

## 8T95, 96, 97, 98 Hex Buffers/Inverters

High Speed Hex 3-State Buffers  
High Speed Hex 3-State Inverters  
*Product Specification*

### Logic Products

#### DESCRIPTION

Each of the 3-state bus interface elements described herein has low current PNP inputs and is designed with Schottky TTL technology for ultra high speed. The devices are used to convert TTL/DTL or MOS/CMOS to 3-state TTL bus levels. For maximum systems flexibility, the 8T95 and 8T97 do so without logical inversion, whereas the 8T96 and 8T98 provide the logical complement of the input. The 8T95 and 8T96 feature a common control line for all six devices, whereas the 8T97 and 8T98 have control lines for four devices from one input and two from another input.

#### FUNCTION TABLE — 8T95

INPUTS			OUTPUT
DIS <sub>1</sub>	DIS <sub>2</sub>	I	Y
L	L	L	L
L	L	H	H
X	H	X	(Z)
H	X	X	(Z)

H = HIGH voltage level  
L = LOW voltage level  
X = Don't care  
(Z) = HIGH impedance (off) state

#### FUNCTION TABLE — 8T96

INPUTS			OUTPUT
DIS <sub>1</sub>	DIS <sub>2</sub>	I	$\bar{Y}$
L	L	L	H
L	L	H	L
X	H	X	(Z)
H	X	X	(Z)

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
N8T95	8ns	65mA
N8T96	6.5ns	59mA
N8T97	8ns	65mA
N8T98	6.5ns	59mA

#### ORDERING CODE

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 5\%$ ; $T_A = 0^\circ C$ to $+70^\circ C$
Plastic DIP	N8T95N, N8T96N N8T97N, N8T98N
Plastic SO	N8T97N, N8T98D

#### NOTE:

For information regarding devices processed to Military Specifications, see the Signetics Military Products Data Manual.

#### INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	8T
DIS	Input	1Sul
I	Input	1Sul
Y	Output	24Sul

#### NOTE:

A unit load (Sul) is  $50\mu A$   $I_{IH}$  and  $-2.0mA$   $I_{IL}$ .

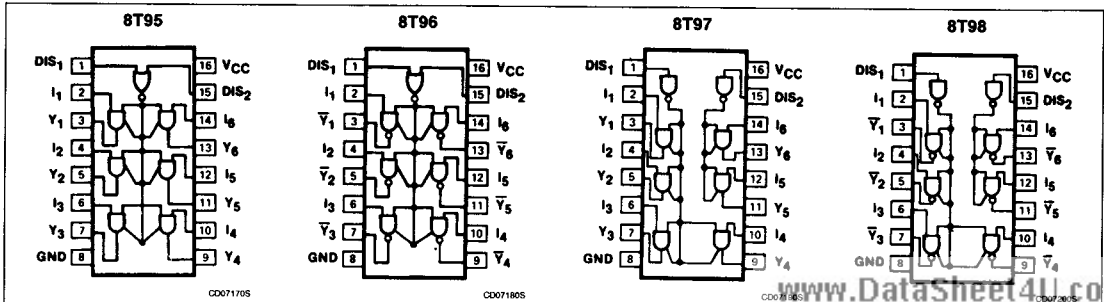
#### FUNCTION TABLE — 8T97

INPUTS		OUTPUT
DIS	I	Y
L	L	L
L	H	H
H	X	(Z)

#### FUNCTION TABLE — 8T98

INPUTS		OUTPUT
DIS	I	$\bar{Y}$
L	L	H
L	H	L
H	X	(Z)

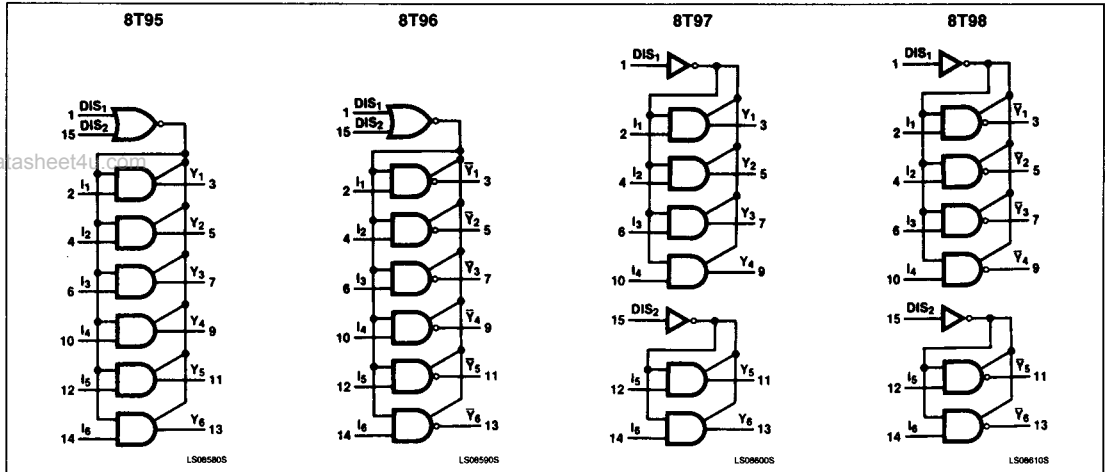
#### PIN CONFIGURATION



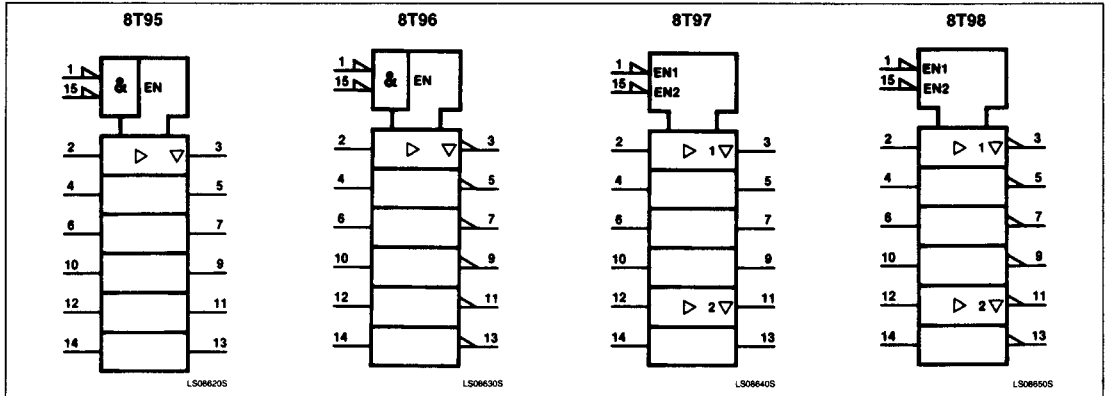
# Hex Buffers/Inverters

8T95, 96, 97, 98

## LOGIC SYMBOL



## LOGIC SYMBOL (IEEE/IEC)



## ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		S8T	N8T	UNIT
V <sub>CC</sub>	Supply voltage	7.0	7.0	V
V <sub>IN</sub>	Input voltage	-0.5 to +5.5	-0.5 to +5.5	V
I <sub>IN</sub>	Input current	-30 to +5	-30 to +5	mA
I <sub>OL</sub>	Continuous	100	100	mA
V <sub>OUT</sub>	Voltage applied to output in HIGH output state	-0.5 to +V <sub>CC</sub>	-0.5 to +V <sub>CC</sub>	V
T <sub>A</sub>	Operating free-air temperature range	-55 to +125	0 to 70	°C

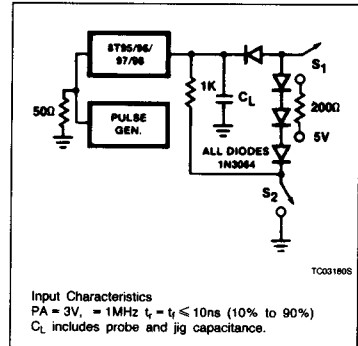
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## RECOMMENDED OPERATING CONDITIONS

PARAMETER	8T			UNIT	
	Min	Nom	Max		
V <sub>CC</sub>	Supply voltage	4.75	5.0	5.25	V
V <sub>IH</sub>	HIGH-level input voltage	2.0			V
V <sub>IL</sub>	LOW-level input voltage			+ 0.8	V
I <sub>IH</sub>	Input clamp current			- 18	mA
I <sub>OH</sub>	HIGH-level output current			- 5.2	V
I <sub>OL</sub>	LOW-level output current			48	mA
T <sub>A</sub>	Operating free-air temperature	0		70	°C

## TEST CIRCUIT



## DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER	TEST CONDITIONS <sup>1</sup>	8T95/97		8T96/98		UNIT		
		Min	Max	Min	Max			
V <sub>IH</sub>	Input HIGH voltage	Guaranteed input HIGH threshold voltage				2.0	V	
V <sub>IL</sub>	Input LOW voltage	Guaranteed input LOW threshold voltage				0.8	V	
V <sub>IK</sub>	Input clamp diode voltage	V <sub>CC</sub> = MIN, I <sub>IK</sub> = -12mA				- 1.5	V	
V <sub>BD</sub>	Input breakdown voltage	V <sub>CC</sub> = MAX, I <sub>I</sub> = 1mA				5.5	V	
V <sub>OH</sub>	HIGH-level output voltage	V <sub>CC</sub> = MIN, I <sub>OH</sub> = -5.2mA				2.4	V	
V <sub>OL</sub>	LOW-level output voltage	V <sub>CC</sub> = MIN, I <sub>OL</sub> = 48mA				0.5 <sup>3</sup>	V	
I <sub>OZH</sub>	Off-state output current, HIGH-level voltage applied	V <sub>CC</sub> = MAX, V <sub>O</sub> = 2.4V				40	μA	
I <sub>OZL</sub>	Off-state output current, LOW-level voltage applied	V <sub>CC</sub> = MAX, V <sub>O</sub> = 0.5V				- 40	μA	
I <sub>IH</sub>	HIGH-level input current	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4V				40	μA	
I <sub>IL</sub>	LOW-level input current	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.5V				Disable = 0.5V	- 400	μA
						Disable = 2.0V	- 40	μA
I <sub>OS</sub>	Short-circuit output current <sup>2</sup>	V <sub>CC</sub> = MAX				- 40	mA	
I <sub>CC</sub>	Supply current (total)	V <sub>CC</sub> = MAX				98	mA	
						89	mA	

## NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- I<sub>OS</sub> is tested with V<sub>OUT</sub> = + 0.5V and V<sub>CC</sub> = V<sub>CC</sub> MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
- V<sub>OL</sub> = + 0.45V MAX for 8T at T<sub>A</sub> = + 125°C only.

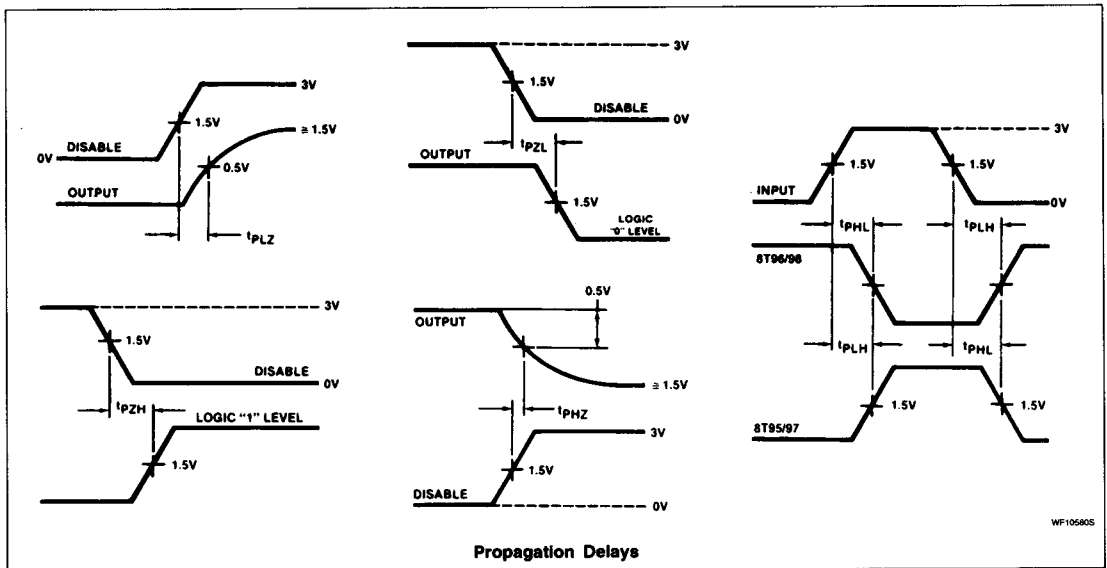
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## AC ELECTRICAL CHARACTERISTICS $T_A = 25^\circ\text{C}$ , $V_{CC} = 5.0\text{V}$

PARAMETER	TEST CONDITIONS	8T95/97		8T96/98		UNIT
		$R_L = 200\Omega$		$R_L = 200\Omega$		
		Min	Max	Min	Max	
$t_{PLH}$ Propagation delay Data inputs to data outputs	$S_1, S_2$ are closed, $C_L = 50\text{pF}$		12		11	ns
$t_{PHL}$ Propagation delay Data inputs to data outputs	$S_1, S_2$ are closed, $C_L = 50\text{pF}$		13		10	ns
$t_{PZH}$ Disable to outputs High Z to logic "1"	$S_1$ is open, $S_2$ is closed, $C_L = 50\text{pF}$		25		22	ns
$t_{PZL}$ Disable to outputs High Z to logic "0"	$S_1$ is closed, $S_2$ is open, $C_L = 50\text{pF}$		25		24	ns
$t_{PHZ}$ Disable to outputs Logic "1" to high Z	$S_1, S_2$ are closed, $C_L = 5\text{pF}$		10		10	ns
$t_{PLZ}$ Disable to outputs Logic "0" to high Z	$S_1, S_1$ are closed, $C_L = 5\text{pF}$		12		16	ns

## AC WAVEFORMS



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