

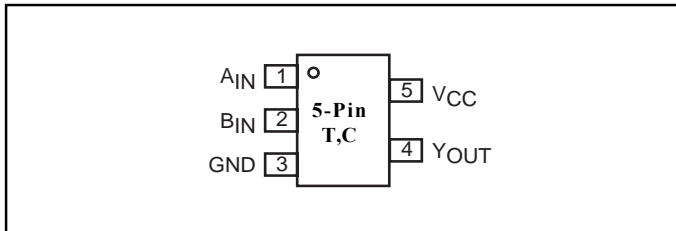
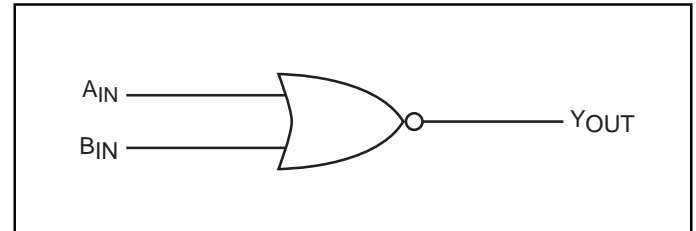
Features

- 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 $3\text{V } V_{CC}$
- Package: 5-pin space saving SOT23 and SC70

Description

The PI74ST1G02 is a 2-input NOR 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.

Pinout

Block Diagram

Pin Description

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

Function Table

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

Notes:

H = HIGH Logic Level

L = LOW Logic Level

Recommended Operating Conditions⁽¹⁾

| Parameter | Condition | Min. | Max. | Units |
|---|---|------|----------|-------|
| Supply Voltage (V_{CC}) | | 1.8 | 3.6 | |
| Input Voltage (V_{IN}) | | 0 | 5.5 | V |
| 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 | |

Note:

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

Absolute Maximum Ratings

| | | |
|--|-------|-----------------|
| Supply Voltage (V_{CC}) | ..... | -0.5V to +4V |
| DC Input Voltage (V_{IN}) | ..... | -0.5V to +6V |
| DC Output Voltage (V_{OUT}) | ..... | -0.5V to +6V |
| DC Input Diode Current (I_{IK}) | ..... | -50mA to 20mA |
| DC Output Diode Current (I_{OK}) | ..... | -50mA to 20mA |
| DC Output Current (I_{OUT}) | ..... | ±50mA |
| DC V_{CC}/GND Current (I_{CC}/I_{GND}) | ..... | ±50mA |
| Storage Temperature (T_{STG}) | ..... | -65°C to +150°C |
| Junction Lead Temperature (IOS) | ..... | 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_{CC} (V) | Conditions | | $T_A = +25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ | | Units |
|-----------|---------------------------|-----------------|-------------------------------------|----------------------------|--------------------------------|------|--------------------------------|---|--------------------------------|---------------|
| | | | | | Min. | Typ. | Max. | Min. | Max. | |
| V_{IH} | HIGH Level Input Voltage | 1.8 2.3-3.6 | | | 0.75 V_{CC} 0.70 V_{CC} | | | 0.75 V_{CC} 0.70 V_{CC} | | V |
| V_{IL} | LOW Level Input Voltage | 1.8 2.3-3.6 | | | | | 0.25 V_{CC} 0.30 V_{CC} | | 0.25 V_{CC} 0.30 V_{CC} | |
| V_{OH} | HIGH Level Output Voltage | 1.8 | $V_{IN} = V_{IL}$ | $I_{OH} = -100\mu\text{A}$ | 1.7 | 1.79 | | 1.7 | | |
| | | 2.3 | | | 2.2 | 2.29 | | 2.2 | | |
| | | 3.0 | | | 2.9 | 2.99 | | 2.9 | | |
| V_{OL} | LOW Level Output Voltage | 2.3 | | $I_{OH} = -8\text{mA}$ | 1.9 | 2.13 | | 1.9 | | |
| | | 3.0 | | $I_{OH} = -16\text{mA}$ | 2.4 | 2.71 | | 2.4 | | |
| | | 3.0 | | $I_{OH} = -24\text{mA}$ | 2.3 | 2.55 | | 2.3 | | |
| V_{OL} | LOW Level Output Voltage | 1.8 | $V_{IN} = V_{IH}$ | $I_{OL} = 100\mu\text{A}$ | | 0.01 | 0.1 | | 0.1 | |
| | | 2.3 | | | | 0.01 | 0.1 | | 0.1 | |
| | | 3.0 | | | | 0.00 | 0.1 | | 0.1 | |
| V_{OL} | LOW Level Output Voltage | 2.3 | | $I_{OL} = 8\text{mA}$ | | 0.10 | 0.3 | | 0.3 | |
| | | 3.0 | | $I_{OL} = 16\text{mA}$ | | 0.18 | 0.4 | | 0.4 | |
| | | 3.0 | | $I_{OL} = 24\text{mA}$ | | 0.28 | 0.55 | | 0.55 | |
| I_{IN} | Input Leakage Current | 0-3.6 | $V_{IN} = 5.5\text{V}, GND$ | | -1 | | 1 | -1 | 1 | μA |
| I_{OFF} | Power Off Leakage Current | 0.0 | V_{IN} or $V_{OUT} = 5.5\text{V}$ | | -1 | | 1 | -1 | 1 | |
| I_{CC} | Quiescent Supply Current | 1.8-3.6 | $V_{IN} = 5.5\text{V}, GND$ | | | | 2.0 | | 20 | |

AC Electrical Characteristics

| Symbol | Parameter | V _{CC} (V) | Conditions | T _A = +25°C | | | T _A = -40°C to +85°C | | Units | Fig. No. |
|--|-------------------------------|-----------------------------|---|------------------------|-------------------|-------------------|---------------------------------|-------------------|-------|----------|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| t _{PLH} , t _{PHL} | Propagation Delay | 1.8 2.5 ±0.2 3.3 ±0.3 | C _L = 15pF, R _L = 1MΩ | 2.0 0.8 0.5 | 2.8 1.7 1.2 | 3.7 2.4 1.7 | 2.0 0.8 0.5 | 4.1 2.6 1.8 | ns | 1, 3 |
| t _{PLH} , t _{PHL} | Propagation Delay | 3.3 ±0.3 | C _L = 50pF, R _L = 500Ω | 1.5 | 2.8 | 3.7 | 1.5 | 4.0 | | |
| C _{IN} | Input Capacitance | V _{IN} = 0 | | | 4 | | | | pF | 2 |
| C _{PD} ⁽³⁾ | Power Dissipation Capacitance | 3.3 | | | 23 | | | | | |

Notes:

- C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output loading and operating at 50% duty cycle (see Figure 2). C_{PD} is related to I_{CCD} dynamic operating current by the expression: I_{CCD} = (C_{PD})(V_{CC})(f_{IN}) + (I_{CC static}).

AC Loading and Waveforms

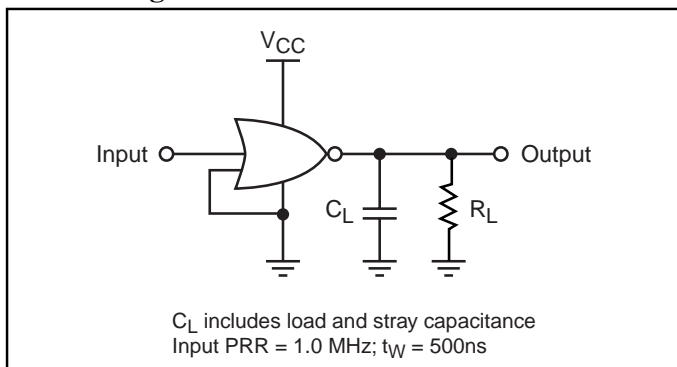


Figure 1. AC Test Circuit

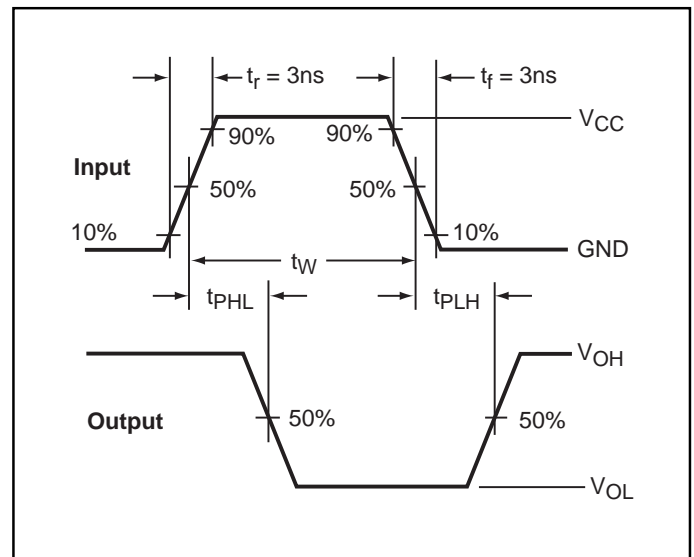


Figure 3. AC Waveforms

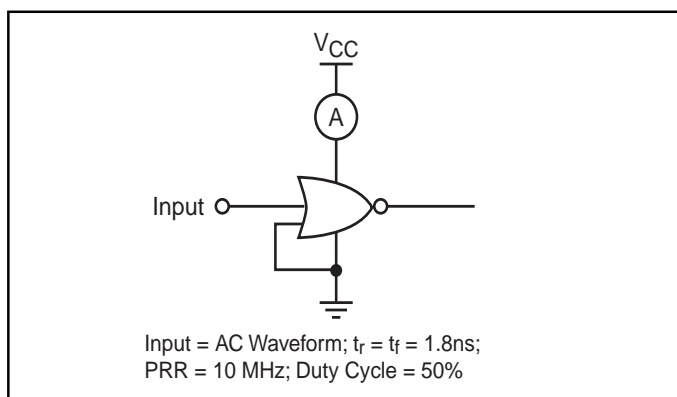
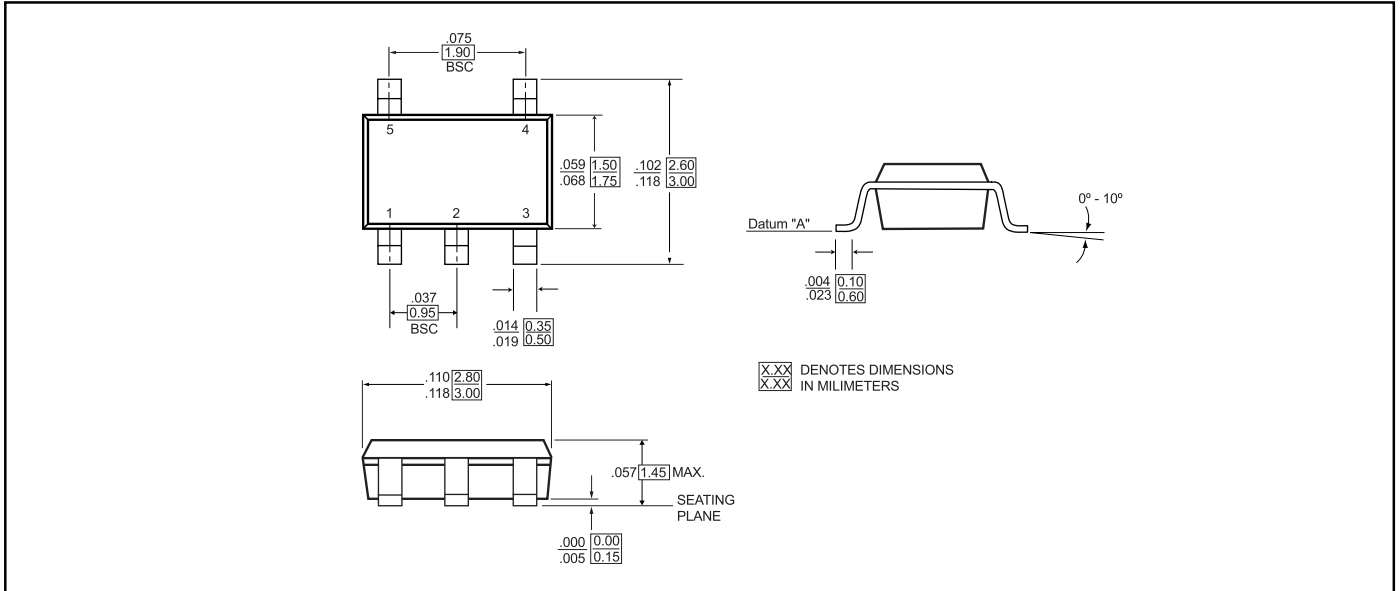
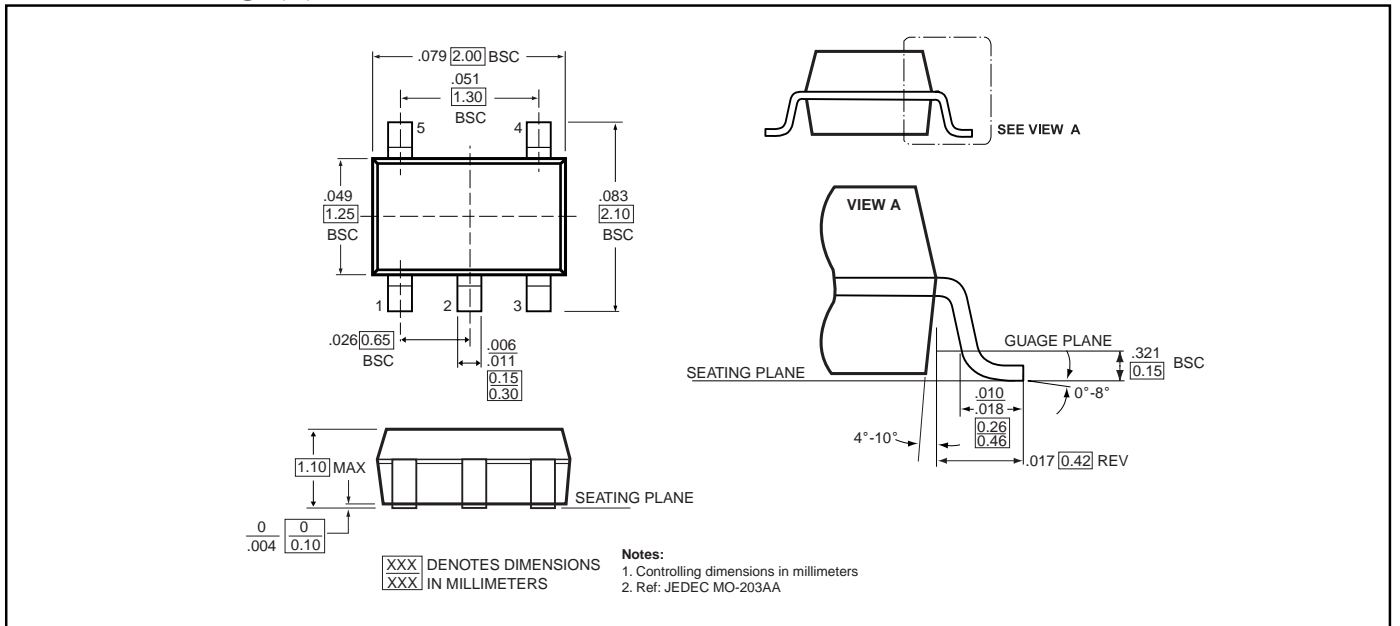


Figure 2. ICCD Test Circuit

5-Pin SOT23 Package (T)



5-Pin SC70 Package (C)



Ordering Information

| Part | Pin-Package | Top Marking | Operating Range |
|--------------|---------------|-------------|-----------------|
| PI74ST1G02TX | 5-Pin - SOT23 | L02 | -40°C to 85°C |
| PI74ST1G02CX | 5-Pin - SC70 | L02 | -40°C to 85°C |

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