Octal Transparent Latches

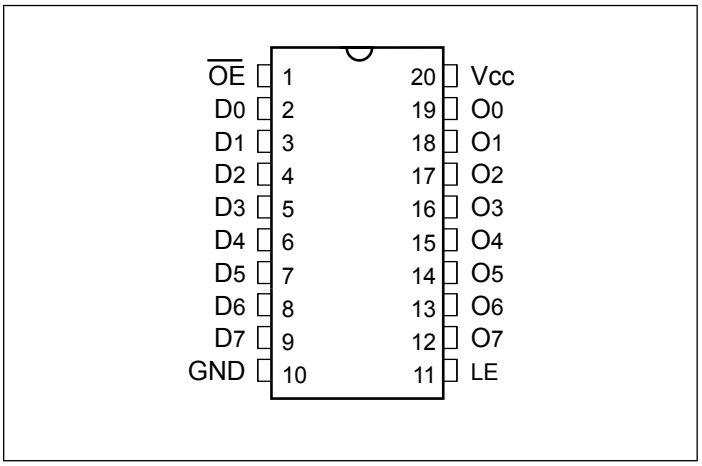
Features

- PI74FCT573T are pin compatible with bipolarFAST™ Series at a higher speed and lower power consumption
- TTL input and output levels
- Low ground bounce outputs
- Extremely low static power
- Hysteresis on all inputs
- Industrial operating temperature range: –40°C to +85°C
- Packaging (Pb-free & Green):
  - 20-pin SOIC (S)

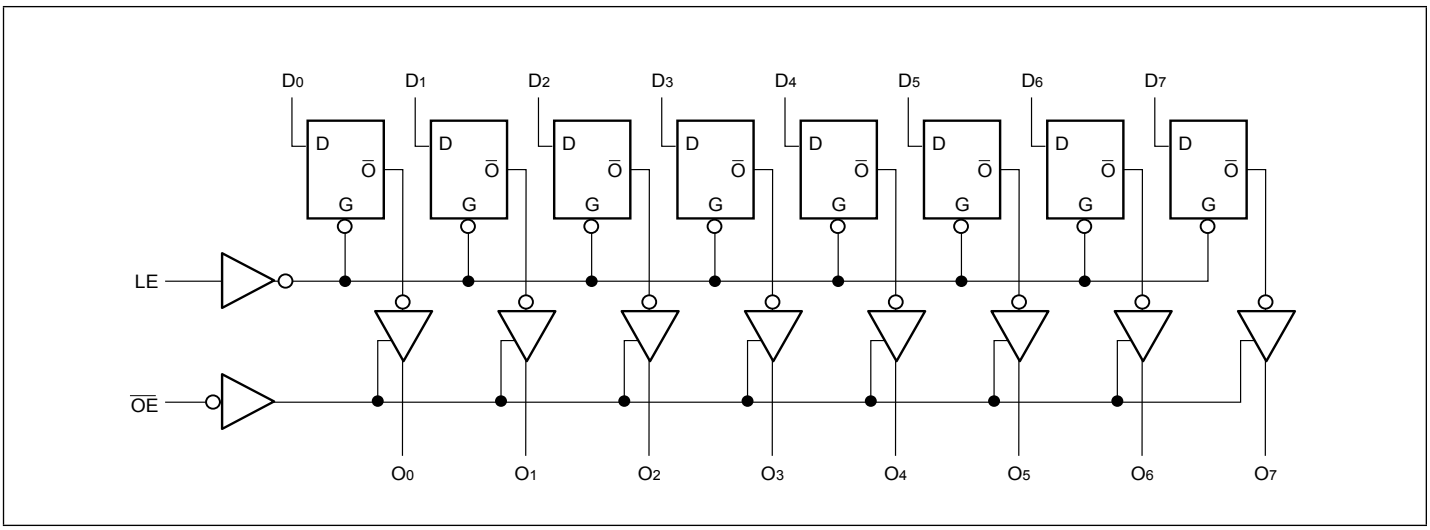
Description

Pericom Semiconductor's PI74FCT573T is an 8-bit wide octal transparent latches designed with 3-state outputs and are intended for bus oriented applications. When Latch Enable (LE) is HIGH, the flip-flops appear transparent to the data. The data that meets the set-up time when LE is LOW is latched. When $\overline{OE}$ is HIGH, the bus output is in the high impedance state.

Pin Configuration (20-Pin SOIC)



Block Diagram



Pinout Table

Pin Name	Description
$\overline{OE}$	Output Enable Input (Active LOW)
LE	Latch Enable Input (Active HIGH)
D0-D7	Data Inputs
O0-O7	3-State Outputs
$\overline{O}0$-$\overline{O}7$	Complementary 3-State Outputs
GND	Ground
V_{CC}	Power

Truth Table(1)

Inputs			Outputs
D_N	LE	$\overline{OE}$	O_N
H	H	L	H
L	H	L	L
X	X	H	Z

Notes:

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

Absolute Maximum Ratings (Over operating free-air temperature range)

Parameter	Min.	Max.	Units
Storage temperature	-65	150	˚C
Ambient Temperature with Power Applied	-40	85	˚C
Supply Voltage to Ground Potential (Inputs & V_{CC} Only)	-0.5	7.0	V
Supply Voltage to Ground Potential (Outputs & D/O Only)	-0.5	7.0	V
DC Input Voltage	-0.5	7.0	V
DC Output Current	-	120	mA
Power Dissipation	-	0.5	W

Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device.

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} = –15.0 mA	2.4	3.0		V
V_{OL}	Output LOW Voltage	V_{CC} = Min., V_{IN} = V_{IH} or V_{IL}	I_{OL} = 64 mA		0.3	0.55	
V_{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level		20			
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level				0.8	
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	
I_{OZH} I_{OZL}	High Impedance Output Current	V_{CC} = Max.	V_{OUT} = 2.7V			1	
			V_{OUT} = 0.5V			-1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18 mA			-0.7	-1.2	V
I_{OFF}	Power Down Disable	V_{CC} = GND, V_{OUT} = 4.5V				100	µA
I_{OS}	Short Circuit Current	V_{CC} = Max.(3), V_{OUT} = GND		-60	-120		mA
V_H	Input Hysteresis				200		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 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.

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters[3]	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	

Notes:

1. 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	500	µA
ΔI_{CC}	Supply Current per Input @ TTL HIGH		V_{IN} = 3V[3]		0.5	2.0	mA
I_{CCD}	Supply Current per Input per MHz[4]	V_{CC} = Max., Outputs Open, $\overline{OE}$ = GND, LE = V_{CC} One Bit 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_I = 10MHz, 50% Duty Cycle, $\overline{OE}$ = GND, LE = V_{CC}, One Bit Toggling	V_{IN} = V_{CC}, V_{IN} = GND		1.5	3.0 [5]	mA
			V_{IN} = V_{CC}, V_{IN} = GND		1.8	4.5 [5]	
		V_{CC} = Max., Outputs Open, f_I = 2.5MHz, 50% Duty Cycle, $\overline{OE}$ = GND, LE = V_{CC}, Eight Bit Toggling	V_{IN} = V_{CC}, V_{IN} = GND		3.0	6.0 [5]	
			V_{IN} = V_{CC}, V_{IN} = GND		5.0	14.0 [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 (VIN = 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. $I_C = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}$

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

   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 fI

   All currents are in milliamps and all frequencies are in megahertz.

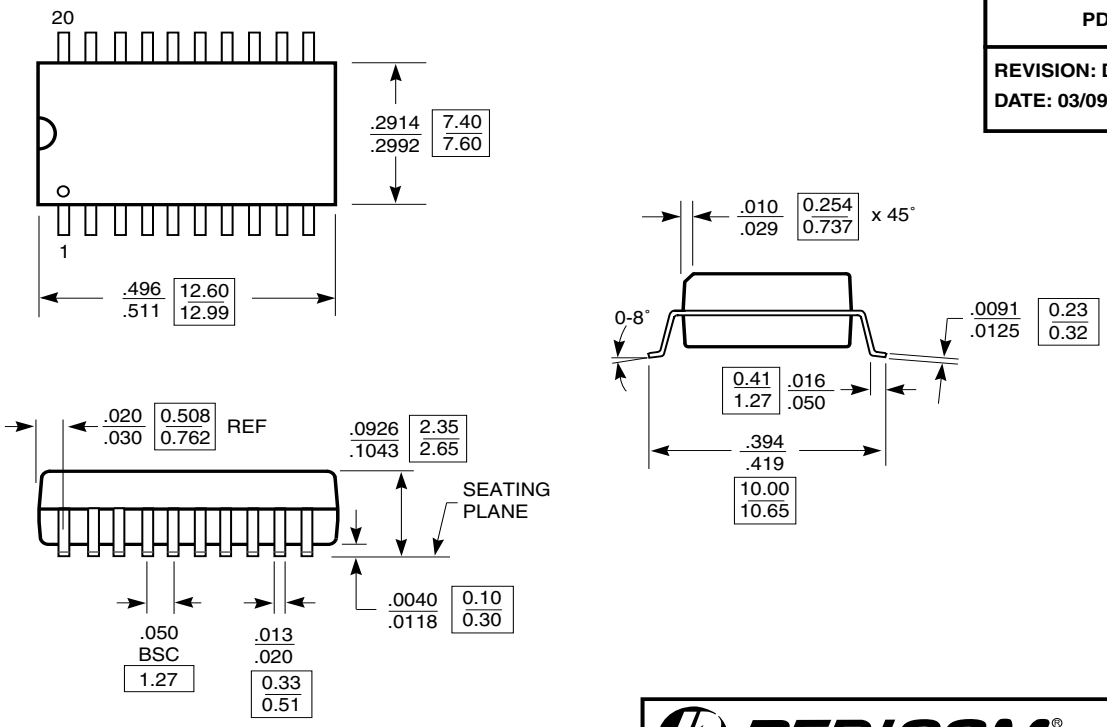
Switching Characteristics over Operating Range

Parameters	Description	Test Conditions	573T Com. Min	573T Com. Max	573AT Com. Min	573AT Com. Max	573CT Com. Min	573CT Com. Max	573DT Com. Min	573DT Com. Max	Units
t_{PLH} t_{PHL}	Propagation Delay[1] D_N to O_N	C_L = 50 pF R_L = 500Ω	15	8.0	15	5.2	15	4.2	15	3.8	ns
t_{PLH} t_{PHL}	Propagation Delay[1] LE to O_N		2.0	12.0	2.0	8.5	2.0	5.5	2.0	4.9	
t_{PZH} t_{PZL}	Output Enable Time $\overline{OE}$ to O_N		1.5	9.5	1.5	6.5	1.5	5.5	1.5	5.5	
t_{PHZ} t_{PLZ}	Output Enable Time[2] $\overline{OE}$ to O_N		1.5	6.5	1.5	5.5	1.5	5.0	1.5	5.0	
t_{SU}	Setup Time HIGH or LOW, D_N to LE		20		20		20		20		
t_H	Hold Time HIGH or LOW, D_N to LE		1.5		1.5		1.5		1.0		
t_W	LE Pulse Width[2] HIGH		6.0		5.0		5.0		3.0		

Notes:

1. Minimum limits are guaranteed but not tested on Propagation Delays.
2. This parameter guaranteed but not production tested.

Packaging Mechanical: 20-Pin SOIC (S)



DOCUMENT CONTROL NO.
PD - 1006

REVISION: D
DATE: 03/09/05

X.XX
X.XX
DENOTES CONTROLLING
DIMENSIONS IN MILLIMETERS

Notes:
1) Controlling dimensions in millimeters.
2) Ref: JEDEC MS-013D/AC

PERICOM®
Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
1-800-435-2335 • www.pericom.com

DESCRIPTION: 20-Pin, 300-Mil Wide, SOIC

PACKAGE CODE: S

Ordering Information

Ordering Code	Package Code	Speed Grade	Package Type
PI74FCT573ATSE	S	A	Pb-free & Green, 20-pin SOIC

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/

2. E = Pb-free & Green

3. Adding an X suffix = Tape/Reel