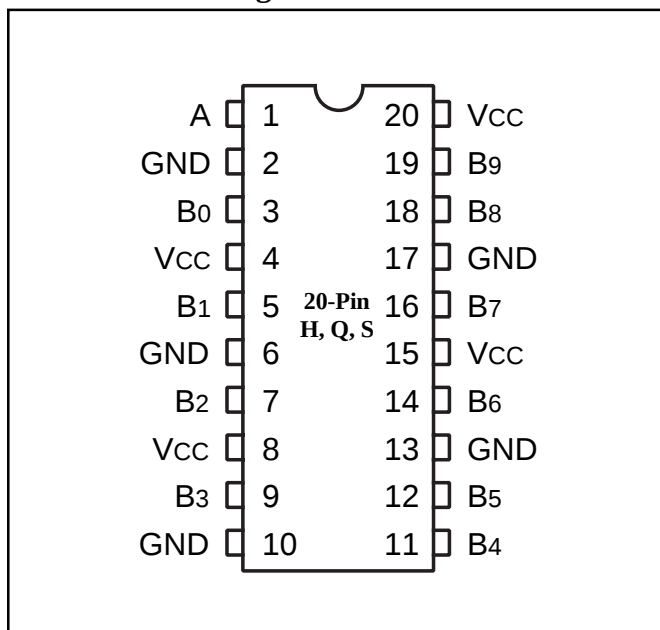


Features

- Ultra low skew: <150ps
- Fast switching frequency <150 MHz
- Fast output rise/fall time <1.2ns
- Low propagation delay <3.0ns
- Low input capacitance <4.0pF
- 5V I/O Tolerant input
- Rail-to-Rail CMOS outputs
- Industrial Temperature: -40°C to +85°C
- 3.3V ±10% operation
- Packages available:
 - 20-pin 300-mil wide SOIC (S)
 - 20-pin 150-mil wide QSOP (Q)
 - 20-pin 209-mil wide SSOP (H)

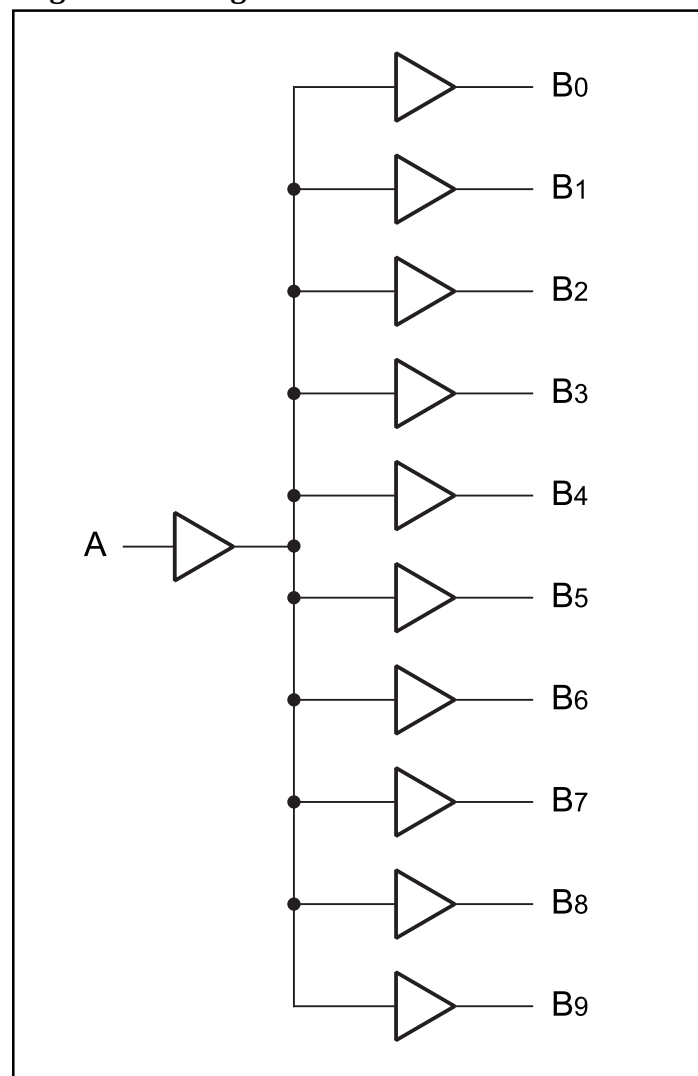
Product Pin Configuration

Product Pin Description

Pin Name	Description
A	Input
B0-B9	Outputs
GND	Ground
VCC	Power

Description

Pericom Semiconductor's PI49FCT series of logic circuits are produced using the Company's advanced 0.5 micron CMOS technology, achieving speeds up to 150 MHz, low-power dissipation, and output skew less than 150ps.

The PI49FCT3807 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.

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)

Parameters	Description	Test Conditions ⁽¹⁾		Min.	Typ ⁽²⁾	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
V _{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level (Input Pins)		2.0	—	5.5	V
V _{IL}	Input LOW Voltage	Guaranteed Logic LOW Level (Input Pins)		–0.5	—	0.8	V
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	μA
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 ⁽⁴⁾		–35	–60	–110	mA
I _{ODL}	Output LOW Current	V _{CC} = 3.3V, V _{IN} = V _{IH} or V _{IL} , V _{OUT} = 1.5V ⁽⁴⁾		50	90	200	mA
I _{OS}	Short Circuit Current ⁽⁵⁾	V _{CC} = Max., V _{OUT} = GND ⁽⁵⁾		–60	–135	–240	mA
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	$V_{CC} = \text{Max.}$	$V_{IN} = \text{GND or } V_{CC}$	—	3	30	μA
ΔI_{CC}	Supply Current per Inputs @ TTL HIGH	$V_{CC} = \text{Max.}$	$V_{IN} = V_{CC} - 0.6\text{V}^{(3)}$	—	2.0	300	μA
I_{CCD}	Supply Current per Input per MHz ⁽⁴⁾	$V_{CC} = \text{Max.},$ Outputs Open Per Output Toggling 50% Duty Cycle	$V_{IN} = V_{CC}$ $V_{IN} = \text{GND}$	—			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 $V_{CC} = 3.3\text{V}$, $+25^\circ\text{C}$ ambient.
3. Per TTL driven input ($V_{IN} = V_{CC} - 0.6\text{V}$); 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 ($T_A = 25^\circ\text{C}$, $f = 1\text{ MHz}$)

Parameters ⁽¹⁾	Description	Test Conditions	Typ	Max.	Units
C_{IN}	Input Capacitance	$V_{IN} = 0\text{V}$	3.0	4.0	pF
C_{OUT}	Output Capacitance	$V_{OUT} = 0\text{V}$	4.0	6.0	pF

Notes:

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

Maximum Switching Characteristics (Over operating range)

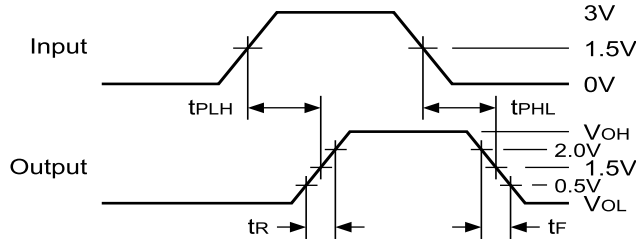
Symbol	Description	Condition	32807D Max.	3807D Max.	3807C Max.	3807B Max.	3807A Max.	3807 Max.	Units
t_{PLH} t_{PHL}	Propagation Delay A to Bn ⁽⁴⁾	10pF ⁽¹⁾ 30pF, <100MHz 50pF, <67MHz	3.3 4.3 4.3	3.0 3.5 4.0	3.5	3.8	4.0	4.5	ns
t_R/t_F	Rise/Fall Time ⁽³⁾	0.8V –2.0V	1.5	1.2	1.5	1.5	1.5	1.5	
$t_{SK(o)}$	Output Skew (same Pkg.) ⁽³⁾	10pF ⁽¹⁾ 30pF, <100MHz 50pF, <67MHz	0.15 0.30 0.50	0.15 0.30 0.50	0.35	0.35	0.50	0.50	
$t_{SK(i)}$	Output Skew (different Pkg.) ⁽³⁾	10pF ⁽¹⁾ 30pF, <100MHz 50pF, <67MHz	0.30 0.50 0.70	0.30 0.50 0.70	0.75	0.75	1.00	1.00	
F_{IN}	Input Frequency		125	150	110	100	80	67	MHz

Notes:

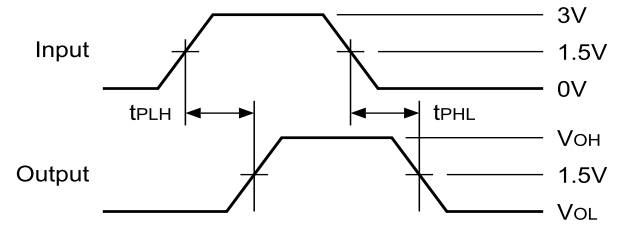
1. 50-Ohm AC terminated or 50-Ohm to $V_{CC}/2$.
2. Other loading condition is shown in Figure.....
3. These parameters are guaranteed by design.
4. Minimum propagation delay of 1.5ns is guaranteed by design.

SWITCHING WAVEFORMS

Propagation Delay

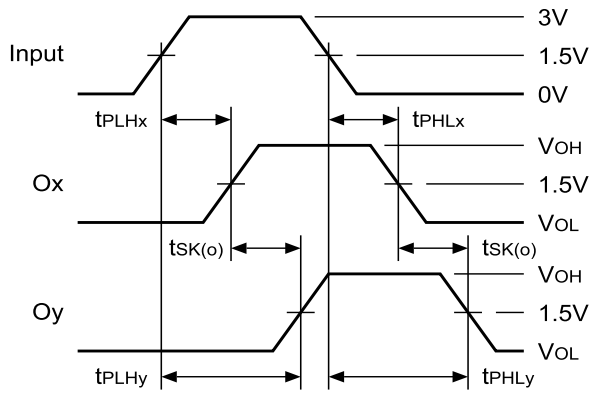


Pulse Skew – $t_{SK(p)}$



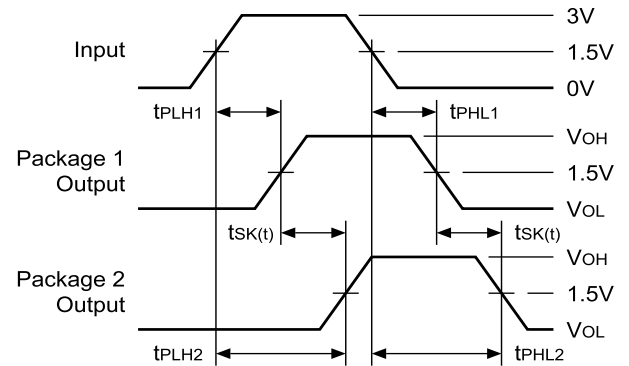
$$t_{SK(p)} = |t_{PHL} - t_{PLH}|$$

Output Skew – $t_{SK(o)}$



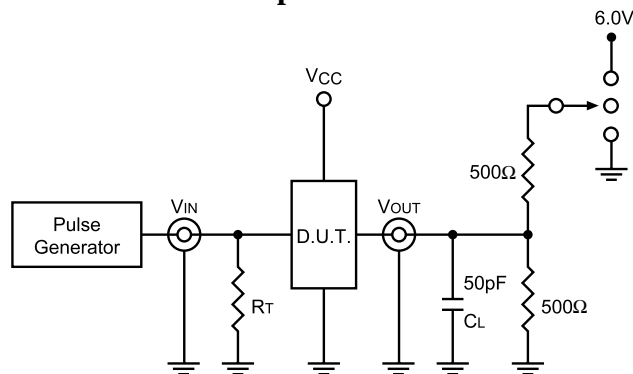
$$t_{SK(o)} = |t_{PLHy} - t_{PLHx}| \text{ or } |t_{PHLy} - t_{PHLx}|$$

Package Skew – $t_{SK(t)}$



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

Tests Circuits for All Outputs⁽¹⁾



Switch Position

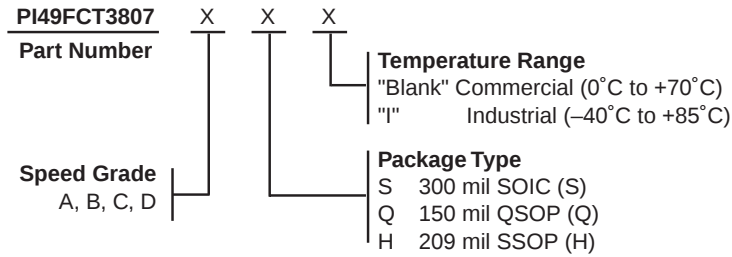
Test	Switch
Disable LOW Enable LOW	6V
Disable HIGH Enable HIGH	GND
All Other Inputs	Open

DEFINITIONS:

CL = Load capacitance: includes jig and probe capacitance.

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

Ordering Information



Ordering Code	Part Marking	Package Type
PI49FCT3807xS	PI49FCT3807Sx	300 mil SOIC
PI49FCT3807xQ	PI49FCT3807Qx	150 mil QSOP
PI49FCT3807xH	PI49FCT3807Hx	209 mil SSOP

Note:

x = Speed grades: "Blank," A, B, C, D

Marketing Information

