

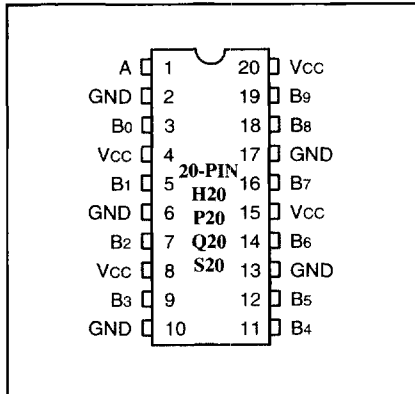
Product Features:

- 3.3V version of PI49FCT807
- Ultra low skew: 0.35 ns
- Low input capacitance
- Minimum duty cycle distortion
- 1:10 fanout
- High speed: 3.5 ns propagation delay
- TTL input and CMOS output compatible
 - $V_{OH} = 3.3V$ (typ.)
 - $V_{OL} = 0.3V$ (typ.)
- Packages available:
 - 20-pin 300 mil wide DIP (P20)
 - 20-pin 300 mil wide SOIC (S20)
 - 20-pin 150 mil wide QSOP (Q20)
 - 20-pin 209 mil wide SSOP (H20)
- Device models available on request

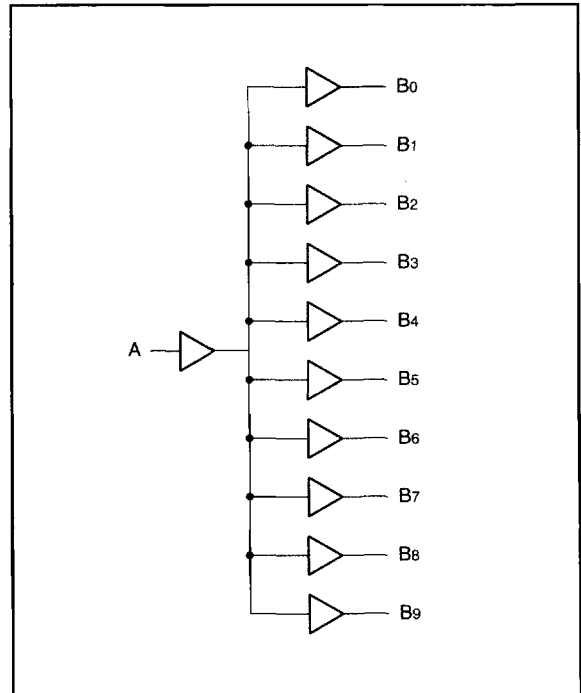
Product Description:

Pericom Semiconductor's PI49FCT series of logic circuits are produced in the Company's advanced 0.6 micron 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
B0-B9	Outputs
GND	Ground
Vcc	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	0°C to +70°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	120 mA
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 = 0°C to +70°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} = -0.1 mA I _{OH} = -8 mA	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} = 0.1 mA I _{OL} = 16 mA I _{OL} = 24 mA	— — —	— 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} = -18 mA	—	-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} = 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	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	
I _c	Total Power Supply Current ⁽⁶⁾	V _{cc} = Max., Outputs Open f _o = 10 MHz 50% Duty Cycle Mon. Output Toggling	V _{IN} = V _{cc} V _{IN} = GND	—			mA	
			V _{IN} = V _{cc} - 0.6V V _{IN} = GND	—				
		V _{cc} = Max., Outputs Open f _o = 2.5 MHz 50% Duty Cycle Eleven Outputs Toggling	V _{IN} = V _{cc} V _{IN} = GND	—				
			V _{IN} = V _{cc} - 0.6V V _{IN} = GND					

Notes:

- For conditions shown as Max. or Min., 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.
- $$I_c = I_{\text{QUIESCENT}} + I_{\text{INPUTS}} + I_{\text{DYNAMIC}}$$

$$I_c = I_{cc} + \Delta I_{cc} D_H N_T + I_{ccd} (f_o N_o)$$

I_{cc} = Quiescent Current
ΔI_{cc} = Power Supply Current for a TTL High Input (V_{IN} = V_{cc} - 0.6V)
D_H = Duty Cycle for TTL Inputs High
N_T = Number of TTL Inputs at D_H
I_{ccd} = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)
f_o = Output Frequency
N_o = Number of Outputs at f_o
All currents are in milliamps and all frequencies are in megahertz.

Capacitance ($T_A = 25^\circ\text{C}$, $f = 1\text{ MHz}$)

Parameters ⁽¹⁾	Description	Test Conditions	Typ	Max.	Units
C_{IN}	Input Capacitance	$V_{IN} = 0V$	4.5	6.0	pF
C_{OUT}	Output Capacitance	$V_{OUT} = 0V$	5.5	8.0	pF

Notes:

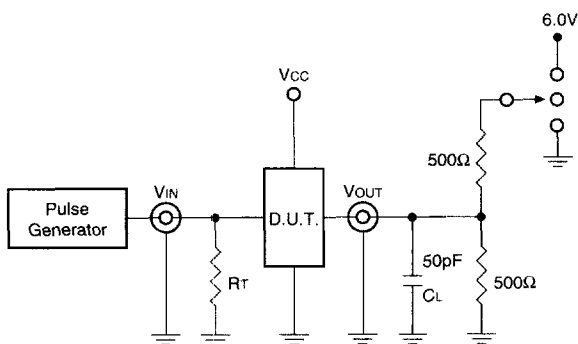
1. This parameter is determined by device characterization but is not production tested.

Switching Characteristics over Operating Range

Parameters	Description	Conditions ⁽¹⁾	3807		3807A		3807B		3807C		Unit
			Com.		Com.		Com.		Com.		
			Min	Max	Min	Max	Min	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay A TO B _N	$C_L = 50\text{ pF}$ $R_L = 500\Omega$	1.5	4.5	1.5	4.0	1.5	3.8	1.5	3.5	ns
$t_{SK(e)}$	Skew between two outputs of same package ⁽³⁾		—	0.5	—	0.5	—	0.35	—	0.35	ns
$t_{SK(p)}$	Skew between opposite transitions of same output ($t_{PHL} - t_{PLH}$) ⁽³⁾		—	0.5	—	0.5	—	0.35	—	0.35	ns
$t_{SK(d)}$	Skew between outputs of different package at same power supply, temperature and speed grade ⁽³⁾		—	1.0	—	1.0	—	0.75	—	0.75	ns

Notes:

1. See test circuit and wave forms.
2. Minimum limits are guaranteed but not tested on Propagation Delays.
3. This parameter is guaranteed but not tested.

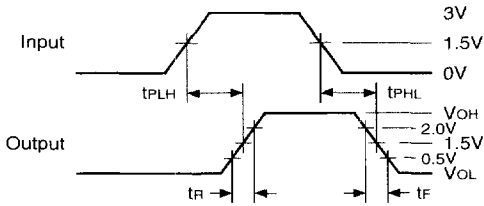
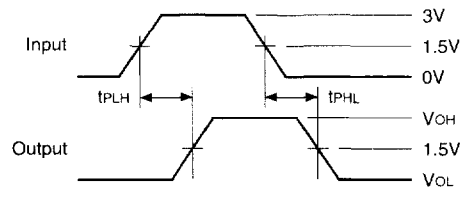
Tests Circuits For All Outputs⁽¹⁾

Switch Position

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

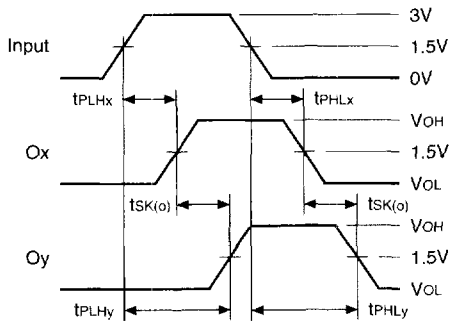
DEFINITIONS:

C_L = Load capacitance: includes jig and probe capacitance.

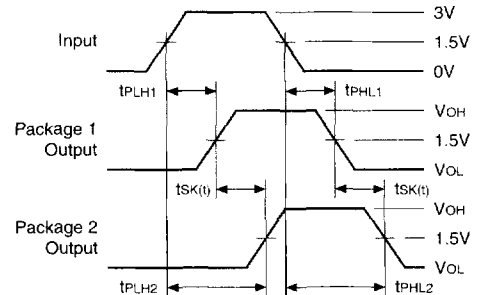
R_T = Termination resistance: should be equal to Z_{OUT} of the Pulse Generator.

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 – $t_{sk(i)}$


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