PI49FCT3807

3.3V Fast CMOS Clock Driver

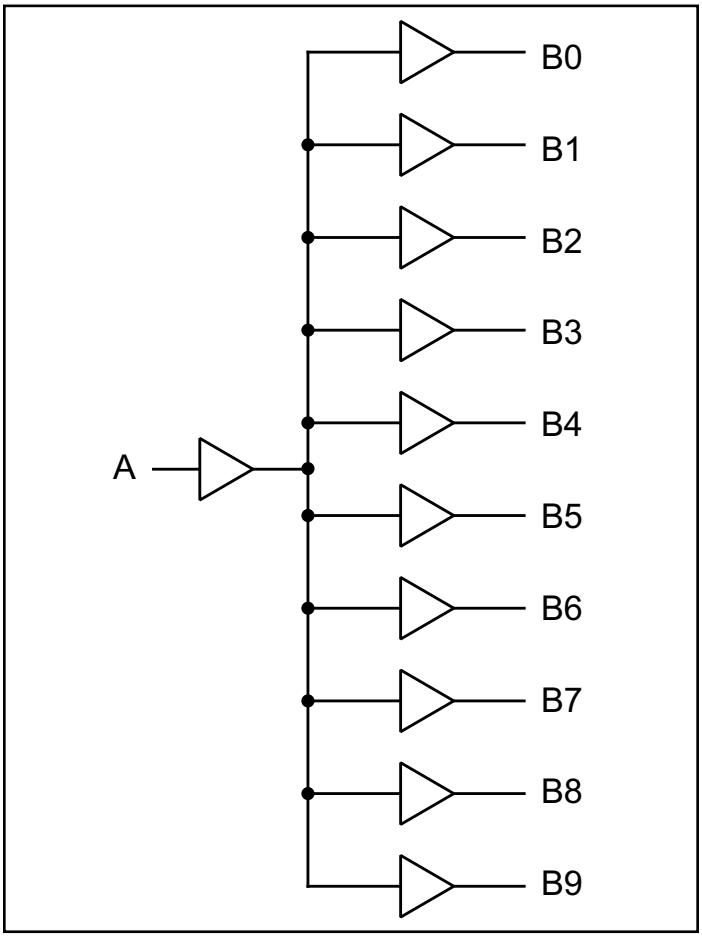
Features

- 3.3V version of PI49FCT807
- Ultra low skew: 0.35ns
- Low Input Capacitance
- Minimum duty cycle distortion
- 1:10 fanout
- High speed: 3.5ns propogation
- TTL input and CMOS output compatible
  - VOH =3.3V (typical)
  - VOL =0.3V (typical)
- Industrial Temperature: –40°C to +85°C
- 3.3V ±10% operation
- Packaging (Pb-free & Green):
  - 20-pin 300-mil wide SOIC (S)
  - 20-pin 150-mil wide QSOP (Q)
  - 20-pin 209-mil wide SSOP (H)

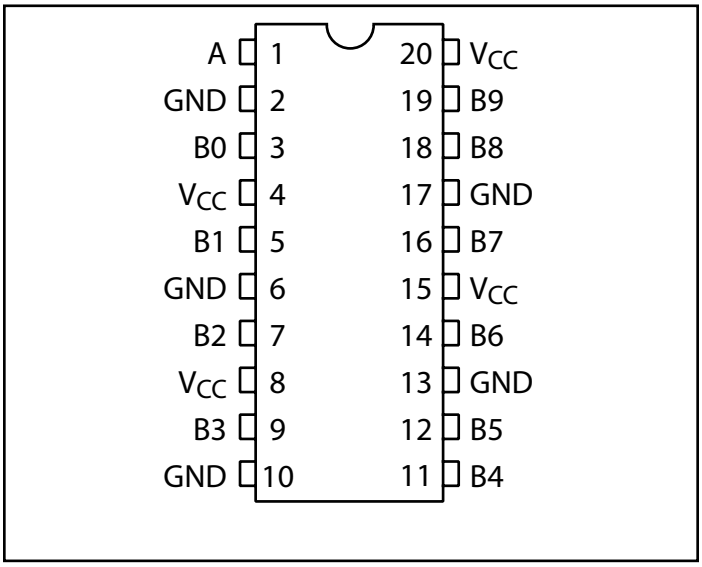
Description

Pericom Semiconductor's PI49FCT3807 is a 3.3V 1-to-10 clock driver. This low skew clock driver features one input and ten outputs fanout. The large fanout from a single input line reduced loading on input clock. TTL level outputs reduce noise levels on the part. Typical applications are clock and signal distributon

Block Diagram



Pin Configuration



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 (TA = –40°C to +85°c V_{CC} = 3.3V ±0.3V)

Symbol	Parameter	Test Condition[1]		Min.	Typ.	Max.	Units
V_{OH}	Output High Voltage	V_{CC} = Min., V_{IN} = V_{IL} or V_{IH}	I_{OH} = -0.1mA I_{OH} = -8mA	V_{CC} - 0.2 2.4	– 3.0		V
V_{OL}	Output Low Voltage	V_{CC} = Min., V_{IN} = V_{IL} or V_{IH}	I_{OH} = 0.1mA I_{OH} = 16mA I_{OH} = 24mA		– 0.2 0.3	0.2 0.4 0.5	
V_{IH}	Input High Voltage	Guaranteed Logic HIGH Level (Input pins)		2.0		5.5	
V_{IL}	Input Low Voltage	Guaranteed Logic LOW Level (Input pins)		-0.5		0.8	
I_{IH}	Input High Current	V_{CC} = Max.	V_{IN} = V_{CC}			1	µA
I_{IL}	Input Low Current	V_{CC} = Max.	V_{IN} = GND			-1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = -18mA			-0.7	-1.2	V
I_{OH}	Output HIGH Current[4,5]	V_{OUT} = 1.5V, V_{IN} =V_{IL} or V_{IH}, V_{CC} = 3.3V		-35	-60	-110	mA
I_{OL}	Output LOW Current[4,5]	V_{OUT} = 1.5V, V_{IN} =V_{IL} or V_{IH}, V_{CC} = 3.3V		50	90	200	
I_{OS}	Short Circuit Current[4,5]	V_{CC} = Max., V_{OUT} = GND		-60	-135	-240	
V_H	Input Hysteresis				150		mV

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}	—	3	30	µA
ΔI_{CC}	Supply Current per Inputs @ TTL HIGH	V_{CC} = Max.	V_{IN} = V_{CC} 0.6V[3]	—	2.0	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	—			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	4.5	6.0	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0V	5.5	8.0	

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

Maximum Switching Characteristics (Over operating range)

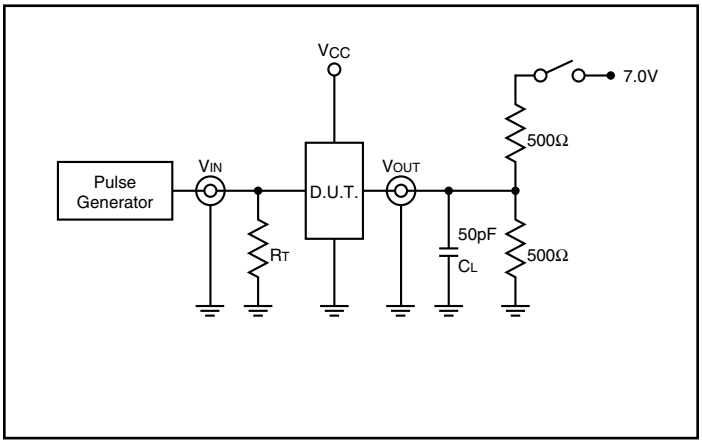
Symbol	Description	Test Conditions	3807 Com.		3087A Com.		3087B Com.		3807C Com.		Units
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay A to B_N	C_L = 15pF R_L = 500Ω	1.5	4.5	1.5	4.0	1.5	3.8	1.5	3.5	ns
$t_{SK(O)}$	Skew between two outputs of same package[3]			0.5		0.5		0.5		0.5	
$t_{SK(P)}$	Skew between opposite transitions of the same output (t_{PHL} - t_{PHL})[3]			0.5		0.5		0.35		0.35	
F_{IN}	Skew between outputs of different packages at the same power supply, temp. and speed grade[3]			1.0		1.0		0.75		0.75	

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.

Phase Jitter Measurement Data

Frequency Band	Input	Output	Additive Jitter	Unit
12kHz-10MHz	342	483	341	fs_{RMS}
12kHz-20MHz	493	642	411	fs_{RMS}

Tests Circuits for All Outputs

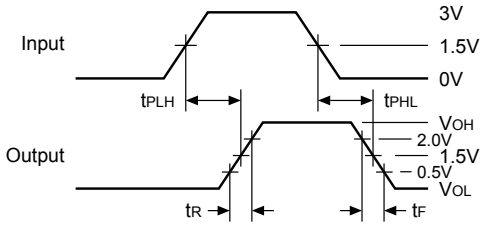


Switch Position

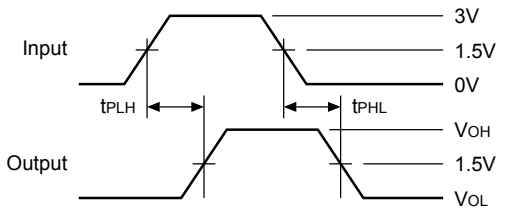
Test	Switch
Disable LOW Enable LOW	6V
Disable HIGH Enable HIGH	GND
All Other Inputs	Open

Switching Waveforms

Propagation Delay

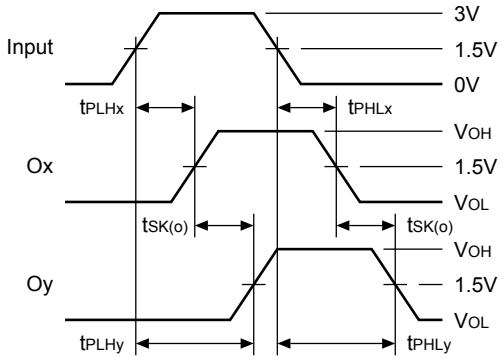


Pulse Skew – $t_{SK(p)}$



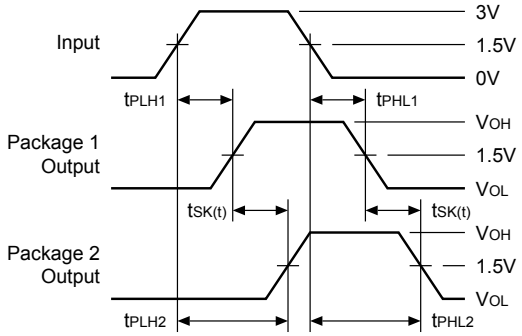
$t_{SK(p)} = | t_{PHL} - t_{PLH} |$

Output Skew – $t_{SK(o)}$



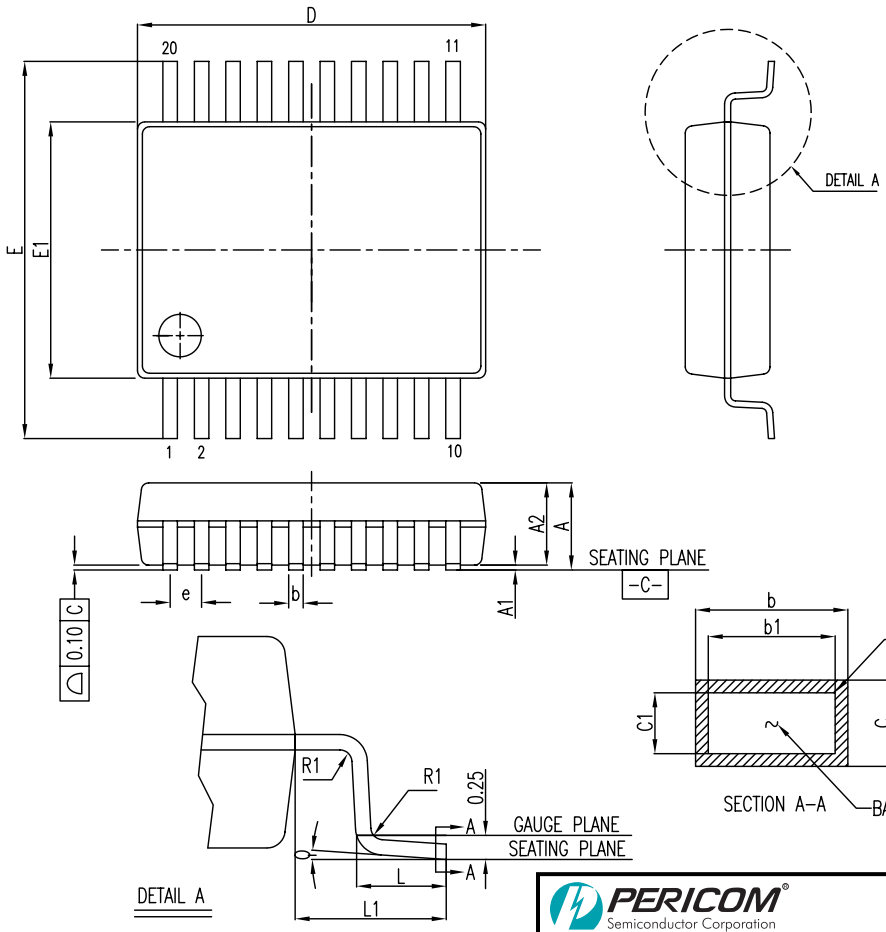
$t_{SK(o)} = | t_{PLHy} - t_{PLHx} |$ or $| t_{PHLy} - t_{PHLx} |$

Package Skew – $t_{SK(t)}$



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

Packaging Mechanical: 20-pint SSOP (H20)



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

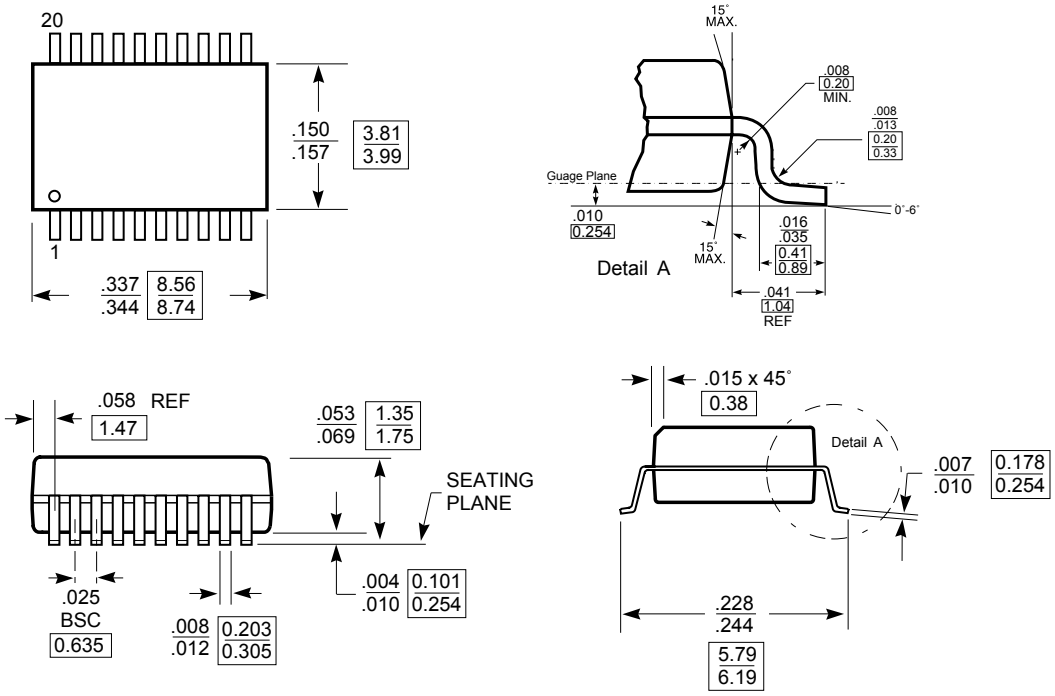
DOCUMENT CONTROL #: PD-1240 **REVISION: E**

08-0140

Packaging Mechanical: 20-pin QSOP (Q20)

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
1-800-435-2335 • www.pericom.com

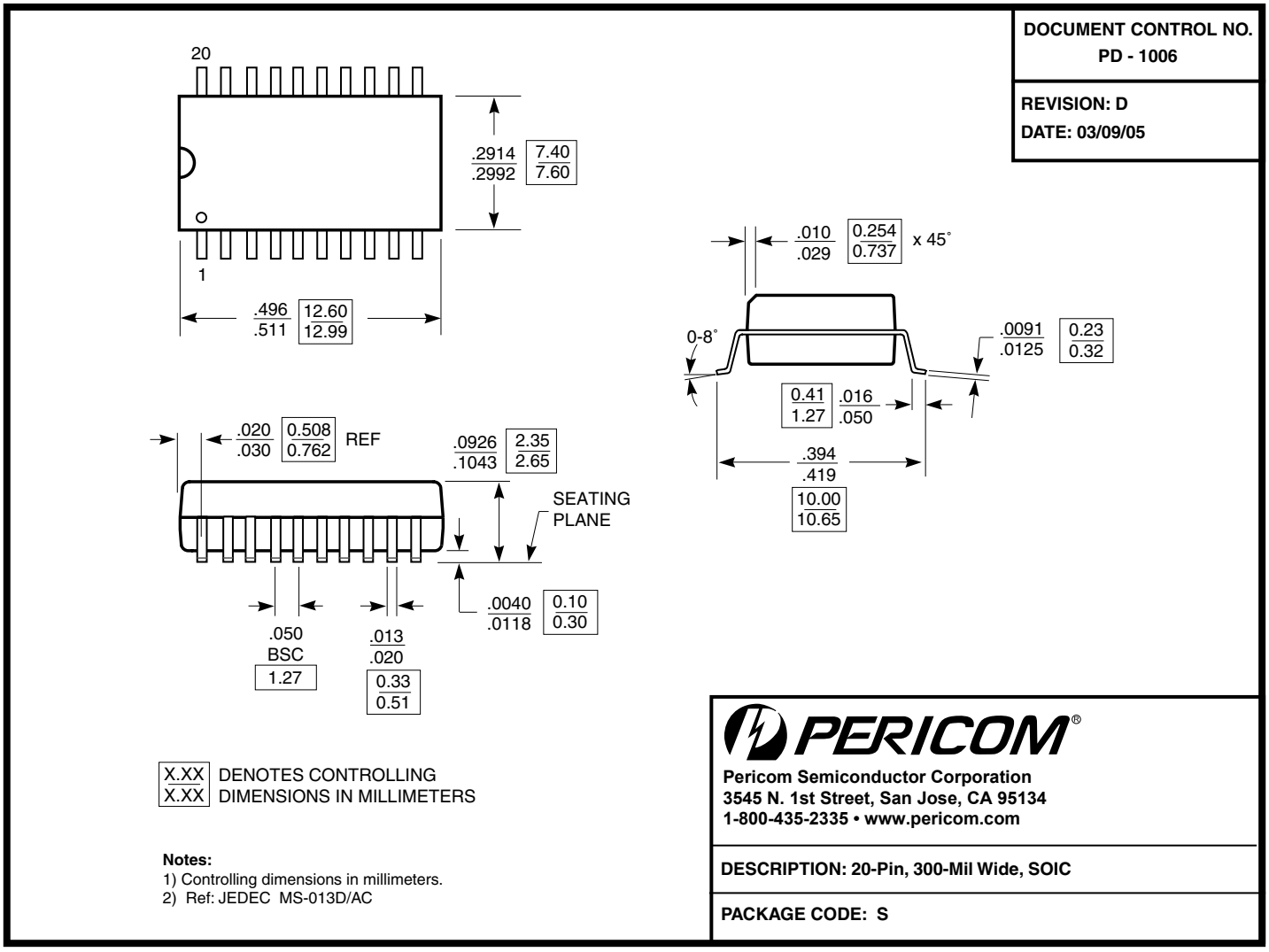
DESCRIPTION: 20-Pin, 150-Mil Wide, QSOP

PACKAGE CODE: Q

Note:

- For latest package info, please check: http://www.pericom.com/products/packaging/mechanicals.php

Packaging Mechanical: 20-pin SOIC (S20)



Note:

- For latest package info, please check: http://www.pericom.com/products/packaging/mechanicals.php

Ordering Information

Ordering Code	Package Code	Speed Grade	Package Description
PI49FCT3807AHE	H	A	Pb-free & Green, 20-pin 209-mil SSOP
PI49FCT3807AQE	Q	A	Pb-free & Green, 20-pin 150-mil QSOP
PI49FCT3807ASE	S	A	Pb-free & Green, 20-pin 300-mil SOIC
PI49FCT3807BQE	Q	B	Pb-free & Green, 20-pin 150-mil QSOP
PI49FCT3807CHE	H	C	Pb-free & Green, 20-pin 209-mil SSOP
PI49FCT3807CQE	Q	C	Pb-free & Green, 20-pin 150-mil QSOP
PI49FCT3807CSE	S	C	Pb-free & Green, 20-pin 300-mil SOIC
PI49FCT3807DHE	H	D	Pb-free & Green, 20-pin 209-mil SSOP
PI49FCT3807DQE	Q	D	Pb-free & Green, 20-pin 150-mil QSOP
PI49FCT3807DSE	S	D	Pb-free & Green, 20-pin 300-mil SOIC
PI49FCT3807HE	H	Blank	Pb-free & Green, 20-pin 209-mil SSOP
PI49FCT3807QE	Q	Blank	Pb-free & Green, 20-pin 150-mil QSOP

Notes:
- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- Adding an X suffix = Tape/Reel