.63	0.78	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0391	0.06

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.27	0.39	0.84
0.38	0.20	0.30	0.42	0.87
1.00	0.24	0.34	0.46	0.92
3.00	0.29	0.41	0.53	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0897	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.54	0.70	1.33
0.38	0.43	0.57	0.74	1.36
1.00	0.50	0.64	0.80	1.42
3.00	0.63	0.77	0.93	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0374	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.49	0.62	1.08
0.38	0.44	0.57	0.70	1.15
1.00	0.50	0.63	0.76	1.22
3.00	0.61	0.74	0.87	1.33

TC200G SERIES

DATA SHEET

HA1

HA1

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0897	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.40	0.56	1.19
0.38	0.34	0.48	0.64	1.27
1.00	0.43	0.57	0.73	1.36
3.00	0.59	0.73	0.90	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0374	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.46	0.60	1.06
0.38	0.36	0.49	0.63	1.09
1.00	0.43	0.57	0.70	1.17
3.00	0.59	0.74	0.88	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.30	0.45	1.05
0.38	0.23	0.36	0.51	1.11
1.00	0.29	0.42	0.57	1.17
3.00	0.39	0.53	0.68	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0391	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.32	0.43	0.89
0.38	0.24	0.35	0.46	0.92
1.00	0.30	0.41	0.53	0.98
3.00	0.42	0.54	0.66	1.12

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TC200G SERIES

DATA SHEET

HA1

HA1

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0897	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.41	0.57	1.20
0.38	0.30	0.44	0.60	1.23
1.00	0.36	0.50	0.66	1.28
3.00	0.46	0.60	0.76	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0374	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.48	0.93
0.38	0.30	0.42	0.55	1.01
1.00	0.41	0.53	0.65	1.11
3.00	0.53	0.65	0.78	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0897	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.49	1.12
0.38	0.27	0.41	0.57	1.20
1.00	0.34	0.48	0.64	1.27
3.00	0.45	0.59	0.75	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0374	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.34	0.47	0.92
0.38	0.25	0.37	0.50	0.95
1.00	0.31	0.44	0.56	1.02
3.00	0.45	0.58	0.71	1.17

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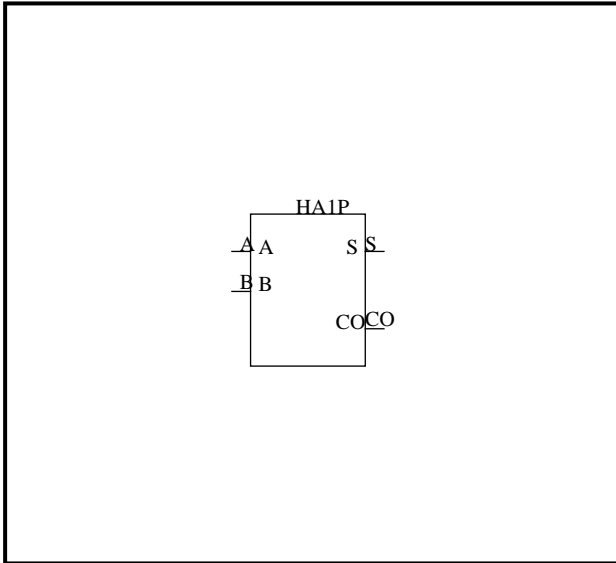
TC200G SERIES

DATA SHEET

HA1P		HA1P		1/4
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
HA1P	HALF ADDER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	B	S	CO
L	L	L	L
H	L	H	L
L	H	H	L
H	H	L	H

Verilog-HDL DESCRIPTION

```
HA1P inst(S,CO,A,B);
```

VHDL DESCRIPTION

```
inst:HA1P
port map(S,CO,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	S,CO
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.98
B	3.19

OUTPUT DRIVE

(LU)

PIN NAME	S	CO
DRIVE	94.8	99.6

Rev.1.01.10

TC200G SERIES

DATA SHEET

HA1P

HA1P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0442	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.24	0.32	0.63
0.38	0.24	0.32	0.40	0.71
1.00	0.33	0.40	0.49	0.80
3.00	0.52	0.59	0.67	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
A->CO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0180	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.23	0.29	0.51
0.38	0.20	0.26	0.32	0.54
1.00	0.25	0.31	0.37	0.60
3.00	0.33	0.40	0.47	0.70

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0439	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.49	0.58	0.90
0.38	0.45	0.52	0.61	0.93
1.00	0.51	0.59	0.67	0.99
3.00	0.64	0.72	0.80	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0200	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.45	0.54	0.80
0.38	0.45	0.53	0.61	0.88
1.00	0.51	0.59	0.68	0.94
3.00	0.62	0.71	0.79	1.06

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TC200G SERIES

DATA SHEET

HA1P

HA1P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0439	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.43	0.75
0.38	0.35	0.43	0.51	0.83
1.00	0.45	0.52	0.61	0.93
3.00	0.63	0.71	0.80	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
A->S	~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0200	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.42	0.51	0.78
0.38	0.37	0.45	0.54	0.81
1.00	0.44	0.53	0.61	0.88
3.00	0.61	0.71	0.80	1.07

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0442	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.25	0.33	0.65
0.38	0.23	0.31	0.39	0.70
1.00	0.30	0.37	0.45	0.77
3.00	0.42	0.50	0.58	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
B->CO	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
CO	0.0180	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.26	0.32	0.55
0.38	0.23	0.29	0.36	0.58
1.00	0.29	0.36	0.42	0.65
3.00	0.42	0.50	0.57	0.80

Rev.1.01.10

TC200G SERIES

DATA SHEET

HA1P

HA1P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0439	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.45	0.77
0.38	0.32	0.39	0.48	0.80
1.00	0.38	0.45	0.54	0.86
3.00	0.50	0.57	0.66	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0200	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.39	0.66
0.38	0.30	0.38	0.46	0.73
1.00	0.42	0.51	0.59	0.85
3.00	0.55	0.63	0.71	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0439	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.28	0.37	0.69
0.38	0.28	0.36	0.45	0.77
1.00	0.37	0.44	0.53	0.85
3.00	0.53	0.60	0.69	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION
B->S	~A	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
S	0.0200	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.30	0.38	0.64
0.38	0.25	0.33	0.41	0.67
1.00	0.31	0.39	0.47	0.73
3.00	0.46	0.54	0.63	0.90

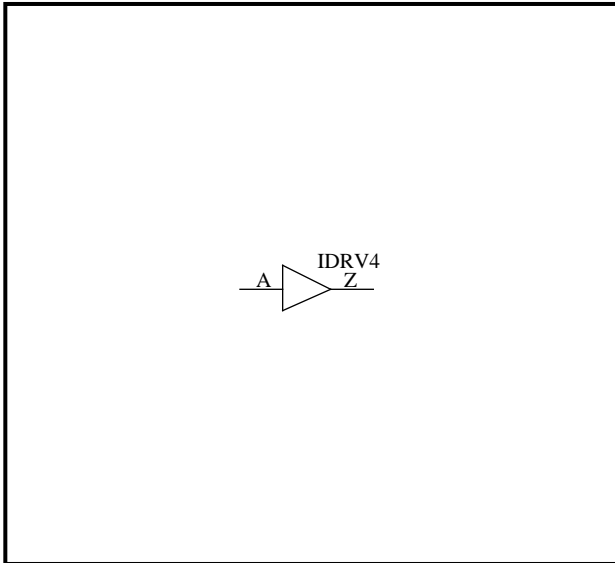
Rev.1.01.10

TC200G SERIES

DATA SHEET

IDRV4		IDRV4		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IDRV4	INTERNAL CLOCK DRIVER (equal 4mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
IDRV4 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IDRV4
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	44123.9

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.55

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	551.5

TC200G SERIES

DATA SHEET

IDRV4

IDRV4

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.80	1.69	3.02	4.79
0.38	0.89	1.77	3.10	4.88
1.00	1.00	1.89	3.22	4.99
3.00	1.25	2.14	3.47	5.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.43

PATH DELAY (ns)

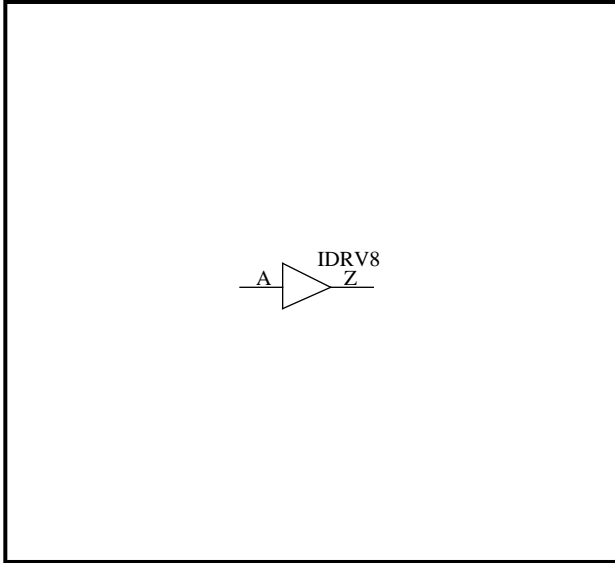
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.33	2.88	5.18	8.04
0.38	1.36	2.91	5.22	8.10
1.00	1.43	2.98	5.29	8.20
3.00	1.57	3.11	5.42	8.40

TC200G SERIES

DATA SHEET

IDRV8		IDRV8		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IDRV8	INTERNAL CLOCK DRIVER (equal 8mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
IDRV8 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IDRV8
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	92825.5

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.55

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	1160.3

TC200G SERIES

DATA SHEET

IDRV8

IDRV8

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.26

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.61	1.07	1.74	2.63
0.38	0.70	1.16	1.83	2.72
1.00	0.84	1.30	1.97	2.85
3.00	1.14	1.60	2.27	3.16

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.31

PATH DELAY (ns)

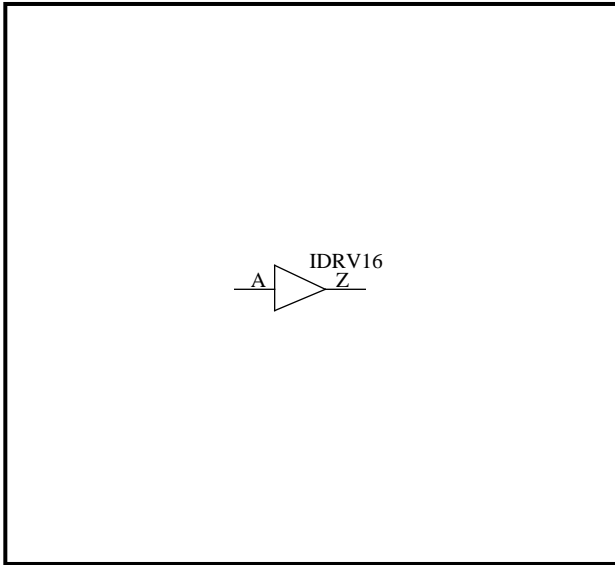
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.99	1.78	2.94	4.49
0.38	1.02	1.81	2.98	4.52
1.00	1.09	1.89	3.05	4.59
3.00	1.28	2.07	3.23	4.77

TC200G SERIES

DATA SHEET

IDRV16		IDRV16		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IDRV16	INTERNAL CLOCK DRIVER (equal 16mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
IDRV16 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IDRV16
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	191415.2

INPUT LOAD

(LU)

PIN NAME	LOAD
A	9.08

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	2392.7

TC200G SERIES

DATA SHEET

IDRV16

IDRV16

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.51	0.92	1.48	2.04
0.38	0.60	1.01	1.57	2.12
1.00	0.74	1.15	1.71	2.26
3.00	1.04	1.45	2.02	2.57

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0013	0.21

PATH DELAY (ns)

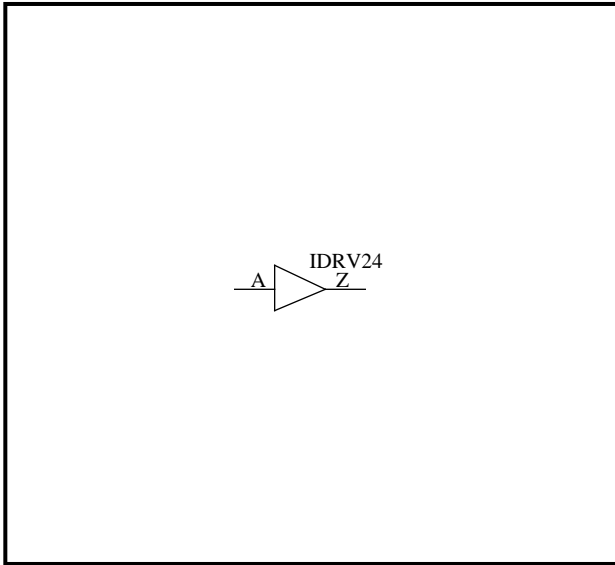
LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.79	1.49	2.46	3.43
0.38	0.82	1.52	2.50	3.47
1.00	0.89	1.59	2.57	3.54
3.00	1.06	1.76	2.73	3.70

TC200G SERIES

DATA SHEET

IDRV24		IDRV24		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IDRV24	INTERNAL CLOCK DRIVER (equal 24mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	2	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
IDRV24 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IDRV24
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	288343.7

INPUT LOAD

(LU)

PIN NAME	LOAD
A	17.93

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	3604.3

TC200G SERIES

DATA SHEET

IDRV24

IDRV24

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.46	0.74	1.11	1.49
0.38	0.55	0.83	1.20	1.57
1.00	0.68	0.96	1.34	1.71
3.00	0.98	1.27	1.65	2.02

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.25

PATH DELAY (ns)

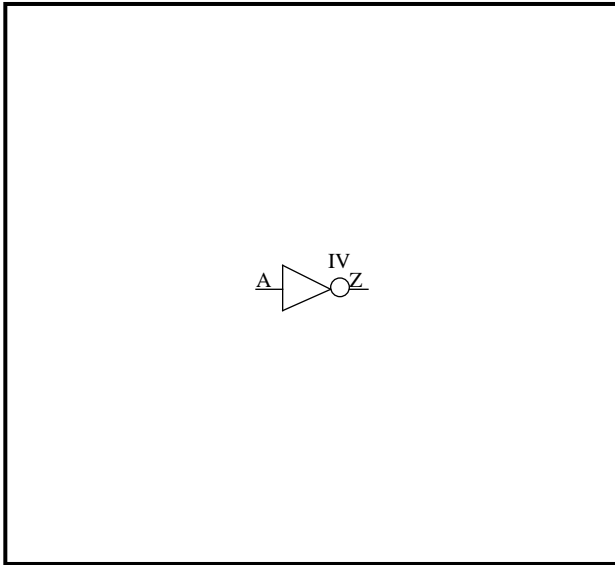
LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.70	1.18	1.83	2.47
0.38	0.73	1.21	1.86	2.50
1.00	0.80	1.28	1.93	2.57
3.00	0.97	1.45	2.10	2.74

TC200G SERIES

DATA SHEET

IV		IV		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IV	INVERTER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
IV inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IV
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	45.7

TC200G SERIES

DATA SHEET

IV

IV

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0842	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.20	0.35	0.94
0.38	0.10	0.23	0.38	0.97
1.00	0.14	0.28	0.44	1.03
3.00	0.20	0.39	0.59	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0359	0.09

PATH DELAY (ns)

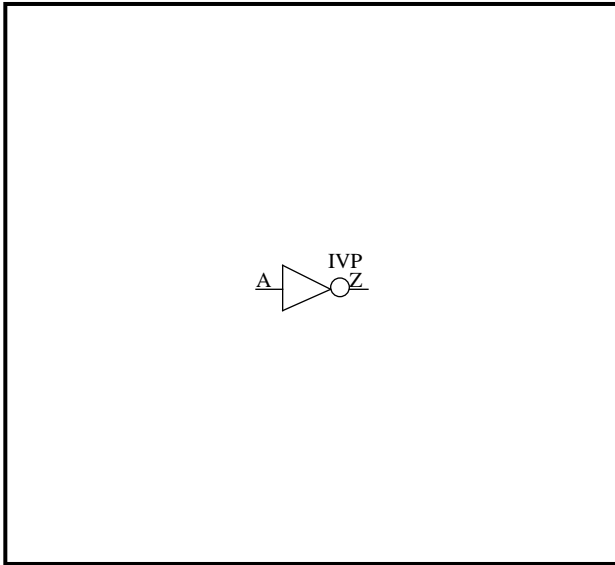
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.14	0.25	0.68
0.38	0.11	0.22	0.34	0.77
1.00	0.15	0.31	0.45	0.91
3.00	0.20	0.44	0.65	1.27

TC200G SERIES

DATA SHEET

IVP		IVP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IVP	INVERTER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
IVP inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IVP
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.01

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	76.6

TC200G SERIES

DATA SHEET

IVP

IVP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0442	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.12	0.20	0.51
0.38	0.07	0.14	0.23	0.54
1.00	0.09	0.18	0.27	0.60
3.00	0.12	0.24	0.36	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0225	0.09

PATH DELAY (ns)

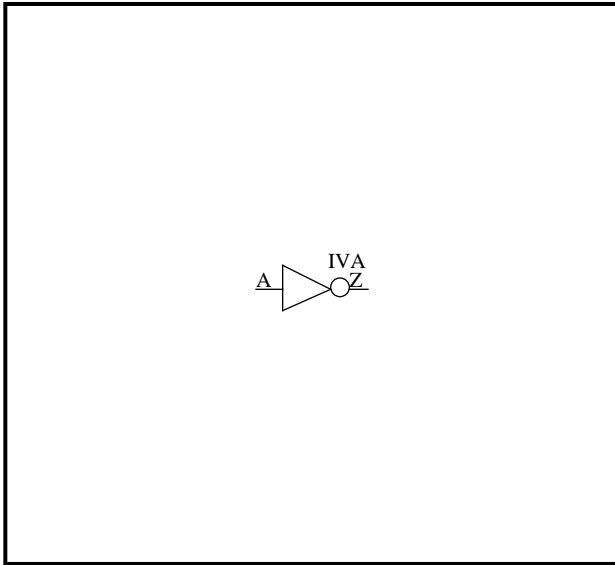
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.04	0.10	0.16	0.43
0.38	0.08	0.16	0.24	0.52
1.00	0.11	0.22	0.32	0.64
3.00	0.13	0.30	0.45	0.90

TC200G SERIES

DATA SHEET

IVA		IVA		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IVA	INVERTER with PARALLEL Pch TRANSISTORS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
IVA inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IVA
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.54

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	61.0

TC200G SERIES

DATA SHEET

IVA

IVA

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0540	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.13	0.22	0.59
0.38	0.06	0.15	0.25	0.61
1.00	0.06	0.17	0.28	0.67
3.00	-0.00	0.15	0.30	0.77

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0332	0.09

PATH DELAY (ns)

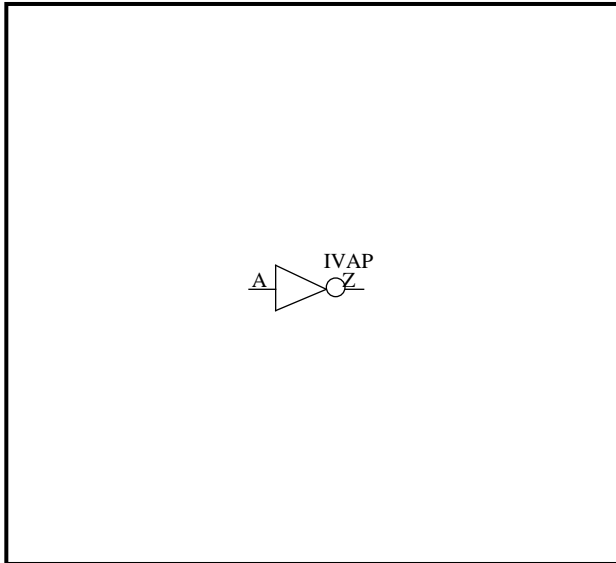
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.14	0.24	0.64
0.38	0.12	0.22	0.32	0.73
1.00	0.17	0.31	0.45	0.87
3.00	0.31	0.51	0.70	1.26

TC200G SERIES

DATA SHEET

IVAP		IVAP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IVAP	INVERTER with PARALLEL Pch TRANSISTORS	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	H
H	L

Verilog-HDL DESCRIPTION

```
IVAP inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IVAP
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.02

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	105.1

TC200G SERIES

DATA SHEET

IVAP

IVAP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0206	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.03	0.07	0.11	0.26
0.38	0.03	0.08	0.12	0.29
1.00	-0.00	0.06	0.13	0.32
3.00	-0.13	-0.04	0.05	0.32

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0228	0.09

PATH DELAY (ns)

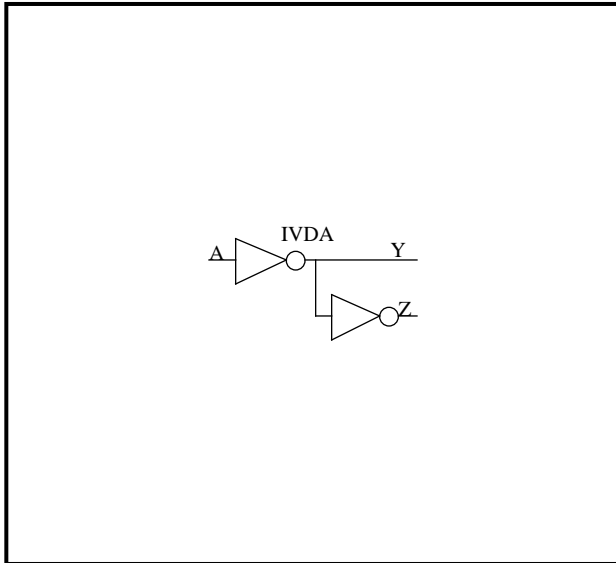
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.11	0.18	0.44
0.38	0.11	0.18	0.25	0.53
1.00	0.17	0.26	0.35	0.66
3.00	0.33	0.47	0.59	0.98

TC200G SERIES

DATA SHEET

IVDA		IVDA		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IVDA	INVERTER into INVERTER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT	
A	Y	Z
L	H	L
H	L	H

Verilog-HDL DESCRIPTION

```
IVDA inst(Y,Z,A);
```

VHDL DESCRIPTION

```
inst:IVDA
port map(Y,Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Y,Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Y	Z
DRIVE	42.8	39.7

TC200G SERIES

DATA SHEET

IVDA

IVDA

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Y	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Y	0.0869	0.20

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.24	0.39	1.00
0.38	0.14	0.27	0.42	1.02
1.00	0.18	0.32	0.48	1.09
3.00	0.25	0.44	0.63	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Y	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Y	0.0395	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.30	0.76
0.38	0.15	0.26	0.38	0.85
1.00	0.20	0.35	0.50	0.99
3.00	0.29	0.52	0.73	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
Y->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0983	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.39	1.06
0.38	0.12	0.26	0.43	1.10
1.00	0.16	0.32	0.50	1.17
3.00	0.25	0.46	0.67	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
Y->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0385	0.10

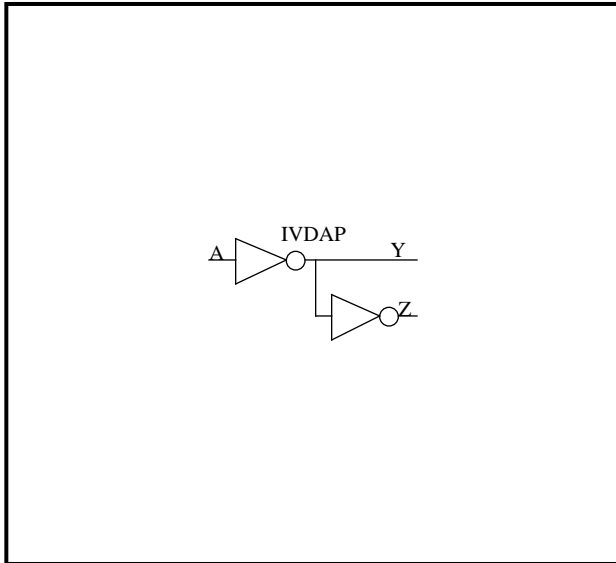
PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.14	0.25	0.70
0.38	0.11	0.22	0.34	0.78
1.00	0.14	0.30	0.45	0.92
3.00	0.16	0.41	0.63	1.27

TC200G SERIES

DATA SHEET

IVDAP		IVDAP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IVDAP	INVERTER into INVERTER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT	
A	Y	Z
L	H	L
H	L	H

Verilog-HDL DESCRIPTION

```
IVDAP inst(Y,Z,A);
```

VHDL DESCRIPTION

```
inst:IVDAP
port map(Y,Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Y,Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Y	Z
DRIVE	77.4	67.1

TC200G SERIES

DATA SHEET

IVDAP

IVDAP

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Y	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Y	0.0444	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.15	0.23	0.54
0.38	0.11	0.18	0.26	0.57
1.00	0.14	0.22	0.31	0.63
3.00	0.19	0.30	0.41	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Y	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Y	0.0231	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.13	0.20	0.47
0.38	0.13	0.20	0.27	0.55
1.00	0.17	0.27	0.36	0.68
3.00	0.25	0.38	0.52	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
Y->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0576	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.17	0.27	0.66
0.38	0.11	0.20	0.30	0.69
1.00	0.14	0.24	0.35	0.76
3.00	0.23	0.36	0.49	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
Y->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0204	0.10

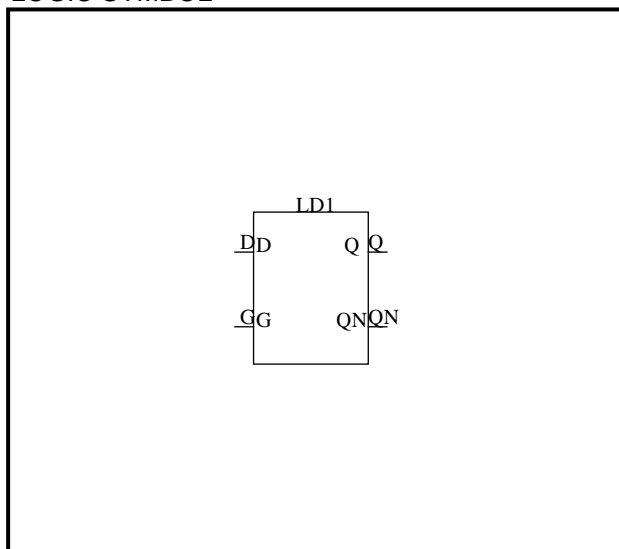
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.10	0.16	0.40
0.38	0.10	0.17	0.24	0.50
1.00	0.12	0.22	0.32	0.62
3.00	0.12	0.28	0.44	0.87

TC200G SERIES
DATA SHEET

LD1		LD1		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD1	D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
G	D	Q	QN
H	L	L	H
H	H	H	L
L	X	HOLD	

Verilog-HDL DESCRIPTION

```
LD1 inst(Q,QN,D,G);
```

VHDL DESCRIPTION

```
inst:LD1
port map(Q,QN,D,G);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,G	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	42.2	50.2

Rev.1.01.10

TC200G SERIES

DATA SHEET

LD1

LD1

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0982	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.47	0.65	1.35
0.38	0.37	0.54	0.72	1.42
1.00	0.45	0.62	0.80	1.50
3.00	0.61	0.77	0.96	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0417	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.49	0.64	1.17
0.38	0.37	0.52	0.67	1.20
1.00	0.44	0.59	0.74	1.27
3.00	0.59	0.75	0.91	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0860	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.61	0.77	1.38
0.38	0.51	0.64	0.80	1.41
1.00	0.58	0.71	0.87	1.48
3.00	0.74	0.88	1.03	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.56	0.68	1.10
0.38	0.52	0.63	0.75	1.17
1.00	0.60	0.71	0.83	1.25
3.00	0.76	0.87	0.99	1.42

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TC200G SERIES

DATA SHEET

LD1

LD1

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0982	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.58	0.76	1.46
0.38	0.48	0.65	0.84	1.54
1.00	0.55	0.72	0.90	1.60
3.00	0.67	0.84	1.03	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0417	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.52	0.67	1.20
0.38	0.45	0.60	0.75	1.27
1.00	0.52	0.67	0.82	1.34
3.00	0.65	0.80	0.96	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0860	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.65	0.80	1.41
0.38	0.59	0.72	0.88	1.49
1.00	0.66	0.79	0.95	1.56
3.00	0.79	0.93	1.08	1.69

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.67	0.78	1.20
0.38	0.63	0.74	0.86	1.28
1.00	0.70	0.81	0.92	1.35
3.00	0.82	0.93	1.05	1.47

TC200G SERIES

DATA SHEET

LD1

LD1

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.340	0.308	0.255	0.083
0.38	0.38	0.381	0.350	0.297	0.126
1.00	1.00	0.450	0.419	0.367	0.198
3.00	3.00	0.672	0.642	0.592	0.428

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.277	0.291	0.315	0.391
0.38	0.38	0.245	0.260	0.284	0.362
1.00	1.00	0.192	0.207	0.232	0.314
3.00	3.00	0.018	0.036	0.064	0.157

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.439	0.426	0.404	0.333
0.38	0.38	0.472	0.458	0.436	0.363
1.00	1.00	0.526	0.512	0.489	0.413
3.00	3.00	0.702	0.687	0.660	0.575

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.380	0.409	0.458	0.615
0.38	0.38	0.340	0.369	0.418	0.576
1.00	1.00	0.272	0.301	0.351	0.510
3.00	3.00	0.053	0.083	0.134	0.298

TC200G SERIES

DATA SHEET

LD1

LD1

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

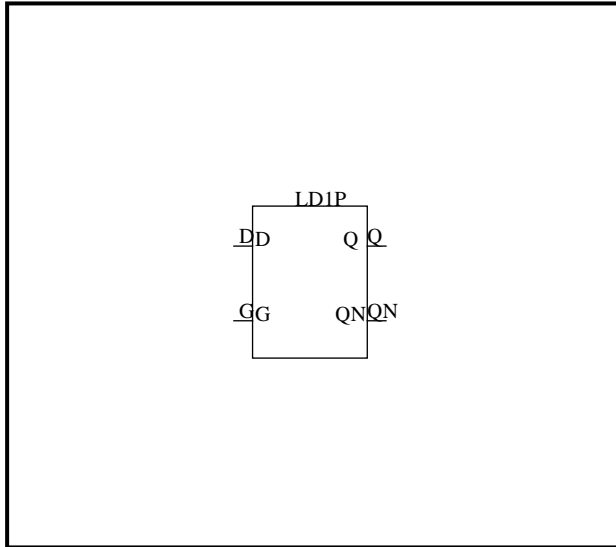
TC200G SERIES

DATA SHEET

LD1P	LD1P	1/5
------	------	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD1P	D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	GATE 6	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
G	D	Q	QN
H	L	L	H
H	H	H	L
L	X	HOLD	

Verilog-HDL DESCRIPTION

```
LD1P inst(Q,QN,D,G);
```

VHDL DESCRIPTION

```
inst:LD1P
port map(Q,QN,D,G);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,G	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	75.1	97.9

TC200G SERIES

DATA SHEET

LD1P

LD1P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0543	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.38	0.49	0.87
0.38	0.36	0.45	0.56	0.94
1.00	0.45	0.54	0.64	1.03
3.00	0.62	0.71	0.81	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0255	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.42	0.52	0.85
0.38	0.35	0.45	0.55	0.88
1.00	0.42	0.52	0.62	0.95
3.00	0.59	0.69	0.79	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.60	0.69	1.00
0.38	0.56	0.64	0.72	1.03
1.00	0.64	0.71	0.79	1.11
3.00	0.82	0.89	0.97	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0178	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.58	0.65	0.89
0.38	0.57	0.65	0.72	0.96
1.00	0.66	0.74	0.81	1.05
3.00	0.84	0.92	0.99	1.23

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TC200G SERIES

DATA SHEET

LD1P

LD1P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0543	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.49	0.59	0.98
0.38	0.47	0.56	0.67	1.05
1.00	0.54	0.63	0.73	1.12
3.00	0.66	0.75	0.86	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0255	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.45	0.55	0.88
0.38	0.43	0.53	0.63	0.95
1.00	0.50	0.60	0.70	1.02
3.00	0.63	0.73	0.83	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.63	0.72	1.03
0.38	0.64	0.71	0.79	1.11
1.00	0.71	0.78	0.86	1.18
3.00	0.84	0.91	1.00	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0178	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.68	0.75	0.99
0.38	0.68	0.76	0.83	1.07
1.00	0.75	0.82	0.90	1.13
3.00	0.87	0.95	1.02	1.26

Rev.1.01.10

TC200G SERIES

DATA SHEET

LD1P

LD1P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.514	0.472	0.401	0.172
0.38	0.38	0.565	0.523	0.453	0.225
1.00	1.00	0.650	0.609	0.539	0.315
3.00	3.00	0.925	0.885	0.819	0.605

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.178	0.201	0.241	0.368
0.38	0.38	0.136	0.160	0.200	0.329
1.00	1.00	0.067	0.091	0.132	0.263
3.00	3.00	-0.158	-0.132	-0.088	0.052

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.690	0.667	0.628	0.503
0.38	0.38	0.733	0.710	0.671	0.545
1.00	1.00	0.805	0.781	0.742	0.614
3.00	3.00	1.036	1.012	0.971	0.838

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.369	0.406	0.470	0.673
0.38	0.38	0.318	0.356	0.419	0.623
1.00	1.00	0.233	0.271	0.335	0.539
3.00	3.00	-0.041	-0.002	0.062	0.268

TC200G SERIES

DATA SHEET

LD1P

LD1P

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.990

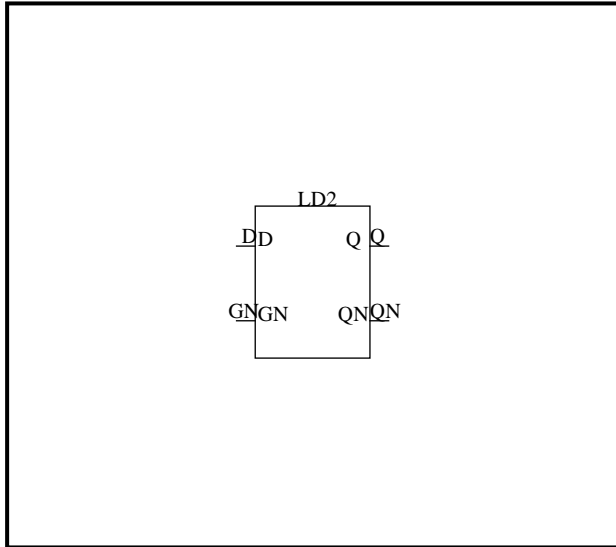
TC200G SERIES

DATA SHEET

LD2	LD2	1/5
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD2	D-TYPE TRANSPARENT LATCH (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
GN	D	Q	QN
L	L	L	H
L	H	H	L
H	X	HOLD	

Verilog-HDL DESCRIPTION

```
LD2 inst(Q,QN,D,GN);
```

VHDL DESCRIPTION

```
inst:LD2
port map(Q,QN,D,GN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,GN	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	47.7	48.1

TC200G SERIES

DATA SHEET

LD2

LD2

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0855	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.42	0.58	1.19
0.38	0.35	0.49	0.65	1.26
1.00	0.43	0.57	0.73	1.34
3.00	0.59	0.73	0.89	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0398	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.47	0.62	1.12
0.38	0.35	0.50	0.65	1.15
1.00	0.42	0.57	0.72	1.23
3.00	0.58	0.73	0.89	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0840	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.59	0.74	1.32
0.38	0.49	0.62	0.77	1.35
1.00	0.56	0.69	0.84	1.42
3.00	0.73	0.85	1.00	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0417	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.57	0.70	1.20
0.38	0.52	0.64	0.77	1.27
1.00	0.60	0.72	0.86	1.35
3.00	0.76	0.89	1.02	1.52

TC200G SERIES

DATA SHEET

LD2

LD2

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0855	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.55	0.71	1.32
0.38	0.44	0.58	0.74	1.35
1.00	0.51	0.65	0.81	1.42
3.00	0.65	0.79	0.95	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0398	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.57	0.71	1.22
0.38	0.45	0.60	0.74	1.25
1.00	0.52	0.67	0.81	1.32
3.00	0.66	0.80	0.95	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0840	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.68	0.83	1.42
0.38	0.59	0.72	0.87	1.45
1.00	0.66	0.78	0.93	1.52
3.00	0.80	0.92	1.07	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0417	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.70	0.83	1.33
0.38	0.61	0.73	0.87	1.36
1.00	0.68	0.80	0.93	1.43
3.00	0.82	0.94	1.07	1.57

TC200G SERIES

DATA SHEET

LD2

LD2

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.413	0.401	0.382	0.319
0.38	0.453	0.441	0.420	0.354
1.00	0.521	0.508	0.486	0.414
3.00	0.741	0.725	0.697	0.606

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.254	0.283	0.330	0.484
0.38	0.221	0.249	0.296	0.448
1.00	0.165	0.193	0.239	0.389
3.00	-0.015	0.011	0.055	0.196

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.429	0.402	0.356	0.207
0.38	0.463	0.436	0.391	0.243
1.00	0.521	0.494	0.449	0.304
3.00	0.706	0.680	0.638	0.501

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.290	0.299	0.313	0.360
0.38	0.251	0.261	0.276	0.326
1.00	0.187	0.197	0.214	0.269
3.00	-0.020	-0.007	0.014	0.085

TC200G SERIES

DATA SHEET

LD2

LD2

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	---

ITEM	WAVE_FORM
NEGLIMIT	<p>The diagram shows three signals: D (Data), GN (Clock), and Q (Output). D is a square wave. GN is a clock signal with a pulse width labeled $t_w(L)$. Q is a series of pulses that occur during the clock pulses.</p>

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.730

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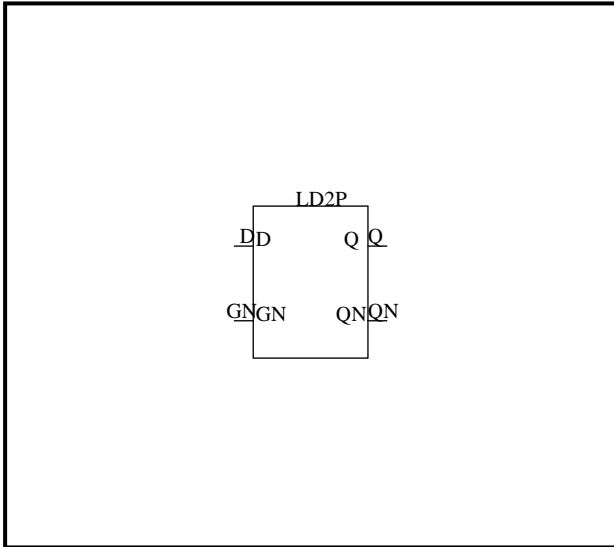
TC200G SERIES

DATA SHEET

LD2P	LD2P	1/5
------	------	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD2P	D-TYPE TRANSPARENT LATCH (LOW ENABLE)	GATE 6	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
GN	D	Q	QN
L	L	L	H
L	H	H	L
H	X	HOLD	

Verilog-HDL DESCRIPTION

```
LD2P inst(Q,QN,D,GN);
```

VHDL DESCRIPTION

```
inst:LD2P
port map(Q,QN,D,GN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	12880.0	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D,GN	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	91.8	90.0

TC200G SERIES

DATA SHEET

LD2P

LD2P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0440	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.79
0.38	0.36	0.44	0.53	0.86
1.00	0.45	0.53	0.62	0.94
3.00	0.62	0.70	0.79	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0215	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.42	0.51	0.80
0.38	0.36	0.45	0.54	0.83
1.00	0.43	0.52	0.61	0.90
3.00	0.59	0.69	0.78	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.61	0.70	1.01
0.38	0.57	0.64	0.73	1.04
1.00	0.64	0.72	0.80	1.12
3.00	0.82	0.90	0.98	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0233	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.61	0.69	0.98
0.38	0.59	0.68	0.76	1.06
1.00	0.68	0.77	0.85	1.14
3.00	0.87	0.95	1.03	1.33

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TC200G SERIES

DATA SHEET

LD2P

LD2P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0440	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.50	0.59	0.92
0.38	0.46	0.54	0.63	0.95
1.00	0.52	0.60	0.69	1.02
3.00	0.67	0.75	0.84	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0215	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.50	0.60	0.89
0.38	0.44	0.54	0.63	0.92
1.00	0.51	0.60	0.70	0.99
3.00	0.65	0.74	0.84	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.70	0.78	1.10
0.38	0.66	0.73	0.82	1.13
1.00	0.73	0.80	0.88	1.20
3.00	0.87	0.94	1.02	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0233	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.74	0.82	1.12
0.38	0.69	0.77	0.86	1.15
1.00	0.76	0.84	0.92	1.22
3.00	0.90	0.98	1.07	1.36

TC200G SERIES

DATA SHEET

LD2P

LD2P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.653	0.633	0.601	0.496
0.38	0.01	0.704	0.684	0.650	0.543
1.00	0.01	0.789	0.768	0.733	0.620
3.00	0.01	1.063	1.039	0.999	0.870

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.068	0.099	0.152	0.320
0.38	0.01	0.025	0.056	0.108	0.276
1.00	0.01	-0.047	-0.016	0.036	0.201
3.00	0.01	-0.278	-0.249	-0.199	-0.038

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.718	0.690	0.644	0.495
0.38	0.01	0.762	0.734	0.688	0.540
1.00	0.01	0.836	0.808	0.762	0.614
3.00	0.01	1.075	1.047	1.001	0.853

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.171	0.182	0.199	0.253
0.38	0.01	0.124	0.134	0.153	0.211
1.00	0.01	0.044	0.056	0.075	0.139
3.00	0.01	-0.214	-0.199	-0.173	-0.091

TC200G SERIES

DATA SHEET

LD2P

LD2P

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	---

ITEM	WAVE_FORM
NEGLIMIT	<p>The diagram shows three signals: D, GN, and Q. D is a high pulse. GN is a pulse with a width labeled $t_w(L)$. Q is a series of five pulses.</p>

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	1.050

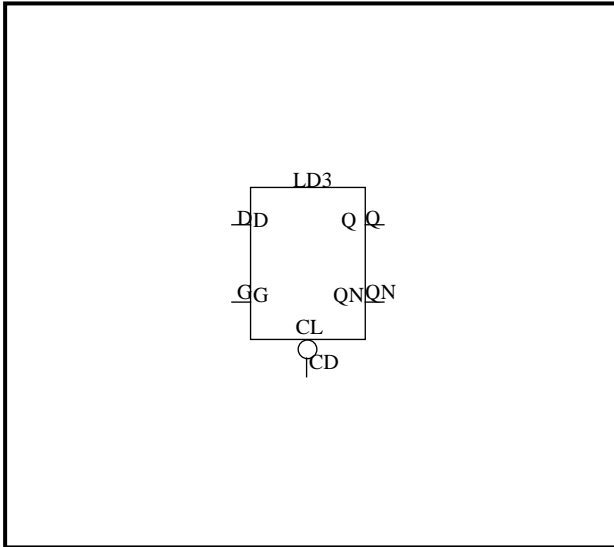
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TC200G SERIES

DATA SHEET

LD3		LD3		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD3	D-TYPE TRANSPARENT LATCH with CLEAR (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	G	D	Q	QN
L	X*	X	L	H
H	H	L	L	H
H	H	H	H	L
H	L	X	HOLD	

*:Consider the Hold Time of CLEAR

Verilog-HDL DESCRIPTION

```
LD3 inst(Q,QN,D,G,CD);
```

VHDL DESCRIPTION

```
inst:LD3
port map(Q,QN,D,G,CD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	1.01
G	0.99
CD	0.98

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	47.6	48.7

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TC200G SERIES

DATA SHEET

LD3

LD3

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0366	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.64	1.10
0.38	0.38	0.52	0.66	1.12
1.00	0.45	0.59	0.73	1.19
3.00	0.62	0.77	0.91	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.62	0.78	1.39
0.38	0.52	0.65	0.80	1.41
1.00	0.59	0.72	0.87	1.48
3.00	0.77	0.90	1.06	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0875	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.54	0.72	1.38
0.38	0.46	0.62	0.80	1.46
1.00	0.58	0.74	0.92	1.58
3.00	0.86	1.02	1.20	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0366	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.58	1.05
0.38	0.34	0.48	0.62	1.08
1.00	0.40	0.54	0.67	1.14
3.00	0.49	0.63	0.78	1.26

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TC200G SERIES

DATA SHEET

LD3

LD3

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.58	0.73	1.35
0.38	0.48	0.61	0.77	1.38
1.00	0.54	0.67	0.83	1.44
3.00	0.64	0.78	0.93	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0357	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.65	0.77	1.21
0.38	0.61	0.73	0.85	1.29
1.00	0.74	0.85	0.97	1.41
3.00	1.02	1.14	1.26	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0875	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.60	0.77	1.43
0.38	0.51	0.67	0.85	1.51
1.00	0.58	0.74	0.91	1.58
3.00	0.70	0.86	1.03	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0366	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.48	0.62	1.08
0.38	0.42	0.56	0.69	1.16
1.00	0.49	0.63	0.76	1.23
3.00	0.62	0.76	0.90	1.36

TC200G SERIES

DATA SHEET

LD3

LD3

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.62	0.77	1.39
0.38	0.56	0.69	0.85	1.46
1.00	0.63	0.76	0.92	1.53
3.00	0.76	0.90	1.05	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0357	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.70	0.83	1.26
0.38	0.66	0.78	0.90	1.34
1.00	0.73	0.85	0.97	1.40
3.00	0.85	0.97	1.09	1.52

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TC200G SERIES

DATA SHEET

LD3

LD3

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	G	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
	0.498	0.466	0.413	0.242
	0.533	0.501	0.449	0.280
	0.591	0.560	0.509	0.343
	0.778	0.749	0.701	0.545

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	G	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	NEGEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
	0.251	0.282	0.332	0.496
	0.219	0.249	0.299	0.462
	0.164	0.194	0.244	0.405
	-0.012	0.017	0.066	0.222

TC200G SERIES

DATA SHEET

LD3

LD3

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.481	0.449	0.396	0.224
0.38	0.38	0.542	0.511	0.458	0.288
1.00	1.00	0.645	0.615	0.563	0.396
3.00	3.00	0.978	0.949	0.901	0.745

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.293	0.309	0.334	0.416
0.38	0.38	0.272	0.287	0.313	0.397
1.00	1.00	0.235	0.251	0.278	0.365
3.00	3.00	0.118	0.136	0.166	0.263

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.409	0.396	0.373	0.300
0.38	0.38	0.433	0.419	0.395	0.319
1.00	1.00	0.472	0.457	0.432	0.352
3.00	3.00	0.597	0.580	0.551	0.457

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.269	0.300	0.352	0.519
0.38	0.38	0.208	0.239	0.290	0.456
1.00	1.00	0.106	0.137	0.187	0.351
3.00	3.00	-0.222	-0.194	-0.145	0.011

TC200G SERIES

DATA SHEET

LD3

LD3

7/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	CD

ITEM	WAVE_FORM
POSLIMIT	

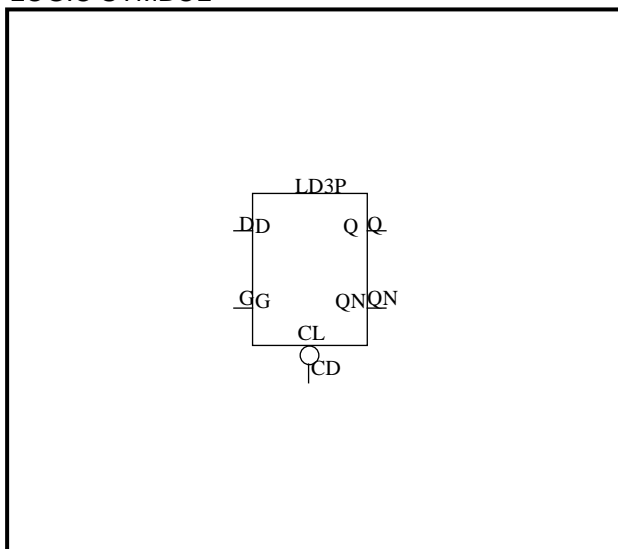
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

TC200G SERIES

DATA SHEET

LD3P		LD3P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD3P	D-TYPE TRANSPARENT LATCH with CLEAR (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	G	D	Q	QN
L	X*	X	L	H
H	H	L	L	H
H	H	H	H	L
H	L	X	HOLD	

*:Consider the Hold Time of CLEAR

Verilog-HDL DESCRIPTION

```
LD3P inst(Q,QN,D,G,CD);
```

VHDL DESCRIPTION

```
inst:LD3P
port map(Q,QN,D,G,CD);
```

ELECTRO MIGRATION

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD
D	1.01
G	0.99
CD	0.98

(LU)

OUTPUT DRIVE

PIN NAME	Q	QN
DRIVE	80.3	97.4

(LU)

TC200G SERIES

DATA SHEET

LD3P

LD3P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0227	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.46	0.55	0.85
0.38	0.38	0.48	0.57	0.87
1.00	0.45	0.55	0.64	0.94
3.00	0.63	0.73	0.83	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.63	0.71	1.02
0.38	0.58	0.65	0.73	1.04
1.00	0.65	0.72	0.80	1.11
3.00	0.85	0.92	1.00	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0516	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.50	0.60	0.98
0.38	0.49	0.58	0.68	1.06
1.00	0.61	0.70	0.80	1.18
3.00	0.91	1.00	1.10	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0227	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.40	0.50	0.80
0.38	0.35	0.44	0.53	0.83
1.00	0.41	0.50	0.59	0.89
3.00	0.51	0.61	0.70	1.01

TC200G SERIES

DATA SHEET

LD3P

LD3P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.66	0.98
0.38	0.55	0.62	0.70	1.01
1.00	0.61	0.68	0.76	1.07
3.00	0.73	0.80	0.88	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.70	0.78	1.02
0.38	0.71	0.78	0.86	1.10
1.00	0.84	0.91	0.98	1.23
3.00	1.14	1.21	1.29	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0516	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.55	0.65	1.03
0.38	0.53	0.62	0.73	1.11
1.00	0.60	0.69	0.79	1.17
3.00	0.72	0.81	0.91	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0227	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.44	0.53	0.83
0.38	0.42	0.51	0.61	0.90
1.00	0.49	0.58	0.68	0.98
3.00	0.62	0.71	0.81	1.11

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TC200G SERIES

DATA SHEET

LD3P

LD3P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.62	0.70	1.01
0.38	0.62	0.69	0.77	1.09
1.00	0.69	0.76	0.84	1.16
3.00	0.82	0.89	0.98	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.75	0.83	1.07
0.38	0.76	0.83	0.90	1.14
1.00	0.82	0.90	0.97	1.21
3.00	0.94	1.02	1.09	1.33

TC200G SERIES

DATA SHEET

LD3P

LD3P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	G	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	

SETUP (ns)					
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00	
DATA SLEW (ns)					
0.01	0.809	0.771	0.708	0.504	
0.38	0.847	0.810	0.747	0.544	
1.00	0.911	0.874	0.811	0.609	
3.00	1.118	1.081	1.020	0.821	

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	G	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	NEGEDGE	LOW	

HOLD (ns)					
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00	
DATA SLEW (ns)					
0.01	0.136	0.176	0.244	0.462	
0.38	0.099	0.139	0.206	0.422	
1.00	0.037	0.076	0.142	0.355	
3.00	-0.163	-0.126	-0.063	0.140	

TC200G SERIES

DATA SHEET

LD3P

LD3P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.780	0.742	0.679	0.475
0.38	0.38	0.849	0.812	0.749	0.545
1.00	1.00	0.965	0.928	0.865	0.663
3.00	3.00	1.341	1.304	1.242	1.044

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.189	0.214	0.255	0.387
0.38	0.38	0.153	0.177	0.219	0.353
1.00	1.00	0.092	0.117	0.159	0.295
3.00	3.00	-0.105	-0.079	-0.034	0.110

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.650	0.627	0.588	0.463
0.38	0.38	0.688	0.665	0.625	0.499
1.00	1.00	0.752	0.728	0.689	0.560
3.00	3.00	0.960	0.935	0.892	0.756

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.169	0.210	0.278	0.496
0.38	0.38	0.101	0.141	0.208	0.425
1.00	1.00	-0.015	0.025	0.091	0.305
3.00	3.00	-0.386	-0.349	-0.286	-0.083

TC200G SERIES

DATA SHEET

LD3P

LD3P

7/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	1.090

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	CD

ITEM	WAVE_FORM
POSLIMIT	

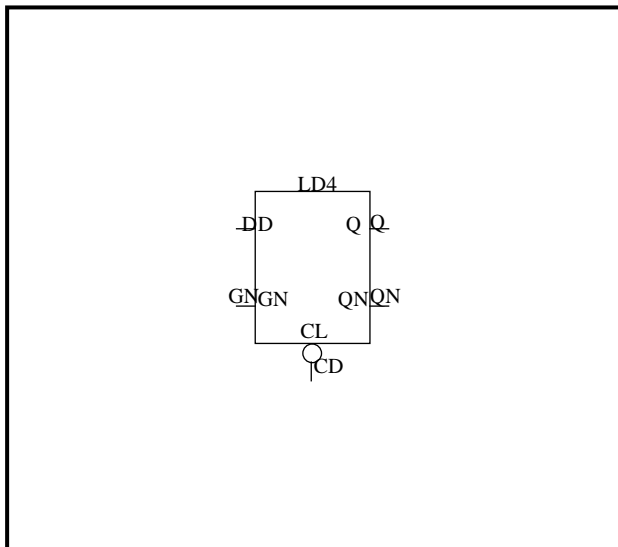
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	1.160

TC200G SERIES

DATA SHEET

LD4		LD4		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD4	D-TYPE TRANSPARENT LATCH with CLEAR (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	GN	D	Q	QN
L	X*	X	L	H
H	L	L	L	H
H	L	H	H	L
H	H	X	HOLD	

*:Consider the Hold Time of CLEAR

Verilog-HDL DESCRIPTION

```
LD4 inst(Q,QN,D,GN,CD);
```

VHDL DESCRIPTION

```
inst:LD4
port map(Q,QN,D,GN,CD);
```

ELECTRO MIGRATION

PIN NAME	(LU*MHz)
Q,QN	6880.0
ELECTRO MIGRATION DRIVE	

INPUT LOAD

PIN NAME	LOAD (LU)
D	1.01
GN	0.99
CD	0.98

OUTPUT DRIVE

PIN NAME	Q	QN
DRIVE	47.7	48.7

TC200G SERIES

DATA SHEET

LD4

LD4

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0366	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.50	0.64	1.10
0.38	0.38	0.52	0.66	1.12
1.00	0.45	0.59	0.73	1.19
3.00	0.62	0.77	0.91	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.62	0.78	1.39
0.38	0.52	0.65	0.80	1.41
1.00	0.58	0.71	0.87	1.48
3.00	0.77	0.90	1.05	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0875	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.54	0.72	1.38
0.38	0.47	0.62	0.80	1.46
1.00	0.58	0.74	0.92	1.58
3.00	0.86	1.02	1.20	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0366	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.58	1.04
0.38	0.34	0.48	0.61	1.08
1.00	0.40	0.53	0.67	1.14
3.00	0.48	0.63	0.78	1.25

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TC200G SERIES

DATA SHEET

LD4

LD4

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.58	0.73	1.35
0.38	0.48	0.61	0.77	1.38
1.00	0.54	0.67	0.83	1.44
3.00	0.64	0.77	0.93	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0356	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.65	0.77	1.21
0.38	0.62	0.73	0.85	1.29
1.00	0.74	0.85	0.97	1.41
3.00	1.02	1.14	1.26	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0875	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.61	0.79	1.45
0.38	0.49	0.64	0.82	1.48
1.00	0.55	0.71	0.89	1.55
3.00	0.68	0.84	1.01	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0366	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.53	0.66	1.13
0.38	0.42	0.56	0.70	1.16
1.00	0.49	0.62	0.76	1.22
3.00	0.61	0.75	0.88	1.35

TC200G SERIES

DATA SHEET

LD4

LD4

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0885	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.66	0.82	1.43
0.38	0.57	0.70	0.85	1.47
1.00	0.63	0.76	0.92	1.53
3.00	0.75	0.89	1.04	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0356	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.72	0.84	1.28
0.38	0.64	0.75	0.87	1.31
1.00	0.70	0.82	0.94	1.38
3.00	0.83	0.94	1.07	1.50

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TC200G SERIES

DATA SHEET

LD4

LD4

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	GN	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.566	0.550	0.524	0.437
0.38	0.600	0.584	0.557	0.468
1.00	0.657	0.640	0.612	0.520
3.00	0.840	0.821	0.790	0.688

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	GN	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.171	0.182	0.201	0.261
0.38	0.140	0.151	0.170	0.231
1.00	0.087	0.098	0.118	0.181
3.00	-0.085	-0.072	-0.050	0.020

TC200G SERIES

DATA SHEET

LD4

LD4

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.541	0.526	0.501	0.419
0.38	0.38	0.603	0.587	0.561	0.475
1.00	1.00	0.707	0.690	0.661	0.570
3.00	3.00	1.040	1.020	0.986	0.876

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.267	0.296	0.346	0.506
0.38	0.38	0.242	0.271	0.321	0.479
1.00	1.00	0.201	0.230	0.278	0.434
3.00	3.00	0.067	0.095	0.141	0.290

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.412	0.383	0.334	0.177
0.38	0.38	0.437	0.409	0.360	0.205
1.00	1.00	0.480	0.452	0.404	0.251
3.00	3.00	0.618	0.591	0.546	0.401

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.190	0.201	0.219	0.278
0.38	0.38	0.131	0.142	0.161	0.223
1.00	1.00	0.031	0.043	0.064	0.130
3.00	3.00	-0.290	-0.275	-0.250	-0.167

TC200G SERIES

DATA SHEET

LD4

LD4

7/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	CD

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.780

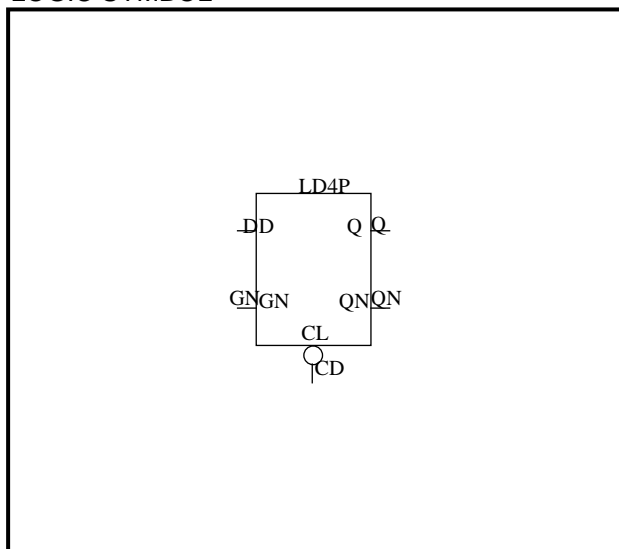
Rev.1.01.10

TC200G SERIES

DATA SHEET

LD4P		LD4P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LD4P	D-TYPE TRANSPARENT LATCH with CLEAR (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	GN	D	Q	QN
L	X*	X	L	H
H	L	L	L	H
H	L	H	H	L
H	H	X	HOLD	

*:Consider the Hold Time of CLEAR

Verilog-HDL DESCRIPTION

```
LD4P inst(Q,QN,D,GN,CD);
```

VHDL DESCRIPTION

```
inst:LD4P
port map(Q,QN,D,GN,CD);
```

ELECTRO MIGRATION

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
D	1.01
GN	0.99
CD	0.98

OUTPUT DRIVE

PIN NAME	Q	QN
DRIVE	80.5	97.4

(LU)

TC200G SERIES

DATA SHEET

LD4P

LD4P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0225	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.46	0.55	0.85
0.38	0.38	0.48	0.57	0.87
1.00	0.45	0.55	0.64	0.93
3.00	0.62	0.73	0.83	1.13

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.63	0.71	1.02
0.38	0.58	0.65	0.73	1.04
1.00	0.65	0.72	0.80	1.11
3.00	0.85	0.92	1.00	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0517	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.50	0.60	0.98
0.38	0.49	0.58	0.68	1.06
1.00	0.61	0.70	0.81	1.18
3.00	0.91	1.00	1.10	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0225	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.40	0.49	0.79
0.38	0.35	0.44	0.53	0.83
1.00	0.41	0.50	0.59	0.89
3.00	0.51	0.60	0.70	1.01

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TC200G SERIES

DATA SHEET

LD4P

LD4P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.66	0.98
0.38	0.55	0.62	0.70	1.01
1.00	0.61	0.68	0.76	1.07
3.00	0.73	0.80	0.88	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.71	0.78	1.02
0.38	0.71	0.79	0.86	1.10
1.00	0.84	0.91	0.98	1.23
3.00	1.14	1.21	1.29	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0517	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.67	1.05
0.38	0.51	0.60	0.71	1.09
1.00	0.57	0.67	0.77	1.15
3.00	0.70	0.79	0.90	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0225	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.48	0.57	0.87
0.38	0.42	0.51	0.61	0.91
1.00	0.49	0.58	0.67	0.97
3.00	0.61	0.70	0.80	1.09

Rev.1.01.10

TC200G SERIES

DATA SHEET

LD4P

LD4P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.66	0.74	1.05
0.38	0.62	0.69	0.78	1.09
1.00	0.69	0.76	0.84	1.15
3.00	0.81	0.88	0.96	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0180	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.70	0.78	0.85	1.09
0.38	0.74	0.81	0.88	1.12
1.00	0.80	0.87	0.95	1.19
3.00	0.93	1.00	1.07	1.32

TC200G SERIES

DATA SHEET

LD4P

LD4P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	GN	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.929	0.904	0.862	0.725
0.38	0.968	0.942	0.899	0.761
1.00	1.032	1.006	0.962	0.821
3.00	1.239	1.212	1.166	1.016

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	GN	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.028	-0.015	0.007	0.079
0.38	-0.063	-0.050	-0.027	0.046
1.00	-0.123	-0.109	-0.085	-0.010
3.00	-0.314	-0.299	-0.273	-0.191

TC200G SERIES

DATA SHEET

LD4P

LD4P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.900	0.874	0.832	0.696
0.38	0.38	0.968	0.943	0.900	0.762
1.00	1.00	1.084	1.058	1.014	0.874
3.00	3.00	1.456	1.428	1.382	1.234

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.091	0.123	0.176	0.348
0.38	0.38	0.053	0.085	0.138	0.309
1.00	1.00	-0.012	0.020	0.073	0.244
3.00	3.00	-0.220	-0.189	-0.137	0.032

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.681	0.652	0.602	0.443
0.38	0.38	0.720	0.691	0.641	0.482
1.00	1.00	0.786	0.757	0.707	0.547
3.00	3.00	0.998	0.969	0.919	0.759

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.001	0.015	0.037	0.108
0.38	0.38	-0.065	-0.051	-0.028	0.046
1.00	1.00	-0.177	-0.162	-0.138	-0.059
3.00	3.00	-0.537	-0.519	-0.490	-0.395

TC200G SERIES

DATA SHEET

LD4P

LD4P

7/7

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	1.090

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	CD

ITEM	WAVE_FORM
NEGLIMIT	

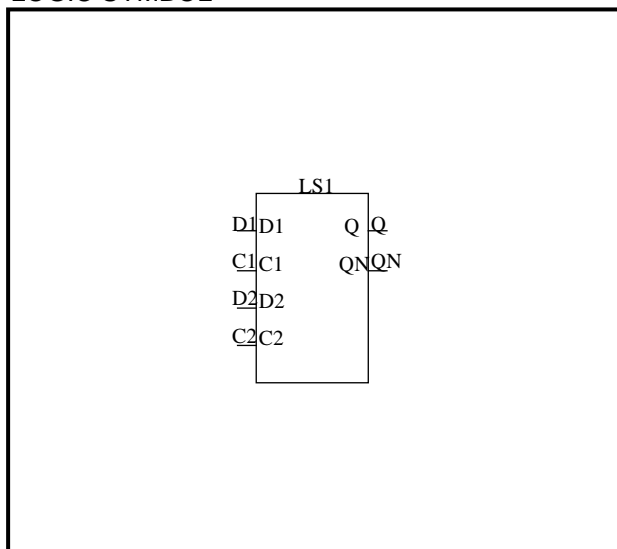
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	1.200

TC200G SERIES

DATA SHEET

LS1		LS1		1/14
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LS1	D-TYPE TRANSPARENT LATCH with SCAN TEST INPUT	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
D1	C1	D2	C2	Q	QN
L	H	X	L	L	H
H	H	X	L	H	L
X	L	L	H	L	H
X	L	H	H	H	L
X	L	X	L	HOLD	
H	H	X	H	H	L
X	H	H	H	H	L
L	H	L	H	L	H

Verilog-HDL DESCRIPTION

```
LS1 inst(Q,QN,D1,C1,D2,C2);
```

VHDL DESCRIPTION

```
inst:LS1
port map(Q,QN,D1,C1,D2,C2);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D1	0.98
C1	2.00
D2	0.99
C2	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	41.7	50.2

TC200G SERIES

DATA SHEET

LS1

LS1

2/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.59	0.78	1.49
0.38	0.47	0.64	0.83	1.54
1.00	0.55	0.72	0.91	1.62
3.00	0.70	0.87	1.06	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.90	1.08	1.66
0.38	0.70	0.89	1.07	1.66
1.00	0.72	0.91	1.09	1.68
3.00	0.86	1.06	1.24	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.66	0.85	1.56
0.38	0.56	0.73	0.92	1.62
1.00	0.64	0.81	1.00	1.70
3.00	0.81	0.98	1.18	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.55	0.71	1.26
0.38	0.46	0.63	0.79	1.34
1.00	0.53	0.70	0.86	1.41
3.00	0.64	0.81	0.96	1.51

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TC200G SERIES

DATA SHEET

LS1

LS1

3/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.88	1.02	1.17	1.78
0.38	0.88	1.01	1.17	1.78
1.00	0.89	1.03	1.19	1.80
3.00	1.04	1.18	1.34	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.69	0.80	1.23
0.38	0.63	0.74	0.86	1.28
1.00	0.70	0.82	0.93	1.36
3.00	0.86	0.97	1.09	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.75	0.87	1.29
0.38	0.71	0.82	0.94	1.36
1.00	0.79	0.90	1.02	1.44
3.00	0.97	1.08	1.20	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.00	0.06	0.33	1.06
0.38	0.01	0.31	0.53	1.30
1.00	0.98	1.00	1.04	1.60
3.00	0.76	1.10	1.18	1.71

TC200G SERIES

DATA SHEET

LS1

LS1

4/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.59	0.78	1.49
0.38	0.47	0.64	0.84	1.54
1.00	0.54	0.72	0.91	1.62
3.00	0.67	0.84	1.04	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.83	1.01	1.59
0.38	0.65	0.84	1.02	1.60
1.00	0.72	0.91	1.09	1.67
3.00	0.98	1.17	1.35	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.65	0.85	1.55
0.38	0.55	0.72	0.92	1.63
1.00	0.62	0.79	0.99	1.69
3.00	0.76	0.94	1.13	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.54	0.70	1.25
0.38	0.45	0.62	0.78	1.33
1.00	0.51	0.68	0.84	1.39
3.00	0.58	0.75	0.91	1.45

TC200G SERIES

DATA SHEET

LS1

LS1

5/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.95	1.11	1.71
0.38	0.82	0.96	1.12	1.72
1.00	0.89	1.03	1.19	1.80
3.00	1.16	1.29	1.45	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.68	0.80	1.22
0.38	0.63	0.74	0.86	1.28
1.00	0.70	0.81	0.93	1.36
3.00	0.83	0.95	1.07	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.65	0.81	1.42
0.38	0.60	0.73	0.89	1.50
1.00	0.66	0.79	0.95	1.56
3.00	0.72	0.86	1.02	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.75	0.87	1.29
0.38	0.71	0.82	0.94	1.36
1.00	0.78	0.89	1.01	1.43
3.00	0.93	1.04	1.16	1.58

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TC200G SERIES

DATA SHEET

LS1

LS1

6/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.58	0.77	1.48
0.38	0.49	0.66	0.85	1.55
1.00	0.60	0.77	0.96	1.66
3.00	0.82	0.99	1.18	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.81	0.99	1.56
0.38	0.62	0.81	0.99	1.56
1.00	0.64	0.83	1.00	1.58
3.00	0.75	0.94	1.12	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.60	0.79	1.50
0.38	0.51	0.68	0.87	1.57
1.00	0.62	0.79	0.98	1.69
3.00	0.86	1.03	1.22	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.88	1.05	1.63
0.38	0.68	0.87	1.05	1.63
1.00	0.70	0.89	1.07	1.64
3.00	0.81	1.00	1.18	1.76

TC200G SERIES

DATA SHEET

LS1

LS1

7/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.59	0.78	1.49
0.38	0.50	0.67	0.86	1.57
1.00	0.62	0.79	0.98	1.68
3.00	0.86	1.03	1.22	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.70	0.87	1.42
0.38	0.53	0.71	0.87	1.43
1.00	0.56	0.74	0.91	1.47
3.00	0.68	0.87	1.04	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.93	1.09	1.69
0.38	0.79	0.93	1.08	1.69
1.00	0.81	0.94	1.10	1.71
3.00	0.92	1.06	1.22	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.68	0.79	1.22
0.38	0.64	0.75	0.87	1.30
1.00	0.75	0.87	0.98	1.41
3.00	0.98	1.10	1.22	1.64

TC200G SERIES

DATA SHEET

LS1

LS1

8/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.99	1.15	1.76
0.38	0.85	0.99	1.15	1.76
1.00	0.87	1.00	1.16	1.77
3.00	0.98	1.12	1.28	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.70	0.81	1.24
0.38	0.66	0.77	0.89	1.31
1.00	0.78	0.89	1.01	1.43
3.00	1.02	1.13	1.25	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.81	0.97	1.58
0.38	0.69	0.82	0.98	1.59
1.00	0.72	0.86	1.01	1.62
3.00	0.85	0.98	1.14	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.69	0.80	1.23
0.38	0.65	0.77	0.88	1.31
1.00	0.77	0.88	1.00	1.43
3.00	1.02	1.13	1.25	1.68

TC200G SERIES

DATA SHEET

LS1

LS1

9/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.58	0.77	1.48
0.38	0.48	0.65	0.85	1.55
1.00	0.58	0.75	0.95	1.65
3.00	0.77	0.94	1.13	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.77	0.94	1.52
0.38	0.60	0.79	0.96	1.53
1.00	0.67	0.85	1.03	1.60
3.00	0.90	1.09	1.27	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.59	0.79	1.50
0.38	0.50	0.67	0.87	1.58
1.00	0.61	0.78	0.97	1.68
3.00	0.80	0.97	1.17	1.88

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.85	1.03	1.62
0.38	0.68	0.87	1.05	1.63
1.00	0.74	0.94	1.12	1.70
3.00	0.99	1.18	1.37	1.95

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1

LS1

10/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0977	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.58	0.77	1.48
0.38	0.48	0.65	0.85	1.55
1.00	0.58	0.76	0.95	1.65
3.00	0.79	0.96	1.15	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0433	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.67	0.84	1.40
0.38	0.52	0.69	0.86	1.42
1.00	0.59	0.76	0.93	1.49
3.00	0.79	0.97	1.14	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.89	1.04	1.65
0.38	0.77	0.90	1.06	1.67
1.00	0.84	0.97	1.13	1.74
3.00	1.08	1.21	1.37	1.98

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.67	0.79	1.21
0.38	0.64	0.75	0.87	1.29
1.00	0.74	0.85	0.97	1.39
3.00	0.93	1.05	1.17	1.59

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1

LS1

11/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.97	1.13	1.74
0.38	0.85	0.98	1.14	1.75
1.00	0.92	1.05	1.21	1.82
3.00	1.17	1.30	1.46	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.69	0.81	1.23
0.38	0.66	0.77	0.89	1.31
1.00	0.76	0.88	1.00	1.42
3.00	0.97	1.08	1.20	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0859	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.79	0.95	1.56
0.38	0.68	0.81	0.97	1.58
1.00	0.75	0.88	1.04	1.65
3.00	0.96	1.09	1.25	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0342	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.67	0.79	1.21
0.38	0.64	0.75	0.87	1.29
1.00	0.74	0.85	0.97	1.40
3.00	0.95	1.07	1.19	1.61

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1

LS1

12/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.539	0.510	0.461	0.304
0.38	0.01	0.560	0.527	0.474	0.301
1.00	0.01	0.595	0.558	0.495	0.295
3.00	0.01	0.708	0.654	0.565	0.276

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.165	0.121	0.046	-0.194
0.38	0.01	0.109	0.065	-0.008	-0.244
1.00	0.01	0.015	-0.027	-0.098	-0.328
3.00	0.01	-0.287	-0.326	-0.390	-0.599

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.555	0.596	0.663	0.881
0.38	0.01	0.613	0.653	0.719	0.933
1.00	0.01	0.711	0.749	0.813	1.020
3.00	0.01	1.024	1.059	1.116	1.302

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.223	0.252	0.300	0.457
0.38	0.01	0.205	0.237	0.292	0.468
1.00	0.01	0.174	0.213	0.278	0.486
3.00	0.01	0.077	0.134	0.231	0.544

TC200G SERIES

DATA SHEET

LS1

LS1

13/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.531	0.490	0.422	0.200
0.38	0.01	0.569	0.526	0.453	0.220
1.00	0.01	0.632	0.585	0.507	0.253
3.00	0.01	0.837	0.778	0.678	0.358

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.169	0.132	0.068	-0.135
0.38	0.01	0.121	0.084	0.023	-0.174
1.00	0.01	0.040	0.005	-0.053	-0.240
3.00	0.01	-0.222	-0.251	-0.298	-0.452

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.555	0.590	0.648	0.833
0.38	0.01	0.607	0.640	0.696	0.876
1.00	0.01	0.693	0.725	0.777	0.948
3.00	0.01	0.972	0.997	1.040	1.178

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.223	0.266	0.337	0.568
0.38	0.01	0.188	0.233	0.309	0.553
1.00	0.01	0.130	0.179	0.262	0.529
3.00	0.01	-0.058	0.005	0.110	0.450

TC200G SERIES
DATA SHEET

LS1

LS1

14/14

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C1	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.910

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C2	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.930

Rev.1.01.10

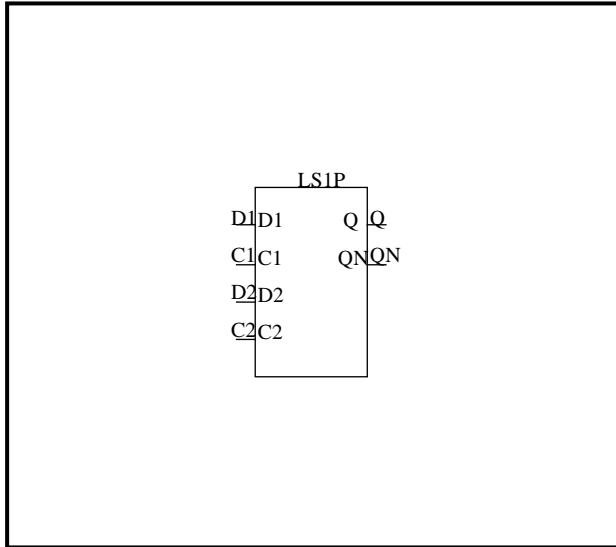
TC200G SERIES

DATA SHEET

LS1P		LS1P		1/14
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CELL NAME	FUNCTION	CELL COUNT		CONDITION
LS1P	D-TYPE TRANSPARENT LATCH with SCAN TEST INPUT	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
D1	C1	D2	C2	Q	QN
L	H	X	L	L	H
H	H	X	L	H	L
X	L	L	H	L	H
X	L	H	H	H	L
X	L	X	L	HOLD	
H	H	X	H	H	L
X	H	H	H	H	L
L	H	L	H	L	H

Verilog-HDL DESCRIPTION

```
LS1P inst(Q,QN,D1,C1,D2,C2);
```

VHDL DESCRIPTION

```
inst:LS1P
port map(Q,QN,D1,C1,D2,C2);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q	QN
ELECTRO MIGRATION DRIVE	6880.0	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D1	0.98
C1	2.00
D2	0.99
C2	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	73.0	98.0

TC200G SERIES

DATA SHEET

LS1P

LS1P

2/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.01
0.38	0.47	0.57	0.67	1.06
1.00	0.55	0.64	0.75	1.14
3.00	0.71	0.80	0.91	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.84	0.96	1.34
0.38	0.71	0.83	0.95	1.33
1.00	0.73	0.85	0.97	1.35
3.00	0.87	0.99	1.12	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.58	0.68	1.07
0.38	0.55	0.65	0.75	1.14
1.00	0.63	0.73	0.83	1.22
3.00	0.81	0.91	1.02	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.58	0.93
0.38	0.44	0.55	0.66	1.01
1.00	0.51	0.62	0.73	1.08
3.00	0.62	0.73	0.83	1.18

TC200G SERIES

DATA SHEET

LS1P

LS1P

3/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.99	1.06	1.15	1.46
0.38	0.99	1.06	1.14	1.46
1.00	1.00	1.08	1.16	1.48
3.00	1.15	1.22	1.31	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.72	0.79	1.03
0.38	0.70	0.77	0.84	1.09
1.00	0.78	0.85	0.92	1.17
3.00	0.95	1.02	1.09	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.66	0.74	1.06
0.38	0.67	0.74	0.82	1.14
1.00	0.74	0.81	0.89	1.21
3.00	0.84	0.91	1.00	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->QN	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.78	0.85	1.09
0.38	0.78	0.85	0.92	1.16
1.00	0.86	0.93	1.00	1.24
3.00	1.05	1.12	1.20	1.44

TC200G SERIES

DATA SHEET

LS1P

LS1P

4/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.01
0.38	0.47	0.57	0.67	1.07
1.00	0.55	0.64	0.75	1.14
3.00	0.69	0.78	0.89	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.77	0.89	1.26
0.38	0.65	0.78	0.90	1.27
1.00	0.73	0.85	0.97	1.34
3.00	0.99	1.11	1.23	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.68	1.07
0.38	0.55	0.64	0.75	1.15
1.00	0.62	0.71	0.82	1.22
3.00	0.77	0.87	0.98	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.57	0.93
0.38	0.43	0.54	0.65	1.00
1.00	0.49	0.60	0.71	1.06
3.00	0.56	0.67	0.78	1.13

TC200G SERIES

DATA SHEET

LS1P

LS1P

5/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	0.99	1.07	1.39
0.38	0.93	1.00	1.08	1.40
1.00	1.00	1.07	1.15	1.47
3.00	1.27	1.34	1.43	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.72	0.79	1.04
0.38	0.70	0.78	0.85	1.09
1.00	0.78	0.86	0.93	1.17
3.00	0.93	1.01	1.08	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.66	0.74	1.06
0.38	0.66	0.74	0.82	1.14
1.00	0.72	0.80	0.88	1.20
3.00	0.79	0.86	0.94	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->QN	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.78	0.86	1.10
0.38	0.78	0.85	0.93	1.17
1.00	0.85	0.93	1.00	1.24
3.00	1.01	1.09	1.16	1.41

TC200G SERIES

DATA SHEET

LS1P

LS1P

6/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.50	0.61	1.00
0.38	0.49	0.58	0.69	1.08
1.00	0.60	0.69	0.80	1.19
3.00	0.84	0.94	1.04	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.75	0.87	1.24
0.38	0.63	0.75	0.87	1.24
1.00	0.65	0.77	0.88	1.25
3.00	0.76	0.88	1.00	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.52	0.63	1.02
0.38	0.50	0.60	0.70	1.09
1.00	0.62	0.72	0.82	1.21
3.00	0.87	0.97	1.07	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.81	0.93	1.31
0.38	0.69	0.81	0.93	1.31
1.00	0.70	0.82	0.94	1.32
3.00	0.81	0.93	1.06	1.43

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1P

LS1P

7/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.01
0.38	0.50	0.59	0.70	1.09
1.00	0.62	0.71	0.82	1.21
3.00	0.88	0.97	1.07	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.63	0.74	1.10
0.38	0.52	0.64	0.75	1.11
1.00	0.56	0.67	0.78	1.14
3.00	0.68	0.80	0.91	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.90	0.97	1.05	1.37
0.38	0.90	0.97	1.05	1.37
1.00	0.91	0.99	1.07	1.38
3.00	1.03	1.10	1.19	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.71	0.78	1.02
0.38	0.71	0.79	0.86	1.10
1.00	0.83	0.90	0.97	1.22
3.00	1.08	1.15	1.23	1.47

TC200G SERIES

DATA SHEET

LS1P

LS1P

8/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.96	1.03	1.12	1.43
0.38	0.96	1.03	1.12	1.43
1.00	0.97	1.05	1.13	1.45
3.00	1.09	1.16	1.25	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.73	0.80	1.04
0.38	0.73	0.80	0.88	1.12
1.00	0.85	0.92	1.00	1.24
3.00	1.11	1.19	1.26	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.83	0.92	1.23
0.38	0.77	0.84	0.92	1.24
1.00	0.80	0.88	0.96	1.27
3.00	0.94	1.01	1.10	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->QN	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.72	0.79	1.03
0.38	0.72	0.80	0.87	1.11
1.00	0.84	0.92	0.99	1.23
3.00	1.11	1.19	1.26	1.50

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1P

LS1P

9/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.50	0.61	1.00
0.38	0.48	0.58	0.69	1.08
1.00	0.59	0.68	0.79	1.18
3.00	0.79	0.89	1.00	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.71	0.83	1.20
0.38	0.61	0.73	0.84	1.21
1.00	0.67	0.79	0.91	1.28
3.00	0.91	1.04	1.15	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.52	0.62	1.02
0.38	0.50	0.60	0.70	1.10
1.00	0.61	0.71	0.81	1.21
3.00	0.82	0.92	1.03	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.79	0.91	1.29
0.38	0.68	0.81	0.93	1.31
1.00	0.75	0.87	0.99	1.37
3.00	1.00	1.12	1.25	1.63

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1P

LS1P

10/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0541	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.50	0.61	1.00
0.38	0.48	0.58	0.68	1.08
1.00	0.59	0.68	0.79	1.18
3.00	0.81	0.91	1.01	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.61	0.72	1.07
0.38	0.52	0.63	0.74	1.10
1.00	0.59	0.70	0.81	1.17
3.00	0.79	0.91	1.02	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.93	1.01	1.33
0.38	0.87	0.95	1.03	1.34
1.00	0.94	1.01	1.10	1.41
3.00	1.19	1.27	1.35	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.71	0.78	1.02
0.38	0.71	0.79	0.86	1.10
1.00	0.82	0.90	0.97	1.21
3.00	1.04	1.11	1.19	1.43

TC200G SERIES

DATA SHEET

LS1P

LS1P

11/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.94	1.02	1.10	1.42
0.38	0.96	1.03	1.12	1.43
1.00	1.03	1.10	1.18	1.50
3.00	1.28	1.36	1.44	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.73	0.80	1.04
0.38	0.73	0.81	0.88	1.12
1.00	0.84	0.92	0.99	1.23
3.00	1.07	1.15	1.22	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0440	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.81	0.90	1.21
0.38	0.76	0.83	0.92	1.23
1.00	0.83	0.90	0.99	1.30
3.00	1.06	1.13	1.21	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->QN	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0177	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.71	0.78	1.02
0.38	0.71	0.79	0.86	1.10
1.00	0.82	0.90	0.97	1.21
3.00	1.05	1.13	1.20	1.45

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS1P

LS1P

12/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.620	0.591	0.541	0.382
0.38	0.643	0.611	0.557	0.385
1.00	0.680	0.644	0.584	0.389
3.00	0.802	0.752	0.670	0.405

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.129	0.083	0.006	-0.243
0.38	0.071	0.026	-0.050	-0.294
1.00	-0.026	-0.070	-0.143	-0.380
3.00	-0.340	-0.379	-0.445	-0.657

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.632	0.671	0.735	0.944
0.38	0.692	0.730	0.794	0.999
1.00	0.793	0.830	0.891	1.090
3.00	1.118	1.151	1.206	1.384

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.200	0.229	0.279	0.438
0.38	0.181	0.214	0.269	0.447
1.00	0.149	0.188	0.253	0.462
3.00	0.048	0.105	0.200	0.509

TC200G SERIES

DATA SHEET

LS1P

LS1P

13/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.626	0.583	0.512	0.282
0.38	0.01	0.665	0.621	0.547	0.308
1.00	0.01	0.731	0.684	0.605	0.352
3.00	0.01	0.942	0.887	0.794	0.493

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.136	0.096	0.028	-0.189
0.38	0.01	0.084	0.045	-0.020	-0.231
1.00	0.01	-0.002	-0.039	-0.101	-0.301
3.00	0.01	-0.281	-0.311	-0.363	-0.528

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.639	0.672	0.729	0.910
0.38	0.01	0.693	0.726	0.780	0.956
1.00	0.01	0.784	0.815	0.867	1.033
3.00	0.01	1.077	1.103	1.145	1.284

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.207	0.249	0.320	0.549
0.38	0.01	0.171	0.215	0.290	0.531
1.00	0.01	0.110	0.158	0.239	0.501
3.00	0.01	-0.087	-0.026	0.075	0.404

TC200G SERIES

DATA SHEET

LS1P

LS1P

14/14

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C1	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.980

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C2	---

ITEM	WAVE_FORM
POSLIMIT	

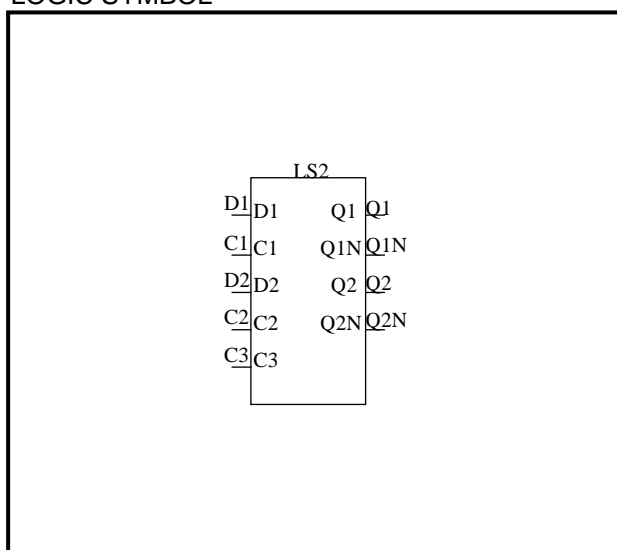
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	1.000

TC200G SERIES

DATA SHEET

LS2		LS2		1/27
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LS2	D-TYPE TRANSPARENT LATCH with SCAN TEST INPUT	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT			
D1	C1	D2	C2	C3	Q1	Q1N	Q2	Q2N
L	H	X	L	-	L	H	-	-
H	H	X	L	-	H	L	-	-
X	L	L	H	-	L	H	-	-
X	L	H	H	-	H	L	-	-
X	L	X	L	-	HOLD	HOLD	-	-
H	H	X	H	-	H	L	-	-
X	H	H	H	-	H	L	-	-
L	H	L	H	-	L	H	-	-
-	-	-	-	H	-	-	Q1	Q1N
-	-	-	-	L	-	-	HOLD	HOLD

Verilog-HDL DESCRIPTION

```
LS2 inst(Q1,Q1N,Q2,Q2N,D1,C1,D2,
C2,C3);
```

VHDL DESCRIPTION

```
inst:LS2
port map(Q1,Q1N,Q2,Q2N,D1,
C1,D2,C2,C3);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q1,Q1N,Q2,Q2N
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D1	0.98
C1	2.00
D2,C3	0.99
C2	1.97

OUTPUT DRIVE

(LU)

PIN NAME	Q1	Q1N	Q2	Q2N
DRIVE	40.9	49.4	50.2	42.1

TC200G SERIES

DATA SHEET

LS2

LS2

2/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.60	0.80	1.52
0.38	0.47	0.65	0.85	1.57
1.00	0.55	0.73	0.92	1.64
3.00	0.69	0.88	1.07	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.91	1.10	1.68
0.38	0.70	0.90	1.09	1.68
1.00	0.72	0.92	1.11	1.69
3.00	0.86	1.07	1.26	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.67	0.86	1.58
0.38	0.55	0.73	0.93	1.65
1.00	0.63	0.81	1.01	1.73
3.00	0.80	0.99	1.18	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.55	0.72	1.28
0.38	0.46	0.63	0.80	1.35
1.00	0.53	0.70	0.87	1.42
3.00	0.64	0.81	0.98	1.52

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2

LS2

3/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.05	1.20	1.37	1.99
0.38	1.05	1.19	1.36	1.98
1.00	1.07	1.21	1.38	2.00
3.00	1.22	1.36	1.53	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.89	1.03	1.49
0.38	0.79	0.94	1.08	1.54
1.00	0.87	1.01	1.15	1.62
3.00	1.02	1.17	1.31	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.82	0.99	1.61
0.38	0.75	0.90	1.07	1.69
1.00	0.82	0.97	1.14	1.76
3.00	0.93	1.07	1.24	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.95	1.09	1.55
0.38	0.87	1.02	1.15	1.62
1.00	0.95	1.09	1.23	1.70
3.00	1.13	1.28	1.42	1.88

TC200G SERIES

DATA SHEET

LS2

LS2

4/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.98	1.11	1.27	1.88
0.38	1.03	1.16	1.32	1.93
1.00	1.11	1.24	1.40	2.01
3.00	1.26	1.40	1.55	2.16

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.29	1.40	1.52	1.95
0.38	1.28	1.40	1.52	1.94
1.00	1.30	1.42	1.53	1.96
3.00	1.45	1.57	1.68	2.11

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	~C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.04	1.17	1.33	1.94
0.38	1.11	1.24	1.40	2.01
1.00	1.19	1.32	1.48	2.09
3.00	1.37	1.50	1.66	2.27

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	~C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.91	1.03	1.14	1.57
0.38	0.99	1.10	1.22	1.65
1.00	1.06	1.18	1.29	1.72
3.00	1.17	1.28	1.40	1.82

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2

LS2

5/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.14	1.31	1.50	2.20
0.38	1.13	1.30	1.49	2.19
1.00	1.15	1.32	1.51	2.21
3.00	1.30	1.47	1.66	2.36

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.99	1.16	1.70
0.38	0.87	1.05	1.21	1.75
1.00	0.95	1.12	1.29	1.83
3.00	1.10	1.28	1.44	1.99

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	~C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.93	1.12	1.82
0.38	0.84	1.01	1.20	1.90
1.00	0.91	1.08	1.27	1.97
3.00	1.01	1.18	1.37	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	~C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.88	1.06	1.22	1.76
0.38	0.95	1.12	1.29	1.83
1.00	1.03	1.20	1.37	1.91
3.00	1.21	1.38	1.55	2.09

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2

LS2

6/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.97	1.11	1.27	1.87
0.38	1.03	1.17	1.32	1.93
1.00	1.11	1.24	1.40	2.01
3.00	1.24	1.38	1.53	2.14

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.22	1.33	1.45	1.88
0.38	1.23	1.34	1.46	1.88
1.00	1.30	1.42	1.53	1.96
3.00	1.57	1.68	1.80	2.22

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	~C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.04	1.17	1.33	1.94
0.38	1.11	1.24	1.40	2.01
1.00	1.18	1.31	1.47	2.08
3.00	1.33	1.47	1.62	2.23

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	~C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.91	1.02	1.14	1.56
0.38	0.98	1.10	1.21	1.64
1.00	1.04	1.16	1.28	1.70
3.00	1.11	1.22	1.34	1.77

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TC200G SERIES

DATA SHEET

LS2

LS2

7/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.07	1.24	1.43	2.13
0.38	1.07	1.25	1.44	2.14
1.00	1.15	1.32	1.51	2.21
3.00	1.41	1.58	1.77	2.48

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.99	1.15	1.70
0.38	0.87	1.05	1.21	1.76
1.00	0.95	1.12	1.29	1.83
3.00	1.08	1.26	1.42	1.97

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	~C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.92	1.11	1.82
0.38	0.83	1.00	1.19	1.90
1.00	0.89	1.06	1.25	1.96
3.00	0.96	1.13	1.32	2.02

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	~C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.88	1.05	1.22	1.76
0.38	0.95	1.13	1.29	1.83
1.00	1.02	1.20	1.36	1.90
3.00	1.17	1.35	1.51	2.06

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TC200G SERIES

DATA SHEET

LS2

LS2

8/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.60	0.80	1.52
0.38	0.48	0.66	0.86	1.58
1.00	0.55	0.73	0.93	1.65
3.00	0.68	0.86	1.06	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.84	1.03	1.61
0.38	0.66	0.86	1.05	1.63
1.00	0.73	0.93	1.12	1.70
3.00	0.99	1.19	1.38	1.97

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.66	0.86	1.58
0.38	0.55	0.73	0.93	1.65
1.00	0.62	0.80	1.00	1.72
3.00	0.76	0.95	1.15	1.88

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.55	0.72	1.27
0.38	0.45	0.63	0.79	1.34
1.00	0.51	0.69	0.85	1.40
3.00	0.58	0.75	0.92	1.47

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TC200G SERIES

DATA SHEET

LS2

LS2

9/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.99	1.14	1.31	1.93
0.38	1.00	1.15	1.32	1.94
1.00	1.08	1.23	1.39	2.01
3.00	1.35	1.49	1.66	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.89	1.03	1.50
0.38	0.80	0.95	1.09	1.55
1.00	0.87	1.02	1.16	1.63
3.00	1.01	1.16	1.30	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.82	0.98	1.61
0.38	0.75	0.90	1.06	1.68
1.00	0.81	0.96	1.12	1.74
3.00	0.87	1.02	1.19	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.95	1.09	1.56
0.38	0.87	1.02	1.16	1.63
1.00	0.94	1.09	1.23	1.70
3.00	1.10	1.25	1.39	1.85

TC200G SERIES

DATA SHEET

LS2

LS2

10/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.63	0.79	1.40
0.38	0.57	0.70	0.86	1.47
1.00	0.63	0.77	0.93	1.54
3.00	0.75	0.89	1.05	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.67	0.79	1.21
0.38	0.63	0.75	0.86	1.29
1.00	0.69	0.81	0.92	1.35
3.00	0.80	0.91	1.03	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2N	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.59	0.77	1.47
0.38	0.49	0.66	0.84	1.55
1.00	0.55	0.72	0.91	1.61
3.00	0.65	0.82	1.01	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2N	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.66	1.19
0.38	0.43	0.58	0.74	1.26
1.00	0.49	0.65	0.80	1.33
3.00	0.61	0.77	0.92	1.45

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TC200G SERIES

DATA SHEET

LS2

LS2

11/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.59	0.79	1.51
0.38	0.49	0.67	0.86	1.58
1.00	0.60	0.78	0.97	1.69
3.00	0.82	1.00	1.20	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.82	1.00	1.58
0.38	0.62	0.82	1.00	1.58
1.00	0.64	0.83	1.02	1.59
3.00	0.75	0.95	1.13	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.61	0.81	1.53
0.38	0.51	0.69	0.88	1.60
1.00	0.62	0.80	1.00	1.72
3.00	0.86	1.04	1.23	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.88	1.07	1.65
0.38	0.68	0.88	1.07	1.65
1.00	0.70	0.89	1.08	1.66
3.00	0.80	1.01	1.20	1.78

TC200G SERIES

DATA SHEET

LS2

LS2

12/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.60	0.80	1.52
0.38	0.50	0.68	0.88	1.59
1.00	0.62	0.80	0.99	1.71
3.00	0.86	1.04	1.23	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.71	0.88	1.44
0.38	0.53	0.71	0.89	1.45
1.00	0.56	0.75	0.92	1.48
3.00	0.68	0.87	1.05	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.96	1.11	1.27	1.89
0.38	0.96	1.10	1.27	1.89
1.00	0.97	1.12	1.29	1.91
3.00	1.09	1.24	1.41	2.03

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.87	1.01	1.48
0.38	0.80	0.95	1.09	1.56
1.00	0.92	1.06	1.20	1.67
3.00	1.15	1.29	1.44	1.90

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TC200G SERIES

DATA SHEET

LS2

LS2

13/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.03	1.17	1.34	1.96
0.38	1.02	1.17	1.34	1.96
1.00	1.04	1.19	1.35	1.97
3.00	1.16	1.30	1.47	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.89	1.03	1.50
0.38	0.82	0.97	1.11	1.58
1.00	0.94	1.09	1.23	1.69
3.00	1.18	1.33	1.47	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.98	1.15	1.77
0.38	0.84	0.99	1.16	1.78
1.00	0.88	1.02	1.19	1.81
3.00	1.01	1.16	1.33	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.89	1.03	1.49
0.38	0.82	0.96	1.10	1.57
1.00	0.93	1.08	1.22	1.69
3.00	1.18	1.33	1.47	1.94

TC200G SERIES

DATA SHEET

LS2

LS2

14/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.97	1.10	1.26	1.87
0.38	1.04	1.18	1.33	1.94
1.00	1.15	1.29	1.45	2.05
3.00	1.39	1.52	1.68	2.29

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.20	1.31	1.43	1.85
0.38	1.19	1.31	1.42	1.85
1.00	1.21	1.32	1.44	1.87
3.00	1.33	1.44	1.56	1.99

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.99	1.12	1.28	1.89
0.38	1.06	1.20	1.35	1.96
1.00	1.18	1.31	1.47	2.08
3.00	1.42	1.56	1.72	2.32

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.26	1.38	1.49	1.92
0.38	1.26	1.38	1.49	1.92
1.00	1.28	1.39	1.51	1.93
3.00	1.39	1.51	1.62	2.05

TC200G SERIES

DATA SHEET

LS2

LS2

15/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.98	1.11	1.27	1.88
0.38	1.05	1.19	1.35	1.95
1.00	1.17	1.31	1.46	2.07
3.00	1.42	1.56	1.71	2.32

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.07	1.19	1.30	1.73
0.38	1.08	1.19	1.31	1.74
1.00	1.11	1.23	1.35	1.77
3.00	1.25	1.36	1.48	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.04	1.21	1.40	2.11
0.38	1.04	1.21	1.40	2.10
1.00	1.06	1.23	1.42	2.12
3.00	1.18	1.35	1.54	2.24

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.98	1.15	1.69
0.38	0.89	1.06	1.22	1.77
1.00	1.00	1.17	1.33	1.88
3.00	1.23	1.40	1.57	2.11

TC200G SERIES

DATA SHEET

LS2

LS2

16/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.11	1.28	1.47	2.17
0.38	1.11	1.28	1.47	2.17
1.00	1.12	1.29	1.48	2.19
3.00	1.24	1.41	1.60	2.30

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	1.00	1.17	1.71
0.38	0.91	1.08	1.24	1.79
1.00	1.02	1.20	1.36	1.90
3.00	1.26	1.44	1.60	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.09	1.28	1.98
0.38	0.93	1.10	1.29	1.99
1.00	0.96	1.13	1.32	2.03
3.00	1.09	1.27	1.45	2.16

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.99	1.16	1.70
0.38	0.90	1.07	1.23	1.78
1.00	1.01	1.19	1.35	1.90
3.00	1.26	1.44	1.60	2.15

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TC200G SERIES

DATA SHEET

LS2

LS2

17/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.59	0.78	1.50
0.38	0.48	0.66	0.86	1.58
1.00	0.58	0.76	0.96	1.68
3.00	0.77	0.95	1.15	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.78	0.96	1.54
0.38	0.60	0.79	0.98	1.55
1.00	0.67	0.86	1.04	1.62
3.00	0.90	1.10	1.28	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.60	0.80	1.53
0.38	0.50	0.68	0.88	1.61
1.00	0.61	0.79	0.99	1.71
3.00	0.80	0.98	1.18	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.86	1.05	1.63
0.38	0.67	0.88	1.06	1.65
1.00	0.74	0.94	1.13	1.72
3.00	0.99	1.19	1.38	1.97

TC200G SERIES

DATA SHEET

LS2

LS2

18/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0987	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.59	0.78	1.50
0.38	0.48	0.66	0.86	1.58
1.00	0.58	0.77	0.96	1.68
3.00	0.79	0.97	1.17	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0438	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.68	0.85	1.41
0.38	0.52	0.70	0.88	1.43
1.00	0.59	0.77	0.95	1.51
3.00	0.79	0.98	1.15	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.06	1.23	1.85
0.38	0.93	1.08	1.25	1.87
1.00	1.00	1.15	1.32	1.94
3.00	1.25	1.39	1.56	2.18

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.72	0.87	1.01	1.48
0.38	0.80	0.95	1.09	1.56
1.00	0.90	1.05	1.19	1.66
3.00	1.10	1.25	1.39	1.85

TC200G SERIES

DATA SHEET

LS2

LS2

19/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.01	1.15	1.32	1.94
0.38	1.02	1.17	1.34	1.96
1.00	1.09	1.24	1.40	2.02
3.00	1.34	1.49	1.66	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.89	1.03	1.50
0.38	0.83	0.97	1.11	1.58
1.00	0.93	1.08	1.22	1.69
3.00	1.13	1.28	1.42	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0845	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.96	1.12	1.74
0.38	0.83	0.98	1.15	1.77
1.00	0.90	1.05	1.22	1.84
3.00	1.12	1.26	1.43	2.05

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0346	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.72	0.87	1.01	1.48
0.38	0.80	0.95	1.09	1.56
1.00	0.91	1.05	1.19	1.66
3.00	1.12	1.27	1.41	1.88

TC200G SERIES

DATA SHEET

LS2

LS2

20/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.96	1.10	1.25	1.86
0.38	1.04	1.18	1.33	1.94
1.00	1.14	1.28	1.43	2.04
3.00	1.34	1.47	1.63	2.24

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.15	1.27	1.38	1.81
0.38	1.17	1.28	1.40	1.82
1.00	1.24	1.35	1.47	1.89
3.00	1.48	1.60	1.71	2.14

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.98	1.12	1.28	1.88
0.38	1.06	1.20	1.36	1.96
1.00	1.17	1.30	1.46	2.07
3.00	1.37	1.51	1.67	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.24	1.36	1.47	1.90
0.38	1.26	1.37	1.49	1.91
1.00	1.33	1.44	1.56	1.98
3.00	1.58	1.69	1.81	2.24

TC200G SERIES

DATA SHEET

LS2

LS2

21/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0860	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.96	1.10	1.25	1.86
0.38	1.04	1.18	1.33	1.94
1.00	1.14	1.28	1.44	2.04
3.00	1.36	1.49	1.65	2.26

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0343	0.11

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.05	1.16	1.28	1.70
0.38	1.07	1.18	1.30	1.72
1.00	1.14	1.25	1.37	1.79
3.00	1.35	1.47	1.58	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.00	1.17	1.36	2.06
0.38	1.01	1.19	1.38	2.08
1.00	1.08	1.26	1.45	2.15
3.00	1.33	1.50	1.69	2.39

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.98	1.14	1.69
0.38	0.88	1.06	1.22	1.77
1.00	0.99	1.16	1.32	1.87
3.00	1.18	1.36	1.52	2.06

TC200G SERIES

DATA SHEET

LS2

LS2

22/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.09	1.26	1.45	2.15
0.38	1.10	1.27	1.46	2.17
1.00	1.17	1.34	1.53	2.24
3.00	1.42	1.60	1.79	2.49

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	1.00	1.16	1.71
0.38	0.91	1.08	1.25	1.79
1.00	1.01	1.19	1.35	1.89
3.00	1.22	1.39	1.56	2.10

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0981	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	1.07	1.26	1.96
0.38	0.92	1.09	1.28	1.98
1.00	0.99	1.16	1.35	2.05
3.00	1.20	1.37	1.56	2.26

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0424	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.98	1.14	1.69
0.38	0.88	1.06	1.22	1.77
1.00	0.99	1.16	1.32	1.87
3.00	1.20	1.38	1.54	2.08

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TC200G SERIES

DATA SHEET

LS2

LS2

23/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.654	0.626	0.578	0.422
0.38	0.677	0.646	0.594	0.427
1.00	0.715	0.680	0.623	0.436
3.00	0.837	0.791	0.713	0.464

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.165	0.121	0.046	-0.194
0.38	0.109	0.065	-0.008	-0.244
1.00	0.015	-0.027	-0.098	-0.328
3.00	-0.287	-0.326	-0.390	-0.599

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.639	0.672	0.729	0.910
0.38	0.697	0.730	0.785	0.962
1.00	0.794	0.825	0.879	1.051
3.00	1.106	1.135	1.182	1.336

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.223	0.252	0.300	0.457
0.38	0.205	0.237	0.292	0.468
1.00	0.174	0.213	0.278	0.488
3.00	0.077	0.135	0.233	0.550

TC200G SERIES

DATA SHEET

LS2

LS2

24/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C3	C1&-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		1.111	1.079	1.025	0.851
0.38		1.127	1.094	1.040	0.867
1.00		1.152	1.120	1.066	0.893
3.00		1.235	1.203	1.150	0.979

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		-0.281	-0.265	-0.237	-0.147
0.38		-0.334	-0.318	-0.290	-0.200
1.00		-0.423	-0.406	-0.379	-0.289
3.00		-0.709	-0.692	-0.665	-0.575

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C3	C1&-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		0.937	0.921	0.893	0.804
0.38		0.990	0.973	0.946	0.857
1.00		1.079	1.062	1.034	0.945
3.00		1.364	1.348	1.320	1.231

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		-0.457	-0.424	-0.369	-0.193
0.38		-0.472	-0.439	-0.385	-0.209
1.00		-0.497	-0.465	-0.411	-0.236
3.00		-0.580	-0.548	-0.495	-0.324

TC200G SERIES

DATA SHEET

LS2

LS2

25/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.650	0.609	0.541	0.322
0.38	0.01	0.689	0.647	0.576	0.349
1.00	0.01	0.754	0.710	0.635	0.392
3.00	0.01	0.966	0.913	0.823	0.534

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.177	0.138	0.073	-0.135
0.38	0.01	0.127	0.090	0.027	-0.174
1.00	0.01	0.045	0.009	-0.050	-0.240
3.00	0.01	-0.222	-0.251	-0.298	-0.452

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.643	0.670	0.716	0.863
0.38	0.01	0.695	0.721	0.765	0.907
1.00	0.01	0.781	0.806	0.847	0.981
3.00	0.01	1.060	1.079	1.112	1.219

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.230	0.271	0.342	0.568
0.38	0.01	0.195	0.239	0.314	0.554
1.00	0.01	0.136	0.185	0.267	0.531
3.00	0.01	-0.052	0.011	0.116	0.456

TC200G SERIES

DATA SHEET

LS2

LS2

26/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C3	C2&-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		1.052	1.021	0.968	0.797
0.38		1.094	1.062	1.009	0.838
1.00		1.163	1.132	1.079	0.908
3.00		1.388	1.356	1.303	1.132

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		-0.281	-0.264	-0.236	-0.143
0.38		-0.328	-0.311	-0.282	-0.190
1.00		-0.405	-0.389	-0.360	-0.269
3.00		-0.656	-0.640	-0.612	-0.523

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C3	C2&-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		0.937	0.921	0.893	0.804
0.38		0.983	0.967	0.939	0.850
1.00		1.061	1.045	1.017	0.928
3.00		1.312	1.295	1.267	1.178

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		-0.398	-0.366	-0.311	-0.134
0.38		-0.440	-0.407	-0.352	-0.177
1.00		-0.509	-0.476	-0.422	-0.247
3.00		-0.732	-0.700	-0.647	-0.475

TC200G SERIES
DATA SHEET

LS2

LS2

27/27

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C1	---

ITEM	WAVE_FORM
POSLIMIT	<p>D1 C1 Q1</p>

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.980

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C3	---

ITEM	WAVE_FORM
POSLIMIT	<p>Q1 C3 Q2</p>

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C2	---

ITEM	WAVE_FORM
POSLIMIT	<p>D1 C1 Q1</p>

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	1.000

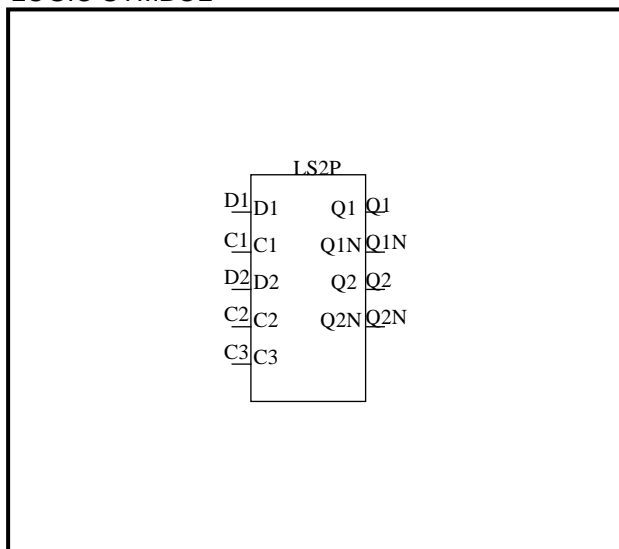
Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P		LS2P		1/27
CELL NAME	FUNCTION		CELL COUNT	CONDITION
LS2P	D-TYPE TRANSPARENT LATCH with SCAN TEST INPUT		GATE	I/O
			13	0
VDD=3.3V, Ta=25°C, Typ.				

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT			
D1	C1	D2	C2	C3	Q1	Q1N	Q2	Q2N
L	H	X	L	-	L	H	-	-
H	H	X	L	-	H	L	-	-
X	L	L	H	-	L	H	-	-
X	L	H	H	-	H	L	-	-
X	L	X	L	-	HOLD	HOLD	-	-
H	H	X	H	-	H	L	-	-
X	H	H	H	-	H	L	-	-
L	H	L	H	-	L	H	-	-
-	-	-	-	H	-	-	Q1	Q1N
-	-	-	-	L	-	-	HOLD	HOLD

Verilog-HDL DESCRIPTION

```
LS2P inst(Q1,Q1N,Q2,Q2N,D1,C1,D2,
          C2,C3);
```

VHDL DESCRIPTION

```
inst:LS2P
port map(Q1,Q1N,Q2,Q2N,D1,
         C1,D2,C2,C3);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q1,Q1N,Q2,Q2N
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D1	0.98
C1	2.00
D2	0.99
C2	1.97
C3	1.01

OUTPUT DRIVE

(LU)

PIN NAME	Q1	Q1N	Q2	Q2N
DRIVE	73.2	88.8	97.9	74.4

TC200G SERIES

DATA SHEET

LS2P

LS2P

2/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.01
0.38	0.47	0.56	0.67	1.06
1.00	0.55	0.64	0.75	1.14
3.00	0.71	0.80	0.91	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.83	0.95	1.33
0.38	0.70	0.83	0.95	1.33
1.00	0.72	0.85	0.97	1.35
3.00	0.86	0.99	1.11	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.68	1.07
0.38	0.55	0.64	0.75	1.14
1.00	0.63	0.72	0.83	1.22
3.00	0.81	0.90	1.01	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.57	0.92
0.38	0.44	0.55	0.65	1.00
1.00	0.51	0.62	0.72	1.07
3.00	0.62	0.72	0.83	1.17

TC200G SERIES

DATA SHEET

LS2P

LS2P

3/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.19	1.28	1.38	1.73
0.38	1.19	1.28	1.37	1.73
1.00	1.21	1.29	1.39	1.74
3.00	1.36	1.44	1.54	1.89

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.94	1.04	1.34
0.38	0.88	0.99	1.09	1.39
1.00	0.96	1.07	1.17	1.47
3.00	1.13	1.24	1.34	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	~C2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.86	0.95	1.31
0.38	0.85	0.94	1.03	1.39
1.00	0.92	1.01	1.10	1.46
3.00	1.02	1.10	1.20	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q1N	~C2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	1.00	1.10	1.40
0.38	0.96	1.07	1.16	1.47
1.00	1.04	1.15	1.24	1.55
3.00	1.23	1.34	1.44	1.74

TC200G SERIES

DATA SHEET

LS2P

LS2P

4/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.17	1.24	1.32	1.63
0.38	1.22	1.29	1.37	1.69
1.00	1.30	1.37	1.45	1.77
3.00	1.47	1.54	1.62	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.52	1.59	1.66	1.90
0.38	1.51	1.58	1.66	1.90
1.00	1.53	1.60	1.67	1.92
3.00	1.68	1.75	1.82	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	~C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.22	1.30	1.38	1.69
0.38	1.29	1.36	1.45	1.76
1.00	1.37	1.44	1.53	1.84
3.00	1.57	1.64	1.72	2.04

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2	~C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.09	1.17	1.24	1.48
0.38	1.17	1.24	1.32	1.56
1.00	1.24	1.31	1.39	1.63
3.00	1.34	1.41	1.49	1.73

TC200G SERIES

DATA SHEET

LS2P

LS2P

5/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.29	1.38	1.49	1.87
0.38	1.28	1.37	1.48	1.87
1.00	1.30	1.39	1.50	1.89
3.00	1.45	1.54	1.65	2.04

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.03	1.15	1.50
0.38	0.97	1.09	1.20	1.55
1.00	1.05	1.16	1.28	1.63
3.00	1.22	1.34	1.45	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	~C2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.96	1.07	1.45
0.38	0.94	1.04	1.14	1.53
1.00	1.01	1.11	1.21	1.60
3.00	1.11	1.21	1.31	1.70

PATH CONDITION

PATH	CONDITION	FUNCTION
C1->Q2N	~C2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.98	1.09	1.20	1.56
0.38	1.05	1.16	1.27	1.63
1.00	1.13	1.24	1.35	1.71
3.00	1.32	1.43	1.55	1.90

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TC200G SERIES

DATA SHEET

LS2P

LS2P

6/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.17	1.24	1.33	1.64
0.38	1.23	1.30	1.38	1.70
1.00	1.30	1.38	1.46	1.77
3.00	1.46	1.53	1.61	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.44	1.51	1.59	1.83
0.38	1.45	1.52	1.60	1.84
1.00	1.52	1.59	1.67	1.91
3.00	1.79	1.87	1.94	2.18

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	~C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.23	1.30	1.39	1.70
0.38	1.30	1.38	1.46	1.77
1.00	1.37	1.45	1.53	1.84
3.00	1.54	1.61	1.70	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2	~C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.09	1.17	1.24	1.48
0.38	1.17	1.24	1.32	1.56
1.00	1.23	1.30	1.37	1.62
3.00	1.29	1.37	1.44	1.68

TC200G SERIES

DATA SHEET

LS2P

LS2P

7/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.21	1.31	1.41	1.80
0.38	1.22	1.31	1.42	1.81
1.00	1.29	1.38	1.49	1.88
3.00	1.56	1.66	1.76	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.04	1.15	1.50
0.38	0.98	1.10	1.21	1.56
1.00	1.06	1.17	1.28	1.64
3.00	1.21	1.33	1.44	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	~C1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.96	1.07	1.45
0.38	0.94	1.04	1.14	1.53
1.00	1.00	1.10	1.20	1.59
3.00	1.06	1.16	1.26	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q2N	~C1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.98	1.10	1.21	1.56
0.38	1.05	1.17	1.28	1.64
1.00	1.13	1.24	1.35	1.71
3.00	1.29	1.41	1.52	1.87

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TC200G SERIES

DATA SHEET

LS2P

LS2P

8/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.01
0.38	0.47	0.57	0.68	1.07
1.00	0.55	0.65	0.75	1.14
3.00	0.69	0.79	0.89	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.64	0.77	0.89	1.27
0.38	0.66	0.78	0.90	1.28
1.00	0.73	0.85	0.97	1.35
3.00	0.99	1.12	1.24	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.57	0.68	1.07
0.38	0.55	0.64	0.75	1.14
1.00	0.62	0.71	0.82	1.21
3.00	0.77	0.87	0.98	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.46	0.57	0.92
0.38	0.43	0.54	0.65	1.00
1.00	0.49	0.60	0.71	1.06
3.00	0.56	0.67	0.77	1.12

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P

LS2P

9/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.12	1.21	1.31	1.66
0.38	1.14	1.23	1.32	1.68
1.00	1.21	1.30	1.39	1.75
3.00	1.48	1.57	1.67	2.02

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.94	1.04	1.35
0.38	0.89	1.00	1.10	1.40
1.00	0.97	1.08	1.18	1.48
3.00	1.12	1.23	1.33	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	~C1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.86	0.96	1.31
0.38	0.85	0.94	1.03	1.39
1.00	0.90	0.99	1.09	1.45
3.00	0.97	1.06	1.15	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
C2->Q1N	~C1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.89	1.00	1.10	1.41
0.38	0.96	1.07	1.17	1.48
1.00	1.03	1.15	1.24	1.55
3.00	1.20	1.31	1.41	1.72

TC200G SERIES

DATA SHEET

LS2P

LS2P

10/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.61	0.70	1.01
0.38	0.61	0.69	0.77	1.09
1.00	0.68	0.75	0.84	1.15
3.00	0.80	0.88	0.96	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.68	0.75	0.99
0.38	0.68	0.75	0.83	1.07
1.00	0.74	0.82	0.89	1.13
3.00	0.85	0.92	0.99	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2N	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.49	0.59	0.98
0.38	0.47	0.56	0.67	1.05
1.00	0.53	0.62	0.73	1.11
3.00	0.64	0.73	0.83	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
C3->Q2N	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.44	0.54	0.87
0.38	0.41	0.51	0.61	0.94
1.00	0.48	0.57	0.68	1.01
3.00	0.60	0.70	0.80	1.13

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TC200G SERIES

DATA SHEET

LS2P

LS2P

11/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.50	0.61	1.00
0.38	0.49	0.58	0.68	1.07
1.00	0.60	0.69	0.80	1.19
3.00	0.84	0.93	1.04	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.75	0.86	1.24
0.38	0.63	0.75	0.86	1.23
1.00	0.64	0.76	0.88	1.25
3.00	0.75	0.87	0.99	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.52	0.62	1.02
0.38	0.50	0.60	0.70	1.09
1.00	0.62	0.71	0.82	1.21
3.00	0.87	0.97	1.07	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.81	0.93	1.30
0.38	0.69	0.81	0.93	1.30
1.00	0.70	0.82	0.94	1.32
3.00	0.81	0.93	1.05	1.43

TC200G SERIES

DATA SHEET

LS2P

LS2P

12/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.01
0.38	0.50	0.59	0.70	1.08
1.00	0.62	0.71	0.81	1.20
3.00	0.88	0.97	1.07	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.63	0.74	1.09
0.38	0.52	0.63	0.74	1.10
1.00	0.56	0.67	0.78	1.14
3.00	0.68	0.79	0.91	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.09	1.18	1.28	1.63
0.38	1.09	1.18	1.28	1.63
1.00	1.11	1.20	1.29	1.65
3.00	1.23	1.32	1.41	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.93	1.03	1.33
0.38	0.89	1.00	1.10	1.40
1.00	1.01	1.12	1.22	1.52
3.00	1.26	1.37	1.47	1.77

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TC200G SERIES

DATA SHEET

LS2P

LS2P

13/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.16	1.25	1.35	1.70
0.38	1.16	1.25	1.35	1.70
1.00	1.17	1.26	1.36	1.71
3.00	1.29	1.38	1.48	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.95	1.05	1.35
0.38	0.91	1.02	1.12	1.43
1.00	1.03	1.14	1.24	1.54
3.00	1.30	1.41	1.50	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.94	1.03	1.13	1.48
0.38	0.95	1.04	1.14	1.49
1.00	0.99	1.07	1.17	1.53
3.00	1.13	1.22	1.31	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q1N	C1&~C2&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.94	1.04	1.34
0.38	0.91	1.02	1.11	1.42
1.00	1.03	1.14	1.23	1.54
3.00	1.29	1.40	1.50	1.80

TC200G SERIES

DATA SHEET

LS2P

LS2P

14/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.15	1.23	1.31	1.62
0.38	1.23	1.30	1.39	1.70
1.00	1.35	1.42	1.50	1.82
3.00	1.60	1.67	1.75	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.41	1.49	1.56	1.80
0.38	1.41	1.49	1.56	1.80
1.00	1.43	1.50	1.58	1.82
3.00	1.55	1.62	1.70	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.18	1.25	1.33	1.64
0.38	1.25	1.32	1.41	1.72
1.00	1.37	1.44	1.53	1.84
3.00	1.63	1.71	1.79	2.10

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.48	1.56	1.63	1.87
0.38	1.48	1.56	1.63	1.87
1.00	1.50	1.57	1.64	1.88
3.00	1.61	1.69	1.76	2.00

TC200G SERIES

DATA SHEET

LS2P

LS2P

15/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.16	1.24	1.32	1.63
0.38	1.24	1.32	1.40	1.71
1.00	1.36	1.43	1.52	1.83
3.00	1.63	1.70	1.79	2.10

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2	C1&~C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.27	1.34	1.41	1.65
0.38	1.27	1.35	1.42	1.66
1.00	1.31	1.38	1.46	1.70
3.00	1.45	1.52	1.60	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.19	1.28	1.39	1.78
0.38	1.18	1.28	1.39	1.77
1.00	1.20	1.30	1.40	1.79
3.00	1.32	1.42	1.52	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.91	1.02	1.14	1.49
0.38	0.98	1.10	1.21	1.56
1.00	1.10	1.21	1.33	1.68
3.00	1.35	1.47	1.58	1.93

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TC200G SERIES

DATA SHEET

LS2P

LS2P

16/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.25	1.35	1.45	1.84
0.38	1.25	1.35	1.45	1.84
1.00	1.27	1.36	1.47	1.86
3.00	1.38	1.48	1.58	1.97

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.93	1.04	1.16	1.51
0.38	1.00	1.12	1.23	1.58
1.00	1.12	1.24	1.35	1.70
3.00	1.39	1.50	1.61	1.97

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&~D2&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.04	1.13	1.24	1.63
0.38	1.05	1.14	1.25	1.64
1.00	1.08	1.18	1.28	1.67
3.00	1.22	1.32	1.42	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Q2N	C1&~C2&~D2&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.03	1.15	1.50
0.38	1.00	1.11	1.22	1.58
1.00	1.12	1.23	1.34	1.70
3.00	1.38	1.50	1.61	1.96

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TC200G SERIES

DATA SHEET

LS2P

LS2P

17/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.50	0.60	1.00
0.38	0.48	0.58	0.68	1.08
1.00	0.59	0.68	0.79	1.18
3.00	0.79	0.89	0.99	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.71	0.82	1.19
0.38	0.60	0.72	0.84	1.21
1.00	0.67	0.79	0.91	1.28
3.00	0.91	1.03	1.15	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.51	0.62	1.02
0.38	0.50	0.60	0.70	1.10
1.00	0.61	0.70	0.81	1.20
3.00	0.82	0.92	1.03	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.66	0.79	0.91	1.29
0.38	0.68	0.80	0.92	1.30
1.00	0.74	0.87	0.99	1.37
3.00	0.99	1.12	1.24	1.62

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P

LS2P

18/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0540	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.50	0.60	1.00
0.38	0.48	0.58	0.68	1.07
1.00	0.59	0.68	0.79	1.18
3.00	0.81	0.91	1.01	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1	0.0274	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.60	0.71	1.07
0.38	0.51	0.63	0.74	1.09
1.00	0.58	0.70	0.81	1.16
3.00	0.79	0.91	1.02	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.05	1.14	1.24	1.59
0.38	1.07	1.16	1.25	1.61
1.00	1.13	1.22	1.32	1.67
3.00	1.39	1.48	1.57	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.93	1.03	1.33
0.38	0.90	1.01	1.11	1.41
1.00	1.01	1.12	1.21	1.52
3.00	1.22	1.33	1.43	1.74

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P

LS2P

19/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.15	1.24	1.33	1.69
0.38	1.16	1.25	1.35	1.70
1.00	1.23	1.32	1.41	1.77
3.00	1.49	1.58	1.67	2.03

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.95	1.05	1.35
0.38	0.92	1.03	1.13	1.44
1.00	1.03	1.14	1.24	1.54
3.00	1.26	1.37	1.47	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0460	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.92	1.01	1.11	1.46
0.38	0.94	1.03	1.13	1.48
1.00	1.01	1.10	1.20	1.55
3.00	1.24	1.33	1.43	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q1N	~C1&C2&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q1N	0.0200	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.93	1.03	1.33
0.38	0.90	1.01	1.11	1.41
1.00	1.01	1.12	1.22	1.52
3.00	1.24	1.35	1.45	1.75

TC200G SERIES

DATA SHEET

LS2P

LS2P

20/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.16	1.23	1.31	1.63
0.38	1.24	1.31	1.39	1.71
1.00	1.34	1.42	1.50	1.81
3.00	1.56	1.63	1.72	2.03

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.37	1.45	1.52	1.76
0.38	1.39	1.46	1.54	1.78
1.00	1.46	1.53	1.60	1.85
3.00	1.71	1.78	1.86	2.10

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.18	1.25	1.34	1.65
0.38	1.26	1.33	1.42	1.73
1.00	1.37	1.44	1.53	1.84
3.00	1.60	1.67	1.75	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.47	1.54	1.62	1.86
0.38	1.48	1.56	1.63	1.87
1.00	1.55	1.62	1.70	1.94
3.00	1.81	1.88	1.96	2.20

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P

LS2P

21/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0441	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.16	1.23	1.31	1.63
0.38	1.24	1.31	1.39	1.71
1.00	1.35	1.42	1.50	1.81
3.00	1.58	1.65	1.74	2.05

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2	C2&~C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2	0.0176	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.25	1.32	1.39	1.63
0.38	1.27	1.34	1.41	1.66
1.00	1.34	1.41	1.48	1.73
3.00	1.56	1.64	1.71	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.14	1.24	1.34	1.73
0.38	1.16	1.25	1.36	1.75
1.00	1.23	1.32	1.43	1.82
3.00	1.48	1.58	1.68	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.91	1.03	1.14	1.49
0.38	0.99	1.11	1.22	1.57
1.00	1.10	1.21	1.32	1.68
3.00	1.31	1.43	1.54	1.89

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P

LS2P

22/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.24	1.33	1.44	1.83
0.38	1.25	1.35	1.46	1.84
1.00	1.32	1.41	1.52	1.91
3.00	1.58	1.67	1.78	2.17

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.93	1.05	1.16	1.51
0.38	1.01	1.13	1.24	1.59
1.00	1.12	1.24	1.35	1.70
3.00	1.35	1.46	1.58	1.93

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&~D1&C3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0542	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.02	1.11	1.22	1.61
0.38	1.04	1.13	1.24	1.63
1.00	1.11	1.20	1.31	1.70
3.00	1.33	1.43	1.53	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Q2N	C2&~C1&~D1&C3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q2N	0.0264	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.91	1.03	1.14	1.49
0.38	0.99	1.11	1.22	1.57
1.00	1.10	1.21	1.33	1.68
3.00	1.33	1.45	1.56	1.91

Rev.1.01.10

TC200G SERIES

DATA SHEET

LS2P

LS2P

23/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.749	0.720	0.670	0.511
0.38	0.773	0.741	0.689	0.520
1.00	0.811	0.777	0.720	0.536
3.00	0.937	0.894	0.821	0.586

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.129	0.083	0.006	-0.243
0.38	0.071	0.026	-0.050	-0.294
1.00	-0.026	-0.070	-0.143	-0.380
3.00	-0.340	-0.379	-0.445	-0.657

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C1	-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.732	0.763	0.816	0.985
0.38	0.792	0.823	0.874	1.041
1.00	0.893	0.923	0.973	1.134
3.00	1.218	1.245	1.290	1.436

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.207	0.237	0.286	0.446
0.38	0.188	0.221	0.276	0.454
1.00	0.156	0.195	0.259	0.468
3.00	0.053	0.110	0.206	0.515

TC200G SERIES

DATA SHEET

LS2P

LS2P

24/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C3	C1&-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		1.340	1.309	1.258	1.091
0.38		1.356	1.325	1.273	1.107
1.00		1.381	1.351	1.299	1.133
3.00		1.464	1.434	1.383	1.219

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		-0.474	-0.456	-0.426	-0.330
0.38		-0.529	-0.512	-0.482	-0.386
1.00		-0.623	-0.605	-0.575	-0.479
3.00		-0.925	-0.907	-0.877	-0.780

TIMING CONDITION

DATA	CLOCK	CONDITION
D1	C3	C1&-C2

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		1.131	1.113	1.083	0.985
0.38		1.187	1.169	1.138	1.041
1.00		1.280	1.262	1.232	1.134
3.00		1.581	1.563	1.533	1.436

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01		-0.684	-0.653	-0.601	-0.433
0.38		-0.699	-0.668	-0.617	-0.450
1.00		-0.725	-0.694	-0.643	-0.477
3.00		-0.808	-0.778	-0.727	-0.564

TC200G SERIES

DATA SHEET

LS2P

LS2P

25/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.754	0.712	0.642	0.415
0.38	0.38	0.794	0.751	0.679	0.446
1.00	1.00	0.861	0.816	0.740	0.497
3.00	3.00	1.077	1.026	0.940	0.663

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.136	0.096	0.028	-0.189
0.38	0.38	0.084	0.045	-0.020	-0.231
1.00	1.00	-0.002	-0.039	-0.101	-0.301
3.00	3.00	-0.281	-0.311	-0.363	-0.528

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C2	-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.750	0.774	0.815	0.944
0.38	0.38	0.804	0.827	0.866	0.993
1.00	1.00	0.893	0.916	0.953	1.074
3.00	3.00	1.182	1.201	1.233	1.336

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.207	0.249	0.320	0.549
0.38	0.38	0.171	0.216	0.291	0.532
1.00	1.00	0.111	0.160	0.241	0.503
3.00	3.00	-0.082	-0.021	0.081	0.409

TC200G SERIES

DATA SHEET

LS2P

LS2P

26/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C3	C2&-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	1.281	1.250	1.199	1.032
0.38	0.38	1.323	1.293	1.241	1.075
1.00	1.00	1.394	1.363	1.312	1.146
3.00	3.00	1.622	1.592	1.541	1.377

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	-0.481	-0.463	-0.433	-0.335
0.38	0.38	-0.531	-0.513	-0.483	-0.385
1.00	1.00	-0.615	-0.596	-0.566	-0.469
3.00	3.00	-0.884	-0.866	-0.836	-0.739

TIMING CONDITION

DATA	CLOCK	CONDITION
D2	C3	C2&-C1

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	1.136	1.118	1.088	0.992
0.38	0.38	1.186	1.168	1.138	1.042
1.00	1.00	1.269	1.252	1.222	1.126
3.00	3.00	1.540	1.522	1.492	1.395

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	-0.627	-0.595	-0.543	-0.375
0.38	0.38	-0.669	-0.638	-0.585	-0.418
1.00	1.00	-0.739	-0.708	-0.656	-0.490
3.00	3.00	-0.966	-0.936	-0.885	-0.722

TC200G SERIES

DATA SHEET

LS2P

LS2P

27/27

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C1	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	1.070

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C3	---

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
C2	---

ITEM	WAVE_FORM
POSLIMIT	

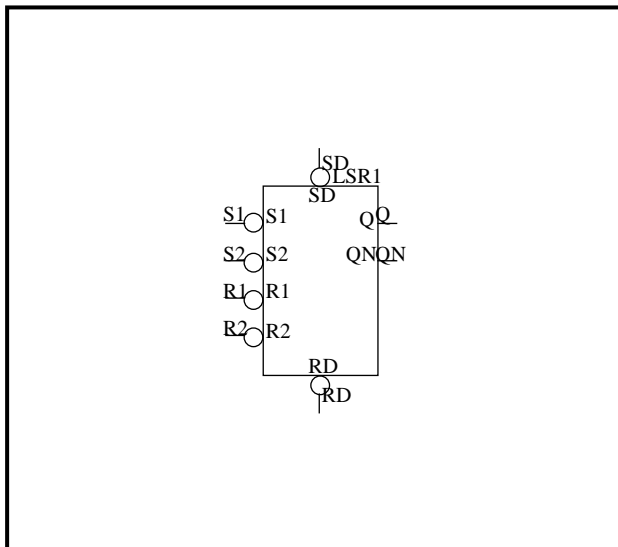
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	1.100

TC200G SERIES

DATA SHEET

LSR1		LSR1		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
LSR1	SR-LATCH with SEPARATE GATE SD and RD	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

		INPUT		OUTPUT	
SD	RD	S1+S2	R1+R2	Q	QN
L	H	X	H	H	L
H	L	H	X	L	H
H	H	L	H	H	L
H	H	H	L	L	H
H	H	H	H	HOLD	
ALL OTHER COMBINATIONS				H*	H*

*:Inhibit from changing directly to HOLD

Verilog-HDL DESCRIPTION

```
LSR1 inst(Q,QN,S1,S2,SD,R1,R2,RD);
```

VHDL DESCRIPTION

```
inst:LSR1
port map(Q,QN,S1,S2,SD,R1,
R2,RD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
S1	1.08
S2,R2	1.05
SD,RD	0.98
R1	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q,QN
DRIVE	19.7

TC200G SERIES

DATA SHEET

LSR1

LSR1

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0837	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.48	0.72	0.98	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
R1->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.50	0.81	2.05
0.38	0.27	0.52	0.83	2.07
1.00	0.31	0.57	0.88	2.11
3.00	0.39	0.70	1.03	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0837	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.48	0.72	0.98	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
R2->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.53	0.84	2.07
0.38	0.28	0.53	0.85	2.09
1.00	0.28	0.54	0.85	2.08
3.00	0.28	0.56	0.88	2.11

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR1

LSR1

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0837	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.48	0.72	0.98	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
RD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.33	0.50	1.16
0.38	0.22	0.36	0.52	1.19
1.00	0.26	0.41	0.58	1.24
3.00	0.30	0.49	0.70	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
S1->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1785	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.50	0.81	2.05
0.38	0.27	0.52	0.83	2.07
1.00	0.31	0.57	0.88	2.11
3.00	0.39	0.70	1.03	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0837	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.48	0.72	0.98	1.95

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR1

LSR1

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S2->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1785	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.53	0.83	2.07
0.38	0.28	0.53	0.84	2.08
1.00	0.28	0.53	0.85	2.08
3.00	0.27	0.55	0.88	2.11

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0837	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.48	0.72	0.98	1.95

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1785	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.33	0.50	1.16
0.38	0.22	0.36	0.52	1.19
1.00	0.26	0.41	0.58	1.24
3.00	0.30	0.49	0.70	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0837	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.48	0.72	0.98	1.95

TC200G SERIES

DATA SHEET

LSR1

LSR1

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
R1	RD&SD&(S1 S2)&~R2

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
R2	RD&SD&(S1 S2)&~R1

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.690

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
S1	RD&SD&(R1 R2)&~S2

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR1

LSR1

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
S2	RD&SD&(R1 R2)&~S1

ITEM	WAVE_FORM
NEGLIMIT	<p>S1</p> <p>Q</p>

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.690

Rev.1.01.10

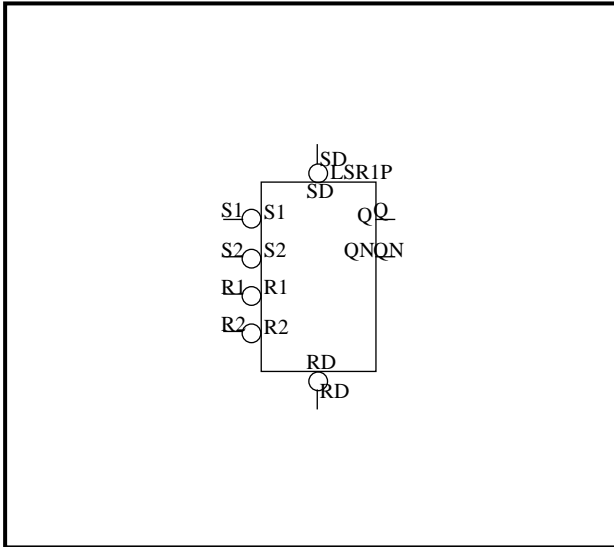
TC200G SERIES

DATA SHEET

LSR1P		LSR1P		1/6
-------	--	-------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
LSR1P	SR-LATCH with SEPARATE GATE SD and RD	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

		INPUT		OUTPUT	
SD	RD	S1+S2	R1+R2	Q	QN
L	H	X	H	H	L
H	L	H	X	L	H
H	H	L	H	H	L
H	H	H	L	L	H
H	H	H	H	HOLD	
ALL OTHER COMBINATIONS				H*	H*

*:Inhibit from changing directly to HOLD

Verilog-HDL DESCRIPTION

```
LSR1P inst(Q,QN,S1,S2,SD,R1,R2,RD);
```

VHDL DESCRIPTION

```
inst:LSR1P
port map(Q,QN,S1,S2,SD,R1,
R2,RD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
S1,R1	2.02
S2,R2	2.20
SD,RD	2.11

OUTPUT DRIVE

(LU)

PIN NAME	Q,QN
DRIVE	42.4

TC200G SERIES

DATA SHEET

LSR1P

LSR1P

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0384	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
R1->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.50	1.11
0.38	0.24	0.37	0.52	1.13
1.00	0.28	0.41	0.57	1.18
3.00	0.37	0.53	0.71	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0384	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
R2->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.53	1.14
0.38	0.25	0.38	0.53	1.15
1.00	0.25	0.38	0.54	1.15
3.00	0.25	0.40	0.57	1.19

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TC200G SERIES

DATA SHEET

LSR1P

LSR1P

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0384	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
RD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.25	0.33	0.67
0.38	0.21	0.28	0.36	0.69
1.00	0.24	0.32	0.41	0.75
3.00	0.29	0.39	0.51	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
S1->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.35	0.50	1.11
0.38	0.24	0.37	0.52	1.13
1.00	0.28	0.41	0.57	1.18
3.00	0.37	0.53	0.71	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0384	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR1P

LSR1P

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S2->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.53	1.14
0.38	0.25	0.38	0.53	1.15
1.00	0.25	0.38	0.54	1.15
3.00	0.25	0.40	0.57	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0384	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.25	0.33	0.67
0.38	0.21	0.28	0.36	0.69
1.00	0.24	0.32	0.41	0.75
3.00	0.29	0.39	0.51	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0384	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR1P

LSR1P

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
R1	RD&SD&(S1 S2)&~R2

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
R2	RD&SD&(S1 S2)&~R1

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.690

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
S1	RD&SD&(R1 R2)&~S2

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR1P

LSR1P

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
S2	RD&SD&(R1 R2)&~S1

ITEM	WAVE_FORM
NEGLIMIT	<p>S1</p> <p>Q</p>

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.690

Rev.1.01.10

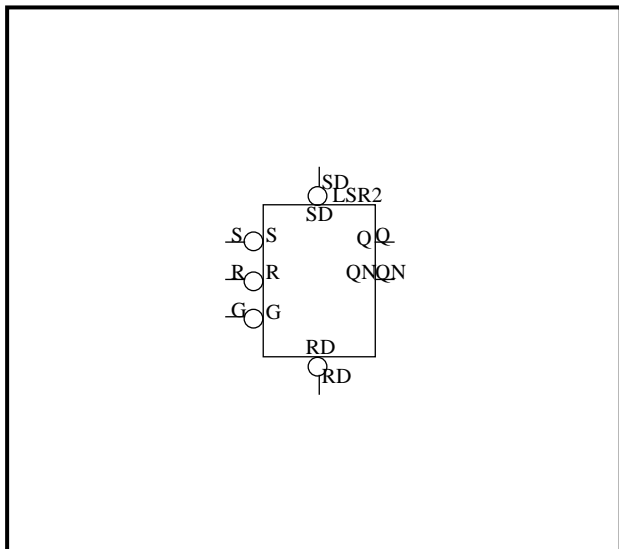
TC200G SERIES

DATA SHEET

LSR2		LSR2		1/5
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
LSR2	SR-LATCH with COMMON GATE SD and RD	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
SD	RD	G+S	G+R	Q	QN
L	H	X	H	H	L
H	L	H	X	L	H
H	H	L	H	H	L
H	H	H	L	L	H
H	H	H	H	HOLD	
ALL OTHER COMBINATIONS				H*	H*

*:Inhibit from changing directly to HOLD

Verilog-HDL DESCRIPTION

```
LSR2 inst(Q,QN,S,R,G,SD,RD);
```

VHDL DESCRIPTION

```
inst:LSR2
port map(Q,QN,S,R,G,SD,RD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
S	1.02
R	1.03
G	2.11
SD	1.06
RD	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	18.3	18.2

TC200G SERIES

DATA SHEET

LSR2

LSR2

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.51	0.82	2.05
0.38	0.27	0.53	0.84	2.08
1.00	0.31	0.57	0.88	2.11
3.00	0.40	0.70	1.03	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.44	0.72	1.80
0.38	0.29	0.52	0.80	1.89
1.00	0.38	0.64	0.94	2.04
3.00	0.55	0.90	1.26	2.47

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.50	0.81	2.05
0.38	0.27	0.52	0.84	2.07
1.00	0.31	0.57	0.88	2.11
3.00	0.40	0.70	1.03	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1003	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.44	0.71	1.80
0.38	0.29	0.52	0.80	1.89
1.00	0.38	0.64	0.94	2.04
3.00	0.55	0.90	1.26	2.47

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TC200G SERIES

DATA SHEET

LSR2

LSR2

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.66
1.00	0.35	0.55	0.79	1.72
3.00	0.47	0.71	0.98	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
R->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.53	0.84	2.07
0.38	0.28	0.54	0.85	2.09
1.00	0.28	0.54	0.85	2.08
3.00	0.28	0.56	0.88	2.11

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1003	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.66
1.00	0.35	0.55	0.79	1.72
3.00	0.47	0.71	0.98	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
RD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.34	0.51	1.20
0.38	0.23	0.37	0.54	1.22
1.00	0.25	0.41	0.59	1.28
3.00	0.28	0.48	0.70	1.45

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR2

LSR2

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.53	0.84	2.07
0.38	0.28	0.53	0.84	2.09
1.00	0.28	0.53	0.85	2.08
3.00	0.28	0.56	0.88	2.11

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1003	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.47	0.71	0.97	1.94

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1784	0.44

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.34	0.51	1.20
0.38	0.23	0.37	0.54	1.22
1.00	0.26	0.41	0.59	1.28
3.00	0.28	0.48	0.70	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1003	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.44	0.68	1.61
0.38	0.30	0.49	0.72	1.65
1.00	0.35	0.55	0.79	1.72
3.00	0.47	0.71	0.97	1.94

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR2

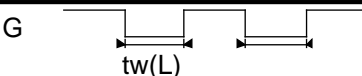
LSR2

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION



CLOCK	CONDITION
G	RD&SD

ITEM	WAVE_FORM
NEGLIMIT	G 

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.730

MINIMUM PULSE WIDTH CONDITION



CLOCK	CONDITION
R	RD&SD&S&~G

ITEM	WAVE_FORM
NEGLIMIT	R  Q 

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.720

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
S	RD&SD&R&~G

ITEM	WAVE_FORM
NEGLIMIT	S  Q 

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.720

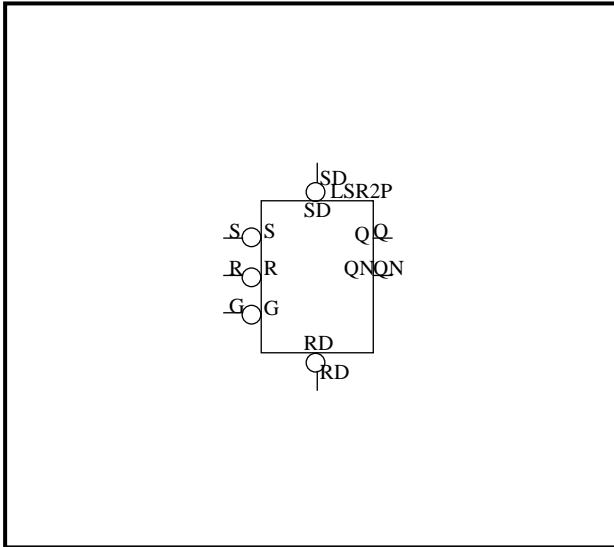
TC200G SERIES

DATA SHEET

LSR2P		LSR2P		1/5
-------	--	-------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
LSR2P	SR-LATCH with COMMON GATE SD and RD	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
SD	RD	G+S	G+R	Q	QN
L	H	X	H	H	L
H	L	H	X	L	H
H	H	L	H	H	L
H	H	H	L	L	H
H	H	H	H	HOLD	
ALL OTHER COMBINATIONS				H*	H*

*:Inhibit from changing directly to HOLD

Verilog-HDL DESCRIPTION

```
LSR2P inst(Q,QN,S,R,G,SD,RD);
```

VHDL DESCRIPTION

```
inst:LSR2P
port map(Q,QN,S,R,G,SD,RD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
S,R	2.02
G	4.53
SD,RD	2.12

OUTPUT DRIVE

(LU)

PIN NAME	Q,QN
DRIVE	38.4

TC200G SERIES

DATA SHEET

LSR2P

LSR2P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.51	1.12
0.38	0.25	0.37	0.53	1.14
1.00	0.29	0.42	0.58	1.18
3.00	0.37	0.53	0.71	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0468	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.29	0.42	0.94
0.38	0.26	0.37	0.50	1.03
1.00	0.34	0.48	0.62	1.17
3.00	0.48	0.67	0.87	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0875	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.51	1.12
0.38	0.25	0.37	0.53	1.14
1.00	0.29	0.42	0.58	1.18
3.00	0.37	0.53	0.71	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0468	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.29	0.42	0.94
0.38	0.26	0.37	0.50	1.03
1.00	0.34	0.48	0.62	1.17
3.00	0.48	0.67	0.87	1.53

TC200G SERIES

DATA SHEET

LSR2P

LSR2P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0468	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.68	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
R->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0875	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.37	0.53	1.14
0.38	0.25	0.38	0.53	1.15
1.00	0.25	0.38	0.54	1.15
3.00	0.25	0.40	0.57	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0468	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.68	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
RD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0875	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.25	0.33	0.67
0.38	0.21	0.28	0.36	0.69
1.00	0.24	0.31	0.41	0.75
3.00	0.27	0.37	0.49	0.88

TC200G SERIES

DATA SHEET

LSR2P

LSR2P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.37	0.53	1.14
0.38	0.25	0.38	0.53	1.15
1.00	0.25	0.38	0.54	1.15
3.00	0.25	0.40	0.57	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0468	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.25	0.33	0.67
0.38	0.21	0.28	0.36	0.69
1.00	0.24	0.31	0.41	0.75
3.00	0.27	0.37	0.49	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0468	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.42	0.85
0.38	0.26	0.35	0.46	0.90
1.00	0.31	0.41	0.52	0.96
3.00	0.42	0.54	0.67	1.16

Rev.1.01.10

TC200G SERIES

DATA SHEET

LSR2P

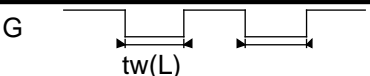
LSR2P

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION



CLOCK	CONDITION
G	RD&SD

ITEM	WAVE_FORM
NEGLIMIT	G 

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.730
0.01 to 3.00	

MINIMUM PULSE WIDTH CONDITION



CLOCK	CONDITION
R	RD&SD&S&~G

ITEM	WAVE_FORM
NEGLIMIT	R  Q 

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.720
0.01 to 3.00	

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
S	RD&SD&R&~G

ITEM	WAVE_FORM
NEGLIMIT	S  Q 

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.720
0.01 to 3.00	

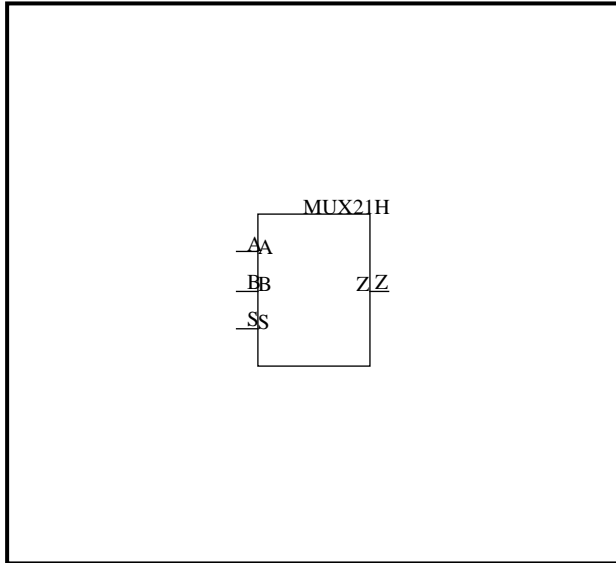
TC200G SERIES

DATA SHEET

MUX21H	MUX21H	1/3
--------	--------	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX21H	2 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

S	INPUT		OUTPUT
	A	B	Z
L	L	X	L
L	H	X	H
H	X	L	L
H	X	H	H

Verilog-HDL DESCRIPTION

```
MUX21H inst(Z,A,B,S);
```

VHDL DESCRIPTION

```
inst:MUX21H
port map(Z,A,B,S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	0.99
S	1.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	64.4

TC200G SERIES

DATA SHEET

MUX21H

MUX21H

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.39	0.76
0.38	0.28	0.37	0.46	0.84
1.00	0.35	0.44	0.54	0.91
3.00	0.47	0.57	0.67	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.44	0.57	1.05
0.38	0.34	0.47	0.61	1.09
1.00	0.42	0.55	0.68	1.16
3.00	0.58	0.71	0.85	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.39	0.77
0.38	0.28	0.37	0.47	0.84
1.00	0.35	0.44	0.55	0.92
3.00	0.48	0.57	0.68	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.46	0.60	1.08
0.38	0.37	0.50	0.63	1.12
1.00	0.44	0.57	0.71	1.19
3.00	0.61	0.74	0.88	1.37

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX21H

MUX21H

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.34	0.44	0.81
0.38	0.29	0.38	0.47	0.85
1.00	0.35	0.44	0.54	0.91
3.00	0.49	0.58	0.67	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.38	0.52	1.00
0.38	0.33	0.46	0.59	1.08
1.00	0.44	0.56	0.70	1.18
3.00	0.53	0.66	0.79	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.25	0.35	0.72
0.38	0.24	0.33	0.43	0.80
1.00	0.30	0.39	0.49	0.87
3.00	0.41	0.50	0.61	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.13

PATH DELAY (ns)

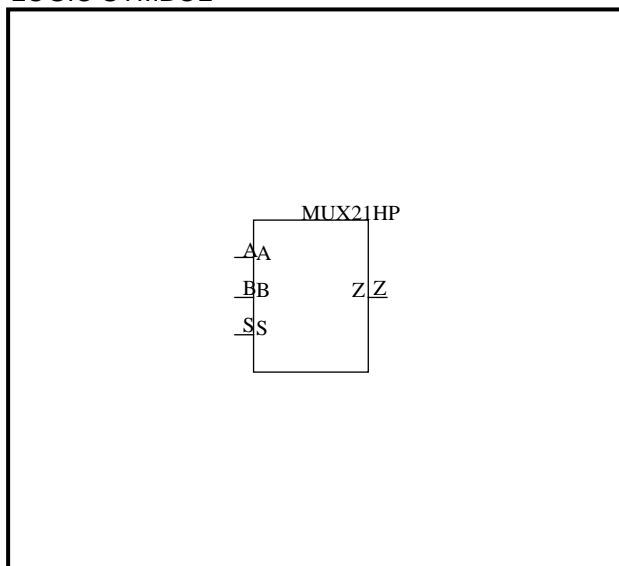
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.38	0.52	0.99
0.38	0.29	0.41	0.55	1.02
1.00	0.35	0.48	0.61	1.09
3.00	0.51	0.64	0.78	1.26

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TC200G SERIES
DATA SHEET

MUX21HP		MUX21HP		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX21HP	2 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
S	A	B	Z
L	L	X	L
L	H	X	H
H	X	L	L
H	X	H	H

Verilog-HDL DESCRIPTION

```
MUX21HP inst(Z,A,B,S);
```

VHDL DESCRIPTION

```
inst:MUX21HP
port map(Z,A,B,S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	0.99
S	1.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	117.5

TC200G SERIES

DATA SHEET

MUX21HP

MUX21HP

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0266	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.29	0.35	0.56
0.38	0.32	0.37	0.43	0.63
1.00	0.40	0.46	0.52	0.72
3.00	0.57	0.62	0.68	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0245	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.47	0.56	0.88
0.38	0.42	0.50	0.59	0.91
1.00	0.49	0.58	0.67	0.99
3.00	0.68	0.77	0.86	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0266	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.28	0.34	0.55
0.38	0.31	0.36	0.42	0.62
1.00	0.39	0.44	0.50	0.71
3.00	0.54	0.59	0.65	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0245	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.48	0.57	0.89
0.38	0.43	0.51	0.61	0.92
1.00	0.50	0.59	0.68	1.00
3.00	0.70	0.78	0.88	1.19

TC200G SERIES

DATA SHEET

MUX21HP

MUX21HP

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0266	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.33	0.39	0.59
0.38	0.31	0.37	0.43	0.63
1.00	0.38	0.43	0.49	0.69
3.00	0.52	0.57	0.63	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0245	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.39	0.48	0.80
0.38	0.37	0.46	0.55	0.87
1.00	0.51	0.60	0.69	1.00
3.00	0.64	0.72	0.81	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0266	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.24	0.30	0.50
0.38	0.27	0.32	0.38	0.58
1.00	0.35	0.41	0.47	0.67
3.00	0.50	0.56	0.62	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0245	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.40	0.49	0.81
0.38	0.34	0.43	0.52	0.83
1.00	0.41	0.49	0.59	0.90
3.00	0.58	0.66	0.76	1.07

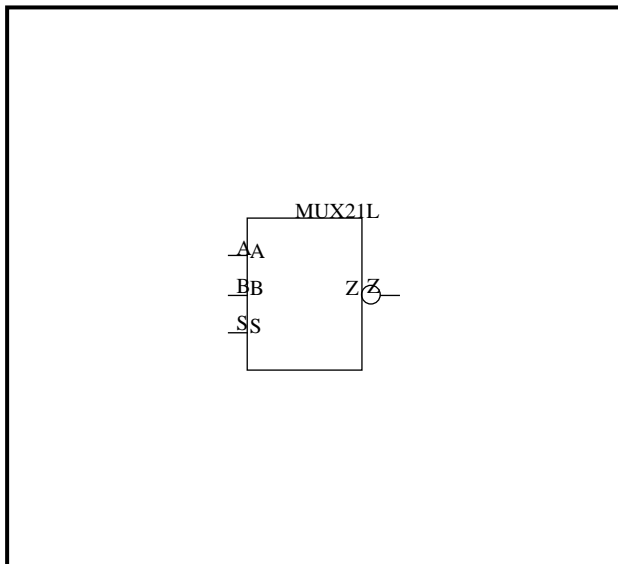
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TC200G SERIES

DATA SHEET

MUX21L		MUX21L		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX21L	2 TO 1 INVERTING MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
S	A	B	Z
L	L	X	H
L	H	X	L
H	X	L	H
H	X	H	L

Verilog-HDL DESCRIPTION

```
MUX21L inst(Z,A,B,S);
```

VHDL DESCRIPTION

```
inst:MUX21L
port map(Z,A,B,S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.85
B	3.84
S	2.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	67.2

TC200G SERIES

DATA SHEET

MUX21L

MUX21L

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0471	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.27	0.59
0.38	0.11	0.19	0.28	0.61
1.00	0.10	0.20	0.31	0.66
3.00	0.04	0.18	0.32	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0347	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.21	0.32	0.73
0.38	0.17	0.28	0.39	0.81
1.00	0.24	0.38	0.51	0.95
3.00	0.38	0.58	0.77	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0471	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.17	0.26	0.58
0.38	0.11	0.19	0.27	0.60
1.00	0.10	0.20	0.30	0.65
3.00	0.04	0.18	0.32	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0347	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.23	0.34	0.75
0.38	0.18	0.29	0.40	0.82
1.00	0.24	0.38	0.52	0.95
3.00	0.38	0.58	0.77	1.34

TC200G SERIES

DATA SHEET

MUX21L

MUX21L

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0471	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.27	0.59
0.38	0.18	0.25	0.33	0.66
1.00	0.23	0.30	0.39	0.72
3.00	0.30	0.38	0.47	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0347	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.29	0.40	0.81
0.38	0.23	0.32	0.43	0.84
1.00	0.29	0.39	0.49	0.90
3.00	0.42	0.53	0.64	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0471	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.28	0.37	0.70
0.38	0.25	0.32	0.40	0.73
1.00	0.31	0.38	0.46	0.79
3.00	0.43	0.50	0.58	0.91

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0347	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.28	0.39	0.80
0.38	0.27	0.37	0.48	0.89
1.00	0.35	0.45	0.56	0.97
3.00	0.46	0.56	0.67	1.08

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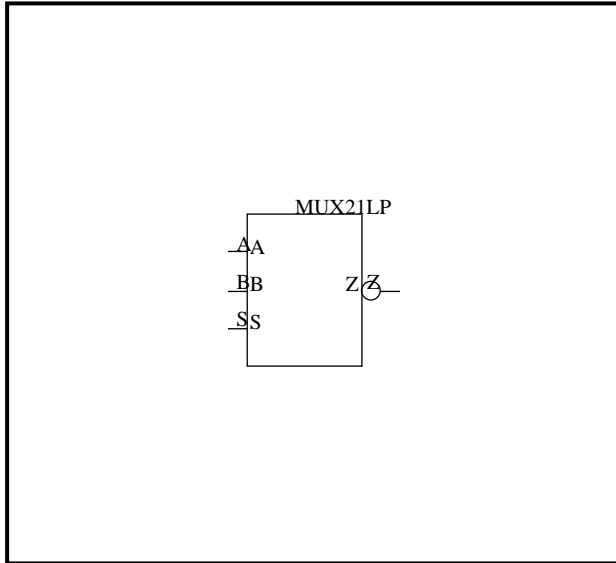
TC200G SERIES

DATA SHEET

MUX21LP		MUX21LP		1/3
---------	--	---------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX21LP	2 TO 1 INVERTING MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

S	INPUT		OUTPUT
	A	B	Z
L	L	X	H
L	H	X	L
H	X	L	H
H	X	H	L

Verilog-HDL DESCRIPTION

```
MUX21LP inst(Z,A,B,S);
```

VHDL DESCRIPTION

```
inst:MUX21LP
port map(Z,A,B,S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.25
B	5.24
S	2.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	112.2

TC200G SERIES

DATA SHEET

MUX21LP

MUX21LP

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0224	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.16	0.21	0.37
0.38	0.12	0.17	0.22	0.38
1.00	0.11	0.17	0.22	0.41
3.00	0.02	0.10	0.19	0.44

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.19	0.26	0.49
0.38	0.18	0.25	0.32	0.55
1.00	0.24	0.33	0.41	0.68
3.00	0.40	0.51	0.63	0.99

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0224	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.15	0.19	0.36
0.38	0.12	0.16	0.21	0.37
1.00	0.10	0.16	0.22	0.41
3.00	0.02	0.10	0.18	0.44

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.21	0.28	0.51
0.38	0.19	0.26	0.33	0.56
1.00	0.25	0.33	0.42	0.68
3.00	0.39	0.51	0.63	0.99

TC200G SERIES

DATA SHEET

MUX21LP

MUX21LP

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0224	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.16	0.21	0.37
0.38	0.20	0.24	0.29	0.45
1.00	0.27	0.31	0.36	0.52
3.00	0.37	0.42	0.47	0.65

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	~A&B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.28	0.35	0.58
0.38	0.25	0.32	0.38	0.61
1.00	0.32	0.38	0.45	0.68
3.00	0.47	0.54	0.61	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0224	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.26	0.31	0.47
0.38	0.26	0.30	0.35	0.51
1.00	0.32	0.36	0.41	0.57
3.00	0.44	0.49	0.53	0.70

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z	A&~B	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.25	0.32	0.55
0.38	0.28	0.34	0.41	0.65
1.00	0.39	0.45	0.52	0.75
3.00	0.50	0.57	0.63	0.87

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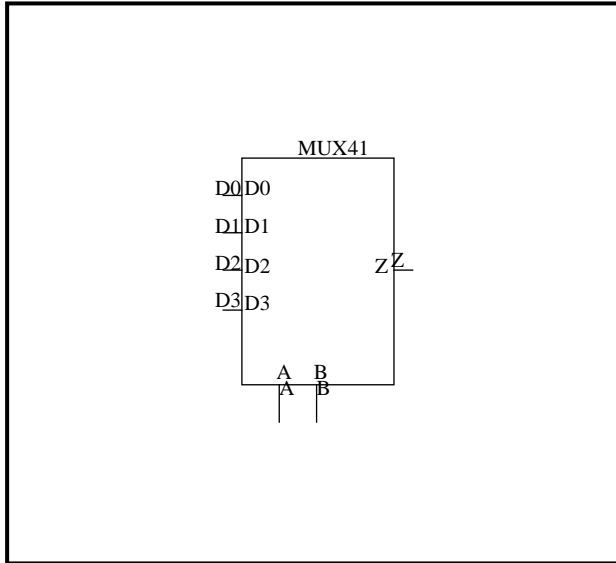
TC200G SERIES

DATA SHEET

MUX41		MUX41		1/7
-------	--	-------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX41	4 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
B	A	Z
L	L	D0
L	H	D1
H	L	D2
H	H	D3

Verilog-HDL DESCRIPTION

```
MUX41 inst(Z,D0,D1,D2,D3,A,B);
```

VHDL DESCRIPTION

```
inst:MUX41
port map(Z,D0,D1,D2,D3,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D0	3.50
D1	3.58
D2	3.35
D3	3.41
A	3.08
B	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	42.2

TC200G SERIES

DATA SHEET

MUX41

MUX41

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~D2&D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.55	0.73	1.41
0.38	0.43	0.58	0.76	1.45
1.00	0.48	0.64	0.81	1.50
3.00	0.60	0.76	0.94	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~D2&D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.53	0.67	1.19
0.38	0.45	0.59	0.74	1.25
1.00	0.50	0.64	0.79	1.30
3.00	0.59	0.73	0.88	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&D2&~D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.56	0.74	1.43
0.38	0.50	0.66	0.83	1.52
1.00	0.60	0.75	0.93	1.62
3.00	0.72	0.88	1.06	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&D2&~D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.67	0.81	1.32
0.38	0.56	0.70	0.84	1.35
1.00	0.63	0.77	0.91	1.42
3.00	0.77	0.91	1.05	1.56

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TC200G SERIES

DATA SHEET

MUX41

MUX41

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~D0&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.55	0.73	1.41
0.38	0.43	0.58	0.76	1.44
1.00	0.49	0.64	0.81	1.50
3.00	0.61	0.76	0.94	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~D0&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.52	0.66	1.17
0.38	0.45	0.58	0.73	1.24
1.00	0.50	0.64	0.78	1.29
3.00	0.59	0.73	0.88	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&D0&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.56	0.74	1.42
0.38	0.50	0.65	0.83	1.52
1.00	0.60	0.75	0.93	1.61
3.00	0.73	0.88	1.06	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&D0&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.80	1.31
0.38	0.55	0.69	0.83	1.34
1.00	0.62	0.76	0.90	1.41
3.00	0.76	0.90	1.04	1.55

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TC200G SERIES

DATA SHEET

MUX41

MUX41

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~D1&D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.63	1.32
0.38	0.33	0.48	0.66	1.35
1.00	0.39	0.54	0.72	1.40
3.00	0.52	0.67	0.84	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~D1&D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.51	1.02
0.38	0.31	0.45	0.59	1.10
1.00	0.42	0.55	0.69	1.20
3.00	0.53	0.66	0.80	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&D1&~D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.52	1.21
0.38	0.28	0.43	0.60	1.29
1.00	0.35	0.50	0.67	1.36
3.00	0.47	0.62	0.80	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&D1&~D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.51	1.01
0.38	0.27	0.40	0.54	1.04
1.00	0.33	0.46	0.60	1.11
3.00	0.47	0.61	0.75	1.26

TC200G SERIES

DATA SHEET

MUX41

MUX41

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~D0&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.63	1.32
0.38	0.33	0.48	0.66	1.35
1.00	0.39	0.54	0.72	1.40
3.00	0.52	0.67	0.84	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~D0&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.51	1.02
0.38	0.31	0.45	0.59	1.10
1.00	0.42	0.55	0.69	1.20
3.00	0.53	0.66	0.80	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&D0&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.52	1.21
0.38	0.28	0.43	0.60	1.29
1.00	0.35	0.50	0.67	1.36
3.00	0.47	0.62	0.80	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&D0&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.51	1.01
0.38	0.27	0.40	0.54	1.04
1.00	0.33	0.46	0.60	1.11
3.00	0.47	0.61	0.75	1.26

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TC200G SERIES

DATA SHEET

MUX41

MUX41

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.47	0.65	1.34
0.38	0.39	0.54	0.71	1.40
1.00	0.46	0.61	0.79	1.48
3.00	0.61	0.76	0.94	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.64	1.15
0.38	0.38	0.52	0.66	1.17
1.00	0.44	0.58	0.73	1.24
3.00	0.59	0.74	0.89	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.49	0.66	1.35
0.38	0.39	0.54	0.72	1.41
1.00	0.47	0.62	0.80	1.48
3.00	0.61	0.76	0.94	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.49	0.64	1.14
0.38	0.38	0.52	0.66	1.17
1.00	0.44	0.58	0.73	1.24
3.00	0.59	0.74	0.89	1.41

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX41

MUX41

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.48	0.65	1.34
0.38	0.39	0.54	0.72	1.41
1.00	0.46	0.62	0.80	1.49
3.00	0.61	0.76	0.94	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.65	1.16
0.38	0.38	0.52	0.67	1.18
1.00	0.45	0.59	0.73	1.25
3.00	0.59	0.74	0.89	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.49	0.66	1.35
0.38	0.39	0.54	0.72	1.41
1.00	0.47	0.62	0.80	1.49
3.00	0.61	0.76	0.94	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0425	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.64	1.16
0.38	0.38	0.52	0.67	1.18
1.00	0.44	0.59	0.73	1.24
3.00	0.59	0.74	0.89	1.41

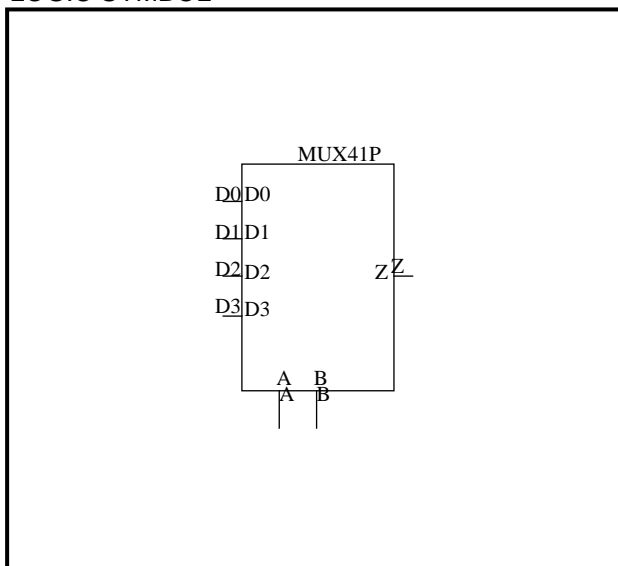
Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX41P		MUX41P		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX41P	4 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
B	A	Z
L	L	D0
L	H	D1
H	L	D2
H	H	D3

Verilog-HDL DESCRIPTION

```
MUX41P inst(Z,D0,D1,D2,D3,A,B);
```

VHDL DESCRIPTION

```
inst:MUX41P
port map(Z,D0,D1,D2,D3,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D0	3.50
D1	3.58
D2	3.35
D3	3.41
A	3.08
B	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	94.9

TC200G SERIES

DATA SHEET

MUX41P

MUX41P

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~D2&D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.46	0.55	0.87
0.38	0.42	0.50	0.58	0.90
1.00	0.47	0.55	0.64	0.96
3.00	0.60	0.67	0.76	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&~D2&D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.47	0.55	0.81
0.38	0.44	0.53	0.61	0.88
1.00	0.49	0.58	0.66	0.93
3.00	0.58	0.67	0.75	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&D2&~D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.48	0.57	0.89
0.38	0.49	0.57	0.66	0.98
1.00	0.59	0.67	0.75	1.07
3.00	0.72	0.79	0.88	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	B&D2&~D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.60	0.68	0.95
0.38	0.55	0.63	0.72	0.98
1.00	0.62	0.70	0.79	1.05
3.00	0.76	0.84	0.93	1.19

TC200G SERIES

DATA SHEET

MUX41P

MUX41P

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~D0&D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.46	0.55	0.87
0.38	0.42	0.50	0.58	0.90
1.00	0.48	0.55	0.64	0.96
3.00	0.60	0.68	0.77	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&~D0&D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.45	0.54	0.80
0.38	0.44	0.52	0.60	0.86
1.00	0.49	0.57	0.65	0.92
3.00	0.59	0.67	0.75	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&D0&~D1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.48	0.56	0.88
0.38	0.49	0.57	0.65	0.97
1.00	0.59	0.66	0.75	1.07
3.00	0.72	0.79	0.88	1.20

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	~B&D0&~D1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.59	0.67	0.93
0.38	0.54	0.62	0.71	0.97
1.00	0.61	0.69	0.78	1.04
3.00	0.75	0.84	0.92	1.18

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX41P

MUX41P

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~D1&D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.35	0.44	0.76
0.38	0.31	0.39	0.47	0.79
1.00	0.37	0.45	0.53	0.85
3.00	0.49	0.57	0.65	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&~D1&D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.37	0.63
0.38	0.28	0.37	0.45	0.71
1.00	0.41	0.49	0.57	0.83
3.00	0.53	0.61	0.69	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&D1&~D3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.28	0.37	0.69
0.38	0.29	0.36	0.45	0.77
1.00	0.37	0.45	0.53	0.85
3.00	0.53	0.61	0.69	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	A&D1&~D3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.64
0.38	0.26	0.34	0.42	0.67
1.00	0.32	0.40	0.48	0.74
3.00	0.46	0.55	0.63	0.90

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX41P

MUX41P

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~D0&D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.35	0.44	0.76
0.38	0.31	0.39	0.47	0.79
1.00	0.37	0.45	0.53	0.85
3.00	0.49	0.57	0.65	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&~D0&D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.29	0.37	0.63
0.38	0.28	0.37	0.45	0.71
1.00	0.41	0.49	0.57	0.83
3.00	0.53	0.61	0.69	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&D0&~D2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.28	0.37	0.69
0.38	0.29	0.36	0.45	0.77
1.00	0.37	0.45	0.53	0.85
3.00	0.53	0.61	0.69	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	~A&D0&~D2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.39	0.64
0.38	0.26	0.34	0.42	0.67
1.00	0.32	0.40	0.48	0.74
3.00	0.46	0.55	0.63	0.90

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX41P

MUX41P

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.39	0.47	0.79
0.38	0.38	0.45	0.54	0.86
1.00	0.46	0.54	0.63	0.94
3.00	0.63	0.71	0.79	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.43	0.51	0.78
0.38	0.37	0.45	0.53	0.79
1.00	0.44	0.52	0.60	0.86
3.00	0.60	0.69	0.77	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.49	0.80
0.38	0.38	0.46	0.55	0.86
1.00	0.47	0.54	0.63	0.95
3.00	0.63	0.71	0.79	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.43	0.51	0.77
0.38	0.37	0.45	0.53	0.79
1.00	0.44	0.52	0.60	0.86
3.00	0.60	0.69	0.77	1.04

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX41P

MUX41P

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.39	0.48	0.80
0.38	0.38	0.46	0.54	0.86
1.00	0.47	0.54	0.63	0.95
3.00	0.63	0.71	0.80	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.52	0.79
0.38	0.38	0.46	0.54	0.81
1.00	0.44	0.52	0.61	0.87
3.00	0.60	0.69	0.77	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0439	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.49	0.81
0.38	0.38	0.46	0.55	0.87
1.00	0.47	0.54	0.63	0.95
3.00	0.63	0.71	0.80	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0199	0.12

PATH DELAY (ns)

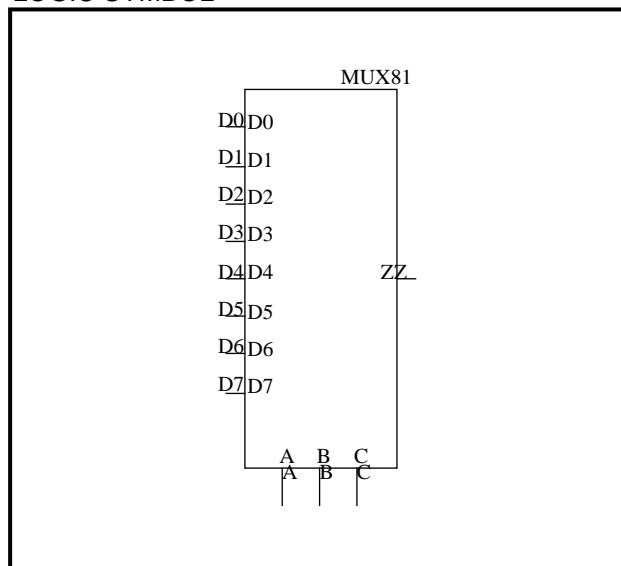
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.43	0.52	0.78
0.38	0.37	0.46	0.54	0.80
1.00	0.44	0.52	0.61	0.87
3.00	0.60	0.69	0.77	1.05

TC200G SERIES

DATA SHEET

MUX81		MUX81		1/17
CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX81	8 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		15	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
C	B	A	Z
L	L	L	D0
L	L	H	D1
L	H	L	D2
L	H	H	D3
H	L	L	D4
H	L	H	D5
H	H	L	D6
H	H	H	D7

Verilog-HDL DESCRIPTION

```
MUX81 inst(Z,D0,D1,D2,D3,D4,D5,
D6,D7,A,B,C);
```

VHDL DESCRIPTION

```
inst:MUX81
port map(Z,D0,D1,D2,D3,D4,
D5,D6,D7,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D0	3.46
D1,D7	3.42
D2	3.30
D3	3.39
D4	3.40
D5	3.49
D6	3.36
A	0.99
B	3.24
C	2.11

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	46.3

TC200G SERIES

DATA SHEET

MUX81

MUX81

2/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(~D6&D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.95	1.12	1.75
0.38	0.84	0.99	1.15	1.78
1.00	0.92	1.06	1.23	1.86
3.00	1.08	1.23	1.39	2.03

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(~D6&D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.95	1.10	1.60
0.38	0.89	1.04	1.19	1.68
1.00	0.98	1.14	1.29	1.78
3.00	1.16	1.32	1.47	1.96

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(D6&~D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.79	0.96	1.59
0.38	0.74	0.88	1.05	1.68
1.00	0.85	0.99	1.16	1.79
3.00	1.06	1.21	1.37	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(D6&~D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.89	1.04	1.53
0.38	0.77	0.92	1.07	1.56
1.00	0.85	1.00	1.15	1.64
3.00	1.03	1.18	1.33	1.83

TC200G SERIES

DATA SHEET

MUX81

MUX81

3/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(~D2&D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	1.00	1.17	1.81
0.38	0.89	1.04	1.20	1.84
1.00	0.96	1.11	1.28	1.91
3.00	1.13	1.28	1.44	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(~D2&D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	1.02	1.17	1.67
0.38	0.95	1.10	1.26	1.76
1.00	1.04	1.20	1.35	1.86
3.00	1.22	1.38	1.53	2.04

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(D2&~D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.84	1.01	1.65
0.38	0.78	0.93	1.10	1.73
1.00	0.90	1.04	1.21	1.85
3.00	1.11	1.26	1.42	2.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(D2&~D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.96	1.11	1.61
0.38	0.83	0.99	1.14	1.64
1.00	0.91	1.07	1.22	1.72
3.00	1.09	1.25	1.40	1.91

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

4/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(~D4&D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.99	1.16	1.79
0.38	0.88	1.02	1.19	1.82
1.00	0.95	1.10	1.27	1.90
3.00	1.12	1.26	1.43	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(~D4&D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.97	1.12	1.61
0.38	0.90	1.05	1.20	1.70
1.00	1.00	1.15	1.30	1.80
3.00	1.18	1.33	1.48	1.98

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(D4&~D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.83	0.99	1.63
0.38	0.77	0.92	1.08	1.72
1.00	0.88	1.03	1.19	1.83
3.00	1.09	1.24	1.40	2.04

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(D4&~D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.92	1.07	1.56
0.38	0.79	0.95	1.10	1.60
1.00	0.87	1.03	1.18	1.68
3.00	1.06	1.22	1.37	1.86

TC200G SERIES

DATA SHEET

MUX81

MUX81

5/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(~D0&D1)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	1.01	1.17	1.81
0.38	0.89	1.04	1.21	1.84
1.00	0.97	1.11	1.28	1.92
3.00	1.13	1.28	1.45	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(~D0&D1)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.85	1.01	1.16	1.66
0.38	0.94	1.09	1.25	1.75
1.00	1.03	1.19	1.34	1.84
3.00	1.21	1.37	1.52	2.02

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(D0&~D1)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.86	1.02	1.66
0.38	0.80	0.94	1.11	1.75
1.00	0.91	1.06	1.22	1.86
3.00	1.12	1.27	1.44	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(D0&~D1)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.78	0.93	1.09	1.59
0.38	0.81	0.96	1.12	1.62
1.00	0.89	1.04	1.20	1.70
3.00	1.07	1.23	1.38	1.88

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

6/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(~D5&D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.76	1.39
0.38	0.48	0.62	0.79	1.42
1.00	0.55	0.69	0.86	1.49
3.00	0.69	0.84	1.00	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(~D5&D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.48	0.63	1.13
0.38	0.41	0.56	0.71	1.21
1.00	0.55	0.70	0.85	1.35
3.00	0.71	0.87	1.02	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(D5&~D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.46	0.63	1.26
0.38	0.40	0.54	0.71	1.34
1.00	0.49	0.64	0.80	1.44
3.00	0.66	0.81	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(D5&~D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.66	1.16
0.38	0.39	0.54	0.69	1.19
1.00	0.46	0.61	0.76	1.26
3.00	0.62	0.78	0.93	1.44

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

7/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(~D1&D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.76	1.39
0.38	0.47	0.62	0.79	1.42
1.00	0.54	0.69	0.86	1.49
3.00	0.69	0.83	1.00	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(~D1&D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.48	0.63	1.13
0.38	0.40	0.56	0.71	1.21
1.00	0.55	0.70	0.85	1.35
3.00	0.71	0.87	1.02	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(D1&~D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.47	0.64	1.27
0.38	0.40	0.55	0.72	1.35
1.00	0.49	0.64	0.81	1.45
3.00	0.67	0.82	0.99	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(D1&~D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.50	0.65	1.15
0.38	0.38	0.53	0.68	1.18
1.00	0.45	0.60	0.75	1.25
3.00	0.61	0.77	0.92	1.43

TC200G SERIES

DATA SHEET

MUX81

MUX81

8/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(~D4&D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.76	1.39
0.38	0.48	0.62	0.79	1.42
1.00	0.55	0.69	0.86	1.49
3.00	0.69	0.84	1.00	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(~D4&D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.48	0.63	1.13
0.38	0.41	0.56	0.71	1.21
1.00	0.55	0.70	0.85	1.35
3.00	0.71	0.87	1.02	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(D4&~D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.46	0.63	1.26
0.38	0.40	0.54	0.71	1.34
1.00	0.49	0.64	0.80	1.44
3.00	0.66	0.81	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(D4&~D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.66	1.16
0.38	0.39	0.54	0.69	1.19
1.00	0.46	0.61	0.76	1.26
3.00	0.62	0.78	0.93	1.44

TC200G SERIES

DATA SHEET

MUX81

MUX81

9/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(~D0&D2)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.76	1.39
0.38	0.47	0.62	0.79	1.42
1.00	0.54	0.69	0.86	1.49
3.00	0.69	0.83	1.00	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(~D0&D2)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.48	0.63	1.13
0.38	0.40	0.56	0.71	1.21
1.00	0.55	0.70	0.85	1.35
3.00	0.71	0.87	1.02	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(D0&~D2)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.47	0.64	1.27
0.38	0.40	0.55	0.72	1.35
1.00	0.49	0.64	0.81	1.45
3.00	0.67	0.82	0.99	1.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(D0&~D2)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.50	0.65	1.15
0.38	0.38	0.53	0.68	1.18
1.00	0.45	0.60	0.75	1.25
3.00	0.61	0.77	0.92	1.43

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

10/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(~D3&D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.46	0.63	1.26
0.38	0.34	0.49	0.66	1.30
1.00	0.40	0.55	0.72	1.35
3.00	0.51	0.66	0.83	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(~D3&D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.36	0.50	0.99
0.38	0.30	0.45	0.59	1.08
1.00	0.43	0.57	0.70	1.19
3.00	0.54	0.68	0.82	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(D3&~D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.52	1.15
0.38	0.29	0.43	0.60	1.23
1.00	0.36	0.50	0.67	1.31
3.00	0.47	0.61	0.78	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(D3&~D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.52	1.00
0.38	0.27	0.41	0.55	1.04
1.00	0.34	0.47	0.62	1.10
3.00	0.49	0.63	0.78	1.27

TC200G SERIES

DATA SHEET

MUX81

MUX81

11/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(~D1&D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.62	1.26
0.38	0.34	0.49	0.65	1.29
1.00	0.39	0.54	0.71	1.34
3.00	0.51	0.65	0.82	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(~D1&D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.36	0.51	1.00
0.38	0.30	0.45	0.59	1.08
1.00	0.43	0.57	0.71	1.19
3.00	0.54	0.68	0.82	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(D1&~D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.52	1.15
0.38	0.28	0.43	0.60	1.23
1.00	0.36	0.50	0.67	1.31
3.00	0.47	0.62	0.78	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(D1&~D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.51	1.00
0.38	0.27	0.41	0.55	1.03
1.00	0.34	0.47	0.61	1.10
3.00	0.49	0.63	0.77	1.26

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

12/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(~D2&D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.46	0.63	1.26
0.38	0.34	0.49	0.66	1.30
1.00	0.40	0.55	0.72	1.35
3.00	0.51	0.66	0.83	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(~D2&D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.36	0.50	0.99
0.38	0.30	0.45	0.59	1.08
1.00	0.43	0.57	0.70	1.19
3.00	0.54	0.68	0.82	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(D2&~D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.52	1.15
0.38	0.29	0.43	0.60	1.23
1.00	0.36	0.50	0.67	1.31
3.00	0.47	0.61	0.78	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(D2&~D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.52	1.00
0.38	0.27	0.41	0.55	1.04
1.00	0.34	0.47	0.62	1.10
3.00	0.49	0.63	0.78	1.27

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

13/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(~D0&D4)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.62	1.26
0.38	0.34	0.49	0.65	1.29
1.00	0.39	0.54	0.71	1.34
3.00	0.51	0.65	0.82	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(~D0&D4)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.36	0.51	1.00
0.38	0.30	0.45	0.59	1.08
1.00	0.43	0.57	0.71	1.19
3.00	0.54	0.68	0.82	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(D0&~D4)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.52	1.15
0.38	0.28	0.43	0.60	1.23
1.00	0.36	0.50	0.67	1.31
3.00	0.47	0.62	0.78	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(D0&~D4)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.51	1.00
0.38	0.27	0.41	0.55	1.03
1.00	0.34	0.47	0.61	1.10
3.00	0.49	0.63	0.77	1.26

TC200G SERIES

DATA SHEET

MUX81

MUX81

14/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.40
0.38	0.51	0.66	0.83	1.46
1.00	0.60	0.75	0.92	1.55
3.00	0.79	0.94	1.11	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.63	0.79	1.29
0.38	0.50	0.65	0.81	1.31
1.00	0.57	0.72	0.88	1.38
3.00	0.74	0.90	1.06	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.40
0.38	0.52	0.67	0.83	1.47
1.00	0.61	0.76	0.92	1.56
3.00	0.80	0.95	1.11	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.64	0.79	1.29
0.38	0.51	0.66	0.81	1.32
1.00	0.57	0.73	0.88	1.38
3.00	0.75	0.91	1.07	1.58

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

15/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.40
0.38	0.52	0.66	0.83	1.47
1.00	0.61	0.76	0.92	1.56
3.00	0.80	0.94	1.11	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.64	0.79	1.30
0.38	0.51	0.66	0.82	1.32
1.00	0.57	0.73	0.89	1.39
3.00	0.75	0.91	1.07	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.40
0.38	0.51	0.66	0.83	1.47
1.00	0.61	0.75	0.92	1.56
3.00	0.79	0.94	1.11	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.64	0.79	1.30
0.38	0.50	0.66	0.82	1.32
1.00	0.57	0.73	0.89	1.39
3.00	0.75	0.91	1.07	1.58

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81

MUX81

16/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D4->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.76	1.39
0.38	0.50	0.65	0.82	1.45
1.00	0.59	0.74	0.90	1.54
3.00	0.77	0.92	1.09	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
D4->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.62	0.77	1.27
0.38	0.49	0.64	0.80	1.29
1.00	0.56	0.71	0.86	1.36
3.00	0.73	0.89	1.04	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
D5->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.58	0.75	1.38
0.38	0.50	0.64	0.81	1.44
1.00	0.59	0.73	0.90	1.53
3.00	0.76	0.91	1.08	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
D5->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.62	0.77	1.26
0.38	0.48	0.64	0.79	1.29
1.00	0.55	0.71	0.86	1.36
3.00	0.72	0.88	1.04	1.54

TC200G SERIES

DATA SHEET

MUX81

MUX81

17/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D6->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.56	0.73	1.36
0.38	0.48	0.62	0.79	1.42
1.00	0.56	0.71	0.87	1.51
3.00	0.73	0.88	1.05	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
D6->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.74	1.24
0.38	0.47	0.62	0.77	1.26
1.00	0.53	0.69	0.84	1.33
3.00	0.70	0.86	1.01	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
D7->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0891	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.56	0.73	1.36
0.38	0.48	0.62	0.79	1.42
1.00	0.56	0.71	0.87	1.51
3.00	0.73	0.88	1.05	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
D7->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0391	0.14

PATH DELAY (ns)

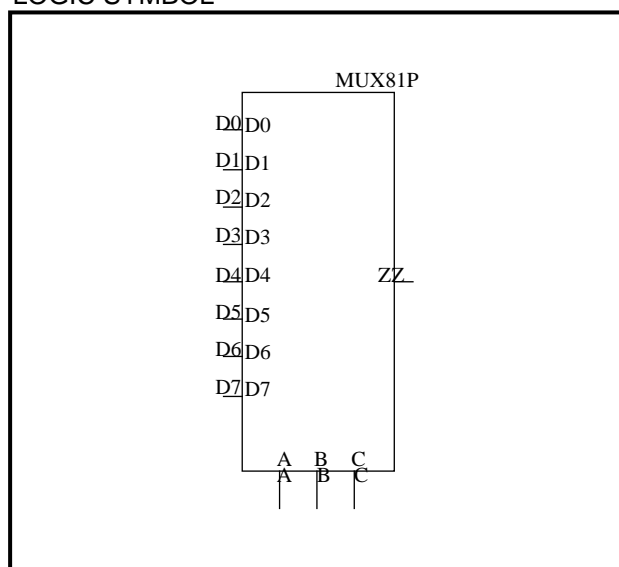
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.59	0.74	1.24
0.38	0.47	0.62	0.77	1.26
1.00	0.53	0.69	0.84	1.33
3.00	0.69	0.85	1.01	1.51

TC200G SERIES

DATA SHEET

MUX81P		MUX81P		1/17
CELL NAME	FUNCTION	CELL COUNT		CONDITION
MUX81P	8 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		15	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
C	B	A	Z
L	L	L	D0
L	L	H	D1
L	H	L	D2
L	H	H	D3
H	L	L	D4
H	L	H	D5
H	H	L	D6
H	H	H	D7

Verilog-HDL DESCRIPTION

```
MUX81P inst(Z,D0,D1,D2,D3,D4,D5,
D6,D7,A,B,C);
```

VHDL DESCRIPTION

```
inst:MUX81P
port map(Z,D0,D1,D2,D3,D4,
D5,D6,D7,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D0	3.46
D1,D7	3.42
D2	3.30
D3	3.39
D4	3.40
D5	3.49
D6	3.36
A	0.99
B	3.24
C	2.11

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	88.9

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

2/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(~D6&D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.83	0.91	1.00	1.33
0.38	0.86	0.94	1.03	1.36
1.00	0.93	1.02	1.11	1.44
3.00	1.10	1.18	1.27	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(~D6&D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.80	0.90	1.00	1.30
0.38	0.89	0.99	1.09	1.39
1.00	0.99	1.09	1.18	1.48
3.00	1.17	1.27	1.36	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(D6&~D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.67	0.75	0.84	1.17
0.38	0.75	0.84	0.93	1.26
1.00	0.87	0.95	1.04	1.37
3.00	1.08	1.16	1.25	1.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&C)&(D6&~D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.84	0.94	1.24
0.38	0.77	0.87	0.97	1.27
1.00	0.85	0.95	1.05	1.35
3.00	1.04	1.13	1.23	1.53

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

3/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(~D2&D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.88	0.96	1.05	1.39
0.38	0.91	0.99	1.08	1.42
1.00	0.98	1.07	1.16	1.50
3.00	1.15	1.23	1.32	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(~D2&D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.87	0.97	1.07	1.37
0.38	0.95	1.05	1.15	1.46
1.00	1.05	1.15	1.25	1.56
3.00	1.23	1.33	1.43	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(D2&~D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.71	0.80	0.89	1.23
0.38	0.80	0.89	0.98	1.31
1.00	0.92	1.00	1.09	1.43
3.00	1.13	1.21	1.30	1.64

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(B&~C)&(D2&~D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.81	0.91	1.00	1.31
0.38	0.84	0.94	1.04	1.34
1.00	0.92	1.02	1.12	1.42
3.00	1.10	1.20	1.30	1.61

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

4/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(~D4&D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.95	1.04	1.37
0.38	0.90	0.98	1.07	1.40
1.00	0.97	1.05	1.15	1.48
3.00	1.14	1.22	1.31	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(~D4&D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.82	0.92	1.01	1.32
0.38	0.91	1.00	1.10	1.40
1.00	1.00	1.10	1.20	1.50
3.00	1.18	1.28	1.38	1.68

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(D4&~D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.70	0.78	0.87	1.21
0.38	0.79	0.87	0.96	1.30
1.00	0.90	0.98	1.07	1.41
3.00	1.11	1.19	1.28	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&C)&(D4&~D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.77	0.87	0.96	1.27
0.38	0.80	0.90	1.00	1.30
1.00	0.88	0.98	1.08	1.38
3.00	1.07	1.17	1.26	1.57

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

5/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(D0&D1)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.88	0.96	1.05	1.39
0.38	0.91	0.99	1.09	1.42
1.00	0.99	1.07	1.16	1.50
3.00	1.15	1.23	1.33	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(D0&D1)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.86	0.96	1.05	1.36
0.38	0.94	1.04	1.14	1.45
1.00	1.04	1.14	1.24	1.54
3.00	1.22	1.32	1.42	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(D0&~D1)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.81	0.90	1.24
0.38	0.82	0.90	0.99	1.33
1.00	0.93	1.01	1.10	1.44
3.00	1.14	1.23	1.32	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	(~B&~C)&(D0&~D1)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.79	0.88	0.98	1.29
0.38	0.82	0.92	1.01	1.32
1.00	0.90	0.99	1.09	1.40
3.00	1.08	1.18	1.27	1.58

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

6/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(~D5&D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.55	0.64	0.97
0.38	0.49	0.58	0.67	1.00
1.00	0.56	0.65	0.74	1.07
3.00	0.71	0.79	0.88	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(~D5&D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.43	0.53	0.83
0.38	0.41	0.51	0.61	0.91
1.00	0.55	0.65	0.75	1.05
3.00	0.73	0.83	0.93	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(D5&~D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.42	0.51	0.84
0.38	0.42	0.50	0.59	0.92
1.00	0.51	0.60	0.69	1.02
3.00	0.71	0.79	0.88	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&C)&(D5&~D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.46	0.56	0.86
0.38	0.40	0.49	0.59	0.89
1.00	0.46	0.56	0.66	0.96
3.00	0.62	0.73	0.82	1.13

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

7/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(~D1&D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.64	0.97
0.38	0.49	0.57	0.67	1.00
1.00	0.56	0.64	0.73	1.07
3.00	0.70	0.79	0.88	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(~D1&D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.43	0.52	0.83
0.38	0.40	0.50	0.60	0.91
1.00	0.55	0.65	0.74	1.05
3.00	0.74	0.84	0.93	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(D1&~D3)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.42	0.52	0.85
0.38	0.42	0.51	0.60	0.93
1.00	0.52	0.61	0.70	1.03
3.00	0.72	0.81	0.90	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(A&~C)&(D1&~D3)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.45	0.55	0.85
0.38	0.38	0.48	0.58	0.88
1.00	0.45	0.55	0.64	0.95
3.00	0.61	0.71	0.81	1.12

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

8/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(~D4&D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.55	0.64	0.97
0.38	0.49	0.58	0.67	1.00
1.00	0.56	0.65	0.74	1.07
3.00	0.71	0.79	0.88	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(~D4&D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.43	0.53	0.83
0.38	0.41	0.51	0.61	0.91
1.00	0.55	0.65	0.75	1.05
3.00	0.73	0.83	0.93	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(D4&~D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.42	0.51	0.84
0.38	0.42	0.50	0.59	0.92
1.00	0.51	0.60	0.69	1.02
3.00	0.71	0.79	0.88	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&C)&(D4&~D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.46	0.56	0.86
0.38	0.40	0.49	0.59	0.89
1.00	0.46	0.56	0.66	0.96
3.00	0.62	0.73	0.82	1.13

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

9/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(~D0&D2)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.64	0.97
0.38	0.49	0.57	0.67	1.00
1.00	0.56	0.64	0.73	1.07
3.00	0.70	0.79	0.88	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(~D0&D2)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.43	0.52	0.83
0.38	0.40	0.50	0.60	0.91
1.00	0.55	0.65	0.74	1.05
3.00	0.74	0.84	0.93	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(D0&~D2)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.42	0.52	0.85
0.38	0.42	0.51	0.60	0.93
1.00	0.52	0.61	0.70	1.03
3.00	0.72	0.81	0.90	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	(~A&~C)&(D0&~D2)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.45	0.55	0.85
0.38	0.38	0.48	0.58	0.88
1.00	0.45	0.55	0.64	0.95
3.00	0.61	0.71	0.81	1.12

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

10/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(~D3&D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.41	0.50	0.84
0.38	0.36	0.44	0.54	0.87
1.00	0.42	0.50	0.59	0.93
3.00	0.53	0.62	0.71	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(~D3&D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.30	0.40	0.70
0.38	0.30	0.39	0.49	0.78
1.00	0.44	0.54	0.63	0.92
3.00	0.59	0.68	0.77	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(D3&~D7)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.40	0.74
0.38	0.31	0.39	0.49	0.82
1.00	0.40	0.48	0.57	0.91
3.00	0.56	0.64	0.73	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&B)&(D3&~D7)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.42	0.72
0.38	0.28	0.37	0.46	0.75
1.00	0.34	0.43	0.52	0.82
3.00	0.50	0.59	0.69	0.99

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

11/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(~D1&D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.50	0.83
0.38	0.35	0.44	0.53	0.86
1.00	0.41	0.49	0.58	0.92
3.00	0.53	0.61	0.70	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(~D1&D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.31	0.40	0.70
0.38	0.30	0.39	0.49	0.79
1.00	0.45	0.54	0.63	0.92
3.00	0.60	0.69	0.77	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(D1&~D5)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.40	0.74
0.38	0.31	0.39	0.48	0.82
1.00	0.40	0.48	0.57	0.91
3.00	0.56	0.64	0.73	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(A&~B)&(D1&~D5)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.42	0.72
0.38	0.27	0.36	0.46	0.75
1.00	0.34	0.43	0.52	0.82
3.00	0.49	0.59	0.68	0.98

Rev.1.01.10

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

12/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(~D2&D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.41	0.50	0.84
0.38	0.36	0.44	0.54	0.87
1.00	0.42	0.50	0.59	0.93
3.00	0.53	0.62	0.71	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(~D2&D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.30	0.40	0.70
0.38	0.30	0.39	0.48	0.78
1.00	0.44	0.54	0.63	0.92
3.00	0.59	0.68	0.77	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(D2&~D6)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.31	0.40	0.74
0.38	0.31	0.39	0.49	0.82
1.00	0.40	0.48	0.57	0.91
3.00	0.56	0.64	0.73	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&B)&(D2&~D6)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.42	0.72
0.38	0.28	0.37	0.46	0.75
1.00	0.34	0.43	0.52	0.82
3.00	0.50	0.59	0.69	0.99

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

13/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(~D0&D4)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.50	0.83
0.38	0.35	0.44	0.53	0.86
1.00	0.41	0.49	0.58	0.92
3.00	0.53	0.61	0.70	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(~D0&D4)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.31	0.40	0.70
0.38	0.30	0.39	0.49	0.79
1.00	0.45	0.54	0.63	0.92
3.00	0.60	0.69	0.77	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(D0&~D4)	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.31	0.40	0.74
0.38	0.31	0.39	0.48	0.82
1.00	0.40	0.48	0.57	0.91
3.00	0.56	0.64	0.73	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	(~A&~B)&(D0&~D4)	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.33	0.42	0.72
0.38	0.27	0.36	0.46	0.75
1.00	0.34	0.43	0.52	0.82
3.00	0.49	0.59	0.68	0.98

TC200G SERIES

DATA SHEET

MUX81P

MUX81P

14/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.55	0.64	0.98
0.38	0.53	0.62	0.71	1.04
1.00	0.63	0.71	0.80	1.13
3.00	0.82	0.91	1.00	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
D0->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.58	0.68	0.99
0.38	0.50	0.60	0.70	1.01
1.00	0.57	0.67	0.77	1.08
3.00	0.76	0.86	0.96	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.56	0.65	0.98
0.38	0.54	0.62	0.71	1.05
1.00	0.63	0.71	0.81	1.14
3.00	0.83	0.91	1.01	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
D1->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.59	0.69	0.99
0.38	0.51	0.61	0.71	1.01
1.00	0.58	0.68	0.78	1.08
3.00	0.76	0.86	0.97	1.28

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TC200G SERIES

DATA SHEET

MUX81P

MUX81P

15/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.56	0.65	0.98
0.38	0.54	0.62	0.71	1.05
1.00	0.63	0.71	0.81	1.14
3.00	0.83	0.91	1.00	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
D2->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.59	0.69	1.00
0.38	0.51	0.61	0.71	1.02
1.00	0.58	0.68	0.78	1.09
3.00	0.76	0.86	0.97	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.55	0.65	0.98
0.38	0.53	0.62	0.71	1.05
1.00	0.63	0.71	0.80	1.14
3.00	0.83	0.91	1.00	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
D3->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.59	0.69	1.00
0.38	0.51	0.61	0.71	1.02
1.00	0.58	0.68	0.78	1.09
3.00	0.76	0.86	0.96	1.28

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TC200G SERIES

DATA SHEET

MUX81P

MUX81P

16/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D4->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.63	0.97
0.38	0.52	0.60	0.70	1.03
1.00	0.61	0.69	0.79	1.12
3.00	0.80	0.88	0.98	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
D4->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.57	0.67	0.97
0.38	0.50	0.59	0.69	1.00
1.00	0.57	0.66	0.76	1.06
3.00	0.74	0.84	0.94	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
D5->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.54	0.63	0.96
0.38	0.52	0.60	0.69	1.02
1.00	0.61	0.69	0.78	1.11
3.00	0.80	0.88	0.97	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
D5->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.57	0.66	0.97
0.38	0.49	0.59	0.69	0.99
1.00	0.56	0.66	0.75	1.06
3.00	0.73	0.84	0.94	1.25

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TC200G SERIES

DATA SHEET

MUX81P

MUX81P

17/17

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
D6->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.52	0.61	0.94
0.38	0.50	0.58	0.67	1.00
1.00	0.58	0.66	0.76	1.09
3.00	0.76	0.85	0.94	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
D6->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.54	0.64	0.94
0.38	0.47	0.57	0.67	0.97
1.00	0.54	0.64	0.73	1.04
3.00	0.71	0.81	0.91	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
D7->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0444	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.51	0.61	0.94
0.38	0.49	0.58	0.67	1.00
1.00	0.58	0.66	0.75	1.09
3.00	0.76	0.84	0.94	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
D7->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0227	0.13

PATH DELAY (ns)

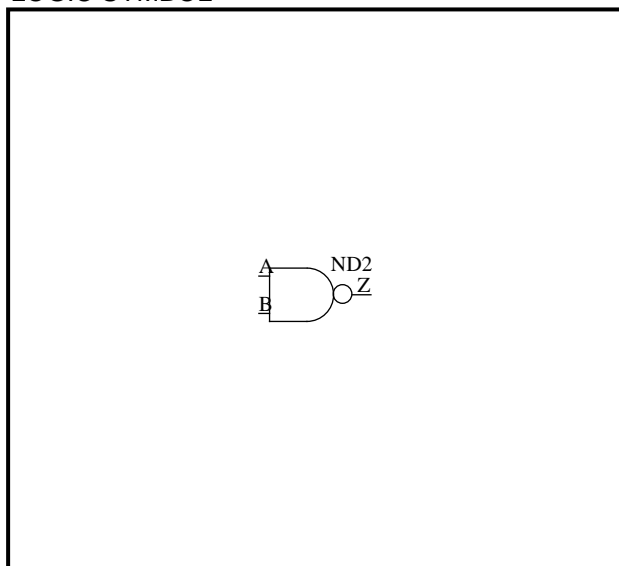
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.54	0.64	0.94
0.38	0.47	0.57	0.66	0.97
1.00	0.54	0.64	0.73	1.04
3.00	0.71	0.81	0.91	1.22

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TC200G SERIES
DATA SHEET

ND2		ND2		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND2	2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	H
L	H	H
H	L	H
H	H	L

Verilog-HDL DESCRIPTION

```
ND2 inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:ND2
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	34.3

TC200G SERIES

DATA SHEET

ND2

ND2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0997	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.09
0.38	0.11	0.26	0.43	1.12
1.00	0.13	0.30	0.49	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0654	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0997	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.26	0.43	1.11
0.38	0.14	0.28	0.45	1.14
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0654	0.10

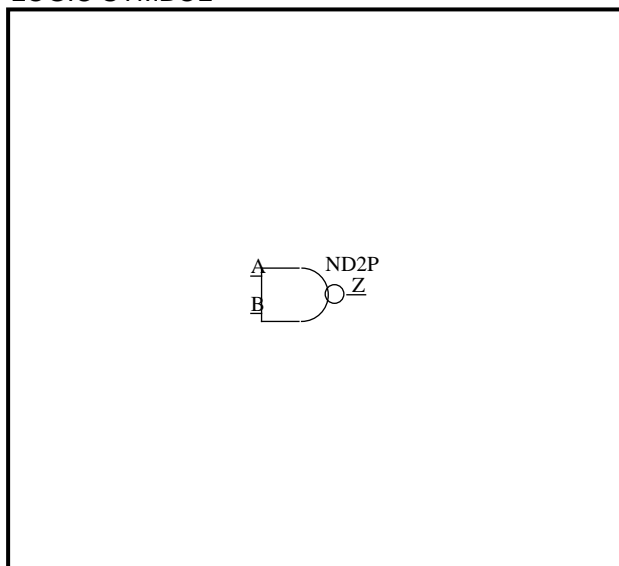
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.44	1.18
0.38	0.15	0.31	0.50	1.24
1.00	0.20	0.38	0.58	1.33
3.00	0.26	0.52	0.78	1.61

TC200G SERIES
DATA SHEET

ND2P		ND2P		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND2P	2-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	H
L	H	H
H	L	H
H	H	L

Verilog-HDL DESCRIPTION

```
ND2P inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:ND2P
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.06
B	2.07

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	66.3

TC200G SERIES

DATA SHEET

ND2P

ND2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0492	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.23	0.57
0.38	0.09	0.17	0.26	0.60
1.00	0.11	0.20	0.30	0.66
3.00	0.11	0.24	0.37	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0316	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.15	0.24	0.61
0.38	0.13	0.22	0.32	0.69
1.00	0.18	0.30	0.42	0.83
3.00	0.27	0.45	0.62	1.15

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0492	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.17	0.25	0.60
0.38	0.11	0.19	0.28	0.62
1.00	0.14	0.23	0.33	0.68
3.00	0.20	0.31	0.43	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0316	0.12

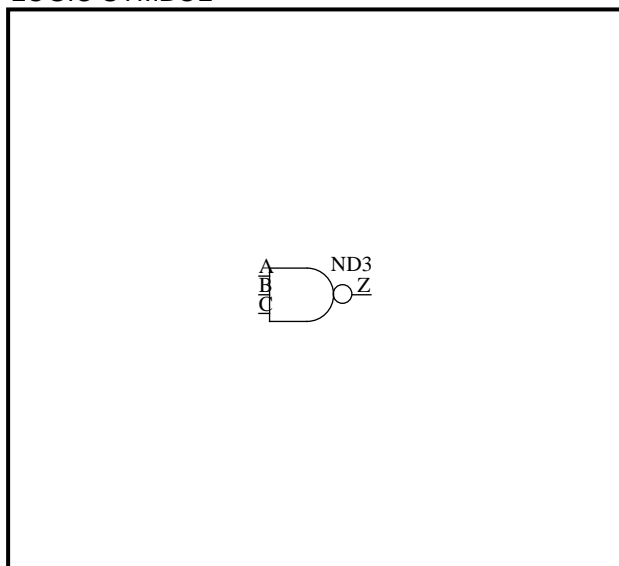
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.16	0.25	0.62
0.38	0.13	0.21	0.31	0.68
1.00	0.16	0.27	0.38	0.77
3.00	0.22	0.37	0.52	1.00

TC200G SERIES
DATA SHEET

ND3		ND3		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND3	3-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	H
L	H	L	H
L	H	H	H
H	L	L	H
H	L	H	H
H	H	L	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
ND3 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:ND3
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.03
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	29.1

TC200G SERIES

DATA SHEET

ND3

ND3

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.24	0.41	1.10
0.38	0.12	0.27	0.44	1.13
1.00	0.13	0.31	0.49	1.18
3.00	0.10	0.34	0.57	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0932	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.36	0.62	1.67
0.38	0.22	0.44	0.70	1.75
1.00	0.30	0.56	0.83	1.89
3.00	0.49	0.83	1.17	2.32

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.43	1.12
0.38	0.15	0.29	0.46	1.15
1.00	0.17	0.33	0.52	1.20
3.00	0.17	0.38	0.61	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0932	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.38	0.65	1.70
0.38	0.22	0.44	0.70	1.76
1.00	0.29	0.53	0.80	1.86
3.00	0.46	0.76	1.08	2.19

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TC200G SERIES

DATA SHEET

ND3

ND3

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.27	0.44	1.07
0.38	0.16	0.30	0.46	1.10
1.00	0.19	0.34	0.51	1.15
3.00	0.22	0.42	0.62	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0932	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.40	0.66	1.71
0.38	0.22	0.43	0.70	1.75
1.00	0.26	0.48	0.74	1.79
3.00	0.34	0.60	0.88	1.95

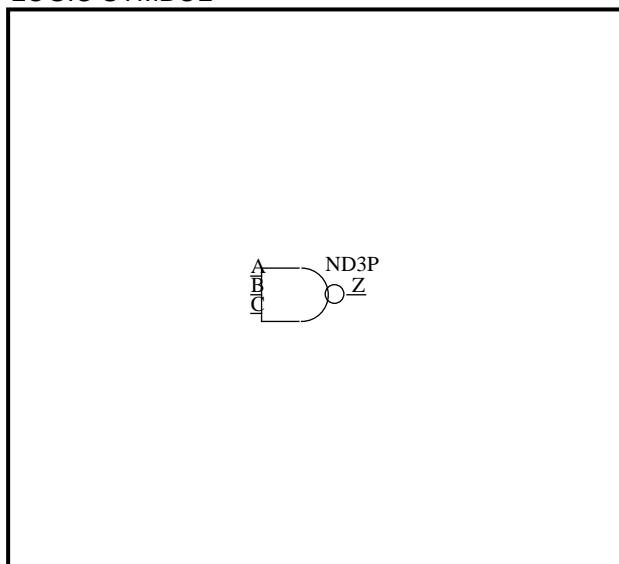
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TC200G SERIES

DATA SHEET

ND3P		ND3P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND3P	3-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	H
L	H	L	H
L	H	H	H
H	L	L	H
H	L	H	H
H	H	L	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
ND3P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:ND3P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.10
B	2.02
C	1.96

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	51.7

TC200G SERIES

DATA SHEET

ND3P

ND3P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0568	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.16	0.24	0.58
0.38	0.10	0.18	0.27	0.61
1.00	0.11	0.20	0.31	0.67
3.00	0.05	0.19	0.33	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0480	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.24	0.37	0.92
0.38	0.19	0.31	0.45	1.00
1.00	0.26	0.41	0.57	1.14
3.00	0.45	0.65	0.85	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0568	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.26	0.60
0.38	0.13	0.20	0.29	0.63
1.00	0.14	0.23	0.33	0.69
3.00	0.12	0.25	0.38	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0480	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.26	0.40	0.95
0.38	0.20	0.31	0.45	1.01
1.00	0.27	0.40	0.55	1.11
3.00	0.43	0.60	0.79	1.42

TC200G SERIES

DATA SHEET

ND3P

ND3P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0568	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.24	0.34	0.73
0.38	0.17	0.26	0.36	0.75
1.00	0.21	0.30	0.41	0.80
3.00	0.26	0.38	0.51	0.96

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0480	0.18

PATH DELAY (ns)

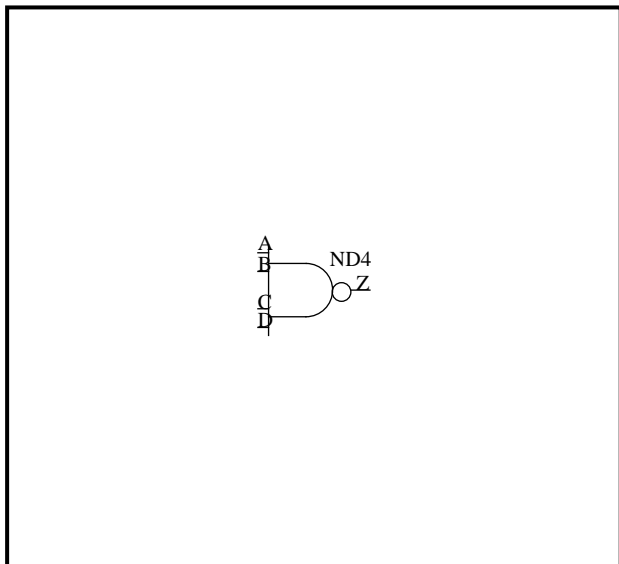
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.28	0.41	0.96
0.38	0.20	0.31	0.45	1.00
1.00	0.24	0.36	0.50	1.05
3.00	0.30	0.45	0.62	1.20

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TC200G SERIES
DATA SHEET

ND4		ND4		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND4	4-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
ND4 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:ND4
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.04
C	0.98
D	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	25.1

TC200G SERIES

DATA SHEET

ND4

ND4

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.24	0.41	1.10
0.38	0.13	0.27	0.45	1.13
1.00	0.13	0.31	0.50	1.18
3.00	0.06	0.30	0.55	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1205	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.46	0.80	2.15
0.38	0.26	0.53	0.87	2.22
1.00	0.35	0.66	1.01	2.36
3.00	0.59	0.97	1.38	2.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.44	1.12
0.38	0.15	0.29	0.47	1.15
1.00	0.16	0.33	0.52	1.20
3.00	0.12	0.35	0.58	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1205	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.49	0.83	2.18
0.38	0.27	0.55	0.89	2.24
1.00	0.36	0.65	0.99	2.35
3.00	0.58	0.93	1.31	2.70

TC200G SERIES

DATA SHEET

ND4

ND4

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.30	0.47	1.16
0.38	0.18	0.32	0.49	1.18
1.00	0.20	0.36	0.55	1.23
3.00	0.19	0.41	0.63	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1205	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.53	0.86	2.22
0.38	0.29	0.57	0.91	2.26
1.00	0.35	0.62	0.96	2.32
3.00	0.50	0.81	1.17	2.52

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0999	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.31	0.49	1.18
0.38	0.19	0.34	0.51	1.20
1.00	0.21	0.38	0.57	1.25
3.00	0.22	0.43	0.66	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1205	0.22

PATH DELAY (ns)

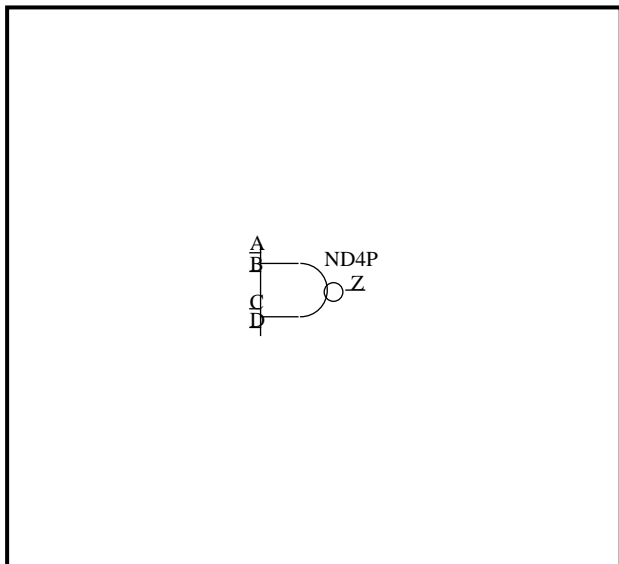
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.54	0.88	2.23
0.38	0.29	0.57	0.91	2.26
1.00	0.33	0.61	0.95	2.30
3.00	0.44	0.74	1.08	2.42

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TC200G SERIES
DATA SHEET

ND4P		ND4P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND4P	4-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
H	H	H	H	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```

ND4P inst(Z,A,B,C,D);
    
```

VHDL DESCRIPTION

```

inst:ND4P
port map(Z,A,B,C,D);
    
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.15
B	2.12
C	2.05
D	1.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	47.9

TC200G SERIES

DATA SHEET

ND4P

ND4P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0498	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.16	0.24	0.58
0.38	0.11	0.19	0.28	0.62
1.00	0.10	0.20	0.31	0.67
3.00	0.00	0.15	0.29	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0645	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.31	0.49	1.22
0.38	0.23	0.38	0.57	1.29
1.00	0.32	0.50	0.70	1.43
3.00	0.57	0.79	1.02	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0498	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.27	0.61
0.38	0.13	0.21	0.30	0.64
1.00	0.14	0.23	0.33	0.69
3.00	0.06	0.20	0.34	0.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0645	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.53	1.26
0.38	0.26	0.40	0.59	1.31
1.00	0.34	0.51	0.69	1.42
3.00	0.57	0.77	0.99	1.77

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TC200G SERIES

DATA SHEET

ND4P

ND4P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0498	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.21	0.30	0.64
0.38	0.16	0.23	0.32	0.67
1.00	0.17	0.26	0.36	0.72
3.00	0.14	0.26	0.40	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0645	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.56	1.29
0.38	0.27	0.42	0.60	1.33
1.00	0.32	0.47	0.65	1.38
3.00	0.47	0.64	0.83	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0498	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.22	0.31	0.66
0.38	0.17	0.25	0.34	0.68
1.00	0.18	0.28	0.38	0.74
3.00	0.17	0.29	0.42	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0645	0.24

PATH DELAY (ns)

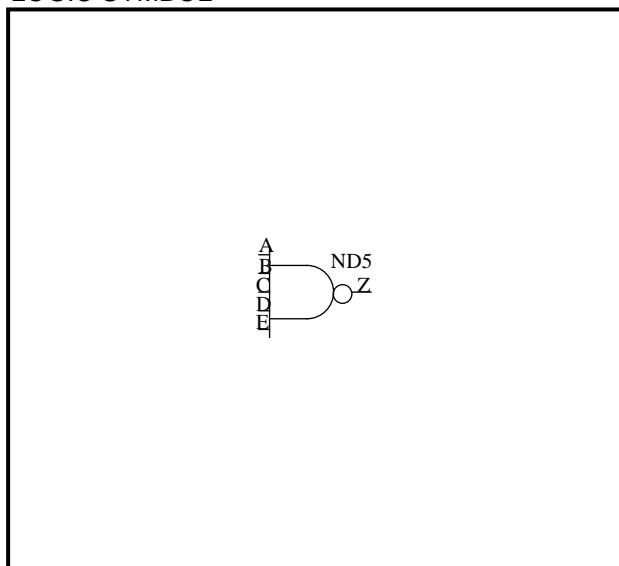
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.39	0.57	1.30
0.38	0.27	0.42	0.61	1.33
1.00	0.31	0.46	0.64	1.36
3.00	0.41	0.58	0.76	1.48

Rev.1.01.10

TC200G SERIES
DATA SHEET

ND5		ND5		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND5	5-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT
A	B	C	D	E	Z
H	H	H	H	H	L
ALL OTHER COMBINATIONS					H

Verilog-HDL DESCRIPTION

```
ND5 inst(Z,A,B,C,D,E);
```

VHDL DESCRIPTION

```
inst:ND5
port map(Z,A,B,C,D,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	0.99
C	0.98
D	1.05
E	1.09

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	44.4

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TC200G SERIES

DATA SHEET

ND5

ND5

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0966	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.60	1.26
0.38	0.32	0.46	0.63	1.29
1.00	0.35	0.49	0.66	1.32
3.00	0.37	0.51	0.67	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0396	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.54	0.66	1.14
0.38	0.49	0.61	0.74	1.21
1.00	0.59	0.71	0.84	1.31
3.00	0.84	0.96	1.09	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0966	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.46	0.63	1.29
0.38	0.35	0.49	0.65	1.32
1.00	0.39	0.53	0.70	1.36
3.00	0.45	0.59	0.76	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0396	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.56	0.69	1.16
0.38	0.50	0.62	0.75	1.22
1.00	0.59	0.71	0.84	1.31
3.00	0.82	0.94	1.07	1.54

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TC200G SERIES

DATA SHEET

ND5

ND5

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0966	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.51	0.68	1.35
0.38	0.39	0.53	0.70	1.37
1.00	0.45	0.59	0.76	1.43
3.00	0.58	0.72	0.89	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0396	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.58	0.71	1.18
0.38	0.50	0.62	0.75	1.22
1.00	0.55	0.67	0.80	1.27
3.00	0.69	0.81	0.94	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0966	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.42	0.59	1.26
0.38	0.31	0.45	0.62	1.29
1.00	0.35	0.49	0.66	1.33
3.00	0.42	0.56	0.73	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0396	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.48	0.61	1.08
0.38	0.42	0.54	0.67	1.14
1.00	0.49	0.61	0.73	1.21
3.00	0.63	0.75	0.88	1.36

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TC200G SERIES

DATA SHEET

ND5

ND5

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0966	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.62	1.29
0.38	0.34	0.48	0.65	1.32
1.00	0.40	0.54	0.71	1.37
3.00	0.52	0.66	0.83	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0396	0.11

PATH DELAY (ns)

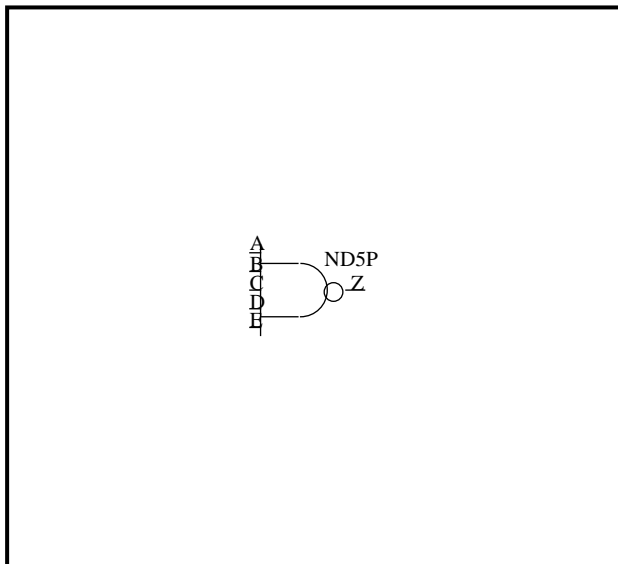
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.49	0.62	1.09
0.38	0.42	0.54	0.66	1.14
1.00	0.47	0.59	0.71	1.19
3.00	0.57	0.69	0.81	1.29

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TC200G SERIES
DATA SHEET

ND5P		ND5P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND5P	5-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT
A	B	C	D	E	Z
H	H	H	H	H	L
ALL OTHER COMBINATIONS					H

Verilog-HDL DESCRIPTION

```
ND5P inst(Z,A,B,C,D,E);
```

VHDL DESCRIPTION

```
inst:ND5P
port map(Z,A,B,C,D,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,C	0.99
B	1.04
D	1.02
E	1.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	81.4

TC200G SERIES

DATA SHEET

ND5P

ND5P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0550	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.37	0.46	0.83
0.38	0.31	0.40	0.49	0.86
1.00	0.35	0.43	0.53	0.89
3.00	0.38	0.46	0.55	0.92

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.53	0.61	0.87
0.38	0.52	0.60	0.68	0.94
1.00	0.62	0.70	0.77	1.04
3.00	0.87	0.94	1.02	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0550	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.50	0.86
0.38	0.35	0.43	0.52	0.89
1.00	0.39	0.48	0.57	0.94
3.00	0.46	0.55	0.64	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.55	0.63	0.89
0.38	0.53	0.61	0.69	0.95
1.00	0.62	0.70	0.77	1.04
3.00	0.84	0.92	1.00	1.26

TC200G SERIES

DATA SHEET

ND5P

ND5P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0550	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.43	0.52	0.89
0.38	0.37	0.45	0.55	0.92
1.00	0.43	0.51	0.61	0.98
3.00	0.55	0.63	0.73	1.10

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.57	0.65	0.91
0.38	0.53	0.60	0.68	0.94
1.00	0.58	0.66	0.73	1.00
3.00	0.72	0.80	0.88	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0550	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.83
0.38	0.31	0.40	0.49	0.86
1.00	0.36	0.44	0.54	0.91
3.00	0.45	0.53	0.63	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.48	0.56	0.82
0.38	0.46	0.54	0.62	0.88
1.00	0.53	0.60	0.68	0.94
3.00	0.66	0.74	0.82	1.08

TC200G SERIES

DATA SHEET

ND5P

ND5P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0550	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.39	0.48	0.85
0.38	0.34	0.42	0.51	0.88
1.00	0.40	0.48	0.57	0.94
3.00	0.52	0.60	0.70	1.07

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.14

PATH DELAY (ns)

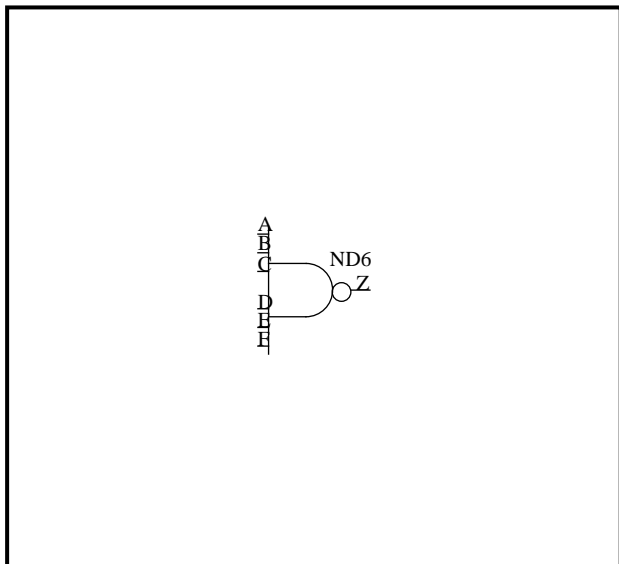
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.49	0.57	0.83
0.38	0.46	0.53	0.61	0.87
1.00	0.50	0.58	0.66	0.92
3.00	0.60	0.68	0.76	1.02

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TC200G SERIES
DATA SHEET

ND6		ND6		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND6	6-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT
A	B	C	D	E	F	Z
H	H	H	H	H	H	L
ALL OTHER COMBINATIONS						H

Verilog-HDL DESCRIPTION

```
ND6 inst(Z,A,B,C,D,E,F);
```

VHDL DESCRIPTION

```
inst:ND6
port map(Z,A,B,C,D,E,F);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.10
B,D	1.03
C,E,F	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	43.1

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TC200G SERIES

DATA SHEET

ND6

ND6

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1005	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.60	1.29
0.38	0.32	0.46	0.63	1.32
1.00	0.35	0.49	0.67	1.35
3.00	0.37	0.52	0.69	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.53	0.66	1.13
0.38	0.48	0.60	0.73	1.20
1.00	0.58	0.70	0.82	1.30
3.00	0.82	0.94	1.07	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1005	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.46	0.63	1.32
0.38	0.35	0.49	0.66	1.35
1.00	0.39	0.54	0.71	1.39
3.00	0.46	0.60	0.77	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.55	0.68	1.15
0.38	0.49	0.61	0.74	1.21
1.00	0.57	0.69	0.82	1.30
3.00	0.79	0.91	1.04	1.52

Rev.1.01.10

TC200G SERIES

DATA SHEET

ND6

ND6

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1005	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.48	0.66	1.34
0.38	0.37	0.51	0.68	1.37
1.00	0.43	0.57	0.74	1.43
3.00	0.55	0.69	0.86	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.57	0.69	1.17
0.38	0.48	0.60	0.73	1.20
1.00	0.53	0.65	0.78	1.26
3.00	0.66	0.78	0.91	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1005	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.45	0.62	1.30
0.38	0.33	0.47	0.65	1.33
1.00	0.36	0.51	0.68	1.36
3.00	0.38	0.53	0.70	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.54	0.67	1.14
0.38	0.49	0.61	0.74	1.22
1.00	0.59	0.71	0.84	1.31
3.00	0.84	0.96	1.09	1.56

Rev.1.01.10

TC200G SERIES

DATA SHEET

ND6

ND6

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1005	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.48	0.65	1.34
0.38	0.36	0.50	0.68	1.36
1.00	0.41	0.55	0.72	1.41
3.00	0.47	0.61	0.78	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.57	0.69	1.17
0.38	0.50	0.62	0.75	1.23
1.00	0.59	0.71	0.84	1.31
3.00	0.81	0.93	1.06	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1005	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.52	0.70	1.38
0.38	0.40	0.55	0.72	1.41
1.00	0.46	0.61	0.79	1.47
3.00	0.60	0.74	0.92	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.11

PATH DELAY (ns)

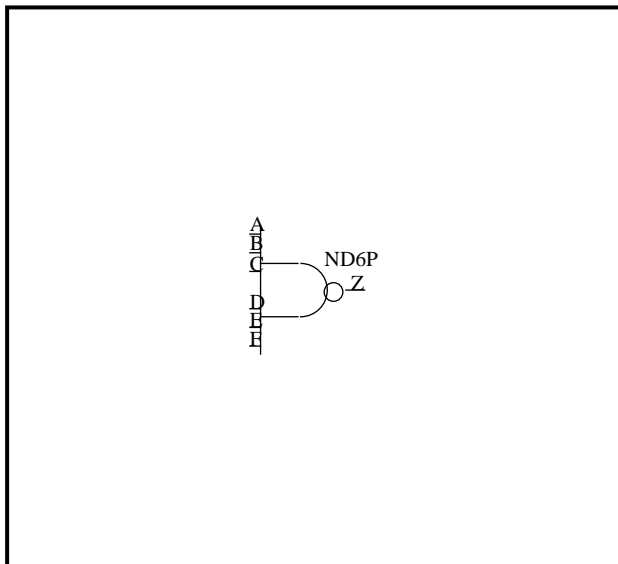
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.58	0.71	1.19
0.38	0.50	0.62	0.75	1.23
1.00	0.55	0.67	0.80	1.28
3.00	0.68	0.80	0.93	1.40

Rev.1.01.10

TC200G SERIES
DATA SHEET

ND6P		ND6P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND6P	6-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT
A	B	C	D	E	F	Z
H	H	H	H	H	H	L
ALL OTHER COMBINATIONS						H

Verilog-HDL DESCRIPTION

```
ND6P inst(Z,A,B,C,D,E,F);
```

VHDL DESCRIPTION

```
inst:ND6P
port map(Z,A,B,C,D,E,F);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B,E,F	0.98
C	0.97
D	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	95.3

Rev.1.01.10

TC200G SERIES

DATA SHEET

ND6P

ND6P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0452	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.32	0.40	0.72
0.38	0.28	0.35	0.43	0.75
1.00	0.32	0.39	0.47	0.78
3.00	0.34	0.41	0.49	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.50	0.58	0.83
0.38	0.50	0.58	0.65	0.90
1.00	0.60	0.68	0.75	1.00
3.00	0.85	0.93	1.00	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0452	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.37	0.45	0.76
0.38	0.33	0.39	0.48	0.79
1.00	0.38	0.45	0.53	0.84
3.00	0.46	0.53	0.61	0.92

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.53	0.60	0.85
0.38	0.51	0.58	0.66	0.91
1.00	0.59	0.67	0.74	0.99
3.00	0.80	0.88	0.95	1.20

Rev.1.01.10

TC200G SERIES

DATA SHEET

ND6P

ND6P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0452	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.40	0.48	0.80
0.38	0.36	0.43	0.51	0.82
1.00	0.43	0.50	0.58	0.89
3.00	0.57	0.64	0.72	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.54	0.62	0.86
0.38	0.51	0.58	0.65	0.90
1.00	0.56	0.63	0.71	0.95
3.00	0.68	0.76	0.83	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0452	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.34	0.42	0.74
0.38	0.30	0.37	0.45	0.77
1.00	0.34	0.40	0.49	0.80
3.00	0.37	0.44	0.52	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.51	0.58	0.83
0.38	0.51	0.58	0.66	0.91
1.00	0.60	0.67	0.75	1.00
3.00	0.83	0.90	0.98	1.23

TC200G SERIES

DATA SHEET

ND6P

ND6P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0452	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.37	0.45	0.77
0.38	0.33	0.40	0.48	0.80
1.00	0.38	0.45	0.53	0.85
3.00	0.46	0.53	0.61	0.92

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.53	0.61	0.86
0.38	0.51	0.59	0.66	0.91
1.00	0.59	0.67	0.74	0.99
3.00	0.79	0.87	0.94	1.19

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0452	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.41	0.49	0.81
0.38	0.37	0.44	0.52	0.83
1.00	0.43	0.50	0.58	0.90
3.00	0.58	0.65	0.73	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0185	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.55	0.62	0.87
0.38	0.51	0.58	0.66	0.91
1.00	0.56	0.63	0.70	0.95
3.00	0.66	0.73	0.81	1.06

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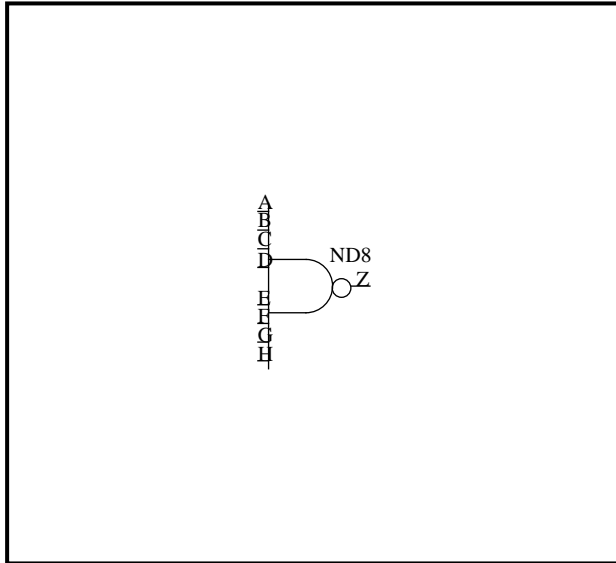
TC200G SERIES

DATA SHEET

ND8		ND8		1/5
-----	--	-----	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND8	8-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT								OUTPUT
A	B	C	D	E	F	G	H	Z
H	H	H	H	H	H	H	H	L
ALL OTHER COMBINATIONS								H

Verilog-HDL DESCRIPTION

```
ND8 inst(Z,A,B,C,D,E,F,G,H);
```

VHDL DESCRIPTION

```
inst:ND8
port map(Z,A,B,C,D,E,F,G,H);
```

ELECTRO MIGRATION

PIN NAME	(LU*MHz)
ELECTRO MIGRATION DRIVE	Z 6880.0

INPUT LOAD

PIN NAME	LOAD (LU)
A	1.09
B,F,H	1.03
C,G	0.98
D	1.07
E	1.00

OUTPUT DRIVE

PIN NAME	DRIVE (LU)
Z	45.4

TC200G SERIES

DATA SHEET

ND8

ND8

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.42	0.58	1.22
0.38	0.31	0.45	0.61	1.25
1.00	0.34	0.47	0.64	1.28
3.00	0.34	0.47	0.63	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.55	0.67	1.14
0.38	0.50	0.62	0.74	1.21
1.00	0.61	0.72	0.85	1.32
3.00	0.89	1.01	1.14	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.45	0.61	1.25
0.38	0.34	0.48	0.64	1.28
1.00	0.38	0.52	0.68	1.32
3.00	0.42	0.55	0.71	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.58	0.70	1.17
0.38	0.52	0.64	0.76	1.23
1.00	0.62	0.73	0.86	1.32
3.00	0.88	1.00	1.12	1.59

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TC200G SERIES

DATA SHEET

ND8

ND8

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.49	0.65	1.29
0.38	0.38	0.51	0.67	1.31
1.00	0.43	0.57	0.73	1.37
3.00	0.53	0.66	0.82	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.61	0.73	1.20
0.38	0.53	0.65	0.77	1.24
1.00	0.60	0.71	0.84	1.30
3.00	0.79	0.91	1.03	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.51	0.67	1.31
0.38	0.39	0.53	0.69	1.33
1.00	0.46	0.59	0.75	1.39
3.00	0.59	0.72	0.88	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.62	0.74	1.21
0.38	0.53	0.65	0.77	1.24
1.00	0.58	0.69	0.82	1.29
3.00	0.71	0.83	0.95	1.42

TC200G SERIES

DATA SHEET

ND8

ND8

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.43	0.59	1.23
0.38	0.32	0.46	0.62	1.26
1.00	0.35	0.49	0.65	1.29
3.00	0.35	0.48	0.65	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.54	0.67	1.13
0.38	0.50	0.62	0.74	1.21
1.00	0.60	0.72	0.85	1.31
3.00	0.89	1.00	1.13	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.46	0.62	1.26
0.38	0.35	0.49	0.65	1.29
1.00	0.39	0.53	0.69	1.33
3.00	0.43	0.57	0.73	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.57	0.70	1.17
0.38	0.51	0.63	0.76	1.22
1.00	0.61	0.73	0.85	1.32
3.00	0.87	0.99	1.11	1.58

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TC200G SERIES

DATA SHEET

ND8

ND8

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.66	1.30
0.38	0.39	0.52	0.68	1.32
1.00	0.45	0.58	0.74	1.38
3.00	0.55	0.68	0.84	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.60	0.73	1.19
0.38	0.53	0.64	0.77	1.23
1.00	0.59	0.70	0.83	1.30
3.00	0.77	0.89	1.01	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.50	0.66	1.30
0.38	0.39	0.52	0.68	1.32
1.00	0.45	0.58	0.74	1.38
3.00	0.57	0.70	0.86	1.50

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0392	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.61	0.74	1.20
0.38	0.53	0.64	0.77	1.23
1.00	0.57	0.69	0.81	1.28
3.00	0.70	0.82	0.94	1.41

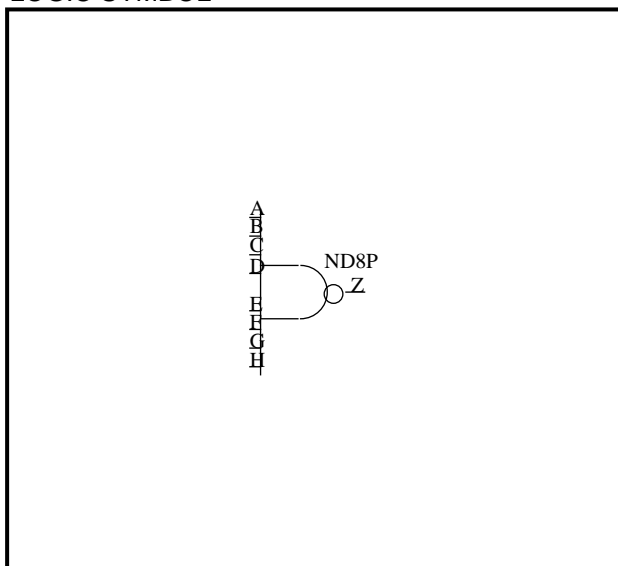
Rev.1.01.10

TC200G SERIES

DATA SHEET

ND8P		ND8P		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
ND8P	8-INPUT NAND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT								OUTPUT
A	B	C	D	E	F	G	H	Z
H	H	H	H	H	H	H	H	L
ALL OTHER COMBINATIONS								H

Verilog-HDL DESCRIPTION

```
ND8P inst(Z,A,B,C,D,E,F,G,H);
```

VHDL DESCRIPTION

```
inst:ND8P
port map(Z,A,B,C,D,E,F,G,H);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	0.99
B,D,F	1.03
C	0.98
E	1.04
G	1.05
H	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	77.2

TC200G SERIES

DATA SHEET

ND8P

ND8P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.83
0.38	0.32	0.40	0.49	0.86
1.00	0.35	0.43	0.52	0.89
3.00	0.35	0.43	0.53	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.56	0.65	0.94
0.38	0.55	0.63	0.72	1.02
1.00	0.66	0.74	0.83	1.13
3.00	0.95	1.03	1.12	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.49	0.86
0.38	0.35	0.43	0.52	0.89
1.00	0.39	0.47	0.57	0.94
3.00	0.43	0.51	0.61	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.59	0.68	0.98
0.38	0.57	0.65	0.74	1.04
1.00	0.67	0.75	0.84	1.13
3.00	0.93	1.02	1.10	1.40

TC200G SERIES

DATA SHEET

ND8P

ND8P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.44	0.54	0.91
0.38	0.39	0.47	0.56	0.93
1.00	0.44	0.53	0.62	0.99
3.00	0.55	0.63	0.72	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.62	0.71	1.01
0.38	0.58	0.66	0.75	1.05
1.00	0.64	0.73	0.81	1.11
3.00	0.84	0.93	1.01	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.44	0.54	0.90
0.38	0.38	0.47	0.56	0.93
1.00	0.45	0.53	0.62	0.99
3.00	0.57	0.65	0.74	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.72	1.02
0.38	0.58	0.66	0.75	1.05
1.00	0.63	0.71	0.80	1.10
3.00	0.77	0.86	0.94	1.24

TC200G SERIES

DATA SHEET

ND8P

ND8P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.46	0.83
0.38	0.31	0.39	0.49	0.86
1.00	0.34	0.42	0.52	0.88
3.00	0.32	0.40	0.50	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.55	0.64	0.94
0.38	0.54	0.63	0.71	1.01
1.00	0.65	0.74	0.82	1.12
3.00	0.95	1.03	1.12	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.41	0.50	0.87
0.38	0.36	0.44	0.53	0.90
1.00	0.40	0.48	0.57	0.94
3.00	0.44	0.52	0.61	0.98

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.59	0.67	0.97
0.38	0.56	0.64	0.73	1.03
1.00	0.66	0.74	0.83	1.13
3.00	0.92	1.01	1.09	1.39

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TC200G SERIES

DATA SHEET

ND8P

ND8P

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.45	0.55	0.92
0.38	0.40	0.48	0.57	0.94
1.00	0.45	0.53	0.63	1.00
3.00	0.55	0.63	0.73	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.62	0.71	1.01
0.38	0.58	0.66	0.75	1.05
1.00	0.64	0.72	0.81	1.11
3.00	0.83	0.92	1.00	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.45	0.54	0.91
0.38	0.39	0.48	0.57	0.94
1.00	0.45	0.54	0.63	1.00
3.00	0.57	0.65	0.75	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0234	0.13

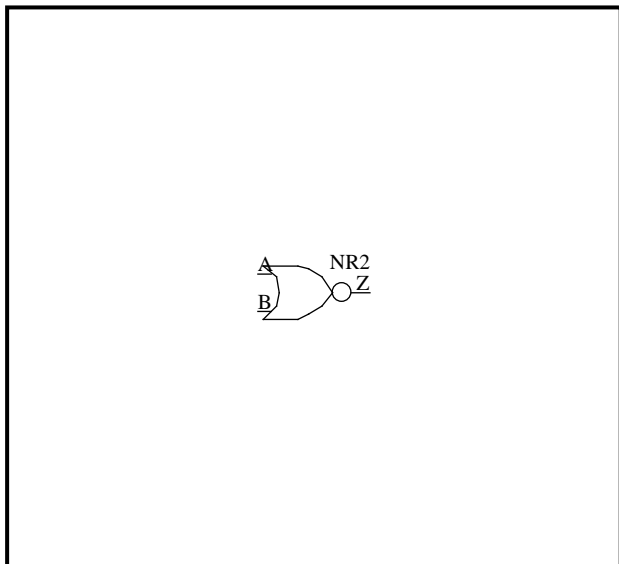
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.72	1.02
0.38	0.58	0.66	0.75	1.05
1.00	0.63	0.71	0.79	1.09
3.00	0.77	0.85	0.94	1.24

TC200G SERIES
DATA SHEET

NR2		NR2		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR2	2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	H
L	H	L
H	L	L
H	H	L

Verilog-HDL DESCRIPTION

```
NR2 inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:NR2
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	24.8

TC200G SERIES

DATA SHEET

NR2

NR2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.41	0.72	1.96
0.38	0.18	0.43	0.74	1.97
1.00	0.24	0.49	0.80	2.02
3.00	0.40	0.70	1.02	2.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0411	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.16	0.28	0.76
0.38	0.12	0.24	0.37	0.85
1.00	0.14	0.32	0.48	0.99
3.00	0.13	0.41	0.66	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1782	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.19	0.44	0.75	1.98
0.38	0.18	0.43	0.74	1.98
1.00	0.21	0.46	0.76	1.98
3.00	0.31	0.58	0.88	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0411	0.09

PATH DELAY (ns)

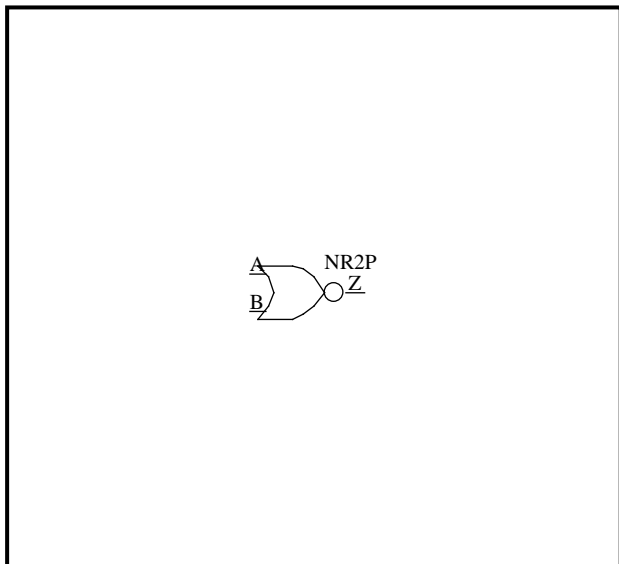
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.17	0.29	0.77
0.38	0.13	0.25	0.38	0.86
1.00	0.17	0.33	0.49	1.00
3.00	0.18	0.45	0.68	1.36

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TC200G SERIES
DATA SHEET

NR2P		NR2P		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR2P	2-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	H
L	H	L
H	L	L
H	H	L

Verilog-HDL DESCRIPTION

```
NR2P inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:NR2P
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	2.07

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	48.8

TC200G SERIES

DATA SHEET

NR2P

NR2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0888	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.42	1.04
0.38	0.15	0.27	0.43	1.04
1.00	0.21	0.34	0.49	1.10
3.00	0.36	0.52	0.70	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.10	0.16	0.40
0.38	0.10	0.17	0.24	0.49
1.00	0.11	0.22	0.32	0.61
3.00	0.08	0.25	0.41	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0888	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.43	1.05
0.38	0.14	0.27	0.43	1.05
1.00	0.17	0.30	0.45	1.06
3.00	0.27	0.41	0.57	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0193	0.11

PATH DELAY (ns)

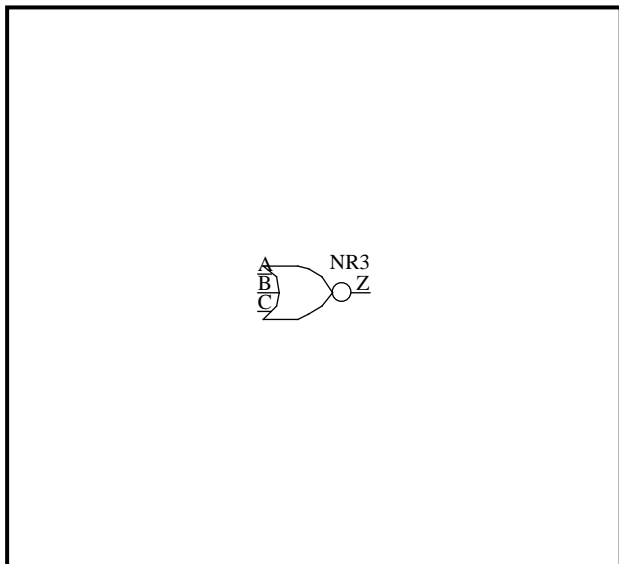
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.41
0.38	0.11	0.18	0.25	0.49
1.00	0.13	0.23	0.33	0.62
3.00	0.14	0.29	0.44	0.88

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TC200G SERIES
DATA SHEET

NR3		NR3		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR3	3-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	L

Verilog-HDL DESCRIPTION

```
NR3 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:NR3
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.03
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	16.8

TC200G SERIES

DATA SHEET

NR3

NR3

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2674	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.67	1.14	3.03
0.38	0.29	0.66	1.14	3.03
1.00	0.37	0.73	1.19	3.06
3.00	0.61	1.00	1.45	3.27

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0413	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.17	0.29	0.77
0.38	0.13	0.25	0.38	0.86
1.00	0.16	0.33	0.49	1.00
3.00	0.13	0.41	0.66	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2674	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.72	1.19	3.07
0.38	0.32	0.70	1.17	3.07
1.00	0.36	0.73	1.19	3.07
3.00	0.55	0.92	1.37	3.18

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0413	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.30	0.78
0.38	0.15	0.26	0.38	0.87
1.00	0.18	0.34	0.50	1.01
3.00	0.17	0.44	0.68	1.36

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TC200G SERIES

DATA SHEET

NR3

NR3

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.2674	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.73	1.21	3.09
0.38	0.33	0.71	1.19	3.08
1.00	0.34	0.70	1.16	3.04
3.00	0.47	0.82	1.25	3.04

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0413	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.29	0.74
0.38	0.14	0.25	0.37	0.83
1.00	0.18	0.34	0.48	0.97
3.00	0.18	0.43	0.66	1.31

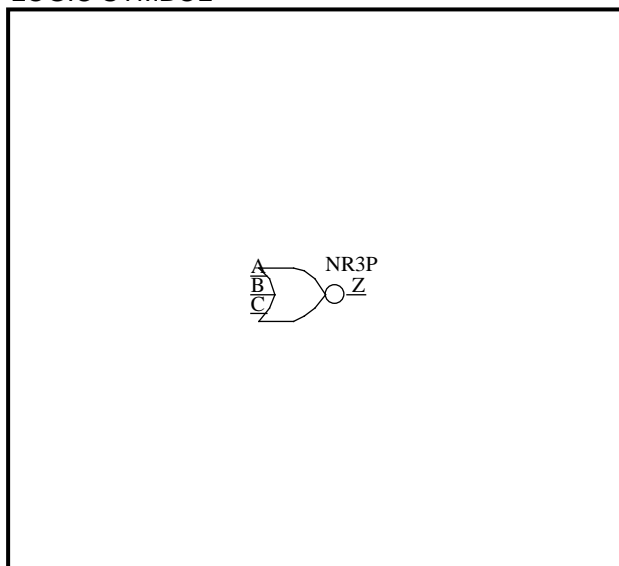
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TC200G SERIES

DATA SHEET

NR3P		NR3P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR3P	3-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	H
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	L

Verilog-HDL DESCRIPTION

```
NR3P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:NR3P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.10
B	2.02
C	1.96

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	32.4

TC200G SERIES

DATA SHEET

NR3P

NR3P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1381	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.44	0.69	1.66
0.38	0.25	0.44	0.68	1.66
1.00	0.33	0.52	0.75	1.70
3.00	0.56	0.78	1.02	1.96

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0229	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.41
0.38	0.12	0.18	0.25	0.50
1.00	0.13	0.23	0.33	0.62
3.00	0.08	0.25	0.41	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1381	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.49	0.74	1.71
0.38	0.27	0.47	0.72	1.70
1.00	0.32	0.51	0.75	1.71
3.00	0.51	0.72	0.95	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0229	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.12	0.18	0.42
0.38	0.13	0.19	0.26	0.51
1.00	0.15	0.25	0.34	0.63
3.00	0.12	0.28	0.44	0.88

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TC200G SERIES

DATA SHEET

NR3P

NR3P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1381	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.52	0.76	1.74
0.38	0.29	0.49	0.74	1.72
1.00	0.30	0.48	0.72	1.69
3.00	0.40	0.60	0.82	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0229	0.18

PATH DELAY (ns)

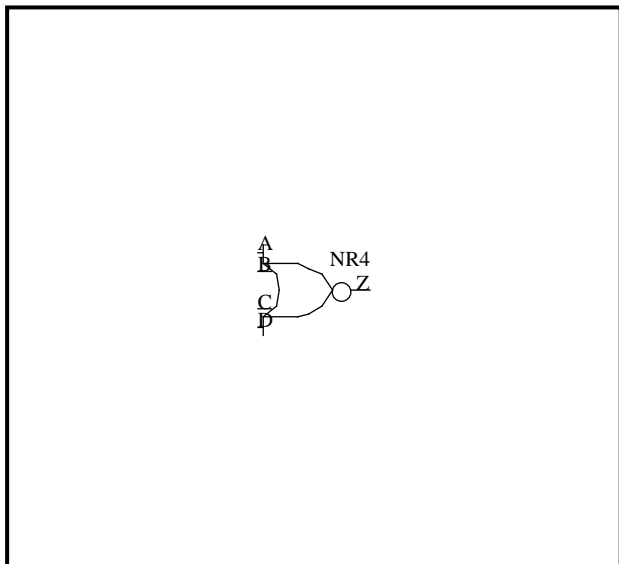
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.15	0.22	0.50
0.38	0.15	0.22	0.30	0.58
1.00	0.19	0.29	0.39	0.71
3.00	0.20	0.36	0.52	0.98

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TC200G SERIES
DATA SHEET

NR4		NR4		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR4	4-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
NR4 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:NR4
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.04
C	0.98
D	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	12.6

TC200G SERIES

DATA SHEET

NR4

NR4

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.3546	0.60

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.37	0.87	1.50	4.00
0.38	0.36	0.86	1.49	4.00
1.00	0.45	0.93	1.54	4.03
3.00	0.73	1.22	1.82	4.22

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0416	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.17	0.29	0.76
0.38	0.14	0.25	0.38	0.85
1.00	0.17	0.33	0.49	1.00
3.00	0.12	0.40	0.65	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.3546	0.60

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.95	1.58	4.08
0.38	0.41	0.92	1.56	4.07
1.00	0.46	0.95	1.57	4.07
3.00	0.70	1.18	1.77	4.19

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0416	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.30	0.77
0.38	0.15	0.26	0.39	0.86
1.00	0.18	0.35	0.50	1.01
3.00	0.15	0.43	0.67	1.35

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TC200G SERIES

DATA SHEET

NR4

NR4

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.3546	0.60

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	1.01	1.64	4.15
0.38	0.47	0.98	1.62	4.13
1.00	0.47	0.97	1.59	4.10
3.00	0.64	1.11	1.69	4.10

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0416	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.31	0.79
0.38	0.15	0.27	0.40	0.88
1.00	0.19	0.36	0.51	1.02
3.00	0.18	0.45	0.69	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.3546	0.60

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	1.03	1.66	4.16
0.38	0.48	1.00	1.63	4.15
1.00	0.46	0.96	1.58	4.09
3.00	0.61	1.07	1.64	4.04

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0416	0.17

PATH DELAY (ns)

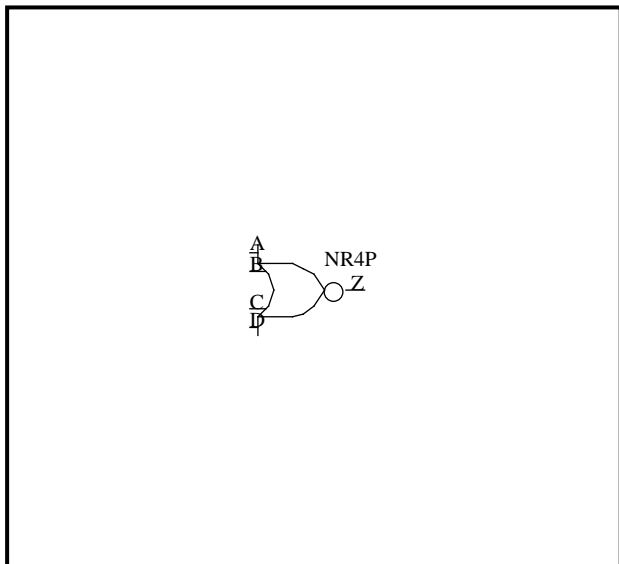
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.32	0.80
0.38	0.15	0.27	0.40	0.89
1.00	0.20	0.36	0.52	1.03
3.00	0.19	0.46	0.70	1.38

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TC200G SERIES
DATA SHEET

NR4P		NR4P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR4P	4-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	H
ALL OTHER COMBINATIONS				L

Verilog-HDL DESCRIPTION

```
NR4P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:NR4P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.98
B	2.09
C	2.14
D	2.16

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	23.9

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TC200G SERIES

DATA SHEET

NR4P

NR4P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1872	0.64

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.58	0.91	2.22
0.38	0.32	0.57	0.90	2.22
1.00	0.41	0.66	0.97	2.26
3.00	0.68	0.95	1.27	2.52

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.16	0.39
0.38	0.12	0.18	0.25	0.48
1.00	0.14	0.23	0.33	0.61
3.00	0.07	0.24	0.40	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1872	0.64

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.68	1.01	2.32
0.38	0.37	0.64	0.98	2.30
1.00	0.42	0.69	1.01	2.31
3.00	0.67	0.92	1.24	2.49

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.12	0.17	0.41
0.38	0.13	0.19	0.26	0.50
1.00	0.16	0.25	0.34	0.62
3.00	0.11	0.27	0.42	0.86

TC200G SERIES

DATA SHEET

NR4P

NR4P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1872	0.64

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.74	1.07	2.38
0.38	0.43	0.70	1.03	2.36
1.00	0.43	0.69	1.02	2.32
3.00	0.60	0.85	1.16	2.39

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.12	0.18	0.42
0.38	0.14	0.20	0.27	0.51
1.00	0.17	0.26	0.35	0.63
3.00	0.13	0.29	0.45	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.1872	0.64

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.49	0.76	1.08	2.40
0.38	0.44	0.71	1.05	2.37
1.00	0.42	0.69	1.01	2.32
3.00	0.59	0.83	1.13	2.35

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.12

PATH DELAY (ns)

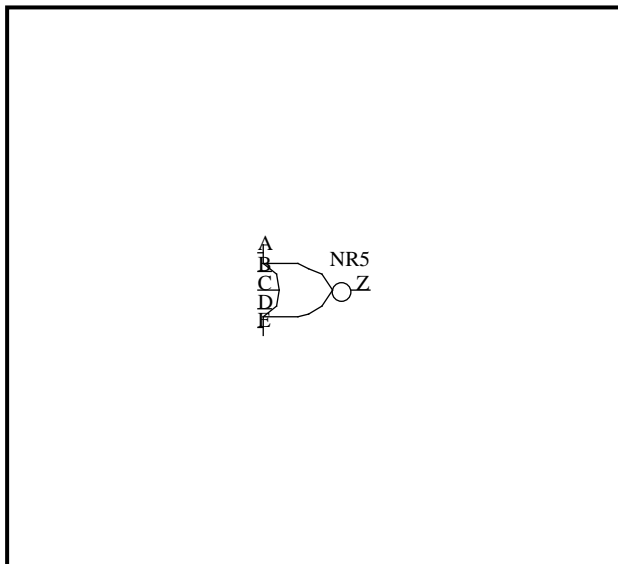
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.39
0.38	0.12	0.19	0.25	0.47
1.00	0.15	0.24	0.33	0.59
3.00	0.11	0.27	0.42	0.83

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TC200G SERIES
DATA SHEET

NR5		NR5		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR5	5-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT
A	B	C	D	E	Z
L	L	L	L	L	H
ALL OTHER COMBINATIONS					L

Verilog-HDL DESCRIPTION

```
NR5 inst(Z,A,B,C,D,E);
```

VHDL DESCRIPTION

```
inst:NR5
port map(Z,A,B,C,D,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B	0.99
C	0.98
D	1.05
E	1.07

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	44.5

TC200G SERIES

DATA SHEET

NR5

NR5

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.70	0.87	1.54
0.38	0.55	0.70	0.87	1.54
1.00	0.64	0.79	0.96	1.63
3.00	0.92	1.06	1.24	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0401	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.36	0.48	0.95
0.38	0.32	0.43	0.55	1.01
1.00	0.36	0.47	0.59	1.06
3.00	0.37	0.47	0.59	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.75	0.92	1.59
0.38	0.58	0.73	0.90	1.57
1.00	0.64	0.78	0.96	1.63
3.00	0.86	1.01	1.18	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0401	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.37	0.49	0.96
0.38	0.34	0.44	0.56	1.03
1.00	0.39	0.49	0.61	1.08
3.00	0.42	0.52	0.64	1.11

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TC200G SERIES

DATA SHEET

NR5

NR5

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.77	0.95	1.62
0.38	0.60	0.75	0.92	1.59
1.00	0.61	0.76	0.93	1.60
3.00	0.78	0.93	1.10	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0401	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.38	0.51	0.97
0.38	0.35	0.46	0.58	1.04
1.00	0.41	0.52	0.64	1.10
3.00	0.46	0.57	0.70	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.38	0.53	0.70	1.37
0.38	0.40	0.54	0.72	1.38
1.00	0.48	0.62	0.79	1.46
3.00	0.68	0.82	0.99	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0401	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.38	0.50	0.96
0.38	0.33	0.44	0.56	1.03
1.00	0.37	0.48	0.60	1.07
3.00	0.39	0.50	0.63	1.09

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TC200G SERIES

DATA SHEET

NR5

NR5

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.55	0.72	1.39
0.38	0.40	0.54	0.71	1.38
1.00	0.44	0.58	0.76	1.42
3.00	0.58	0.73	0.90	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0401	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.39	0.52	0.98
0.38	0.34	0.45	0.58	1.04
1.00	0.39	0.51	0.63	1.09
3.00	0.48	0.59	0.71	1.18

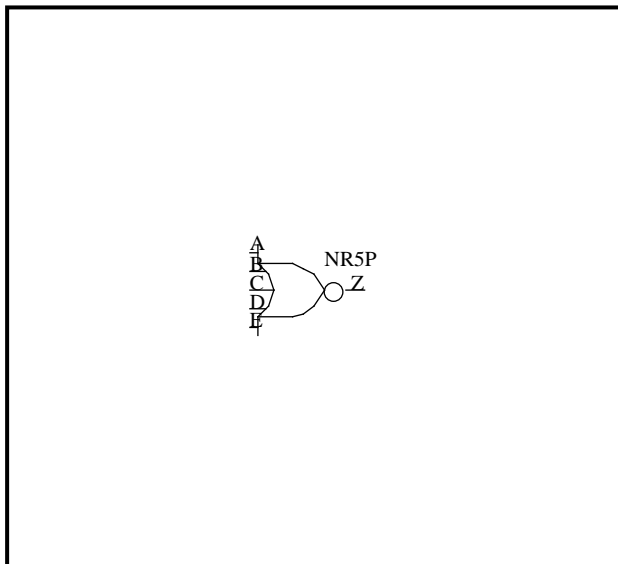
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TC200G SERIES

DATA SHEET

NR5P		NR5P		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR5P	5-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT					OUTPUT
A	B	C	D	E	Z
L	L	L	L	L	H
ALL OTHER COMBINATIONS					L

Verilog-HDL DESCRIPTION

```
NR5P inst(Z,A,B,C,D,E);
```

VHDL DESCRIPTION

```
inst:NR5P
port map(Z,A,B,C,D,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.04
C	0.99
D	1.01
E	1.02

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	86.2

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TC200G SERIES

DATA SHEET

NR5P

NR5P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0467	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.72	1.05
0.38	0.55	0.63	0.72	1.05
1.00	0.64	0.72	0.81	1.14
3.00	0.92	0.99	1.08	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.42	0.71
0.38	0.34	0.41	0.49	0.78
1.00	0.38	0.46	0.53	0.82
3.00	0.39	0.46	0.54	0.82

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0467	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.68	0.77	1.10
0.38	0.58	0.66	0.74	1.08
1.00	0.64	0.71	0.80	1.13
3.00	0.86	0.94	1.02	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.43	0.72
0.38	0.36	0.43	0.51	0.79
1.00	0.41	0.48	0.56	0.84
3.00	0.44	0.51	0.59	0.87

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TC200G SERIES

DATA SHEET

NR5P

NR5P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0467	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.70	0.79	1.12
0.38	0.59	0.67	0.76	1.09
1.00	0.61	0.69	0.78	1.11
3.00	0.79	0.86	0.95	1.28

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.36	0.44	0.72
0.38	0.36	0.43	0.51	0.79
1.00	0.41	0.48	0.56	0.84
3.00	0.46	0.53	0.61	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0467	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.47	0.56	0.89
0.38	0.41	0.48	0.57	0.90
1.00	0.48	0.56	0.65	0.98
3.00	0.69	0.76	0.85	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.36	0.44	0.72
0.38	0.35	0.42	0.50	0.79
1.00	0.38	0.46	0.54	0.83
3.00	0.41	0.49	0.57	0.85

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TC200G SERIES

DATA SHEET

NR5P

NR5P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0467	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.48	0.57	0.90
0.38	0.40	0.48	0.57	0.90
1.00	0.45	0.53	0.61	0.94
3.00	0.59	0.66	0.75	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.45	0.74
0.38	0.36	0.44	0.52	0.80
1.00	0.41	0.49	0.57	0.85
3.00	0.48	0.56	0.64	0.93

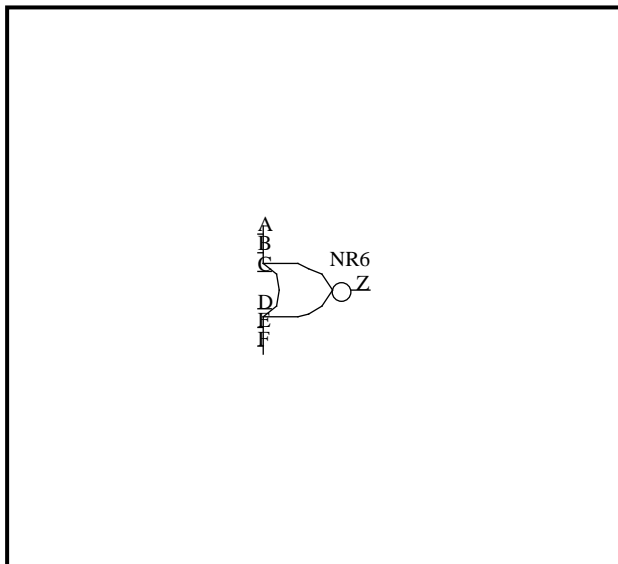
Rev.1.01.10

TC200G SERIES

DATA SHEET

NR6		NR6		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR6	6-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT
A	B	C	D	E	F	Z
L	L	L	L	L	L	H
ALL OTHER COMBINATIONS						L

Verilog-HDL DESCRIPTION

```
NR6 inst(Z,A,B,C,D,E,F);
```

VHDL DESCRIPTION

```
inst:NR6
port map(Z,A,B,C,D,E,F);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B,F	0.99
C	0.98
D	1.08
E	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	44.4

TC200G SERIES

DATA SHEET

NR6

NR6

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.69	0.86	1.53
0.38	0.54	0.69	0.86	1.53
1.00	0.64	0.78	0.95	1.62
3.00	0.91	1.06	1.23	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0402	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.35	0.47	0.93
0.38	0.31	0.42	0.53	1.00
1.00	0.35	0.46	0.58	1.04
3.00	0.36	0.46	0.58	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.59	0.74	0.91	1.58
0.38	0.57	0.72	0.89	1.56
1.00	0.63	0.78	0.95	1.62
3.00	0.86	1.00	1.17	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0402	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.36	0.48	0.94
0.38	0.33	0.43	0.55	1.01
1.00	0.38	0.48	0.60	1.06
3.00	0.41	0.51	0.63	1.09

Rev.1.01.10

TC200G SERIES

DATA SHEET

NR6

NR6

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.77	0.94	1.61
0.38	0.59	0.74	0.91	1.58
1.00	0.61	0.75	0.92	1.60
3.00	0.78	0.92	1.09	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0402	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.37	0.49	0.95
0.38	0.34	0.44	0.56	1.03
1.00	0.40	0.50	0.62	1.09
3.00	0.45	0.56	0.68	1.15

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.65	0.82	1.49
0.38	0.51	0.65	0.82	1.49
1.00	0.60	0.75	0.92	1.59
3.00	0.87	1.01	1.18	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0402	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.37	0.49	0.95
0.38	0.33	0.44	0.56	1.02
1.00	0.37	0.48	0.60	1.06
3.00	0.38	0.48	0.60	1.07

Rev.1.01.10

TC200G SERIES

DATA SHEET

NR6

NR6

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.70	0.87	1.54
0.38	0.54	0.68	0.85	1.52
1.00	0.59	0.74	0.91	1.58
3.00	0.81	0.95	1.13	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0402	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.38	0.50	0.96
0.38	0.34	0.45	0.57	1.03
1.00	0.39	0.50	0.62	1.09
3.00	0.43	0.54	0.66	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0964	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.58	0.72	0.89	1.56
0.38	0.55	0.69	0.86	1.53
1.00	0.57	0.71	0.88	1.55
3.00	0.73	0.88	1.05	1.72

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0402	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.38	0.50	0.96
0.38	0.34	0.45	0.57	1.03
1.00	0.40	0.51	0.63	1.09
3.00	0.45	0.56	0.68	1.14

Rev.1.01.10

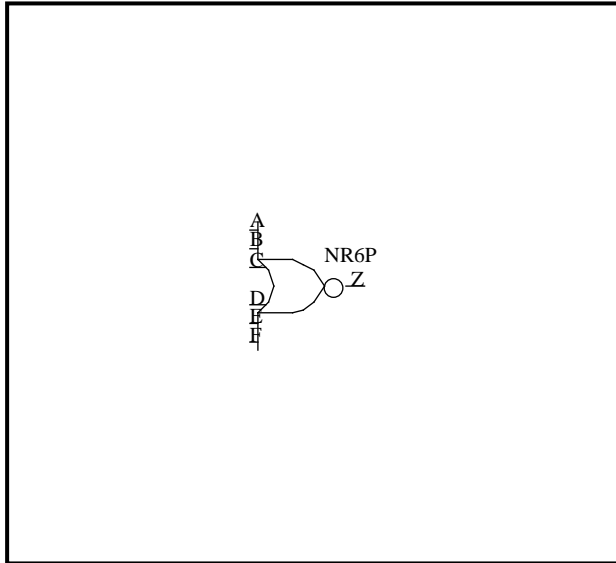
TC200G SERIES

DATA SHEET

NR6P		NR6P		1/4
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR6P	6-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT						OUTPUT
A	B	C	D	E	F	Z
L	L	L	L	L	L	H
ALL OTHER COMBINATIONS						L

Verilog-HDL DESCRIPTION

```
NR6P inst(Z,A,B,C,D,E,F);
```

VHDL DESCRIPTION

```
inst:NR6P
port map(Z,A,B,C,D,E,F);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,C	0.98
B,D,E	0.99
F	0.97

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	96.5

TC200G SERIES

DATA SHEET

NR6P

NR6P

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	1.04
0.38	0.57	0.64	0.72	1.04
1.00	0.66	0.74	0.82	1.14
3.00	0.95	1.02	1.11	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.32	0.38	0.61
0.38	0.32	0.38	0.45	0.68
1.00	0.36	0.42	0.49	0.72
3.00	0.35	0.41	0.48	0.71

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.63	0.70	0.78	1.10
0.38	0.61	0.68	0.76	1.08
1.00	0.66	0.74	0.82	1.14
3.00	0.90	0.97	1.05	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.33	0.40	0.63
0.38	0.34	0.41	0.47	0.70
1.00	0.40	0.46	0.53	0.76
3.00	0.43	0.49	0.56	0.79

TC200G SERIES

DATA SHEET

NR6P

NR6P

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.72	0.81	1.12
0.38	0.62	0.69	0.77	1.09
1.00	0.64	0.71	0.79	1.11
3.00	0.82	0.89	0.98	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.33	0.39	0.62
0.38	0.34	0.40	0.47	0.69
1.00	0.39	0.45	0.52	0.75
3.00	0.43	0.49	0.56	0.79

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.61	0.70	1.01
0.38	0.54	0.61	0.69	1.01
1.00	0.63	0.70	0.79	1.11
3.00	0.91	0.98	1.07	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.33	0.40	0.63
0.38	0.33	0.40	0.47	0.70
1.00	0.38	0.44	0.51	0.74
3.00	0.38	0.44	0.51	0.74

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TC200G SERIES

DATA SHEET

NR6P

NR6P

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.67	0.75	1.07
0.38	0.57	0.65	0.73	1.05
1.00	0.63	0.70	0.79	1.11
3.00	0.86	0.93	1.02	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.34	0.41	0.64
0.38	0.35	0.41	0.48	0.71
1.00	0.40	0.46	0.53	0.76
3.00	0.43	0.49	0.56	0.79

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0448	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.69	0.78	1.09
0.38	0.59	0.66	0.74	1.06
1.00	0.60	0.68	0.76	1.08
3.00	0.79	0.86	0.94	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0184	0.08

PATH DELAY (ns)

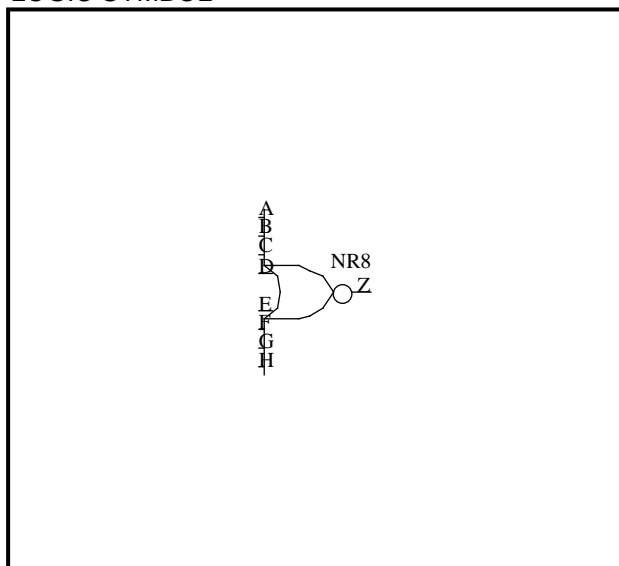
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.33	0.40	0.63
0.38	0.34	0.40	0.47	0.70
1.00	0.39	0.46	0.52	0.75
3.00	0.42	0.49	0.56	0.79

Rev.1.01.10

TC200G SERIES
DATA SHEET

NR8		NR8		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR8	8-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT								OUTPUT
A	B	C	D	E	F	G	H	Z
L	L	L	L	L	L	L	L	H
ALL OTHER COMBINATIONS								L

Verilog-HDL DESCRIPTION

```
NR8 inst(Z,A,B,C,D,E,F,G,H);
```

VHDL DESCRIPTION

```
inst:NR8
port map(Z,A,B,C,D,E,F,G,H);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.12
B,F,H	1.03
C,G	0.98
D,E	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	47.6

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TC200G SERIES

DATA SHEET

NR8

NR8

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.74	0.90	1.51
0.38	0.60	0.73	0.89	1.50
1.00	0.70	0.83	0.99	1.60
3.00	1.00	1.13	1.29	1.91

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.36	0.47	0.93
0.38	0.32	0.43	0.54	1.00
1.00	0.36	0.47	0.58	1.04
3.00	0.35	0.46	0.58	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.69	0.82	0.97	1.59
0.38	0.65	0.79	0.94	1.56
1.00	0.72	0.85	1.00	1.62
3.00	0.96	1.10	1.25	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.37	0.48	0.94
0.38	0.34	0.44	0.56	1.01
1.00	0.38	0.49	0.61	1.06
3.00	0.40	0.50	0.62	1.08

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TC200G SERIES

DATA SHEET

NR8

NR8

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.88	1.04	1.65
0.38	0.71	0.84	1.00	1.61
1.00	0.72	0.85	1.01	1.62
3.00	0.91	1.04	1.20	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.38	0.49	0.95
0.38	0.35	0.45	0.57	1.02
1.00	0.40	0.51	0.62	1.08
3.00	0.44	0.54	0.66	1.12

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.89	1.05	1.66
0.38	0.71	0.85	1.00	1.62
1.00	0.70	0.84	0.99	1.61
3.00	0.87	1.01	1.16	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.38	0.49	0.95
0.38	0.35	0.45	0.57	1.02
1.00	0.40	0.51	0.63	1.08
3.00	0.44	0.55	0.67	1.13

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TC200G SERIES

DATA SHEET

NR8

NR8

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.73	0.89	1.51
0.38	0.59	0.73	0.88	1.50
1.00	0.69	0.83	0.98	1.60
3.00	1.00	1.13	1.29	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.38	0.50	0.96
0.38	0.35	0.46	0.58	1.03
1.00	0.39	0.50	0.62	1.08
3.00	0.38	0.49	0.61	1.07

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.81	0.97	1.59
0.38	0.65	0.78	0.94	1.56
1.00	0.71	0.84	1.00	1.62
3.00	0.96	1.09	1.25	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.39	0.51	0.97
0.38	0.36	0.47	0.59	1.05
1.00	0.41	0.52	0.64	1.10
3.00	0.43	0.54	0.66	1.12

Rev.1.01.10

TC200G SERIES

DATA SHEET

NR8

NR8

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.87	1.03	1.65
0.38	0.70	0.83	0.99	1.61
1.00	0.71	0.85	1.00	1.62
3.00	0.90	1.03	1.19	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.41	0.53	0.98
0.38	0.37	0.48	0.60	1.06
1.00	0.43	0.54	0.66	1.12
3.00	0.47	0.58	0.70	1.16

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0877	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.89	1.04	1.66
0.38	0.71	0.84	1.00	1.62
1.00	0.70	0.83	0.99	1.61
3.00	0.88	1.01	1.17	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.40	0.52	0.97
0.38	0.36	0.47	0.59	1.05
1.00	0.41	0.52	0.64	1.10
3.00	0.44	0.55	0.67	1.13

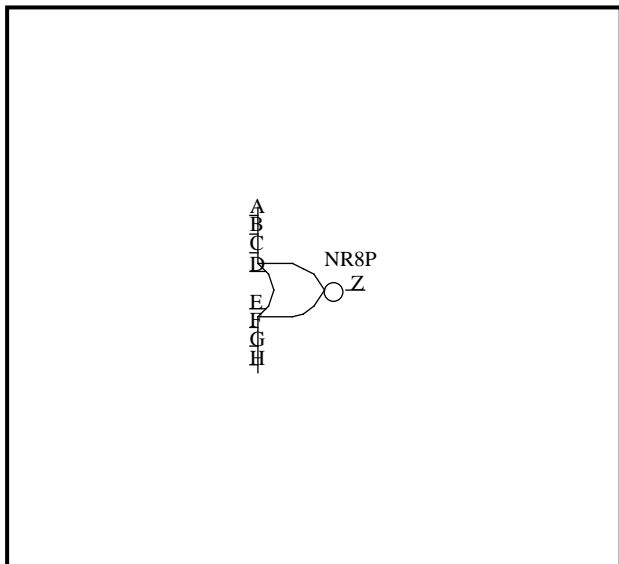
Rev.1.01.10

TC200G SERIES

DATA SHEET

NR8P		NR8P		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
NR8P	8-INPUT NOR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT								OUTPUT
A	B	C	D	E	F	G	H	Z
L	L	L	L	L	L	L	L	H
ALL OTHER COMBINATIONS								L

Verilog-HDL DESCRIPTION

```
NR8P inst(Z,A,B,C,D,E,F,G,H);
```

VHDL DESCRIPTION

```
inst:NR8P
port map(Z,A,B,C,D,E,F,G,H);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.06
B	1.04
C,G	0.98
D	1.07
E	0.99
F,H	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	77.7

TC200G SERIES

DATA SHEET

NR8P

NR8P

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.62	0.71	0.80	1.18
0.38	0.62	0.70	0.80	1.17
1.00	0.71	0.80	0.89	1.27
3.00	1.02	1.10	1.20	1.57

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.34	0.42	0.70
0.38	0.34	0.41	0.49	0.77
1.00	0.38	0.45	0.53	0.81
3.00	0.37	0.44	0.52	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.70	0.78	0.88	1.25
0.38	0.67	0.75	0.85	1.22
1.00	0.73	0.81	0.91	1.28
3.00	0.98	1.07	1.16	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.35	0.43	0.71
0.38	0.35	0.43	0.51	0.79
1.00	0.40	0.48	0.55	0.84
3.00	0.42	0.49	0.57	0.85

Rev.1.01.10

TC200G SERIES

DATA SHEET

NR8P

NR8P

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.76	0.85	0.94	1.31
0.38	0.72	0.81	0.90	1.27
1.00	0.73	0.82	0.91	1.28
3.00	0.92	1.01	1.10	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.36	0.44	0.72
0.38	0.36	0.44	0.52	0.80
1.00	0.42	0.49	0.57	0.86
3.00	0.46	0.53	0.61	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.78	0.86	0.96	1.33
0.38	0.73	0.82	0.91	1.28
1.00	0.72	0.81	0.90	1.27
3.00	0.89	0.97	1.07	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.44	0.73
0.38	0.36	0.44	0.52	0.80
1.00	0.42	0.50	0.58	0.86
3.00	0.47	0.54	0.62	0.90

Rev.1.01.10

TC200G SERIES

DATA SHEET

NR8P

NR8P

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.69	0.79	1.16
0.38	0.60	0.68	0.78	1.15
1.00	0.70	0.78	0.88	1.25
3.00	1.00	1.08	1.18	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.36	0.45	0.73
0.38	0.36	0.44	0.52	0.80
1.00	0.40	0.48	0.56	0.85
3.00	0.40	0.48	0.56	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.68	0.77	0.86	1.24
0.38	0.65	0.74	0.83	1.20
1.00	0.71	0.80	0.89	1.27
3.00	0.96	1.05	1.14	1.52

PATH CONDITION

PATH	CONDITION	FUNCTION
F->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.37	0.45	0.74
0.38	0.37	0.45	0.53	0.82
1.00	0.42	0.50	0.58	0.87
3.00	0.44	0.52	0.60	0.89

Rev.1.01.10

TC200G SERIES

DATA SHEET

NR8P

NR8P

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.83	0.92	1.30
0.38	0.70	0.79	0.88	1.26
1.00	0.71	0.80	0.90	1.27
3.00	0.90	0.99	1.08	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
G->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.39	0.47	0.75
0.38	0.38	0.46	0.54	0.83
1.00	0.44	0.52	0.60	0.89
3.00	0.48	0.56	0.64	0.93

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0545	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.75	0.84	0.93	1.31
0.38	0.71	0.79	0.89	1.26
1.00	0.70	0.79	0.88	1.26
3.00	0.88	0.96	1.06	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
H->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0238	0.08

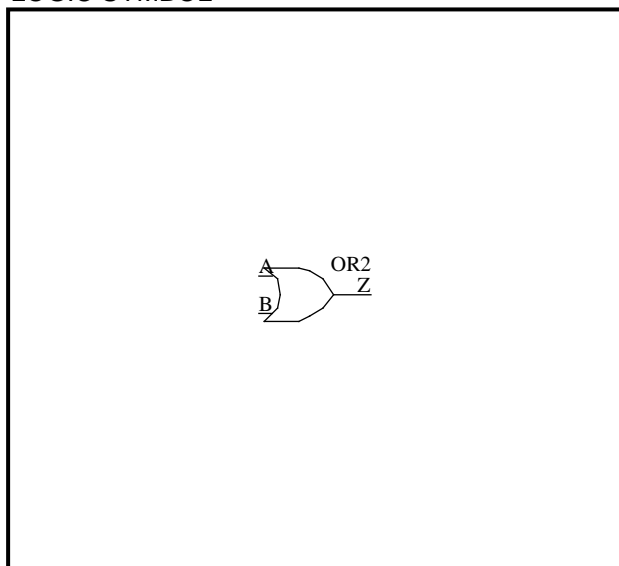
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.38	0.46	0.74
0.38	0.37	0.45	0.53	0.82
1.00	0.43	0.50	0.59	0.87
3.00	0.46	0.54	0.62	0.91

TC200G SERIES
DATA SHEET

OR2		OR2		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
OR2	2-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	H

Verilog-HDL DESCRIPTION

```
OR2 inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:OR2
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.08
B	1.09

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	45.4

Rev.1.01.10

TC200G SERIES

DATA SHEET

OR2

OR2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.28	0.44	1.08
0.38	0.21	0.34	0.50	1.14
1.00	0.24	0.38	0.54	1.18
3.00	0.26	0.40	0.57	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0393	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.37	0.50	0.96
0.38	0.27	0.39	0.51	0.98
1.00	0.35	0.47	0.59	1.06
3.00	0.55	0.67	0.80	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0942	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.29	0.45	1.09
0.38	0.22	0.35	0.52	1.16
1.00	0.27	0.41	0.57	1.21
3.00	0.34	0.48	0.64	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0393	0.10

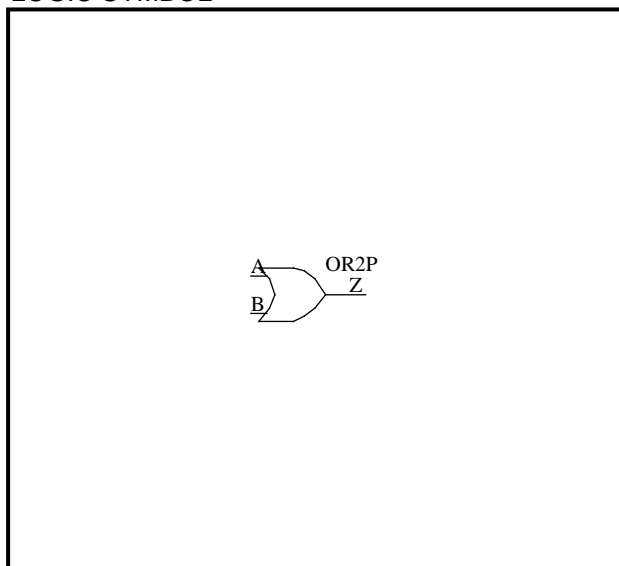
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.39	0.52	0.98
0.38	0.27	0.39	0.51	0.98
1.00	0.31	0.43	0.56	1.02
3.00	0.44	0.57	0.70	1.18

TC200G SERIES
DATA SHEET

OR2P		OR2P		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
OR2P	2-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	H

Verilog-HDL DESCRIPTION

```
OR2P inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:OR2P
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.08
B	1.04

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	77.5

TC200G SERIES

DATA SHEET

OR2P

OR2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.22	0.32	0.69
0.38	0.22	0.30	0.39	0.76
1.00	0.27	0.35	0.45	0.82
3.00	0.33	0.41	0.51	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0236	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.38	0.47	0.77
0.38	0.31	0.40	0.48	0.78
1.00	0.39	0.48	0.56	0.87
3.00	0.61	0.70	0.79	1.09

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0549	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.23	0.33	0.70
0.38	0.23	0.31	0.40	0.77
1.00	0.30	0.38	0.47	0.84
3.00	0.39	0.48	0.57	0.94

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0236	0.13

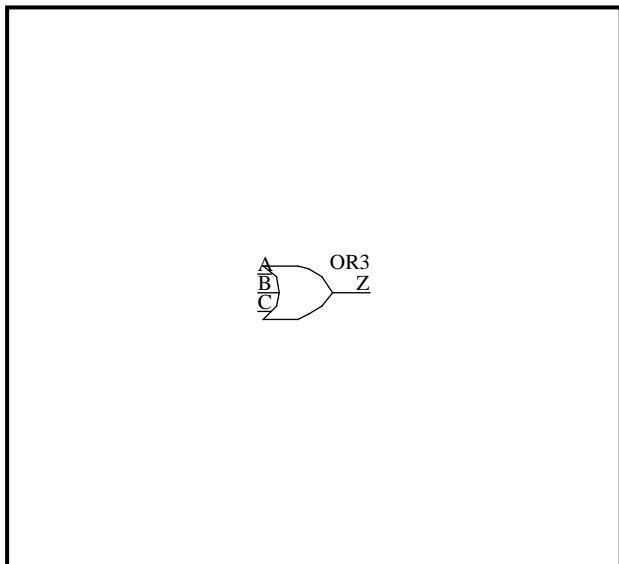
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.49	0.79
0.38	0.31	0.39	0.48	0.78
1.00	0.35	0.44	0.52	0.83
3.00	0.50	0.59	0.68	0.98

TC200G SERIES
DATA SHEET

OR3		OR3		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
OR3	3-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		2	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	L
L	L	H	H
L	H	L	H
L	H	H	H
H	L	L	H
H	L	H	H
H	H	L	H
H	H	H	H

Verilog-HDL DESCRIPTION

```
OR3 inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:OR3
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.06
B	1.02
C	0.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	46.7

TC200G SERIES

DATA SHEET

OR3

OR3

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0888	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.05
0.38	0.22	0.35	0.51	1.12
1.00	0.26	0.39	0.55	1.16
3.00	0.26	0.40	0.55	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0394	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.53	0.67	1.17
0.38	0.39	0.53	0.67	1.17
1.00	0.48	0.62	0.76	1.26
3.00	0.75	0.89	1.04	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0888	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.29	0.45	1.06
0.38	0.23	0.36	0.52	1.13
1.00	0.29	0.42	0.57	1.19
3.00	0.31	0.45	0.60	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0394	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.58	0.72	1.22
0.38	0.42	0.56	0.70	1.20
1.00	0.47	0.61	0.76	1.26
3.00	0.69	0.83	0.98	1.48

TC200G SERIES

DATA SHEET

OR3

OR3

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0888	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.05
0.38	0.23	0.36	0.51	1.12
1.00	0.29	0.41	0.57	1.18
3.00	0.35	0.48	0.63	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0394	0.17

PATH DELAY (ns)

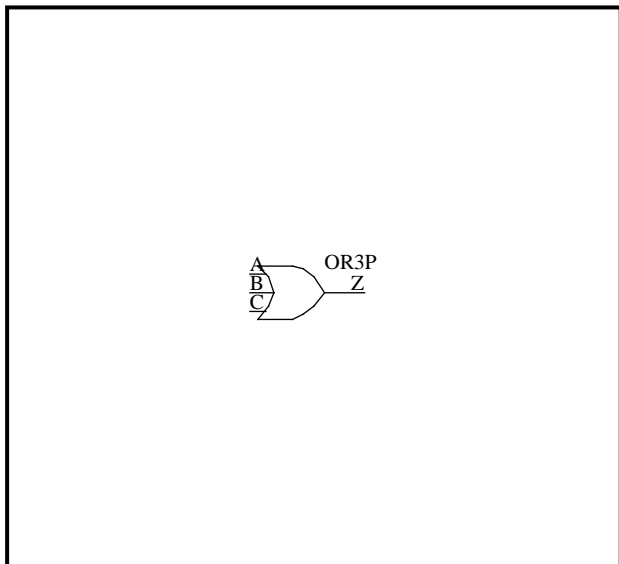
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.60	0.74	1.24
0.38	0.43	0.57	0.71	1.21
1.00	0.44	0.58	0.73	1.23
3.00	0.59	0.73	0.88	1.38

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TC200G SERIES
DATA SHEET

OR3P		OR3P		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
OR3P	3-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT
A	B	C	Z
L	L	L	L
L	L	H	H
L	H	L	H
L	H	H	H
H	L	L	H
H	L	H	H
H	H	L	H
H	H	H	H

Verilog-HDL DESCRIPTION

```
OR3P inst(Z,A,B,C);
```

VHDL DESCRIPTION

```
inst:OR3P
port map(Z,A,B,C);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.07
B	1.04
C	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	84.3

TC200G SERIES

DATA SHEET

OR3P

OR3P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0469	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.22	0.31	0.64
0.38	0.23	0.30	0.39	0.72
1.00	0.29	0.36	0.45	0.78
3.00	0.32	0.40	0.49	0.82

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0239	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.57	0.66	0.99
0.38	0.46	0.56	0.66	0.99
1.00	0.55	0.65	0.75	1.07
3.00	0.84	0.94	1.04	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0469	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.23	0.32	0.65
0.38	0.24	0.31	0.40	0.73
1.00	0.31	0.38	0.47	0.80
3.00	0.37	0.44	0.53	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0239	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.61	0.71	1.04
0.38	0.50	0.59	0.69	1.02
1.00	0.55	0.65	0.74	1.07
3.00	0.77	0.87	0.97	1.30

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TC200G SERIES

DATA SHEET

OR3P

OR3P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0469	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.24	0.32	0.65
0.38	0.24	0.31	0.40	0.73
1.00	0.31	0.38	0.47	0.80
3.00	0.38	0.46	0.55	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0239	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.63	0.73	1.06
0.38	0.51	0.61	0.70	1.03
1.00	0.52	0.62	0.72	1.04
3.00	0.68	0.78	0.88	1.21

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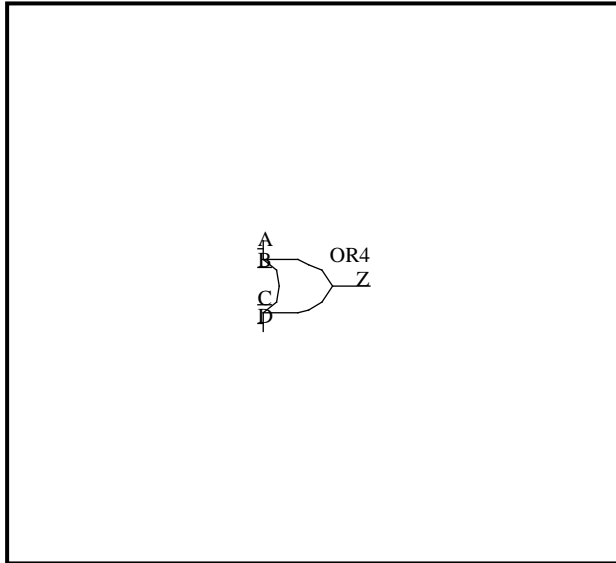
TC200G SERIES

DATA SHEET

OR4	OR4	1/3
-----	-----	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
OR4	4-INPUT OR	GATE 3	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
OR4 inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:OR4
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.04
B,D	1.03
C	0.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	45.5

TC200G SERIES

DATA SHEET

OR4

OR4

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0902	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.06
0.38	0.22	0.35	0.51	1.13
1.00	0.26	0.39	0.55	1.18
3.00	0.25	0.38	0.54	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.61	0.76	1.27
0.38	0.45	0.60	0.75	1.26
1.00	0.55	0.70	0.85	1.36
3.00	0.85	1.00	1.15	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0902	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.29	0.45	1.07
0.38	0.24	0.37	0.53	1.15
1.00	0.29	0.42	0.58	1.20
3.00	0.30	0.43	0.59	1.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.69	0.84	1.35
0.38	0.51	0.65	0.81	1.32
1.00	0.57	0.72	0.87	1.38
3.00	0.81	0.97	1.12	1.64

TC200G SERIES

DATA SHEET

OR4

OR4

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0902	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.31	0.47	1.09
0.38	0.25	0.38	0.54	1.16
1.00	0.30	0.44	0.59	1.22
3.00	0.34	0.47	0.63	1.26

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.60	0.75	0.90	1.41
0.38	0.56	0.71	0.86	1.37
1.00	0.57	0.72	0.87	1.38
3.00	0.75	0.91	1.06	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0902	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.30	0.46	1.09
0.38	0.23	0.37	0.53	1.16
1.00	0.29	0.42	0.58	1.21
3.00	0.31	0.45	0.61	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0398	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.76	0.91	1.42
0.38	0.57	0.71	0.87	1.38
1.00	0.56	0.71	0.86	1.37
3.00	0.73	0.88	1.04	1.56

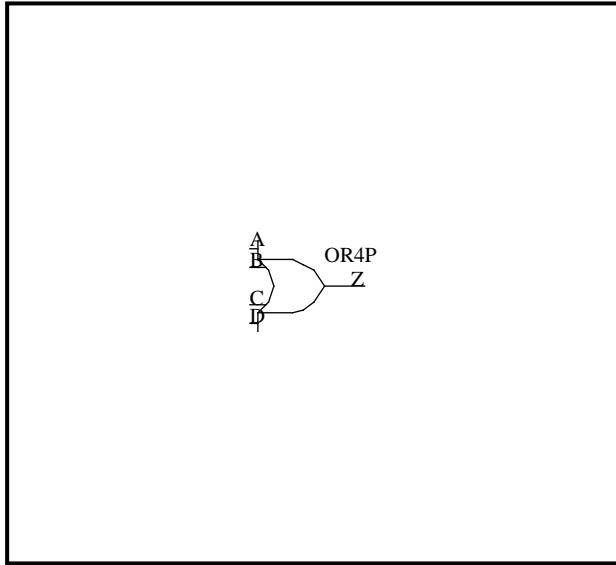
TC200G SERIES

DATA SHEET

OR4P		OR4P		1/3
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
OR4P	4-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT
A	B	C	D	Z
L	L	L	L	L
ALL OTHER COMBINATIONS				H

Verilog-HDL DESCRIPTION

```
OR4P inst(Z,A,B,C,D);
```

VHDL DESCRIPTION

```
inst:OR4P
port map(Z,A,B,C,D);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	1.06
C	0.98
D	1.00

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	82.8

TC200G SERIES

DATA SHEET

OR4P

OR4P

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0470	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.22	0.31	0.63
0.38	0.23	0.30	0.38	0.71
1.00	0.28	0.36	0.44	0.77
3.00	0.31	0.38	0.47	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.27

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.68	0.78	1.13
0.38	0.56	0.67	0.77	1.12
1.00	0.65	0.76	0.86	1.21
3.00	0.97	1.08	1.18	1.53

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0470	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.23	0.32	0.65
0.38	0.24	0.31	0.40	0.73
1.00	0.31	0.38	0.47	0.79
3.00	0.35	0.43	0.51	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.27

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.65	0.76	0.87	1.22
0.38	0.62	0.73	0.84	1.18
1.00	0.68	0.78	0.89	1.24
3.00	0.93	1.04	1.15	1.50

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TC200G SERIES

DATA SHEET

OR4P

OR4P

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0470	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.24	0.33	0.66
0.38	0.25	0.32	0.41	0.74
1.00	0.32	0.39	0.48	0.81
3.00	0.39	0.46	0.55	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
C->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.27

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.72	0.82	0.93	1.28
0.38	0.68	0.79	0.89	1.24
1.00	0.68	0.79	0.90	1.24
3.00	0.87	0.97	1.08	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0470	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.23	0.32	0.65
0.38	0.23	0.31	0.39	0.73
1.00	0.30	0.38	0.46	0.79
3.00	0.36	0.43	0.52	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION
D->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0244	0.27

PATH DELAY (ns)

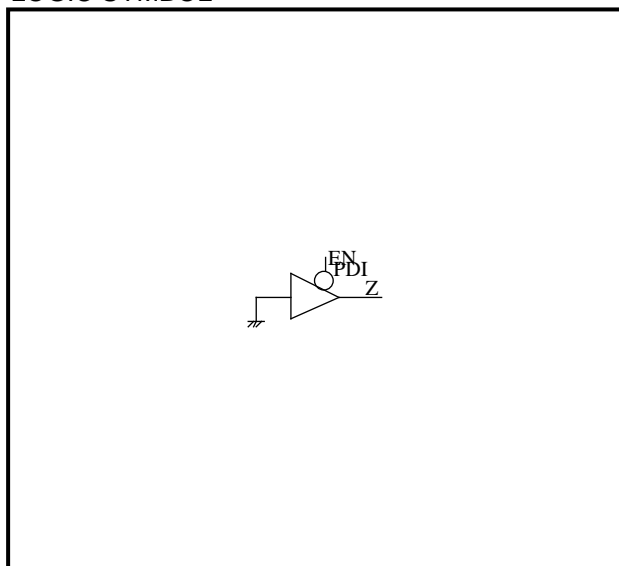
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.73	0.84	0.94	1.29
0.38	0.69	0.80	0.90	1.25
1.00	0.67	0.78	0.89	1.23
3.00	0.84	0.95	1.06	1.41

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TC200G SERIES
DATA SHEET

PDI		PDI		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
PDI	INTERNAL PULL-DOWN for PREVENTING BUS FLOATING	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
EN	Z
L	L
H	HZ

Verilog-HDL DESCRIPTION

```
PDI inst(Z,EN);
```

VHDL DESCRIPTION

```
inst:PDI
port map(Z,EN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT CAPACITANCE

(LU)

PIN NAME	Z
Cin	0.39

INPUT LOAD

(LU)

PIN NAME	TYPICAL
EN	1.01

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	168.1

TC200G SERIES

DATA SHEET

PDI

PDI

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
EN->Z	---	0-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.39	5.39	10.39	30.39
0.01	0.06	0.06	0.06	0.06
0.38	0.12	0.12	0.12	0.12
1.00	0.18	0.18	0.18	0.18
3.00	0.34	0.34	0.34	0.34

PATH CONDITION

PATH	CONDITION	FUNCTION
EN->Z	---	Z-0

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0386	0.05

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.39	5.39	10.39	30.39
0.01	0.11	0.21	0.32	0.76
0.38	0.14	0.24	0.35	0.79
1.00	0.18	0.29	0.40	0.85
3.00	0.27	0.40	0.52	0.97

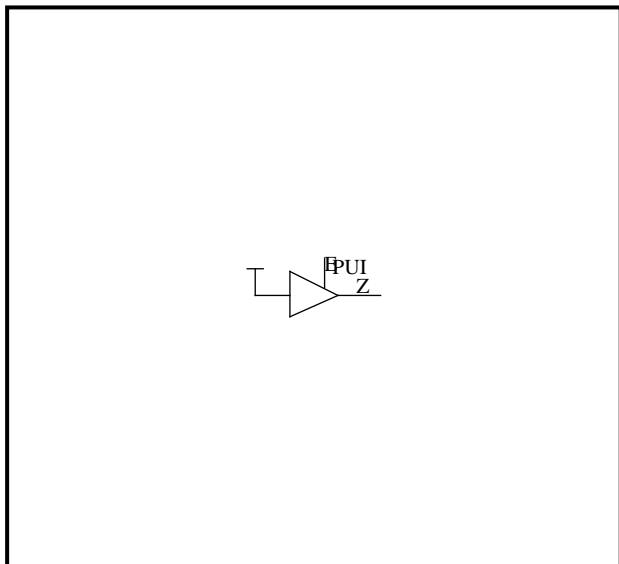
Rev.1.01.11

TC200G SERIES

DATA SHEET

PUI		PUI		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
PUI	INTERNAL PULL-UP for PREVENTING BUS FLOATING	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
E	Z
L	HZ
H	H

Verilog-HDL DESCRIPTION

```
PUI inst(Z,E);
```

VHDL DESCRIPTION

```
inst:PUI
port map(Z,E);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	6880.0

INPUT CAPACITANCE

(LU)

PIN NAME	Z
Cin	0.39

INPUT LOAD

(LU)

PIN NAME	TYPICAL
E	1.01

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	67.9

TC200G SERIES

DATA SHEET

PUI

PUI

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	1-Z

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.39	5.39	10.39	30.39
0.01	0.11	0.11	0.11	0.11
0.38	0.15	0.15	0.15	0.15
1.00	0.24	0.24	0.24	0.24
3.00	0.49	0.49	0.49	0.49

PATH CONDITION

PATH	CONDITION	FUNCTION
E->Z	---	Z-1

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0929	0.04

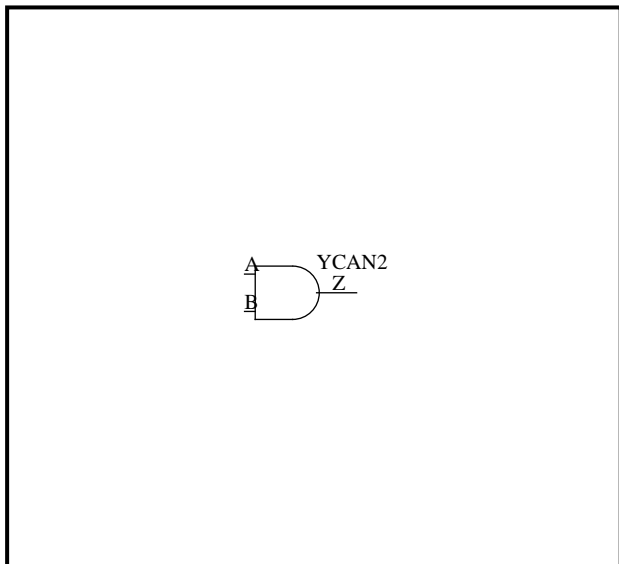
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.39	5.39	10.39	30.39
0.01	0.10	0.22	0.37	0.98
0.38	0.14	0.27	0.42	1.04
1.00	0.17	0.30	0.46	1.08
3.00	0.19	0.36	0.53	1.17

TC200G SERIES
DATA SHEET

YCAN2		YCAN2		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YCAN2	CLOCK BUFFER with 2-INPUT AND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	L
H	L	L
H	H	H

Verilog-HDL DESCRIPTION

```
YCAN2 inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:YCAN2
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	0.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	235.9

TC200G SERIES

DATA SHEET

YCAN2

YCAN2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0145	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.24	0.28	0.40
0.38	0.29	0.32	0.36	0.48
1.00	0.40	0.43	0.47	0.59
3.00	0.62	0.66	0.69	0.82

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0118	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.32	0.37	0.53
0.38	0.31	0.36	0.40	0.57
1.00	0.39	0.43	0.47	0.64
3.00	0.54	0.58	0.63	0.79

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0145	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.25	0.29	0.41
0.38	0.27	0.31	0.34	0.46
1.00	0.35	0.38	0.42	0.54
3.00	0.51	0.54	0.58	0.70

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0118	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.34	0.39	0.56
0.38	0.33	0.37	0.42	0.59
1.00	0.41	0.45	0.50	0.66
3.00	0.59	0.63	0.68	0.85

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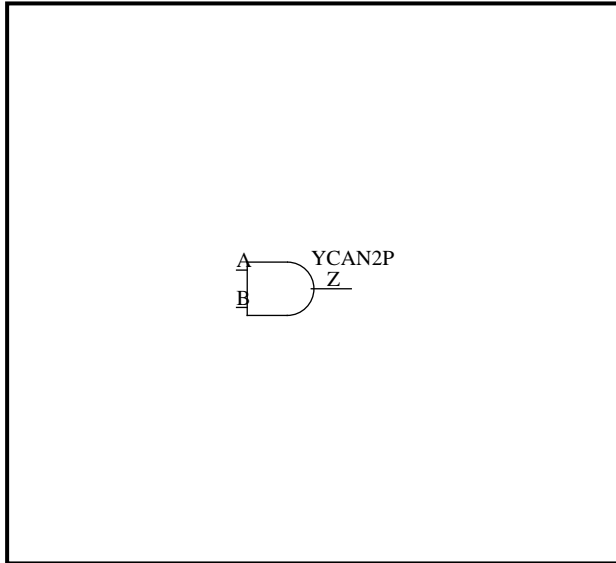
TC200G SERIES

DATA SHEET

YCAN2P	YCAN2P	1/2
--------	--------	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YCAN2P	CLOCK BUFFER with 2-INPUT AND	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	L
H	L	L
H	H	H

Verilog-HDL DESCRIPTION

```
YCAN2P inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:YCAN2P
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.97
B	2.05

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	458.8

TC200G SERIES

DATA SHEET

YCAN2P

YCAN2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0074	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.24	0.26	0.33
0.38	0.30	0.32	0.34	0.41
1.00	0.41	0.43	0.45	0.52
3.00	0.65	0.67	0.69	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0061	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.29	0.32	0.41
0.38	0.30	0.33	0.35	0.44
1.00	0.37	0.40	0.42	0.51
3.00	0.51	0.54	0.56	0.65

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0074	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.25	0.27	0.34
0.38	0.29	0.31	0.33	0.40
1.00	0.37	0.39	0.41	0.48
3.00	0.54	0.56	0.58	0.65

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0061	0.13

PATH DELAY (ns)

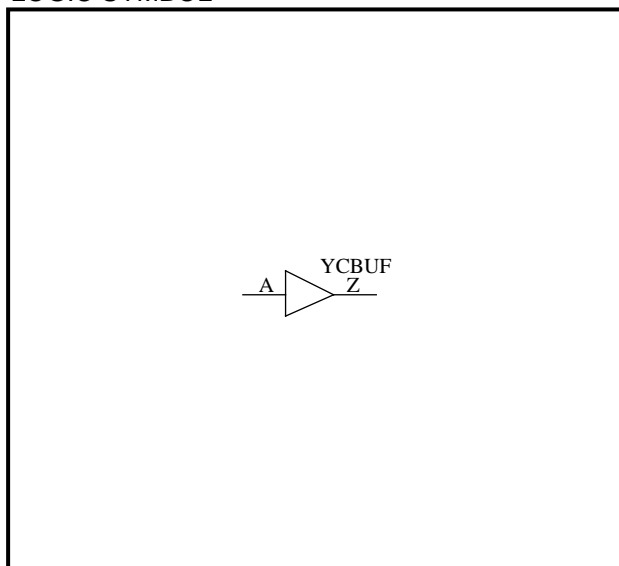
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.32	0.35	0.44
0.38	0.33	0.35	0.38	0.47
1.00	0.40	0.43	0.45	0.54
3.00	0.57	0.60	0.63	0.72

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TC200G SERIES
DATA SHEET

YCBUF		YCBUF		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YCBUF	CLOCK BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
YCBUF inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YCBUF
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.11

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	236.1

TC200G SERIES

DATA SHEET

YCBUF

YCBUF

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0144	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.18	0.22	0.33
0.38	0.24	0.27	0.30	0.41
1.00	0.33	0.36	0.39	0.51
3.00	0.50	0.53	0.56	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0124	0.12

PATH DELAY (ns)

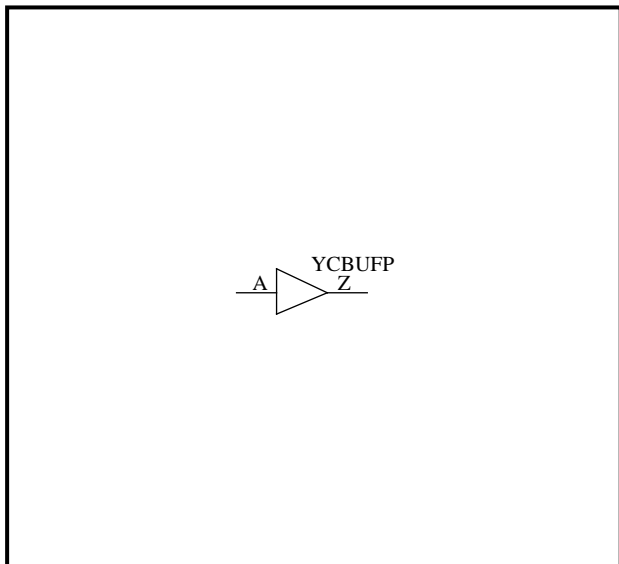
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.33	0.37	0.54
0.38	0.31	0.36	0.40	0.57
1.00	0.39	0.43	0.48	0.65
3.00	0.55	0.60	0.65	0.82

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TC200G SERIES
DATA SHEET

YCBUFP		YCBUFP		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YCBUFP	CLOCK BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
YCBUFP inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YCBUFP
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	2.06

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	489.7

TC200G SERIES

DATA SHEET

YCBUFF

YCBUFF

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0072	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.15	0.17	0.23
0.38	0.22	0.23	0.25	0.31
1.00	0.30	0.31	0.33	0.39
3.00	0.43	0.45	0.47	0.54

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0061	0.12

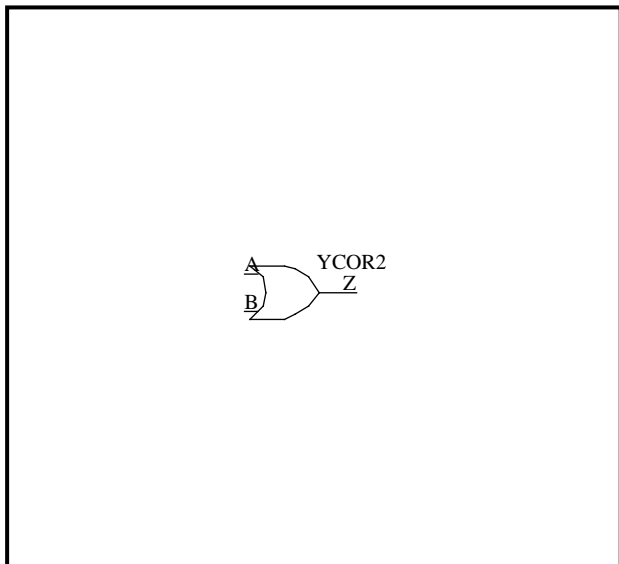
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.29	0.31	0.40
0.38	0.29	0.32	0.34	0.44
1.00	0.37	0.40	0.42	0.51
3.00	0.55	0.58	0.60	0.69

TC200G SERIES
DATA SHEET

YCOR2		YCOR2		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YCOR2	CLOCK BUFFER with 2-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	H

Verilog-HDL DESCRIPTION

```
YCOR2 inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:YCOR2
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A,B	0.98

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	233.5

TC200G SERIES

DATA SHEET

YCOR2

YCOR2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0145	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.17	0.21	0.32
0.38	0.23	0.26	0.29	0.40
1.00	0.31	0.34	0.37	0.49
3.00	0.40	0.44	0.47	0.59

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0118	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.50	0.54	0.60	0.78
0.38	0.51	0.56	0.61	0.79
1.00	0.59	0.64	0.69	0.87
3.00	0.86	0.91	0.96	1.14

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0145	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.18	0.21	0.32
0.38	0.23	0.26	0.29	0.41
1.00	0.32	0.35	0.38	0.50
3.00	0.44	0.47	0.51	0.63

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0118	0.22

PATH DELAY (ns)

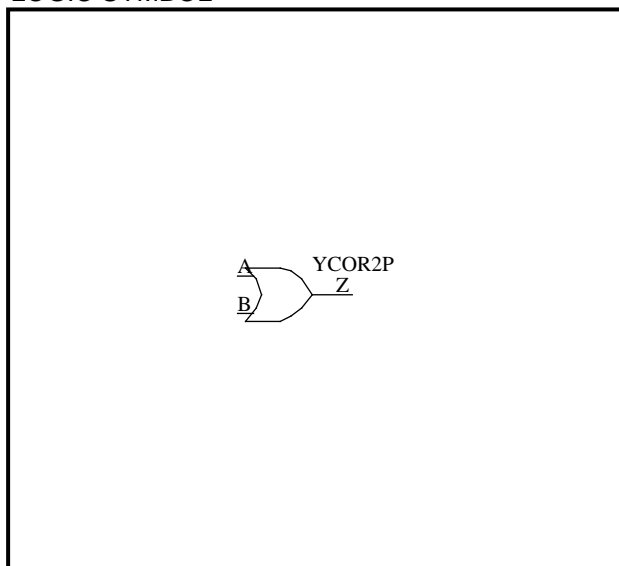
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.56	0.61	0.79
0.38	0.50	0.55	0.61	0.78
1.00	0.55	0.60	0.65	0.82
3.00	0.72	0.77	0.82	1.00

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TC200G SERIES
DATA SHEET

YCOR2P		YCOR2P		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YCOR2P	CLOCK BUFFER with 2-INPUT OR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	H

Verilog-HDL DESCRIPTION

```
YCOR2P inst(Z,A,B);
```

VHDL DESCRIPTION

```
inst:YCOR2P
port map(Z,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.97
B	2.05

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	449.5

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TC200G SERIES

DATA SHEET

YCOR2P

YCOR2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0071	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.15	0.17	0.23
0.38	0.22	0.24	0.26	0.32
1.00	0.30	0.32	0.33	0.40
3.00	0.39	0.40	0.42	0.49

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.54	0.58	0.68
0.38	0.53	0.56	0.59	0.69
1.00	0.61	0.64	0.67	0.77
3.00	0.89	0.91	0.95	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0071	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.16	0.18	0.24
0.38	0.23	0.25	0.26	0.33
1.00	0.32	0.33	0.35	0.41
3.00	0.43	0.45	0.47	0.54

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	0.23

PATH DELAY (ns)

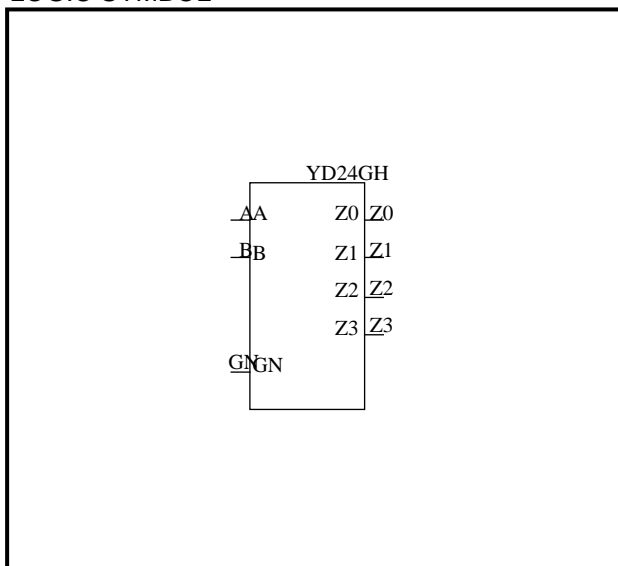
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.56	0.59	0.70
0.38	0.53	0.56	0.59	0.69
1.00	0.57	0.60	0.63	0.73
3.00	0.75	0.78	0.81	0.92

TC200G SERIES

DATA SHEET

YD24GH		YD24GH		1/7
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YD24GH	2 TO 4 DECODER (GATED OUTPUTS ACTIVE HIGH)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT			
GN	A	B	Z0	Z1	Z2	Z3
H	X	X	L	L	L	L
L	L	L	H	L	L	L
L	H	L	L	H	L	L
L	L	H	L	L	H	L
L	H	H	L	L	L	H

Verilog-HDL DESCRIPTION

```
YD24GH inst(Z0,Z1,Z2,Z3,A,B,GN);
```

VHDL DESCRIPTION

```
inst:YD24GH
port map(Z0,Z1,Z2,Z3,A,B,GN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.44
B	3.46
GN	4.21

OUTPUT DRIVE

(LU)

PIN NAME	Z0	Z1	Z2	Z3
DRIVE	17.1	15.8	15.2	16.7

TC200G SERIES

DATA SHEET

YD24GH

YD24GH

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.2629	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.70	1.17	3.02
0.38	0.31	0.69	1.16	3.02
1.00	0.35	0.72	1.18	3.02
3.00	0.54	0.91	1.35	3.13

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0412	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.30	0.78
0.38	0.15	0.26	0.39	0.87
1.00	0.18	0.35	0.50	1.01
3.00	0.17	0.44	0.68	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.2874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.84	1.35	3.36
0.38	0.49	0.91	1.41	3.43
1.00	0.54	0.96	1.47	3.48
3.00	0.64	1.05	1.55	3.57

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0415	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.37	0.50	0.99
0.38	0.29	0.41	0.54	1.03
1.00	0.35	0.48	0.61	1.10
3.00	0.50	0.63	0.77	1.26

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TC200G SERIES

DATA SHEET

YD24GH

YD24GH

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.2971	0.47

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.78	1.30	3.38
0.38	0.34	0.76	1.29	3.37
1.00	0.39	0.79	1.30	3.37
3.00	0.60	1.00	1.49	3.49

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0419	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.08	0.18	0.30	0.78
0.38	0.15	0.26	0.39	0.87
1.00	0.18	0.35	0.50	1.01
3.00	0.16	0.43	0.67	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.2971	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.87	1.39	3.47
0.38	0.50	0.93	1.46	3.54
1.00	0.56	0.99	1.51	3.60
3.00	0.65	1.08	1.60	3.69

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0419	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.37	0.50	0.99
0.38	0.29	0.41	0.53	1.02
1.00	0.35	0.47	0.60	1.10
3.00	0.50	0.63	0.76	1.26

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TC200G SERIES

DATA SHEET

YD24GH

YD24GH

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.2629	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.65	1.11	2.97
0.38	0.28	0.65	1.12	2.97
1.00	0.36	0.72	1.17	3.01
3.00	0.60	0.98	1.43	3.21

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0412	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.17	0.29	0.77
0.38	0.14	0.25	0.38	0.86
1.00	0.16	0.33	0.49	1.00
3.00	0.13	0.41	0.66	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.2874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.70	1.21	3.21
0.38	0.30	0.70	1.21	3.22
1.00	0.39	0.78	1.26	3.25
3.00	0.63	1.04	1.53	3.46

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0415	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.17	0.29	0.77
0.38	0.14	0.25	0.38	0.86
1.00	0.16	0.33	0.49	1.00
3.00	0.13	0.41	0.66	1.35

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TC200G SERIES

DATA SHEET

YD24GH

YD24GH

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.2971	0.47

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.79	1.32	3.40
0.38	0.43	0.86	1.38	3.47
1.00	0.49	0.91	1.44	3.52
3.00	0.59	1.01	1.53	3.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0419	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.48	0.97
0.38	0.27	0.38	0.51	1.00
1.00	0.33	0.45	0.58	1.07
3.00	0.47	0.60	0.73	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.2971	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.79	1.32	3.40
0.38	0.43	0.86	1.38	3.47
1.00	0.49	0.91	1.43	3.52
3.00	0.59	1.01	1.53	3.61

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0419	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.35	0.48	0.97
0.38	0.27	0.38	0.51	1.00
1.00	0.33	0.45	0.58	1.07
3.00	0.47	0.60	0.73	1.23

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TC200G SERIES

DATA SHEET

YD24GH

YD24GH

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.2629	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.74	1.20	3.05
0.38	0.33	0.72	1.19	3.05
1.00	0.34	0.70	1.16	3.01
3.00	0.45	0.81	1.23	2.99

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0412	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.31	0.79
0.38	0.15	0.27	0.40	0.88
1.00	0.19	0.36	0.51	1.02
3.00	0.20	0.46	0.70	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.2874	0.45

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.40	0.80	1.31	3.32
0.38	0.36	0.78	1.29	3.31
1.00	0.36	0.76	1.25	3.26
3.00	0.49	0.87	1.32	3.23

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0415	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.31	0.79
0.38	0.15	0.27	0.40	0.88
1.00	0.19	0.36	0.51	1.02
3.00	0.20	0.46	0.69	1.37

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24GH

YD24GH

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.2971	0.47

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.84	1.36	3.44
0.38	0.38	0.81	1.34	3.43
1.00	0.38	0.79	1.31	3.38
3.00	0.51	0.90	1.38	3.36

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0419	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.31	0.79
0.38	0.15	0.27	0.40	0.88
1.00	0.19	0.36	0.51	1.02
3.00	0.19	0.46	0.69	1.37

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.2971	0.46

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.83	1.35	3.43
0.38	0.38	0.81	1.33	3.42
1.00	0.37	0.79	1.30	3.38
3.00	0.51	0.90	1.37	3.35

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0419	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.19	0.31	0.79
0.38	0.15	0.27	0.40	0.88
1.00	0.19	0.36	0.51	1.02
3.00	0.19	0.46	0.69	1.36

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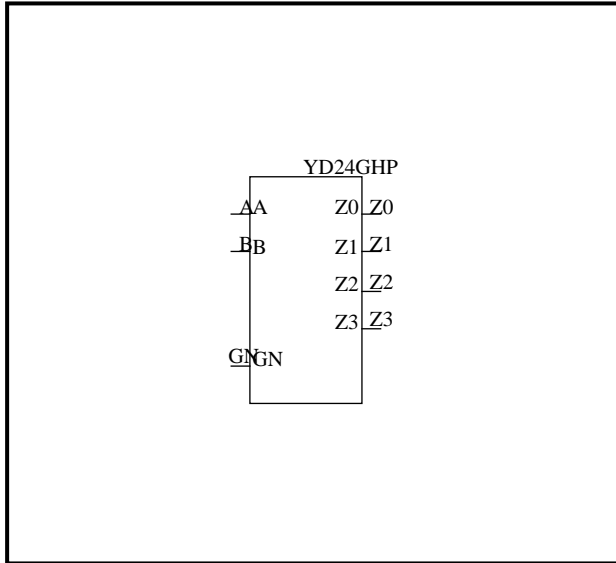
TC200G SERIES

DATA SHEET

YD24GHP		YD24GHP		1/7
---------	--	---------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YD24GHP	2 TO 4 DECODER (GATED OUTPUTS ACTIVE HIGH)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		13	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT			
GN	A	B	Z0	Z1	Z2	Z3
H	X	X	L	L	L	L
L	L	L	H	L	L	L
L	H	L	L	H	L	L
L	L	H	L	L	H	L
L	H	H	L	L	L	H

Verilog-HDL DESCRIPTION

```
YD24GHP inst(Z0,Z1,Z2,Z3,A,B,GN);
```

VHDL DESCRIPTION

```
inst:YD24GHP
port map(Z0,Z1,Z2,Z3,A,B,GN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.79
B	5.57
GN	8.76

OUTPUT DRIVE

(LU)

PIN NAME	Z0	Z1	Z2	Z3
DRIVE	30.7	30.3	30.2	32.4

TC200G SERIES

DATA SHEET

YD24GHP

YD24GHP

2/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1454	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.51	0.76	1.76
0.38	0.28	0.49	0.74	1.75
1.00	0.31	0.51	0.76	1.74
3.00	0.48	0.69	0.93	1.87

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0218	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.39
0.38	0.12	0.18	0.25	0.48
1.00	0.14	0.24	0.33	0.60
3.00	0.10	0.26	0.41	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1475	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.41	0.62	0.88	1.91
0.38	0.49	0.70	0.96	1.99
1.00	0.57	0.78	1.04	2.06
3.00	0.71	0.92	1.17	2.19

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0218	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.39	0.46	0.72
0.38	0.34	0.42	0.49	0.75
1.00	0.42	0.49	0.57	0.82
3.00	0.59	0.67	0.75	1.02

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TC200G SERIES

DATA SHEET

YD24GHP

YD24GHP

3/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1505	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.31	0.52	0.77	1.80
0.38	0.29	0.50	0.75	1.79
1.00	0.32	0.52	0.77	1.79
3.00	0.50	0.71	0.95	1.92

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0231	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.39
0.38	0.12	0.18	0.25	0.48
1.00	0.14	0.24	0.33	0.60
3.00	0.10	0.26	0.41	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.1501	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.64	0.90	1.94
0.38	0.50	0.71	0.98	2.02
1.00	0.57	0.79	1.06	2.10
3.00	0.72	0.93	1.19	2.22

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0241	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.40	0.48	0.75
0.38	0.35	0.43	0.51	0.78
1.00	0.43	0.50	0.58	0.86
3.00	0.59	0.68	0.77	1.05

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TC200G SERIES

DATA SHEET

YD24GHP

YD24GHP

4/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1454	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.44	0.69	1.69
0.38	0.24	0.44	0.69	1.70
1.00	0.32	0.52	0.76	1.74
3.00	0.54	0.77	1.02	1.99

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0218	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.12	0.18	0.45
0.38	0.12	0.19	0.27	0.54
1.00	0.14	0.25	0.36	0.67
3.00	0.09	0.28	0.45	0.93

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1475	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.44	0.70	1.71
0.38	0.24	0.44	0.70	1.72
1.00	0.32	0.52	0.77	1.76
3.00	0.55	0.78	1.03	2.02

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0218	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.12	0.18	0.45
0.38	0.12	0.19	0.27	0.54
1.00	0.14	0.25	0.36	0.67
3.00	0.09	0.27	0.45	0.93

TC200G SERIES

DATA SHEET

YD24GHP

YD24GHP

5/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1505	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.56	0.82	1.86
0.38	0.42	0.63	0.90	1.94
1.00	0.51	0.72	0.98	2.02
3.00	0.66	0.86	1.12	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0231	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.75
0.38	0.32	0.40	0.49	0.78
1.00	0.39	0.47	0.56	0.86
3.00	0.55	0.64	0.74	1.04

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.1501	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.56	0.82	1.86
0.38	0.42	0.64	0.90	1.94
1.00	0.51	0.72	0.98	2.02
3.00	0.66	0.86	1.12	2.15

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0241	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.38	0.46	0.77
0.38	0.32	0.41	0.49	0.80
1.00	0.40	0.48	0.57	0.87
3.00	0.56	0.65	0.74	1.06

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TC200G SERIES

DATA SHEET

YD24GHP

YD24GHP

6/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1454	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.32	0.53	0.78	1.78
0.38	0.29	0.50	0.75	1.76
1.00	0.30	0.49	0.74	1.73
3.00	0.43	0.62	0.86	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0218	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.40
0.38	0.12	0.19	0.25	0.49
1.00	0.15	0.24	0.34	0.61
3.00	0.12	0.28	0.43	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1475	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.33	0.54	0.79	1.81
0.38	0.30	0.51	0.76	1.79
1.00	0.30	0.50	0.75	1.75
3.00	0.44	0.64	0.87	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0218	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.39
0.38	0.12	0.18	0.25	0.48
1.00	0.14	0.24	0.33	0.60
3.00	0.12	0.28	0.42	0.84

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TC200G SERIES

DATA SHEET

YD24GHP

YD24GHP

7/7

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1505	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.55	0.81	1.85
0.38	0.31	0.52	0.79	1.83
1.00	0.31	0.51	0.77	1.79
3.00	0.45	0.65	0.89	1.85

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0231	0.15

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.40
0.38	0.12	0.19	0.25	0.49
1.00	0.15	0.25	0.34	0.61
3.00	0.12	0.28	0.43	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.1501	0.43

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.56	0.81	1.85
0.38	0.31	0.52	0.79	1.83
1.00	0.31	0.51	0.77	1.80
3.00	0.44	0.64	0.88	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0241	0.15

PATH DELAY (ns)

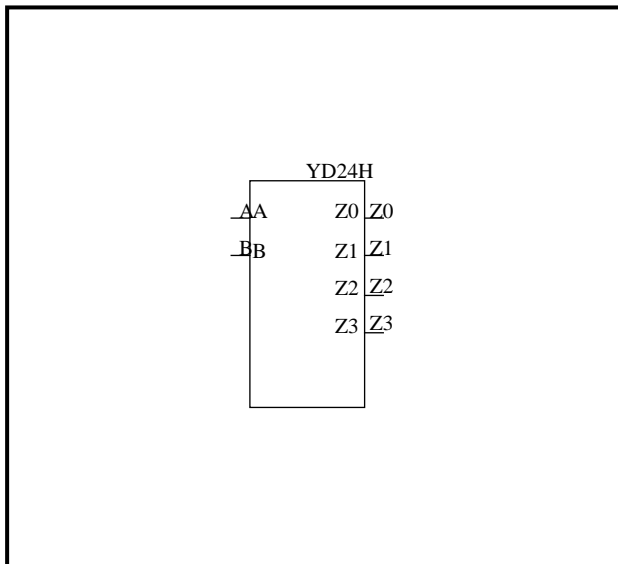
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.12	0.19	0.43
0.38	0.13	0.20	0.27	0.52
1.00	0.16	0.26	0.35	0.64
3.00	0.14	0.30	0.45	0.89

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TC200G SERIES
DATA SHEET

YD24H		YD24H		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YD24H	2 TO 4 DECODER (OUTPUTS ACTIVE HIGH)	GATE 5	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT			
A	B	Z0	Z1	Z2	Z3
L	L	H	L	L	L
H	L	L	H	L	L
L	H	L	L	H	L
H	H	L	L	L	H

Verilog-HDL DESCRIPTION

```
YD24H inst(Z0,Z1,Z2,Z3,A,B);
```

VHDL DESCRIPTION

```
inst:YD24H
port map(Z0,Z1,Z2,Z3,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	3.19
B	3.22

OUTPUT DRIVE

(LU)

PIN NAME	Z0	Z1	Z2	Z3
DRIVE	24.8	25.7	25.5	27.1

TC200G SERIES

DATA SHEET

YD24H

YD24H

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1783	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.43	0.74	1.98
0.38	0.18	0.43	0.74	1.98
1.00	0.21	0.45	0.76	1.98
3.00	0.31	0.57	0.88	2.07

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0411	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.07	0.17	0.29	0.77
0.38	0.13	0.25	0.37	0.86
1.00	0.16	0.33	0.49	1.00
3.00	0.18	0.45	0.68	1.36

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1784	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.51	0.82	2.06
0.38	0.32	0.58	0.89	2.13
1.00	0.38	0.63	0.95	2.19
3.00	0.48	0.72	1.03	2.27

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0334	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.33	0.44	0.85
0.38	0.26	0.36	0.47	0.88
1.00	0.32	0.43	0.54	0.95
3.00	0.46	0.58	0.70	1.12

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24H

YD24H

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1784	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.43	0.74	1.97
0.38	0.18	0.43	0.73	1.97
1.00	0.21	0.45	0.76	1.98
3.00	0.32	0.59	0.89	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0338	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.14	0.25	0.66
0.38	0.12	0.22	0.33	0.75
1.00	0.15	0.30	0.45	0.89
3.00	0.15	0.40	0.63	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.1784	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.52	0.83	2.07
0.38	0.33	0.58	0.90	2.14
1.00	0.38	0.64	0.95	2.19
3.00	0.48	0.73	1.04	2.27

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0420	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.36	0.49	0.98
0.38	0.27	0.39	0.52	1.01
1.00	0.34	0.46	0.59	1.08
3.00	0.48	0.61	0.75	1.25

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24H

YD24H

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.1783	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.41	0.72	1.96
0.38	0.18	0.43	0.74	1.97
1.00	0.24	0.49	0.80	2.02
3.00	0.40	0.70	1.02	2.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0411	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.16	0.28	0.76
0.38	0.12	0.24	0.36	0.85
1.00	0.14	0.32	0.48	0.99
3.00	0.13	0.41	0.66	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.1784	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.16	0.41	0.72	1.96
0.38	0.18	0.42	0.73	1.97
1.00	0.25	0.50	0.80	2.02
3.00	0.42	0.72	1.04	2.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0334	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.13	0.23	0.63
0.38	0.11	0.21	0.32	0.72
1.00	0.12	0.29	0.43	0.86
3.00	0.09	0.36	0.59	1.21

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24H

YD24H

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.1784	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.48	0.79	2.03
0.38	0.30	0.55	0.86	2.10
1.00	0.35	0.61	0.92	2.16
3.00	0.45	0.70	1.01	2.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0338	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.30	0.41	0.82
0.38	0.23	0.34	0.45	0.85
1.00	0.29	0.40	0.51	0.92
3.00	0.43	0.55	0.66	1.08

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.1784	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.49	0.80	2.04
0.38	0.30	0.55	0.87	2.10
1.00	0.36	0.61	0.92	2.16
3.00	0.45	0.70	1.01	2.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0420	0.08

PATH DELAY (ns)

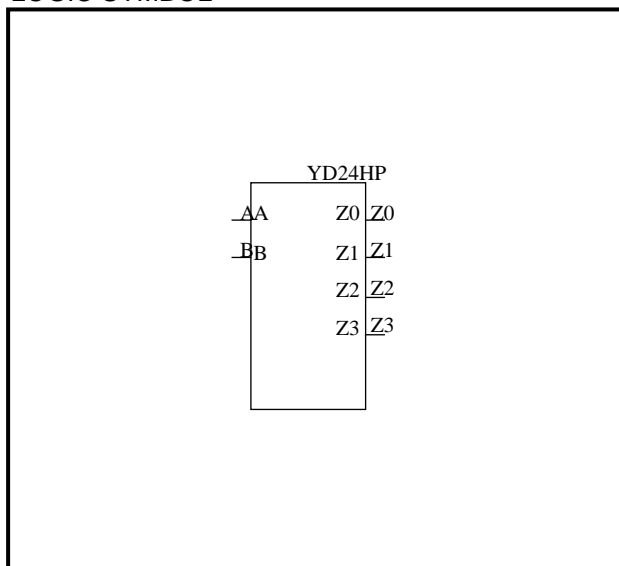
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.33	0.46	0.95
0.38	0.25	0.36	0.49	0.98
1.00	0.31	0.43	0.56	1.05
3.00	0.44	0.58	0.71	1.21

Rev.1.01.10

TC200G SERIES
DATA SHEET

YD24HP		YD24HP		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YD24HP	2 TO 4 DECODER (OUTPUTS ACTIVE HIGH)	GATE 9	I/O 0	VDD=3.3V, Ta=25°C, Typ.

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT			
A	B	Z0	Z1	Z2	Z3
L	L	H	L	L	L
H	L	L	H	L	L
L	H	L	L	H	L
H	H	L	L	L	H

Verilog-HDL DESCRIPTION

```
YD24HP inst(Z0,Z1,Z2,Z3,A,B);
```

VHDL DESCRIPTION

```
inst:YD24HP
port map(Z0,Z1,Z2,Z3,A,B);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z0,Z1,Z2,Z3
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	5.35
B	5.40

OUTPUT DRIVE

(LU)

PIN NAME	Z0,Z2	Z1	Z3
DRIVE	48.8	51.6	54.3

TC200G SERIES

DATA SHEET

YD24HP

YD24HP

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0889	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.03
0.38	0.15	0.27	0.42	1.04
1.00	0.20	0.34	0.49	1.10
3.00	0.36	0.52	0.70	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0193	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.10	0.16	0.40
0.38	0.10	0.17	0.24	0.49
1.00	0.11	0.22	0.32	0.61
3.00	0.07	0.25	0.41	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0834	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.36	0.51	1.10
0.38	0.32	0.44	0.59	1.18
1.00	0.40	0.52	0.67	1.26
3.00	0.55	0.67	0.82	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0208	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.34	0.42	0.69
0.38	0.30	0.37	0.45	0.72
1.00	0.37	0.45	0.53	0.80
3.00	0.53	0.62	0.70	0.98

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24HP

YD24HP

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0889	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.03
0.38	0.15	0.27	0.42	1.04
1.00	0.20	0.34	0.49	1.10
3.00	0.36	0.52	0.70	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0202	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.05	0.10	0.16	0.40
0.38	0.10	0.17	0.24	0.49
1.00	0.11	0.22	0.32	0.61
3.00	0.07	0.25	0.41	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0890	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.53	1.15
0.38	0.32	0.45	0.61	1.23
1.00	0.41	0.54	0.69	1.32
3.00	0.55	0.68	0.84	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0207	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.27	0.35	0.42	0.69
0.38	0.30	0.37	0.45	0.72
1.00	0.37	0.45	0.53	0.80
3.00	0.53	0.62	0.70	0.98

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24HP

YD24HP

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0889	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.28	0.44	1.05
0.38	0.14	0.27	0.43	1.05
1.00	0.18	0.30	0.45	1.06
3.00	0.27	0.41	0.58	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z0	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z0	0.0193	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.41
0.38	0.11	0.18	0.25	0.50
1.00	0.14	0.24	0.33	0.62
3.00	0.14	0.30	0.45	0.88

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0834	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.27	0.41	0.99
0.38	0.14	0.26	0.41	0.99
1.00	0.17	0.29	0.43	1.00
3.00	0.25	0.39	0.55	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0208	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.06	0.11	0.17	0.41
0.38	0.11	0.18	0.25	0.50
1.00	0.14	0.24	0.33	0.62
3.00	0.15	0.30	0.45	0.88

Rev.1.01.10

TC200G SERIES

DATA SHEET

YD24HP

YD24HP

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0889	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.39	0.55	1.17
0.38	0.34	0.47	0.63	1.25
1.00	0.42	0.55	0.71	1.33
3.00	0.57	0.69	0.85	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0202	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.38	0.46	0.73
0.38	0.33	0.40	0.48	0.76
1.00	0.40	0.48	0.56	0.83
3.00	0.57	0.65	0.74	1.02

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0890	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.26	0.39	0.56	1.18
0.38	0.34	0.48	0.64	1.26
1.00	0.42	0.55	0.71	1.34
3.00	0.57	0.69	0.85	1.46

PATH CONDITION

PATH	CONDITION	FUNCTION
B->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0207	0.12

PATH DELAY (ns)

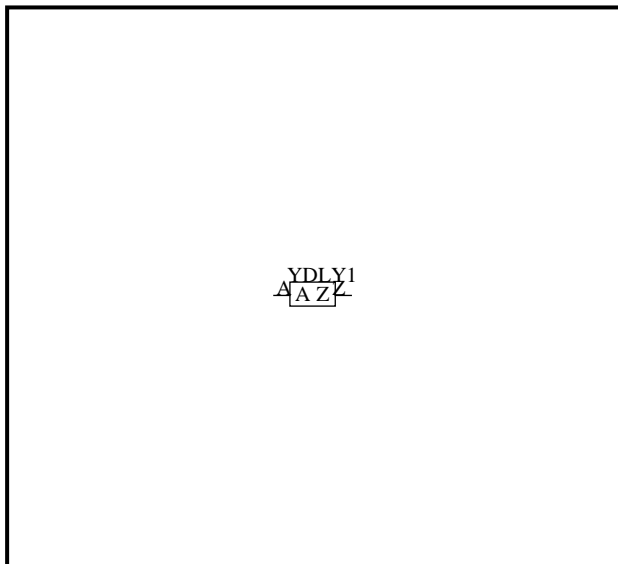
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.30	0.38	0.46	0.73
0.38	0.33	0.41	0.49	0.76
1.00	0.40	0.48	0.56	0.83
3.00	0.57	0.65	0.74	1.02

Rev.1.01.10

TC200G SERIES
DATA SHEET

YDLY1		YDLY1		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YDLY1	DELAY BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
YDLY1 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YDLY1
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.94

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	78.6

TC200G SERIES

DATA SHEET

YDLY1

YDLY1

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0436	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	1.03
0.38	0.66	0.74	0.82	1.13
1.00	0.76	0.83	0.91	1.22
3.00	0.92	0.99	1.07	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0335	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.74	0.84	0.96	1.37
0.38	0.76	0.87	0.98	1.39
1.00	0.84	0.95	1.06	1.47
3.00	1.03	1.14	1.25	1.66

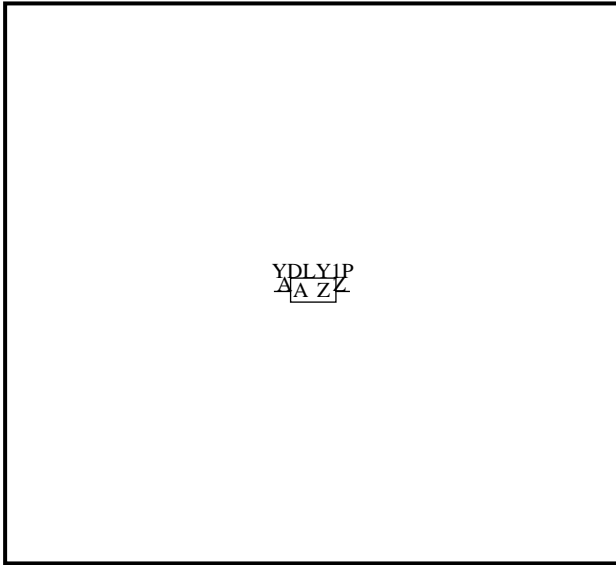
TC200G SERIES

DATA SHEET

YDLY1P		YDLY1P		1/2
--------	--	--------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YDLY1P	DELAY BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
YDLY1P inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YDLY1P
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.94

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	150.9

Rev.1.01.10

TC200G SERIES

DATA SHEET

YDLY1P

YDLY1P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0216	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.61	0.66	0.71	0.87
0.38	0.71	0.75	0.80	0.97
1.00	0.80	0.84	0.89	1.06
3.00	0.96	1.01	1.05	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0182	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.84	0.91	0.98	1.22
0.38	0.86	0.93	1.00	1.25
1.00	0.94	1.01	1.08	1.33
3.00	1.13	1.20	1.27	1.52

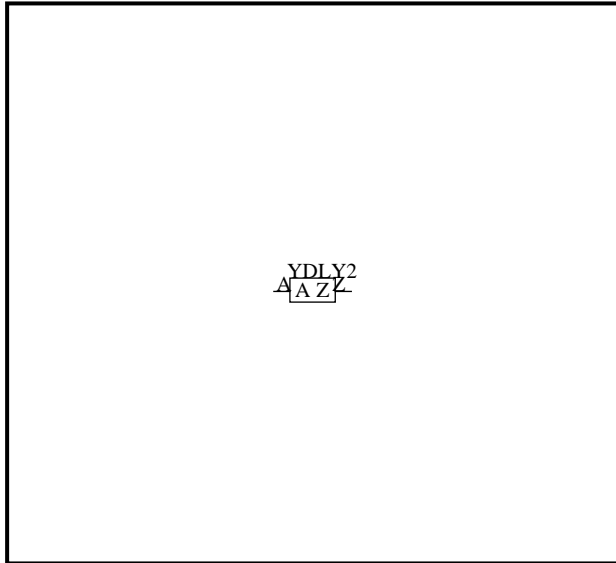
TC200G SERIES

DATA SHEET

YDLY2		YDLY2		1/2
-------	--	-------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YDLY2	DELAY BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		8	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	B
L	L
H	H

Verilog-HDL DESCRIPTION

```
YDLY2 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YDLY2
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.94

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	78.6

TC200G SERIES

DATA SHEET

YDLY2

YDLY2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0436	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.43	1.51	1.59	1.90
0.38	1.53	1.60	1.68	1.99
1.00	1.62	1.69	1.77	2.08
3.00	1.78	1.85	1.94	2.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0335	0.11

PATH DELAY (ns)

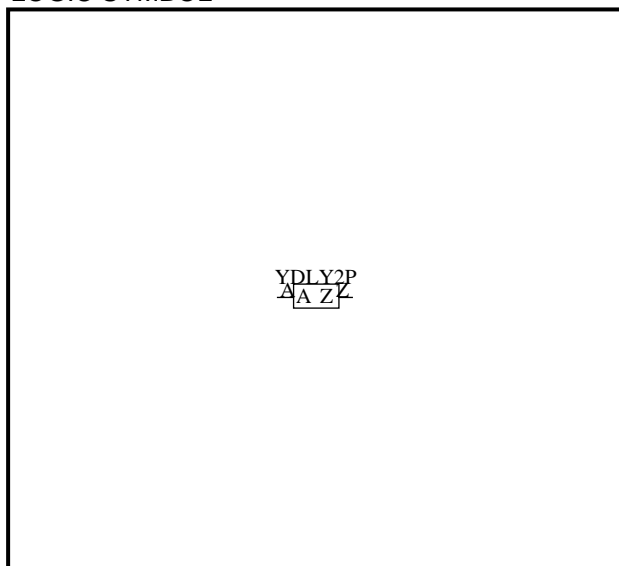
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.60	1.71	1.82	2.24
0.38	1.63	1.73	1.85	2.26
1.00	1.71	1.81	1.93	2.34
3.00	1.90	2.00	2.12	2.53

TC200G SERIES

DATA SHEET

YDLY2P		YDLY2P		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YDLY2P	DELAY BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	B
L	L
H	H

Verilog-HDL DESCRIPTION

```
YDLY2P inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YDLY2P
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.94

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	150.9

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TC200G SERIES

DATA SHEET

YDLY2P

YDLY2P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0216	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.48	1.52	1.57	1.74
0.38	1.57	1.61	1.66	1.83
1.00	1.66	1.71	1.76	1.92
3.00	1.83	1.87	1.92	2.08

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0181	0.16

PATH DELAY (ns)

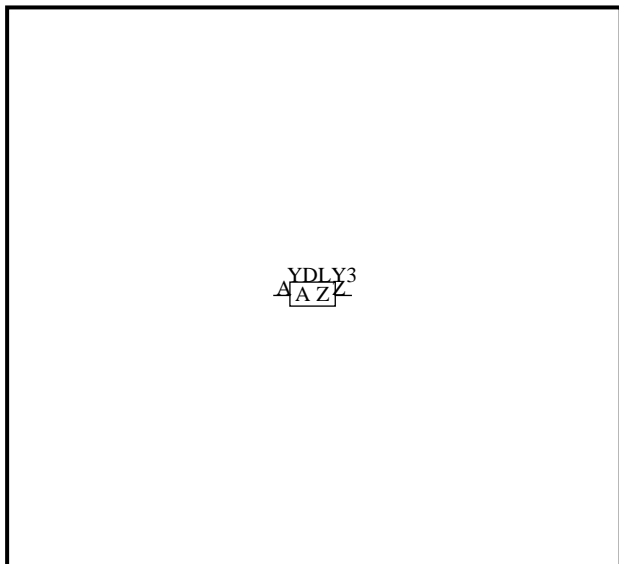
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	1.71	1.77	1.84	2.09
0.38	1.73	1.80	1.87	2.11
1.00	1.81	1.88	1.95	2.19
3.00	2.00	2.07	2.14	2.38

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TC200G SERIES
DATA SHEET

YDLY3		YDLY3		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YDLY3	DELAY BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		16	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
YDLY3 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YDLY3
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.94

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	78.6

TC200G SERIES

DATA SHEET

YDLY3

YDLY3

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0436	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	3.16	3.23	3.31	3.62
0.38	3.25	3.32	3.41	3.72
1.00	3.34	3.42	3.50	3.81
3.00	3.51	3.58	3.66	3.97

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0335	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	3.33	3.44	3.55	3.97
0.38	3.36	3.46	3.58	3.99
1.00	3.44	3.54	3.66	4.07
3.00	3.63	3.73	3.85	4.26

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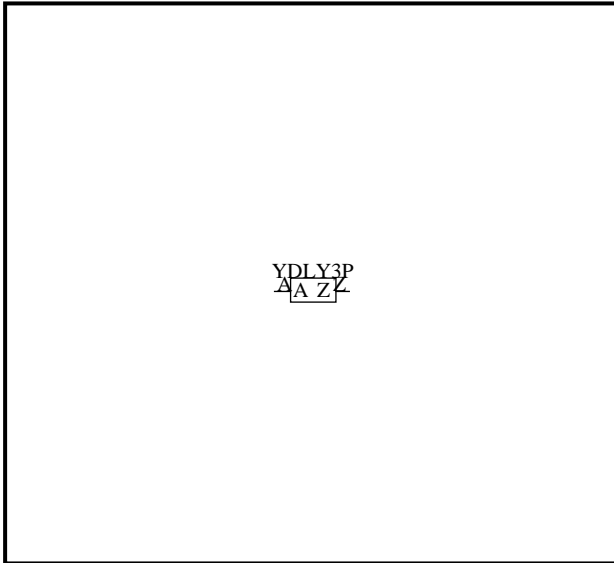
TC200G SERIES

DATA SHEET

YDLY3P		YDLY3P		1/2
--------	--	--------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YDLY3P	DELAY BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		17	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
YDLY3P inst(Z,A);
```

VHDL DESCRIPTION

```
inst:YDLY3P
port map(Z,A);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A	1.94

OUTPUT DRIVE

(LU)

PIN NAME	Z
DRIVE	150.8

TC200G SERIES

DATA SHEET

YDLY3P

YDLY3P

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0216	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	3.20	3.25	3.29	3.46
0.38	3.30	3.34	3.39	3.56
1.00	3.39	3.43	3.48	3.65
3.00	3.55	3.60	3.64	3.81

PATH CONDITION

PATH	CONDITION	FUNCTION
A->Z	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0182	0.16

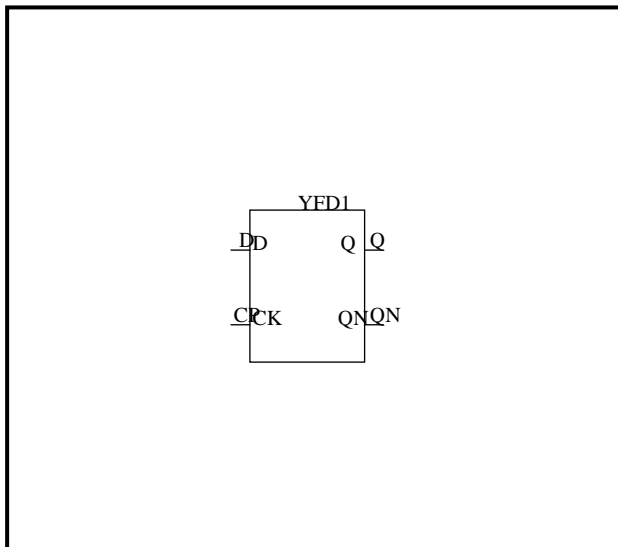
PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	3.44	3.50	3.58	3.82
0.38	3.46	3.53	3.60	3.85
1.00	3.54	3.61	3.68	3.93
3.00	3.73	3.80	3.87	4.12

TC200G SERIES
DATA SHEET

YFD1		YFD1		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YFD1	D-TYPE FLIP FLOP	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		5	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
D	CP	Qn+1	QNn+1
L	Up	L	H
H	Up	H	L
X	Dn	Qn	QNn

Verilog-HDL DESCRIPTION

```
YFD1 inst(Q,QN,D,CP);
```

VHDL DESCRIPTION

```
inst:YFD1
port map(Q,QN,D,CP);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	3.36
CP	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	40.5	39.0

TC200G SERIES

DATA SHEET

YFD1

YFD1

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1006	0.25

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.60	0.78	1.47
0.38	0.54	0.68	0.86	1.55
1.00	0.61	0.76	0.94	1.63
3.00	0.75	0.90	1.07	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0436	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.52	0.66	1.18
0.38	0.47	0.60	0.74	1.26
1.00	0.55	0.68	0.82	1.34
3.00	0.70	0.83	0.97	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0974	0.39

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.25
0.38	0.25	0.39	0.58	1.28
1.00	0.31	0.47	0.65	1.35
3.00	0.46	0.66	0.86	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0397	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.85
0.38	0.24	0.35	0.47	0.95
1.00	0.34	0.48	0.62	1.12
3.00	0.55	0.76	0.97	1.60

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TC200G SERIES

DATA SHEET

YFD1

YFD1

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.166	0.129	0.067	-0.133
0.01	0.207	0.172	0.113	-0.078
0.38	0.277	0.244	0.190	0.014
1.00	0.501	0.478	0.439	0.312
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.414	0.436	0.472	0.589
0.01	0.386	0.408	0.444	0.562
0.38	0.339	0.361	0.398	0.516
1.00	0.188	0.210	0.248	0.370
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.242	0.220	0.184	0.068
0.01	0.270	0.249	0.212	0.095
0.38	0.317	0.295	0.259	0.141
1.00	0.469	0.447	0.409	0.288
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.492	0.529	0.591	0.792
0.01	0.450	0.486	0.545	0.737
0.38	0.381	0.413	0.468	0.644
1.00	0.157	0.180	0.220	0.346
3.00				

TC200G SERIES

DATA SHEET

YFD1

YFD1

4/4

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	~D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

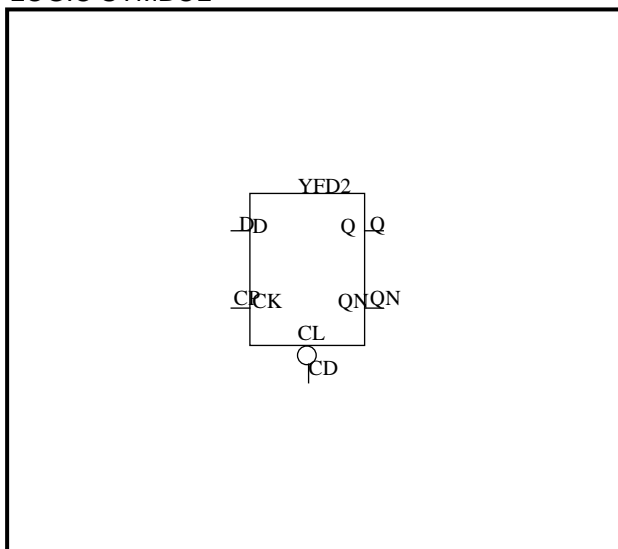
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.710

TC200G SERIES

DATA SHEET

YFD2		YFD2		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YFD2	D-TYPE FLIP FLOP with CLEAR	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
CD	D	CP	Qn+1	QNn+1
L	X	X*	L	H
H	L	Up	L	H
H	H	Up	H	L
H	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR

Verilog-HDL DESCRIPTION

```
YFD2 inst(Q,QN,D,CP,CD);
```

VHDL DESCRIPTION

```
inst:YFD2
port map(Q,QN,D,CP,CD);
```

ELECTRO MIGRATION

PIN NAME	Q,QN	(LU*MHz)
ELECTRO MIGRATION DRIVE	6880.0	

INPUT LOAD

PIN NAME	LOAD	(LU)
D	3.34	
CP	0.99	
CD	2.21	

OUTPUT DRIVE

PIN NAME	Q	QN	(LU)
DRIVE	45.5	35.5	

TC200G SERIES

DATA SHEET

YFD2

YFD2

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0431	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.26	0.38	0.87
0.38	0.21	0.32	0.45	0.94
1.00	0.26	0.42	0.57	1.09
3.00	0.34	0.57	0.79	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0845	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.32	0.47	1.06
0.38	0.22	0.35	0.50	1.09
1.00	0.26	0.40	0.55	1.14
3.00	0.33	0.50	0.68	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0853	0.25

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.60	0.76	1.36
0.38	0.54	0.68	0.84	1.44
1.00	0.62	0.76	0.92	1.52
3.00	0.77	0.91	1.07	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0431	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.39	0.51	0.65	1.16
0.38	0.47	0.59	0.73	1.24
1.00	0.55	0.67	0.81	1.32
3.00	0.70	0.83	0.96	1.47

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TC200G SERIES

DATA SHEET

YFD2

YFD2

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0845	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.32	0.47	1.06
0.38	0.22	0.35	0.50	1.09
1.00	0.26	0.40	0.55	1.14
3.00	0.33	0.50	0.68	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0652	0.33

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.57	1.31
0.38	0.28	0.44	0.62	1.37
1.00	0.35	0.52	0.71	1.46
3.00	0.49	0.70	0.93	1.74

TC200G SERIES

DATA SHEET

YFD2

YFD2

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.090	0.053	-0.010	-0.213
0.38	0.143	0.106	0.043	-0.157
1.00	0.230	0.194	0.133	-0.064
3.00	0.512	0.478	0.421	0.237

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.564	0.602	0.666	0.870
0.38	0.512	0.550	0.612	0.814
1.00	0.425	0.461	0.523	0.721
3.00	0.143	0.177	0.234	0.418

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TC200G SERIES

DATA SHEET

YFD2

YFD2

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.185	0.147	0.084	-0.121
0.38	0.01	0.234	0.198	0.136	-0.061
1.00	0.01	0.317	0.282	0.225	0.039
3.00	0.01	0.583	0.555	0.509	0.360

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.402	0.426	0.468	0.602
0.38	0.01	0.375	0.400	0.441	0.575
1.00	0.01	0.330	0.354	0.396	0.529
3.00	0.01	0.184	0.209	0.250	0.384

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.255	0.230	0.189	0.056
0.38	0.01	0.282	0.257	0.216	0.083
1.00	0.01	0.327	0.302	0.261	0.128
3.00	0.01	0.471	0.447	0.405	0.273

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.471	0.508	0.571	0.775
0.38	0.01	0.421	0.458	0.519	0.715
1.00	0.01	0.339	0.373	0.431	0.616
3.00	0.01	0.073	0.101	0.147	0.295

TC200G SERIES

DATA SHEET

YFD2

YFD2

6/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.690

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&~D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

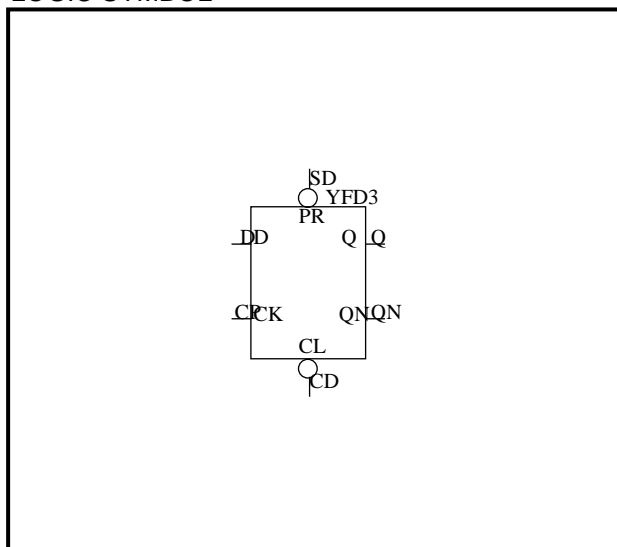
NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

TC200G SERIES

DATA SHEET

YFD3		YFD3		1/9
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YFD3	D-TYPE FLIP FLOP with CLEAR and PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT				OUTPUT	
CD	SD	D	CP	Qn+1	QNn+1
L	H	X	X*	L	H
H	L	X	X*	H	L
L	L	X	X	H	H
H	H	L	Up	L	H
H	H	H	Up	H	L
H	H	X	Dn	Qn	QNn

*:Consider the HOLD Time of CLEAR or PRESET

Verilog-HDL DESCRIPTION

```
YFD3 inst(Q,QN,D,CP,CD,SD);
```

VHDL DESCRIPTION

```
inst:YFD3
port map(Q,QN,D,CP,CD,SD);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	3.31
CP	0.99
CD	2.27
SD	2.16

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	34.6	36.5

TC200G SERIES

DATA SHEET

YFD3

YFD3

2/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0662	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.27	0.46	1.20
0.38	0.19	0.35	0.54	1.28
1.00	0.26	0.46	0.66	1.42
3.00	0.39	0.67	0.94	1.82

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0985	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.42	1.00
0.38	0.15	0.29	0.45	1.03
1.00	0.18	0.34	0.50	1.09
3.00	0.22	0.41	0.61	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0662	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.35	0.54	1.29
0.38	0.25	0.41	0.60	1.34
1.00	0.30	0.48	0.68	1.44
3.00	0.38	0.63	0.88	1.71

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0845	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.29	0.42	0.91
0.38	0.21	0.32	0.44	0.93
1.00	0.25	0.37	0.50	0.99
3.00	0.33	0.48	0.64	1.18

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD3

YFD3

3/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0599	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.35	0.52	1.21
0.38	0.26	0.40	0.58	1.26
1.00	0.32	0.48	0.66	1.35
3.00	0.44	0.65	0.86	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0985	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.66	0.84	1.53
0.38	0.59	0.74	0.92	1.61
1.00	0.67	0.82	1.00	1.69
3.00	0.82	0.97	1.15	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0662	0.20

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.61	0.81	1.56
0.38	0.52	0.69	0.88	1.63
1.00	0.61	0.77	0.97	1.72
3.00	0.76	0.93	1.12	1.88

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0845	0.35

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.30	0.45	1.04
0.38	0.20	0.33	0.48	1.07
1.00	0.24	0.38	0.54	1.13
3.00	0.29	0.47	0.66	1.31

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD3

YFD3

4/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0599	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.34	0.51	1.19
0.38	0.27	0.42	0.59	1.27
1.00	0.36	0.53	0.72	1.42
3.00	0.55	0.77	1.01	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0599	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.20	0.34	0.51	1.19
0.38	0.27	0.42	0.59	1.27
1.00	0.36	0.53	0.72	1.42
3.00	0.55	0.77	1.01	1.81

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD3

YFD3

5/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.080	0.041	-0.024	-0.232
0.38	0.130	0.092	0.029	-0.177
1.00	0.215	0.178	0.116	-0.084
3.00	0.489	0.455	0.398	0.214

TIMING CONDITION

DATA	CLOCK	CONDITION
CD	CP	SD&D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.577	0.616	0.680	0.886
0.38	0.527	0.564	0.627	0.831
1.00	0.441	0.478	0.540	0.739
3.00	0.167	0.201	0.258	0.442

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD3

YFD3

6/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.179	0.141	0.076	-0.132
0.01	0.227	0.190	0.128	-0.073
0.38	0.307	0.272	0.214	0.025
1.00	0.565	0.537	0.491	0.343
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.395	0.421	0.465	0.606
0.01	0.367	0.393	0.436	0.577
0.38	0.319	0.345	0.389	0.528
1.00	0.167	0.192	0.235	0.372
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	CD&SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.259	0.233	0.190	0.048
0.01	0.288	0.262	0.218	0.078
0.38	0.336	0.310	0.266	0.127
1.00	0.489	0.464	0.422	0.285
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.478	0.516	0.580	0.787
0.01	0.430	0.467	0.529	0.728
0.38	0.350	0.384	0.442	0.630
1.00	0.091	0.118	0.164	0.313
3.00				

TC200G SERIES

DATA SHEET

YFD3

YFD3

7/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.080	-0.122	-0.192	-0.419
0.38	-0.074	-0.116	-0.186	-0.413
1.00	-0.064	-0.106	-0.176	-0.404
3.00	-0.032	-0.074	-0.145	-0.372

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	CD&~D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.734	0.777	0.849	1.081
0.38	0.728	0.771	0.843	1.075
1.00	0.719	0.761	0.833	1.064
3.00	0.688	0.730	0.801	1.028

TC200G SERIES

DATA SHEET

YFD3

YFD3

8/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.690

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD&D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	CD&SD&~D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

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TC200G SERIES

DATA SHEET

YFD3

YFD3

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CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.690

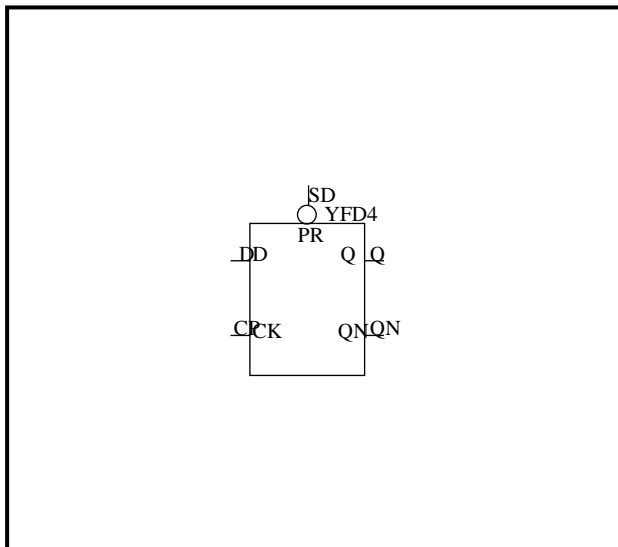
Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD4		YFD4		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YFD4	D-TYPE FLIP FLOP with PRESET	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		6	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT			OUTPUT	
SD	D	CP	Qn+1	QNn+1
L	X	X*	H	L
H	L	Up	L	H
H	H	Up	H	L
H	X	Dn	Qn	QNn

*:Consider the HOLD Time of PRESET

Verilog-HDL DESCRIPTION

```
YFD4 inst(Q,QN,D,CP,SD);
```

VHDL DESCRIPTION

```
inst:YFD4
port map(Q,QN,D,CP,SD);
```

ELECTRO MIGRATION

PIN NAME	(LU*MHz)
ELECTRO MIGRATION DRIVE	Q,QN 6880.0

INPUT LOAD

PIN NAME	LOAD (LU)
D	3.36
CP	0.99
SD	2.17

OUTPUT DRIVE

PIN NAME	Q (LU)	QN (LU)
DRIVE	35.6	36.1

TC200G SERIES

DATA SHEET

YFD4

YFD4

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0947	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.48	0.62	0.79	1.46
0.38	0.56	0.70	0.87	1.54
1.00	0.64	0.78	0.95	1.62
3.00	0.79	0.93	1.10	1.77

PATH CONDITION

PATH	CONDITION	FUNCTION
CP->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0666	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.44	0.60	0.80	1.55
0.38	0.52	0.68	0.88	1.63
1.00	0.60	0.77	0.96	1.72
3.00	0.76	0.92	1.12	1.88

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.1006	0.42

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.21	0.35	0.52	1.21
0.38	0.23	0.37	0.55	1.23
1.00	0.27	0.43	0.61	1.29
3.00	0.38	0.56	0.76	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0417	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.24	0.36	0.84
0.38	0.21	0.32	0.45	0.93
1.00	0.29	0.43	0.57	1.08
3.00	0.40	0.60	0.81	1.45

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD4

YFD4

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
SD->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0947	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.25	0.40	0.95
0.38	0.15	0.28	0.42	0.98
1.00	0.18	0.33	0.48	1.03
3.00	0.21	0.40	0.60	1.22

PATH CONDITION

PATH	CONDITION	FUNCTION
Q->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0417	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.24	0.36	0.84
0.38	0.21	0.32	0.45	0.93
1.00	0.29	0.43	0.57	1.08
3.00	0.40	0.60	0.81	1.45

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD4

YFD4

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.168	0.130	0.065	-0.143
0.38	0.01	0.211	0.174	0.112	-0.087
1.00	0.01	0.282	0.248	0.191	0.006
3.00	0.01	0.512	0.487	0.444	0.307

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.413	0.437	0.479	0.613
0.38	0.01	0.384	0.409	0.450	0.585
1.00	0.01	0.335	0.360	0.402	0.537
3.00	0.01	0.179	0.204	0.247	0.384

TIMING CONDITION

DATA	CLOCK	CONDITION
D	CP	SD

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.242	0.218	0.177	0.044
0.38	0.01	0.271	0.247	0.205	0.073
1.00	0.01	0.320	0.295	0.254	0.120
3.00	0.01	0.478	0.452	0.410	0.273

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.489	0.528	0.592	0.800
0.38	0.01	0.447	0.483	0.545	0.744
1.00	0.01	0.375	0.409	0.466	0.650
3.00	0.01	0.143	0.169	0.211	0.348

Rev.1.01.10

TC200G SERIES

DATA SHEET

YFD4

YFD4

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	-0.027	-0.068	-0.137	-0.361
0.38	-0.030	-0.071	-0.140	-0.364
1.00	-0.034	-0.076	-0.146	-0.370
3.00	-0.050	-0.092	-0.162	-0.390

TIMING CONDITION

DATA	CLOCK	CONDITION
SD	CP	~D

ITEM	CLOCK	DATA	WAVE_FORM
HOLD	POSEDGE	LOW	

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)				
0.01	0.681	0.723	0.792	1.015
0.38	0.684	0.726	0.795	1.019
1.00	0.689	0.731	0.801	1.025
3.00	0.706	0.748	0.818	1.045

TC200G SERIES

DATA SHEET

YFD4

YFD4

6/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD&D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
CP	SD&~D

ITEM	WAVE_FORM
POSLIMIT	
NEGLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.870

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.710

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
SD	---

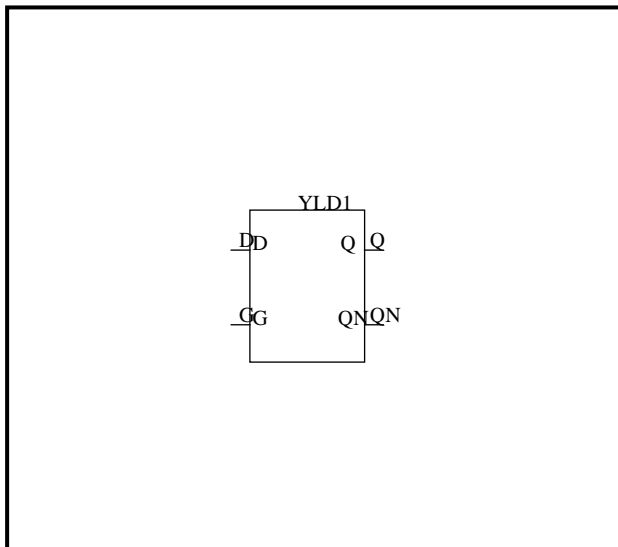
ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	
0.01 to 3.00	0.690

TC200G SERIES
DATA SHEET

YLD1		YLD1		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YLD1	D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
G	D	Q	QN
H	L	L	H
H	H	H	L
L	X	HOLD	

Verilog-HDL DESCRIPTION

```
YLD1 inst(Q,QN,D,G);
```

VHDL DESCRIPTION

```
inst:YLD1
port map(Q,QN,D,G);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	3.27
G	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	36.2	42.8

TC200G SERIES

DATA SHEET

YLD1

YLD1

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1033	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.56	1.29
0.38	0.25	0.40	0.59	1.33
1.00	0.31	0.47	0.66	1.39
3.00	0.45	0.66	0.87	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0435	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.26	0.39	0.90
0.38	0.25	0.36	0.49	1.00
1.00	0.35	0.50	0.64	1.18
3.00	0.55	0.76	0.98	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0976	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.16
0.38	0.20	0.33	0.50	1.17
1.00	0.24	0.38	0.56	1.22
3.00	0.32	0.51	0.72	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0410	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.24	0.36	0.83
0.38	0.19	0.31	0.43	0.91
1.00	0.24	0.40	0.55	1.05
3.00	0.31	0.54	0.77	1.42

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TC200G SERIES

DATA SHEET

YLD1

YLD1

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1033	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.56	1.29
0.38	0.25	0.40	0.59	1.33
1.00	0.31	0.47	0.66	1.39
3.00	0.45	0.66	0.87	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0435	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.26	0.39	0.90
0.38	0.25	0.36	0.49	1.00
1.00	0.35	0.50	0.64	1.18
3.00	0.55	0.76	0.98	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0976	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.48	0.65	1.32
0.38	0.42	0.56	0.72	1.40
1.00	0.48	0.62	0.79	1.46
3.00	0.60	0.74	0.91	1.58

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0410	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.39	0.52	0.99
0.38	0.37	0.47	0.59	1.06
1.00	0.44	0.54	0.66	1.13
3.00	0.56	0.67	0.79	1.26

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TC200G SERIES

DATA SHEET

YLD1

YLD1

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.181	0.166	0.141	0.060
0.38	0.204	0.188	0.163	0.079
1.00	0.241	0.225	0.198	0.110
3.00	0.362	0.344	0.313	0.212

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.522	0.548	0.593	0.738
0.38	0.495	0.522	0.567	0.713
1.00	0.450	0.477	0.523	0.672
3.00	0.305	0.334	0.382	0.538

TIMING CONDITION

DATA	CLOCK	CONDITION
D	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.121	0.094	0.050	-0.094
0.38	0.148	0.121	0.076	-0.070
1.00	0.193	0.166	0.120	-0.028
3.00	0.339	0.310	0.262	0.106

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.463	0.478	0.503	0.585
0.38	0.441	0.456	0.482	0.566
1.00	0.403	0.419	0.447	0.535
3.00	0.282	0.301	0.332	0.433

TC200G SERIES

DATA SHEET

YLD1

YLD1

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	D

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	~D

ITEM	WAVE_FORM
POSLIMIT	

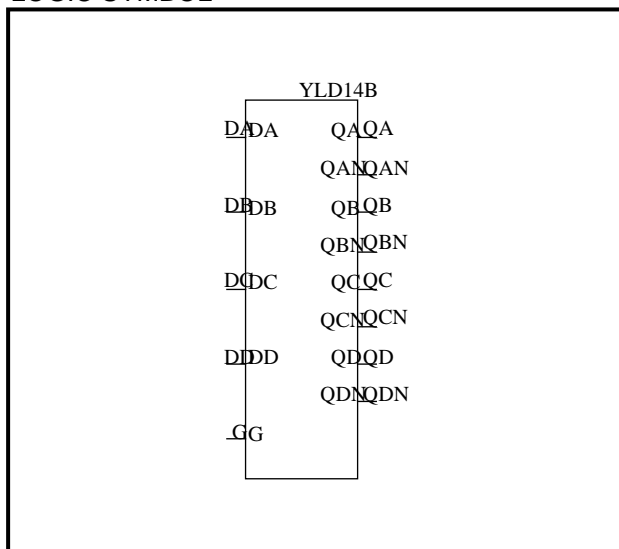
POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

TC200G SERIES

DATA SHEET

YLD14B		YLD14B		1/16
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YLD14B	QUAD D-TYPE TRANSPARENT LATCH (HIGH ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
G	D	Q	QN
H	L	L	H
H	H	H	L
L	X	HOLD	

Verilog-HDL DESCRIPTION

```
YLD14B inst(QA,QAN,QB,QBN,QC,QCN,
            QD,QDN,DA,DB,DC,DD,G)
            ;
```

VHDL DESCRIPTION

```
inst:YLD14B
port map(QA,QAN,QB,QBN,QC,
         QCN,QD,QDN,DA,DB,
         DC,DD,G);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	QA,QAN,QB,QBN,QC,QCN,QD,QDN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
DA	3.29
DB,DC,DD	3.30
G	0.99

OUTPUT DRIVE

(LU)

PIN NAME	QA,QB,QC,QD	QAN,QBN,QCN,QDN
DRIVE	38.0	40.8

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

2/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DA->QAN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DA->QAN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

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TC200G SERIES

DATA SHEET

YLD14B

YLD14B

3/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DB->QBN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.1013	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DB->QBN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

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TC200G SERIES

DATA SHEET

YLD14B

YLD14B

4/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DC->QCN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.1013	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DC->QCN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

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TC200G SERIES

DATA SHEET

YLD14B

YLD14B

5/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DD->QDN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.1013	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DD->QDN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

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TC200G SERIES

DATA SHEET

YLD14B

YLD14B

6/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QAN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.83	1.52
0.38	0.60	0.74	0.92	1.61
1.00	0.71	0.85	1.02	1.71
3.00	0.90	1.04	1.21	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QAN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.60	1.09
0.38	0.45	0.56	0.68	1.18
1.00	0.55	0.66	0.79	1.28
3.00	0.74	0.85	0.98	1.47

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TC200G SERIES

DATA SHEET

YLD14B

YLD14B

7/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QBN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.1013	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.83	1.52
0.38	0.60	0.74	0.92	1.61
1.00	0.71	0.85	1.02	1.71
3.00	0.90	1.04	1.21	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QBN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.60	1.09
0.38	0.45	0.56	0.69	1.18
1.00	0.55	0.66	0.79	1.28
3.00	0.74	0.85	0.98	1.47

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TC200G SERIES

DATA SHEET

YLD14B

YLD14B

8/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QCN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.1013	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.83	1.52
0.38	0.60	0.74	0.92	1.61
1.00	0.71	0.85	1.02	1.71
3.00	0.90	1.04	1.21	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QCN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.60	1.09
0.38	0.45	0.56	0.69	1.18
1.00	0.55	0.66	0.79	1.28
3.00	0.74	0.85	0.98	1.47

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

9/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QDN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.1013	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.83	1.52
0.38	0.60	0.74	0.92	1.61
1.00	0.71	0.85	1.02	1.71
3.00	0.90	1.04	1.21	1.90

PATH CONDITION

PATH	CONDITION	FUNCTION
G->QDN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.0436	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.47	0.60	1.09
0.38	0.45	0.56	0.69	1.18
1.00	0.55	0.66	0.79	1.28
3.00	0.74	0.85	0.98	1.47

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

10/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DA	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.100	0.072	0.025	-0.127
0.38	0.120	0.092	0.046	-0.105
1.00	0.154	0.126	0.081	-0.067
3.00	0.262	0.237	0.193	0.054

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.688	0.721	0.778	0.959
0.38	0.662	0.696	0.754	0.938
1.00	0.619	0.654	0.713	0.903
3.00	0.481	0.519	0.583	0.790

TIMING CONDITION

DATA	CLOCK	CONDITION
DA	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	-0.042	-0.076	-0.133	-0.317
0.38	-0.016	-0.051	-0.109	-0.296
1.00	0.026	-0.009	-0.069	-0.260
3.00	0.163	0.125	0.061	-0.145

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.546	0.574	0.621	0.773
0.38	0.526	0.553	0.600	0.750
1.00	0.491	0.519	0.565	0.713
3.00	0.381	0.407	0.451	0.591

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

11/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DB	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.100	0.072	0.025	-0.127
0.38	0.01	0.120	0.092	0.046	-0.105
1.00	0.01	0.154	0.126	0.081	-0.067
3.00	0.01	0.262	0.237	0.193	0.054

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.688	0.721	0.778	0.959
0.38	0.01	0.662	0.696	0.754	0.938
1.00	0.01	0.619	0.654	0.713	0.903
3.00	0.01	0.481	0.519	0.583	0.790

TIMING CONDITION

DATA	CLOCK	CONDITION
DB	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	-0.042	-0.076	-0.133	-0.317
0.38	0.01	-0.016	-0.051	-0.109	-0.296
1.00	0.01	0.026	-0.009	-0.069	-0.260
3.00	0.01	0.163	0.125	0.061	-0.145

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.546	0.574	0.621	0.773
0.38	0.01	0.526	0.553	0.600	0.750
1.00	0.01	0.491	0.519	0.565	0.713
3.00	0.01	0.381	0.407	0.451	0.591

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

12/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DC	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.100	0.072	0.025	-0.127
0.38	0.01	0.120	0.092	0.046	-0.105
1.00	0.01	0.154	0.126	0.081	-0.067
3.00	0.01	0.262	0.237	0.193	0.054

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.688	0.721	0.778	0.959
0.38	0.01	0.662	0.696	0.754	0.938
1.00	0.01	0.619	0.654	0.713	0.903
3.00	0.01	0.481	0.519	0.583	0.790

TIMING CONDITION

DATA	CLOCK	CONDITION
DC	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	-0.042	-0.076	-0.133	-0.317
0.38	0.01	-0.016	-0.051	-0.109	-0.296
1.00	0.01	0.026	-0.009	-0.069	-0.260
3.00	0.01	0.163	0.125	0.061	-0.145

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.546	0.574	0.621	0.773
0.38	0.01	0.526	0.553	0.600	0.750
1.00	0.01	0.491	0.519	0.565	0.713
3.00	0.01	0.381	0.407	0.451	0.591

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

13/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DD	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	HIGH	
HOLD	NEGEDGE	HIGH	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.100	0.072	0.025	-0.127
0.38	0.01	0.120	0.092	0.046	-0.105
1.00	0.01	0.154	0.126	0.081	-0.067
3.00	0.01	0.262	0.237	0.193	0.054

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.688	0.721	0.778	0.959
0.38	0.01	0.662	0.696	0.754	0.938
1.00	0.01	0.619	0.654	0.713	0.903
3.00	0.01	0.481	0.519	0.583	0.790

TIMING CONDITION

DATA	CLOCK	CONDITION
DD	G	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	NEGEDGE	LOW	
HOLD	NEGEDGE	LOW	

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	-0.042	-0.076	-0.133	-0.317
0.38	0.01	-0.016	-0.051	-0.109	-0.296
1.00	0.01	0.026	-0.009	-0.069	-0.260
3.00	0.01	0.163	0.125	0.061	-0.145

CLOCK SLEW (ns)	DATA SLEW (ns)	0.01	0.38	1.00	3.00
0.01	0.01	0.546	0.574	0.621	0.773
0.38	0.01	0.526	0.553	0.600	0.750
1.00	0.01	0.491	0.519	0.565	0.713
3.00	0.01	0.381	0.407	0.451	0.591

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

14/16

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	DA

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	~DA

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	DB

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

15/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	~DB

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	DC

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	~DC

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD14B

YLD14B

16/16

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	DD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
G	~DD

ITEM	WAVE_FORM
POSLIMIT	

POSLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.870

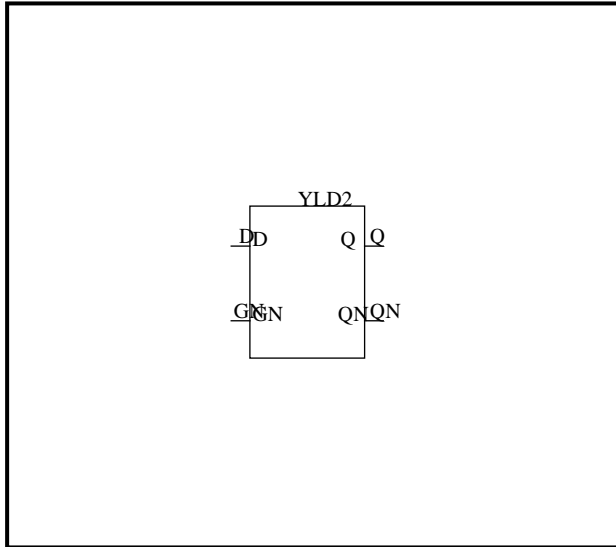
TC200G SERIES

DATA SHEET

YLD2		YLD2		1/5
------	--	------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YLD2	D-TYPE TRANSPARENT LATCH (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
GN	D	Q	QN
L	L	L	H
L	H	H	L
H	X	HOLD	

Verilog-HDL DESCRIPTION

```
YLD2 inst(Q,QN,D,GN);
```

VHDL DESCRIPTION

```
inst:YLD2
port map(Q,QN,D,GN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Q,QN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
D	3.26
GN	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Q	QN
DRIVE	36.2	42.8

TC200G SERIES

DATA SHEET

YLD2

YLD2

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1033	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.56	1.29
0.38	0.25	0.40	0.59	1.33
1.00	0.31	0.47	0.66	1.39
3.00	0.45	0.66	0.87	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0435	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.26	0.39	0.90
0.38	0.25	0.36	0.49	1.00
1.00	0.35	0.50	0.64	1.18
3.00	0.55	0.76	0.98	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0976	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.16
0.38	0.20	0.33	0.50	1.17
1.00	0.24	0.38	0.56	1.22
3.00	0.32	0.51	0.72	1.43

PATH CONDITION

PATH	CONDITION	FUNCTION
D->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0410	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.24	0.36	0.83
0.38	0.19	0.31	0.43	0.91
1.00	0.24	0.40	0.55	1.05
3.00	0.31	0.54	0.77	1.42

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD2

YLD2

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.1033	0.41

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.38	0.56	1.29
0.38	0.25	0.40	0.59	1.33
1.00	0.31	0.47	0.66	1.39
3.00	0.45	0.66	0.87	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
QN->Q	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Q	0.0435	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.26	0.39	0.90
0.38	0.25	0.36	0.49	1.00
1.00	0.35	0.50	0.64	1.18
3.00	0.55	0.76	0.98	1.65

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0976	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.48	0.65	1.32
0.38	0.38	0.52	0.69	1.36
1.00	0.44	0.58	0.75	1.42
3.00	0.56	0.69	0.86	1.54

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QN	0.0410	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.44	0.56	1.03
0.38	0.37	0.48	0.60	1.07
1.00	0.43	0.54	0.66	1.13
3.00	0.55	0.65	0.77	1.24

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD2

YLD2

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.172	0.140	0.085	-0.091
0.38	0.205	0.174	0.122	-0.045
1.00	0.260	0.232	0.185	0.033
3.00	0.437	0.418	0.386	0.285

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.424	0.440	0.467	0.554
0.38	0.405	0.421	0.447	0.534
1.00	0.372	0.388	0.415	0.501
3.00	0.266	0.282	0.309	0.395

TIMING CONDITION

DATA	CLOCK	CONDITION
D	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.219	0.203	0.176	0.090
0.38	0.238	0.222	0.196	0.109
1.00	0.271	0.255	0.229	0.143
3.00	0.378	0.362	0.335	0.249

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.471	0.503	0.558	0.734
0.38	0.438	0.469	0.521	0.687
1.00	0.384	0.412	0.459	0.610
3.00	0.208	0.227	0.258	0.360

TC200G SERIES
DATA SHEET

YLD2

YLD2

5/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	D

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.690
0.01 to 3.00	0.690

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	~D

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.690
0.01 to 3.00	0.690

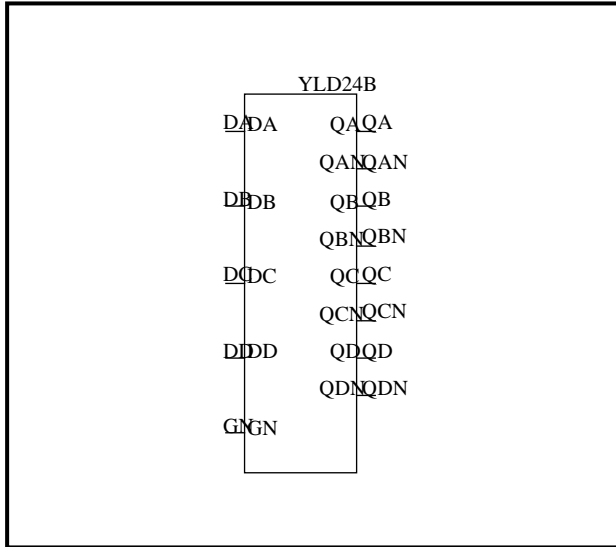
TC200G SERIES

DATA SHEET

YLD24B		YLD24B		1/16
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CELL NAME	FUNCTION	CELL COUNT		CONDITION
YLD24B	QUAD D-TYPE TRANSPARENT LATCH (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
GN	D	Q	QN
L	L	L	H
L	H	H	L
H	X	HOLD	

Verilog-HDL DESCRIPTION

```
YLD24B inst(QA,QAN,QB,QBN,QC,QCN,
            QD,QDN,DA,DB,DC,DD,
            GN);
```

VHDL DESCRIPTION

```
inst:YLD24B
port map(QA,QAN,QB,QBN,QC,
         QCN,QD,QDN,DA,DB,
         DC,DD,GN);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	QA,QAN,QB,QBN,QC,QCN,QD,QDN
ELECTRO MIGRATION DRIVE	6880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
DA	3.29
DB,DC,DD	3.30
GN	0.99

OUTPUT DRIVE

(LU)

PIN NAME	QA,QB,QC,QD,QAN,QBN,QDN	QCN
DRIVE	38.0	40.8
		36.8

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

2/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DA->QAN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DA->QAN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

3/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DB->QBN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DB->QBN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

4/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DC->QCN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.1025	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.17	0.32	0.50	1.22
0.38	0.19	0.34	0.51	1.24
1.00	0.23	0.39	0.57	1.29
3.00	0.30	0.51	0.73	1.51

PATH CONDITION

PATH	CONDITION	FUNCTION
DC->QCN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.88
0.38	0.19	0.31	0.45	0.95
1.00	0.24	0.40	0.56	1.10
3.00	0.30	0.54	0.78	1.49

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

5/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
DD->QDN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.18	0.32	0.49	1.18
0.38	0.20	0.34	0.51	1.19
1.00	0.23	0.39	0.57	1.25
3.00	0.32	0.51	0.72	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
DD->QDN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.14	0.25	0.38	0.87
0.38	0.19	0.31	0.44	0.94
1.00	0.24	0.40	0.56	1.08
3.00	0.31	0.54	0.77	1.44

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

6/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QAN->QA	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QA	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QAN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.46
0.38	0.49	0.63	0.80	1.49
1.00	0.56	0.70	0.88	1.57
3.00	0.72	0.86	1.04	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QAN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QAN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.65	0.78	1.27
0.38	0.57	0.68	0.81	1.30
1.00	0.65	0.76	0.89	1.38
3.00	0.82	0.93	1.06	1.55

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

7/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QBN->QB	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QB	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QBN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.46
0.38	0.48	0.63	0.80	1.49
1.00	0.56	0.70	0.88	1.57
3.00	0.72	0.86	1.04	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QBN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QBN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.65	0.78	1.27
0.38	0.57	0.68	0.81	1.30
1.00	0.65	0.76	0.89	1.38
3.00	0.82	0.93	1.06	1.55

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

8/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QCN->QC	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QC	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QCN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.1025	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.46
0.38	0.48	0.63	0.80	1.49
1.00	0.56	0.70	0.88	1.57
3.00	0.72	0.86	1.04	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QCN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QCN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.65	0.78	1.27
0.38	0.57	0.68	0.81	1.30
1.00	0.65	0.76	0.89	1.38
3.00	0.82	0.93	1.06	1.55

Rev.1.01.10

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

9/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0995	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.22	0.37	0.55	1.26
0.38	0.25	0.40	0.58	1.30
1.00	0.31	0.47	0.65	1.36
3.00	0.46	0.65	0.86	1.62

PATH CONDITION

PATH	CONDITION	FUNCTION
QDN->QD	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QD	0.0408	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.15	0.25	0.37	0.86
0.38	0.24	0.35	0.47	0.96
1.00	0.34	0.48	0.63	1.13
3.00	0.54	0.75	0.97	1.61

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QDN	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.1014	0.23

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.60	0.77	1.46
0.38	0.48	0.63	0.80	1.49
1.00	0.56	0.70	0.88	1.57
3.00	0.72	0.86	1.04	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION
GN->QDN	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
QDN	0.0433	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.54	0.65	0.78	1.27
0.38	0.57	0.68	0.81	1.30
1.00	0.65	0.76	0.89	1.38
3.00	0.82	0.93	1.06	1.55

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TC200G SERIES

DATA SHEET

YLD24B

YLD24B

10/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DA	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.073	0.025	-0.055	-0.313
0.01	0.111	0.065	-0.012	-0.260
0.38	0.176	0.133	0.061	-0.171
1.00	0.384	0.351	0.295	0.115
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.472	0.506	0.563	0.746
0.01	0.455	0.488	0.543	0.720
0.38	0.427	0.458	0.510	0.676
1.00	0.337	0.362	0.403	0.535
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
DA	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.172	0.138	0.080	-0.103
0.01	0.189	0.156	0.101	-0.077
0.38	0.218	0.187	0.135	-0.033
1.00	0.313	0.288	0.245	0.108
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.570	0.618	0.698	0.957
0.01	0.532	0.578	0.655	0.904
0.38	0.468	0.511	0.583	0.816
1.00	0.261	0.294	0.350	0.530
3.00				

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

11/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DB	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.073	0.025	-0.055	-0.313
0.38	0.111	0.065	-0.012	-0.260
1.00	0.176	0.133	0.061	-0.171
3.00	0.384	0.351	0.295	0.115

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.472	0.506	0.563	0.746
0.38	0.455	0.488	0.543	0.720
1.00	0.427	0.458	0.510	0.676
3.00	0.337	0.362	0.403	0.535

TIMING CONDITION

DATA	CLOCK	CONDITION
DB	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.172	0.138	0.080	-0.103
0.38	0.189	0.156	0.101	-0.077
1.00	0.218	0.187	0.135	-0.033
3.00	0.313	0.288	0.245	0.108

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.570	0.618	0.698	0.957
0.38	0.532	0.578	0.655	0.904
1.00	0.468	0.511	0.583	0.816
3.00	0.261	0.294	0.350	0.530

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

12/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DC	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.073	0.025	-0.055	-0.313
0.38	0.111	0.065	-0.012	-0.260
1.00	0.176	0.133	0.061	-0.171
3.00	0.384	0.351	0.295	0.115

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.472	0.506	0.563	0.746
0.38	0.455	0.488	0.543	0.720
1.00	0.427	0.458	0.510	0.676
3.00	0.337	0.362	0.403	0.535

TIMING CONDITION

DATA	CLOCK	CONDITION
DC	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.172	0.138	0.080	-0.103
0.38	0.189	0.156	0.101	-0.077
1.00	0.218	0.187	0.135	-0.033
3.00	0.313	0.288	0.245	0.108

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns) 0.01	0.570	0.618	0.698	0.957
0.38	0.532	0.578	0.655	0.904
1.00	0.468	0.511	0.583	0.816
3.00	0.261	0.294	0.350	0.530

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

13/16

CONDITION:VDD=3.3V, Ta=25°C, Typ.

TIMING CONDITION

DATA	CLOCK	CONDITION
DD	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	HIGH	
HOLD	POSEDGE	HIGH	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.073	0.025	-0.055	-0.313
0.01	0.111	0.065	-0.012	-0.260
0.38	0.176	0.133	0.061	-0.171
1.00	0.384	0.351	0.295	0.115
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.472	0.506	0.563	0.746
0.01	0.455	0.488	0.543	0.720
0.38	0.427	0.458	0.510	0.676
1.00	0.337	0.362	0.403	0.535
3.00				

TIMING CONDITION

DATA	CLOCK	CONDITION
DD	GN	---

ITEM	CLOCK	DATA	WAVE_FORM
SETUP	POSEDGE	LOW	
HOLD	POSEDGE	LOW	

SETUP (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.172	0.138	0.080	-0.103
0.01	0.189	0.156	0.101	-0.077
0.38	0.218	0.187	0.135	-0.033
1.00	0.313	0.288	0.245	0.108
3.00				

HOLD (ns)				
CLOCK SLEW (ns)	0.01	0.38	1.00	3.00
DATA SLEW (ns)	0.570	0.618	0.698	0.957
0.01	0.532	0.578	0.655	0.904
0.38	0.468	0.511	0.583	0.816
1.00	0.261	0.294	0.350	0.530
3.00				

TC200G SERIES

DATA SHEET

YLD24B

YLD24B

14/16

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	DA

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.760
0.01 to 3.00	

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	~DA

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.720
0.01 to 3.00	

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	DB

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.760
0.01 to 3.00	

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TC200G SERIES

DATA SHEET

YLD24B

YLD24B

15/16

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	~DB

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.720
0.01 to 3.00	

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	DC

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.760
0.01 to 3.00	

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	~DC

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.720
0.01 to 3.00	

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TC200G SERIES

DATA SHEET

YLD24B

YLD24B

16/16

CONDITION: VDD=3.3V, Ta=25°C, Typ.

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	DD

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.760

MINIMUM PULSE WIDTH CONDITION

CLOCK	CONDITION
GN	~DD

ITEM	WAVE_FORM
NEGLIMIT	

NEGLIMIT (ns)	
RISE SLEW (ns)	0.01 to 3.00
FALL SLEW (ns)	0.01 to 3.00
	0.720

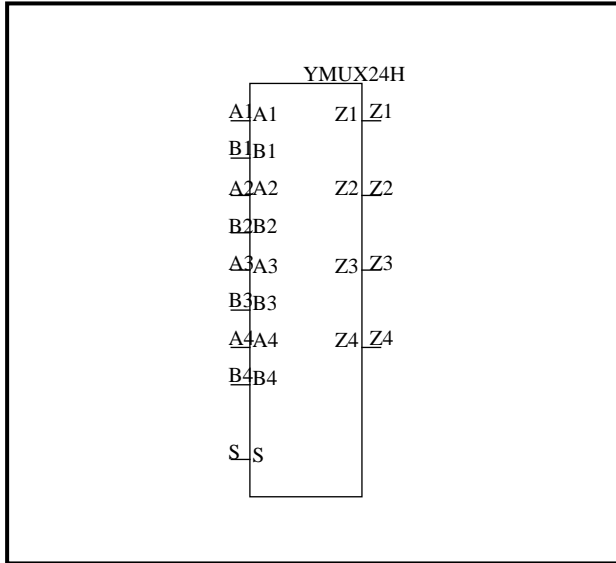
TC200G SERIES

DATA SHEET

YMUX24H		YMUX24H		1/9
---------	--	---------	--	-----

CELL NAME	FUNCTION	CELL COUNT		CONDITION
YMUX24H	QUAD 2 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		11	0	

LOGIC SYMBOL



TRUTH TABLE

S	INPUT		OUTPUT Z
	A	B	
L	L	X	L
L	H	X	H
H	X	L	L
H	X	H	H

Verilog-HDL DESCRIPTION

```
YMUX24H inst(Z1,Z2,Z3,Z4,A1,B1,
             A2,B2,A3,B3,A4,B4,S)
             ;
```

VHDL DESCRIPTION

```
inst:YMUX24H
port map(Z1,Z2,Z3,Z4,A1,B1,
         A2,B2,A3,B3,A4,B4,
         S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1,Z2,Z3,Z4
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A1,A2,A3	1.03
B1,B2,B3	1.01
A4	1.00
B4,S	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z1,Z4	Z2,Z3
DRIVE	49.8	49.7

TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

2/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0863	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.54	1.14
0.38	0.32	0.45	0.61	1.22
1.00	0.40	0.53	0.69	1.30
3.00	0.54	0.68	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.53	0.98
0.38	0.31	0.44	0.57	1.01
1.00	0.38	0.51	0.64	1.08
3.00	0.52	0.66	0.79	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.54	1.14
0.38	0.32	0.45	0.61	1.22
1.00	0.40	0.53	0.69	1.30
3.00	0.54	0.67	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.53	0.98
0.38	0.31	0.44	0.57	1.01
1.00	0.38	0.51	0.64	1.08
3.00	0.52	0.66	0.79	1.24

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TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

3/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.54	1.14
0.38	0.32	0.45	0.61	1.22
1.00	0.40	0.53	0.69	1.30
3.00	0.54	0.68	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.53	0.98
0.38	0.32	0.44	0.57	1.01
1.00	0.38	0.51	0.64	1.08
3.00	0.52	0.66	0.79	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.38	0.54	1.14
0.38	0.32	0.45	0.61	1.22
1.00	0.40	0.53	0.69	1.30
3.00	0.54	0.67	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.53	0.98
0.38	0.31	0.44	0.57	1.01
1.00	0.38	0.51	0.64	1.08
3.00	0.52	0.66	0.79	1.24

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TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

4/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0863	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.23	0.37	0.52	1.13
0.38	0.31	0.44	0.60	1.21
1.00	0.39	0.52	0.68	1.29
3.00	0.54	0.67	0.83	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.40	0.53	0.97
0.38	0.31	0.44	0.56	1.00
1.00	0.38	0.51	0.63	1.07
3.00	0.53	0.66	0.80	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.53	1.14
0.38	0.32	0.45	0.61	1.21
1.00	0.40	0.53	0.69	1.30
3.00	0.54	0.68	0.84	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.53	0.97
0.38	0.31	0.44	0.56	1.00
1.00	0.38	0.51	0.64	1.08
3.00	0.53	0.67	0.80	1.25

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TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

5/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.53	1.13
0.38	0.31	0.45	0.60	1.21
1.00	0.40	0.53	0.69	1.29
3.00	0.54	0.68	0.84	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.41	0.53	0.97
0.38	0.32	0.44	0.57	1.01
1.00	0.38	0.51	0.64	1.08
3.00	0.53	0.67	0.80	1.25

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.37	0.53	1.13
0.38	0.31	0.45	0.60	1.21
1.00	0.39	0.53	0.68	1.29
3.00	0.54	0.68	0.83	1.45

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.28	0.40	0.53	0.96
0.38	0.31	0.44	0.56	1.00
1.00	0.38	0.51	0.63	1.07
3.00	0.53	0.66	0.79	1.24

TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

6/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0863	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.82	1.43
0.38	0.55	0.69	0.84	1.45
1.00	0.63	0.77	0.92	1.53
3.00	0.83	0.97	1.13	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.53	0.65	1.08
0.38	0.50	0.62	0.74	1.17
1.00	0.61	0.72	0.84	1.28
3.00	0.81	0.92	1.04	1.47

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0863	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.68	0.84	1.45
0.38	0.64	0.77	0.93	1.53
1.00	0.73	0.87	1.02	1.63
3.00	0.90	1.03	1.19	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.70	0.82	1.26
0.38	0.60	0.73	0.85	1.29
1.00	0.68	0.80	0.93	1.37
3.00	0.86	0.99	1.11	1.55

TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

7/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.66	0.82	1.43
0.38	0.56	0.69	0.85	1.46
1.00	0.64	0.77	0.93	1.54
3.00	0.84	0.98	1.13	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.43	0.54	0.66	1.10
0.38	0.51	0.63	0.75	1.18
1.00	0.62	0.74	0.86	1.29
3.00	0.82	0.93	1.05	1.49

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.69	0.84	1.45
0.38	0.64	0.77	0.93	1.54
1.00	0.73	0.87	1.03	1.63
3.00	0.90	1.04	1.19	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.69	0.82	1.26
0.38	0.59	0.72	0.85	1.29
1.00	0.67	0.80	0.92	1.36
3.00	0.86	0.98	1.11	1.55

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TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

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CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.66	0.81	1.43
0.38	0.55	0.68	0.84	1.45
1.00	0.63	0.76	0.92	1.53
3.00	0.83	0.97	1.12	1.74

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.53	0.65	1.09
0.38	0.51	0.62	0.74	1.17
1.00	0.61	0.73	0.85	1.28
3.00	0.81	0.93	1.05	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.69	0.84	1.45
0.38	0.64	0.77	0.93	1.54
1.00	0.73	0.87	1.03	1.63
3.00	0.90	1.04	1.19	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0352	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.69	0.82	1.26
0.38	0.60	0.72	0.85	1.29
1.00	0.68	0.80	0.93	1.37
3.00	0.86	0.99	1.11	1.55

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TC200G SERIES

DATA SHEET

YMUX24H

YMUX24H

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CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.53	0.67	0.82	1.44
0.38	0.56	0.69	0.85	1.46
1.00	0.64	0.77	0.93	1.54
3.00	0.84	0.98	1.14	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.42	0.54	0.66	1.09
0.38	0.51	0.63	0.74	1.18
1.00	0.62	0.73	0.85	1.28
3.00	0.82	0.93	1.05	1.48

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0862	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.68	0.84	1.45
0.38	0.64	0.77	0.93	1.53
1.00	0.73	0.87	1.02	1.63
3.00	0.90	1.03	1.19	1.80

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0351	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.69	0.82	1.26
0.38	0.60	0.72	0.85	1.29
1.00	0.67	0.80	0.93	1.37
3.00	0.86	0.98	1.11	1.55

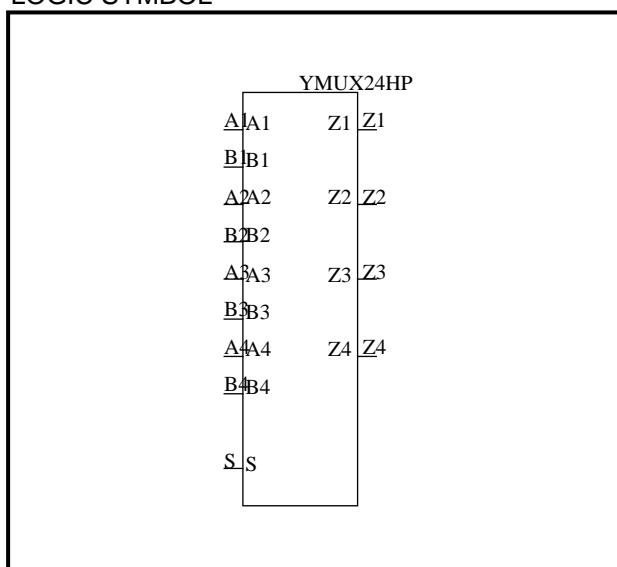
Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24HP		YMUX24HP		1/9
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YMUX24HP	QUAD 2 TO 1 MULTIPLEXER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		13	0	

LOGIC SYMBOL



TRUTH TABLE

S	INPUT		OUTPUT Z
	A	B	
L	L	X	L
L	H	X	H
H	X	L	L
H	X	H	H

Verilog-HDL DESCRIPTION

```
YMUX24HP inst(Z1,Z2,Z3,Z4,A1,B1,
              A2,B2,A3,B3,A4,B4,
              S);
```

VHDL DESCRIPTION

```
inst:YMUX24HP
port map(Z1,Z2,Z3,Z4,A1,B1,
         A2,B2,A3,B3,A4,B4,
         S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1,Z2,Z3,Z4
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A1,A2,A3	1.03
B1,B2,B3	1.01
A4	1.00
B4,S	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z1,Z2,Z3,Z4
DRIVE	94.7

TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

2/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.73
0.38	0.33	0.40	0.49	0.80
1.00	0.41	0.49	0.57	0.89
3.00	0.57	0.65	0.74	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.73
0.38	0.32	0.41	0.49	0.76
1.00	0.39	0.48	0.56	0.83
3.00	0.55	0.63	0.72	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.73
0.38	0.33	0.40	0.49	0.81
1.00	0.41	0.49	0.57	0.89
3.00	0.57	0.65	0.74	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.73
0.38	0.32	0.41	0.49	0.76
1.00	0.39	0.48	0.56	0.83
3.00	0.55	0.63	0.72	1.00

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TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

3/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.73
0.38	0.33	0.40	0.49	0.80
1.00	0.41	0.49	0.57	0.89
3.00	0.57	0.65	0.74	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.73
0.38	0.32	0.41	0.49	0.76
1.00	0.39	0.48	0.56	0.83
3.00	0.55	0.63	0.72	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.25	0.33	0.41	0.73
0.38	0.33	0.40	0.49	0.81
1.00	0.41	0.49	0.57	0.89
3.00	0.57	0.65	0.74	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.46	0.73
0.38	0.32	0.41	0.49	0.76
1.00	0.39	0.48	0.56	0.83
3.00	0.55	0.63	0.72	1.00

TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

4/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.31	0.40	0.71
0.38	0.31	0.39	0.47	0.79
1.00	0.40	0.48	0.56	0.88
3.00	0.57	0.65	0.73	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.45	0.72
0.38	0.32	0.40	0.48	0.75
1.00	0.39	0.47	0.56	0.82
3.00	0.55	0.64	0.73	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.31	0.40	0.71
0.38	0.32	0.39	0.48	0.79
1.00	0.41	0.48	0.57	0.88
3.00	0.57	0.65	0.74	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.45	0.72
0.38	0.32	0.40	0.48	0.75
1.00	0.39	0.47	0.55	0.82
3.00	0.55	0.64	0.72	1.00

TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

5/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.31	0.40	0.71
0.38	0.31	0.39	0.47	0.79
1.00	0.40	0.48	0.56	0.88
3.00	0.57	0.65	0.73	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.45	0.72
0.38	0.32	0.40	0.48	0.75
1.00	0.39	0.47	0.56	0.82
3.00	0.55	0.64	0.73	1.00

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.24	0.31	0.40	0.71
0.38	0.32	0.39	0.48	0.79
1.00	0.41	0.48	0.57	0.88
3.00	0.57	0.65	0.74	1.05

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.29	0.37	0.45	0.71
0.38	0.32	0.40	0.48	0.75
1.00	0.39	0.47	0.55	0.82
3.00	0.55	0.64	0.72	1.00

TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

6/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.71	1.03
0.38	0.58	0.65	0.74	1.06
1.00	0.66	0.73	0.82	1.14
3.00	0.86	0.94	1.02	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.61	0.87
0.38	0.54	0.62	0.70	0.96
1.00	0.65	0.73	0.81	1.07
3.00	0.85	0.93	1.01	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	1.04
0.38	0.65	0.73	0.81	1.12
1.00	0.75	0.82	0.91	1.22
3.00	0.92	1.00	1.08	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.66	0.74	1.01
0.38	0.60	0.69	0.77	1.04
1.00	0.68	0.77	0.85	1.12
3.00	0.87	0.95	1.04	1.31

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

7/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.63	0.72	1.04
0.38	0.59	0.66	0.75	1.07
1.00	0.67	0.74	0.83	1.15
3.00	0.87	0.95	1.03	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.55	0.62	0.88
0.38	0.55	0.63	0.71	0.97
1.00	0.66	0.74	0.82	1.08
3.00	0.86	0.94	1.01	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	1.04
0.38	0.65	0.73	0.81	1.12
1.00	0.75	0.83	0.91	1.22
3.00	0.92	1.00	1.08	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.65	0.74	1.01
0.38	0.60	0.68	0.77	1.04
1.00	0.68	0.76	0.85	1.12
3.00	0.87	0.95	1.03	1.30

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

8/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.55	0.63	0.71	1.03
0.38	0.58	0.65	0.74	1.06
1.00	0.66	0.73	0.82	1.14
3.00	0.86	0.94	1.02	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.54	0.61	0.87
0.38	0.54	0.62	0.70	0.96
1.00	0.65	0.73	0.81	1.07
3.00	0.85	0.93	1.01	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0434	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	1.04
0.38	0.65	0.73	0.81	1.12
1.00	0.75	0.82	0.91	1.22
3.00	0.92	1.00	1.08	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.66	0.74	1.01
0.38	0.60	0.69	0.77	1.04
1.00	0.68	0.77	0.85	1.12
3.00	0.87	0.95	1.04	1.31

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TC200G SERIES

DATA SHEET

YMUX24HP

YMUX24HP

9/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.56	0.63	0.72	1.04
0.38	0.59	0.66	0.75	1.07
1.00	0.67	0.74	0.83	1.15
3.00	0.87	0.95	1.03	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0204	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.54	0.62	0.88
0.38	0.55	0.63	0.71	0.97
1.00	0.66	0.74	0.82	1.08
3.00	0.86	0.94	1.01	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0434	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.64	0.72	1.04
0.38	0.65	0.73	0.81	1.12
1.00	0.75	0.83	0.91	1.22
3.00	0.92	1.00	1.08	1.39

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0204	0.13

PATH DELAY (ns)

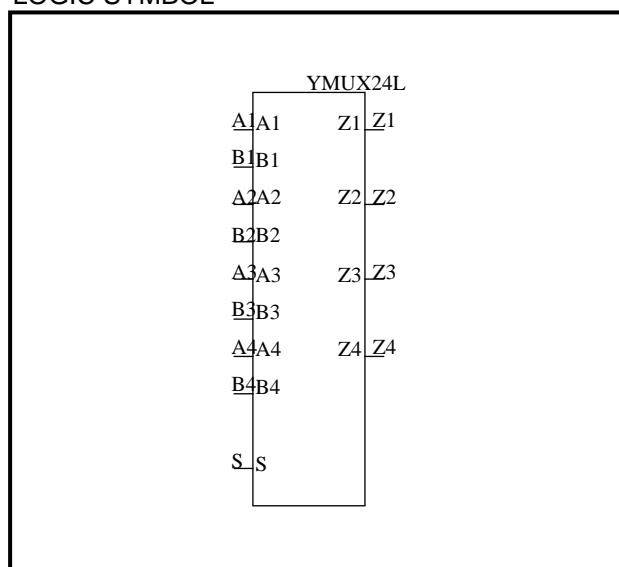
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.57	0.65	0.74	1.01
0.38	0.60	0.68	0.77	1.04
1.00	0.68	0.76	0.85	1.12
3.00	0.87	0.95	1.03	1.30

TC200G SERIES

DATA SHEET

YMUX24L		YMUX24L		1/9
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YMUX24L	QUAD 2 TO 1 MULTIPLEXER (INVERTED OUTPUT)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		7	0	

LOGIC SYMBOL



TRUTH TABLE

S	INPUT		OUTPUT Z
	A	B	
L	L	X	H
L	H	X	L
H	X	L	H
H	X	H	L

Verilog-HDL DESCRIPTION

```
YMUX24L inst(Z1,Z2,Z3,Z4,A1,B1,
             A2,B2,A3,B3,A4,B4,S)
             ;
```

VHDL DESCRIPTION

```
inst:YMUX24L
port map(Z1,Z2,Z3,Z4,A1,B1,
         A2,B2,A3,B3,A4,B4,
         S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1,Z2,Z3,Z4
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A1,A2,B4	3.34
B1,B2,A3	3.35
B3	3.36
A4	3.33
S	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z1,Z3	Z2,Z4
DRIVE	44.2	45.2

TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

2/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.02
0.38	0.14	0.27	0.43	1.04
1.00	0.18	0.32	0.49	1.10
3.00	0.25	0.44	0.64	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.74
0.38	0.15	0.26	0.38	0.81
1.00	0.18	0.34	0.49	0.95
3.00	0.23	0.47	0.68	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.25	0.41	1.01
0.38	0.14	0.27	0.42	1.03
1.00	0.18	0.32	0.48	1.08
3.00	0.25	0.44	0.64	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.72
0.38	0.15	0.26	0.38	0.80
1.00	0.18	0.34	0.49	0.94
3.00	0.23	0.47	0.68	1.30

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

3/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.02
0.38	0.14	0.27	0.43	1.04
1.00	0.18	0.32	0.49	1.10
3.00	0.25	0.44	0.64	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.74
0.38	0.15	0.26	0.38	0.81
1.00	0.18	0.34	0.49	0.95
3.00	0.23	0.47	0.68	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.25	0.40	1.01
0.38	0.14	0.27	0.42	1.03
1.00	0.18	0.32	0.48	1.08
3.00	0.25	0.44	0.64	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.72
0.38	0.15	0.26	0.38	0.80
1.00	0.18	0.34	0.49	0.94
3.00	0.23	0.47	0.68	1.29

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

4/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.03
0.38	0.15	0.28	0.43	1.04
1.00	0.18	0.33	0.49	1.10
3.00	0.25	0.44	0.64	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.74
0.38	0.15	0.26	0.38	0.81
1.00	0.18	0.34	0.49	0.95
3.00	0.23	0.47	0.68	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.01
0.38	0.15	0.27	0.43	1.03
1.00	0.18	0.32	0.48	1.09
3.00	0.25	0.44	0.64	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.72
0.38	0.15	0.26	0.38	0.80
1.00	0.19	0.34	0.49	0.94
3.00	0.23	0.47	0.68	1.30

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

5/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.03
0.38	0.15	0.28	0.43	1.04
1.00	0.18	0.33	0.49	1.10
3.00	0.25	0.44	0.64	1.30

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.74
0.38	0.15	0.27	0.38	0.81
1.00	0.19	0.34	0.49	0.95
3.00	0.23	0.47	0.68	1.31

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.13	0.26	0.41	1.01
0.38	0.15	0.27	0.42	1.03
1.00	0.18	0.32	0.48	1.09
3.00	0.25	0.44	0.64	1.29

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.20	0.31	0.72
0.38	0.15	0.26	0.38	0.80
1.00	0.19	0.34	0.49	0.94
3.00	0.23	0.47	0.68	1.30

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

6/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.64	0.80	1.41
0.38	0.60	0.73	0.89	1.50
1.00	0.70	0.83	0.98	1.60
3.00	0.86	0.99	1.15	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.62	0.73	1.15
0.38	0.54	0.65	0.76	1.18
1.00	0.62	0.73	0.84	1.26
3.00	0.80	0.90	1.01	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.58	0.74	1.36
0.38	0.48	0.61	0.77	1.38
1.00	0.56	0.69	0.85	1.47
3.00	0.76	0.89	1.05	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.44	0.55	0.97
0.38	0.43	0.53	0.64	1.06
1.00	0.54	0.64	0.75	1.17
3.00	0.74	0.84	0.95	1.38

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TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

7/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.64	0.79	1.40
0.38	0.60	0.73	0.88	1.48
1.00	0.69	0.82	0.98	1.58
3.00	0.86	0.99	1.14	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.61	0.72	1.14
0.38	0.54	0.64	0.75	1.17
1.00	0.62	0.72	0.83	1.25
3.00	0.80	0.90	1.01	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.59	0.74	1.35
0.38	0.49	0.62	0.77	1.38
1.00	0.57	0.70	0.85	1.46
3.00	0.77	0.90	1.05	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.55	0.97
0.38	0.43	0.53	0.64	1.05
1.00	0.55	0.64	0.75	1.17
3.00	0.75	0.84	0.95	1.37

TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

8/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.64	0.80	1.41
0.38	0.60	0.73	0.89	1.50
1.00	0.70	0.83	0.98	1.60
3.00	0.86	0.99	1.15	1.76

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.62	0.73	1.16
0.38	0.55	0.65	0.76	1.19
1.00	0.62	0.73	0.84	1.26
3.00	0.80	0.90	1.01	1.44

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0887	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.45	0.58	0.74	1.36
0.38	0.48	0.61	0.77	1.38
1.00	0.56	0.70	0.85	1.47
3.00	0.76	0.90	1.05	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0363	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.34	0.44	0.55	0.97
0.38	0.43	0.53	0.64	1.06
1.00	0.54	0.64	0.75	1.17
3.00	0.74	0.84	0.95	1.38

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TC200G SERIES

DATA SHEET

YMUX24L

YMUX24L

9/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.64	0.79	1.40
0.38	0.60	0.73	0.88	1.48
1.00	0.69	0.82	0.97	1.58
3.00	0.86	0.99	1.14	1.75

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0353	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.61	0.72	1.14
0.38	0.54	0.64	0.75	1.17
1.00	0.62	0.72	0.83	1.25
3.00	0.80	0.90	1.01	1.42

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0865	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.59	0.74	1.35
0.38	0.49	0.62	0.77	1.38
1.00	0.57	0.70	0.85	1.46
3.00	0.77	0.90	1.05	1.66

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0353	0.07

PATH DELAY (ns)

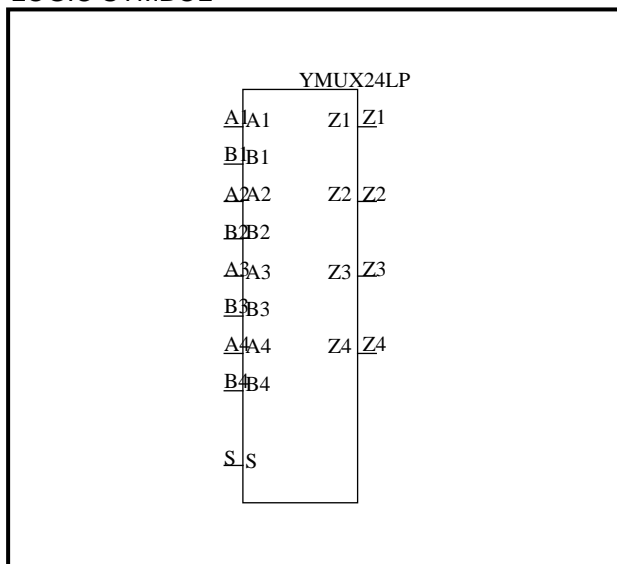
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.35	0.44	0.55	0.97
0.38	0.43	0.53	0.64	1.05
1.00	0.54	0.64	0.75	1.16
3.00	0.75	0.84	0.95	1.37

TC200G SERIES

DATA SHEET

YMUX24LP		YMUX24LP		1/9
CELL NAME	FUNCTION	CELL COUNT		CONDITION
YMUX24LP	QUAD 2 TO 1 MULTIPLEXER (INVERTED OUTPUT)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		9	0	

LOGIC SYMBOL



TRUTH TABLE

S	INPUT		OUTPUT Z
	A	B	
L	L	X	H
L	H	X	L
H	X	L	H
H	X	H	L

Verilog-HDL DESCRIPTION

```
YMUX24LP inst(Z1,Z2,Z3,Z4,A1,B1,
              A2,B2,A3,B3,A4,B4,
              S);
```

VHDL DESCRIPTION

```
inst:YMUX24LP
port map(Z1,Z2,Z3,Z4,A1,B1,
         A2,B2,A3,B3,A4,B4,
         S);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z1,Z2,Z3,Z4
ELECTRO MIGRATION DRIVE	12880.0

INPUT LOAD

(LU)

PIN NAME	LOAD
A1,A2,A3,A4	4.30
B1,B2,B3,B4	4.31
S	0.99

OUTPUT DRIVE

(LU)

PIN NAME	Z1,Z2,Z3,Z4
DRIVE	84.1

TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

2/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.26	0.57
0.38	0.13	0.20	0.28	0.58
1.00	0.15	0.24	0.32	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.46
0.38	0.13	0.21	0.28	0.52
1.00	0.15	0.25	0.35	0.63
3.00	0.17	0.32	0.47	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.26	0.57
0.38	0.13	0.20	0.28	0.58
1.00	0.15	0.24	0.32	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.45
0.38	0.13	0.21	0.28	0.52
1.00	0.15	0.25	0.35	0.63
3.00	0.17	0.32	0.47	0.87

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TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

3/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.26	0.57
0.38	0.13	0.20	0.28	0.58
1.00	0.15	0.24	0.32	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.46
0.38	0.13	0.21	0.28	0.52
1.00	0.15	0.25	0.35	0.63
3.00	0.17	0.32	0.47	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.18	0.26	0.57
0.38	0.13	0.20	0.28	0.58
1.00	0.15	0.24	0.32	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
A4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.45
0.38	0.13	0.21	0.28	0.52
1.00	0.15	0.25	0.35	0.63
3.00	0.17	0.32	0.47	0.87

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

4/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.19	0.27	0.57
0.38	0.13	0.20	0.28	0.59
1.00	0.16	0.24	0.33	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
B1->Z1	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.45
0.38	0.13	0.21	0.28	0.52
1.00	0.16	0.26	0.35	0.64
3.00	0.18	0.33	0.47	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.19	0.27	0.57
0.38	0.13	0.20	0.28	0.59
1.00	0.16	0.24	0.33	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
B2->Z2	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.45
0.38	0.13	0.21	0.28	0.52
1.00	0.16	0.26	0.35	0.64
3.00	0.18	0.33	0.47	0.87

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

5/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.19	0.27	0.57
0.38	0.13	0.20	0.28	0.59
1.00	0.16	0.24	0.33	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
B3->Z3	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.45
0.38	0.13	0.21	0.28	0.52
1.00	0.16	0.26	0.35	0.64
3.00	0.18	0.33	0.47	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.12	0.19	0.27	0.57
0.38	0.13	0.20	0.28	0.59
1.00	0.16	0.24	0.33	0.64
3.00	0.21	0.32	0.43	0.80

PATH CONDITION

PATH	CONDITION	FUNCTION
B4->Z4	---	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.16	0.22	0.45
0.38	0.13	0.21	0.28	0.52
1.00	0.16	0.26	0.35	0.64
3.00	0.18	0.33	0.47	0.87

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

6/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.59	0.66	0.97
0.38	0.60	0.67	0.75	1.06
1.00	0.70	0.77	0.85	1.16
3.00	0.87	0.94	1.02	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	A1&~B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.65	0.88
0.38	0.54	0.61	0.68	0.91
1.00	0.62	0.69	0.76	0.99
3.00	0.80	0.87	0.94	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.53	0.61	0.92
0.38	0.49	0.56	0.64	0.94
1.00	0.57	0.64	0.72	1.02
3.00	0.78	0.84	0.92	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z1	~A1&B1	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z1	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.42	0.48	0.72
0.38	0.44	0.51	0.57	0.80
1.00	0.56	0.62	0.68	0.92
3.00	0.76	0.82	0.89	1.12

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

7/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.58	0.66	0.97
0.38	0.60	0.67	0.75	1.06
1.00	0.70	0.77	0.85	1.15
3.00	0.87	0.94	1.02	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	A2&~B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.64	0.88
0.38	0.54	0.61	0.67	0.91
1.00	0.62	0.69	0.75	0.99
3.00	0.80	0.87	0.93	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.53	0.61	0.92
0.38	0.49	0.56	0.64	0.95
1.00	0.58	0.64	0.72	1.03
3.00	0.78	0.85	0.93	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z2	~A2&B2	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z2	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.42	0.49	0.72
0.38	0.45	0.51	0.58	0.81
1.00	0.56	0.62	0.69	0.92
3.00	0.77	0.83	0.90	1.13

Rev.1.01.10

TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

8/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.59	0.66	0.97
0.38	0.60	0.67	0.75	1.06
1.00	0.70	0.77	0.85	1.16
3.00	0.87	0.94	1.02	1.33

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	A3&~B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.65	0.88
0.38	0.54	0.61	0.68	0.91
1.00	0.62	0.69	0.76	0.99
3.00	0.80	0.87	0.94	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.46	0.53	0.61	0.92
0.38	0.49	0.56	0.64	0.94
1.00	0.57	0.64	0.72	1.02
3.00	0.78	0.84	0.92	1.23

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z3	~A3&B3	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z3	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.42	0.48	0.72
0.38	0.44	0.51	0.57	0.80
1.00	0.56	0.62	0.68	0.92
3.00	0.76	0.82	0.89	1.12

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TC200G SERIES

DATA SHEET

YMUX24LP

YMUX24LP

9/9

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.52	0.58	0.66	0.97
0.38	0.60	0.67	0.75	1.06
1.00	0.70	0.77	0.85	1.15
3.00	0.87	0.94	1.02	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	A4&~B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.51	0.58	0.64	0.88
0.38	0.54	0.61	0.67	0.91
1.00	0.62	0.69	0.75	0.99
3.00	0.80	0.87	0.93	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	RISE

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0437	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.47	0.53	0.61	0.92
0.38	0.49	0.56	0.64	0.95
1.00	0.58	0.64	0.72	1.03
3.00	0.78	0.85	0.93	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION
S->Z4	~A4&B4	FALL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z4	0.0188	0.08

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.36	0.42	0.49	0.72
0.38	0.45	0.51	0.58	0.81
1.00	0.56	0.62	0.69	0.92
3.00	0.77	0.83	0.90	1.13

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Chapter 3

I/O Macrocells

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I/O Macrocell Data Sheets

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TC200G SERIES

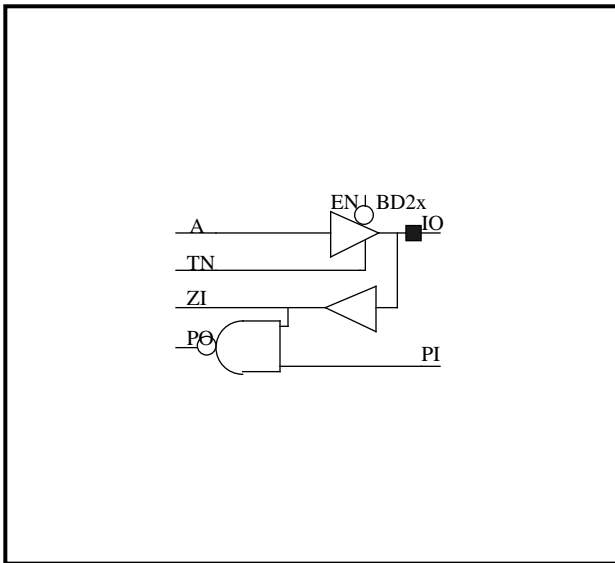
DATA SHEET

BD2x		BD2x		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD2x	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 2mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD2C	BD2CD	BD2CU
	INVERT	BD2CN	BD2CND	BD2CNU
LVTTTL LEVEL		BD2TH	BD2THD	BD2THU
	INVERT	BD2TN	BD2TND	BD2TNU
HIGH-SPEED CMOS LEVEL	INVERT	BD2CNH	BD2CNHD	BD2CNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD2TNH	BD2TNHD	BD2TNHU
CMOS SCHMITT TRIGGER		BD2SC	BD2SCD	BD2SCU
LVTTTL SCHMITT TRIGGER		BD2ST	BD2STD	BD2STU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD2x inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD2x
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	6.31
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD2x

BD2x

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD2x

BD2x

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0002	0.96

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.63	2.09	2.98	4.71
0.38	1.71	2.18	3.06	4.79
1.00	1.87	2.34	3.23	4.96
3.00	2.38	2.85	3.75	5.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0003	0.96

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.84	2.53	3.89	6.58
0.38	1.84	2.53	3.88	6.58
1.00	1.88	2.57	3.92	6.62
3.00	2.05	2.74	4.10	6.79

TC200G SERIES

DATA SHEET

BD2x

BD2x

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.83	0.83	0.83	0.83
0.38	0.92	0.92	0.92	0.92
1.00	1.02	1.02	1.02	1.02
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.40	0.40	0.40	0.40
0.38	0.49	0.49	0.49	0.49
1.00	0.59	0.59	0.59	0.59
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.14	2.62	3.51	5.24
0.38	2.15	2.63	3.52	5.25
1.00	2.23	2.70	3.60	5.33
3.00	2.50	2.97	3.87	5.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.43	3.11	4.47	7.16
0.38	2.44	3.13	4.48	7.17
1.00	2.51	3.20	4.56	7.25
3.00	2.78	3.47	4.82	7.52

TC200G SERIES

DATA SHEET

BD2x

BD2x

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.97	0.97	0.97	0.97
0.38	1.00	1.00	1.00	1.00
1.00	1.05	1.05	1.05	1.05
3.00	1.18	1.18	1.18	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.53	0.53	0.53	0.53
0.38	0.56	0.56	0.56	0.56
1.00	0.62	0.62	0.62	0.62
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.21	2.69	3.58	5.31
0.38	2.26	2.74	3.63	5.37
1.00	2.30	2.78	3.67	5.41
3.00	2.37	2.85	3.74	5.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.50	3.18	4.54	7.23
0.38	2.55	3.24	4.59	7.29
1.00	2.59	3.28	4.63	7.33
3.00	2.66	3.35	4.70	7.39

TC200G SERIES

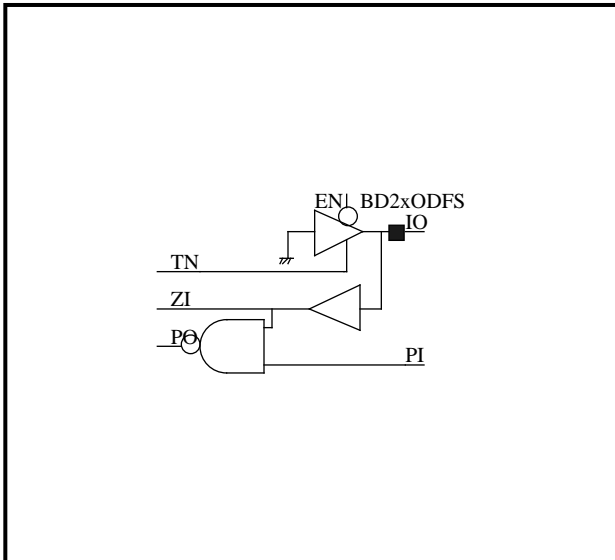
DATA SHEET

BD2xODFS		BD2xODFS		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD2xODFS	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 2mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

CMOS LEVEL		BD2CODFS
	INVERT	BD2CNODFS
LVTTTL LEVEL		BD2THODFS
	INVERT	BD2TNODFS
HIGH-SPEED CMOS LEVEL	INVERT	BD2CNHODFS
HIGH-SPEED LVTTTL LEVEL	INVERT	BD2TNHODFS
	CMOS SCHMITT TRIGGER	BD2SCODFS
	LVTTTL SCHMITT TRIGGER	BD2STODFS

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT		OUTPUT
EN	TN	IO
L	H	L
H	X	Hz
X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD2xODFS inst(IO,ZI,PO,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD2xODFS
port map(IO,ZI,PO,EN,TN,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	ZI	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	ZI	PO
DRIVE	312.6	34.3

TC200G SERIES

DATA SHEET

BD2xODFS

BD2xODFS

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD2xODFS

BD2xODFS

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.34	0.34	0.34	0.34
0.38	0.43	0.43	0.43	0.43
1.00	0.52	0.52	0.52	0.52
3.00	0.64	0.64	0.64	0.64

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0098	0.63

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.11	2.81	4.17	6.86
0.38	2.13	2.82	4.18	6.87
1.00	2.21	2.90	4.26	6.95
3.00	2.46	3.16	4.51	7.21

TC200G SERIES

DATA SHEET

BD2xODFS

BD2xODFS

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.47	0.47	0.47	0.47
0.38	0.50	0.50	0.50	0.50
1.00	0.56	0.56	0.56	0.56
3.00	0.68	0.68	0.68	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0098	0.63

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.18	2.88	4.24	6.93
0.38	2.24	2.93	4.29	6.98
1.00	2.28	2.97	4.33	7.02
3.00	2.35	3.04	4.40	7.09

TC200G SERIES

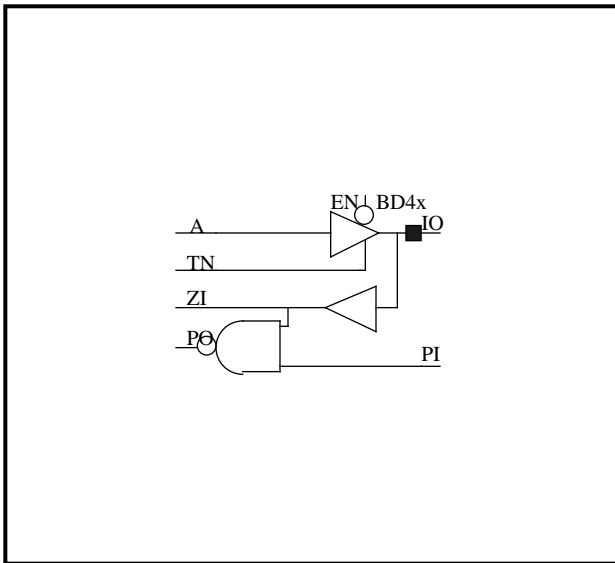
DATA SHEET

BD4x		BD4x		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD4x	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 4mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD4C	BD4CD	BD4CU
	INVERT	BD4CN	BD4CND	BD4CNU
LVTTTL LEVEL		BD4TH	BD4THD	BD4THU
	INVERT	BD4TN	BD4TND	BD4TNU
HIGH-SPEED CMOS LEVEL	INVERT	BD4CNH	BD4CNHD	BD4CNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD4TNH	BD4TNHD	BD4TNHU
CMOS SCHMITT TRIGGER		BD4SC	BD4SCD	BD4SCU
LVTTTL SCHMITT TRIGGER		BD4ST	BD4STD	BD4STU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD4x inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD4x
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	6.31
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD4x

BD4x

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD4x

BD4x

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0001	0.83

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.85	3.00	4.61	6.70
0.38	1.93	3.08	4.69	6.78
1.00	2.09	3.24	4.85	6.95
3.00	2.63	3.78	5.39	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.65

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.79	3.21	5.30	8.06
0.38	1.78	3.21	5.29	8.06
1.00	1.82	3.25	5.33	8.09
3.00	1.99	3.42	5.50	8.27

TC200G SERIES

DATA SHEET

BD4x

BD4x

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.07	1.07	1.07	1.07
0.38	1.16	1.16	1.16	1.16
1.00	1.26	1.26	1.26	1.26
3.00	1.40	1.40	1.40	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.41	0.41	0.41	0.41
0.38	0.50	0.50	0.50	0.50
1.00	0.60	0.60	0.60	0.60
3.00	0.75	0.75	0.75	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.38	3.54	5.15	7.25
0.38	2.39	3.55	5.16	7.26
1.00	2.47	3.63	5.24	7.34
3.00	2.74	3.90	5.51	7.61

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.37	3.80	5.88	8.65
0.38	2.38	3.81	5.90	8.66
1.00	2.46	3.89	5.97	8.74
3.00	2.72	4.15	6.24	9.00

TC200G SERIES

DATA SHEET

BD4x

BD4x

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.20	1.20	1.20	1.20
0.38	1.23	1.23	1.23	1.23
1.00	1.29	1.29	1.29	1.29
3.00	1.41	1.41	1.41	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.54	0.54	0.54	0.54
0.38	0.58	0.58	0.58	0.58
1.00	0.63	0.63	0.63	0.63
3.00	0.76	0.76	0.76	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.45	3.61	5.22	7.32
0.38	2.51	3.67	5.28	7.38
1.00	2.55	3.71	5.32	7.42
3.00	2.62	3.78	5.38	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.44	3.87	5.96	8.72
0.38	2.49	3.92	6.01	8.77
1.00	2.53	3.96	6.05	8.81
3.00	2.60	4.03	6.12	8.88

TC200G SERIES

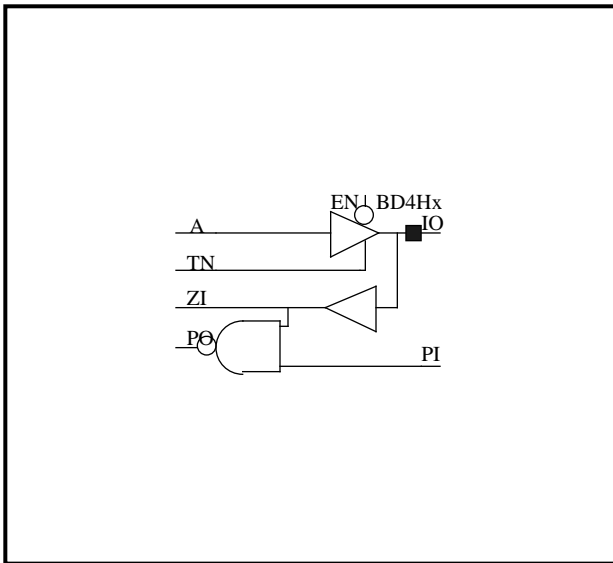
DATA SHEET

BD4Hx		BD4Hx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD4Hx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 4mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD4HC	BD4HCD	BD4HCU
	INVERT	BD4HCN	BD4HCND	BD4HCNU
LVTTL LEVEL		BD4HTH	BD4HTHD	BD4HTHU
	INVERT	BD4HTN	BD4HTND	BD4HTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD4HCNH	BD4HCNHD	BD4HCNHU
HIGH-SPEED LVTTL LEVEL	INVERT	BD4HTNH	BD4HTNHD	BD4HTNHU
CMOS SCHMITT TRIGGER		BD4HSC	BD4HSCD	BD4HSCU
LVTTL SCHMITT TRIGGER		BD4HST	BD4HSTD	BD4HSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD4Hx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD4Hx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	9.03
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD4Hx

BD4Hx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD4Hx

BD4Hx

3/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0047	0.50

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.10	2.15	3.71	5.79
0.38	1.19	2.24	3.80	5.88
1.00	1.32	2.37	3.93	6.01
3.00	1.62	2.67	4.23	6.31

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.50

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.43	2.82	4.89	7.65
0.38	1.44	2.83	4.90	7.65
1.00	1.45	2.84	4.91	7.66
3.00	1.52	2.89	4.95	7.71

TC200G SERIES

DATA SHEET

BD4Hx

BD4Hx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.97	0.97	0.97	0.97
0.38	1.06	1.06	1.06	1.06
1.00	1.17	1.17	1.17	1.17
3.00	1.34	1.34	1.34	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.52	0.52	0.52	0.52
0.38	0.61	0.61	0.61	0.61
1.00	0.71	0.71	0.71	0.71
3.00	0.87	0.87	0.87	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.67	2.73	4.29	6.37
0.38	1.68	2.74	4.30	6.38
1.00	1.76	2.81	4.38	6.46
3.00	2.03	3.09	4.65	6.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.07	3.46	5.53	8.29
0.38	2.08	3.47	5.54	8.30
1.00	2.15	3.55	5.62	8.38
3.00	2.42	3.81	5.89	8.65

TC200G SERIES

DATA SHEET

BD4Hx

BD4Hx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.10	1.10	1.10	1.10
0.38	1.14	1.14	1.14	1.14
1.00	1.19	1.19	1.19	1.19
3.00	1.32	1.32	1.32	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.65	0.65	0.65	0.65
0.38	0.68	0.68	0.68	0.68
1.00	0.74	0.74	0.74	0.74
3.00	0.86	0.86	0.86	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.74	2.80	4.36	6.44
0.38	1.80	2.85	4.41	6.49
1.00	1.83	2.89	4.45	6.53
3.00	1.90	2.96	4.52	6.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.14	3.53	5.60	8.36
0.38	2.19	3.58	5.66	8.41
1.00	2.23	3.62	5.69	8.45
3.00	2.30	3.69	5.76	8.52

TC200G SERIES

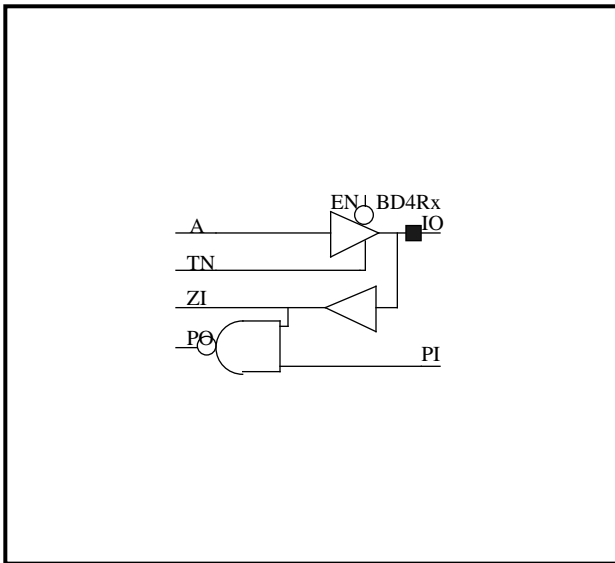
DATA SHEET

BD4Rx		BD4Rx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD4Rx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 4mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD4RC	BD4RCD	BD4RCU
	INVERT	BD4RCN	BD4RCND	BD4RCNU
LVTTTL LEVEL		BD4RTH	BD4RTHD	BD4RTHU
	INVERT	BD4RTN	BD4RTND	BD4RTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD4RCNH	BD4RCNHD	BD4RCNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD4RTNH	BD4RTNHD	BD4RTNHU
CMOS SCHMITT TRIGGER		BD4RSC	BD4RSCD	BD4RSCU
LVTTTL SCHMITT TRIGGER		BD4RST	BD4RSTD	BD4RSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT			OUTPUT
EN	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD4Rx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD4Rx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	7.58
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD4Rx

BD4Rx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD4Rx

BD4Rx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.52	4.10	6.26	8.90
0.38	2.61	4.20	6.36	9.00
1.00	2.79	4.37	6.53	9.18
3.00	3.39	4.98	7.14	9.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.43	5.68	8.75	12.52
0.38	3.48	5.73	8.80	12.57
1.00	3.62	5.87	8.94	12.71
3.00	4.08	6.33	9.40	13.17

TC200G SERIES

DATA SHEET

BD4Rx

BD4Rx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.82	0.82	0.82	0.82
0.38	0.91	0.91	0.91	0.91
1.00	1.01	1.01	1.01	1.01
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.51	0.51	0.51	0.51
0.38	0.60	0.60	0.60	0.60
1.00	0.69	0.69	0.69	0.69
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.18	4.78	6.95	9.60
0.38	3.19	4.79	6.96	9.61
1.00	3.27	4.87	7.04	9.68
3.00	3.55	5.15	7.32	9.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.26	6.51	9.58	13.35
0.38	4.27	6.53	9.59	13.37
1.00	4.35	6.60	9.67	13.44
3.00	4.61	6.86	9.93	13.70

TC200G SERIES

DATA SHEET

BD4Rx

BD4Rx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.95	0.95	0.95	0.95
0.38	0.99	0.99	0.99	0.99
1.00	1.04	1.04	1.04	1.04
3.00	1.18	1.18	1.18	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.64	0.64	0.64	0.64
0.38	0.67	0.67	0.67	0.67
1.00	0.73	0.73	0.73	0.73
3.00	0.85	0.85	0.85	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.25	4.85	7.02	9.67
0.38	3.31	4.90	7.07	9.72
1.00	3.35	4.94	7.11	9.76
3.00	3.42	5.01	7.18	9.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.33	6.58	9.65	13.42
0.38	4.39	6.64	9.71	13.48
1.00	4.43	6.68	9.75	13.52
3.00	4.49	6.75	9.81	13.59

TC200G SERIES

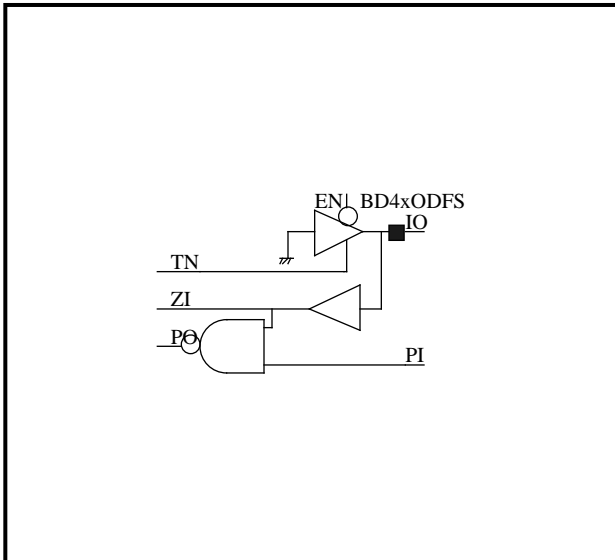
DATA SHEET

BD4xODFS		BD4xODFS		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD4xODFS	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 4mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

CMOS LEVEL		BD4C0DFS
	INVERT	BD4CN0DFS
LVTTTL LEVEL		BD4TH0DFS
	INVERT	BD4TN0DFS
HIGH-SPEED CMOS LEVEL	INVERT	BD4CNH0DFS
HIGH-SPEED LVTTTL LEVEL	INVERT	BD4TNH0DFS
	CMOS SCHMITT TRIGGER	BD4SC0DFS
	LVTTTL SCHMITT TRIGGER	BD4ST0DFS

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT		OUTPUT
EN	TN	IO
L	H	L
H	X	Hz
X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD4xODFS inst(IO,ZI,PO,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD4xODFS
port map(IO,ZI,PO,EN,TN,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	ZI	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	ZI	PO
DRIVE	312.6	34.3

TC200G SERIES

DATA SHEET

BD4xODFS

BD4xODFS

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD4xODFS

BD4xODFS

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.35	0.35	0.35	0.35
0.38	0.44	0.44	0.44	0.44
1.00	0.53	0.53	0.53	0.53
3.00	0.66	0.66	0.66	0.66

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.16	3.59	5.68	8.44
0.38	2.17	3.61	5.69	8.46
1.00	2.25	3.69	5.77	8.54
3.00	2.50	3.94	6.03	8.79

TC200G SERIES

DATA SHEET

BD4xODFS

BD4xODFS

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.48	0.48	0.48	0.48
0.38	0.52	0.52	0.52	0.52
1.00	0.57	0.57	0.57	0.57
3.00	0.69	0.69	0.69	0.69

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0050	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.23	3.66	5.75	8.51
0.38	2.28	3.72	5.80	8.57
1.00	2.32	3.76	5.84	8.61
3.00	2.39	3.83	5.91	8.67

TC200G SERIES

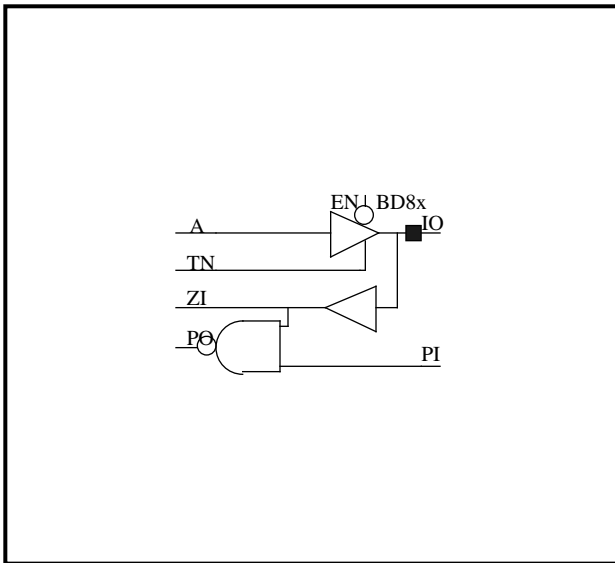
DATA SHEET

BD8x		BD8x		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD8x	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 8mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD8C	BD8CD	BD8CU
	INVERT	BD8CN	BD8CND	BD8CNU
LVTTL LEVEL		BD8TH	BD8THD	BD8THU
	INVERT	BD8TN	BD8TND	BD8TNU
HIGH-SPEED CMOS LEVEL	INVERT	BD8CNH	BD8CNHD	BD8CNHU
HIGH-SPEED LVTTL LEVEL	INVERT	BD8TNH	BD8TNHD	BD8TNHU
CMOS SCHMITT TRIGGER		BD8SC	BD8SCD	BD8SCU
LVTTL SCHMITT TRIGGER		BD8ST	BD8STD	BD8STU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT			OUTPUT
EN	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD8x inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD8x
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	6.31
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD8x

BD8x

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD8x

BD8x

3/5

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0023	1.03

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.93	2.69	3.62	4.76
0.38	2.01	2.77	3.71	4.84
1.00	2.17	2.93	3.86	5.00
3.00	2.71	3.48	4.41	5.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.61

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.57	2.36	3.44	4.85
0.38	1.58	2.36	3.44	4.85
1.00	1.61	2.39	3.47	4.88
3.00	1.79	2.56	3.64	5.05

TC200G SERIES

DATA SHEET

BD8x

BD8x

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.67	1.67	1.67	1.67
0.38	1.75	1.75	1.75	1.75
1.00	1.85	1.85	1.85	1.85
3.00	2.00	2.00	2.00	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.44	0.44	0.44	0.44
0.38	0.53	0.53	0.53	0.53
1.00	0.63	0.63	0.63	0.63
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.46	3.24	4.18	5.32
0.38	2.47	3.25	4.19	5.33
1.00	2.55	3.33	4.27	5.40
3.00	2.81	3.59	4.53	5.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.10	2.92	4.02	5.43
0.38	2.11	2.93	4.03	5.44
1.00	2.19	3.01	4.11	5.52
3.00	2.45	3.27	4.37	5.78

TC200G SERIES

DATA SHEET

BD8x

BD8x

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.80	1.80	1.80	1.80
0.38	1.83	1.83	1.83	1.83
1.00	1.89	1.89	1.89	1.89
3.00	2.01	2.01	2.01	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.57	0.57	0.57	0.57
0.38	0.60	0.60	0.60	0.60
1.00	0.66	0.66	0.66	0.66
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.53	3.31	4.25	5.39
0.38	2.58	3.36	4.30	5.44
1.00	2.62	3.40	4.34	5.48
3.00	2.69	3.47	4.41	5.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.17	2.99	4.09	5.50
0.38	2.23	3.04	4.14	5.55
1.00	2.27	3.08	4.18	5.59
3.00	2.33	3.15	4.25	5.66

TC200G SERIES

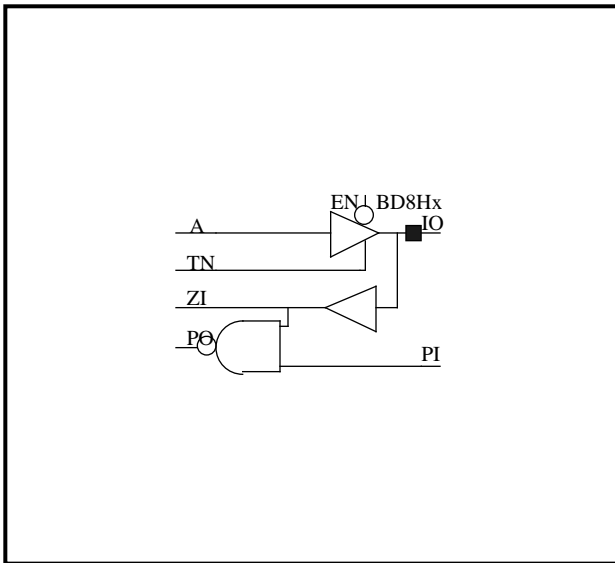
DATA SHEET

BD8Hx		BD8Hx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD8Hx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 8mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD8HC	BD8HCD	BD8HCU
	INVERT	BD8HCN	BD8HCND	BD8HCNU
LVTTTL LEVEL		BD8HTH	BD8HTHD	BD8HTHU
	INVERT	BD8HTN	BD8HTND	BD8HTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD8HCNH	BD8HCNHD	BD8HCNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD8HTNH	BD8HTNHD	BD8HTNHU
CMOS SCHMITT TRIGGER		BD8HSC	BD8HSCD	BD8HSCU
LVTTTL SCHMITT TRIGGER		BD8HST	BD8HSTD	BD8HSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT			OUTPUT
EN	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD8Hx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD8Hx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	9.03
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD8Hx

BD8Hx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD8Hx

BD8Hx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.93	1.50	2.31	3.36
0.38	1.02	1.59	2.39	3.44
1.00	1.17	1.74	2.54	3.59
3.00	1.53	2.10	2.90	3.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.12	1.83	2.86	4.24
0.38	1.13	1.84	2.87	4.25
1.00	1.16	1.85	2.88	4.26
3.00	1.27	1.95	2.96	4.33

TC200G SERIES

DATA SHEET

BD8Hx

BD8Hx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.44	1.44	1.44	1.44
0.38	1.53	1.53	1.53	1.53
1.00	1.64	1.64	1.64	1.64
3.00	1.81	1.81	1.81	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.55	0.55	0.55	0.55
0.38	0.64	0.64	0.64	0.64
1.00	0.74	0.74	0.74	0.74
3.00	0.90	0.90	0.90	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.51	2.10	2.90	3.95
0.38	1.52	2.11	2.91	3.97
1.00	1.60	2.18	2.99	4.04
3.00	1.87	2.46	3.27	4.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.70	2.43	3.48	4.87
0.38	1.71	2.44	3.50	4.88
1.00	1.79	2.52	3.57	4.96
3.00	2.06	2.79	3.84	5.22

TC200G SERIES

DATA SHEET

BD8Hx

BD8Hx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.58	1.58	1.58	1.58
0.38	1.61	1.61	1.61	1.61
1.00	1.66	1.66	1.66	1.66
3.00	1.79	1.79	1.79	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.68	0.68	0.68	0.68
0.38	0.71	0.71	0.71	0.71
1.00	0.77	0.77	0.77	0.77
3.00	0.89	0.89	0.89	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.58	2.17	2.97	4.03
0.38	1.64	2.22	3.03	4.08
1.00	1.68	2.26	3.07	4.12
3.00	1.74	2.33	3.14	4.19

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.77	2.50	3.56	4.94
0.38	1.83	2.56	3.61	4.99
1.00	1.86	2.60	3.65	5.03
3.00	1.93	2.67	3.72	5.10

TC200G SERIES

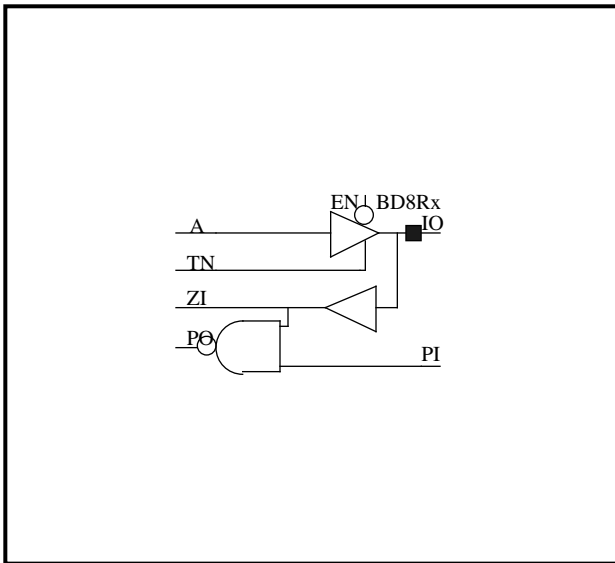
DATA SHEET

BD8Rx		BD8Rx		1/5
CELL NAME	FUNCTION		CELL COUNT	CONDITION
BD8Rx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 8mA SLEW RATE CONTROL		GATE	I/O
			4	1
VDD=3.3V, Ta=25°C, Typ.				

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD8RC	BD8RCD	BD8RCU
	INVERT	BD8RCN	BD8RCND	BD8RCNU
LVTTTL LEVEL		BD8RTH	BD8RTHD	BD8RTHU
	INVERT	BD8RTN	BD8RTND	BD8RTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD8RCNH	BD8RCNHD	BD8RCNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD8RTNH	BD8RTNHD	BD8RTNHU
CMOS SCHMITT TRIGGER		BD8RSC	BD8RSCD	BD8RSCU
LVTTTL SCHMITT TRIGGER		BD8RST	BD8RSTD	BD8RSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD8Rx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD8Rx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	7.58
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD8Rx

BD8Rx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD8Rx

BD8Rx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0032	1.31

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.56	3.57	4.84	6.40
0.38	2.66	3.67	4.95	6.51
1.00	2.84	3.85	5.12	6.68
3.00	3.43	4.45	5.72	7.28

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0035	1.46

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.24	4.63	6.40	8.57
0.38	3.28	4.68	6.44	8.62
1.00	3.41	4.80	6.57	8.74
3.00	3.85	5.24	7.01	9.18

TC200G SERIES

DATA SHEET

BD8Rx

BD8Rx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.19	1.19	1.19	1.19
0.38	1.28	1.28	1.28	1.28
1.00	1.39	1.39	1.39	1.39
3.00	1.55	1.55	1.55	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.54	0.54	0.54	0.54
0.38	0.63	0.63	0.63	0.63
1.00	0.73	0.73	0.73	0.73
3.00	0.87	0.87	0.87	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.23	4.26	5.54	7.11
0.38	3.25	4.27	5.56	7.12
1.00	3.32	4.35	5.63	7.20
3.00	3.61	4.63	5.92	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.05	5.44	7.20	9.38
0.38	4.06	5.45	7.22	9.39
1.00	4.14	5.53	7.29	9.47
3.00	4.40	5.79	7.56	9.73

TC200G SERIES

DATA SHEET

BD8Rx

BD8Rx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.32	1.32	1.32	1.32
0.38	1.36	1.36	1.36	1.36
1.00	1.42	1.42	1.42	1.42
3.00	1.56	1.56	1.56	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.67	0.67	0.67	0.67
0.38	0.71	0.71	0.71	0.71
1.00	0.76	0.76	0.76	0.76
3.00	0.89	0.89	0.89	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.31	4.33	5.61	7.18
0.38	3.36	4.39	5.67	7.23
1.00	3.40	4.43	5.71	7.27
3.00	3.47	4.50	5.78	7.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.12	5.51	7.28	9.45
0.38	4.17	5.56	7.33	9.50
1.00	4.21	5.60	7.37	9.54
3.00	4.28	5.67	7.44	9.61

TC200G SERIES

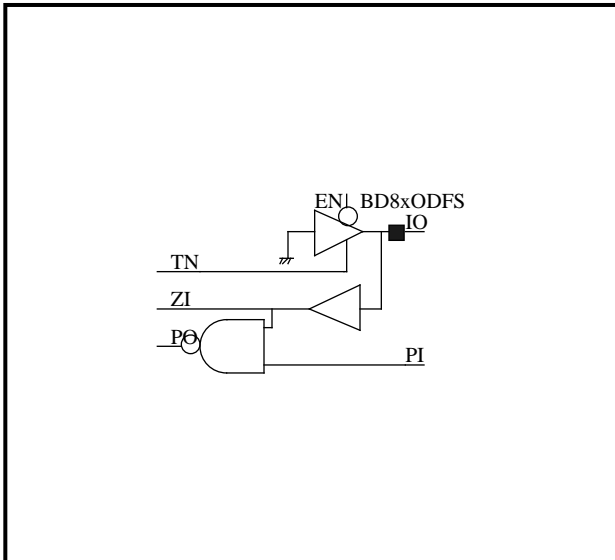
DATA SHEET

BD8xODFS		BD8xODFS		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD8xODFS	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 8mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

CMOS LEVEL		BD8CODFS
	INVERT	BD8CNODFS
LVTTL LEVEL		BD8THODFS
	INVERT	BD8TNODFS
HIGH-SPEED CMOS LEVEL		BD8CNHODFS
HIGH-SPEED LVTTL LEVEL		BD8TNHODFS
	CMOS SCHMITT TRIGGER	BD8SCODFS
	LVTTL SCHMITT TRIGGER	BD8STODFS

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT		OUTPUT
EN	TN	IO
L	H	L
H	X	Hz
X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD8xODFS inst(IO,ZI,PO,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD8xODFS
port map(IO,ZI,PO,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO
DRIVE	312.6	34.3

TC200G SERIES

DATA SHEET

BD8xODFS

BD8xODFS

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD8xODFS

BD8xODFS

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.38	0.38	0.38	0.38
0.38	0.46	0.46	0.46	0.46
1.00	0.55	0.55	0.55	0.55
3.00	0.68	0.68	0.68	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.57

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.93	2.76	3.87	5.28
0.38	1.94	2.77	3.88	5.29
1.00	2.02	2.86	3.96	5.37
3.00	2.28	3.11	4.21	5.62

TC200G SERIES

DATA SHEET

BD8xODFS

BD8xODFS

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.51	0.51	0.51	0.51
0.38	0.54	0.54	0.54	0.54
1.00	0.60	0.60	0.60	0.60
3.00	0.72	0.72	0.72	0.72

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0024	0.57

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.00	2.83	3.94	5.35
0.38	2.05	2.89	3.99	5.40
1.00	2.09	2.93	4.03	5.44
3.00	2.16	2.99	4.10	5.51

TC200G SERIES

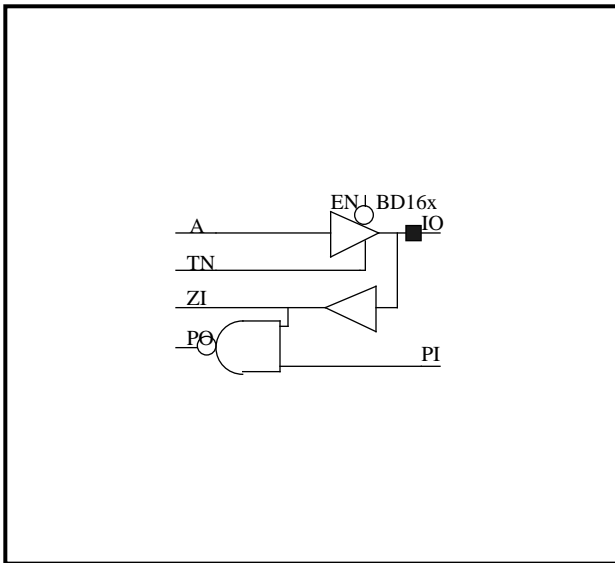
DATA SHEET

BD16x		BD16x		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD16x	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 16mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD16C	BD16CD	BD16CU
	INVERT	BD16CN	BD16CND	BD16CNU
LVTTTL LEVEL		BD16TH	BD16THD	BD16THU
	INVERT	BD16TN	BD16TND	BD16TNU
HIGH-SPEED CMOS LEVEL	INVERT	BD16CNH	BD16CNHD	BD16CNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD16TNH	BD16TNHD	BD16TNHU
CMOS SCHMITT TRIGGER		BD16SC	BD16SCD	BD16SCU
LVTTTL SCHMITT TRIGGER		BD16ST	BD16STD	BD16STU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD16x inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD16x
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	7.75
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD16x

BD16x

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD16x

BD16x

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	0.94

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.72	2.44	3.25	3.98
0.38	1.80	2.52	3.33	4.06
1.00	1.95	2.67	3.48	4.21
3.00	2.47	3.20	4.00	4.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.52

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.30	2.01	2.93	3.82
0.38	1.31	2.01	2.93	3.82
1.00	1.35	2.05	2.96	3.85
3.00	1.53	2.22	3.14	4.02

TC200G SERIES

DATA SHEET

BD16x

BD16x

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.50	1.50	1.50	1.50
0.38	1.58	1.58	1.58	1.58
1.00	1.68	1.68	1.68	1.68
3.00	1.83	1.83	1.83	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.50	0.50	0.50	0.50
0.38	0.59	0.59	0.59	0.59
1.00	0.69	0.69	0.69	0.69
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.23	2.97	3.78	4.51
0.38	2.24	2.98	3.79	4.52
1.00	2.32	3.06	3.87	4.60
3.00	2.58	3.33	4.14	4.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.88	2.63	3.57	4.46
0.38	1.90	2.65	3.58	4.47
1.00	1.97	2.72	3.65	4.55
3.00	2.24	2.99	3.92	4.81

TC200G SERIES

DATA SHEET

BD16x

BD16x

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.63	1.63	1.63	1.63
0.38	1.66	1.66	1.66	1.66
1.00	1.72	1.72	1.72	1.72
3.00	1.84	1.84	1.84	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.63	0.63	0.63	0.63
0.38	0.66	0.66	0.66	0.66
1.00	0.72	0.72	0.72	0.72
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.30	3.04	3.85	4.58
0.38	2.35	3.09	3.90	4.64
1.00	2.39	3.13	3.94	4.68
3.00	2.46	3.20	4.01	4.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.96	2.71	3.64	4.53
0.38	2.01	2.76	3.69	4.58
1.00	2.05	2.80	3.73	4.62
3.00	2.12	2.87	3.80	4.69

TC200G SERIES

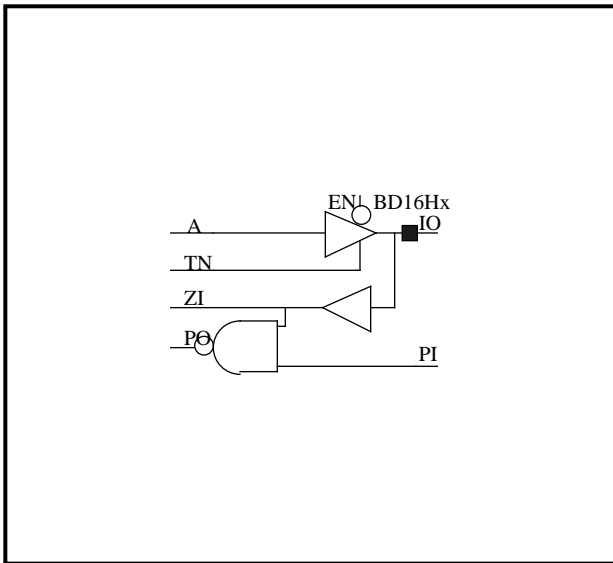
DATA SHEET

BD16Hx		BD16Hx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD16Hx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 16mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD16HC	BD16HCD	BD16HCU
	INVERT	BD16HCN	BD16HCND	BD16HCNU
LVTTTL LEVEL		BD16HTH	BD16HTHD	BD16HTHU
	INVERT	BD16HTN	BD16HTND	BD16HTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD16HCNH	BD16HCNHD	BD16HCNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD16HTNH	BD16HTNHD	BD16HTNHU
CMOS SCHMITT TRIGGER		BD16HSC	BD16HSCD	BD16HSCU
LVTTTL SCHMITT TRIGGER		BD16HST	BD16HSTD	BD16HSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD16Hx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD16Hx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	10.65
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD16Hx

BD16Hx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD16Hx

BD16Hx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.78	1.31	1.99	2.65
0.38	0.87	1.39	2.07	2.74
1.00	1.01	1.54	2.22	2.88
3.00	1.36	1.89	2.58	3.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.90	1.52	2.38	3.23
0.38	0.91	1.52	2.39	3.23
1.00	0.94	1.55	2.40	3.25
3.00	1.06	1.65	2.50	3.35

TC200G SERIES

DATA SHEET

BD16Hx

BD16Hx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.33	1.33	1.33	1.33
0.38	1.42	1.42	1.42	1.42
1.00	1.53	1.53	1.53	1.53
3.00	1.73	1.73	1.73	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.66	0.66	0.66	0.66
0.38	0.75	0.75	0.75	0.75
1.00	0.87	0.87	0.87	0.87
3.00	1.06	1.06	1.06	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.43	1.97	2.66	3.32
0.38	1.44	1.98	2.67	3.33
1.00	1.51	2.06	2.74	3.41
3.00	1.79	2.34	3.02	3.69

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	2.31	3.20	4.07
0.38	1.67	2.32	3.21	4.08
1.00	1.74	2.40	3.28	4.15
3.00	2.02	2.68	3.56	4.43

TC200G SERIES

DATA SHEET

BD16Hx

BD16Hx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.46	1.46	1.46	1.46
0.38	1.49	1.49	1.49	1.49
1.00	1.55	1.55	1.55	1.55
3.00	1.67	1.67	1.67	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.79	0.79	0.79	0.79
0.38	0.83	0.83	0.83	0.83
1.00	0.88	0.88	0.88	0.88
3.00	1.01	1.01	1.01	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.50	2.04	2.73	3.39
0.38	1.55	2.10	2.78	3.45
1.00	1.59	2.14	2.82	3.49
3.00	1.66	2.20	2.89	3.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.73	2.39	3.27	4.14
0.38	1.78	2.44	3.32	4.19
1.00	1.82	2.48	3.36	4.23
3.00	1.89	2.55	3.43	4.30

TC200G SERIES

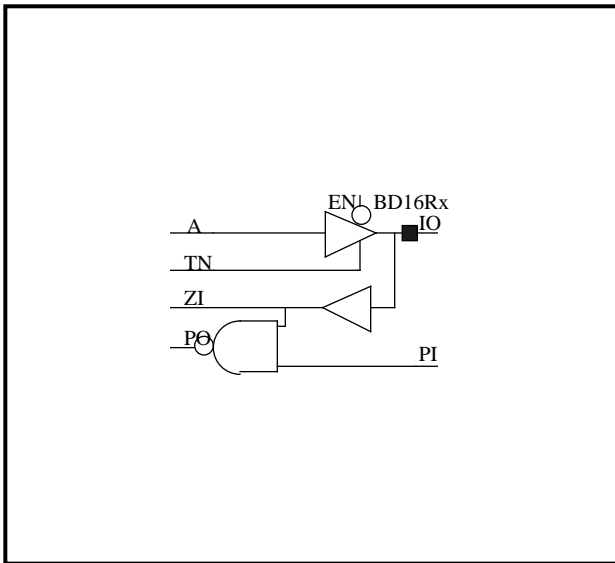
DATA SHEET

BD16Rx		BD16Rx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD16Rx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 16mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD16RC	BD16RCD	BD16RCU
	INVERT	BD16RCN	BD16RCND	BD16RCNU
LVTTTL LEVEL		BD16RTH	BD16RTHD	BD16RTHU
	INVERT	BD16RTN	BD16RTND	BD16RTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD16RCNH	BD16RCNHD	BD16RCNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD16RTNH	BD16RTNHD	BD16RTNHU
CMOS SCHMITT TRIGGER		BD16RSC	BD16RSCD	BD16RSCU
LVTTTL SCHMITT TRIGGER		BD16RST	BD16RSTD	BD16RSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD16Rx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD16Rx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	8.93
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD16Rx

BD16Rx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD16Rx

BD16Rx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.25	3.22	4.33	5.34
0.38	2.37	3.34	4.45	5.46
1.00	2.57	3.54	4.65	5.66
3.00	3.24	4.21	5.32	6.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.77	4.02	5.52	6.90
0.38	2.82	4.08	5.57	6.96
1.00	2.93	4.19	5.69	7.07
3.00	3.28	4.55	6.05	7.44

TC200G SERIES

DATA SHEET

BD16Rx

BD16Rx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.02	2.02	2.02	2.02
0.38	2.12	2.12	2.12	2.12
1.00	2.23	2.23	2.23	2.23
3.00	2.40	2.40	2.40	2.40

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.61	0.61	0.61	0.61
0.38	0.70	0.70	0.70	0.70
1.00	0.80	0.80	0.80	0.80
3.00	0.95	0.95	0.95	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.90	3.89	5.01	6.02
0.38	2.91	3.91	5.02	6.03
1.00	2.99	3.98	5.10	6.11
3.00	3.27	4.27	5.38	6.39

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.12	4.40	5.90	7.28
0.38	3.14	4.41	5.91	7.30
1.00	3.21	4.49	5.99	7.37
3.00	3.48	4.75	6.25	7.64

TC200G SERIES

DATA SHEET

BD16Rx

BD16Rx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.16	2.16	2.16	2.16
0.38	2.20	2.20	2.20	2.20
1.00	2.26	2.26	2.26	2.26
3.00	2.41	2.41	2.41	2.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.74	0.74	0.74	0.74
0.38	0.77	0.77	0.77	0.77
1.00	0.83	0.83	0.83	0.83
3.00	0.95	0.95	0.95	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.97	3.96	5.08	6.09
0.38	3.02	4.02	5.13	6.14
1.00	3.06	4.06	5.17	6.18
3.00	3.13	4.13	5.24	6.25

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.20	4.47	5.97	7.36
0.38	3.25	4.52	6.02	7.41
1.00	3.29	4.56	6.06	7.45
3.00	3.36	4.63	6.13	7.52

TC200G SERIES

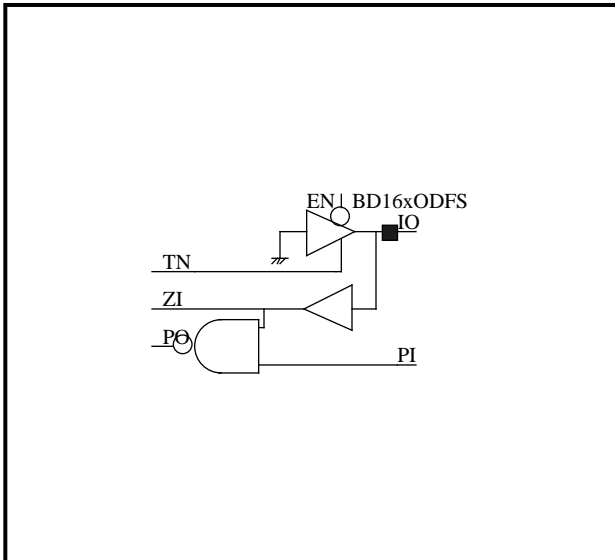
DATA SHEET

BD16xODFS		BD16xODFS		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD16xODFS	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 16mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	1	

CELL NAME

CMOS LEVEL		BD16CODFS
	INVERT	BD16CNODFS
LVTTTL LEVEL		BD16THODFS
	INVERT	BD16TNODFS
HIGH-SPEED CMOS LEVEL	INVERT	BD16CNHODFS
HIGH-SPEED LVTTTL LEVEL	INVERT	BD16TNHODFS
	CMOS SCHMITT TRIGGER	BD16SCODFS
	LVTTTL SCHMITT TRIGGER	BD16STODFS

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT		OUTPUT
EN	TN	IO
L	H	L
H	X	Hz
X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD16xODFS inst(IO,ZI,PO,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD16xODFS
port map(IO,ZI,PO,EN,TN,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	ZI	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	ZI	PO
DRIVE	312.6	34.3

TC200G SERIES

DATA SHEET

BD16xODFS

BD16xODFS

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD16xODFS

BD16xODFS

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.44	0.44	0.44	0.44
0.38	0.52	0.52	0.52	0.52
1.00	0.61	0.61	0.61	0.61
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.48

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.75	2.51	3.44	4.33
0.38	1.76	2.52	3.45	4.34
1.00	1.84	2.60	3.53	4.42
3.00	2.09	2.85	3.79	4.68

TC200G SERIES

DATA SHEET

BD16xODFS

BD16xODFS

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.57	0.57	0.57	0.57
0.38	0.60	0.60	0.60	0.60
1.00	0.66	0.66	0.66	0.66
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.82	2.58	3.51	4.40
0.38	1.87	2.63	3.56	4.46
1.00	1.91	2.67	3.60	4.49
3.00	1.98	2.74	3.67	4.56

TC200G SERIES

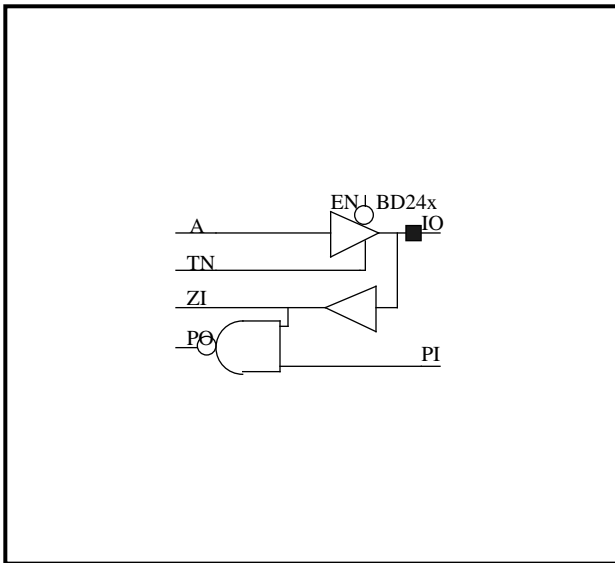
DATA SHEET

BD24x		BD24x		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD24x	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 24mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	2	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD24C	BD24CD	BD24CU
	INVERT	BD24CN	BD24CND	BD24CNU
LVTTTL LEVEL		BD24TH	BD24THD	BD24THU
	INVERT	BD24TN	BD24TND	BD24TNU
HIGH-SPEED CMOS LEVEL	INVERT	BD24CNH	BD24CNHD	BD24CNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD24TNH	BD24TNHD	BD24TNHU
CMOS SCHMITT TRIGGER		BD24SC	BD24SCD	BD24SCU
LVTTTL SCHMITT TRIGGER		BD24ST	BD24STD	BD24STU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT			OUTPUT
EN	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD24x inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD24x
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	13.11
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD24x

BD24x

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD24x

BD24x

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.60	2.15	2.75	3.28
0.38	1.68	2.23	2.83	3.36
1.00	1.83	2.39	2.99	3.51
3.00	2.36	2.92	3.52	4.04

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.23	1.73	2.37	2.97
0.38	1.24	1.73	2.36	2.97
1.00	1.28	1.77	2.40	3.00
3.00	1.46	1.94	2.57	3.17

TC200G SERIES

DATA SHEET

BD24x

BD24x

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	1.66	1.66	1.66
0.38	1.75	1.75	1.75	1.75
1.00	1.87	1.87	1.87	1.87
3.00	2.09	2.09	2.09	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.68	0.68	0.68	0.68
0.38	0.77	0.77	0.77	0.77
1.00	0.89	0.89	0.89	0.89
3.00	1.11	1.11	1.11	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.38	2.96	3.57	4.10
0.38	2.39	2.97	3.58	4.11
1.00	2.46	3.04	3.65	4.18
3.00	2.74	3.32	3.93	4.46

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.12	2.67	3.32	3.93
0.38	2.14	2.68	3.34	3.95
1.00	2.20	2.75	3.41	4.02
3.00	2.48	3.03	3.69	4.30

TC200G SERIES

DATA SHEET

BD24x

BD24x

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.80	1.80	1.80	1.80
0.38	1.83	1.83	1.83	1.83
1.00	1.88	1.88	1.88	1.88
3.00	2.01	2.01	2.01	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.81	0.81	0.81	0.81
0.38	0.84	0.84	0.84	0.84
1.00	0.90	0.90	0.90	0.90
3.00	1.03	1.03	1.03	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.45	3.03	3.64	4.17
0.38	2.51	3.09	3.70	4.23
1.00	2.55	3.13	3.74	4.27
3.00	2.61	3.19	3.80	4.33

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.20	2.75	3.40	4.01
0.38	2.25	2.80	3.45	4.06
1.00	2.29	2.84	3.49	4.10
3.00	2.36	2.91	3.56	4.17

TC200G SERIES

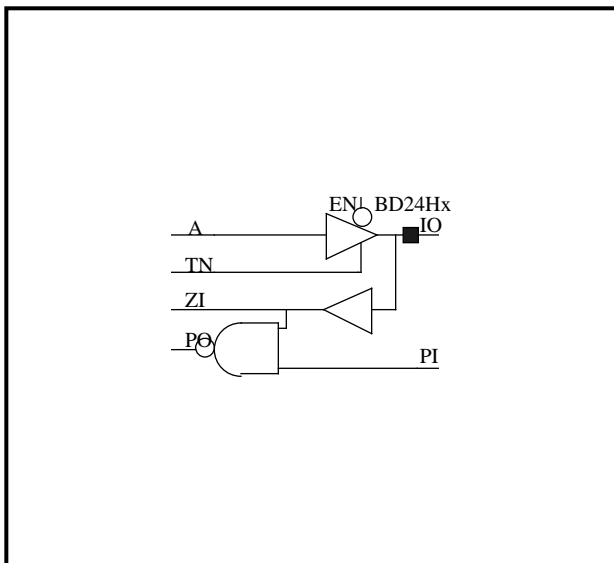
DATA SHEET

BD24Hx		BD24Hx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD24Hx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 24mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	2	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD24HC	BD24HCD	BD24HCU
	INVERT	BD24HCN	BD24HCND	BD24HCNU
LVTTL LEVEL		BD24HTH	BD24HTHD	BD24HTHU
	INVERT	BD24HTN	BD24HTND	BD24HTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD24HCNH	BD24HCNHD	BD24HCNHU
HIGH-SPEED LVTTL LEVEL	INVERT	BD24HTNH	BD24HTNHD	BD24HTNHU
CMOS SCHMITT TRIGGER		BD24HSC	BD24HSCD	BD24HSCU
LVTTL SCHMITT TRIGGER		BD24HST	BD24HSTD	BD24HSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD24Hx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD24Hx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	18.71
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD24Hx

BD24Hx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD24Hx

BD24Hx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.71	1.08	1.55	2.00
0.38	0.79	1.16	1.63	2.08
1.00	0.94	1.31	1.78	2.23
3.00	1.29	1.67	2.14	2.59

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.85	1.27	1.85	2.42
0.38	0.86	1.27	1.85	2.42
1.00	0.89	1.29	1.87	2.44
3.00	1.02	1.40	1.96	2.52

TC200G SERIES

DATA SHEET

BD24Hx

BD24Hx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.51	1.51	1.51	1.51
0.38	1.60	1.60	1.60	1.60
1.00	1.73	1.73	1.73	1.73
3.00	2.00	2.00	2.00	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.92	0.92	0.92	0.92
0.38	1.01	1.01	1.01	1.01
1.00	1.15	1.15	1.15	1.15
3.00	1.41	1.41	1.41	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	2.06	2.54	3.00
0.38	1.68	2.08	2.56	3.01
1.00	1.74	2.14	2.62	3.07
3.00	2.02	2.42	2.90	3.36

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.99	2.45	3.05	3.63
0.38	2.01	2.47	3.06	3.65
1.00	2.07	2.53	3.13	3.71
3.00	2.35	2.81	3.41	3.99

TC200G SERIES

DATA SHEET

BD24Hx

BD24Hx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.64	1.64	1.64	1.64
0.38	1.68	1.68	1.68	1.68
1.00	1.73	1.73	1.73	1.73
3.00	1.86	1.86	1.86	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.06	1.06	1.06	1.06
0.38	1.09	1.09	1.09	1.09
1.00	1.15	1.15	1.15	1.15
3.00	1.27	1.27	1.27	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.74	2.14	2.62	3.07
0.38	1.79	2.19	2.67	3.13
1.00	1.83	2.23	2.71	3.17
3.00	1.90	2.30	2.78	3.23

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.07	2.53	3.13	3.71
0.38	2.12	2.58	3.18	3.76
1.00	2.16	2.62	3.22	3.80
3.00	2.23	2.69	3.29	3.87

TC200G SERIES

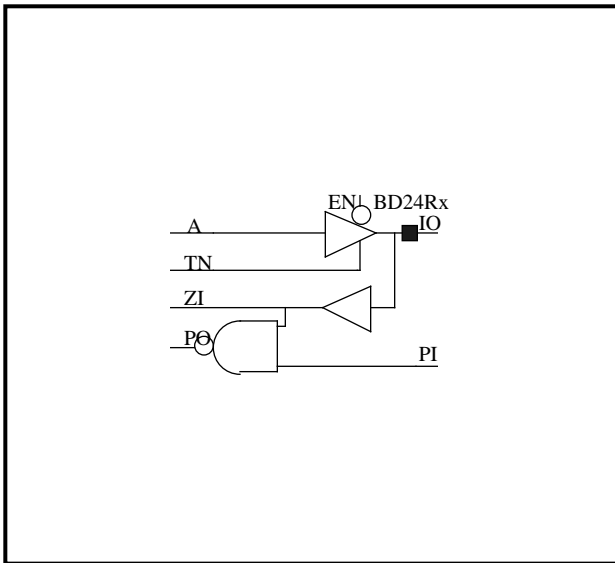
DATA SHEET

BD24Rx		BD24Rx		1/5
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD24Rx	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 24mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	2	

CELL NAME

		no resistor	PULL-DOWN	PULL-UP
CMOS LEVEL		BD24RC	BD24RCD	BD24RCU
	INVERT	BD24RCN	BD24RCND	BD24RCNU
LVTTTL LEVEL		BD24RTH	BD24RTHD	BD24RTHU
	INVERT	BD24RTN	BD24RTND	BD24RTNU
HIGH-SPEED CMOS LEVEL	INVERT	BD24RCNH	BD24RCNHD	BD24RCNHU
HIGH-SPEED LVTTTL LEVEL	INVERT	BD24RTNH	BD24RTNHD	BD24RTNHU
CMOS SCHMITT TRIGGER		BD24RSC	BD24RSCD	BD24RSCU
LVTTTL SCHMITT TRIGGER		BD24RST	BD24RSTD	BD24RSTU

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

EN	INPUT		OUTPUT
	A	TN	IO
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD24Rx inst(IO,ZI,PO,A,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD24Rx
port map(IO,ZI,PO,A,EN,TN,PI);
```

ELECTRO MIGRATION

PIN NAME	ZI	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
A	15.44
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

PIN NAME	ZI	PO	(LU)
DRIVE	312.6	34.3	

TC200G SERIES

DATA SHEET

BD24Rx

BD24Rx

2/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD24Rx

BD24Rx

3/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.11	2.84	3.65	4.38
0.38	2.23	2.96	3.77	4.49
1.00	2.42	3.15	3.96	4.68
3.00	3.06	3.79	4.60	5.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.57	3.52	4.61	5.59
0.38	2.62	3.58	4.66	5.65
1.00	2.74	3.69	4.78	5.76
3.00	3.13	4.09	5.17	6.15

TC200G SERIES

DATA SHEET

BD24Rx

BD24Rx

4/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.70	1.70	1.70	1.70
0.38	1.80	1.80	1.80	1.80
1.00	1.93	1.93	1.93	1.93
3.00	2.16	2.16	2.16	2.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.82	0.82	0.82	0.82
0.38	0.91	0.91	0.91	0.91
1.00	1.03	1.03	1.03	1.03
3.00	1.24	1.24	1.24	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.11	3.87	4.70	5.42
0.38	3.13	3.89	4.71	5.43
1.00	3.19	3.96	4.78	5.50
3.00	3.48	4.24	5.06	5.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.46	4.42	5.50	6.48
0.38	3.48	4.43	5.52	6.50
1.00	3.54	4.50	5.58	6.56
3.00	3.82	4.78	5.86	6.84

TC200G SERIES

DATA SHEET

BD24Rx

BD24Rx

5/5

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.84	1.84	1.84	1.84
0.38	1.88	1.88	1.88	1.88
1.00	1.94	1.94	1.94	1.94
3.00	2.09	2.09	2.09	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.96	0.96	0.96	0.96
0.38	0.99	0.99	0.99	0.99
1.00	1.05	1.05	1.05	1.05
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.19	3.95	4.77	5.49
0.38	3.24	4.00	4.82	5.55
1.00	3.28	4.04	4.86	5.59
3.00	3.35	4.11	4.93	5.66

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.54	4.49	5.58	6.56
0.38	3.59	4.54	5.63	6.61
1.00	3.63	4.59	5.67	6.65
3.00	3.70	4.65	5.74	6.72

TC200G SERIES

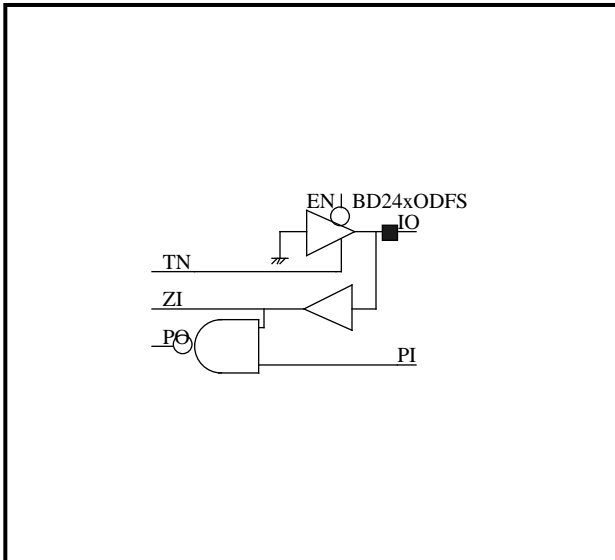
DATA SHEET

BD24xODFS		BD24xODFS		1/4
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BD24xODFS	BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE) 24mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		4	2	

CELL NAME

CMOS LEVEL		BD24CODFS
	INVERT	BD24CNODFS
LVTTTL LEVEL		BD24THODFS
	INVERT	BD24TNODFS
HIGH-SPEED CMOS LEVEL	INVERT	BD24CNHODFS
HIGH-SPEED LVTTTL LEVEL	INVERT	BD24TNHODFS
	CMOS SCHMITT TRIGGER	BD24SCODFS
	LVTTTL SCHMITT TRIGGER	BD24STODFS

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT		OUTPUT
EN	TN	IO
L	H	L
H	X	Hz
X	L	Hz

Note : IO is input when EN=H or TN=L

Verilog-HDL DESCRIPTION

```
BD24xODFS inst(IO,ZI,PO,EN,TN,PI);
```

VHDL DESCRIPTION

```
inst:BD24xODFS
port map(IO,ZI,PO,EN,TN,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	ZI	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
EN	0.98
TN	1.00
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	ZI	PO
DRIVE	312.6	34.3

TC200G SERIES

DATA SHEET

BD24xODFS

BD24xODFS

2/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
ZI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

BD24xODFS

BD24xODFS

3/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.62	0.62	0.62	0.62
0.38	0.71	0.71	0.71	0.71
1.00	0.83	0.83	0.83	0.83
3.00	1.03	1.03	1.03	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.96	2.53	3.19	3.80
0.38	1.98	2.54	3.20	3.81
1.00	2.05	2.61	3.27	3.88
3.00	2.33	2.89	3.55	4.16

TC200G SERIES

DATA SHEET

BD24xODFS

BD24xODFS

4/4

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.75	0.75	0.75	0.75
0.38	0.79	0.79	0.79	0.79
1.00	0.84	0.84	0.84	0.84
3.00	0.97	0.97	0.97	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->IO	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0008	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.04	2.60	3.26	3.87
0.38	2.09	2.66	3.31	3.93
1.00	2.13	2.70	3.35	3.96
3.00	2.20	2.76	3.42	4.03

TC200G SERIES

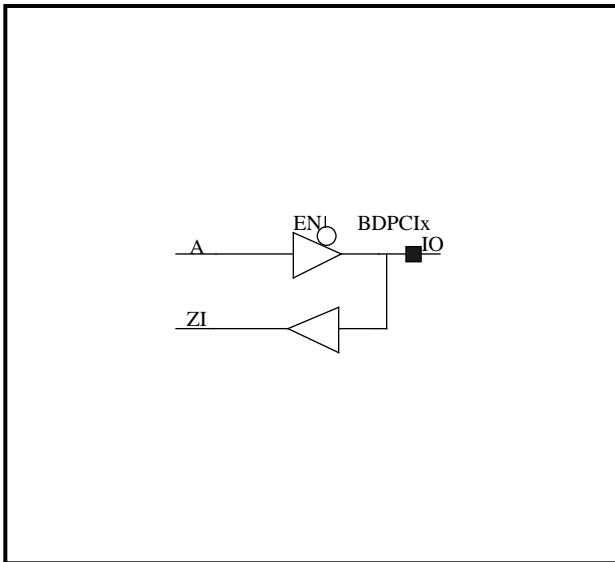
DATA SHEET

BDPC1x		BDPC1x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BDPC1x	PCI (Peripheral Component Interconnect) BUS BIDIRECTIONAL OUTPUT BUFFER (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

CELL NAME

no resistor BDPC1	PULL-DOWN BDPC1D	PULL-UP BDPC1U
----------------------	---------------------	-------------------

LOGIC SYMBOL



TRUTH TABLE (OUTPUT BUFFER)

INPUT		OUTPUT
EN	A	IO
L	L	L
L	H	H
H	X	H _Z

Note : IO is input when EN=H

Verilog-HDL DESCRIPTION

```
BDPC1x inst(IO,ZI,A,EN);
```

VHDL DESCRIPTION

```
inst:BDPC1x
port map(IO,ZI,A,EN);
```

ELECTRO MIGRATION

PIN NAME	ZI	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	

INPUT LOAD

PIN NAME	LOAD	(LU)
A	3.92	
EN	3.97	

OUTPUT DRIVE

PIN NAME	ZI	(LU)
DRIVE	411.4	

TC200G SERIES

DATA SHEET

BDPCIx

BDPCIx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.84	2.77	3.84	4.84
0.38	1.93	2.86	3.93	4.93
1.00	2.10	3.02	4.09	5.09
3.00	2.64	3.57	4.65	5.65

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->IO	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.75

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.71	2.51	3.49	4.41
0.38	1.74	2.54	3.51	4.43
1.00	1.80	2.59	3.57	4.49
3.00	2.03	2.84	3.82	4.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.75

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.01	2.01	2.01	2.01
0.38	2.08	2.08	2.08	2.08
1.00	2.15	2.15	2.15	2.15
3.00	2.28	2.28	2.28	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.15	0.15	0.15	0.15
0.38	0.24	0.24	0.24	0.24
1.00	0.37	0.37	0.37	0.37
3.00	0.56	0.56	0.56	0.56

TC200G SERIES

DATA SHEET

BDPCIx

BDPCIx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.88	2.84	3.93	4.93
0.38	1.92	2.88	3.97	4.97
1.00	1.98	2.94	4.03	5.03
3.00	2.11	3.07	4.16	5.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->IO	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
IO	0.0012	0.75

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.62	2.49	3.49	4.41
0.38	1.62	2.49	3.49	4.41
1.00	1.64	2.50	3.50	4.42
3.00	1.75	2.61	3.61	4.54

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0114	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.25	0.32	0.38	0.55
0.38	0.25	0.31	0.38	0.55
1.00	0.26	0.32	0.39	0.55
3.00	0.26	0.33	0.39	0.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
IO->ZI	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
ZI	0.0037	0.14

PATH DELAY (ns)

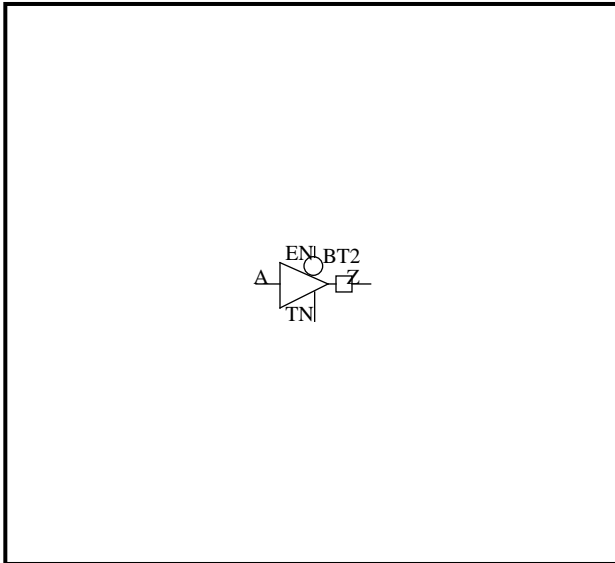
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.29	0.35	0.40	0.51
0.38	0.31	0.37	0.43	0.54
1.00	0.38	0.44	0.49	0.60
3.00	0.62	0.68	0.73	0.85

TC200G SERIES

DATA SHEET

BT2		BT2		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT2	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 2mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT2 inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT2
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	6.31
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT2

BT2

2/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.63	2.09	2.98	4.71
0.38	1.71	2.18	3.06	4.79
1.00	1.87	2.34	3.23	4.96
3.00	2.38	2.85	3.75	5.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.84	2.53	3.89	6.58
0.38	1.84	2.53	3.88	6.58
1.00	1.88	2.57	3.92	6.62
3.00	2.05	2.74	4.10	6.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.63	2.09	2.98	4.71
0.38	1.71	2.18	3.06	4.79
1.00	1.87	2.34	3.23	4.96
3.00	2.38	2.85	3.75	5.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.84	2.53	3.89	6.58
0.38	1.84	2.53	3.88	6.58
1.00	1.88	2.57	3.92	6.62
3.00	2.05	2.74	4.10	6.79

TC200G SERIES

DATA SHEET

BT2

BT2

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.83	0.83	0.83	0.83
0.38	0.92	0.92	0.92	0.92
1.00	1.02	1.02	1.02	1.02
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.40	0.40	0.40	0.40
0.38	0.49	0.49	0.49	0.49
1.00	0.59	0.59	0.59	0.59
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.14	2.62	3.51	5.24
0.38	2.15	2.63	3.52	5.25
1.00	2.23	2.70	3.60	5.33
3.00	2.50	2.97	3.87	5.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.43	3.11	4.47	7.16
0.38	2.44	3.13	4.48	7.17
1.00	2.51	3.20	4.56	7.25
3.00	2.78	3.47	4.82	7.52

TC200G SERIES

DATA SHEET

BT2

BT2

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.83	0.83	0.83	0.83
0.38	0.92	0.92	0.92	0.92
1.00	1.02	1.02	1.02	1.02
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.40	0.40	0.40	0.40
0.38	0.49	0.49	0.49	0.49
1.00	0.59	0.59	0.59	0.59
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.14	2.62	3.51	5.24
0.38	2.15	2.63	3.52	5.25
1.00	2.23	2.70	3.60	5.33
3.00	2.50	2.97	3.87	5.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.43	3.11	4.47	7.16
0.38	2.44	3.13	4.48	7.17
1.00	2.51	3.20	4.56	7.25
3.00	2.78	3.47	4.82	7.52

TC200G SERIES

DATA SHEET

BT2

BT2

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.97	0.97	0.97	0.97
0.38	1.00	1.00	1.00	1.00
1.00	1.05	1.05	1.05	1.05
3.00	1.18	1.18	1.18	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.53	0.53	0.53	0.53
0.38	0.56	0.56	0.56	0.56
1.00	0.62	0.62	0.62	0.62
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.21	2.69	3.58	5.31
0.38	2.26	2.74	3.63	5.37
1.00	2.30	2.78	3.67	5.41
3.00	2.37	2.85	3.74	5.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.50	3.18	4.54	7.23
0.38	2.55	3.24	4.59	7.29
1.00	2.59	3.28	4.63	7.33
3.00	2.66	3.35	4.70	7.39

TC200G SERIES

DATA SHEET

BT2

BT2

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.97	0.97	0.97	0.97
0.38	1.00	1.00	1.00	1.00
1.00	1.05	1.05	1.05	1.05
3.00	1.18	1.18	1.18	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.53	0.53	0.53	0.53
0.38	0.56	0.56	0.56	0.56
1.00	0.62	0.62	0.62	0.62
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.21	2.69	3.58	5.31
0.38	2.26	2.74	3.63	5.37
1.00	2.30	2.78	3.67	5.41
3.00	2.37	2.85	3.74	5.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.96

PATH DELAY (ns)

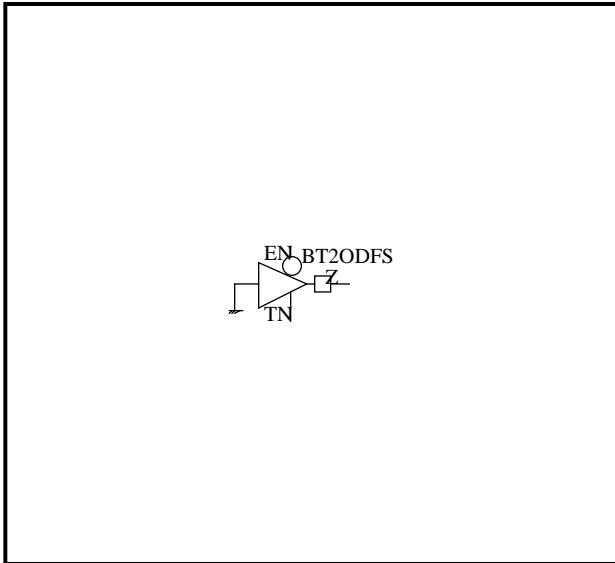
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.50	3.18	4.54	7.23
0.38	2.55	3.24	4.59	7.29
1.00	2.59	3.28	4.63	7.33
3.00	2.66	3.35	4.70	7.39

TC200G SERIES

DATA SHEET

BT2ODFS		BT2ODFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT2ODFS	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 2mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
EN	TN	Z
L	H	L
H	X	H _z
X	L	H _z

Verilog-HDL DESCRIPTION

```
BT2ODFS inst(Z,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT2ODFS
port map(Z,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT2ODFS

BT2ODFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.34	0.34	0.34	0.34
0.38	0.43	0.43	0.43	0.43
1.00	0.52	0.52	0.52	0.52
3.00	0.64	0.64	0.64	0.64

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0098	0.63

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.11	2.81	4.17	6.86
0.38	2.13	2.82	4.18	6.87
1.00	2.21	2.90	4.26	6.95
3.00	2.46	3.16	4.51	7.21

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.34	0.34	0.34	0.34
0.38	0.43	0.43	0.43	0.43
1.00	0.52	0.52	0.52	0.52
3.00	0.64	0.64	0.64	0.64

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0098	0.63

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.11	2.81	4.17	6.86
0.38	2.13	2.82	4.18	6.87
1.00	2.21	2.90	4.26	6.95
3.00	2.46	3.16	4.51	7.21

TC200G SERIES

DATA SHEET

BT2ODFS

BT2ODFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.47	0.47	0.47	0.47
0.38	0.50	0.50	0.50	0.50
1.00	0.56	0.56	0.56	0.56
3.00	0.68	0.68	0.68	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0098	0.63

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.18	2.88	4.24	6.93
0.38	2.24	2.93	4.29	6.98
1.00	2.28	2.97	4.33	7.02
3.00	2.35	3.04	4.40	7.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	0.47	0.47	0.47	0.47
0.38	0.50	0.50	0.50	0.50
1.00	0.56	0.56	0.56	0.56
3.00	0.68	0.68	0.68	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0098	0.63

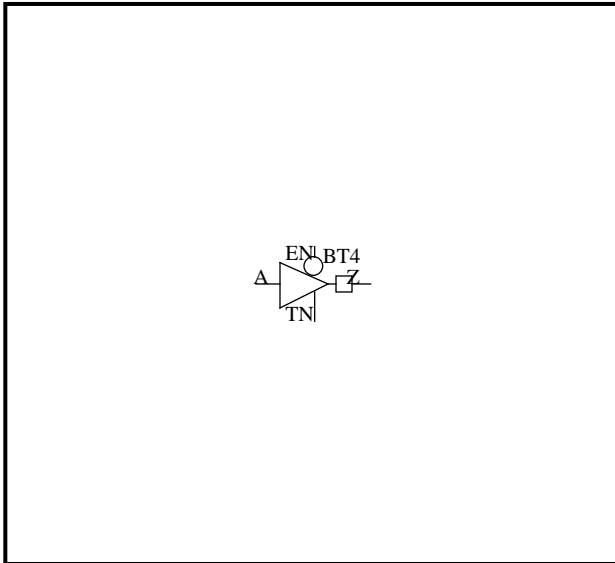
PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	2.18	2.88	4.24	6.93
0.38	2.24	2.93	4.29	6.98
1.00	2.28	2.97	4.33	7.02
3.00	2.35	3.04	4.40	7.09

TC200G SERIES

DATA SHEET

BT4		BT4		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT4	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 4mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT4 inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT4
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	6.31
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT4

BT4

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.85	3.00	4.61	6.70
0.38	1.93	3.08	4.69	6.78
1.00	2.09	3.24	4.85	6.95
3.00	2.63	3.78	5.39	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.79	3.21	5.30	8.06
0.38	1.78	3.21	5.29	8.06
1.00	1.82	3.25	5.33	8.09
3.00	1.99	3.42	5.50	8.27

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.85	3.00	4.61	6.70
0.38	1.93	3.08	4.69	6.78
1.00	2.09	3.24	4.85	6.95
3.00	2.63	3.78	5.39	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.79	3.21	5.30	8.06
0.38	1.78	3.21	5.29	8.06
1.00	1.82	3.25	5.33	8.09
3.00	1.99	3.42	5.50	8.27

TC200G SERIES

DATA SHEET

BT4

BT4

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.07	1.07	1.07	1.07
0.38	1.16	1.16	1.16	1.16
1.00	1.26	1.26	1.26	1.26
3.00	1.40	1.40	1.40	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.41	0.41	0.41	0.41
0.38	0.50	0.50	0.50	0.50
1.00	0.60	0.60	0.60	0.60
3.00	0.75	0.75	0.75	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.38	3.54	5.15	7.25
0.38	2.39	3.55	5.16	7.26
1.00	2.47	3.63	5.24	7.34
3.00	2.74	3.90	5.51	7.61

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.37	3.80	5.88	8.65
0.38	2.38	3.81	5.90	8.66
1.00	2.46	3.89	5.97	8.74
3.00	2.72	4.15	6.24	9.00

TC200G SERIES

DATA SHEET

BT4

BT4

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.07	1.07	1.07	1.07
0.38	1.16	1.16	1.16	1.16
1.00	1.26	1.26	1.26	1.26
3.00	1.40	1.40	1.40	1.40

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.41	0.41	0.41	0.41
0.38	0.50	0.50	0.50	0.50
1.00	0.60	0.60	0.60	0.60
3.00	0.75	0.75	0.75	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.38	3.54	5.15	7.25
0.38	2.39	3.55	5.16	7.26
1.00	2.47	3.63	5.24	7.34
3.00	2.74	3.90	5.51	7.61

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.37	3.80	5.88	8.65
0.38	2.38	3.81	5.90	8.66
1.00	2.46	3.89	5.97	8.74
3.00	2.72	4.15	6.24	9.00

TC200G SERIES

DATA SHEET

BT4

BT4

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.20	1.20	1.20	1.20
0.38	1.23	1.23	1.23	1.23
1.00	1.29	1.29	1.29	1.29
3.00	1.41	1.41	1.41	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.54	0.54	0.54	0.54
0.38	0.58	0.58	0.58	0.58
1.00	0.63	0.63	0.63	0.63
3.00	0.76	0.76	0.76	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.45	3.61	5.22	7.32
0.38	2.51	3.67	5.28	7.38
1.00	2.55	3.71	5.32	7.42
3.00	2.62	3.78	5.38	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.44	3.87	5.96	8.72
0.38	2.49	3.92	6.01	8.77
1.00	2.53	3.96	6.05	8.81
3.00	2.60	4.03	6.12	8.88

TC200G SERIES

DATA SHEET

BT4

BT4

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.20	1.20	1.20	1.20
0.38	1.23	1.23	1.23	1.23
1.00	1.29	1.29	1.29	1.29
3.00	1.41	1.41	1.41	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.54	0.54	0.54	0.54
0.38	0.58	0.58	0.58	0.58
1.00	0.63	0.63	0.63	0.63
3.00	0.76	0.76	0.76	0.76

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.83

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.45	3.61	5.22	7.32
0.38	2.51	3.67	5.28	7.38
1.00	2.55	3.71	5.32	7.42
3.00	2.62	3.78	5.38	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.65

PATH DELAY (ns)

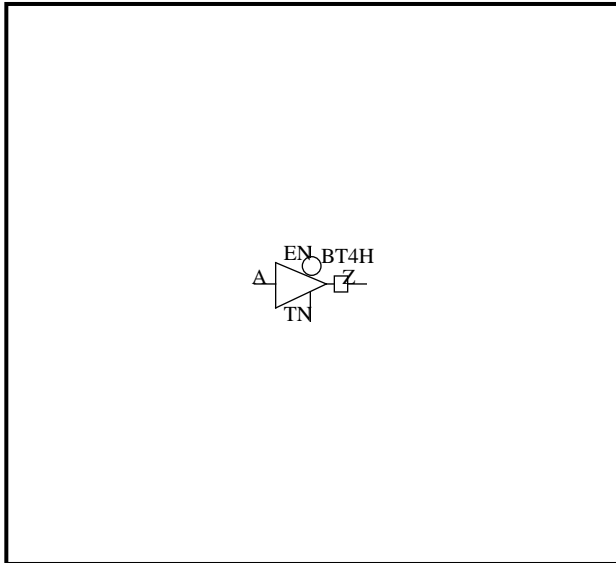
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.44	3.87	5.96	8.72
0.38	2.49	3.92	6.01	8.77
1.00	2.53	3.96	6.05	8.81
3.00	2.60	4.03	6.12	8.88

TC200G SERIES

DATA SHEET

BT4H		BT4H		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT4H	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 4mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT4H inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT4H
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	9.03
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT4H

BT4H

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.10	2.15	3.71	5.79
0.38	1.19	2.24	3.80	5.88
1.00	1.32	2.37	3.93	6.01
3.00	1.62	2.67	4.23	6.31

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.43	2.82	4.89	7.65
0.38	1.44	2.83	4.90	7.65
1.00	1.45	2.84	4.91	7.66
3.00	1.52	2.89	4.95	7.71

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.10	2.15	3.71	5.79
0.38	1.19	2.24	3.80	5.88
1.00	1.32	2.37	3.93	6.01
3.00	1.62	2.67	4.23	6.31

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.43	2.82	4.89	7.65
0.38	1.44	2.83	4.90	7.65
1.00	1.45	2.84	4.91	7.66
3.00	1.52	2.89	4.95	7.71

TC200G SERIES

DATA SHEET

BT4H

BT4H

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.97	0.97	0.97	0.97
0.38	1.06	1.06	1.06	1.06
1.00	1.17	1.17	1.17	1.17
3.00	1.34	1.34	1.34	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.52	0.52	0.52	0.52
0.38	0.61	0.61	0.61	0.61
1.00	0.71	0.71	0.71	0.71
3.00	0.87	0.87	0.87	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.67	2.73	4.29	6.37
0.38	1.68	2.74	4.30	6.38
1.00	1.76	2.81	4.38	6.46
3.00	2.03	3.09	4.65	6.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.07	3.46	5.53	8.29
0.38	2.08	3.47	5.54	8.30
1.00	2.15	3.55	5.62	8.38
3.00	2.42	3.81	5.89	8.65

TC200G SERIES

DATA SHEET

BT4H

BT4H

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.97	0.97	0.97	0.97
0.38	1.06	1.06	1.06	1.06
1.00	1.17	1.17	1.17	1.17
3.00	1.34	1.34	1.34	1.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.52	0.52	0.52	0.52
0.38	0.61	0.61	0.61	0.61
1.00	0.71	0.71	0.71	0.71
3.00	0.87	0.87	0.87	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.67	2.73	4.29	6.37
0.38	1.68	2.74	4.30	6.38
1.00	1.76	2.81	4.38	6.46
3.00	2.03	3.09	4.65	6.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.07	3.46	5.53	8.29
0.38	2.08	3.47	5.54	8.30
1.00	2.15	3.55	5.62	8.38
3.00	2.42	3.81	5.89	8.65

TC200G SERIES

DATA SHEET

BT4H

BT4H

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.10	1.10	1.10	1.10
0.38	1.14	1.14	1.14	1.14
1.00	1.19	1.19	1.19	1.19
3.00	1.32	1.32	1.32	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.65	0.65	0.65	0.65
0.38	0.68	0.68	0.68	0.68
1.00	0.74	0.74	0.74	0.74
3.00	0.86	0.86	0.86	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.74	2.80	4.36	6.44
0.38	1.80	2.85	4.41	6.49
1.00	1.83	2.89	4.45	6.53
3.00	1.90	2.96	4.52	6.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.14	3.53	5.60	8.36
0.38	2.19	3.58	5.66	8.41
1.00	2.23	3.62	5.69	8.45
3.00	2.30	3.69	5.76	8.52

TC200G SERIES

DATA SHEET

BT4H

BT4H

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.10	1.10	1.10	1.10
0.38	1.14	1.14	1.14	1.14
1.00	1.19	1.19	1.19	1.19
3.00	1.32	1.32	1.32	1.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.65	0.65	0.65	0.65
0.38	0.68	0.68	0.68	0.68
1.00	0.74	0.74	0.74	0.74
3.00	0.86	0.86	0.86	0.86

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.74	2.80	4.36	6.44
0.38	1.80	2.85	4.41	6.49
1.00	1.83	2.89	4.45	6.53
3.00	1.90	2.96	4.52	6.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.50

PATH DELAY (ns)

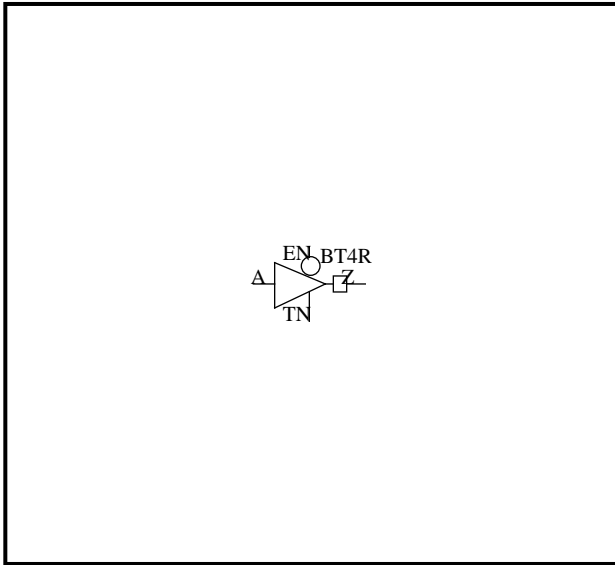
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.14	3.53	5.60	8.36
0.38	2.19	3.58	5.66	8.41
1.00	2.23	3.62	5.69	8.45
3.00	2.30	3.69	5.76	8.52

TC200G SERIES

DATA SHEET

BT4R		BT4R		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT4R	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 4mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	Z
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT4R inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT4R
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	7.58
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT4R

BT4R

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.52	4.10	6.26	8.90
0.38	2.61	4.20	6.36	9.00
1.00	2.79	4.37	6.53	9.18
3.00	3.39	4.98	7.14	9.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.43	5.68	8.75	12.52
0.38	3.48	5.73	8.80	12.57
1.00	3.62	5.87	8.94	12.71
3.00	4.08	6.33	9.40	13.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.52	4.10	6.26	8.90
0.38	2.61	4.20	6.36	9.00
1.00	2.79	4.37	6.53	9.18
3.00	3.39	4.98	7.14	9.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.43	5.68	8.75	12.52
0.38	3.48	5.73	8.80	12.57
1.00	3.62	5.87	8.94	12.71
3.00	4.08	6.33	9.40	13.17

TC200G SERIES

DATA SHEET

BT4R

BT4R

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.82	0.82	0.82	0.82
0.38	0.91	0.91	0.91	0.91
1.00	1.01	1.01	1.01	1.01
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.51	0.51	0.51	0.51
0.38	0.60	0.60	0.60	0.60
1.00	0.69	0.69	0.69	0.69
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.18	4.78	6.95	9.60
0.38	3.19	4.79	6.96	9.61
1.00	3.27	4.87	7.04	9.68
3.00	3.55	5.15	7.32	9.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.26	6.51	9.58	13.35
0.38	4.27	6.53	9.59	13.37
1.00	4.35	6.60	9.67	13.44
3.00	4.61	6.86	9.93	13.70

TC200G SERIES

DATA SHEET

BT4R

BT4R

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.82	0.82	0.82	0.82
0.38	0.91	0.91	0.91	0.91
1.00	1.01	1.01	1.01	1.01
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.51	0.51	0.51	0.51
0.38	0.60	0.60	0.60	0.60
1.00	0.69	0.69	0.69	0.69
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.18	4.78	6.95	9.60
0.38	3.19	4.79	6.96	9.61
1.00	3.27	4.87	7.04	9.68
3.00	3.55	5.15	7.32	9.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.26	6.51	9.58	13.35
0.38	4.27	6.53	9.59	13.37
1.00	4.35	6.60	9.67	13.44
3.00	4.61	6.86	9.93	13.70

TC200G SERIES

DATA SHEET

BT4R

BT4R

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.95	0.95	0.95	0.95
0.38	0.99	0.99	0.99	0.99
1.00	1.04	1.04	1.04	1.04
3.00	1.18	1.18	1.18	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.64	0.64	0.64	0.64
0.38	0.67	0.67	0.67	0.67
1.00	0.73	0.73	0.73	0.73
3.00	0.85	0.85	0.85	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.25	4.85	7.02	9.67
0.38	3.31	4.90	7.07	9.72
1.00	3.35	4.94	7.11	9.76
3.00	3.42	5.01	7.18	9.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.33	6.58	9.65	13.42
0.38	4.39	6.64	9.71	13.48
1.00	4.43	6.68	9.75	13.52
3.00	4.49	6.75	9.81	13.59

TC200G SERIES

DATA SHEET

BT4R

BT4R

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.95	0.95	0.95	0.95
0.38	0.99	0.99	0.99	0.99
1.00	1.04	1.04	1.04	1.04
3.00	1.18	1.18	1.18	1.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.64	0.64	0.64	0.64
0.38	0.67	0.67	0.67	0.67
1.00	0.73	0.73	0.73	0.73
3.00	0.85	0.85	0.85	0.85

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0058	1.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.25	4.85	7.02	9.67
0.38	3.31	4.90	7.07	9.72
1.00	3.35	4.94	7.11	9.76
3.00	3.42	5.01	7.18	9.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0066	1.71

PATH DELAY (ns)

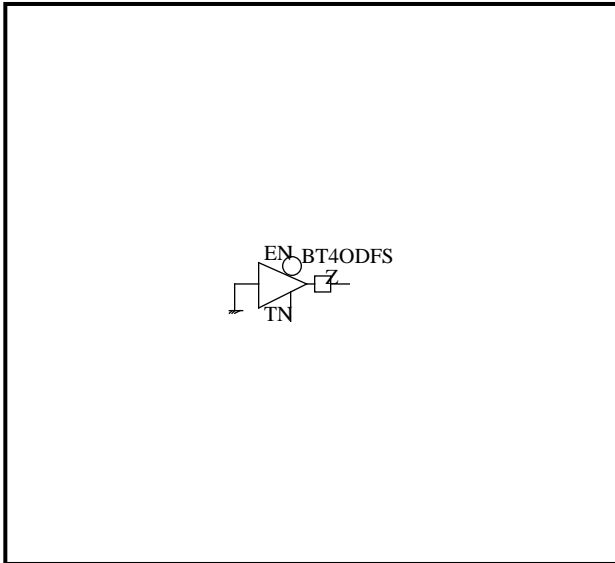
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.33	6.58	9.65	13.42
0.38	4.39	6.64	9.71	13.48
1.00	4.43	6.68	9.75	13.52
3.00	4.49	6.75	9.81	13.59

TC200G SERIES

DATA SHEET

BT4ODFS		BT4ODFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT4ODFS	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 4mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
EN	TN	Z
L	H	L
H	X	H _z
X	L	H _z

Verilog-HDL DESCRIPTION

```
BT4ODFS inst(Z,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT4ODFS
port map(Z,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT4ODFS

BT4ODFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.35	0.35	0.35	0.35
0.38	0.44	0.44	0.44	0.44
1.00	0.53	0.53	0.53	0.53
3.00	0.66	0.66	0.66	0.66

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.48

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.16	3.59	5.68	8.44
0.38	2.17	3.61	5.69	8.46
1.00	2.25	3.69	5.77	8.54
3.00	2.50	3.94	6.03	8.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.35	0.35	0.35	0.35
0.38	0.44	0.44	0.44	0.44
1.00	0.53	0.53	0.53	0.53
3.00	0.66	0.66	0.66	0.66

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.48

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.16	3.59	5.68	8.44
0.38	2.17	3.61	5.69	8.46
1.00	2.25	3.69	5.77	8.54
3.00	2.50	3.94	6.03	8.79

TC200G SERIES

DATA SHEET

BT4ODFS

BT4ODFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.48	0.48	0.48	0.48
0.38	0.52	0.52	0.52	0.52
1.00	0.57	0.57	0.57	0.57
3.00	0.69	0.69	0.69	0.69

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.48

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.23	3.66	5.75	8.51
0.38	2.28	3.72	5.80	8.57
1.00	2.32	3.76	5.84	8.61
3.00	2.39	3.83	5.91	8.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.48	0.48	0.48	0.48
0.38	0.52	0.52	0.52	0.52
1.00	0.57	0.57	0.57	0.57
3.00	0.69	0.69	0.69	0.69

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.48

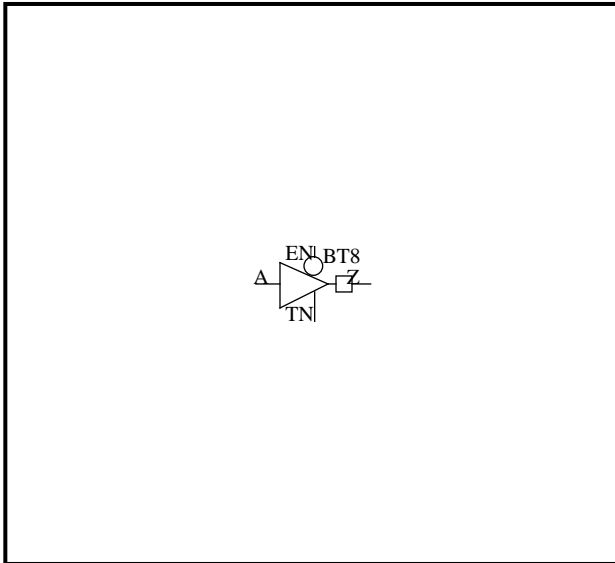
PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.23	3.66	5.75	8.51
0.38	2.28	3.72	5.80	8.57
1.00	2.32	3.76	5.84	8.61
3.00	2.39	3.83	5.91	8.67

TC200G SERIES

DATA SHEET

BT8		BT8		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT8	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 8mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT8 inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT8
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	6.31
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT8

BT8

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.93	2.69	3.62	4.76
0.38	2.01	2.77	3.71	4.84
1.00	2.17	2.93	3.86	5.00
3.00	2.71	3.48	4.41	5.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.57	2.36	3.44	4.85
0.38	1.58	2.36	3.44	4.85
1.00	1.61	2.39	3.47	4.88
3.00	1.79	2.56	3.64	5.05

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.93	2.69	3.62	4.76
0.38	2.01	2.77	3.71	4.84
1.00	2.17	2.93	3.86	5.00
3.00	2.71	3.48	4.41	5.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.57	2.36	3.44	4.85
0.38	1.58	2.36	3.44	4.85
1.00	1.61	2.39	3.47	4.88
3.00	1.79	2.56	3.64	5.05

TC200G SERIES

DATA SHEET

BT8

BT8

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.67	1.67	1.67	1.67
0.38	1.75	1.75	1.75	1.75
1.00	1.85	1.85	1.85	1.85
3.00	2.00	2.00	2.00	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.44	0.44	0.44	0.44
0.38	0.53	0.53	0.53	0.53
1.00	0.63	0.63	0.63	0.63
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.46	3.24	4.18	5.32
0.38	2.47	3.25	4.19	5.33
1.00	2.55	3.33	4.27	5.40
3.00	2.81	3.59	4.53	5.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.10	2.92	4.02	5.43
0.38	2.11	2.93	4.03	5.44
1.00	2.19	3.01	4.11	5.52
3.00	2.45	3.27	4.37	5.78

TC200G SERIES

DATA SHEET

BT8

BT8

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.67	1.67	1.67	1.67
0.38	1.75	1.75	1.75	1.75
1.00	1.85	1.85	1.85	1.85
3.00	2.00	2.00	2.00	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.44	0.44	0.44	0.44
0.38	0.53	0.53	0.53	0.53
1.00	0.63	0.63	0.63	0.63
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.46	3.24	4.18	5.32
0.38	2.47	3.25	4.19	5.33
1.00	2.55	3.33	4.27	5.40
3.00	2.81	3.59	4.53	5.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.10	2.92	4.02	5.43
0.38	2.11	2.93	4.03	5.44
1.00	2.19	3.01	4.11	5.52
3.00	2.45	3.27	4.37	5.78

TC200G SERIES

DATA SHEET

BT8

BT8

5/6

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.80	1.80	1.80	1.80
0.38	1.83	1.83	1.83	1.83
1.00	1.89	1.89	1.89	1.89
3.00	2.01	2.01	2.01	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.57	0.57	0.57	0.57
0.38	0.60	0.60	0.60	0.60
1.00	0.66	0.66	0.66	0.66
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.53	3.31	4.25	5.39
0.38	2.58	3.36	4.30	5.44
1.00	2.62	3.40	4.34	5.48
3.00	2.69	3.47	4.41	5.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.17	2.99	4.09	5.50
0.38	2.23	3.04	4.14	5.55
1.00	2.27	3.08	4.18	5.59
3.00	2.33	3.15	4.25	5.66

TC200G SERIES

DATA SHEET

BT8

BT8

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.80	1.80	1.80	1.80
0.38	1.83	1.83	1.83	1.83
1.00	1.89	1.89	1.89	1.89
3.00	2.01	2.01	2.01	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.57	0.57	0.57	0.57
0.38	0.60	0.60	0.60	0.60
1.00	0.66	0.66	0.66	0.66
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0023	1.03

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.53	3.31	4.25	5.39
0.38	2.58	3.36	4.30	5.44
1.00	2.62	3.40	4.34	5.48
3.00	2.69	3.47	4.41	5.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.61

PATH DELAY (ns)

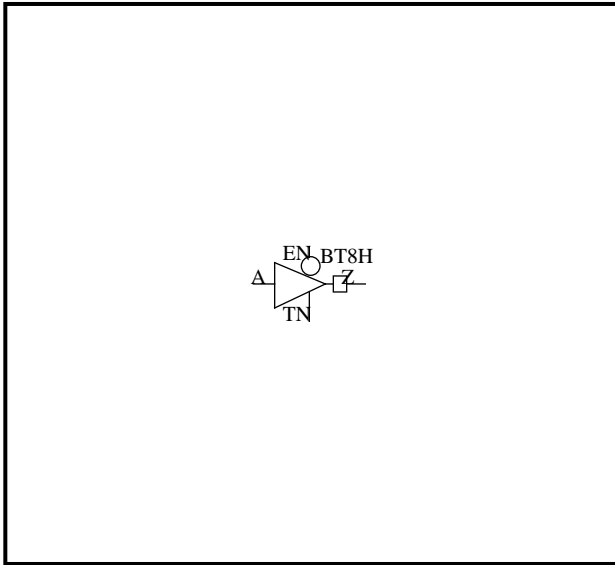
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.17	2.99	4.09	5.50
0.38	2.23	3.04	4.14	5.55
1.00	2.27	3.08	4.18	5.59
3.00	2.33	3.15	4.25	5.66

TC200G SERIES

DATA SHEET

BT8H		BT8H		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT8H	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 8mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT8H inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT8H
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	9.03
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT8H

BT8H

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.93	1.50	2.31	3.36
0.38	1.02	1.59	2.39	3.44
1.00	1.17	1.74	2.54	3.59
3.00	1.53	2.10	2.90	3.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.12	1.83	2.86	4.24
0.38	1.13	1.84	2.87	4.25
1.00	1.16	1.85	2.88	4.26
3.00	1.27	1.95	2.96	4.33

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.93	1.50	2.31	3.36
0.38	1.02	1.59	2.39	3.44
1.00	1.17	1.74	2.54	3.59
3.00	1.53	2.10	2.90	3.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.12	1.83	2.86	4.24
0.38	1.13	1.84	2.87	4.25
1.00	1.16	1.85	2.88	4.26
3.00	1.27	1.95	2.96	4.33

TC200G SERIES

DATA SHEET

BT8H

BT8H

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.44	1.44	1.44	1.44
0.38	1.53	1.53	1.53	1.53
1.00	1.64	1.64	1.64	1.64
3.00	1.81	1.81	1.81	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.55	0.55	0.55	0.55
0.38	0.64	0.64	0.64	0.64
1.00	0.74	0.74	0.74	0.74
3.00	0.90	0.90	0.90	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.51	2.10	2.90	3.95
0.38	1.52	2.11	2.91	3.97
1.00	1.60	2.18	2.99	4.04
3.00	1.87	2.46	3.27	4.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.70	2.43	3.48	4.87
0.38	1.71	2.44	3.50	4.88
1.00	1.79	2.52	3.57	4.96
3.00	2.06	2.79	3.84	5.22

TC200G SERIES

DATA SHEET

BT8H

BT8H

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.44	1.44	1.44	1.44
0.38	1.53	1.53	1.53	1.53
1.00	1.64	1.64	1.64	1.64
3.00	1.81	1.81	1.81	1.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.55	0.55	0.55	0.55
0.38	0.64	0.64	0.64	0.64
1.00	0.74	0.74	0.74	0.74
3.00	0.90	0.90	0.90	0.90

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.51	2.10	2.90	3.95
0.38	1.52	2.11	2.91	3.97
1.00	1.60	2.18	2.99	4.04
3.00	1.87	2.46	3.27	4.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.70	2.43	3.48	4.87
0.38	1.71	2.44	3.50	4.88
1.00	1.79	2.52	3.57	4.96
3.00	2.06	2.79	3.84	5.22

TC200G SERIES

DATA SHEET

BT8H

BT8H

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.58	1.58	1.58	1.58
0.38	1.61	1.61	1.61	1.61
1.00	1.66	1.66	1.66	1.66
3.00	1.79	1.79	1.79	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.68	0.68	0.68	0.68
0.38	0.71	0.71	0.71	0.71
1.00	0.77	0.77	0.77	0.77
3.00	0.89	0.89	0.89	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.58	2.17	2.97	4.03
0.38	1.64	2.22	3.03	4.08
1.00	1.68	2.26	3.07	4.12
3.00	1.74	2.33	3.14	4.19

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.77	2.50	3.56	4.94
0.38	1.83	2.56	3.61	4.99
1.00	1.86	2.60	3.65	5.03
3.00	1.93	2.67	3.72	5.10

TC200G SERIES

DATA SHEET

BT8H

BT8H

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.58	1.58	1.58	1.58
0.38	1.61	1.61	1.61	1.61
1.00	1.66	1.66	1.66	1.66
3.00	1.79	1.79	1.79	1.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.68	0.68	0.68	0.68
0.38	0.71	0.71	0.71	0.71
1.00	0.77	0.77	0.77	0.77
3.00	0.89	0.89	0.89	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.58	2.17	2.97	4.03
0.38	1.64	2.22	3.03	4.08
1.00	1.68	2.26	3.07	4.12
3.00	1.74	2.33	3.14	4.19

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.39

PATH DELAY (ns)

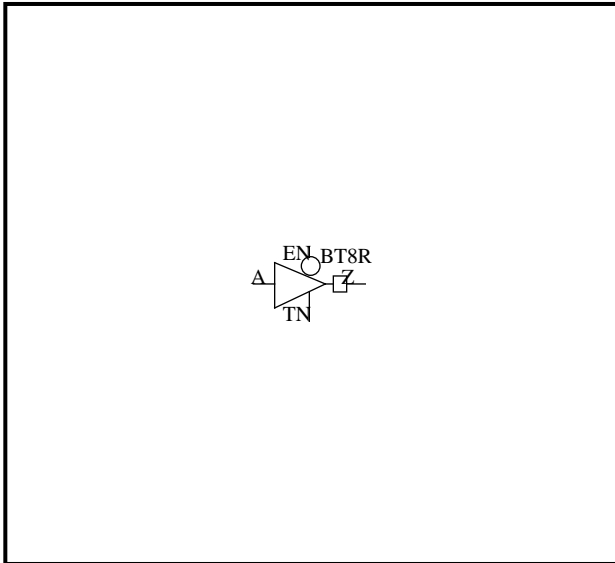
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.77	2.50	3.56	4.94
0.38	1.83	2.56	3.61	4.99
1.00	1.86	2.60	3.65	5.03
3.00	1.93	2.67	3.72	5.10

TC200G SERIES

DATA SHEET

BT8R		BT8R		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT8R	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 8mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT8R inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT8R
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	7.58
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT8R

BT8R

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.56	3.57	4.84	6.40
0.38	2.66	3.67	4.95	6.51
1.00	2.84	3.85	5.12	6.68
3.00	3.43	4.45	5.72	7.28

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.24	4.63	6.40	8.57
0.38	3.28	4.68	6.44	8.62
1.00	3.41	4.80	6.57	8.74
3.00	3.85	5.24	7.01	9.18

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.56	3.57	4.84	6.40
0.38	2.66	3.67	4.95	6.51
1.00	2.84	3.85	5.12	6.68
3.00	3.43	4.45	5.72	7.28

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.24	4.63	6.40	8.57
0.38	3.28	4.68	6.44	8.62
1.00	3.41	4.80	6.57	8.74
3.00	3.85	5.24	7.01	9.18

TC200G SERIES

DATA SHEET

BT8R

BT8R

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.19	1.19	1.19	1.19
0.38	1.28	1.28	1.28	1.28
1.00	1.39	1.39	1.39	1.39
3.00	1.55	1.55	1.55	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.54	0.54	0.54	0.54
0.38	0.63	0.63	0.63	0.63
1.00	0.73	0.73	0.73	0.73
3.00	0.87	0.87	0.87	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.23	4.26	5.54	7.11
0.38	3.25	4.27	5.56	7.12
1.00	3.32	4.35	5.63	7.20
3.00	3.61	4.63	5.92	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.05	5.44	7.20	9.38
0.38	4.06	5.45	7.22	9.39
1.00	4.14	5.53	7.29	9.47
3.00	4.40	5.79	7.56	9.73

TC200G SERIES

DATA SHEET

BT8R

BT8R

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.19	1.19	1.19	1.19
0.38	1.28	1.28	1.28	1.28
1.00	1.39	1.39	1.39	1.39
3.00	1.55	1.55	1.55	1.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.54	0.54	0.54	0.54
0.38	0.63	0.63	0.63	0.63
1.00	0.73	0.73	0.73	0.73
3.00	0.87	0.87	0.87	0.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.23	4.26	5.54	7.11
0.38	3.25	4.27	5.56	7.12
1.00	3.32	4.35	5.63	7.20
3.00	3.61	4.63	5.92	7.48

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.05	5.44	7.20	9.38
0.38	4.06	5.45	7.22	9.39
1.00	4.14	5.53	7.29	9.47
3.00	4.40	5.79	7.56	9.73

TC200G SERIES

DATA SHEET

BT8R

BT8R

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.32	1.32	1.32	1.32
0.38	1.36	1.36	1.36	1.36
1.00	1.42	1.42	1.42	1.42
3.00	1.56	1.56	1.56	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.67	0.67	0.67	0.67
0.38	0.71	0.71	0.71	0.71
1.00	0.76	0.76	0.76	0.76
3.00	0.89	0.89	0.89	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.31	4.33	5.61	7.18
0.38	3.36	4.39	5.67	7.23
1.00	3.40	4.43	5.71	7.27
3.00	3.47	4.50	5.78	7.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.12	5.51	7.28	9.45
0.38	4.17	5.56	7.33	9.50
1.00	4.21	5.60	7.37	9.54
3.00	4.28	5.67	7.44	9.61

TC200G SERIES

DATA SHEET

BT8R

BT8R

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.32	1.32	1.32	1.32
0.38	1.36	1.36	1.36	1.36
1.00	1.42	1.42	1.42	1.42
3.00	1.56	1.56	1.56	1.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.67	0.67	0.67	0.67
0.38	0.71	0.71	0.71	0.71
1.00	0.76	0.76	0.76	0.76
3.00	0.89	0.89	0.89	0.89

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.31	4.33	5.61	7.18
0.38	3.36	4.39	5.67	7.23
1.00	3.40	4.43	5.71	7.27
3.00	3.47	4.50	5.78	7.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.46

PATH DELAY (ns)

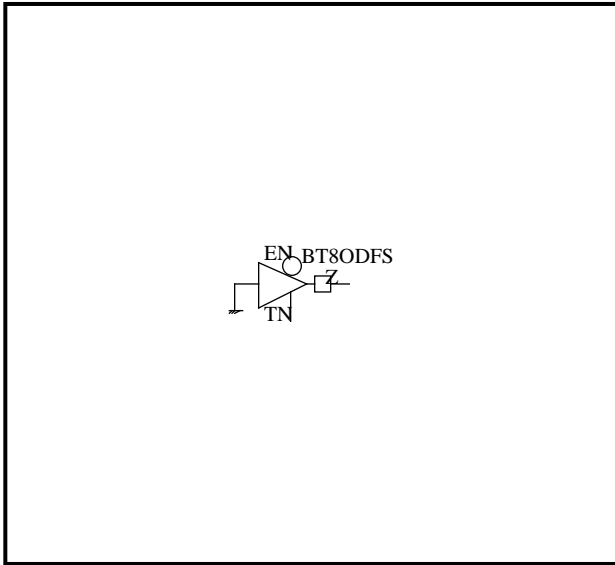
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	4.12	5.51	7.28	9.45
0.38	4.17	5.56	7.33	9.50
1.00	4.21	5.60	7.37	9.54
3.00	4.28	5.67	7.44	9.61

TC200G SERIES

DATA SHEET

BT8ODFS		BT8ODFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT8ODFS	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 8mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
EN	TN	Z
L	H	L
H	X	H _z
X	L	H _z

Verilog-HDL DESCRIPTION

```
BT8ODFS inst(Z,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT8ODFS
port map(Z,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT8ODFS

BT8ODFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.38	0.38	0.38	0.38
0.38	0.46	0.46	0.46	0.46
1.00	0.55	0.55	0.55	0.55
3.00	0.68	0.68	0.68	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.57

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.93	2.76	3.87	5.28
0.38	1.94	2.77	3.88	5.29
1.00	2.02	2.86	3.96	5.37
3.00	2.28	3.11	4.21	5.62

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.38	0.38	0.38	0.38
0.38	0.46	0.46	0.46	0.46
1.00	0.55	0.55	0.55	0.55
3.00	0.68	0.68	0.68	0.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.57

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.93	2.76	3.87	5.28
0.38	1.94	2.77	3.88	5.29
1.00	2.02	2.86	3.96	5.37
3.00	2.28	3.11	4.21	5.62

TC200G SERIES

DATA SHEET

BT8ODFS

BT8ODFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.51	0.51	0.51	0.51
0.38	0.54	0.54	0.54	0.54
1.00	0.60	0.60	0.60	0.60
3.00	0.72	0.72	0.72	0.72

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.57

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.00	2.83	3.94	5.35
0.38	2.05	2.89	3.99	5.40
1.00	2.09	2.93	4.03	5.44
3.00	2.16	2.99	4.10	5.51

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.51	0.51	0.51	0.51
0.38	0.54	0.54	0.54	0.54
1.00	0.60	0.60	0.60	0.60
3.00	0.72	0.72	0.72	0.72

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.57

PATH DELAY (ns)

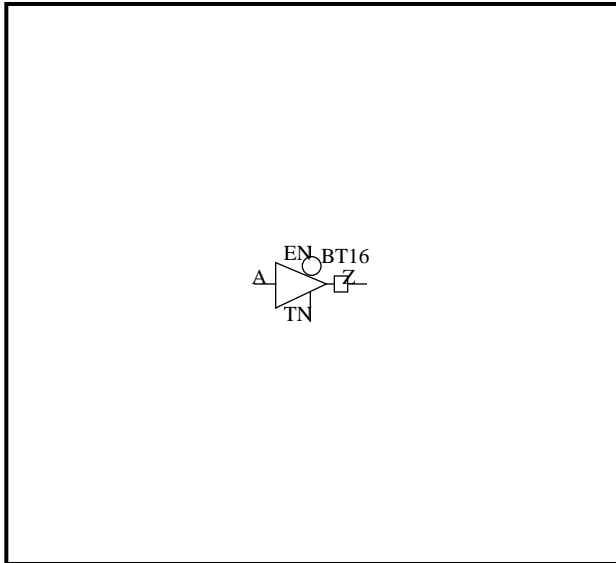
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.00	2.83	3.94	5.35
0.38	2.05	2.89	3.99	5.40
1.00	2.09	2.93	4.03	5.44
3.00	2.16	2.99	4.10	5.51

TC200G SERIES

DATA SHEET

BT16		BT16		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT16	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 16mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT16 inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT16
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	7.75
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT16

BT16

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.72	2.44	3.25	3.98
0.38	1.80	2.52	3.33	4.06
1.00	1.95	2.67	3.48	4.21
3.00	2.47	3.20	4.00	4.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.30	2.01	2.93	3.82
0.38	1.31	2.01	2.93	3.82
1.00	1.35	2.05	2.96	3.85
3.00	1.53	2.22	3.14	4.02

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.72	2.44	3.25	3.98
0.38	1.80	2.52	3.33	4.06
1.00	1.95	2.67	3.48	4.21
3.00	2.47	3.20	4.00	4.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.30	2.01	2.93	3.82
0.38	1.31	2.01	2.93	3.82
1.00	1.35	2.05	2.96	3.85
3.00	1.53	2.22	3.14	4.02

TC200G SERIES

DATA SHEET

BT16

BT16

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.50	1.50	1.50	1.50
0.38	1.58	1.58	1.58	1.58
1.00	1.68	1.68	1.68	1.68
3.00	1.83	1.83	1.83	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.50	0.50	0.50	0.50
0.38	0.59	0.59	0.59	0.59
1.00	0.69	0.69	0.69	0.69
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.23	2.97	3.78	4.51
0.38	2.24	2.98	3.79	4.52
1.00	2.32	3.06	3.87	4.60
3.00	2.58	3.33	4.14	4.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.88	2.63	3.57	4.46
0.38	1.90	2.65	3.58	4.47
1.00	1.97	2.72	3.65	4.55
3.00	2.24	2.99	3.92	4.81

TC200G SERIES

DATA SHEET

BT16

BT16

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.50	1.50	1.50	1.50
0.38	1.58	1.58	1.58	1.58
1.00	1.68	1.68	1.68	1.68
3.00	1.83	1.83	1.83	1.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.50	0.50	0.50	0.50
0.38	0.59	0.59	0.59	0.59
1.00	0.69	0.69	0.69	0.69
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.23	2.97	3.78	4.51
0.38	2.24	2.98	3.79	4.52
1.00	2.32	3.06	3.87	4.60
3.00	2.58	3.33	4.14	4.87

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.88	2.63	3.57	4.46
0.38	1.90	2.65	3.58	4.47
1.00	1.97	2.72	3.65	4.55
3.00	2.24	2.99	3.92	4.81

TC200G SERIES

DATA SHEET

BT16

BT16

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.63	1.63	1.63	1.63
0.38	1.66	1.66	1.66	1.66
1.00	1.72	1.72	1.72	1.72
3.00	1.84	1.84	1.84	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.63	0.63	0.63	0.63
0.38	0.66	0.66	0.66	0.66
1.00	0.72	0.72	0.72	0.72
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.30	3.04	3.85	4.58
0.38	2.35	3.09	3.90	4.64
1.00	2.39	3.13	3.94	4.68
3.00	2.46	3.20	4.01	4.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.96	2.71	3.64	4.53
0.38	2.01	2.76	3.69	4.58
1.00	2.05	2.80	3.73	4.62
3.00	2.12	2.87	3.80	4.69

TC200G SERIES

DATA SHEET

BT16

BT16

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.63	1.63	1.63	1.63
0.38	1.66	1.66	1.66	1.66
1.00	1.72	1.72	1.72	1.72
3.00	1.84	1.84	1.84	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.63	0.63	0.63	0.63
0.38	0.66	0.66	0.66	0.66
1.00	0.72	0.72	0.72	0.72
3.00	0.84	0.84	0.84	0.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	0.94

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.30	3.04	3.85	4.58
0.38	2.35	3.09	3.90	4.64
1.00	2.39	3.13	3.94	4.68
3.00	2.46	3.20	4.01	4.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.52

PATH DELAY (ns)

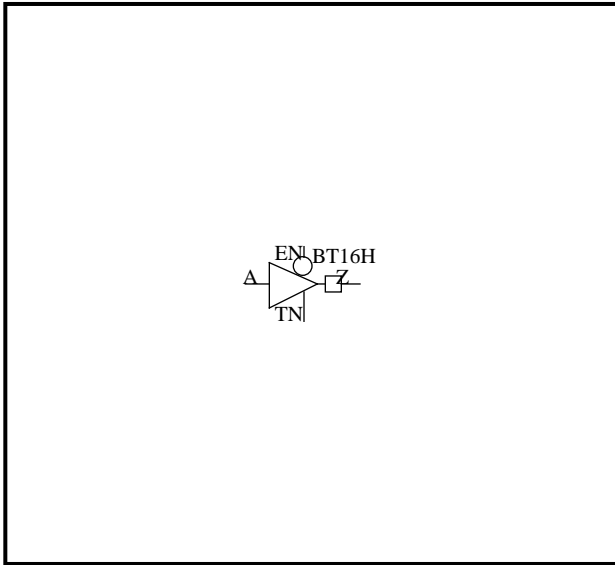
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.96	2.71	3.64	4.53
0.38	2.01	2.76	3.69	4.58
1.00	2.05	2.80	3.73	4.62
3.00	2.12	2.87	3.80	4.69

TC200G SERIES

DATA SHEET

BT16H		BT16H		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT16H	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 16mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT16H inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT16H
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	10.65
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT16H

BT16H

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.78	1.31	1.99	2.65
0.38	0.87	1.39	2.07	2.74
1.00	1.01	1.54	2.22	2.88
3.00	1.36	1.89	2.58	3.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.90	1.52	2.38	3.23
0.38	0.91	1.52	2.39	3.23
1.00	0.94	1.55	2.40	3.25
3.00	1.06	1.65	2.50	3.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.78	1.31	1.99	2.65
0.38	0.87	1.39	2.07	2.74
1.00	1.01	1.54	2.22	2.88
3.00	1.36	1.89	2.58	3.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.90	1.52	2.38	3.23
0.38	0.91	1.52	2.39	3.23
1.00	0.94	1.55	2.40	3.25
3.00	1.06	1.65	2.50	3.35

TC200G SERIES

DATA SHEET

BT16H

BT16H

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.33	1.33	1.33	1.33
0.38	1.42	1.42	1.42	1.42
1.00	1.53	1.53	1.53	1.53
3.00	1.73	1.73	1.73	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.66	0.66	0.66	0.66
0.38	0.75	0.75	0.75	0.75
1.00	0.87	0.87	0.87	0.87
3.00	1.06	1.06	1.06	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.43	1.97	2.66	3.32
0.38	1.44	1.98	2.67	3.33
1.00	1.51	2.06	2.74	3.41
3.00	1.79	2.34	3.02	3.69

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	2.31	3.20	4.07
0.38	1.67	2.32	3.21	4.08
1.00	1.74	2.40	3.28	4.15
3.00	2.02	2.68	3.56	4.43

TC200G SERIES

DATA SHEET

BT16H

BT16H

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.33	1.33	1.33	1.33
0.38	1.42	1.42	1.42	1.42
1.00	1.53	1.53	1.53	1.53
3.00	1.73	1.73	1.73	1.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.66	0.66	0.66	0.66
0.38	0.75	0.75	0.75	0.75
1.00	0.87	0.87	0.87	0.87
3.00	1.06	1.06	1.06	1.06

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.43	1.97	2.66	3.32
0.38	1.44	1.98	2.67	3.33
1.00	1.51	2.06	2.74	3.41
3.00	1.79	2.34	3.02	3.69

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	2.31	3.20	4.07
0.38	1.67	2.32	3.21	4.08
1.00	1.74	2.40	3.28	4.15
3.00	2.02	2.68	3.56	4.43

TC200G SERIES

DATA SHEET

BT16H

BT16H

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.46	1.46	1.46	1.46
0.38	1.49	1.49	1.49	1.49
1.00	1.55	1.55	1.55	1.55
3.00	1.67	1.67	1.67	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.79	0.79	0.79	0.79
0.38	0.83	0.83	0.83	0.83
1.00	0.88	0.88	0.88	0.88
3.00	1.01	1.01	1.01	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.50	2.04	2.73	3.39
0.38	1.55	2.10	2.78	3.45
1.00	1.59	2.14	2.82	3.49
3.00	1.66	2.20	2.89	3.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.73	2.39	3.27	4.14
0.38	1.78	2.44	3.32	4.19
1.00	1.82	2.48	3.36	4.23
3.00	1.89	2.55	3.43	4.30

TC200G SERIES

DATA SHEET

BT16H

BT16H

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.46	1.46	1.46	1.46
0.38	1.49	1.49	1.49	1.49
1.00	1.55	1.55	1.55	1.55
3.00	1.67	1.67	1.67	1.67

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.79	0.79	0.79	0.79
0.38	0.83	0.83	0.83	0.83
1.00	0.88	0.88	0.88	0.88
3.00	1.01	1.01	1.01	1.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.50	2.04	2.73	3.39
0.38	1.55	2.10	2.78	3.45
1.00	1.59	2.14	2.82	3.49
3.00	1.66	2.20	2.89	3.55

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.28

PATH DELAY (ns)

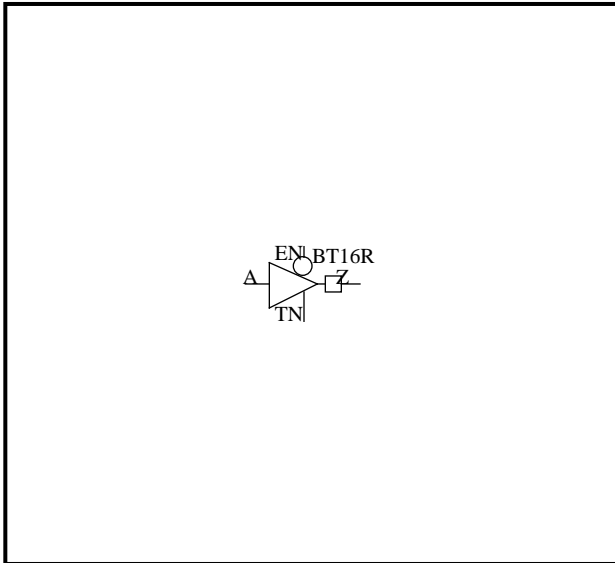
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.73	2.39	3.27	4.14
0.38	1.78	2.44	3.32	4.19
1.00	1.82	2.48	3.36	4.23
3.00	1.89	2.55	3.43	4.30

TC200G SERIES

DATA SHEET

BT16R		BT16R		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT16R	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 16mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT16R inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT16R
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	8.93
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT16R

BT16R

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.25	3.22	4.33	5.34
0.38	2.37	3.34	4.45	5.46
1.00	2.57	3.54	4.65	5.66
3.00	3.24	4.21	5.32	6.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.77	4.02	5.52	6.90
0.38	2.82	4.08	5.57	6.96
1.00	2.93	4.19	5.69	7.07
3.00	3.28	4.55	6.05	7.44

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.25	3.22	4.33	5.34
0.38	2.37	3.34	4.45	5.46
1.00	2.57	3.54	4.65	5.66
3.00	3.24	4.21	5.32	6.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.77	4.02	5.52	6.90
0.38	2.82	4.08	5.57	6.96
1.00	2.93	4.19	5.69	7.07
3.00	3.28	4.55	6.05	7.44

TC200G SERIES

DATA SHEET

BT16R

BT16R

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.02	2.02	2.02	2.02
0.38	2.12	2.12	2.12	2.12
1.00	2.23	2.23	2.23	2.23
3.00	2.40	2.40	2.40	2.40

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.61	0.61	0.61	0.61
0.38	0.70	0.70	0.70	0.70
1.00	0.80	0.80	0.80	0.80
3.00	0.95	0.95	0.95	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.90	3.89	5.01	6.02
0.38	2.91	3.91	5.02	6.03
1.00	2.99	3.98	5.10	6.11
3.00	3.27	4.27	5.38	6.39

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.12	4.40	5.90	7.28
0.38	3.14	4.41	5.91	7.30
1.00	3.21	4.49	5.99	7.37
3.00	3.48	4.75	6.25	7.64

TC200G SERIES

DATA SHEET

BT16R

BT16R

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.02	2.02	2.02	2.02
0.38	2.12	2.12	2.12	2.12
1.00	2.23	2.23	2.23	2.23
3.00	2.40	2.40	2.40	2.40

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.61	0.61	0.61	0.61
0.38	0.70	0.70	0.70	0.70
1.00	0.80	0.80	0.80	0.80
3.00	0.95	0.95	0.95	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.90	3.89	5.01	6.02
0.38	2.91	3.91	5.02	6.03
1.00	2.99	3.98	5.10	6.11
3.00	3.27	4.27	5.38	6.39

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.12	4.40	5.90	7.28
0.38	3.14	4.41	5.91	7.30
1.00	3.21	4.49	5.99	7.37
3.00	3.48	4.75	6.25	7.64

TC200G SERIES

DATA SHEET

BT16R

BT16R

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.16	2.16	2.16	2.16
0.38	2.20	2.20	2.20	2.20
1.00	2.26	2.26	2.26	2.26
3.00	2.41	2.41	2.41	2.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.74	0.74	0.74	0.74
0.38	0.77	0.77	0.77	0.77
1.00	0.83	0.83	0.83	0.83
3.00	0.95	0.95	0.95	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.97	3.96	5.08	6.09
0.38	3.02	4.02	5.13	6.14
1.00	3.06	4.06	5.17	6.18
3.00	3.13	4.13	5.24	6.25

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.20	4.47	5.97	7.36
0.38	3.25	4.52	6.02	7.41
1.00	3.29	4.56	6.06	7.45
3.00	3.36	4.63	6.13	7.52

TC200G SERIES

DATA SHEET

BT16R

BT16R

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.16	2.16	2.16	2.16
0.38	2.20	2.20	2.20	2.20
1.00	2.26	2.26	2.26	2.26
3.00	2.41	2.41	2.41	2.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.74	0.74	0.74	0.74
0.38	0.77	0.77	0.77	0.77
1.00	0.83	0.83	0.83	0.83
3.00	0.95	0.95	0.95	0.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.16

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.97	3.96	5.08	6.09
0.38	3.02	4.02	5.13	6.14
1.00	3.06	4.06	5.17	6.18
3.00	3.13	4.13	5.24	6.25

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

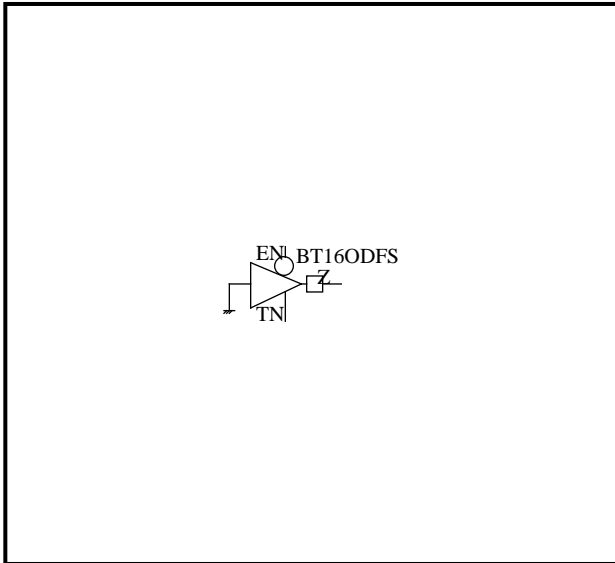
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.20	4.47	5.97	7.36
0.38	3.25	4.52	6.02	7.41
1.00	3.29	4.56	6.06	7.45
3.00	3.36	4.63	6.13	7.52

TC200G SERIES

DATA SHEET

BT16ODFS		BT16ODFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT16ODFS	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 16mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
EN	TN	Z
L	H	L
H	X	H _z
X	L	H _z

Verilog-HDL DESCRIPTION

```
BT16ODFS inst(Z,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT16ODFS
port map(Z,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT16ODFS

BT16ODFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.44	0.44	0.44	0.44
0.38	0.52	0.52	0.52	0.52
1.00	0.61	0.61	0.61	0.61
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.75	2.51	3.44	4.33
0.38	1.76	2.52	3.45	4.34
1.00	1.84	2.60	3.53	4.42
3.00	2.09	2.85	3.79	4.68

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.44	0.44	0.44	0.44
0.38	0.52	0.52	0.52	0.52
1.00	0.61	0.61	0.61	0.61
3.00	0.74	0.74	0.74	0.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.75	2.51	3.44	4.33
0.38	1.76	2.52	3.45	4.34
1.00	1.84	2.60	3.53	4.42
3.00	2.09	2.85	3.79	4.68

TC200G SERIES

DATA SHEET

BT16ODFS

BT16ODFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.57	0.57	0.57	0.57
0.38	0.60	0.60	0.60	0.60
1.00	0.66	0.66	0.66	0.66
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.48

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.82	2.58	3.51	4.40
0.38	1.87	2.63	3.56	4.46
1.00	1.91	2.67	3.60	4.49
3.00	1.98	2.74	3.67	4.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.57	0.57	0.57	0.57
0.38	0.60	0.60	0.60	0.60
1.00	0.66	0.66	0.66	0.66
3.00	0.78	0.78	0.78	0.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.48

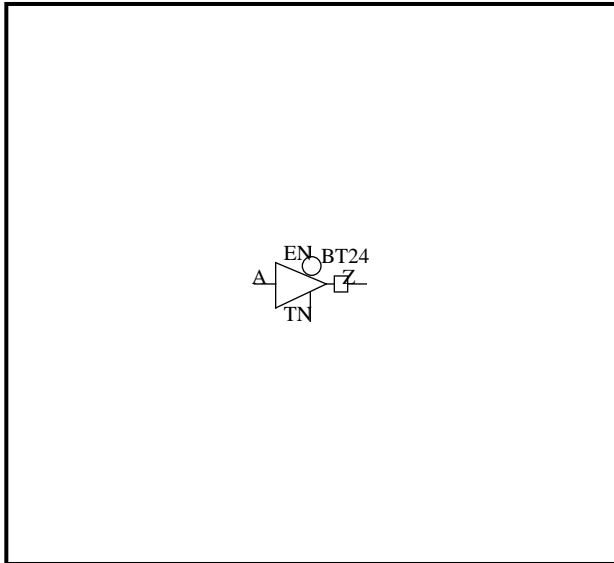
PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.82	2.58	3.51	4.40
0.38	1.87	2.63	3.56	4.46
1.00	1.91	2.67	3.60	4.49
3.00	1.98	2.74	3.67	4.56

TC200G SERIES

DATA SHEET

BT24		BT24		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT24	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 24mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	2	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT24 inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT24
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	13.11
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT24

BT24

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.60	2.15	2.75	3.28
0.38	1.68	2.23	2.83	3.36
1.00	1.83	2.39	2.99	3.51
3.00	2.36	2.92	3.52	4.04

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.23	1.73	2.37	2.97
0.38	1.24	1.73	2.36	2.97
1.00	1.28	1.77	2.40	3.00
3.00	1.46	1.94	2.57	3.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.60	2.15	2.75	3.28
0.38	1.68	2.23	2.83	3.36
1.00	1.83	2.39	2.99	3.51
3.00	2.36	2.92	3.52	4.04

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.23	1.73	2.37	2.97
0.38	1.24	1.73	2.36	2.97
1.00	1.28	1.77	2.40	3.00
3.00	1.46	1.94	2.57	3.17

TC200G SERIES

DATA SHEET

BT24

BT24

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	1.66	1.66	1.66
0.38	1.75	1.75	1.75	1.75
1.00	1.87	1.87	1.87	1.87
3.00	2.09	2.09	2.09	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.68	0.68	0.68	0.68
0.38	0.77	0.77	0.77	0.77
1.00	0.89	0.89	0.89	0.89
3.00	1.11	1.11	1.11	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.38	2.96	3.57	4.10
0.38	2.39	2.97	3.58	4.11
1.00	2.46	3.04	3.65	4.18
3.00	2.74	3.32	3.93	4.46

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.12	2.67	3.32	3.93
0.38	2.14	2.68	3.34	3.95
1.00	2.20	2.75	3.41	4.02
3.00	2.48	3.03	3.69	4.30

TC200G SERIES

DATA SHEET

BT24

BT24

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	1.66	1.66	1.66
0.38	1.75	1.75	1.75	1.75
1.00	1.87	1.87	1.87	1.87
3.00	2.09	2.09	2.09	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.68	0.68	0.68	0.68
0.38	0.77	0.77	0.77	0.77
1.00	0.89	0.89	0.89	0.89
3.00	1.11	1.11	1.11	1.11

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.38	2.96	3.57	4.10
0.38	2.39	2.97	3.58	4.11
1.00	2.46	3.04	3.65	4.18
3.00	2.74	3.32	3.93	4.46

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.12	2.67	3.32	3.93
0.38	2.14	2.68	3.34	3.95
1.00	2.20	2.75	3.41	4.02
3.00	2.48	3.03	3.69	4.30

TC200G SERIES

DATA SHEET

BT24

BT24

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.80	1.80	1.80	1.80
0.38	1.83	1.83	1.83	1.83
1.00	1.88	1.88	1.88	1.88
3.00	2.01	2.01	2.01	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.81	0.81	0.81	0.81
0.38	0.84	0.84	0.84	0.84
1.00	0.90	0.90	0.90	0.90
3.00	1.03	1.03	1.03	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.45	3.03	3.64	4.17
0.38	2.51	3.09	3.70	4.23
1.00	2.55	3.13	3.74	4.27
3.00	2.61	3.19	3.80	4.33

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.20	2.75	3.40	4.01
0.38	2.25	2.80	3.45	4.06
1.00	2.29	2.84	3.49	4.10
3.00	2.36	2.91	3.56	4.17

TC200G SERIES

DATA SHEET

BT24

BT24

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.80	1.80	1.80	1.80
0.38	1.83	1.83	1.83	1.83
1.00	1.88	1.88	1.88	1.88
3.00	2.01	2.01	2.01	2.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.81	0.81	0.81	0.81
0.38	0.84	0.84	0.84	0.84
1.00	0.90	0.90	0.90	0.90
3.00	1.03	1.03	1.03	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.45	3.03	3.64	4.17
0.38	2.51	3.09	3.70	4.23
1.00	2.55	3.13	3.74	4.27
3.00	2.61	3.19	3.80	4.33

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

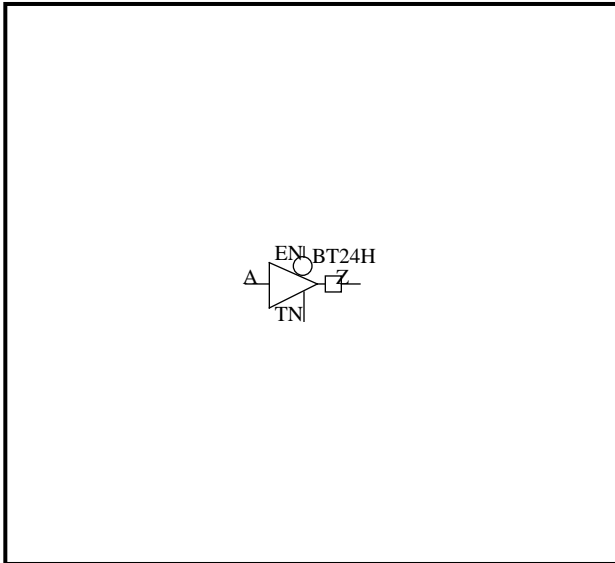
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.20	2.75	3.40	4.01
0.38	2.25	2.80	3.45	4.06
1.00	2.29	2.84	3.49	4.10
3.00	2.36	2.91	3.56	4.17

TC200G SERIES

DATA SHEET

BT24H		BT24H		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT24H	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 24mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	2	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT24H inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT24H
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	18.71
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT24H

BT24H

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.71	1.08	1.55	2.00
0.38	0.79	1.16	1.63	2.08
1.00	0.94	1.31	1.78	2.23
3.00	1.29	1.67	2.14	2.59

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.85	1.27	1.85	2.42
0.38	0.86	1.27	1.85	2.42
1.00	0.89	1.29	1.87	2.44
3.00	1.02	1.40	1.96	2.52

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.71	1.08	1.55	2.00
0.38	0.79	1.16	1.63	2.08
1.00	0.94	1.31	1.78	2.23
3.00	1.29	1.67	2.14	2.59

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.85	1.27	1.85	2.42
0.38	0.86	1.27	1.85	2.42
1.00	0.89	1.29	1.87	2.44
3.00	1.02	1.40	1.96	2.52

TC200G SERIES

DATA SHEET

BT24H

BT24H

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.51	1.51	1.51	1.51
0.38	1.60	1.60	1.60	1.60
1.00	1.73	1.73	1.73	1.73
3.00	2.00	2.00	2.00	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.92	0.92	0.92	0.92
0.38	1.01	1.01	1.01	1.01
1.00	1.15	1.15	1.15	1.15
3.00	1.41	1.41	1.41	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	2.06	2.54	3.00
0.38	1.68	2.08	2.56	3.01
1.00	1.74	2.14	2.62	3.07
3.00	2.02	2.42	2.90	3.36

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.99	2.45	3.05	3.63
0.38	2.01	2.47	3.06	3.65
1.00	2.07	2.53	3.13	3.71
3.00	2.35	2.81	3.41	3.99

TC200G SERIES

DATA SHEET

BT24H

BT24H

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.51	1.51	1.51	1.51
0.38	1.60	1.60	1.60	1.60
1.00	1.73	1.73	1.73	1.73
3.00	2.00	2.00	2.00	2.00

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.92	0.92	0.92	0.92
0.38	1.01	1.01	1.01	1.01
1.00	1.15	1.15	1.15	1.15
3.00	1.41	1.41	1.41	1.41

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.66	2.06	2.54	3.00
0.38	1.68	2.08	2.56	3.01
1.00	1.74	2.14	2.62	3.07
3.00	2.02	2.42	2.90	3.36

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.99	2.45	3.05	3.63
0.38	2.01	2.47	3.06	3.65
1.00	2.07	2.53	3.13	3.71
3.00	2.35	2.81	3.41	3.99

TC200G SERIES

DATA SHEET

BT24H

BT24H

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.64	1.64	1.64	1.64
0.38	1.68	1.68	1.68	1.68
1.00	1.73	1.73	1.73	1.73
3.00	1.86	1.86	1.86	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.06	1.06	1.06	1.06
0.38	1.09	1.09	1.09	1.09
1.00	1.15	1.15	1.15	1.15
3.00	1.27	1.27	1.27	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.74	2.14	2.62	3.07
0.38	1.79	2.19	2.67	3.13
1.00	1.83	2.23	2.71	3.17
3.00	1.90	2.30	2.78	3.23

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.07	2.53	3.13	3.71
0.38	2.12	2.58	3.18	3.76
1.00	2.16	2.62	3.22	3.80
3.00	2.23	2.69	3.29	3.87

TC200G SERIES

DATA SHEET

BT24H

BT24H

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.64	1.64	1.64	1.64
0.38	1.68	1.68	1.68	1.68
1.00	1.73	1.73	1.73	1.73
3.00	1.86	1.86	1.86	1.86

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.06	1.06	1.06	1.06
0.38	1.09	1.09	1.09	1.09
1.00	1.15	1.15	1.15	1.15
3.00	1.27	1.27	1.27	1.27

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.74	2.14	2.62	3.07
0.38	1.79	2.19	2.67	3.13
1.00	1.83	2.23	2.71	3.17
3.00	1.90	2.30	2.78	3.23

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.31

PATH DELAY (ns)

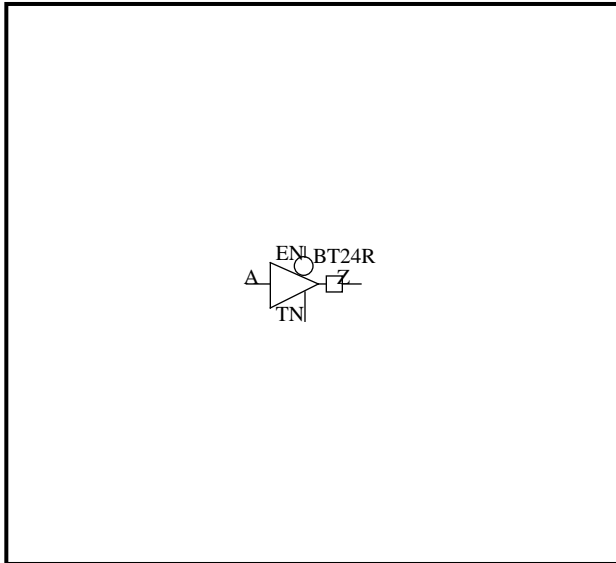
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.07	2.53	3.13	3.71
0.38	2.12	2.58	3.18	3.76
1.00	2.16	2.62	3.22	3.80
3.00	2.23	2.69	3.29	3.87

TC200G SERIES

DATA SHEET

BT24R		BT24R		1/6
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT24R	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 24mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	2	

LOGIC SYMBOL



TRUTH TABLE

EN	INPUT		OUTPUT
	A	TN	
L	L	H	L
L	H	H	H
H	X	X	Hz
X	X	L	Hz

Verilog-HDL DESCRIPTION

```
BT24R inst(Z,A,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT24R
port map(Z,A,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	15.44
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT24R

BT24R

2/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.11	2.84	3.65	4.38
0.38	2.23	2.96	3.77	4.49
1.00	2.42	3.15	3.96	4.68
3.00	3.06	3.79	4.60	5.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.57	3.52	4.61	5.59
0.38	2.62	3.58	4.66	5.65
1.00	2.74	3.69	4.78	5.76
3.00	3.13	4.09	5.17	6.15

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.11	2.84	3.65	4.38
0.38	2.23	2.96	3.77	4.49
1.00	2.42	3.15	3.96	4.68
3.00	3.06	3.79	4.60	5.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.57	3.52	4.61	5.59
0.38	2.62	3.58	4.66	5.65
1.00	2.74	3.69	4.78	5.76
3.00	3.13	4.09	5.17	6.15

TC200G SERIES

DATA SHEET

BT24R

BT24R

3/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.70	1.70	1.70	1.70
0.38	1.80	1.80	1.80	1.80
1.00	1.93	1.93	1.93	1.93
3.00	2.16	2.16	2.16	2.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.82	0.82	0.82	0.82
0.38	0.91	0.91	0.91	0.91
1.00	1.03	1.03	1.03	1.03
3.00	1.24	1.24	1.24	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.11	3.87	4.70	5.42
0.38	3.13	3.89	4.71	5.43
1.00	3.19	3.96	4.78	5.50
3.00	3.48	4.24	5.06	5.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.46	4.42	5.50	6.48
0.38	3.48	4.43	5.52	6.50
1.00	3.54	4.50	5.58	6.56
3.00	3.82	4.78	5.86	6.84

TC200G SERIES

DATA SHEET

BT24R

BT24R

4/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.70	1.70	1.70	1.70
0.38	1.80	1.80	1.80	1.80
1.00	1.93	1.93	1.93	1.93
3.00	2.16	2.16	2.16	2.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.82	0.82	0.82	0.82
0.38	0.91	0.91	0.91	0.91
1.00	1.03	1.03	1.03	1.03
3.00	1.24	1.24	1.24	1.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.11	3.87	4.70	5.42
0.38	3.13	3.89	4.71	5.43
1.00	3.19	3.96	4.78	5.50
3.00	3.48	4.24	5.06	5.79

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.46	4.42	5.50	6.48
0.38	3.48	4.43	5.52	6.50
1.00	3.54	4.50	5.58	6.56
3.00	3.82	4.78	5.86	6.84

TC200G SERIES

DATA SHEET

BT24R

BT24R

5/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.84	1.84	1.84	1.84
0.38	1.88	1.88	1.88	1.88
1.00	1.94	1.94	1.94	1.94
3.00	2.09	2.09	2.09	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.96	0.96	0.96	0.96
0.38	0.99	0.99	0.99	0.99
1.00	1.05	1.05	1.05	1.05
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.19	3.95	4.77	5.49
0.38	3.24	4.00	4.82	5.55
1.00	3.28	4.04	4.86	5.59
3.00	3.35	4.11	4.93	5.66

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.54	4.49	5.58	6.56
0.38	3.59	4.54	5.63	6.61
1.00	3.63	4.59	5.67	6.65
3.00	3.70	4.65	5.74	6.72

TC200G SERIES

DATA SHEET

BT24R

BT24R

6/6

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	1-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.84	1.84	1.84	1.84
0.38	1.88	1.88	1.88	1.88
1.00	1.94	1.94	1.94	1.94
3.00	2.09	2.09	2.09	2.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.96	0.96	0.96	0.96
0.38	0.99	0.99	0.99	0.99
1.00	1.05	1.05	1.05	1.05
3.00	1.17	1.17	1.17	1.17

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-1	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.19	3.95	4.77	5.49
0.38	3.24	4.00	4.82	5.55
1.00	3.28	4.04	4.86	5.59
3.00	3.35	4.11	4.93	5.66

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

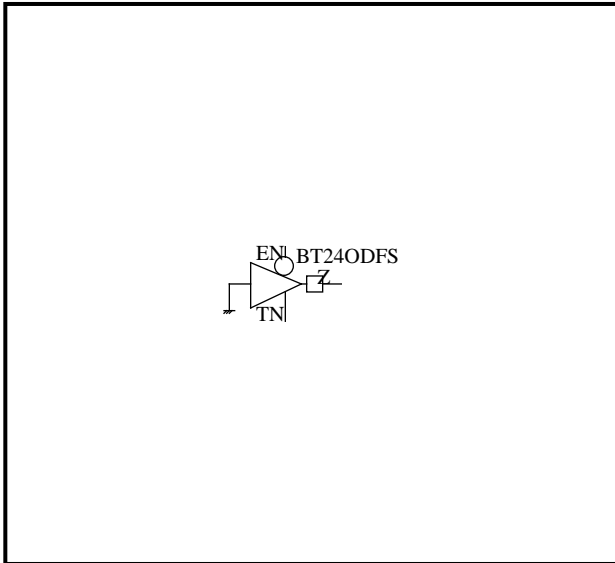
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	3.54	4.49	5.58	6.56
0.38	3.59	4.54	5.63	6.61
1.00	3.63	4.59	5.67	6.65
3.00	3.70	4.65	5.74	6.72

TC200G SERIES

DATA SHEET

BT24ODFS		BT24ODFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BT24ODFS	TRI-STATE OUTPUT BUFFER (LOW ENABLE) 24mA OPEN DRAIN with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		3	2	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
EN	TN	Z
L	H	L
H	X	H _z
X	L	H _z

Verilog-HDL DESCRIPTION

```
BT24ODFS inst(Z,EN,TN);
```

VHDL DESCRIPTION

```
inst:BT24ODFS
port map(Z,EN,TN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
EN	0.98
TN	1.00

TC200G SERIES

DATA SHEET

BT24ODFS

BT24ODFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.62	0.62	0.62	0.62
0.38	0.71	0.71	0.71	0.71
1.00	0.83	0.83	0.83	0.83
3.00	1.03	1.03	1.03	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.96	2.53	3.19	3.80
0.38	1.98	2.54	3.20	3.81
1.00	2.05	2.61	3.27	3.88
3.00	2.33	2.89	3.55	4.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.62	0.62	0.62	0.62
0.38	0.71	0.71	0.71	0.71
1.00	0.83	0.83	0.83	0.83
3.00	1.03	1.03	1.03	1.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.96	2.53	3.19	3.80
0.38	1.98	2.54	3.20	3.81
1.00	2.05	2.61	3.27	3.88
3.00	2.33	2.89	3.55	4.16

TC200G SERIES

DATA SHEET

BT24ODFS

BT24ODFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.75	0.75	0.75	0.75
0.38	0.79	0.79	0.79	0.79
1.00	0.84	0.84	0.84	0.84
3.00	0.97	0.97	0.97	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.48

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.04	2.60	3.26	3.87
0.38	2.09	2.66	3.31	3.93
1.00	2.13	2.70	3.35	3.96
3.00	2.20	2.76	3.42	4.03

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	0-Z	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0000	0.00

PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.75	0.75	0.75	0.75
0.38	0.79	0.79	0.79	0.79
1.00	0.84	0.84	0.84	0.84
3.00	0.97	0.97	0.97	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
TN->Z	---	Z-0	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.48

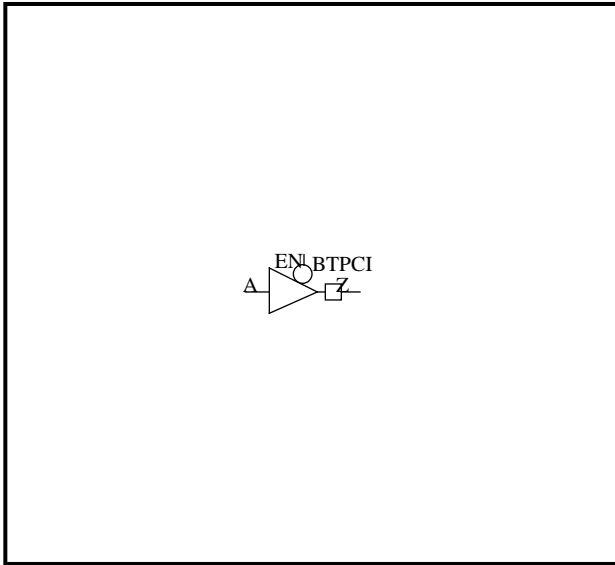
PATH DELAY (ns)				
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.04	2.60	3.26	3.87
0.38	2.09	2.66	3.31	3.93
1.00	2.13	2.70	3.35	3.96
3.00	2.20	2.76	3.42	4.03

TC200G SERIES

DATA SHEET

BTPCI		BTPCI		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
BTPCI	PCI (Peripheral Component Interconnect) BUS TRI-STATE OUTPUT BUFFER (LOW ENABLE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT
EN	A	Z
L	L	L
L	H	H
H	X	Hz
X	X	Hz

Verilog-HDL DESCRIPTION

```
BTPCI inst(Z,A,EN);
```

VHDL DESCRIPTION

```
inst:BTPCI
port map(Z,A,EN);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	3.92
EN	3.97

TC200G SERIES

DATA SHEET

BTPCI

BTPCI

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.84	2.77	3.84	4.84
0.38	1.93	2.86	3.93	4.93
1.00	2.10	3.02	4.09	5.09
3.00	2.64	3.57	4.65	5.65

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.75

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.71	2.51	3.49	4.41
0.38	1.74	2.54	3.51	4.43
1.00	1.80	2.59	3.57	4.49
3.00	2.03	2.84	3.82	4.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	1-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.75

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.01	2.01	2.01	2.01
0.38	2.08	2.08	2.08	2.08
1.00	2.15	2.15	2.15	2.15
3.00	2.28	2.28	2.28	2.28

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	0-Z	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.15	0.15	0.15	0.15
0.38	0.24	0.24	0.24	0.24
1.00	0.37	0.37	0.37	0.37
3.00	0.56	0.56	0.56	0.56

TC200G SERIES

DATA SHEET

BTPCI

BTPCI

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-1	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.88	2.84	3.93	4.93
0.38	1.92	2.88	3.97	4.97
1.00	1.98	2.94	4.03	5.03
3.00	2.11	3.07	4.16	5.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
EN->Z	---	Z-0	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.75

PATH DELAY (ns)

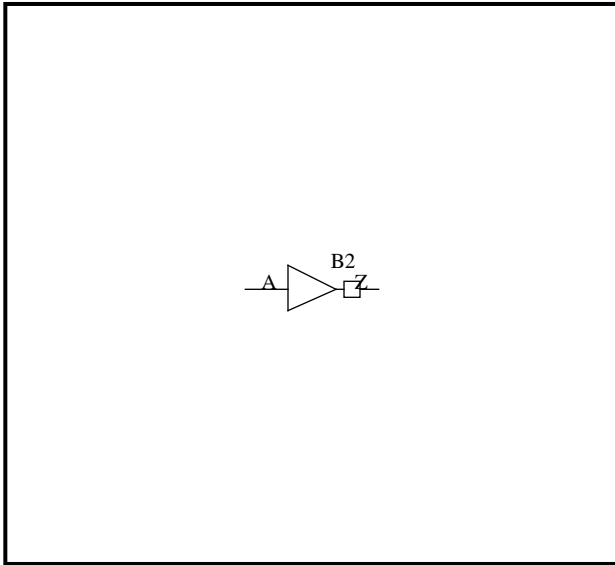
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.62	2.49	3.49	4.41
0.38	1.62	2.49	3.49	4.41
1.00	1.64	2.50	3.50	4.42
3.00	1.75	2.61	3.61	4.54

TC200G SERIES

DATA SHEET

B2		B2		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B2	OUTPUT BUFFER (2mA DRIVE)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B2 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B2
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	5.21

TC200G SERIES

DATA SHEET

B2

B2

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.90

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.51	1.97	2.85	4.57
0.38	1.59	2.05	2.94	4.66
1.00	1.76	2.22	3.10	4.82
3.00	2.25	2.72	3.60	5.33

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.93

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.79	2.48	3.83	6.52
0.38	1.79	2.47	3.83	6.52
1.00	1.83	2.51	3.87	6.56
3.00	2.00	2.69	4.04	6.74

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0002	0.90

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.51	1.97	2.85	4.57
0.38	1.59	2.05	2.94	4.66
1.00	1.76	2.22	3.10	4.82
3.00	2.25	2.72	3.60	5.33

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0003	0.93

PATH DELAY (ns)

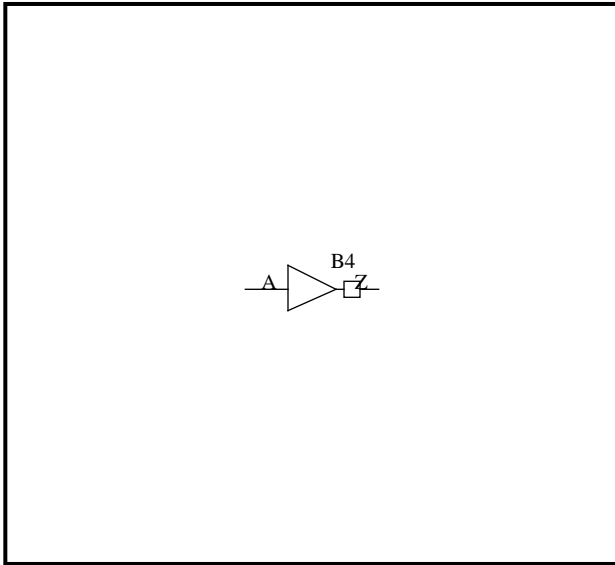
LOAD (pF) SLEW (ns)	5.00	10.00	20.00	40.00
0.01	1.79	2.48	3.83	6.52
0.38	1.79	2.47	3.83	6.52
1.00	1.83	2.51	3.87	6.56
3.00	2.00	2.69	4.04	6.74

TC200G SERIES

DATA SHEET

B4		B4		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B4	OUTPUT BUFFER 4mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B4 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B4
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	5.21

TC200G SERIES

DATA SHEET

B4

B4

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.77

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.75	2.88	4.48	6.57
0.38	1.83	2.96	4.56	6.65
1.00	1.99	3.13	4.72	6.81
3.00	2.52	3.66	5.25	7.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.61

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.74	3.16	5.25	8.01
0.38	1.74	3.16	5.24	8.01
1.00	1.78	3.20	5.28	8.04
3.00	1.95	3.37	5.46	8.22

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.77

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.75	2.88	4.48	6.57
0.38	1.83	2.96	4.56	6.65
1.00	1.99	3.13	4.72	6.81
3.00	2.52	3.66	5.25	7.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.61

PATH DELAY (ns)

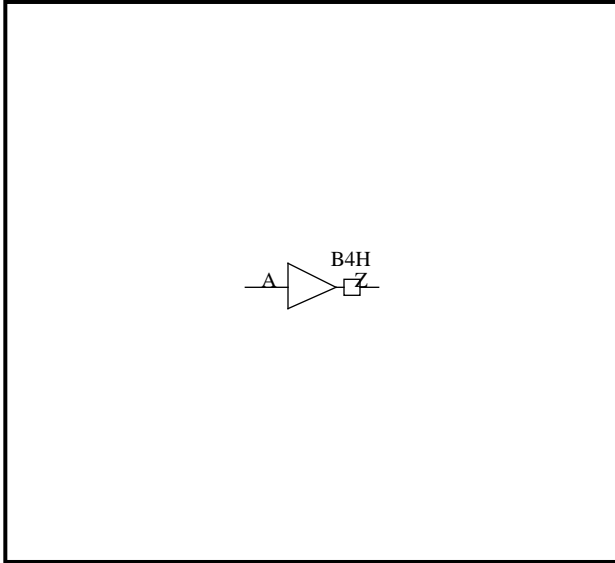
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.74	3.16	5.25	8.01
0.38	1.74	3.16	5.24	8.01
1.00	1.78	3.20	5.28	8.04
3.00	1.95	3.37	5.46	8.22

TC200G SERIES

DATA SHEET

B4H		B4H		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B4H	OUTPUT BUFFER 4mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B4H inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B4H
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	9.56

TC200G SERIES

DATA SHEET

B4H

B4H

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.97	2.02	3.58	5.65
0.38	1.05	2.10	3.66	5.74
1.00	1.17	2.21	3.77	5.85
3.00	1.41	2.46	4.02	6.10

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.47

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.23	2.62	4.69	7.45
0.38	1.24	2.62	4.69	7.45
1.00	1.26	2.64	4.71	7.47
3.00	1.31	2.68	4.75	7.50

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0047	0.46

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.97	2.02	3.58	5.65
0.38	1.05	2.10	3.66	5.74
1.00	1.17	2.21	3.77	5.85
3.00	1.41	2.46	4.02	6.10

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0050	0.47

PATH DELAY (ns)

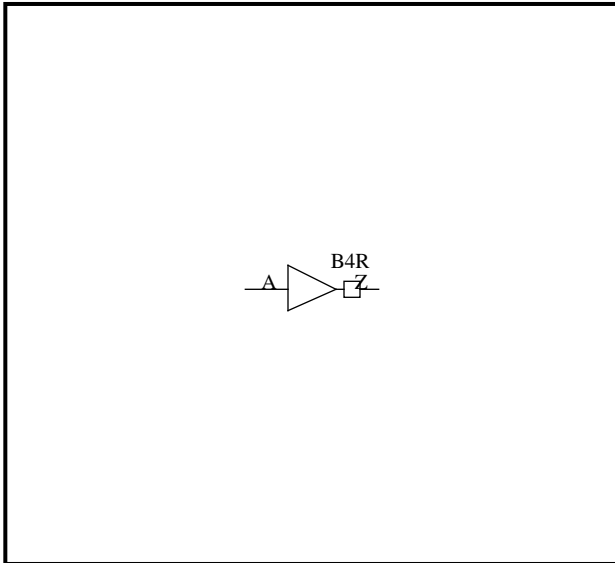
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.23	2.62	4.69	7.45
0.38	1.24	2.62	4.69	7.45
1.00	1.26	2.64	4.71	7.47
3.00	1.31	2.68	4.75	7.50

TC200G SERIES

DATA SHEET

B4R		B4R		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B4R	OUTPUT BUFFER 4mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B4R inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B4R
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	6.50

TC200G SERIES

DATA SHEET

B4R

B4R

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0057	1.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.36	3.92	6.05	8.65
0.38	2.45	4.02	6.15	8.76
1.00	2.63	4.20	6.33	8.93
3.00	3.25	4.82	6.95	9.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0065	1.67

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.35	5.58	8.63	12.38
0.38	3.39	5.62	8.67	12.42
1.00	3.53	5.77	8.82	12.56
3.00	3.99	6.23	9.28	13.02

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0057	1.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.36	3.92	6.05	8.65
0.38	2.45	4.02	6.15	8.76
1.00	2.63	4.20	6.33	8.93
3.00	3.25	4.82	6.95	9.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0065	1.67

PATH DELAY (ns)

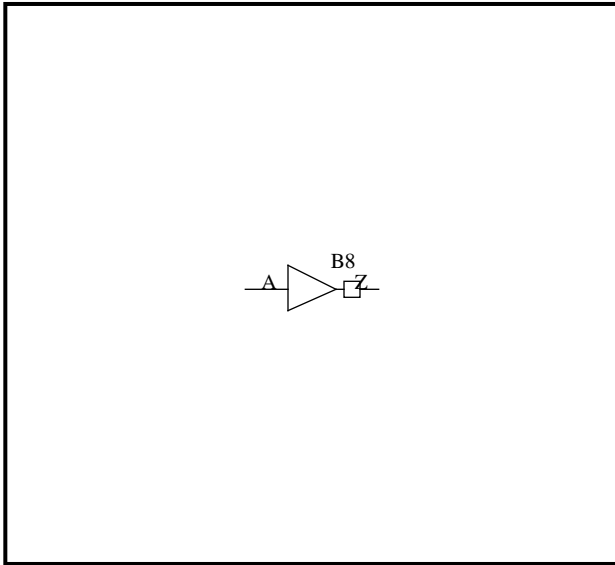
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.35	5.58	8.63	12.38
0.38	3.39	5.62	8.67	12.42
1.00	3.53	5.77	8.82	12.56
3.00	3.99	6.23	9.28	13.02

TC200G SERIES

DATA SHEET

B8		B8		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B8	OUTPUT BUFFER 8mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B8 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B8
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	5.21

TC200G SERIES

DATA SHEET

B8

B8

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.98

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.85	2.60	3.52	4.65
0.38	1.93	2.68	3.60	4.73
1.00	2.09	2.84	3.76	4.89
3.00	2.63	3.38	4.30	5.43

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.59

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.53	2.31	3.40	4.80
0.38	1.53	2.31	3.40	4.80
1.00	1.57	2.35	3.43	4.83
3.00	1.75	2.52	3.60	5.01

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.98

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.85	2.60	3.52	4.65
0.38	1.93	2.68	3.60	4.73
1.00	2.09	2.84	3.76	4.89
3.00	2.63	3.38	4.30	5.43

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0001	0.59

PATH DELAY (ns)

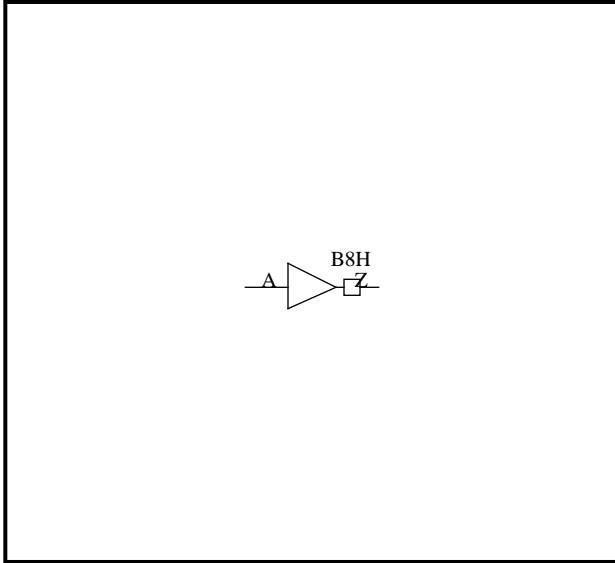
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.53	2.31	3.40	4.80
0.38	1.53	2.31	3.40	4.80
1.00	1.57	2.35	3.43	4.83
3.00	1.75	2.52	3.60	5.01

TC200G SERIES

DATA SHEET

B8H		B8H		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B8H	OUTPUT BUFFER 8mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B8H inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B8H
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	7.94

TC200G SERIES

DATA SHEET

B8H

B8H

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.40

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.90	1.47	2.27	3.32
0.38	0.99	1.55	2.35	3.40
1.00	1.13	1.70	2.50	3.55
3.00	1.49	2.05	2.85	3.90

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.38

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.09	1.80	2.83	4.21
0.38	1.10	1.81	2.84	4.22
1.00	1.13	1.83	2.86	4.23
3.00	1.24	1.92	2.94	4.30

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.40

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	0.90	1.47	2.27	3.32
0.38	0.99	1.55	2.35	3.40
1.00	1.13	1.70	2.50	3.55
3.00	1.49	2.05	2.85	3.90

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.38

PATH DELAY (ns)

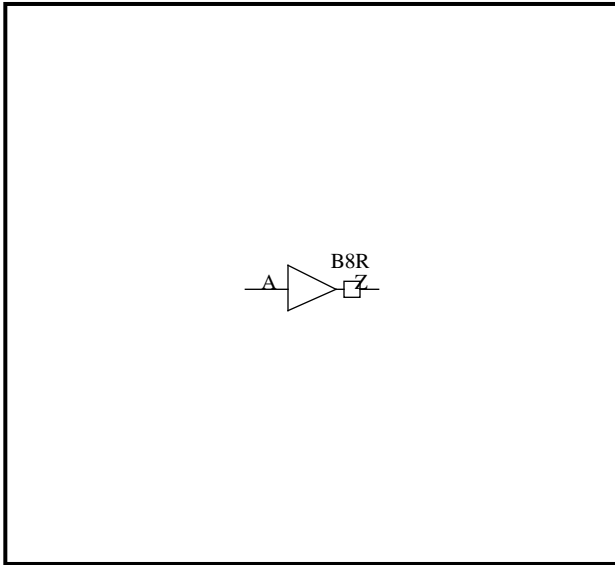
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	1.09	1.80	2.83	4.21
0.38	1.10	1.81	2.84	4.22
1.00	1.13	1.83	2.86	4.23
3.00	1.24	1.92	2.94	4.30

TC200G SERIES

DATA SHEET

B8R		B8R		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B8R	OUTPUT BUFFER 8mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B8R inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B8R
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	6.50

TC200G SERIES

DATA SHEET

B8R

B8R

2/2

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.25

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.42	3.41	4.67	6.22
0.38	2.52	3.52	4.78	6.32
1.00	2.70	3.70	4.96	6.51
3.00	3.31	4.31	5.57	7.12

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.42

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.16	4.55	6.30	8.47
0.38	3.21	4.59	6.35	8.51
1.00	3.34	4.72	6.47	8.64
3.00	3.77	5.15	6.91	9.07

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0032	1.25

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	2.42	3.41	4.67	6.22
0.38	2.52	3.52	4.78	6.32
1.00	2.70	3.70	4.96	6.51
3.00	3.31	4.31	5.57	7.12

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0035	1.42

PATH DELAY (ns)

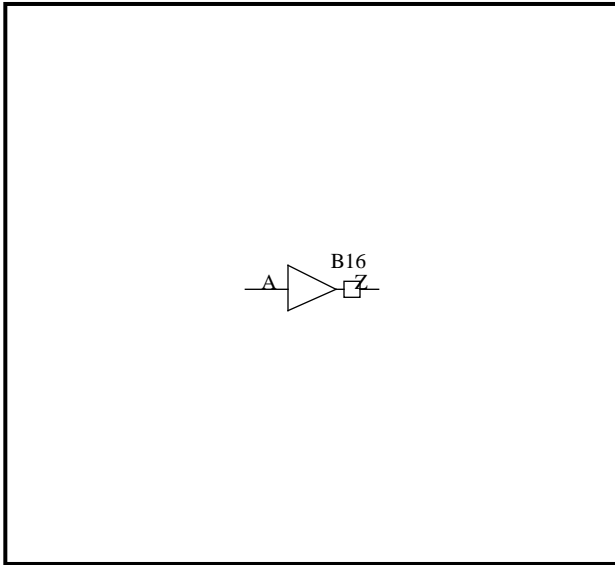
LOAD (pF) SLEW (ns)	10.00	30.00	60.00	100.00
0.01	3.16	4.55	6.30	8.47
0.38	3.21	4.59	6.35	8.51
1.00	3.34	4.72	6.47	8.64
3.00	3.77	5.15	6.91	9.07

TC200G SERIES

DATA SHEET

B16		B16		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B16	OUTPUT BUFFER 16mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B16 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B16
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	6.66

TC200G SERIES

DATA SHEET

B16

B16

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.73	2.45	3.25	3.98
0.38	1.80	2.52	3.33	4.06
1.00	1.95	2.67	3.48	4.21
3.00	2.47	3.20	4.00	4.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.48

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.30	2.00	2.92	3.81
0.38	1.30	2.01	2.92	3.81
1.00	1.34	2.04	2.95	3.84
3.00	1.52	2.22	3.13	4.02

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.73	2.45	3.25	3.98
0.38	1.80	2.52	3.33	4.06
1.00	1.95	2.67	3.48	4.21
3.00	2.47	3.20	4.00	4.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.48

PATH DELAY (ns)

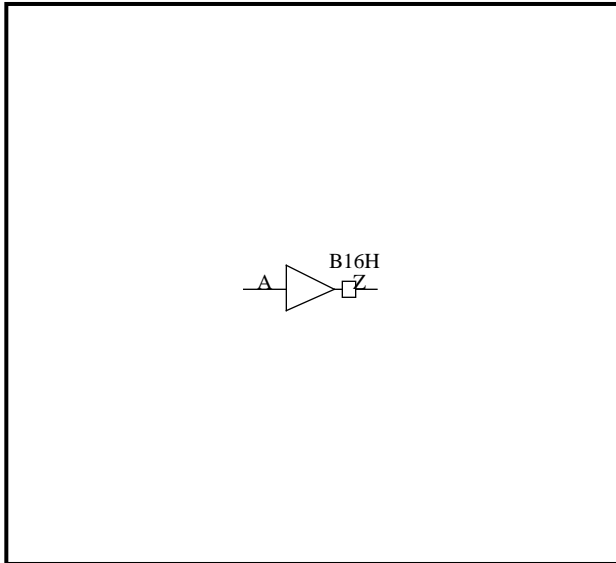
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.30	2.00	2.92	3.81
0.38	1.30	2.01	2.92	3.81
1.00	1.34	2.04	2.95	3.84
3.00	1.52	2.22	3.13	4.02

TC200G SERIES

DATA SHEET

B16H		B16H		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B16H	OUTPUT BUFFER 16mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B16H inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B16H
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	9.56

TC200G SERIES

DATA SHEET

B16H

B16H

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.78	1.31	1.99	2.65
0.38	0.87	1.39	2.07	2.74
1.00	1.01	1.54	2.22	2.88
3.00	1.36	1.89	2.58	3.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.88	1.50	2.37	3.23
0.38	0.90	1.51	2.37	3.23
1.00	0.93	1.54	2.40	3.26
3.00	1.06	1.65	2.49	3.34

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.78	1.31	1.99	2.65
0.38	0.87	1.39	2.07	2.74
1.00	1.01	1.54	2.22	2.88
3.00	1.36	1.89	2.58	3.24

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.33

PATH DELAY (ns)

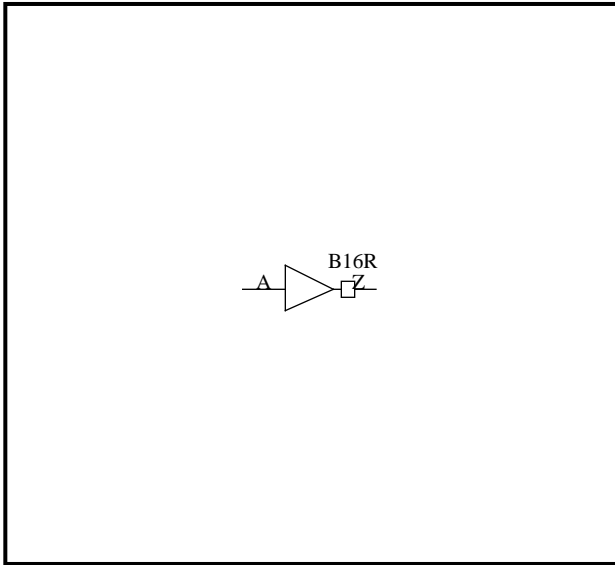
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.88	1.50	2.37	3.23
0.38	0.90	1.51	2.37	3.23
1.00	0.93	1.54	2.40	3.26
3.00	1.06	1.65	2.49	3.34

TC200G SERIES

DATA SHEET

B16R		B16R		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B16R	OUTPUT BUFFER 16mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B16R inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B16R
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	7.85

TC200G SERIES

DATA SHEET

B16R

B16R

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.15

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.25	3.22	4.32	5.33
0.38	2.37	3.34	4.44	5.45
1.00	2.57	3.54	4.64	5.65
3.00	3.24	4.21	5.31	6.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.75	4.00	5.50	6.89
0.38	2.81	4.06	5.56	6.94
1.00	2.91	4.17	5.67	7.06
3.00	3.27	4.54	6.04	7.43

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	1.15

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.25	3.22	4.32	5.33
0.38	2.37	3.34	4.44	5.45
1.00	2.57	3.54	4.64	5.65
3.00	3.24	4.21	5.31	6.32

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0018	1.13

PATH DELAY (ns)

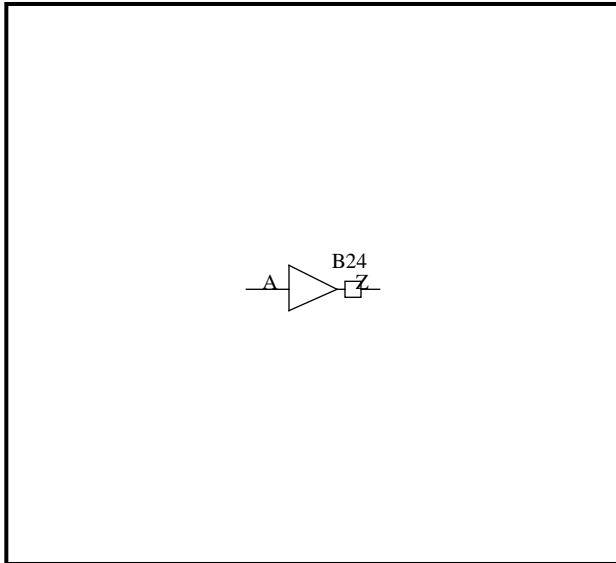
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.75	4.00	5.50	6.89
0.38	2.81	4.06	5.56	6.94
1.00	2.91	4.17	5.67	7.06
3.00	3.27	4.54	6.04	7.43

TC200G SERIES

DATA SHEET

B24		B24		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B24	OUTPUT BUFFER 24mA	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	2	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B24 inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B24
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	12.02

TC200G SERIES

DATA SHEET

B24

B24

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.60	2.16	2.76	3.28
0.38	1.68	2.24	2.84	3.36
1.00	1.83	2.39	2.99	3.51
3.00	2.36	2.92	3.52	4.04

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.22	1.72	2.35	2.95
0.38	1.23	1.72	2.35	2.96
1.00	1.27	1.76	2.39	2.99
3.00	1.45	1.94	2.56	3.16

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.88

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.60	2.16	2.76	3.28
0.38	1.68	2.24	2.84	3.36
1.00	1.83	2.39	2.99	3.51
3.00	2.36	2.92	3.52	4.04

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.50

PATH DELAY (ns)

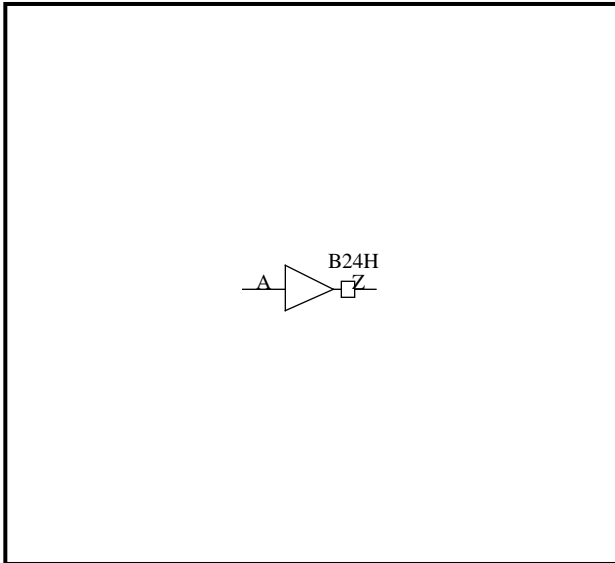
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.22	1.72	2.35	2.95
0.38	1.23	1.72	2.35	2.96
1.00	1.27	1.76	2.39	2.99
3.00	1.45	1.94	2.56	3.16

TC200G SERIES

DATA SHEET

B24H		B24H		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B24H	OUTPUT BUFFER 24mA HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	2	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B24H inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B24H
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	17.61

TC200G SERIES

DATA SHEET

B24H

B24H

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.71	1.08	1.55	2.00
0.38	0.79	1.16	1.63	2.08
1.00	0.94	1.31	1.78	2.23
3.00	1.29	1.67	2.14	2.59

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.38

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.83	1.24	1.82	2.39
0.38	0.84	1.25	1.83	2.40
1.00	0.88	1.28	1.85	2.42
3.00	1.01	1.39	1.96	2.52

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.35

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.71	1.08	1.55	2.00
0.38	0.79	1.16	1.63	2.08
1.00	0.94	1.31	1.78	2.23
3.00	1.29	1.67	2.14	2.59

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0008	0.38

PATH DELAY (ns)

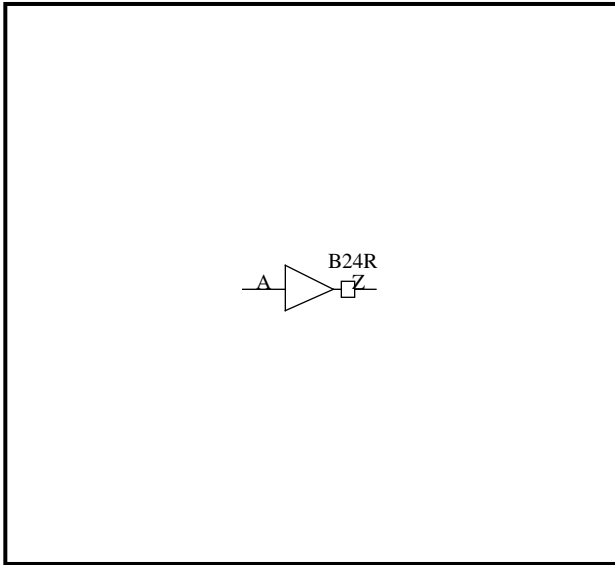
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	0.83	1.24	1.82	2.39
0.38	0.84	1.25	1.83	2.40
1.00	0.88	1.28	1.85	2.42
3.00	1.01	1.39	1.96	2.52

TC200G SERIES

DATA SHEET

B24R		B24R		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
B24R	OUTPUT BUFFER 24mA SLEW RATE CONTROL	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	2	

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
B24R inst(Z,A);
```

VHDL DESCRIPTION

```
inst:B24R
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	14.33

TC200G SERIES

DATA SHEET

B24R

B24R

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.12

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.09	2.82	3.63	4.35
0.38	2.21	2.93	3.74	4.46
1.00	2.40	3.13	3.94	4.66
3.00	3.05	3.78	4.58	5.31

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	CMOS

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.56	3.51	4.60	5.58
0.38	2.61	3.56	4.65	5.63
1.00	2.73	3.68	4.77	5.75
3.00	3.12	4.08	5.16	6.14

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0011	1.12

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.09	2.82	3.63	4.35
0.38	2.21	2.93	3.74	4.46
1.00	2.40	3.13	3.94	4.66
3.00	3.05	3.78	4.58	5.31

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	1.14

PATH DELAY (ns)

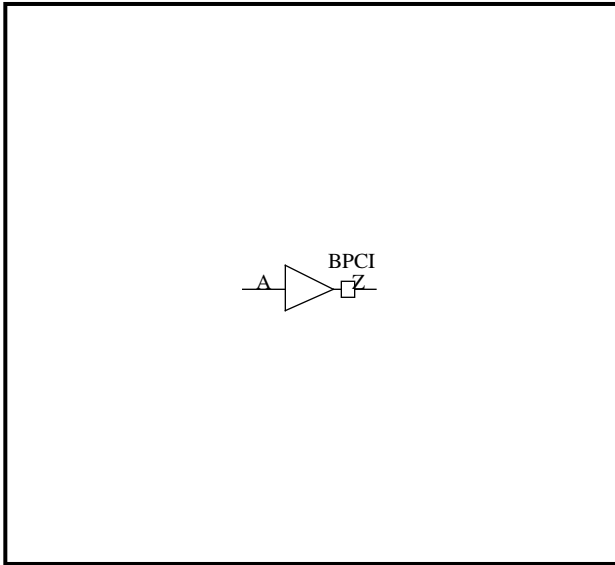
LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	2.56	3.51	4.60	5.58
0.38	2.61	3.56	4.65	5.63
1.00	2.73	3.68	4.77	5.75
3.00	3.12	4.08	5.16	6.14

TC200G SERIES

DATA SHEET

BPCI			BPCI		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION	
BPCI	PCI (Peripheral Component Interconnect) BUS OUTPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.	
		0	1		

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
BPCI inst(Z,A);
```

VHDL DESCRIPTION

```
inst:BPCI
port map(Z,A);
```

INPUT LOAD (LU)

PIN NAME	LOAD
A	3.92

TC200G SERIES

DATA SHEET

BPCI

BPCI

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	TTL

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0016	0.96

PATH DELAY (ns)

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01	1.84	2.77	3.84	4.84
0.38	1.93	2.86	3.93	4.93
1.00	2.10	3.02	4.09	5.09
3.00	2.64	3.57	4.65	5.65

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.75

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	TTL

LOAD (pF) SLEW (ns)	15.00	50.00	100.00	150.00
0.01				
0.38				
1.00				
3.00				3820

TC200G SERIES

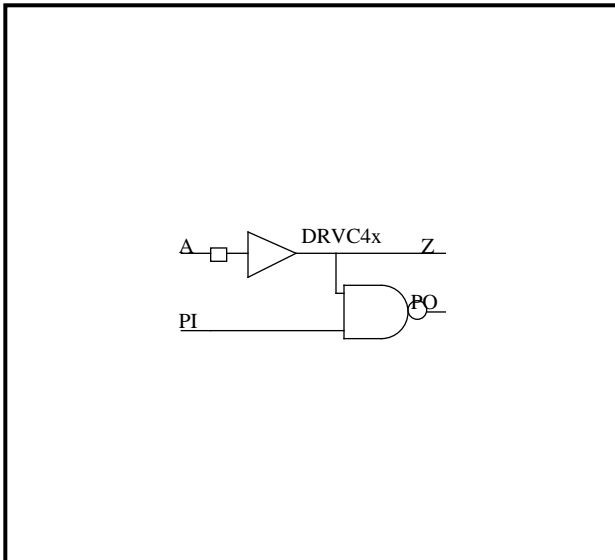
DATA SHEET

DRVC4x		DRVC4x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVC4x	CLOCK DRIVER with CMOS LEVEL INPUT BUFFER (equal 4mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVC4	DRVC4D	DRVC4U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVC4x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVC4x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	537.0	34.3

(LU)

TC200G SERIES

DATA SHEET

DRVC4x

DRVC4x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0061	0.07

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.77	1.90	3.59	5.85
0.38	0.83	1.95	3.65	5.90
1.00	0.89	2.02	3.71	5.97
3.00	1.01	2.14	3.83	6.08

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0052	0.06

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.04	2.64	5.00	7.61
0.38	1.07	2.67	5.04	7.69
1.00	1.15	2.75	5.12	7.83
3.00	1.30	2.91	5.29	8.15

TC200G SERIES

DATA SHEET

DRV4x

DRV4x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

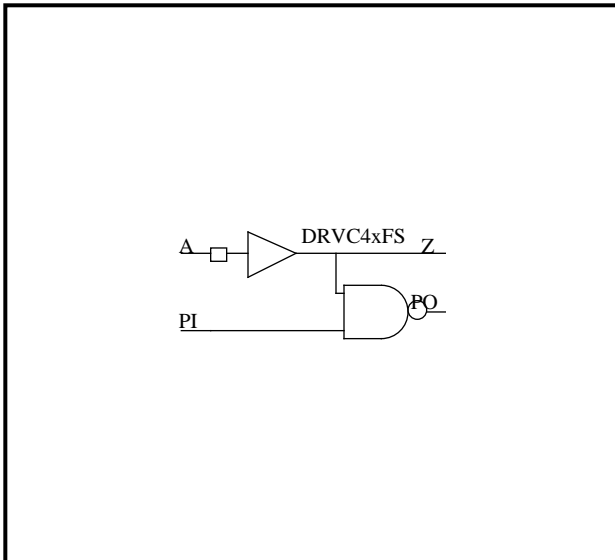
DATA SHEET

DRVC4xFS		DRVC4xFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVC4xFS	CLOCK DRIVER with CMOS LEVEL INPUT BUFFER (equal 4mA DRIVER) with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN
DRVC4FS	DRVC4DFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVC4xFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVC4xFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	537.0	34.3

(LU)

TC200G SERIES

DATA SHEET

DRVC4xFS

DRVC4xFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0061	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.77	1.90	3.59	5.85
0.38	0.83	1.95	3.65	5.90
1.00	0.89	2.02	3.71	5.97
3.00	1.01	2.14	3.83	6.08

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0052	0.06

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.04	2.64	5.00	7.61
0.38	1.07	2.67	5.04	7.69
1.00	1.15	2.75	5.12	7.83
3.00	1.30	2.91	5.29	8.15

TC200G SERIES

DATA SHEET

DRVC4xFS

DRVC4xFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

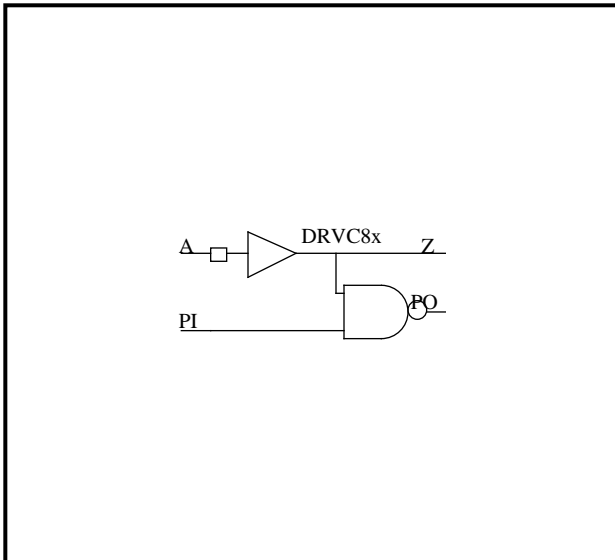
DATA SHEET

DRVC8x		DRVC8x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVC8x	CLOCK DRIVER with CMOS LEVEL INPUT BUFFER (equal 8mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVC8	DRVC8D	DRVC8U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVC8x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVC8x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	1171.4	34.3

(LU)

TC200G SERIES

DATA SHEET

DRV8x

DRV8x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.24

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.61	1.06	1.73	2.62
0.38	0.67	1.12	1.79	2.67
1.00	0.76	1.21	1.88	2.77
3.00	0.93	1.39	2.06	2.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.25

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.89	1.67	2.83	4.37
0.38	0.92	1.70	2.86	4.40
1.00	1.01	1.79	2.95	4.49
3.00	1.23	2.01	3.17	4.71

TC200G SERIES

DATA SHEET

DRVC8x

DRVC8x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

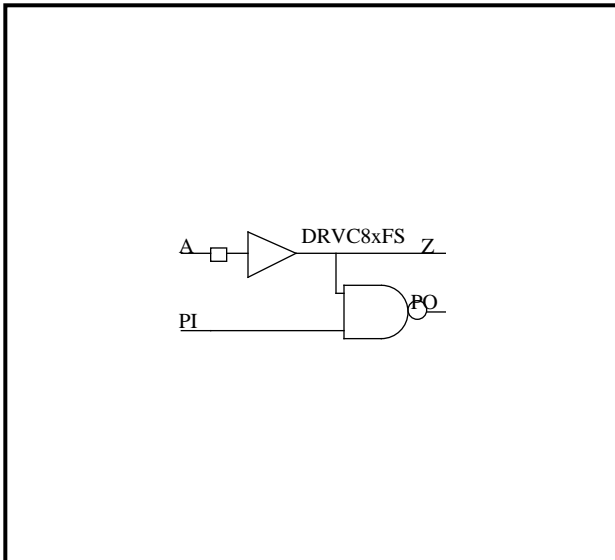
DATA SHEET

DRVC8xFS		DRVC8xFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVC8xFS	CLOCK DRIVER with CMOS LEVEL INPUT BUFFER (equal 8mA DRIVER) with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN
DRVC8FS	DRVC8DFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVC8xFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVC8xFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	1171.4	34.3

TC200G SERIES

DATA SHEET

DRVC8xFS

DRVC8xFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.24

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.61	1.06	1.73	2.62
0.38	0.67	1.12	1.79	2.67
1.00	0.76	1.21	1.88	2.77
3.00	0.93	1.39	2.06	2.95

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.25

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.89	1.67	2.83	4.37
0.38	0.92	1.70	2.86	4.40
1.00	1.01	1.79	2.95	4.49
3.00	1.23	2.01	3.17	4.71

TC200G SERIES

DATA SHEET

DRVC8xFS

DRVC8xFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

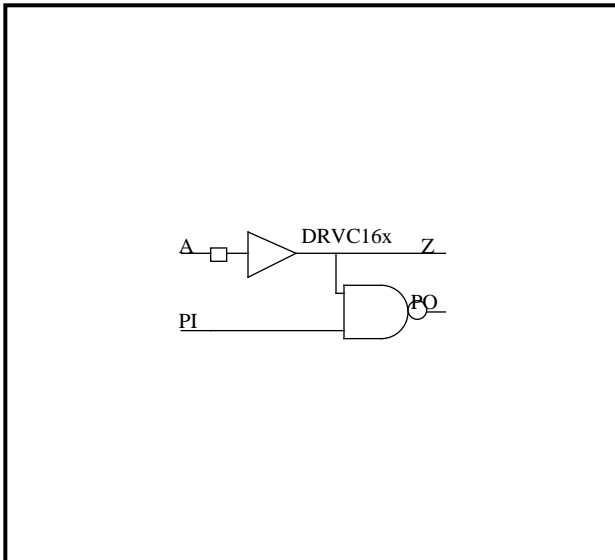
DATA SHEET

DRVC16x		DRVC16x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVC16x	CLOCK DRIVER with CMOS LEVEL INPUT BUFFER (equal 16mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVC16	DRVC16D	DRVC16U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVC16x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVC16x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	2389.3	34.3

TC200G SERIES

DATA SHEET

DRVC16x

DRVC16x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.19

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.64	1.05	1.61	2.17
0.38	0.69	1.10	1.66	2.22
1.00	0.80	1.21	1.77	2.33
3.00	1.02	1.44	2.00	2.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0013	0.21

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.87	1.57	2.55	3.52
0.38	0.91	1.61	2.58	3.55
1.00	1.01	1.70	2.68	3.65
3.00	1.27	1.97	2.94	3.91

TC200G SERIES

DATA SHEET

DRVC16x

DRVC16x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

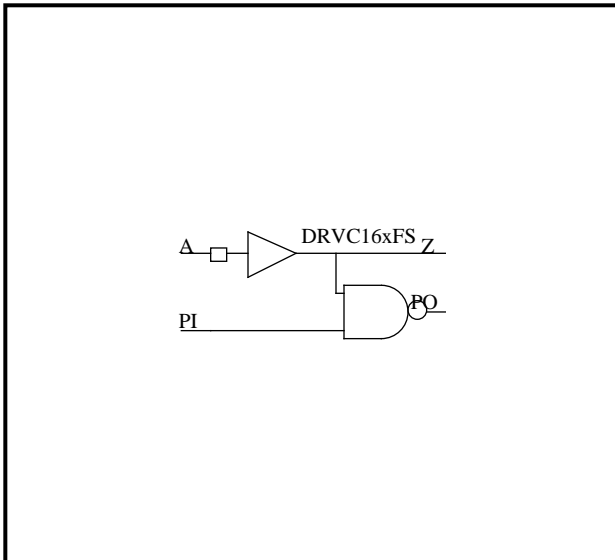
DATA SHEET

DRVC16xFS		DRVC16xFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVC16xFS	CLOCK DRIVER with CMOS LEVEL INPUT BUFFER (equal 16mA DRIVER) with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN
DRVC16FS	DRVC16DFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVC16xFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVC16xFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	2389.3	34.3

TC200G SERIES

DATA SHEET

DRVC16xFS

DRVC16xFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.19

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.64	1.05	1.61	2.17
0.38	0.69	1.10	1.66	2.22
1.00	0.80	1.21	1.77	2.33
3.00	1.02	1.44	2.00	2.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0013	0.21

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	0.87	1.57	2.55	3.52
0.38	0.91	1.61	2.58	3.55
1.00	1.01	1.70	2.68	3.65
3.00	1.27	1.97	2.94	3.91

TC200G SERIES

DATA SHEET

DRVC16xFS

DRVC16xFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

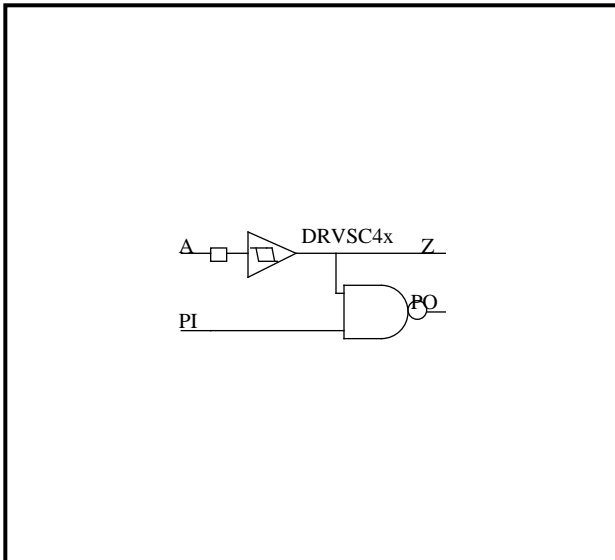
DATA SHEET

DRVSC4x		DRVSC4x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVSC4x	CLOCK DRIVER with CMOS LEVEL SCHMITT INPUT BUFFER (equal 4mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVSC4	DRVSC4D	DRVSC4U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVSC4x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVSC4x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	548.3	34.3

(LU)

TC200G SERIES

DATA SHEET

DRVSC4x

DRVSC4x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0057	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.13	2.18	3.75	5.83
0.38	1.20	2.25	3.82	5.90
1.00	1.34	2.38	3.95	6.04
3.00	1.64	2.69	4.26	6.35

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0055	0.07

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.65	3.33	5.81	8.71
0.38	1.68	3.36	5.84	8.77
1.00	1.80	3.47	5.96	8.94
3.00	2.14	3.81	6.31	9.41

TC200G SERIES

DATA SHEET

DRVSC4x

DRVSC4x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

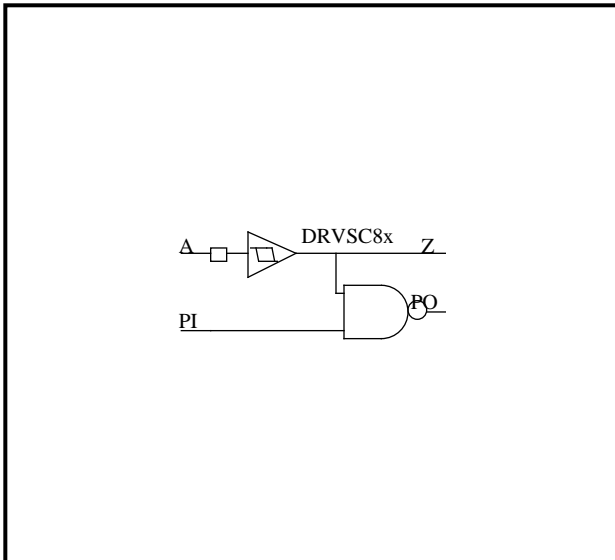
DATA SHEET

DRVSC8x		DRVSC8x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVSC8x	CLOCK DRIVER with CMOS LEVEL SCHMITT INPUT BUFFER (equal 8mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVC8	DRVC8D	DRVC8U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVSC8x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVSC8x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	1162.4	34.3

(LU)

TC200G SERIES

DATA SHEET

DRVSC8x

DRVSC8x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0024	0.26

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.11	1.57	2.24	3.12
0.38	1.18	1.64	2.31	3.20
1.00	1.31	1.77	2.44	3.33
3.00	1.62	2.08	2.75	3.63

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.63	2.43	3.59	5.13
0.38	1.66	2.45	3.62	5.16
1.00	1.78	2.57	3.73	5.27
3.00	2.12	2.91	4.07	5.61

TC200G SERIES

DATA SHEET

DRVSC8x

DRVSC8x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

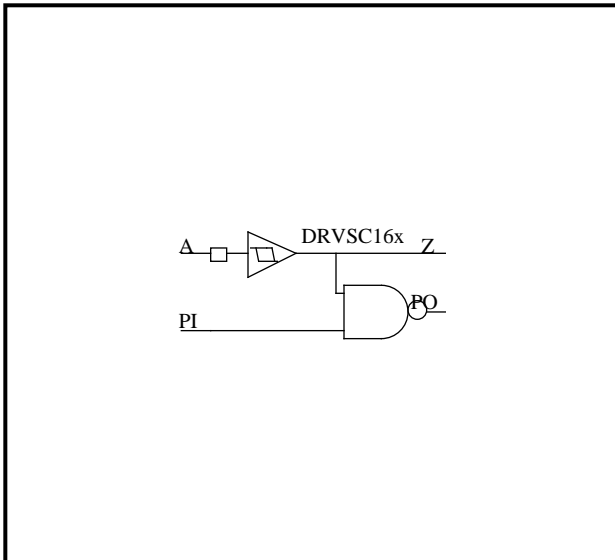
DATA SHEET

DRVSC16x		DRVSC16x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVSC16x	CLOCK DRIVER with CMOS LEVEL SCHMITT INPUT BUFFER (equal 16mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVSC16	DRVSC16D	DRVSC16U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVSC16x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVSC16x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	2397.1	34.3

TC200G SERIES

DATA SHEET

DRVSC16x

DRVSC16x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.18

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	1.09	1.50	2.06	2.62
0.38	1.16	1.57	2.13	2.69
1.00	1.30	1.71	2.27	2.82
3.00	1.60	2.01	2.57	3.13

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0013	0.22

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	1.51	2.22	3.19	4.16
0.38	1.54	2.25	3.22	4.19
1.00	1.66	2.36	3.33	4.30
3.00	2.00	2.70	3.67	4.64

TC200G SERIES

DATA SHEET

DRVSC16x

DRVSC16x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

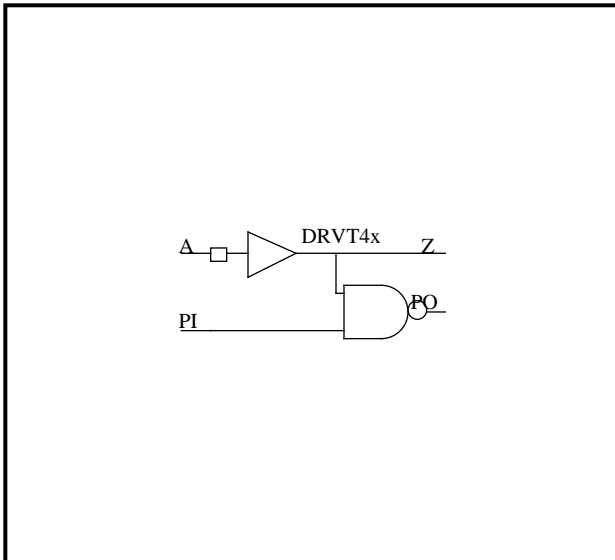
DATA SHEET

DRV4x		DRV4x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRV4x	CLOCK DRIVER with LVTTTL LEVEL INPUT BUFFER (equal 4mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRV4	DRV4D	DRV4U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRV4x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRV4x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	520.7	34.3

(LU)

TC200G SERIES

DATA SHEET

DRV4x

DRV4x

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0064	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.93	2.12	3.91	6.29
0.38	0.93	2.12	3.91	6.28
1.00	0.94	2.13	3.92	6.30
3.00	1.02	2.21	3.99	6.37

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0053	0.06

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.10	2.73	5.17	8.41
0.38	1.12	2.75	5.19	8.43
1.00	1.17	2.80	5.24	8.47
3.00	1.31	2.94	5.38	8.62

TC200G SERIES

DATA SHEET

DRV4x

DRV4x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

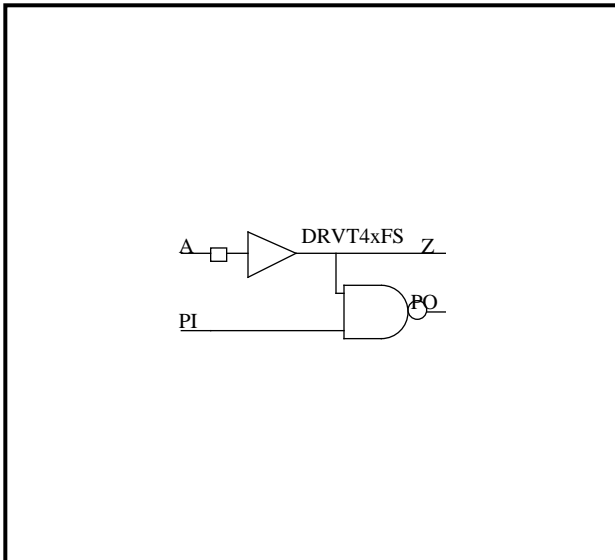
DATA SHEET

DRVT4xFS		DRVT4xFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVT4xFS	CLOCK DRIVER with LVTTTL LEVEL INPUT BUFFER (equal 4mA DRIVER) with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN
DRVT4FS	DRVT4DFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVT4xFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVT4xFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	520.7	34.3

(LU)

TC200G SERIES

DATA SHEET

DRV4xFS

DRV4xFS

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0064	0.08

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.93	2.12	3.91	6.29
0.38	0.93	2.12	3.91	6.28
1.00	0.94	2.13	3.92	6.30
3.00	1.02	2.21	3.99	6.37

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0053	0.06

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.10	2.73	5.17	8.41
0.38	1.12	2.75	5.19	8.43
1.00	1.17	2.80	5.24	8.47
3.00	1.31	2.94	5.38	8.62

TC200G SERIES

DATA SHEET

DRV4xFS

DRV4xFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

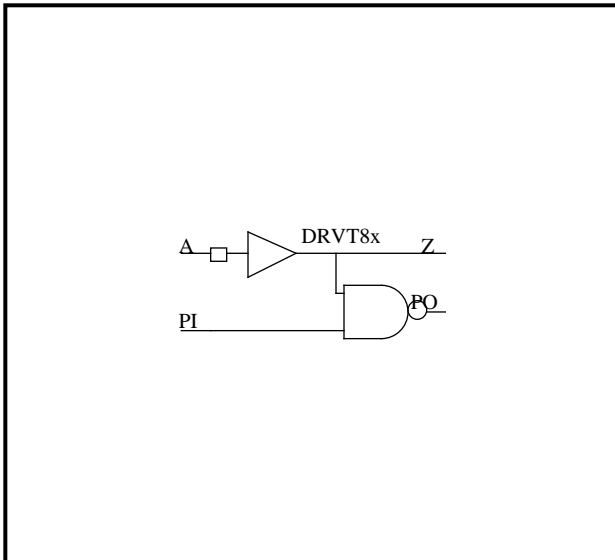
DATA SHEET

DRVT8x		DRVT8x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVT8x	CLOCK DRIVER with LVTTTL LEVEL INPUT BUFFER (equal 8mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVT8	DRVT8D	DRVT8U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVT8x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVT8x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	1126.8	34.3

(LU)

TC200G SERIES

DATA SHEET

DRV8T8x

DRV8T8x

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.28

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.87	1.36	2.07	3.01
0.38	0.87	1.35	2.06	3.00
1.00	0.88	1.36	2.07	3.01
3.00	0.95	1.44	2.15	3.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0026	0.28

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.01	1.81	2.99	4.56
0.38	1.03	1.83	3.01	4.58
1.00	1.07	1.87	3.05	4.62
3.00	1.24	2.04	3.22	4.79

TC200G SERIES

DATA SHEET

DRV8T8x

DRV8T8x

3/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

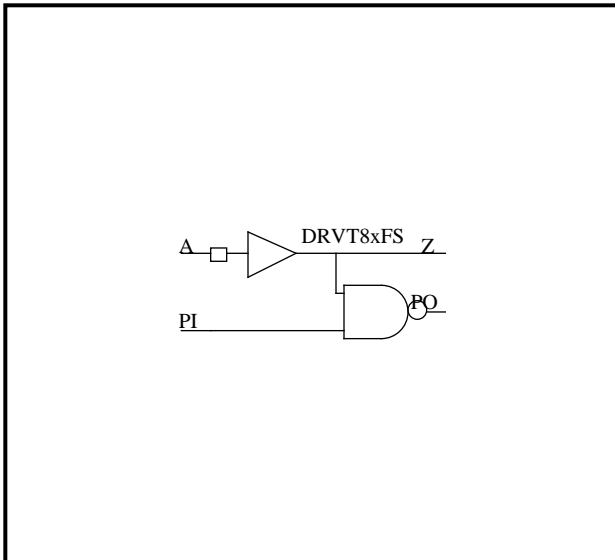
DATA SHEET

DRVT8xFS		DRVT8xFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVT8xFS	CLOCK DRIVER with LVTTTL LEVEL INPUT BUFFER (equal 8mA DRIVER) with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN
DRVT8FS	DRVT8DFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVT8xFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVT8xFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	1126.8	34.3

TC200G SERIES

DATA SHEET

DRVT8xFS

DRVT8xFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0025	0.28

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	0.87	1.36	2.07	3.01
0.38	0.87	1.35	2.06	3.00
1.00	0.88	1.36	2.07	3.01
3.00	0.95	1.44	2.15	3.09

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0026	0.28

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	266.67	800.00	1600.00	2666.67
0.01	1.01	1.81	2.99	4.56
0.38	1.03	1.83	3.01	4.58
1.00	1.07	1.87	3.05	4.62
3.00	1.24	2.04	3.22	4.79

TC200G SERIES

DATA SHEET

DRV8T8xFS

DRV8T8xFS

3/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

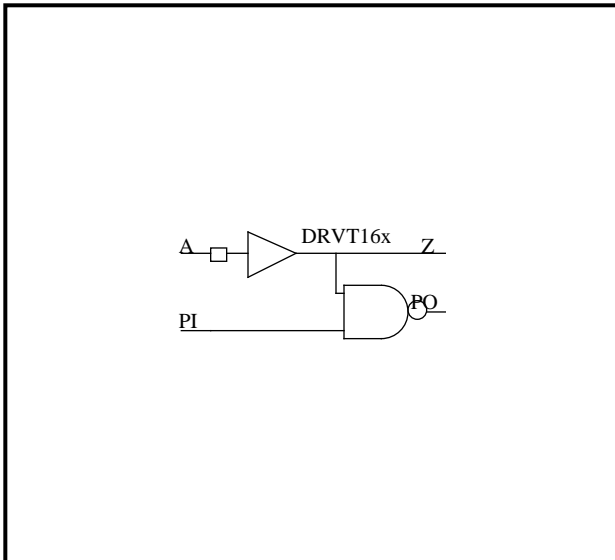
DATA SHEET

DRVT16x		DRVT16x		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVT16x	CLOCK DRIVER with LVTTTL LEVEL INPUT BUFFER (equal 16mA DRIVER)	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
DRVT16	DRVT16D	DRVT16U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVT16x inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVT16x
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	2285.1	34.3

(LU)

TC200G SERIES

DATA SHEET

DRV16x

DRV16x

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.29

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	1.02	1.47	2.08	2.67
0.38	1.02	1.47	2.07	2.66
1.00	1.02	1.47	2.07	2.66
3.00	1.09	1.54	2.14	2.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0013	0.28

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	1.07	1.79	2.79	3.78
0.38	1.09	1.81	2.80	3.79
1.00	1.13	1.85	2.84	3.83
3.00	1.30	2.02	3.01	4.00

TC200G SERIES

DATA SHEET

DRV16x

DRV16x

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

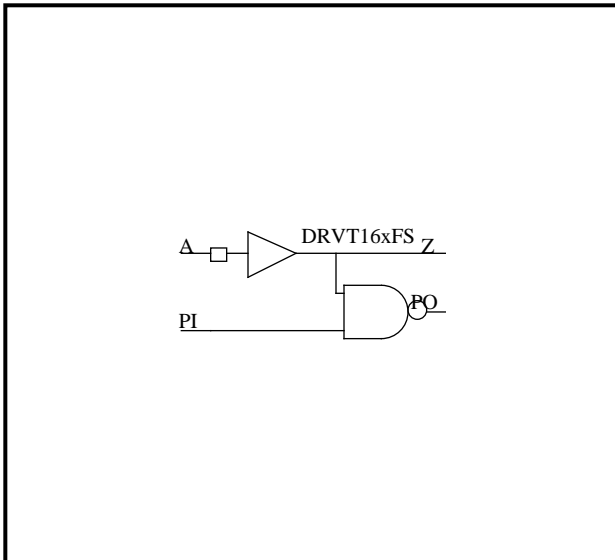
DATA SHEET

DRVT16xFS		DRVT16xFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
DRVT16xFS	CLOCK DRIVER with LVTTTL LEVEL INPUT BUFFER (equal 16mA DRIVER) with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	2	

CELL NAME

no resistor	PULL-DOWN
DRVT16FS	DRVT16DFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
DRVT16xFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:DRVT16xFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	17240.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	2285.1	34.3

TC200G SERIES

DATA SHEET

DRV16xFS

DRV16xFS

2/3

CONDITION: VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0012	0.29

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	1.02	1.47	2.08	2.67
0.38	1.02	1.47	2.07	2.66
1.00	1.02	1.47	2.07	2.66
3.00	1.09	1.54	2.14	2.73

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0013	0.28

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	400.00	1333.33	2666.67	4000.00
0.01	1.07	1.79	2.79	3.78
0.38	1.09	1.81	2.80	3.79
1.00	1.13	1.85	2.84	3.83
3.00	1.30	2.02	3.01	4.00

TC200G SERIES

DATA SHEET

DRVT16xFS

DRVT16xFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

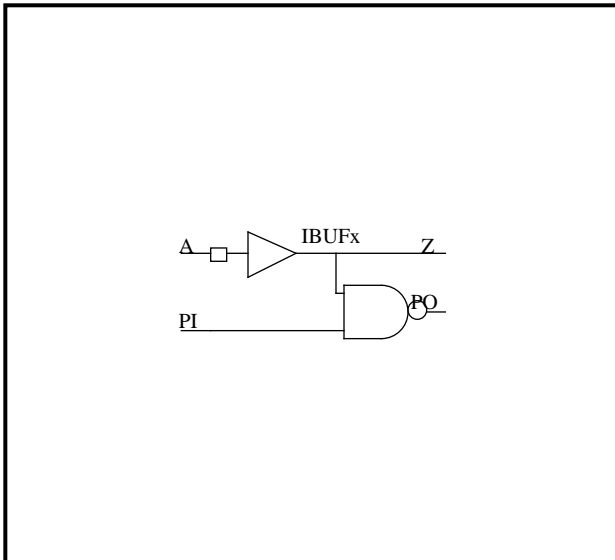
DATA SHEET

IBUFx		IBUFx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IBUFx	CMOS LEVEL INPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
IBUF	IBUFD	IBUFU

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
IBUFx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:IBUFx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE (LU)	312.6	34.3

TC200G SERIES

DATA SHEET

IBUFx

IBUFx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0115	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0080	0.12

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

IBUFx

IBUFx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

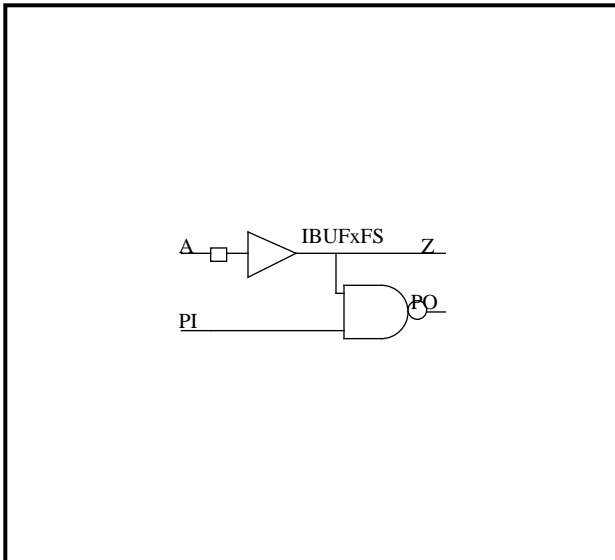
DATA SHEET

IBUFxFS		IBUFxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IBUFxFS	CMOS LEVEL INPUT BUFFER with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN
IBUFFS	IBUFDfs

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
IBUFxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:IBUFxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	312.6	34.3

(LU)

TC200G SERIES

DATA SHEET

IBUFxFS

IBUFxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0115	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.22	0.29	0.36	0.53
0.38	0.28	0.35	0.42	0.59
1.00	0.35	0.42	0.49	0.66
3.00	0.48	0.56	0.63	0.81

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0080	0.12

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.23	0.32	0.41	0.61
0.38	0.28	0.37	0.45	0.65
1.00	0.35	0.44	0.53	0.73
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

IBUFxFS

IBUFxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

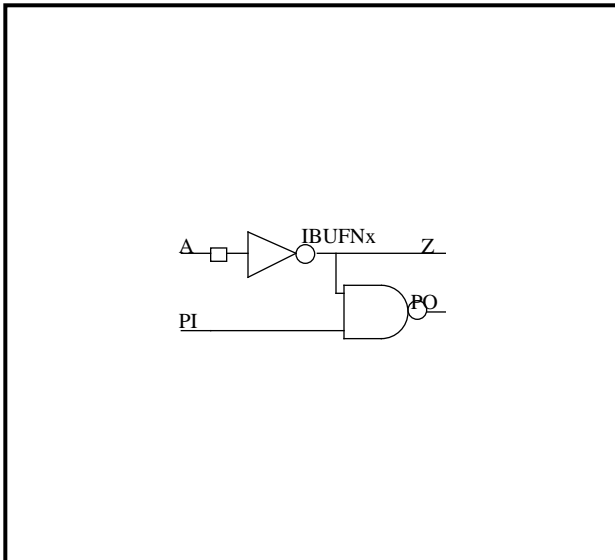
DATA SHEET

IBUFNx		IBUFNx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IBUFNx	CMOS LEVEL INVERTED INPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
IBUFN	IBUFND	IBUFNU

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
IBUFNx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:IBUFNx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	183.5	34.3

(LU)

TC200G SERIES

DATA SHEET

IBUFNx

IBUFNx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0206	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.27	0.38	0.49	0.78
0.38	0.31	0.42	0.53	0.82
1.00	0.36	0.47	0.58	0.87
3.00	0.45	0.57	0.68	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0121	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.34	0.47	0.59	0.89
0.38	0.39	0.52	0.64	0.94
1.00	0.44	0.57	0.69	0.99
3.00	0.53	0.66	0.78	1.08

TC200G SERIES

DATA SHEET

IBUFNx

IBUFNx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

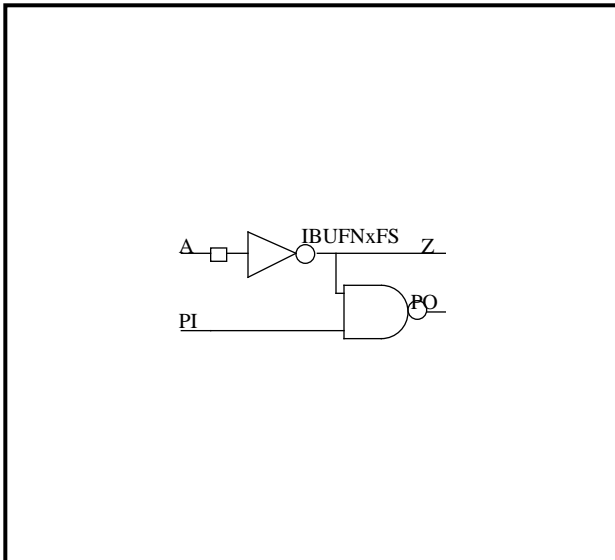
DATA SHEET

IBUFNxFS		IBUFNxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IBUFNxFS	CMOS LEVEL INVERTED INPUT BUFFER with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN
IBUFNFS	IBUFNDFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
IBUFNxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:IBUFNxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	183.5	34.3

(LU)

TC200G SERIES

DATA SHEET

IBUFNxFS

IBUFNxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0206	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.27	0.38	0.49	0.78
0.38	0.31	0.42	0.53	0.82
1.00	0.36	0.47	0.58	0.87
3.00	0.45	0.57	0.68	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0121	0.14

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.34	0.47	0.59	0.89
0.38	0.39	0.52	0.64	0.94
1.00	0.44	0.57	0.69	0.99
3.00	0.53	0.66	0.78	1.08

TC200G SERIES

DATA SHEET

IBUFNxFS

IBUFNxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

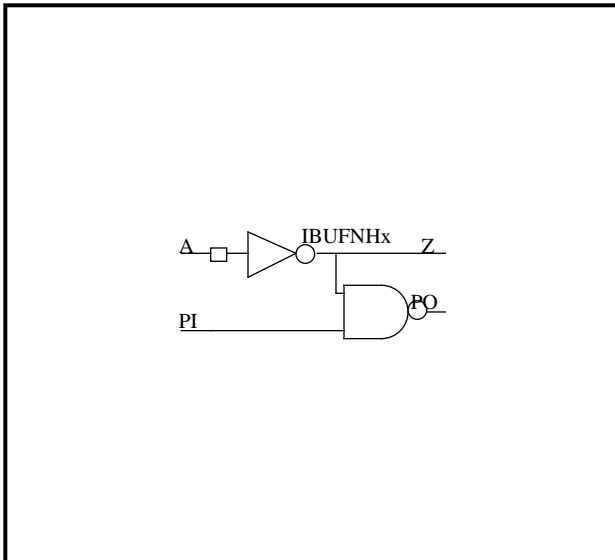
DATA SHEET

IBUFNHx		IBUFNHx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IBUFNHx	CMOS LEVEL INVERTED INPUT BUFFER HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
IBUFNH	IBUFNHD	IBUFNHU

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
IBUFNHx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:IBUFNHx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	202.4	34.3

(LU)

TC200G SERIES

DATA SHEET

IBUFNHx

IBUFNHx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0133	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.09	0.17	0.24	0.44
0.38	0.12	0.20	0.28	0.48
1.00	0.15	0.26	0.35	0.57
3.00	0.21	0.37	0.50	0.77

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0105	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.10	0.20	0.30	0.56
0.38	0.14	0.25	0.35	0.62
1.00	0.18	0.32	0.44	0.72
3.00	0.23	0.44	0.61	0.98

TC200G SERIES

DATA SHEET

IBUFNHx

IBUFNHx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

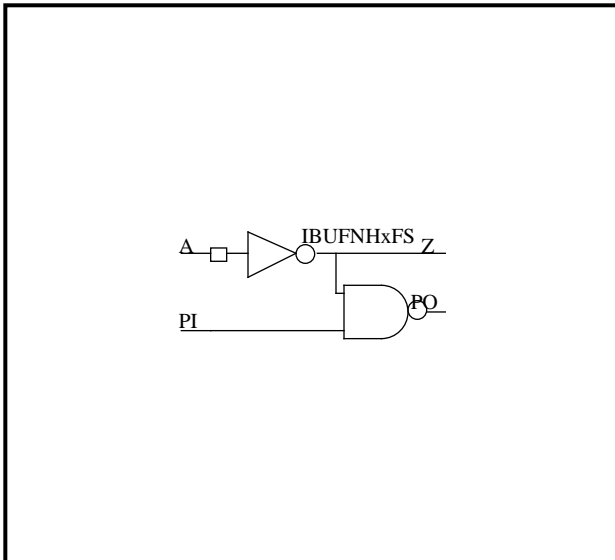
DATA SHEET

IBUFNHxFS		IBUFNHxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IBUFNHxFS	CMOS LEVEL INVERTED INPUT BUFFER HIGH-SPEED with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN
IBUFNHFS	IBUFNHDFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
IBUFNHxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:IBUFNHxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE (LU)	202.4	34.3

TC200G SERIES

DATA SHEET

IBUFNHxFS

IBUFNHxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0133	0.13

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.09	0.17	0.24	0.44
0.38	0.12	0.20	0.28	0.48
1.00	0.15	0.26	0.35	0.57
3.00	0.21	0.37	0.50	0.77

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0105	0.11

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.10	0.20	0.30	0.56
0.38	0.14	0.25	0.35	0.62
1.00	0.18	0.32	0.44	0.72
3.00	0.23	0.44	0.61	0.98

TC200G SERIES

DATA SHEET

IBUFNHxFS

IBUFNHxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

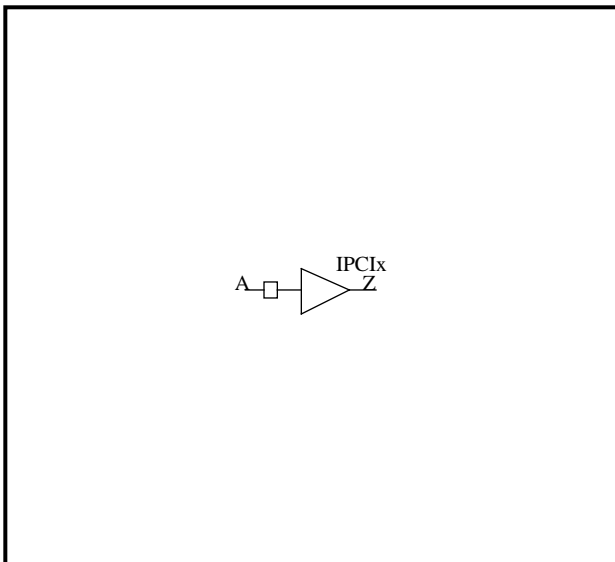
DATA SHEET

IPCix		IPCix		1/2
CELL NAME	FUNCTION	CELL COUNT		CONDITION
IPCix	PCI (Peripheral Component Interconnect) BUS RECEIVER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		0	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
IPCI	IPCID	IPCIU

LOGIC SYMBOL



TRUTH TABLE

INPUT	OUTPUT
A	Z
L	L
H	H

Verilog-HDL DESCRIPTION

```
IPCix inst(Z,A);
```

VHDL DESCRIPTION

```
inst:IPCix
port map(Z,A);
```

ELECTRO MIGRATION

PIN NAME	(LU*MHz)
ELECTRO MIGRATION DRIVE	Z 12064.0

OUTPUT DRIVE

PIN NAME	(LU)
DRIVE	Z 411.4

TC200G SERIES

DATA SHEET

IPC1x

IPC1x

2/2

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0114	0.09

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.25	0.32	0.38	0.55
0.38	0.25	0.31	0.38	0.55
1.00	0.26	0.32	0.39	0.55
3.00	0.26	0.33	0.39	0.56

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0037	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.29	0.35	0.40	0.51
0.38	0.31	0.37	0.43	0.54
1.00	0.38	0.44	0.49	0.60
3.00	0.62	0.68	0.73	0.85

TC200G SERIES

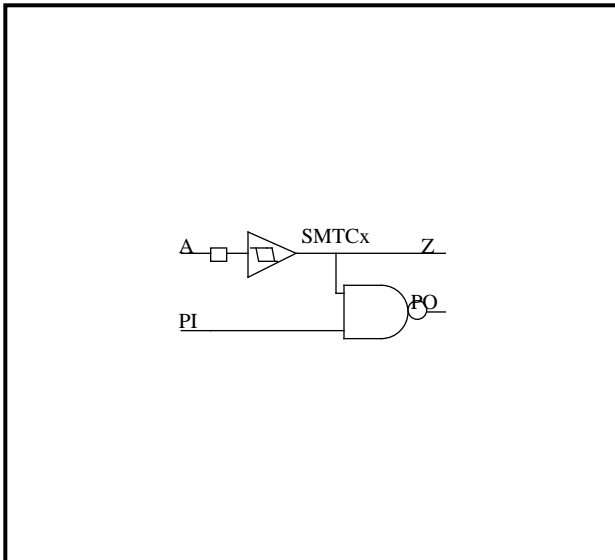
DATA SHEET

SMTCx		SMTCx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
SMTCx	SCHMITT TRIGGER CMOS LEVEL INPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor SMTc	PULL-DOWN SMTCD	PULL-UP SMTcU
---------------------	--------------------	------------------

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
SMTCx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:SMTCx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	80.1	34.3

TC200G SERIES

DATA SHEET

SMTCx

SMTCx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0387	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.35	0.56	0.77	1.33
0.38	0.42	0.63	0.84	1.40
1.00	0.55	0.76	0.98	1.53
3.00	0.85	1.06	1.28	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.27

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.53	0.82	1.10	1.84
0.38	0.56	0.85	1.13	1.87
1.00	0.67	0.96	1.24	1.98
3.00	1.01	1.30	1.59	2.32

TC200G SERIES

DATA SHEET

SMTCx

SMTCx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

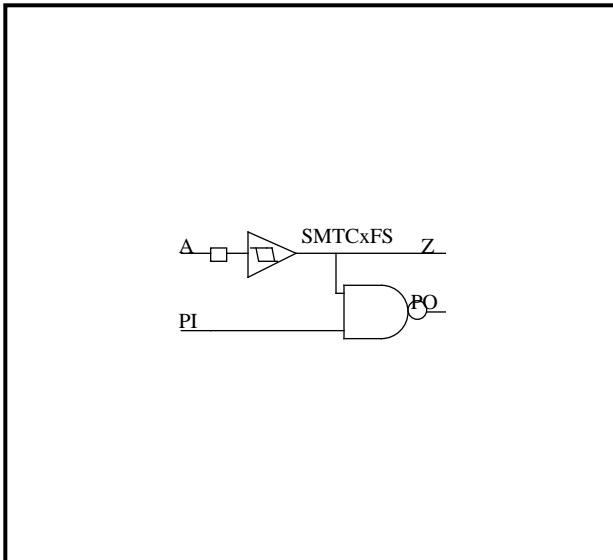
DATA SHEET

SMTCxFS		SMTCxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
SMTCxFS	SCHMITT TRIGGER CMOS LEVEL INPUT BUFFER with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor SMTCF5	PULL-DOWN SMTCDF5
-----------------------	----------------------

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
SMTCxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:SMTCxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	80.1	34.3

(LU)

TC200G SERIES

DATA SHEET

SMTCxFS

SMTCxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0387	0.32

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.35	0.56	0.77	1.33
0.38	0.42	0.63	0.84	1.40
1.00	0.55	0.76	0.98	1.53
3.00	0.85	1.06	1.28	1.84

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0318	0.27

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.53	0.82	1.10	1.84
0.38	0.56	0.85	1.13	1.87
1.00	0.67	0.96	1.24	1.98
3.00	1.01	1.30	1.59	2.32

TC200G SERIES

DATA SHEET

SMTCxFS

SMTCxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

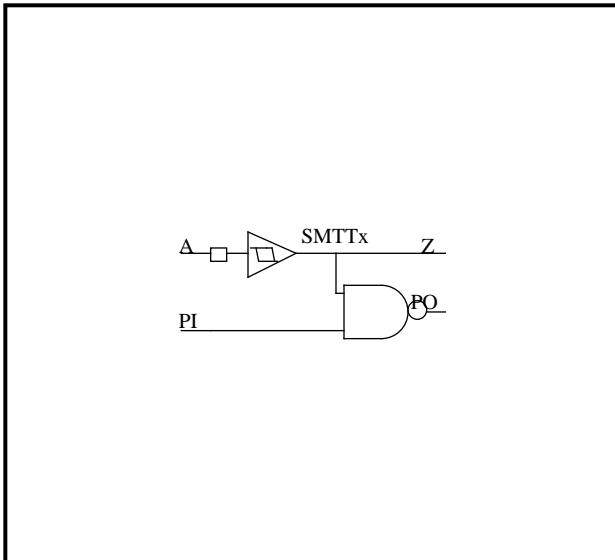
DATA SHEET

SMTTx		SMTTx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
SMTTx	SCHMITT TRIGGER LVTTTL LEVEL INPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor SMTT	PULL-DOWN SMTTD	PULL-UP SMTTU
---------------------	--------------------	------------------

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
SMTTx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:SMTTx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE (LU)	76.8	34.3

TC200G SERIES

DATA SHEET

SMTTx

SMTTx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.73	0.96	1.18	1.78
0.38	0.73	0.96	1.18	1.78
1.00	0.75	0.98	1.21	1.81
3.00	0.92	1.15	1.38	1.98

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0322	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.73	1.03	1.33	2.10
0.38	0.74	1.04	1.34	2.11
1.00	0.79	1.09	1.39	2.16
3.00	1.04	1.34	1.64	2.41

TC200G SERIES

DATA SHEET

SMTTx

SMTTx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

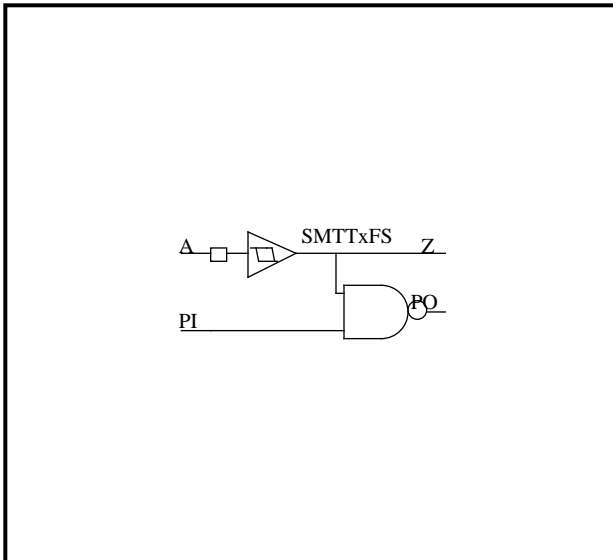
DATA SHEET

SMTTxFS		SMTTxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
SMTTxFS	SCHMITT TRIGGER LVTTTL LEVEL INPUT BUFFER with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN
SMTTFS	SMTTDFS

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
SMTTxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:SMTTxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

(LU*MHz)

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

INPUT LOAD

(LU)

PIN NAME	LOAD
PI	1.03

OUTPUT DRIVE

(LU)

PIN NAME	Z	PO
DRIVE	76.8	34.3

TC200G SERIES

DATA SHEET

SMTTxFS

SMTTxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0395	0.40

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.73	0.96	1.18	1.78
0.38	0.73	0.96	1.18	1.78
1.00	0.75	0.98	1.21	1.81
3.00	0.92	1.15	1.38	1.98

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0322	0.34

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.73	1.03	1.33	2.10
0.38	0.74	1.04	1.34	2.11
1.00	0.79	1.09	1.39	2.16
3.00	1.04	1.34	1.64	2.41

TC200G SERIES

DATA SHEET

SMTTxFS

SMTTxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

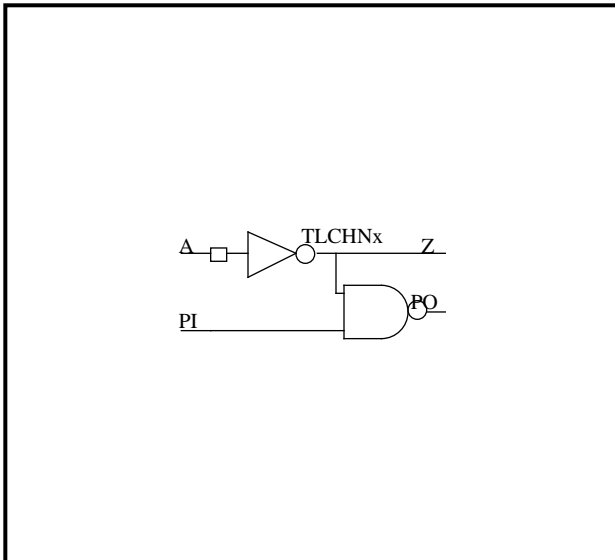
DATA SHEET

TLCHNx		TLCHNx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
TLCHNx	LVTTTL LEVEL INVERTED INPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
TLCHN	TLCHND	TLCHNU

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
TLCHNx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:TLCHNx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO	(LU*MHz)
ELECTRO MIGRATION DRIVE	12064.0	12928.0	

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO	(LU)
DRIVE	182.9	34.3	

TC200G SERIES

DATA SHEET

TLCHNx

TLCHNx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0206	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.29	0.40	0.52	0.81
0.38	0.31	0.43	0.54	0.83
1.00	0.36	0.47	0.58	0.87
3.00	0.45	0.57	0.68	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0121	0.14

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.42	0.55	0.67	0.98
0.38	0.42	0.55	0.68	0.98
1.00	0.45	0.58	0.70	1.00
3.00	0.53	0.66	0.78	1.08

TC200G SERIES

DATA SHEET

TLCHNx

TLCHNx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

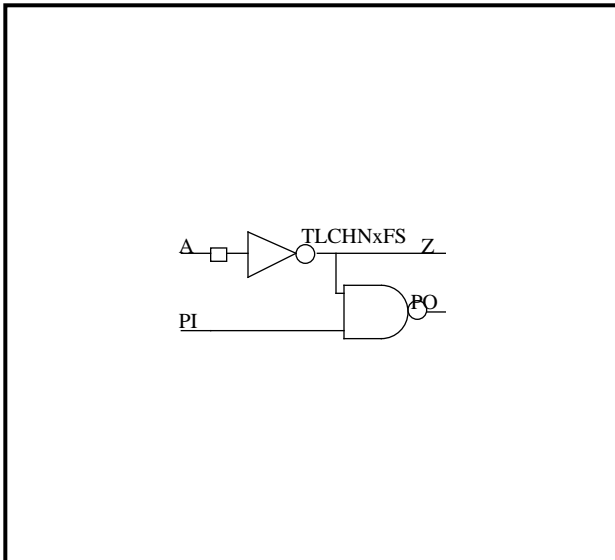
DATA SHEET

TLCHNxFS		TLCHNxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
TLCHNxFS	LVTTTL LEVEL INVERTED INPUT BUFFER with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor TLCHNFS	PULL-DOWN TLCHNDFS
------------------------	-----------------------

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
TLCHNxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:TLCHNxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	182.9	34.3

(LU)

TC200G SERIES

DATA SHEET

TLCHNxFS

TLCHNxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0206	0.13

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.29	0.40	0.52	0.81
0.38	0.31	0.43	0.54	0.83
1.00	0.36	0.47	0.58	0.87
3.00	0.45	0.57	0.68	0.97

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0121	0.14

PATH DELAY (ns)				
LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.42	0.55	0.67	0.98
0.38	0.42	0.55	0.68	0.98
1.00	0.45	0.58	0.70	1.00
3.00	0.53	0.66	0.78	1.08

TC200G SERIES

DATA SHEET

TLCHNxFS

TLCHNxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

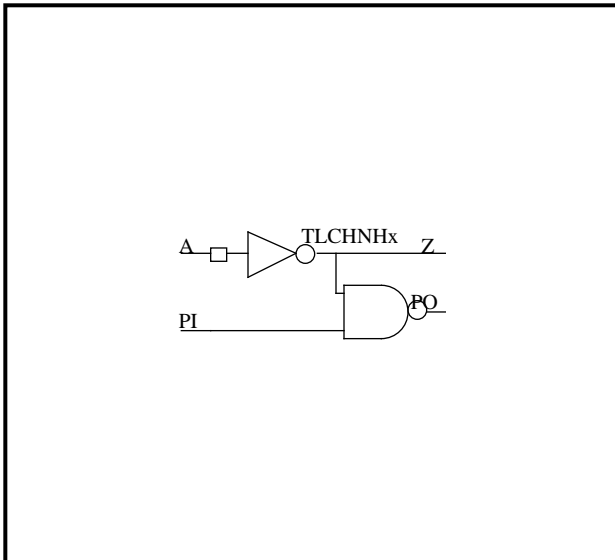
DATA SHEET

TLCHNHx		TLCHNHx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
TLCHNHx	LVTTTL LEVEL INVERTED INPUT BUFFER HIGH-SPEED	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
TLCHNH	TLCHNH D	TLCHNH U

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
TLCHNHx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:TLCHNHx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	127.9	34.3

(LU)

TC200G SERIES

DATA SHEET

TLCHNHx

TLCHNHx

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

TC200G SERIES

DATA SHEET

TLCHNHx

TLCHNHx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

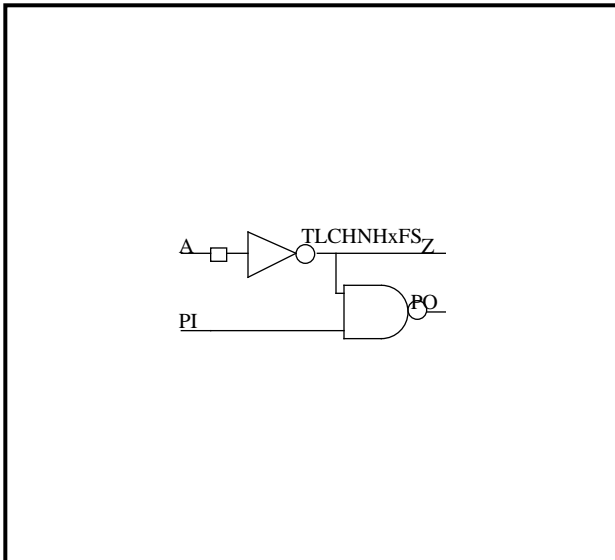
DATA SHEET

TLCHNHxFS		TLCHNHxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
TLCHNHxFS	LVTTL LEVEL INVERTED INPUT BUFFER HIGH-SPEED with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor TLCHNHFS	PULL-DOWN TLCHNHDFS
-------------------------	------------------------

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	H

Verilog-HDL DESCRIPTION

```
TLCHNHxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:TLCHNHxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	127.9	34.3

(LU)

TC200G SERIES

DATA SHEET

TLCHNHxFS

TLCHNHxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0228	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.10	0.22	0.34	0.64
0.38	0.12	0.24	0.35	0.66
1.00	0.15	0.28	0.39	0.69
3.00	0.21	0.37	0.50	0.83

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0267	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.17	0.39	0.62	1.22
0.38	0.17	0.38	0.61	1.22
1.00	0.18	0.39	0.62	1.22
3.00	0.23	0.45	0.67	1.25

TC200G SERIES

DATA SHEET

TLCHNHxFS

TLCHNHxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

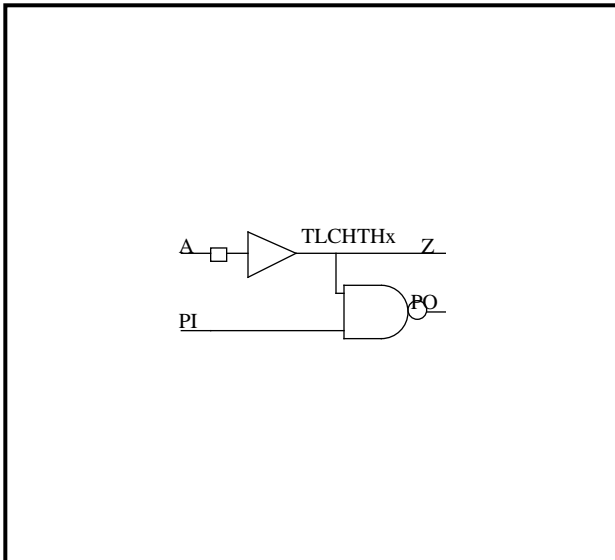
DATA SHEET

TLCHTHx		TLCHTHx		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
TLCHTHx	LVTTTL LEVEL INPUT BUFFER	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor	PULL-DOWN	PULL-UP
TLCHTH	TLCHTHD	TLCHTHU

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
TLCHTHx inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:TLCHTHx
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE (LU)	299.5	34.3

TC200G SERIES

DATA SHEET

TLCHTHx

TLCHTHx

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0121	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.37	0.45	0.53	0.71
0.38	0.37	0.45	0.52	0.71
1.00	0.38	0.46	0.54	0.73
3.00	0.48	0.56	0.63	0.82

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0081	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.29	0.38	0.47	0.68
0.38	0.31	0.40	0.49	0.70
1.00	0.36	0.45	0.54	0.75
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

TLCHTHx

TLCHTHx

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35

TC200G SERIES

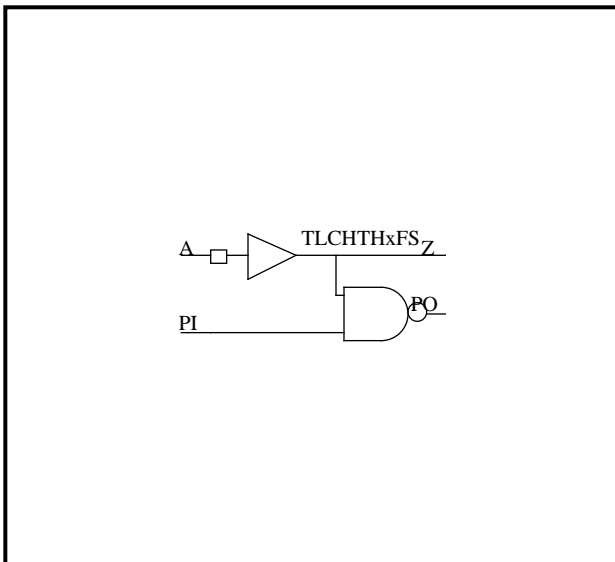
DATA SHEET

TLCHTHxFS		TLCHTHxFS		1/3
CELL NAME	FUNCTION	CELL COUNT		CONDITION
TLCHTHxFS	LVTTTL LEVEL INPUT BUFFER with FAILSAFE	GATE	I/O	VDD=3.3V, Ta=25°C, Typ.
		1	1	

CELL NAME

no resistor TLCHTHFS	PULL-DOWN TLCHTHDFS
-------------------------	------------------------

LOGIC SYMBOL



TRUTH TABLE

INPUT		OUTPUT	
A	PI	Z	PO
L	L	L	H
L	H	L	H
H	L	H	H
H	H	H	L

Verilog-HDL DESCRIPTION

```
TLCHTHxFS inst(Z,PO,A,PI);
```

VHDL DESCRIPTION

```
inst:TLCHTHxFS
port map(Z,PO,A,PI);
```

ELECTRO MIGRATION

PIN NAME	Z	PO
ELECTRO MIGRATION DRIVE	12064.0	12928.0

(LU*MHz)

INPUT LOAD

PIN NAME	LOAD (LU)
PI	1.03

OUTPUT DRIVE

PIN NAME	Z	PO
DRIVE	299.5	34.3

(LU)

TC200G SERIES

DATA SHEET

TLCHTHxFS

TLCHTHxFS

2/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.11	0.25	0.42	1.11
0.38	0.13	0.28	0.45	1.13
1.00	0.17	0.33	0.51	1.19
3.00	0.23	0.43	0.64	1.38

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
Z->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.10	0.25	0.44	1.18
0.38	0.15	0.31	0.49	1.24
1.00	0.19	0.38	0.58	1.33
3.00	0.26	0.52	0.77	1.60

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0121	0.17

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.37	0.45	0.53	0.71
0.38	0.37	0.45	0.52	0.71
1.00	0.38	0.46	0.54	0.73
3.00	0.48	0.56	0.63	0.82

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
A->Z	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
Z	0.0081	0.14

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	15.00	30.00	70.00
0.01	0.29	0.38	0.47	0.68
0.38	0.31	0.40	0.49	0.70
1.00	0.36	0.45	0.54	0.75
3.00	0.51	0.61	0.69	0.90

TC200G SERIES

DATA SHEET

TLCHTHxFS

TLCHTHxFS

3/3

CONDITION:VDD=3.3V, Ta=25°C, Typ.

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	FALL	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0653	0.10

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.24	0.43	1.17
0.38	0.15	0.32	0.51	1.25
1.00	0.21	0.42	0.63	1.39
3.00	0.32	0.62	0.90	1.78

PATH CONDITION

PATH	CONDITION	FUNCTION	IO LEVEL
PI->PO	---	RISE	---

SLEW FACTOR

PIN NAME	FACTOR (ns/LU)	CONSTANT (ns)
PO	0.0996	0.16

PATH DELAY (ns)

LOAD (LU) SLEW (ns)	1.00	5.00	10.00	30.00
0.01	0.09	0.23	0.40	1.08
0.38	0.11	0.26	0.43	1.11
1.00	0.13	0.30	0.48	1.17
3.00	0.15	0.37	0.60	1.35