PI74FCT890T

High-Speed Inverted Hex Driver

Product Features:

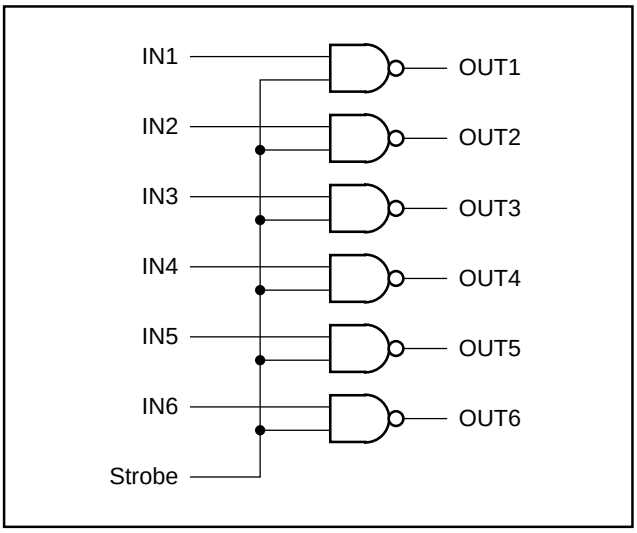
- High Drive Capability
  - I_{OL} = 100 mA
  - I_{OH} = –32 mA with capacitive loads up to 150 pF
- TTL input and output levels
- Extremely low static power
- Hysteresis on all inputs
- ESD protection exceeds 2000V
- Industrial operating temperature range: –40°C to +85°C
- Packages available:
  – 16-pin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

Product Description:

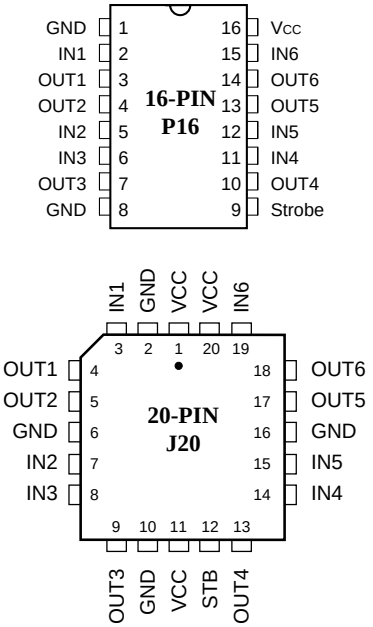
Pericom Semiconductor's PI74FCT series of logic circuits are produced in the Company's advanced 0.8 micron CMOS technology, achieving industry leading speed grades.

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
V_{CC}	Power

PS2027A03/11/96

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 & Vcc 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 $+85°C$, $V_{CC} = 5.0V \pm 5\%$)

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 Vcc = 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:
1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at Vcc = 5.0V, +25°C ambient.
3. Per TTL driven input (V_{IN} = 3.4V); all other inputs at Vcc 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 Icc formula. These limits are guaranteed but not tested.
6. $I_C = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}$
   $I_C = I_{CC} + \Delta I_{CC} D_H N_T + I_{CCD} (f_{CP}/2 + f_i N_i)$
   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 Com. Min	890T Com. Max	Unit
t_{PLH} t_{PHL}	Propagation Delay, Data & Strobe to Low-to-High	C_L = 150 pF R_L = 500Ω	3.0	9.0	ns

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 tr & tf < 2.0 ns
3. C_L includes probe and jig capacitance.