3.3V 1:10 CMOS Clock Driver

Features

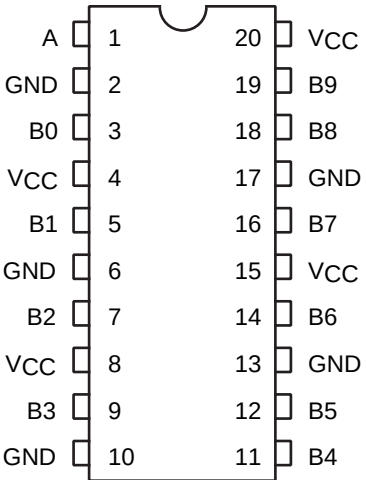
- Low skew: < 200ps
- Fast switching frequency >133 MHz
- Fast output rise/fall time < 1.5ns
- Low propagation delay < 2.5ns
- Low input capacitance < 6.0pF
- 5V I/O Tolerant input
- Rail-to-Rail CMOS outputs
- Industrial Temperature: –40°C to +85°C
- 3.3V ±10% operation
- Packaging (Pb-free & Green Available):
  – 20-pin 300-mil wide SOIC (S)
  – 20-pin 150-mil wide QSOP (Q)
  – 20-pin 209-mil wide SSOP (H)

Description

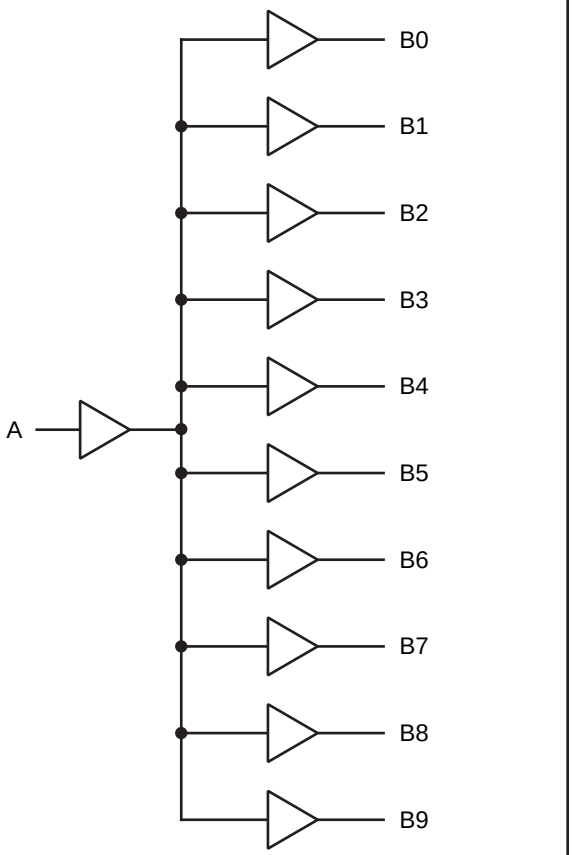
Pericom Semiconductor's PI49FCT32807 is a 3.3V very low-skew clock buffer that produces ten outputs from a single low-capacitance input. Excellent output signals to power and ground ratio minimize power and ground noise, and also improves output performance.

The PI49FCT32807 integrates series damping resistors on all outputs.

Pin Configuration



Block Diagram



Pin Description

Pin Name	Description
A	Input
B_0-B_9	Outputs
GND	Ground
V_{CC}	Power

Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature	–65°C to +150°C
Ambient Temperature with Power Applied	–40°C to +85°C
Supply Voltage to Ground Potential (Inputs & V_{CC} Only)	–0.5V to +7.0V
Supply Voltage to Ground Potential (Outputs & D/O Only)	–0.5V to +7.0V
DC Input Voltage	–0.5V to +7.0V
DC Output Current	120mA
Power Dissipation	0.5W

Note:
Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

DC Electrical Characteristics (Over the Operating Range)

Symbol	Parameter	Test Condition[1]		Min.	Typ.	Max.	Units
V_{OH}	Output High Voltage	V_{CC} = 3V, V_{IN} = V_{IH} or V_{IL}	I_{OH} = -8mA	2.4	3.0		V
V_{OL}	Output Low Voltage	V_{CC} = 3V V_{IH} or V_{IL}	I_{OL} = 12mA		0.4	0.5	
V_{IH}	Input High Voltage	Guaranteed Logic HIGH Level (Input pins)		2.0		505	
V_{IL}	Input Low Voltage	Guaranteed Logic LOW Level (Input pins)		-0.5		0.8	
I_{IH}	Input High Current	V_{CC} = 3.6V	V_{IN} = 3.6V			1	µA
I_{IL}	Input Low Current	V_{CC} = 3.6V	V_{IN} = 0V			-1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = -18mA			-0.7	-1.2	V
I_{OH}	Output HIGH Current	V_{CC} = 3.3V, V_{IN} =V_{IL} or V_{IH}, V_{OUT} = 1.5V[5]		-25	-45	-80	mA
I_{OL}	Output LOW Current	V_{CC} = 3.3V, V_{IN} =V_{IL} or V_{IH}, V_{OUT} = 1.5V[5]		25	45	90	
I_{OS}	Short Circuit[5] Current	V_{CC} = Max., V_{OUT} = GND[5]		-50	-100	-180	
V_H	Input Hysteresis				150		mV
R_S	Internal Series Resistor				22		Ω

Notes:
1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient and maximum loading.
3. V_{OH} = V_{CC} – 0.6V at rated current.
4. This parameter is determined by device characterization but is not production tested.
5. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.

Power Supply Characteristics

Parameters	Description	Test Conditions[1]		Min.	Typ[2]	Max.	Units
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max.	V_{IN} = GND or V_{CC}	—	0.1	30	µA
ΔI_{CC}	Supply Current per Inputs @ TTL HIGH	V_{CC} = Max.	V_{IN} = V_{CC} – 0.6V[3]	—	47	300	
I_{CCD}	Supply Current per Input per MHz[4]	V_{CC} = Max., Outputs Open Per Output Toggling 50% Duty Cycle	V_{IN} = V_{CC} V_{IN} = GND	—	0.08	0.16	mA/ MHz

Notes:
1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient.
3. Per TTL driven input (V_{IN} = V_{CC} – 0.6V); all other inputs at V_{CC} or GND.
4. This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
5. Values for these conditions are examples of the I_C formula. These limits are guaranteed but not tested.

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters[1]	Description	Test Conditions	Typ	Max.	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	3.0	4	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0V		6	

Notes:
1. This parameter is determined by device characterization but is not production tested.

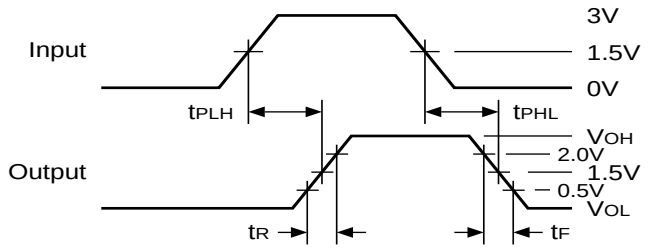
Maximum Switching Characteristics (Over operating range)

Symbol	Description	Condition	Max.	Units[3]
t_{PLH} t_{PHL}	Propagation Delay A to B_N[3]	C_L = 15pF	2.5	ns
t_R/t_F	Rise/Fall Time[2]	0.8V - 2.0V	1.5	
$t_{SK(P)}$	Pulse Skew, same package[1, 2]	C_L = 15pF	0.35	
$t_{SK(O)}$	Output Skew, same package[1, 2]		0.20	
$t_{SK(I)}$	Package Skew, different package[1, 2]		0.55	
F_{IN}	Input Frequency[1, 2]		133	MHz

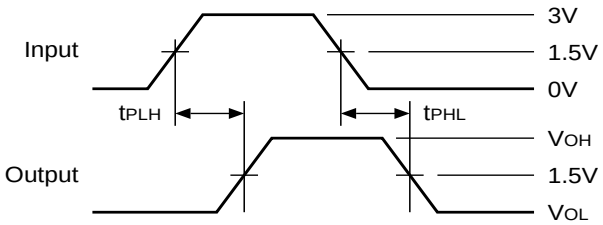
Notes:
1. Other loading condition is described on page 4, "Test Circuits for All Outputs."
2. These parameters are guaranteed by design.
3. Minimum propagation delay of 1.5ns is guaranteed by design.

Switching Waveforms

Propagation Delay

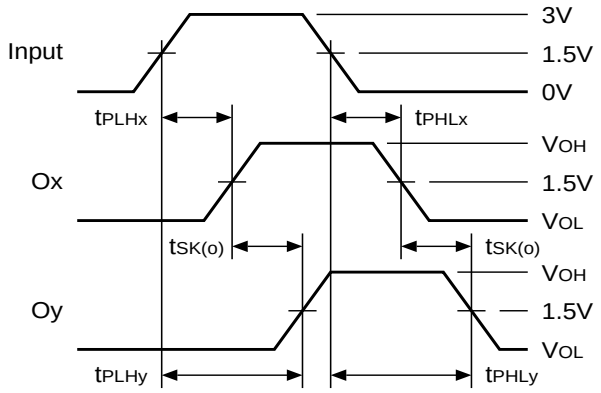


Pulse Skew – $t_{SK(p)}$



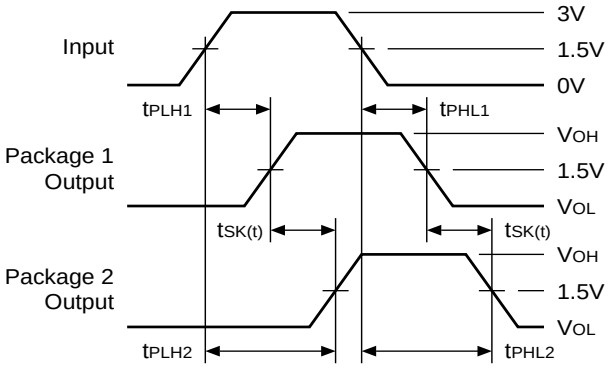
$t_{SK(p)} = |t_{PHL} - t_{PLH}|$

Output Skew – $t_{SK(o)}$



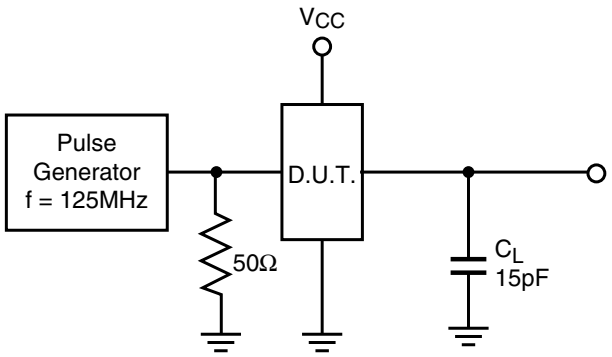
$t_{SK(o)} = |t_{PLHy} - t_{PLHx}|$ or $|t_{PHLy} - t_{PHLx}|$

Package Skew – $t_{SK(t)}$

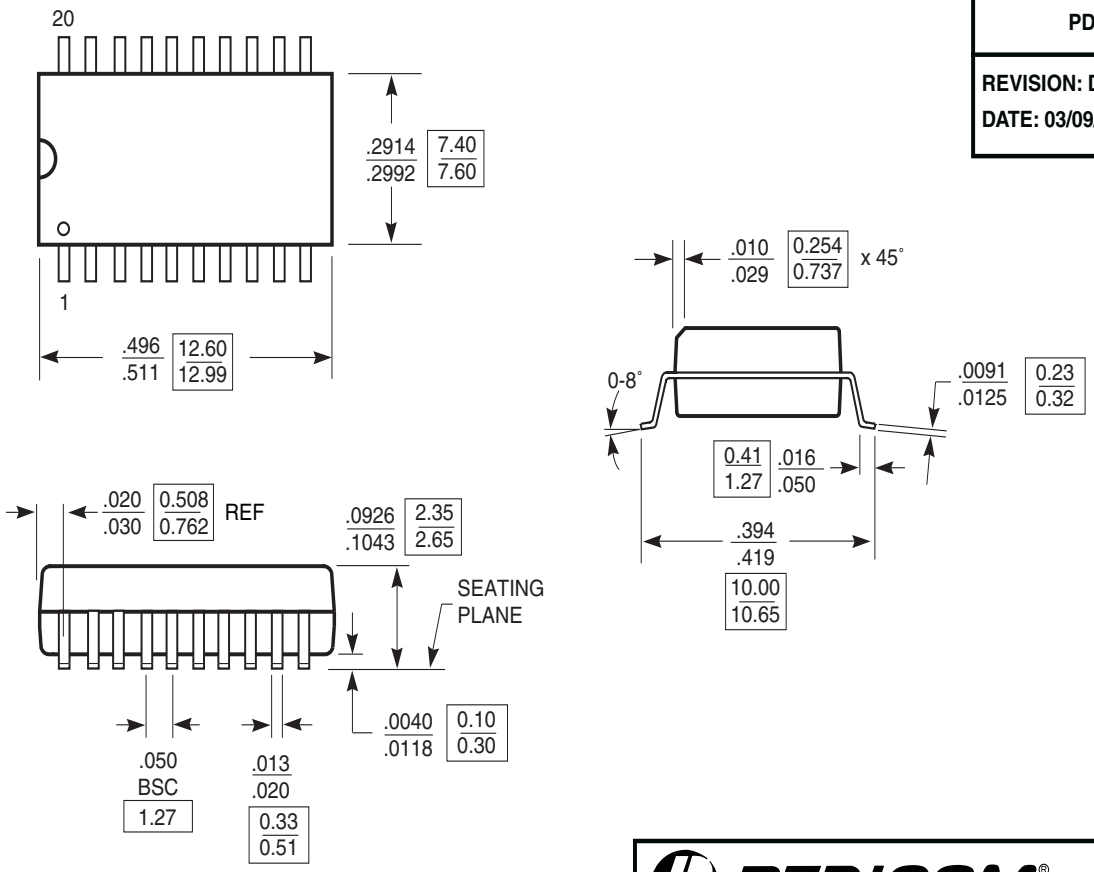


$t_{SK(t)} = |t_{PLH2} - t_{PLH1}|$ or $|t_{PHL2} - t_{PHL1}|$

Tests Circuits for All Outputs



Packaging Mechanical: 20-pin SOIC (S)



Notes:
1) Controlling dimensions in millimeters.
2) Ref: JEDEC MS-013D/AC

DOCUMENT CONTROL NO.
PD - 1006

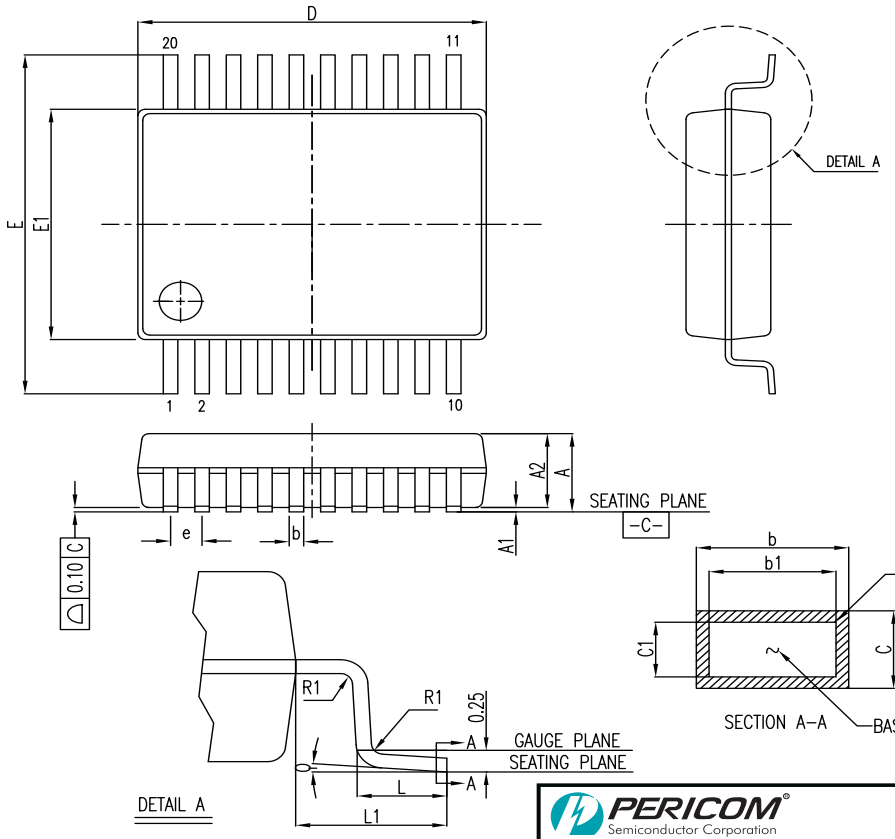
REVISION: D
DATE: 03/09/05

Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
1-800-435-2335 • www.pericom.com

DESCRIPTION: 20-Pin, 300-Mil Wide, SOIC

PACKAGE CODE: S

Packaging Mechanical: 20-pin SSOP (H)



SYMBOL	COMMON DIMENSION MILLIMETERS		
	MIN.	NOM.	MAX.
A	--	--	2.0
A1	0.05	--	--
A2	1.65	1.75	1.85
b	0.22	--	0.38
b1	0.22	0.30	0.33
c	0.09	--	0.25
c1	0.09	0.15	0.21
E	7.40	7.80	8.20
E1	5.00	5.30	5.60
D	6.90	7.20	7.50
e	0.65 BSC		
L	0.55	0.75	0.95
L1	1.25 REF.		
R1	0.09	--	--
θ	0°	4°	8°

NOTE:
1. Controlling dimensions in millimeters
2. Ref.: JEDEC MS-150B/AE
3. Package Outline Exclusive of Mold Flash and Metal Burr

PERICOM Semiconductor Corporation — DATE: 04/10/08

DESCRIPTION: 20-Pin, 209-Mil Wide, SSOP

PACKAGE CODE: H20

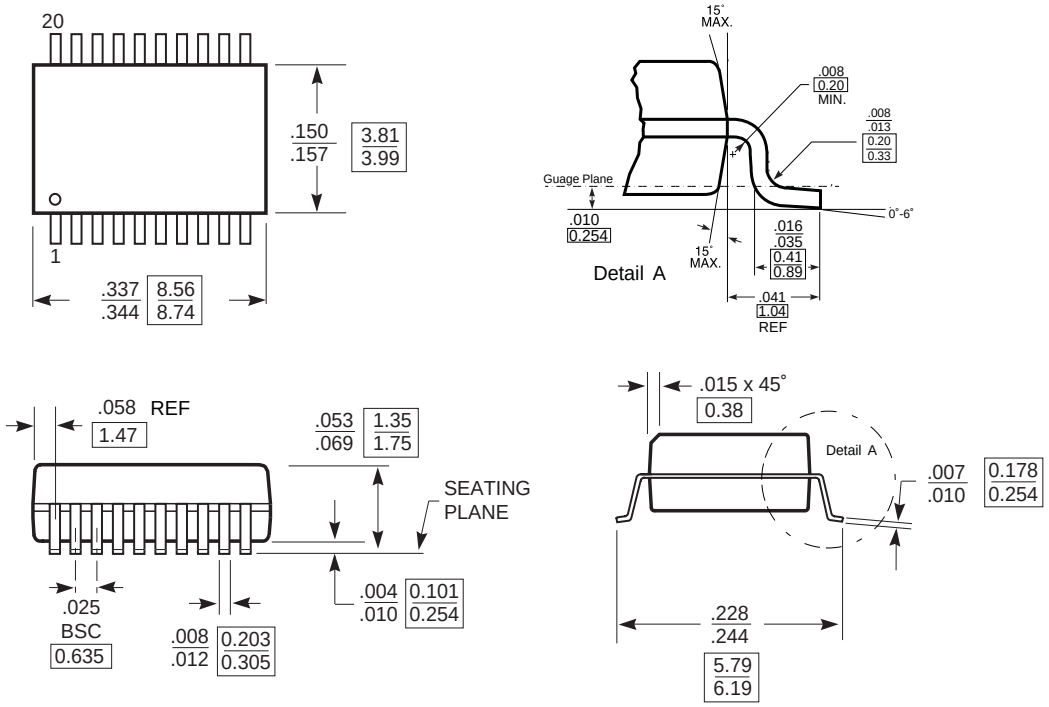
DOCUMENT CONTROL #: PD-1240 — REVISION: E

08-0140

Packaging Mechanical: 20-pin QSOP (Q)

DOCUMENT CONTROL NO.
PD - 1202

REVISION: H
DATE: 10/22/07



X.XX
X.XX DENOTES DIMENSIONS IN MILLIMETERS

Note:
1) Controlling dimensions in inches.
2) Ref: JEDEC MO-137B/AD
3) Dimensions do not include mold flash, protrusions or gate burrs

Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
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DESCRIPTION: 20-Pin, 150-Mil Wide, QSOP

PACKAGE CODE: Q

Ordering Information

Ordering Code	Package Code	Package Description
PI49FCT32807HE	H	Pb-free & Green, 20-pin 209-mil SSOP
PI49FCT32807QE	Q	Pb-free & Green, 20-pin 150-mil QSOP
PI49FCT32807SE	S	Pb-free & Green, 20-pin 300-mil SOIC

Notes:

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. Number of Transistors = TBD

Mouser Electronics

Authorized Distributor

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Diodes Incorporated:

PI49FCT32807SE PI49FCT32807QE PI49FCT32807QEX PI49FCT32807HEX PI49FCT32807HE