

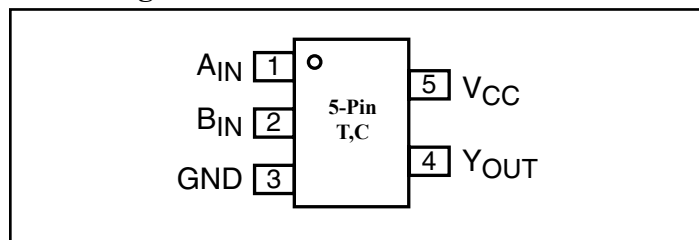
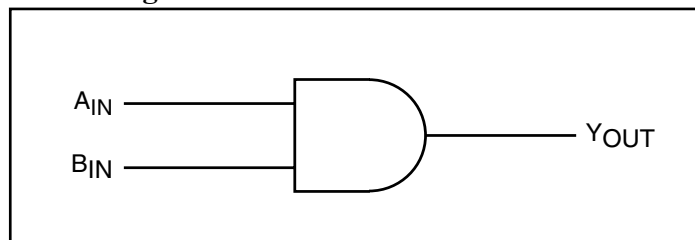
**Features**

- High-speed:  $t_{PD} = 1.8\text{ns}$  typical
- Broad operating range:  $V_{CC} = 1.8\text{V} - 3.6\text{V}$
- Power down high-impedance inputs/outputs
- High output drive:  $\pm 24\text{mA}$  at  $3\text{V } V_{CC}$
- Packaging:
  - 5-pin SOT23 (T)
  - 5-pin SC70 (C)

**Description**

The PI74ST1G08 is a 2-Input AND Gate that operates over the 1.8V to 3.6V  $V_{CC}$  operating range.

Pericom's PI74ST series of products are produced using the Company's advanced submicron technology.

**Pin Configuration**

**Block Diagram**

**Pin Description**

| Pin Name  | Description |
|-----------|-------------|
| $A_{IN}$  | Input       |
| $B_{IN}$  | Input       |
| $Y_{OUT}$ | Output      |

**Recommended Operating Conditions<sup>(1)</sup>**

| Parameter                               | Condition   | Min. | Max.     | Units |
|---|---|------|----------|-------|
| Supply Voltage ( $V_{CC}$ )             |   | 1.8  | 3.6      | V     |
| Input Voltage ( $V_{IN}$ )              |   | 0    | 5.5      |       |
| Output Voltage ( $V_{OUT}$ )            |   | 0    | $V_{CC}$ |       |
| Operating Temperature                   |   | -40  | 85       | °C    |
| Input Rise and Fall Time ( $t_r, t_f$ ) | $V_{CC} = 1.8\text{V}, 2.5\text{V} \pm 0.2\text{V}$ | 0    | 20       | ns/V  |
|   | $V_{CC} = 3.3\text{V} \pm 0.3\text{V}$              | 0    | 10       |       |

**Function Table**

| Inputs   |          | Outputs   |
|----------|----------|-----------|
| $A_{IN}$ | $B_{IN}$ | $Y_{OUT}$ |
| L        | L        | L         |
| L        | H        | L         |
| H        | L        | L         |
| H        | H        | H         |

**Notes:**

1. H = HIGH Logic Level  
L = LOW Logic Level

**Note:**

1. Unused inputs must be held HIGH or LOW. They may not float.

**Absolute Maximum Ratings**

|   |                 |
|---|-----------------|
| Supply Voltage (V <sub>CC</sub> ) .....                                   | -0.5V to +4V    |
| DC Input Voltage (V <sub>IN</sub> ).....                                  | -0.5V to +6V    |
| DC Output Voltage (V <sub>OUT</sub> ).....                                | -0.5V to +6V    |
| DC Input Diode Current (I <sub>IK</sub> ).....                            | -50mA to 20mA   |
| DC Output Diode Current (I <sub>OK</sub> ).....                           | -50mA to 20mA   |
| DC Output Current (I <sub>OUT</sub> ) .....                               | ±50mA           |
| DC V <sub>CC</sub> /GND Current (I <sub>CC</sub> /I <sub>GND</sub> )..... | ±50mA           |
| Storage Temperature (T <sub>STG</sub> ) .....                             | -65°C to +150°C |
| Junction Lead Temperature (I <sub>OS</sub> ) .....                        | 200°C           |
| Power Dissipation SOT23 .....   | 200mW           |
| SC70 .....  | 150mW           |

**Note:**

Absolute maximum ratings are DC values beyond which the device may be damaged or have its useful life impaired. The datasheet specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. Pericom does not recommend operation outside datasheet specifications.

**DC Electrical Characteristics** (Over supply voltage and operating temperature ranges, unless otherwise specified)

| Symbol           | Parameter                 | V <sub>CC</sub> (V) | Conditions                                 | T <sub>A</sub> = +25°C   |   |  | T <sub>A</sub> = -40° C to +85°C           |  | Units |     |
|------------------|---------------------------|---------------------|--|--|---|--|--|--|-------|-----|
|                  |                           |                     |  | Min.   | Typ.  | Max.                                       | Min.                                       | Max.                                       |       |     |
| V <sub>IH</sub>  | HIGH Level Input Voltage  | 1.8<br>2.3-3.6      |  | 0.75V <sub>CC</sub><br>0.70V <sub>CC</sub>                                   |   |  | 0.75V <sub>CC</sub><br>0.70V <sub>CC</sub> |  | V     |     |
| V <sub>IL</sub>  | LOW Level Input Voltage   | 1.8<br>2.3-3.6      |  |  |   | 0.25V <sub>CC</sub><br>0.30V <sub>CC</sub> |  | 0.25V <sub>CC</sub><br>0.30V <sub>CC</sub> |       |     |
| V <sub>OH</sub>  | HIGH Level Output Voltage | 1.8                 | V <sub>IN</sub> = V <sub>IH</sub>          | I <sub>OH</sub> = -100μA   | 1.7   | 1.79                                       |  | 1.7  |       |     |
|                  |                           | 2.3                 |  |  | 2.2   | 2.29                                       |  | 2.2  |       |     |
|                  |                           | 3.0                 |  |  | 2.9   | 2.99                                       |  | 2.9  |       |     |
| V <sub>OH</sub>  | HIGH Level Output Voltage | 2.3                 |  | I <sub>OH</sub> = -8mA<br>I <sub>OH</sub> = -16mA<br>I <sub>OH</sub> = -24mA | 1.9   | 2.13                                       |  | 1.9  |       |     |
|                  |                           | 3.0                 |  |  | 2.4   | 2.71                                       |  | 2.4  |       |     |
|                  |                           | 3.0                 |  |  | 2.3   | 2.55                                       |  | 2.3  |       |     |
| V <sub>OL</sub>  | LOW Level Output Voltage  | 1.8                 | V <sub>IN</sub> = V <sub>IL</sub>          | I <sub>OL</sub> = 100μA  |   | 0.01                                       | 0.1  |  |       | 0.1 |
|                  |                           | 2.3                 |  |  |   | 0.01                                       | 0.1  |  |       | 0.1 |
|                  |                           | 3.0                 |  |  |   | 0.00                                       | 0.1  |  | 0.1   |     |
|                  |                           | 2.3                 |  |  | I <sub>OH</sub> = 8mA<br>I <sub>OH</sub> = 16mA<br>I <sub>OH</sub> = 24mA | 0.10                                       | 0.3  |  | 0.3   |     |
| 3.0              | 0.18                      | 0.4                 |  | 0.4  |   |  |  |  |       |     |
| 3.0              | 0.28                      | 0.55                |  | 0.55   |   |  |  |  |       |     |
| I <sub>IN</sub>  | Input Leakage Current     | 0-3.6               | V <sub>IN</sub> = 5.5V, GND                |  | -1  |  | 1  | -1   | 1     | μA  |
| I <sub>OFF</sub> | Power Off Leakage Current | 0.0                 | V <sub>IN</sub> or V <sub>OUT</sub> = 5.5V |  | -1  |  | 1  | -1   | 1     |     |
| I <sub>CC</sub>  | Quiescent Supply Current  | 1.8-3.6             | V <sub>IN</sub> = 5.5V, GND                |  |   | 2.0  |  |  | 20    |     |

### AC Electrical Characteristics

| Symbol                               | Parameter                     | V <sub>CC</sub> (V)       | Conditions                                      | T <sub>A</sub> = +25°C |                   |                   | T <sub>A</sub> = -40° C to +85°C |                   | Units | Fig. No. |
|--------------------------------------|-------------------------------|---------------------------|---|------------------------|-------------------|-------------------|----------------------------------|-------------------|-------|----------|
|                                      |                               |                           |   | Min.                   | Typ.              | Max.              | Min.                             | Max.              |       |          |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Propagation Delay             | 1.8<br>2.5±0.2<br>3.3±0.3 | C <sub>L</sub> = 15pF,<br>R <sub>L</sub> = 1MΩ  | 2.2<br>0.8<br>0.5      | 3.0<br>1.9<br>1.3 | 4.0<br>2.6<br>2.0 | 2.0<br>0.8<br>0.5                | 4.4<br>2.8<br>2.2 | ns    | 1<br>3   |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Propagation Delay             | 3.3±0.3                   | C <sub>L</sub> = 50pF,<br>R <sub>L</sub> = 500Ω | 1.5                    | 2.9               | 3.8               | 1.5                              | 4.2               |       | 1<br>3   |
| C <sub>IN</sub>                      | Input Capacitance             | V <sub>IN</sub> = 0       |   |                        | 4                 |                   |                                  |                   | pF    |          |
| C <sub>PD</sub>                      | Power Dissipation Capacitance | 3.3                       | Note 3  |                        | 20                |                   |                                  |                   |       | 2        |

#### Notes:

3. C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I<sub>CCD</sub>) at no output loading and operating at 50% duty cycle (see Figure 2). C<sub>PD</sub> is related to I<sub>CCD</sub> dynamic operating current by the expression: I<sub>CCD</sub> = (C<sub>PD</sub>)(V<sub>CC</sub>)(f<sub>IN</sub>) + (I<sub>CC</sub> static).

### AC Loading and Waveforms

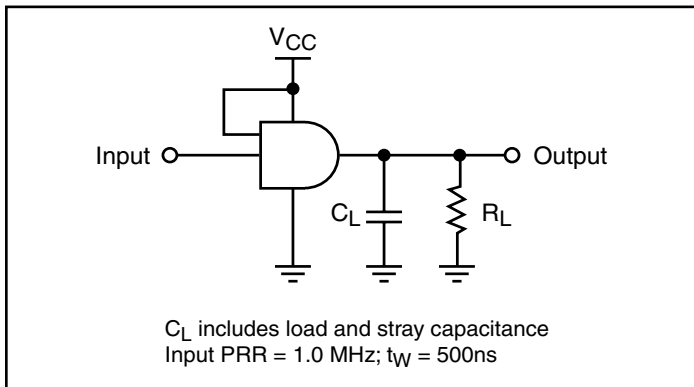


Figure 1. AC Test Circuit

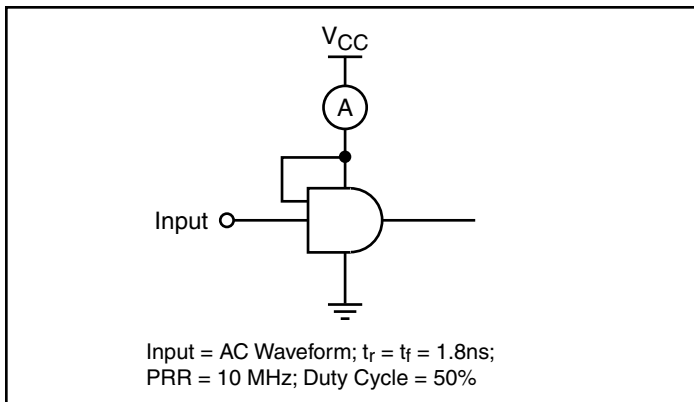


Figure 2. I<sub>CCD</sub> Test Circuit

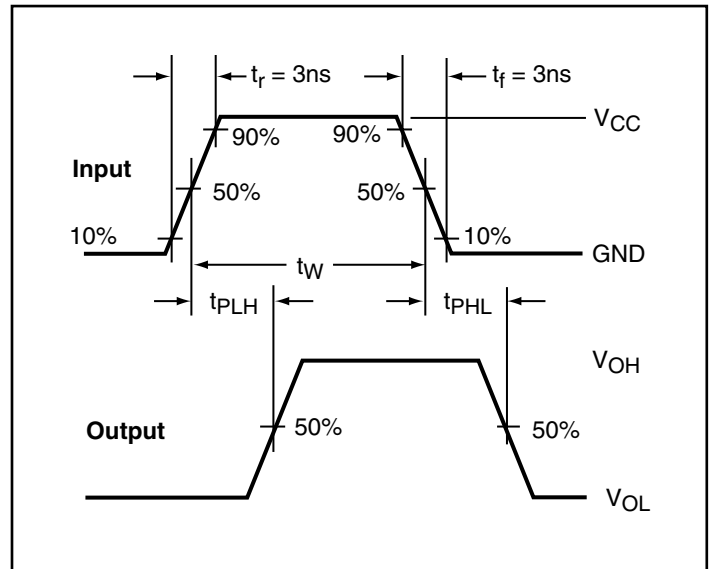
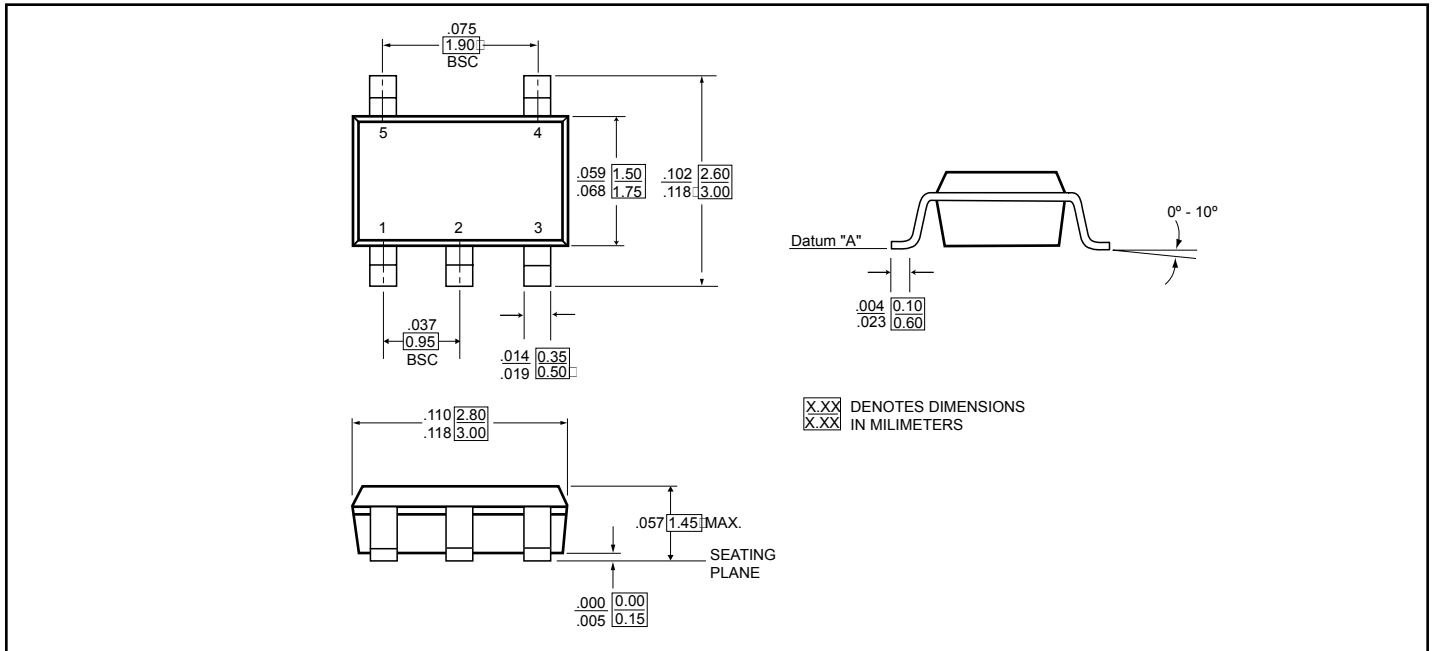
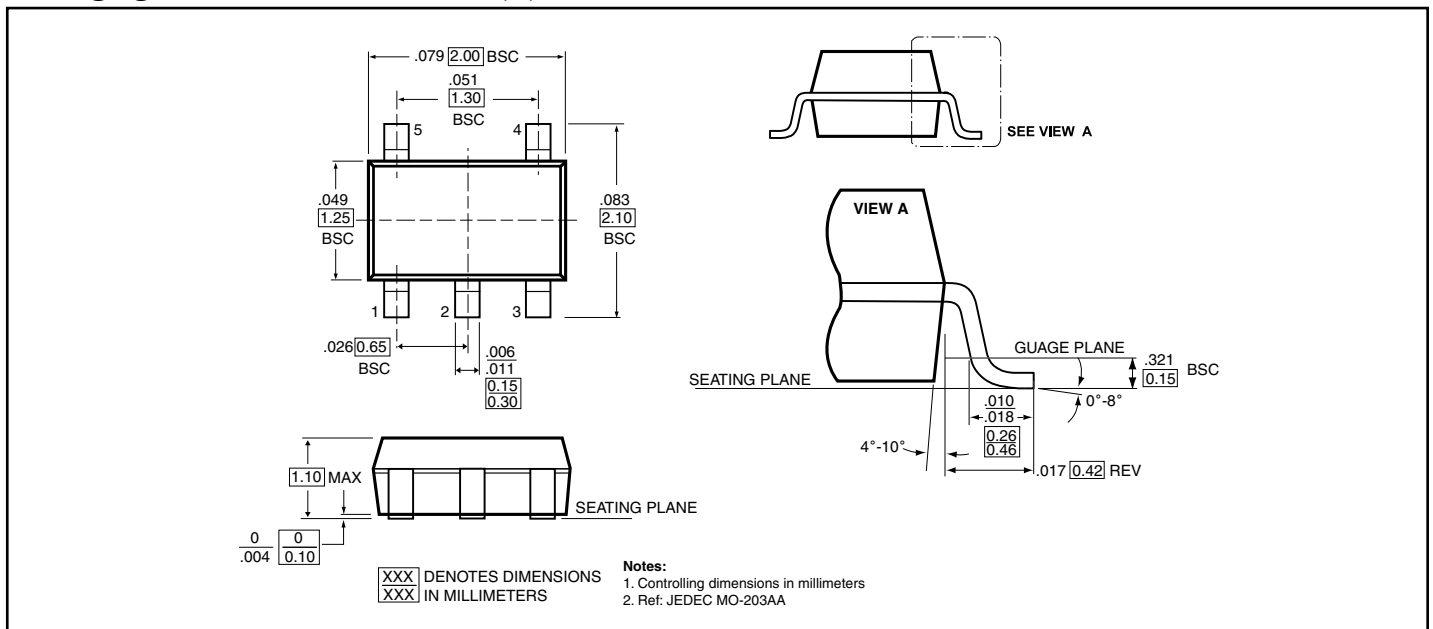


Figure 3. AC Waveforms

**Packaging Mechanical: 5-Pin SOT23 (T)**



**Packaging Mechanical: 5-Pin SC70 (C)**



**Ordering Information**

| <b>Ordering Code</b> | <b>Packaging Code</b> | <b>Package Type</b> | <b>Package Top Marking</b> |
|----------------------|-----------------------|---------------------|----------------------------|
| PI74ST1G08TX         | T                     | 5-pin SOT23         | A8                         |
| PI74ST1G08CX         | C                     | 5-pin SC70          | A8                         |

**Notes:**

1. Thermal characteristics can be found on the company web site at <http://www.pericom.com/packaging/>
2. X = Tape and Reel