

High-Speed Inverted Hex Driver

Product Features:

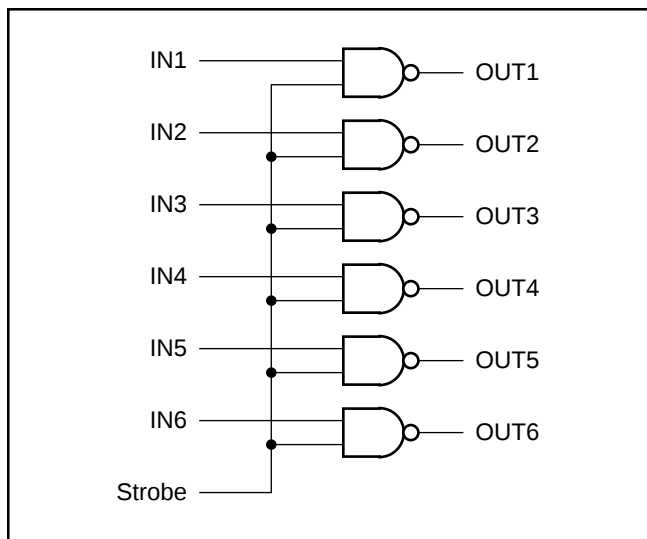
- High Drive Capability
 $I_{OL} = 100 \text{ mA}$
 $I_{OH} = -32 \text{ mA}$ with capacitive loads up to 150 pF
- TTL input and output levels
- Extremely low static power
- Hysteresis on all inputs
- ESD protection exceeds 2000V
- Industrial operating temperature range: -40°C to $+85^{\circ}\text{C}$
- Packages available:
 - 16-pin 300 mil wide plastic DIP (P)
 - 20-pin plastic PLCC (J)

Product Description:

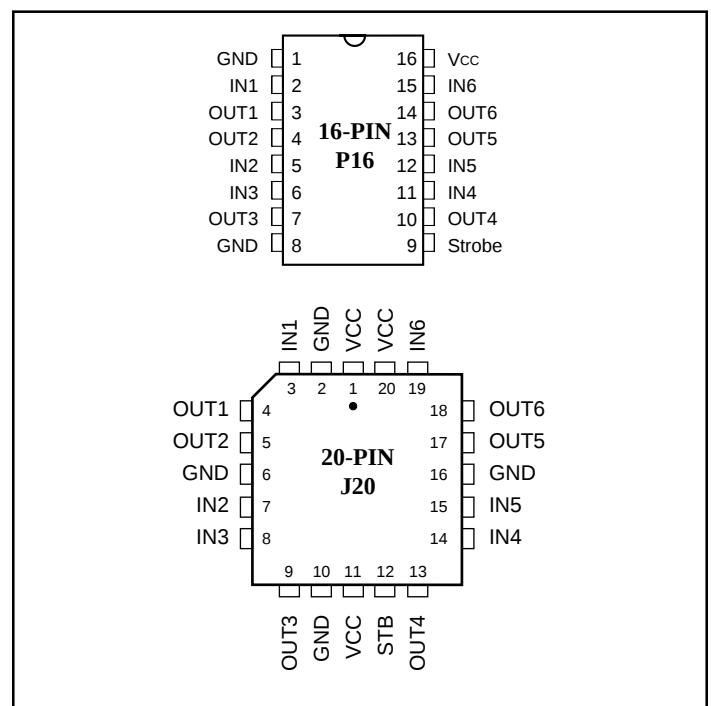
Pericom Semiconductor's PI74FCT series of logic circuits are produced in the Company's advanced 0.8 micron CMOS technology, achieving industry leading speed grades.

The PI74FCT890T is a very high-speed, high-drive inverting hex driver capable of providing high-current drive into large capacitive loads. The device can be used as an inverting clock or DRAM driver, as well as high-speed buffer.

Logic Block Diagram



Product Pin Configurations



Truth Table⁽¹⁾

Inputs		Outputs
STB	IN	OUT
L	X	H
H	L	H
H	H	L

Note:

1. H = High Voltage Level
 L = Low Voltage Level
 X = Don't Care

Product Pin Description

Pin Name	Description
IN0-IN6	Data Inputs
OUT0-OUT6	Data Outputs
Strobe	Strobe Input
GND	Ground
Vcc	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	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.

DC Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 5.0V ± 5%)

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} = –32.0 mA	2.4	3.0		V
V _{OL}	Output LOW Voltage	V _{CC} = Min., V _{IN} = V _{IH} or V _{IL}	I _{OL} = 100 mA		0.3	0.55	V
V _{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level		2.0			V
V _{IL}	Input LOW Voltage	Guaranteed Logic LOW Level				0.8	V
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}	Except I/O Pins			1	μA
			I/O Pins			1	
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND	Except I/O Pins			–1	μA
			I/O Pins			–1	
V _{IK}	Clamp Diode Voltage	V _{CC} = Min., I _{IN} = –18 mA			–0.7	–1.2	V
I _{OS}	Short Circuit Current	V _{CC} = Max. ⁽³⁾ , V _{OUT} = GND		–60	–120		mA
I _{OFF}	Power Down Disable	V _{CC} = GND, V _{OUT} = 4.5V		—	—	100	μA
V _H	Input Hysteresis				200		mV

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters ⁽⁴⁾	Description	Test Conditions	Typ	Max.	Units
C _{IN}	Input Capacitance	V _{IN} = 0V	6	10	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0V	8	12	pF

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} = 5.0V, +25°C ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
4. This parameter is determined by device characterization but is not production tested.

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	10	μA
ΔI _{CC}	Supply Current per Input @ TTL HIGH	V _{CC} = Max.	V _{IN} = 3.4V ⁽³⁾		0.5	2.5	mA
I _{CCD}	Supply Current per Input per MHz ⁽⁴⁾	V _{CC} = Max., Outputs Open One Input Toggling 50% Duty Cycle	V _{IN} = V _{CC} V _{IN} = GND		0.15	0.25	mA/ MHz
I _C	Total Power Supply Current ⁽⁶⁾	V _{CC} = Max., Outputs Open f _{CP} = 10 MHz 50% Duty Cycle f _I = 5 MHz One Bit Toggling	V _{IN} = V _{CC} V _{IN} = GND		2.0	4.0 ⁽⁵⁾	mA
			V _{IN} = 3.4V V _{IN} = GND		2.5	6.0 ⁽⁵⁾	
		V _{CC} = Max., Outputs Open f _{CP} = 10 MHz 50% Duty Cycle Eight Bits Toggling f _I = 2.5 MHz 50% Duty Cycle	V _{IN} = V _{CC} V _{IN} = GND		4.3	7.8 ⁽⁵⁾	
			V _{IN} = 3.4V V _{IN} = GND		6.5	16.8 ⁽⁵⁾	

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} = 5.0V, +25°C ambient.
- Per TTL driven input (V_{IN} = 3.4V); 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_{CC} formula. These limits are guaranteed but not tested.
- I_C = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}

$$I_C = I_{CC} + \Delta I_{CC} D_H N_T + I_{CCD} (f_{CP}/2 + f_I N_I)$$

I_{CC} = Quiescent Current
ΔI_{CC} = Power Supply Current for a TTL High Input (V_{IN} = 3.4V)
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_{CP} = Clock Frequency for Register Devices (Zero for Non-Register Devices)
f_I = Input Frequency
N_I = Number of Inputs at f_I
All currents are in milliamps and all frequencies are in megahertz.

Switching Characteristics over Operating Range

Parameters	Description	Conditions ⁽¹⁾	890T		Unit
			Com.		
			Min	Max	
t _{PLH}	Propagation Delay, Data	C _L = 150 pF	3.0	9.0	ns
t _{PHL}	& Strobe to Low-to-High	R _L = 500Ω			

Notes:

1. See test circuit and wave forms.
2. Input pulse is supplied by a generator with the following characteristics: PRR = 1 MHz, Z_{OUT} = 50, and t_r & t_f < 2.0 ns
3. C_L includes probe and jig capacitance.