Fast CMOS
9-Bit Parity Generator/Checker

Product Features:

- PI74FCT280T have the same speed and drive of Bipolar FAST™ "F" series, at CMOS power levels.
  - "A" speeds at 7.5 ns max.
  - "B" speeds at 6.3 ns max.
  - "C" speeds are an industry first, at 5.3 ns max.
  - "D" speeds are an industry first 4.5 ns max.
- TTL input and output levels, reducing problematic "ground bounce"
- 6.3 ns delay, An to e for PI74FCT280BT
- High output drive, I_{OL} = 48 mA
- Extremely low static power (1 mW, typ.)
- Industry standard pinout, plug into existing "74F" sockets for speed enhancement at reduced power levels
- Positive edge triggered D-type flip-flops
- Buffered common clock and asynchronous Clear input
- Hysteresis on all inputs
- Packaged in 14-pin 150 mil SOIC

Product Description:

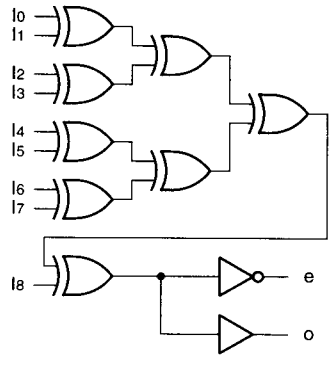
Pericom Semiconductor's PI74FCT series of logic circuits are produced in the Company's advanced 0.8 micron CMOS technology, achieving industry leading speed grades.

The PI74FCT280T is a high speed CMOS TTL-compatible 9-bit parity generator-checkers. Both odd and even parity outputs are available for generating or checking odd or even parity.

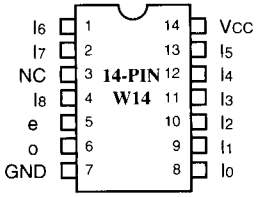
This product is available in a 14-pin 150 mil SOIC.

Logic Block Diagram

PI74FCT280T



PI74FCT280Product Pin Configuration



Product Pin Description

Pin Name	Description
I0 – I8	Data In
e	Even Parity Out
o	Odd Parity Out
GND	Ground
VCC	Power

Truth Table[1]

Function	Inputs I0 - I8	Outputs e	Outputs o
Even Parity	No. of Bits at TTL High = 0, 2, 4, 6, 8	H	L
Odd Parity	No. of Bits at TTL High = 1, 3, 5, 7, 9	L	H

Note:
1. H = High Voltage Level
   L = Low Voltage Level

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 & Vcc Only)	–0.5V to +7.0V
Supply Voltage to Ground Potential (Outputs & D/O Only)	–0.5V to Vcc
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.

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters[4]	Description	Test Conditions	Typ	Max.	Units
C_{IN}	Input Capacitance	V_{IN} = 0 V	6	10	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0 V	8	12	pF

Notes:
1. For conditions show as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 5.0, +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.

DC Electrical Characteristics (Over the Operating Range, T_A = 0°C to +70°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} = –15.0 mA	2.0			V
V_{OL}	Output LOW Voltage	V_{CC} = Min., V_{IN} = V_{IH} or V_{IL}	I_{OL} = 48 mA			0.5	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} = 2.7 V			5	µA
I_{IL}	Input LOW Current	V_{CC} = Max.	V_{IN} = 0.5 V			–5	µA
I_{OZH}	High Impedance	V_{CC} = Max.	V_{OUT} = 2.7 V			+5	µA
I_{OZL}	Output Current		V_{OUT} = 0.5 V			–5	µA
I_I	Input HIGH Current	V_{CC} = Max., V_{IN} = V_{CC} (Max.)				20	µA
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18 mA[3]			–0.7	–1.2	V
I_{OS}	Short Circuit Current	V_{CC} = Max.,[2][3], V_{OUT} = GND		–60			mA
I_{OFF}	Power Down Disable	V_{CC} = GND, V_{OUT} = 4.5 V				100	µA
V_H	Input Hysteresis				200		mV

Notes:
1. Typical values are at V_{CC} = 5.0V and T_A = 25°C.
2. No more than one output should be shorted at one time. Duration of the test should not exceed one second.
3. These parameters is determined by device characterization but is not production tested.

Switching Characteristics over Operating Range

(T_A = 0°C to 70°C, V_{CC} = 5.0V ± 5%)

Parameters	Description	Conditions[1]	FCT280AT Com.		FCT280BT Com.		FCT280CT Com.		FCT280DT Com.		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	
t_{PHLE}	Propagation Delay	C_L = 50 pF	3.0	7.5	3.0	6.3	3.0	5.3	3.0	4.5	ns
t_{PLHE}	I_0 – I_8 to Σeven	R_L = 500Ω									
t_{PHLO}	Propagation Delay		3.0	7.5	3.0	6.3	3.0	5.3	3.0	4.5	ns
t_{PLHO}	I_0 – I_8 to Σodd										

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 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}			1.5	mA
ΔI_{CC}	Supply Current per Input @ TTL HIGH	V_{CC} = Max.	V_{IN} = 3.4 V[3]			2.0	mA
I_{CCD}	Supply Current per Input per MHz[4]	V_{CC} = Max., Outputs Open $\overline{OE}$ = $\overline{EN}$ = GND One Input Toggling 50% Duty Cycle	V_{IN} = V_{CC} V_{IN} = GND			0.25	mA/ MHz
I_C	Total Power Supply Current[6]	V_{CC} = Max., Outputs Open f_{CP} = 10 MHz 50% Duty Cycle $\overline{OE}$ = $\overline{EN}$ = GND f_i = 5 MHz One Bit Toggling	V_{IN} = V_{CC} V_{IN} = GND		1.7	4.0[5]	mA
			V_{IN} = 3.4 V V_{IN} = GND		2.2	6.0[5]	
		V_{CC} = Max., Outputs Open f_{CP} = 10 MHz 50% Duty Cycle $\overline{OE}$ = $\overline{EN}$ = GND Eight Bits Toggling f_i = 2.5 MHz 50% Duty Cycle	V_{IN} = V_{CC} V_{IN} = GND		4.0	7.8[5]	
			V_{IN} = 3.4 V V_{IN} = GND		6.2	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 = 5.0 V, +25°C ambient.
3. Per TTL driven input (V_{IN} = 3.4 V); 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} = 3.4 V)
   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.