



PI49FCT3807/PI49FCT3807A/ PI49FCT3807B/PI49FCT3807C

3.3V Fast CMOS Clock Driver

Features

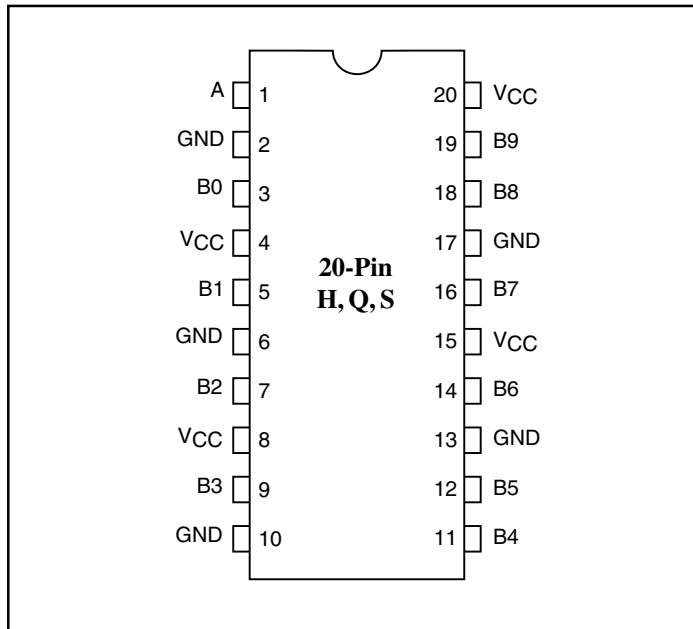
- 3.3V version of PI49FCT807
- Ultra low skew: 0.35ns
- Low Input Capacitance
- Minimum duty cycle distortion
- 1:10 fanout
- High speed: 3.5ns propagation
- TTL input and CMOS output compatible
 - $V_{OH} = 3.3V$ (typ.)
 - $V_{OH} = 0.3V$ (typ.)
- Industrial operation at $-40^{\circ}C$ to $85^{\circ}C$
- Packages available:
 - 20-pin 300mil wide SOIC (S)
 - 20-pin 150mil wide QSOP (Q)
 - 20-pin 209mil wide SSOP (H)

Description

Pericom Semiconductor's PI49FCT series of logic circuits are produced using the Company's advanced submicron CMOS technology, achieving industry leading speed grades.

The 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 reduces loading on input clock. TTL level outputs reduce noise levels on the part. Typical applications are clock and signal distribution.

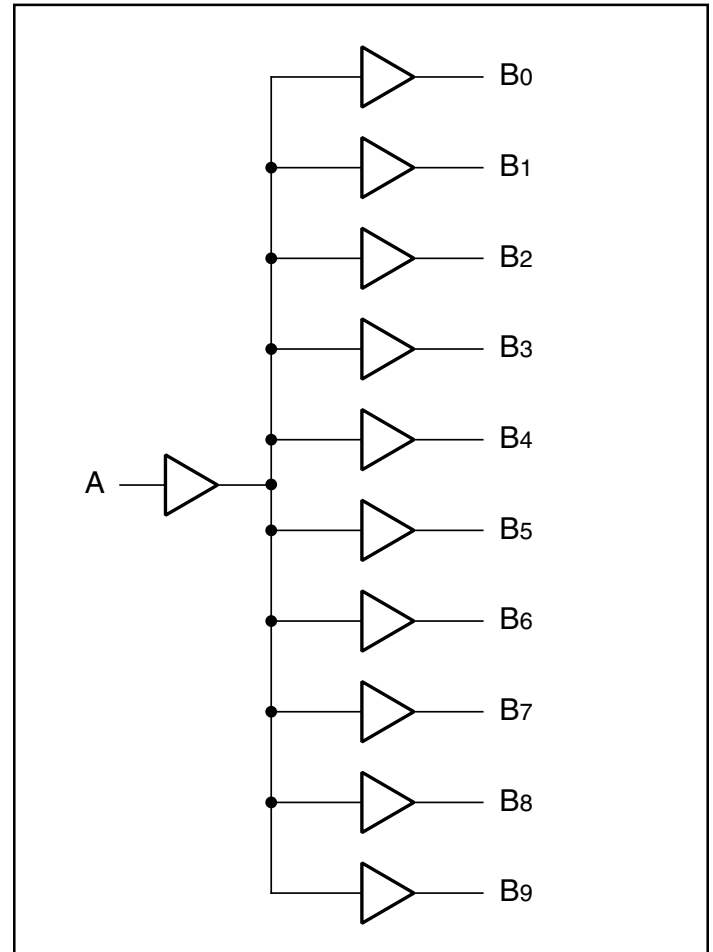
Product Pin Configuration



Product Pin Description

Pin Name	Description
A	Input
B ₀ -B ₉	Outputs
GND	Ground
V _{CC}	Power

Logic Block Diagram



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.

Operating Range

Ambient Temperature = –40°C to +85°C V_{CC} = 3.3V ±0.3V

DC Electrical Characteristics (Over the Operating Range)

Symbol	Description	Test Conditions ⁽¹⁾		Min.	Typ.	Max.	Units
V _{OH}	Output HIGH voltage	V _{CC} =Min., V _{IN} =V _{IH} or V _{IL}	I _{OH} = –0.1mA I _{OH} = –8mA	V _{CC} –0.2 2.4 ⁽³⁾	– 3.0	– –	V
V _{OL}	Output LOW voltage	V _{CC} =Min., V _{IN} =V _{IH} or V _{IL}	I _{OL} = 0.1mA I _{OL} = 16mA I _{OL} = 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 _{ODH}	Output HIGH current	V _{CC} = 3.3V, V _{IN} = V _{IH} or V _{IL} , V _{OUT} = 1.5V ⁽⁵⁾		–35	–60	–110	mA
I _{ODL}	Output LOW current	V _{CC} = 3.3V, V _{IN} = V _{IH} or V _{IL} , V _{OUT} = 1.5V ⁽⁵⁾		50	90	200	
I _{OS}	Short circuit current ⁽⁵⁾	V _{CC} = Max., V _{OUT} = GND ⁽⁵⁾		–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
DI _{CC}	Supply Current per Inputs @ TTL HIGH	V _{CC} =Max.	V _{IN} = V _{CC} – 0.6V ⁽³⁾	—	2.0	300	μA
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:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V_{CC}=3.3V, +25°C ambient.
- Per TTL driven input (V_{IN} = V_{CC} – 0.6V); all other inputs at V_{CC} or GND.
- This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
- 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	pF

Notes:

- This parameter is determined by device characterization but is not production tested.

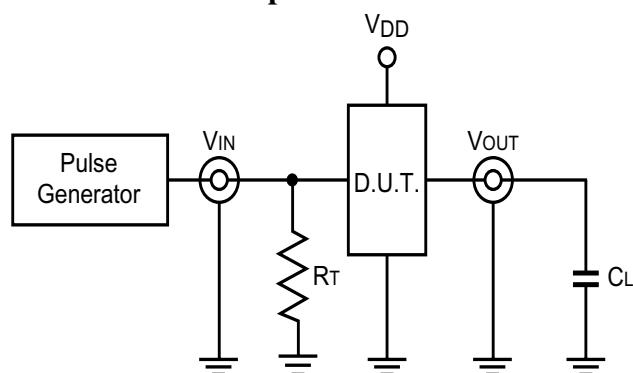
Switching Characteristics over Operating Range

Symbol	Description	Condition ⁽¹⁾	3807		3807A		3807B		3807C		Units
			Com.		Com.		Com.		Com.		
			Min.	Max	Min.	Max	Min.	Max	Min.	Max	
t _{PLH} t _{PHL}	Propagation Delay A to B _N	CL = 50pF RL = 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	—	0.35	—	0.35	
t _{SK(P)}	Skew between opposite transitions of same output (t _{PHL} — t _{PHL}) ⁽³⁾		—	0.5	—	0.5	—	0.35	—	0.35	
t _{SK(t)}	Skew between outputs of different package at same power supply, temperature and speed grade ⁽³⁾		—	1.0	—	1.0	—	0.75	—	0.75	

Notes:

- See test circuits and waveforms
- Minimum limits are guaranteed but not tested on Propagation Delays.
- These parameters are guaranteed by design.

Tests Circuits for All Outputs⁽¹⁾



Switch Position

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

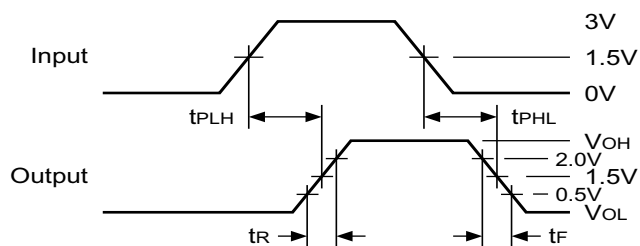
DEFINITIONS:

CL = Load capacitance: includes jig and probe capacitance.

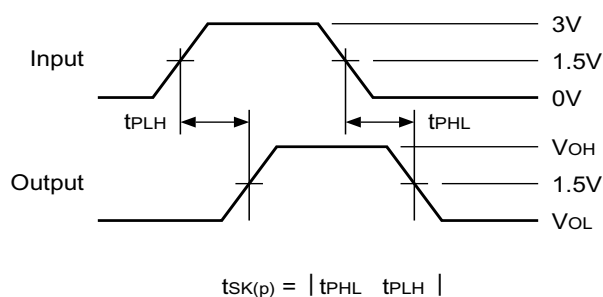
RT = Termination resistance: should be equal to ZOUT of the Pulse Generator.

SWITCHING WAVEFORMS

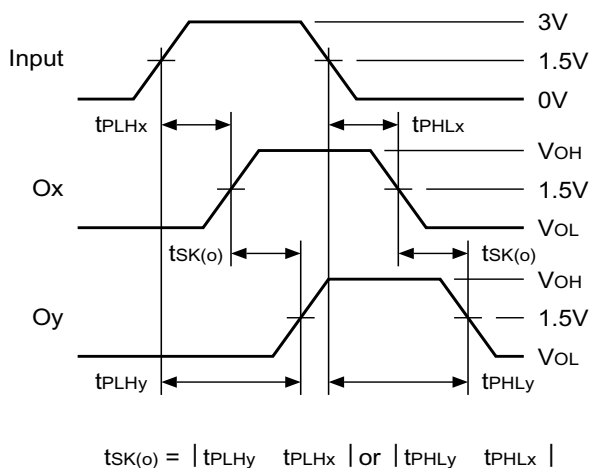
Propagation Delay



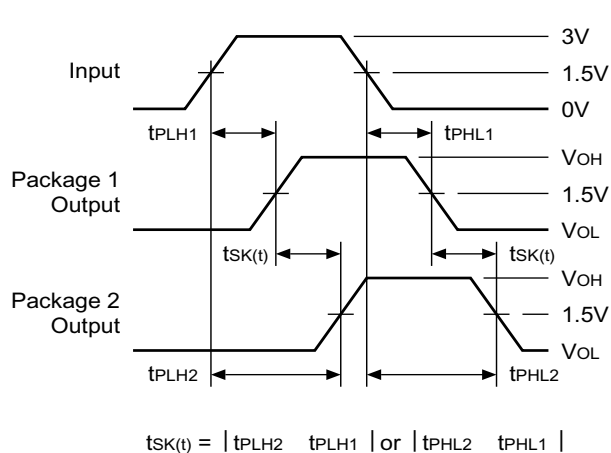
Pulse Skew – tsk(p)

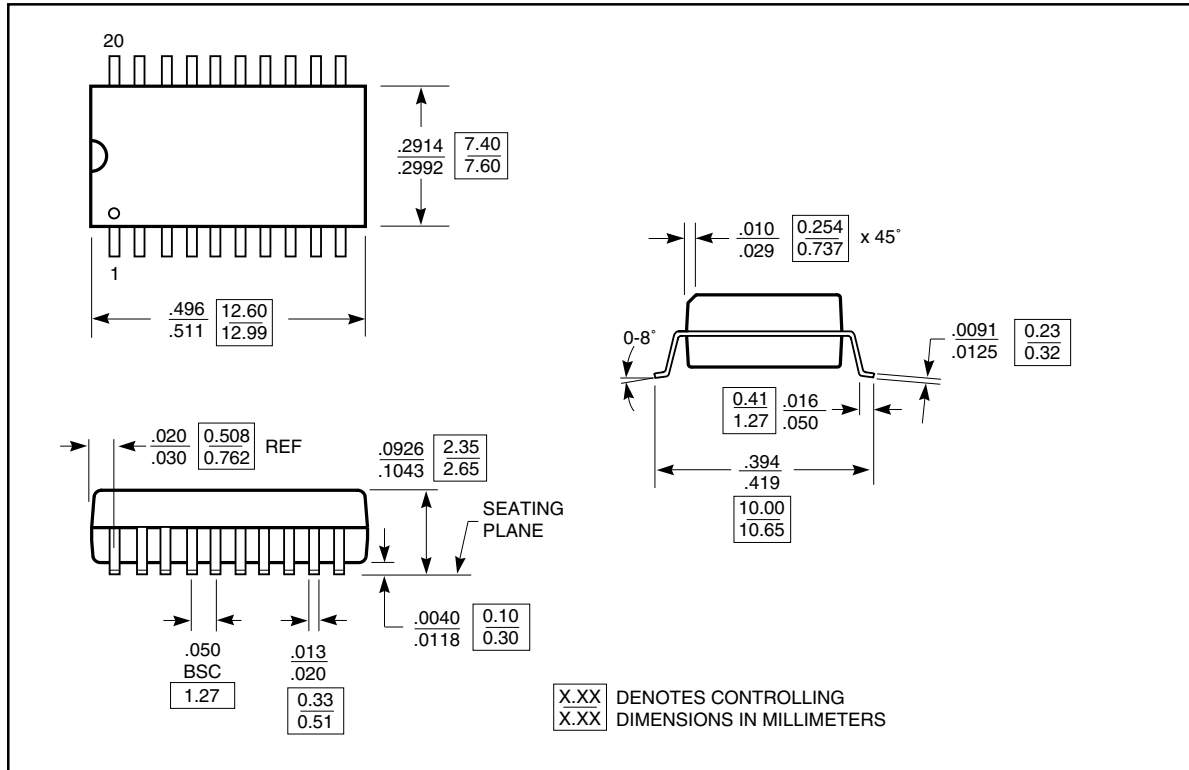
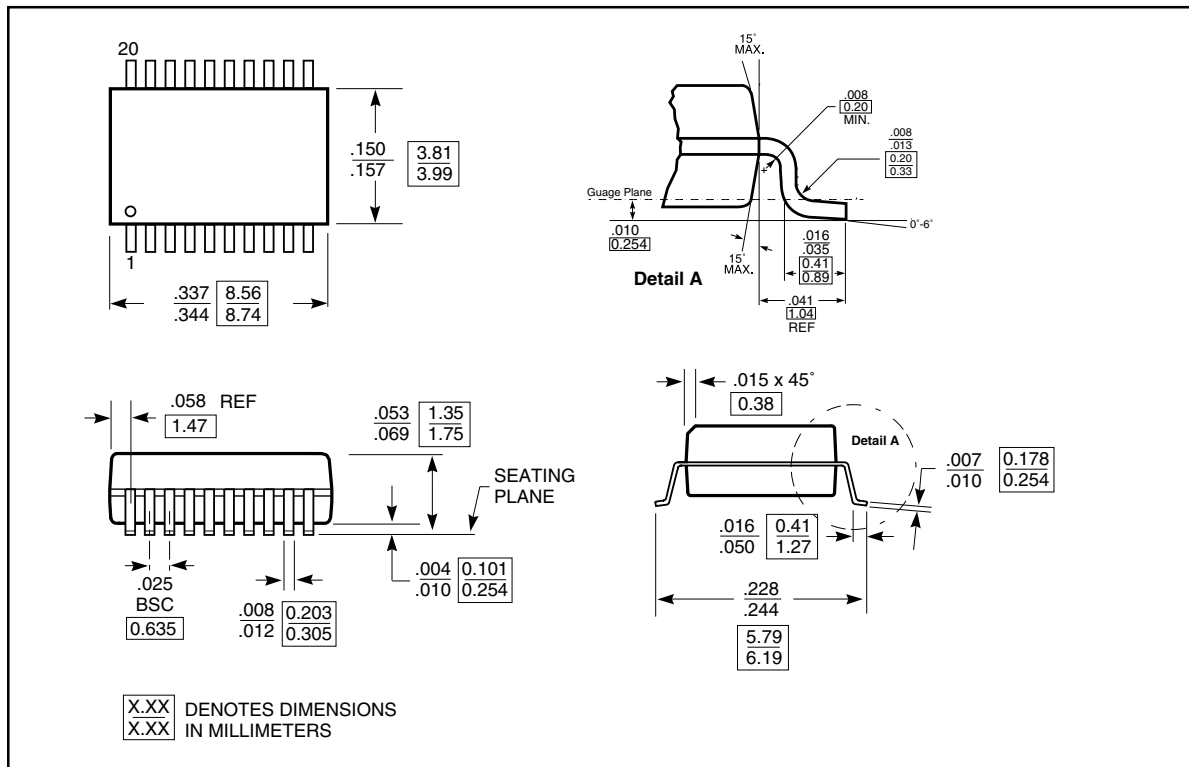


Output Skew – tsk(o)

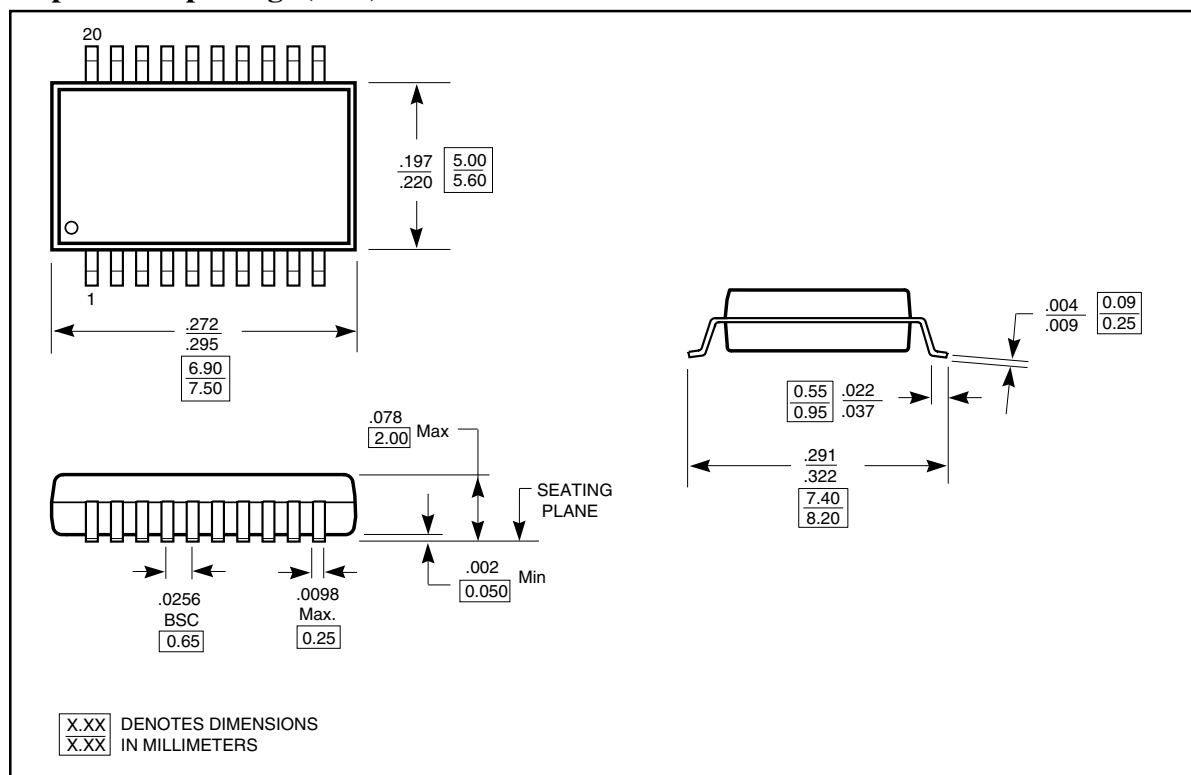


Package Skew – tsk(t)



20-pin SOIC package (S20)

20-pin QSOP package (Q20)


20-pin SSOP package (H20)



Ordering Information

Ordering Code	Package Type	Rating	Note
PI49FCT3807S	300-mil SOIC	Industrial	Refer to Switching Characteristic Table for Speed Grade Characteristics
PI49FCT3807Q	150-mil QSOP		
PI49FCT3807H	209-mil SSOP		
PI49FCT3807AS	300-mil SOIC		
PI49FCT3807AQ	150-mil QSOP		
PI49FCT3807AH	209-mil SSOP		
PI49FCT3807BS	300-mil SOIC		
PI49FCT3807BQ	150-mil QSOP		
PI49FCT3807BH	209-mil SSOP		
PI49FCT3807CS	300-mil SOIC		
PI49FCT3807CQ	150-mil QSOP		
PI49FCT3807CH	209-mil SSOP		