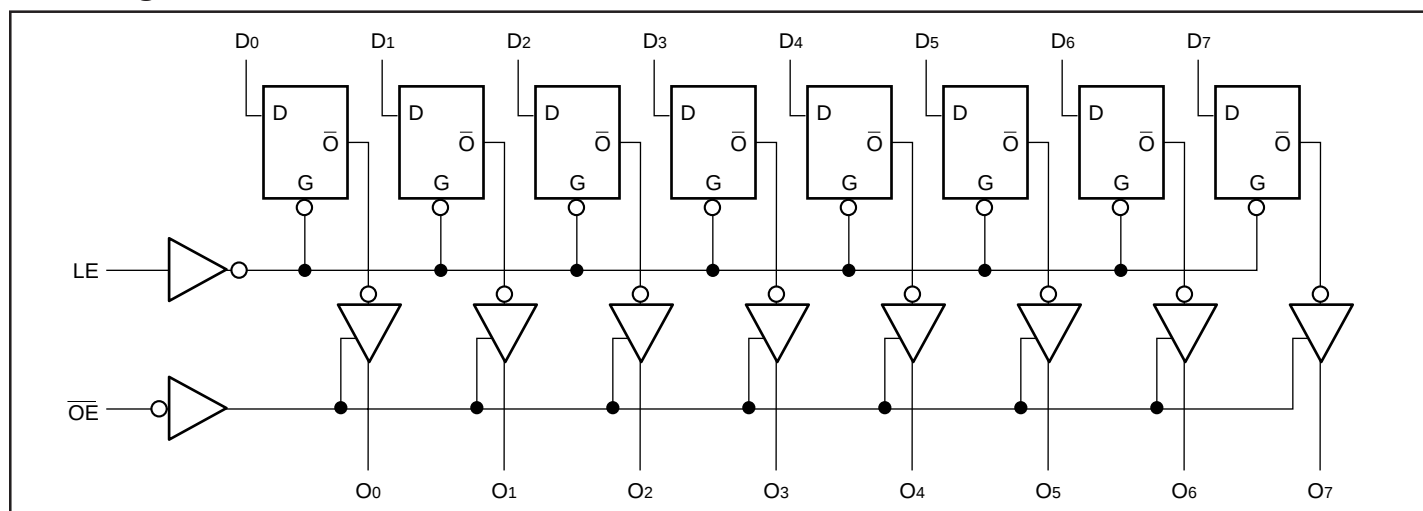


**Features:**

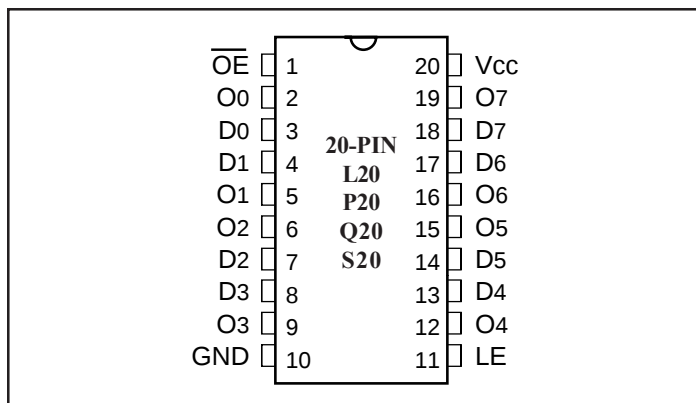
- PI74FCT373/573T are pin compatible with bipolar FAST<sup>™</sup> Series at a higher speed and lower power consumption
- TTL input and output levels
- Low ground bounce outputs
- Extremely low static power
- Hysteresis on all inputs
- Industrial operating temperature range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Device models available upon request
- Packaging:
  - 20-pin TSSOP (L)
  - 20-pin SSOP (H)
  - 20-pin QSOP (Q)
  - 20-pin SOIC (S)

**Description:**

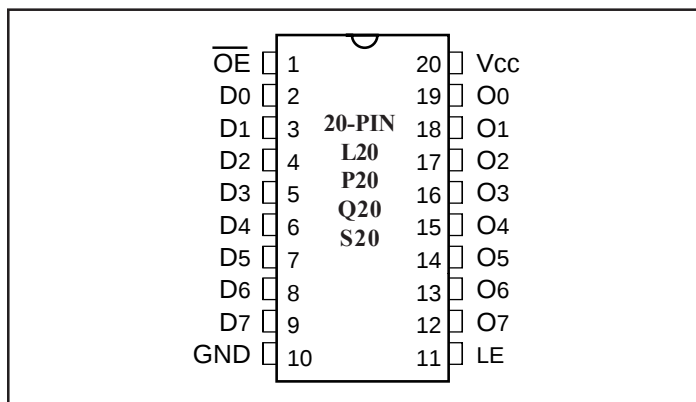
Pericom Semiconductor's PI74FCT373T and PI74FCT 573T are 8-bit wide octal transparent latches designed with 3-state outputs and are intended for bus oriented applications. When Latch Enable (LE) is HIGH, the flip-flops appear transparent to the data. The data that meets the set-up time when LE is LOW is latched. When  $\overline{\text{OE}}$  is HIGH, the bus output is in the high impedance state.

**Block Diagram**


### PI74FCT373 Pin Configuration



### PI74FCT573 Pin Configuration



### Pin Description

| 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                  |
| $\overline{O0-O7}$ | Complementary 3-State Outputs    |
| GND                | Ground                           |
| Vcc                | Power                            |

### Truth Table<sup>(1)</sup>

| Inputs         |    |                 | Outputs        |
|----------------|----|-----------------|----------------|
| D <sub>N</sub> | LE | $\overline{OE}$ | O <sub>N</sub> |
| H              | H  | L               | H              |
| L              | H  | L               | L              |
| X              | X  | H               | Z              |

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

## 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, TA = –40°C to +85°C, VCC = 5.0V ± 5%)

| Parameters | Description           | Test Conditions <sup>(1)</sup>         |                          | Min. | Typ <sup>(2)</sup> | Max. | Units |
|------------|-----------------------|----------------------------------------|--------------------------|------|--------------------|------|-------|
| VOH        | Output HIGH Voltage   | VCC = Min., VIN = VIH or VIL           | IOH = –15.0 mA           | 2.4  | 3.0                |      | V     |
| VOL        | Output LOW Current    | VCC = Min., VIN = VIH or VIL           | IOL = 64 mA              |      | 0.3                | 0.55 | V     |
| VOL        | Output LOW Current    | VCC = Min., VIN = VIH or VIL           | IOL = 12 mA (25Ω Series) |      | 0.3                | 0.50 | V     |
| VIH        | Input HIGH Voltage    | Guaranteed Logic HIGH Level            |                          | 2.0  |                    |      | V     |
| VIL        | Input LOW Voltage     | Guaranteed Logic LOW Level             |                          |      |                    | 0.8  | V     |
| IIH        | Input HIGH Current    | VCC = Max.                             | VIN = VCC                |      |                    | 1    | μA    |
| IIL        | Input LOW Current     | VCC = Max.                             | VIN = GND                |      |                    | –1   | μA    |
| IOZH       | High Impedance        | VCC = MAX.                             | VOUT = 2.7V              |      |                    | 1    | μA    |
| IOZL       | Output Current        |                                        | VOUT = 0.5V              |      |                    | –1   | μA    |
| VIK        | Clamp Diode Voltage   | VCC = Min., IIN = –18 mA               |                          |      | –0.7               | –1.2 | V     |
| IOFF       | Power Down Disable    | VCC = GND, VOUT = 4.5V                 |                          | —    | —                  | 100  | μA    |
| IOS        | Short Circuit Current | VCC = Max. <sup>(3)</sup> , VOUT = GND |                          | –60  | –120               |      | mA    |
| VH         | Input Hysteresis      |                                        |                          |      | 200                |      | mV    |

## Capacitance (TA = 25°C, f = 1 MHz)

| Parameters <sup>(4)</sup> | Description        | Test Conditions | Typ | Max. | Units |
|---------------------------|--------------------|-----------------|-----|------|-------|
| CIN                       | Input Capacitance  | VIN = 0V        | 6   | 10   | pF    |
| COUT                      | Output Capacitance | VOUT = 0V       | 8   | 12   | pF    |

### Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at VCC = 5.0V, +25°C ambient and maximum loading.
- Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
- This parameter is determined by device characterization but is not production tested.

## Power Supply Characteristics

| Parameters       | Description                                     | Test Conditions <sup>(1)</sup>                                                                                                                   |                                                            | Min. | Typ <sup>(2)</sup> | Max.                | Units      |
|------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------|--------------------|---------------------|------------|
| I <sub>CC</sub>  | Quiescent Power Supply Current                  | V <sub>CC</sub> = Max.                                                                                                                           | V <sub>IN</sub> = GND or V <sub>CC</sub>                   |      | 0.1                | 500                 | μA         |
| ΔI <sub>CC</sub> | Supply Current per Input @ TTL HIGH             | V <sub>CC</sub> = Max.,                                                                                                                          | V <sub>IN</sub> = 3.4V <sup>(3)</sup>                      |      | 0.5                | 2.0                 | mA         |
| I <sub>CCD</sub> | Supply Current per Input per MHz <sup>(4)</sup> | V <sub>CC</sub> = Max.,<br>Outputs Open<br>OE = GND<br>LE = V <sub>CC</sub><br>One Bit Toggling<br>50% Duty Cycle                                | V <sub>IN</sub> = V <sub>CC</sub><br>V <sub>IN</sub> = GND |      | 0.15               | 0.25                | mA/<br>MHz |
| I <sub>C</sub>   | Total Power Supply Current <sup>(6)</sup>       | V <sub>CC</sub> = Max.,<br>Outputs Open<br>f <sub>i</sub> = 10 MHz<br>50% Duty Cycle<br>OE = GND<br>LE = V <sub>CC</sub><br>One Bit Toggling     | V <sub>IN</sub> = V <sub>CC</sub><br>V <sub>IN</sub> = GND |      | 1.5                | 3.0 <sup>(5)</sup>  | mA         |
|                  |                                                 |                                                                                                                                                  | V <sub>IN</sub> = 3.4V<br>V <sub>IN</sub> = GND            |      | 1.8                | 4.5 <sup>(5)</sup>  |            |
|                  |                                                 | V <sub>CC</sub> = Max.,<br>Outputs Open<br>f <sub>i</sub> = 2.5 MHz<br>50% Duty Cycle<br>OE = GND<br>LE = V <sub>CC</sub><br>Eight Bits Toggling | V <sub>IN</sub> = V <sub>CC</sub><br>V <sub>IN</sub> = GND |      | 3.0                | 6.0 <sup>(5)</sup>  |            |
|                  |                                                 |                                                                                                                                                  | V <sub>IN</sub> = 3.4V<br>V <sub>IN</sub> = GND            |      | 5.0                | 14.0 <sup>(5)</sup> |            |

### Notes:

- For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V<sub>CC</sub> = 5.0V, +25°C ambient.
- Per TTL driven input (V<sub>IN</sub> = 3.4V); all other inputs at V<sub>CC</sub> 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<sub>CC</sub> formula. These limits are guaranteed but not tested.
- I<sub>C</sub> = I<sub>QUIESCENT</sub> + I<sub>INPUTS</sub> + I<sub>DYNAMIC</sub>  

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

I<sub>CC</sub> = Quiescent Current  
ΔI<sub>CC</sub> = Power Supply Current for a TTL High Input (V<sub>IN</sub> = 3.4V)  
D<sub>H</sub> = Duty Cycle for TTL Inputs High  
N<sub>T</sub> = Number of TTL Inputs at D<sub>H</sub>  
I<sub>CCD</sub> = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)  
f<sub>CP</sub> = Clock Frequency for Register Devices (Zero for Non-Register Devices)  
f<sub>i</sub> = Input Frequency  
N<sub>i</sub> = Number of Inputs at f<sub>i</sub>  
All currents are in milliamps and all frequencies are in megahertz.

**PI74FCT373T Switching Characteristics over Operating Range**

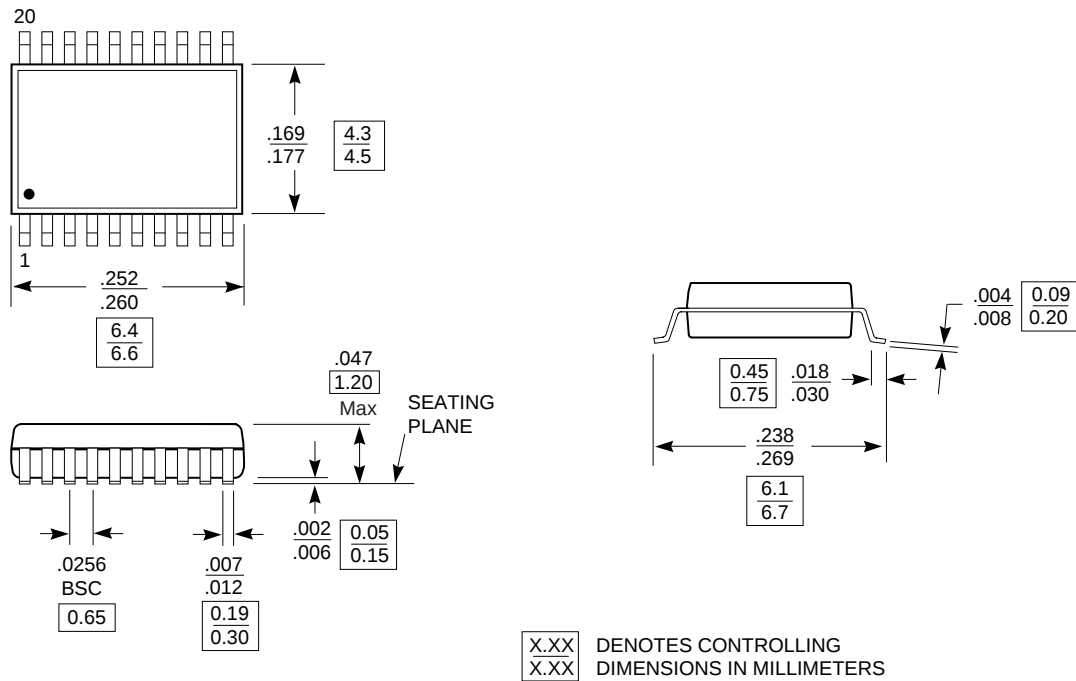
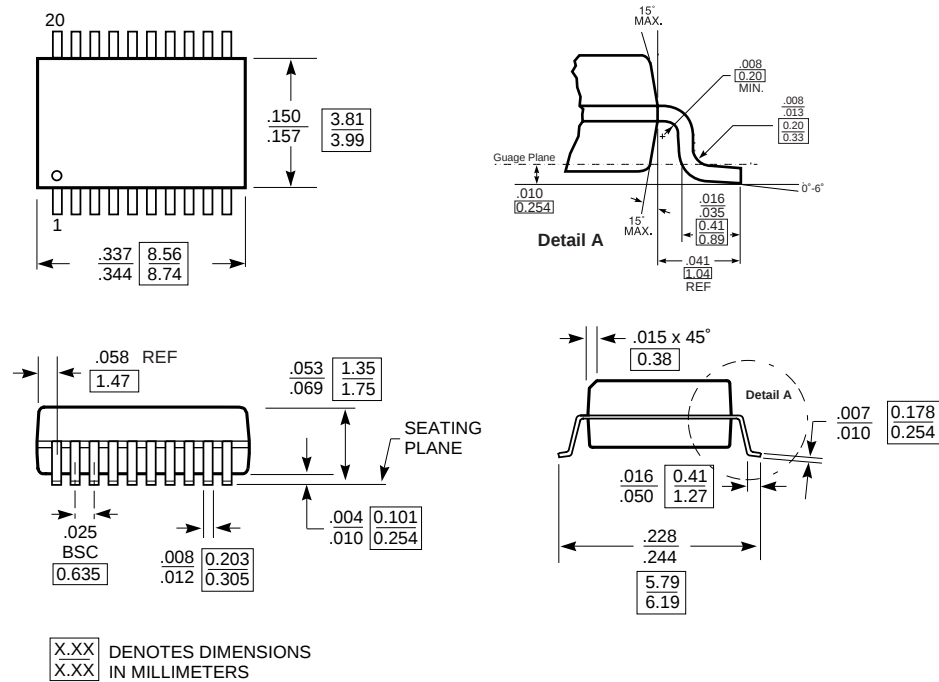
| Parameters   | Description                                    | Conditions <sup>(1)</sup> | 373T |      | 373AT |     | 373CT |     | 373DT |     | Unit |
|--------------|------------------------------------------------|---------------------------|------|------|-------|-----|-------|-----|-------|-----|------|
|              |                                                |                           | Com. |      | Com.  |     | Com.  |     | Com.  |     |      |
|              |                                                |                           | Min  | Max  | Min   | Max | Min   | Max | Min   | Max |      |
| tPLH<br>tPHL | Propagation Delay<br>DN to ON                  | CL = 50 pF<br>RL = 500Ω   | 1.5  | 8.0  | 1.5   | 5.2 | 1.5   | 4.2 | 1.5   | 3.8 | ns   |
| tPLH<br>tPHL | Propagation Delay<br>LE to ON                  |                           | 2.0  | 13.0 | 2.0   | 8.5 | 2.0   | 5.5 | 1.5   | 4.9 | ns   |
| tpZH<br>tpZL | Output Enable Time<br>OE to ON                 |                           | 1.5  | 12.0 | 1.5   | 6.5 | 1.5   | 5.5 | 1.5   | 5.5 | ns   |
| tpHZ<br>tplZ | Output Disable Time <sup>(3)</sup><br>OE to ON |                           | 1.5  | 7.5  | 1.5   | 5.5 | 1.5   | 5.0 | 1.5   | 5.0 | ns   |
| tsU          | Setup Time HIGH or<br>LOW, DN to LE            |                           | 2.0  | —    | 2.0   | —   | 2.0   | —   | 2.0   | —   | ns   |
| tH           | Hold Time HIGH or<br>LOW, DN to LE             |                           | 1.5  | —    | 1.5   | —   | 1.5   | —   | 1.5   | —   | ns   |
| tW           | LE Pulse Width <sup>(3)</sup><br>HIGH          |                           | 6.0  | —    | 5.0   | —   | 5.0   | —   | 4.0   | —   | ns   |

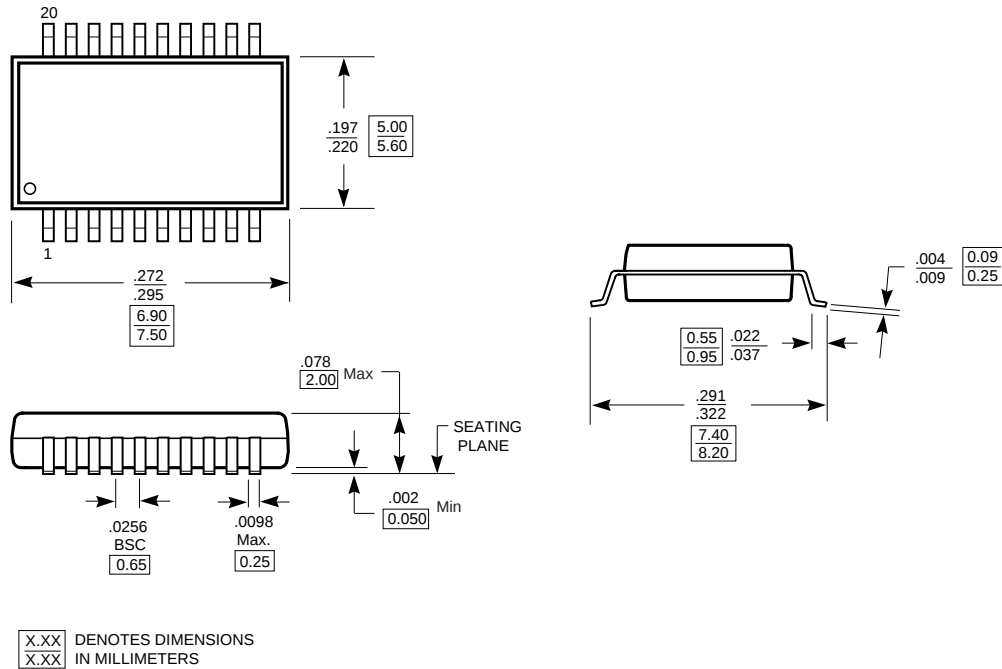
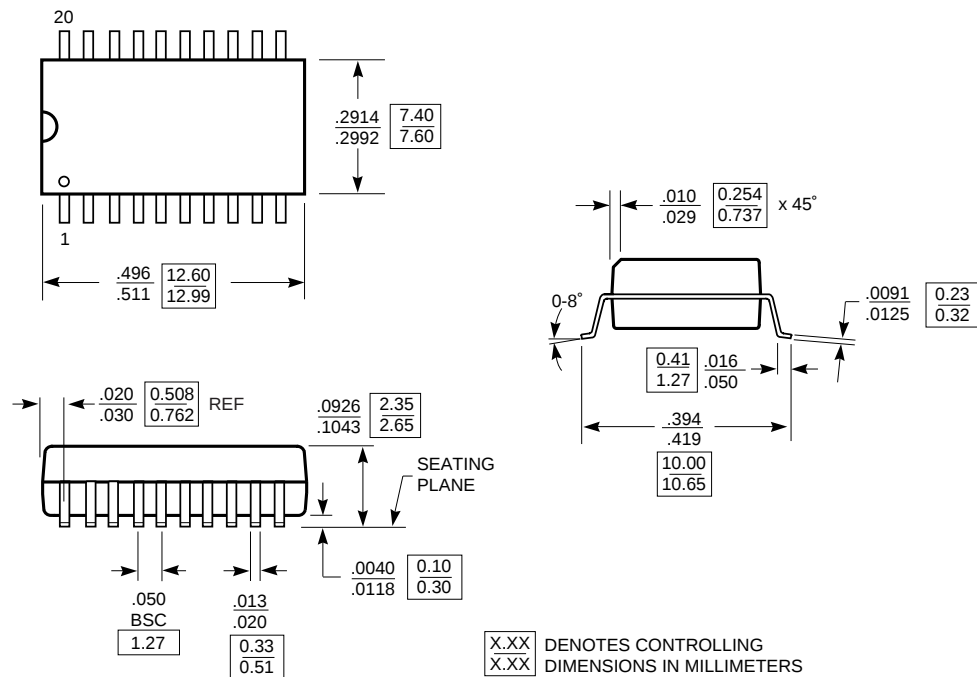
**PI74FCT573T Switching Characteristics over Operating Range**

| Parameters   | Description                                                        | Conditions <sup>(1)</sup> | 573T |      | 573AT |     | 573CT |     | 573DT |     | Unit |
|--------------|--------------------------------------------------------------------|---------------------------|------|------|-------|-----|-------|-----|-------|-----|------|
|              |                                                                    |                           | Com. |      | Com.  |     | Com.  |     | Com.  |     |      |
|              |                                                                    |                           | Min  | Max  | Min   | Max | Min   | Max | Min   | Max |      |
| tPLH<br>tPHL | Propagation Delay<br>DN to $\overline{\text{ON}}$                  | CL = 50 pF<br>RL = 500Ω   | 1.5  | 8.0  | 1.5   | 5.2 | 1.5   | 4.2 | 1.5   | 3.8 | ns   |
| tPLH<br>tPHL | Propagation Delay<br>LE to $\overline{\text{ON}}$                  |                           | 2.0  | 12.0 | 2.0   | 8.5 | 2.0   | 5.5 | 2.0   | 4.9 | ns   |
| tpZH<br>tpZL | Output Enable Time<br>$\overline{\text{OE}}$ to ON                 |                           | 1.5  | 9.5  | 1.5   | 6.5 | 1.5   | 5.5 | 1.5   | 5.5 | ns   |
| tpHZ<br>tplZ | Output Disable Time <sup>(3)</sup><br>$\overline{\text{OE}}$ to ON |                           | 1.5  | 6.5  | 1.5   | 5.5 | 1.5   | 5.0 | 1.5   | 5.0 | ns   |
| tsU          | Setup Time HIGH or<br>LOW, DN to LE                                |                           | 2.0  | —    | 2.0   | —   | 2.0   | —   | 1.5   | —   | ns   |
| tH           | Hold Time HIGH or<br>LOW, DN to LE                                 |                           | 1.5  | —    | 1.5   | —   | 1.5   | —   | 1.0   | —   | ns   |
| tw           | LE Pulse Width <sup>(3)</sup><br>HIGH                              |                           | 6.0  | —    | 5.0   | —   | 5.0   | —   | 3.0   | —   | ns   |

**Notes:**

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

**Packaging Mechanical: 20-Pin TSSOP (L)**

**Packaging Mechanical: 20-pin QSOP (Q)**


**Packaging Mechanical: 20-Pin SSOP (H)**

**Packaging Mechanical: 20-pin SOIC (S)**


**PI74FCT373T Ordering Information**

| Ordering Code | Package Code | Speed Grade | Package Type |
|---------------|--------------|-------------|--------------|
| PI74FCT373TL  | L            | Blank       | 20-pin TSSOP |
| PI74FCT373TQ  | Q            | Blank       | 20-pin QSOP  |
| PI74FCT373TS  | S            | Blank       | 20-pin SOIC  |
| PI74FCT373ATH | H            | A           | 20-pin SSOP  |
| PI74FCT373ATL | L            | A           | 20-pin TSSOP |
| PI74FCT373ATS | S            | A           | 20-pin SOIC  |
| PI74FCT373ATQ | Q            | A           | 20-pin QSOP  |
| PI74FCT373CTH | H            | C           | 20-pin SSOP  |
| PI74FCT373CTL | L            | C           | 20-pin TSSOP |
| PI74FCT373CTS | S            | C           | 20-pin SOIC  |
| PI74FCT373CTQ | Q            | C           | 20-pin QSOP  |
| PI74FCT373DTH | H            | D           | 20-pin SSOP  |
| PI74FCT373DTL | L            | D           | 20-pin TSSOP |
| PI74FCT373DTQ | Q            | D           | 20-pin QSOP  |

**PI74FCT573T Ordering Information**

| Ordering Code | Package Code | Speed Grade | Package Type |
|---------------|--------------|-------------|--------------|
| PI74FCT573TQ  | Q            | Blank       | 20-pin QSOP  |
| PI74FCT573TS  | S            | Blank       | 20-pin SOIC  |
| PI74FCT573ATH | H            | A           | 20-pin SSOP  |
| PI74FCT573ATL | L            | A           | 20-pin TSSOP |
| PI74FCT573ATS | S            | A           | 20-pin SOIC  |
| PI74FCT573ATQ | Q            | A           | 20-pin QSOP  |
| PI74FCT573CTH | H            | C           | 20-pin SSOP  |
| PI74FCT573CTL | L            | C           | 20-pin TSSOP |
| PI74FCT573CTS | S            | C           | 20-pin SOIC  |
| PI74FCT573CTQ | Q            | C           | 20-pin QSOP  |
| PI74FCT573DTQ | Q            | D           | 20-pin QSOP  |

**Notes:**

1. Thermal characteristics can be found on the company web site at [www.pericom.com/packaging/](http://www.pericom.com/packaging/)