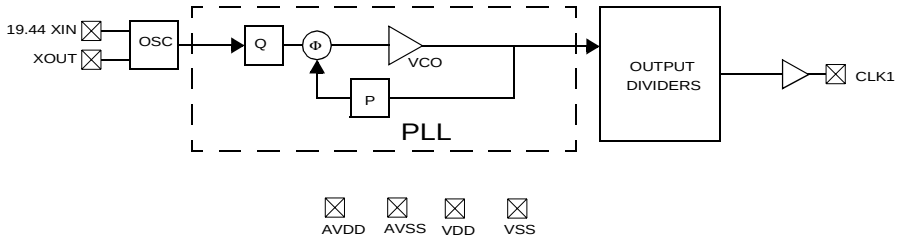
T1/E1 Clock Generator

Features	Benefits
• **Integrated phase-locked loop (PLL)**	High-performance PLL tailored for T1/E1 clock generation
• **Low-jitter, high-accuracy outputs**	Meets critical timing requirements in complex system designs
• **3.3V operation**	Enables application compatibility

Part Number	Outputs	Input Frequency Range	Output Frequencies
CY26200	1	19.44 MHz	1.544 MHz/2.048 MHz (selectable)

Logic Block Diagram



Pin Configuration

CY26200
8-pin SOIC

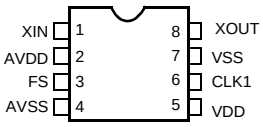


Table 1: CY26200 Frequency Select Option

Frequency Select	CLK1	Unit
0	1.544	MHz
1	2.048	MHz

Pin Summary

Pin Name	Pin Number	Pin Description
XIN	1	19.44-MHz Reference Input
AVDD	2	Analog Voltage Supply
FS	3	Frequency Select – see *Table 1*
AVSS	4	Analog Ground
VDD	5	Voltage Supply
CLK1	6	1.544-MHz/2.048-MHz Clock Output
VSS	7	Ground
XOUT[1]	8	Reference Output

Absolute Maximum Conditions

Parameter	Description	Min.	Max.	Unit
V_{DD}	Supply Voltage	–0.5	7.0	V
T_S	Storage Temperature[2]	–65	125	°C
T_J	Junction Temperature		125	°C
	Digital Inputs	V_{SS} – 0.3	V_{DD} + 0.3	V
	Digital Outputs Referred to V_{DD}	V_{SS} – 0.3	V_{DD} + 0.3	V
	Electrostatic Discharge	2000		V

Recommended Operating Conditions

Parameter	Description	Min.	Typ.	Max.	Unit
V_{DD}/AV_{DD}	Operating Voltage	3.135	3.3	3.465	V
T_A	Ambient Temperature (Commercial)	0		70	° C
T_A	Ambient Temperature (Industrial)	–40		+85	° C
C_{LOAD}	Max. Load Capacitance			15	pF
f_{REF}	Reference Frequency		19.44		MHz
t_{PU}	Power-up time for all VDD's to reach minimum specified voltage (power ramps must be monotonic)	0.05		500	ms

DC Electrical Characteristics (Commercial)

Parameter	Description	Conditions	Min.	Typ.	Max.	Unit
I_{OH}	Output High Current	$V_{OH} = V_{DD} – 0.5$, $V_{DD} = 3.3V$	12	24		mA
I_{OL}	Output Low Current	$V_{OL} = 0.5$, $V_{DD} = 3.3V$	12	24		mA
C_{IN}	Input Capacitance				7	pF
I_{IZ}	Input Leakage Current			5		µA
I_{DD}	Supply Current	Sum of Core and Output Current			20	mA

DC Electrical Characteristics (Industrial)

Parameter	Description	Conditions	Min.	Typ.	Max.	Unit
I_{OH}	Output High Current	$V_{OH} = V_{DD} – 0.5$, $V_{DD} = 3.3V$	11	24		mA
I_{OL}	Output Low Current	$V_{OL} = 0.5$, $V_{DD} = 3.3V$	11	24		mA
C_{IN}	Input Capacitance				7	pF
I_{IZ}	Input Leakage Current			5		µA
I_{DD}	Supply Current	Sum of Core and Output Current			25	mA

AC Electrical Characteristics (V_{DD} = 3.3V, Commercial)

Parameter[3]	Description	Conditions	Min.	Typ.	Max.	Unit
DC	Output Duty Cycle	Duty Cycle is defined in *Figure 1*, 50% of V_{DD}	45	50	55	%
t_3	Rising Edge Slew Rate	Output Clock Rise Time, 20% - 80% of V_{DD}	0.8	1.4		V/ns

Notes:
1. Float XOUT if XIN is externally driven
2. Rated for 10 years
3. Not 100% tested

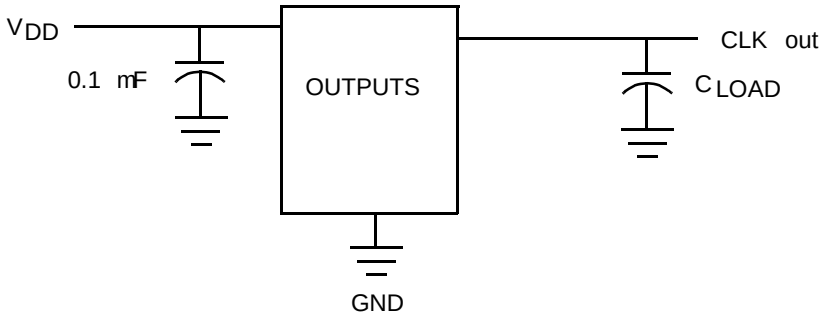
AC Electrical Characteristics (V_{DD} = 3.3V, Commercial) (continued)

Parameter[3]	Description	Conditions	Min.	Typ.	Max.	Unit
t_4	Falling Edge Slew Rate	Output Clock Fall Time, 80% - 20% of V_{DD}	0.8	1.4		V/ns
t_9	Clock Jitter	Peak to Peak period jitter		200		ps
t_{10}	PLL Lock Time				3	ms

AC Electrical Characteristics (V_{DD} = 3.3V, Industrial)

Parameter[3]	Name	Description	Min.	Typ.	Max.	Unit
DC	Output Duty Cycle	Duty Cycle is defined in *Figure 1*, 50% of V_{DD}	45	50	55	%
t_3	Rising Edge Slew Rate	Output Clock Rise Time, 20% – 80% of V_{DD}	0.8	1.4		V/ns
t_4	Falling Edge Slew Rate	Output Clock Fall Time, 80% – 20% of V_{DD}	0.8	1.4		V/ns
t_9	Clock Jitter	Peak to Peak period jitter		200		ps
t_{10}	PLL Lock Time				3	ms

Test Circuit



Ordering Information

Ordering Code	Package Name	Package Type	Operating Range	Operating Voltage
CY26200SC	S8	8-lead SOIC	Commercial	3.3V
CY26200SI	S8	8-lead SOIC	Industrial	3.3V

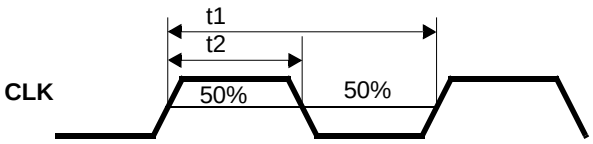


Figure 1. Duty Cycle Definition; DC = t2/t1

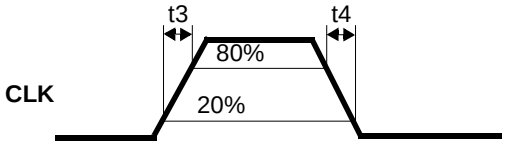
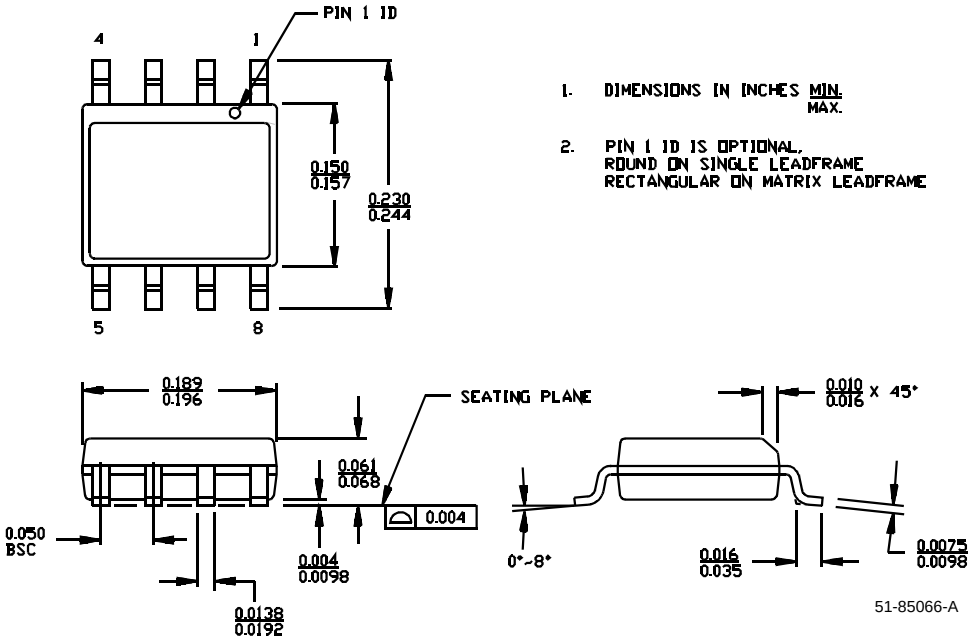


Figure 2. Rise and Fall Time Definitions

Package Diagram

8-lead (150-mil) SOIC S8



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Document Title: CY26200 T1/E1 Clock Generator Document Number: 38-07335				
REV.	**ECN No.**	**Issue Date**	**Orig. of Change**	**Description of Change**
**	111745	05/06/02	CKN	New Data Sheet
*A	121890	12/14/02	RBI	Power up requirements added to Operating Conditions Information