

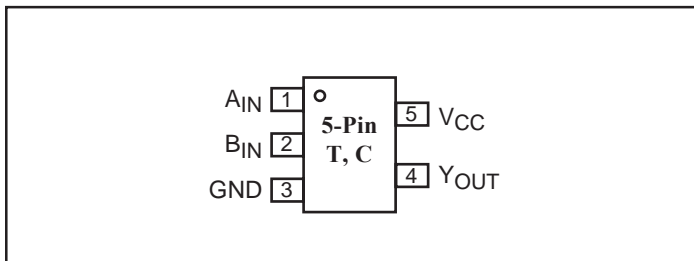
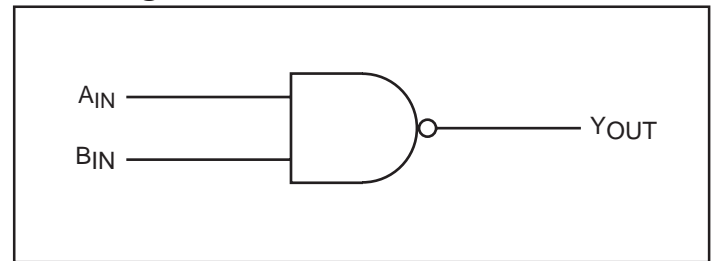
Features

- High-speed: $t_{PD} = 2.5\text{ns}$ typical into 15pF @ $5\text{V } V_{CC}$
- Power down high-impedance inputs/outputs
- TTL Input compatible: $V_{IL} = 0.8\text{V}$ (Max.)
 $V_{IH} = 2.0\text{V}$ (Min.)
- Packaging: 5-pin space saving SOT23 (T) and SC70 (C)

Description

The PI74STX1GT00 is a 2-input NAND gate that operates over the 4.5V to 5.5V V_{CC} operating range. The input threshold levels are TTL compatible. This device can be used for level shifting from 3V to 5V system.

Pericom's PI74STX 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	H
H	L	H
H	H	L

Note:

H = HIGH Logic Level
L = LOW Logic Level

Recommended Operating Conditions⁽¹⁾

Parameter	Condition	Min.	Max.	Units
Supply Voltage (V_{CC})		4.5	5.5	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)	$V_{CC} = 5.0\text{V} \pm 0.5\text{V}$	0	20	ns/V

Note:

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

Absolute Maximum Ratings

Supply Voltage (V_{CC})	-0.5V to +7V	DC Output Diode Current (I_{OK})	-50mA to 20mA
DC Input Voltage, $V_{IN}^{(1)}$	-0.5V to +7V	DC Output Current (I_{OUT})	± 50 mA
Voltage Range Applied to any Output in the Power-Off State, $V_{OUT}^{(1)}$	0.5V to +7V	DC V_{CC}/GND Current (I_{CC}/I_{GND})	± 50 mA
Voltage Range Applied to any Output in the High or Low State, $V_{OUT}^{(1)}$	0.5V to $V_{CC}+0.5$ V	Storage Temperature (T_{STG})	-65°C to +150°C
DC Input Diode Current (I_{IK})	-50mA to 20mA	Junction Lead Temperature (IOS)	200°C
		Power Dissipation SOT23	200mW
		SC70	150mW

Notes:

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.

1. The input negative voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

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

Symbol	Parameters	$V_{CC}(V)$	Conditions		$T_A = +25^\circ C$			$T_A = -40 \text{ to } +85^\circ C$		Units
					Min.	Typ.	Max.	Min.	Max.	
V_{IH}	High Level Input Voltage	4.5 - 5.5			2.0			2.0		V
V_{IL}	Low Level Input Voltage	4.5 - 5.5					0.8	0.8		
V_{OH}	High Level Output Voltage	4.5	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OH} = -50\mu A$ $I_{OH} = -8mA$	4.4 3.94	4.5 -		4.4 3.8		
V_{OL}	Low Level Output Voltage	4.5	$V_{IN} = V_{IH}$	$I_{OL} = 50\mu A$ $I_{OL} = 8mA$			0.1 0.36	0.1 0.44		
I_{IN}	Input Leakage Current	0.0 - 5.5	$V_{IN} = 5.5V$ or GND				± 0.1		± 1.0	μA
I_{OFF}	Power-Off Leakage Current	0.0	V_{IN} or $V_{OUT} = 5.5V$				± 1.0		± 10	
I_{CC}	Quiescent Supply Current	5.5	$V_{IN} = 5.5V$ or GND				1.0		10	
I_{CCT}	I_{CC} per Input	5.5	One input $V_{IN} = 3.4V$ Other input = V_{CC} or GND				1.35		1.50	mA

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	5.0 ±0.5	C _L = 15pF		2.5	3.9	1.0	4.2	ns	1, 3
			C _L = 50pF		3.0	4.9	1.0	5.4		
C _{IN}	Input Capacitance	0			3	10		10	pF	
C _{PD}	Power Dissipation Capacitance ⁽³⁾	5.0			22					

Notes:

3. 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

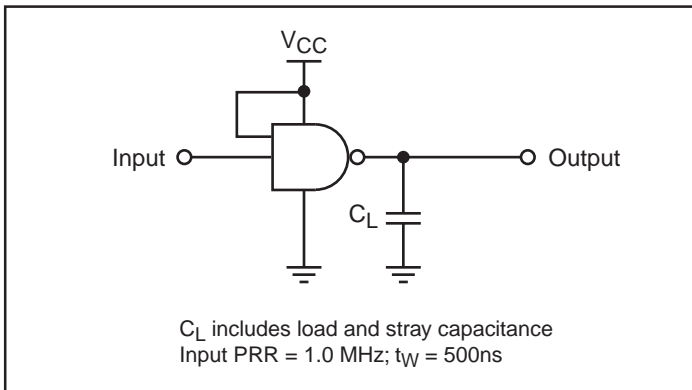


Figure 1. AC Test Circuit

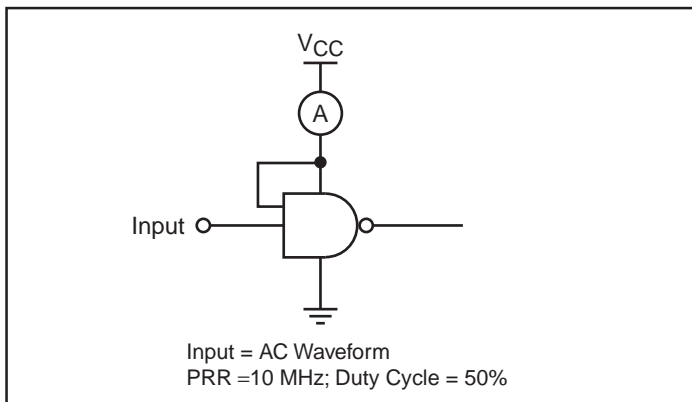


Figure 2. I_{CCD} Test Circuit

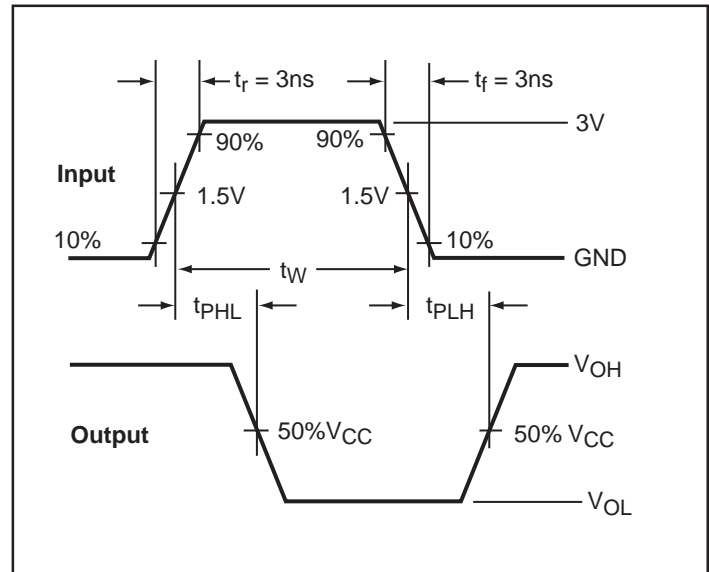
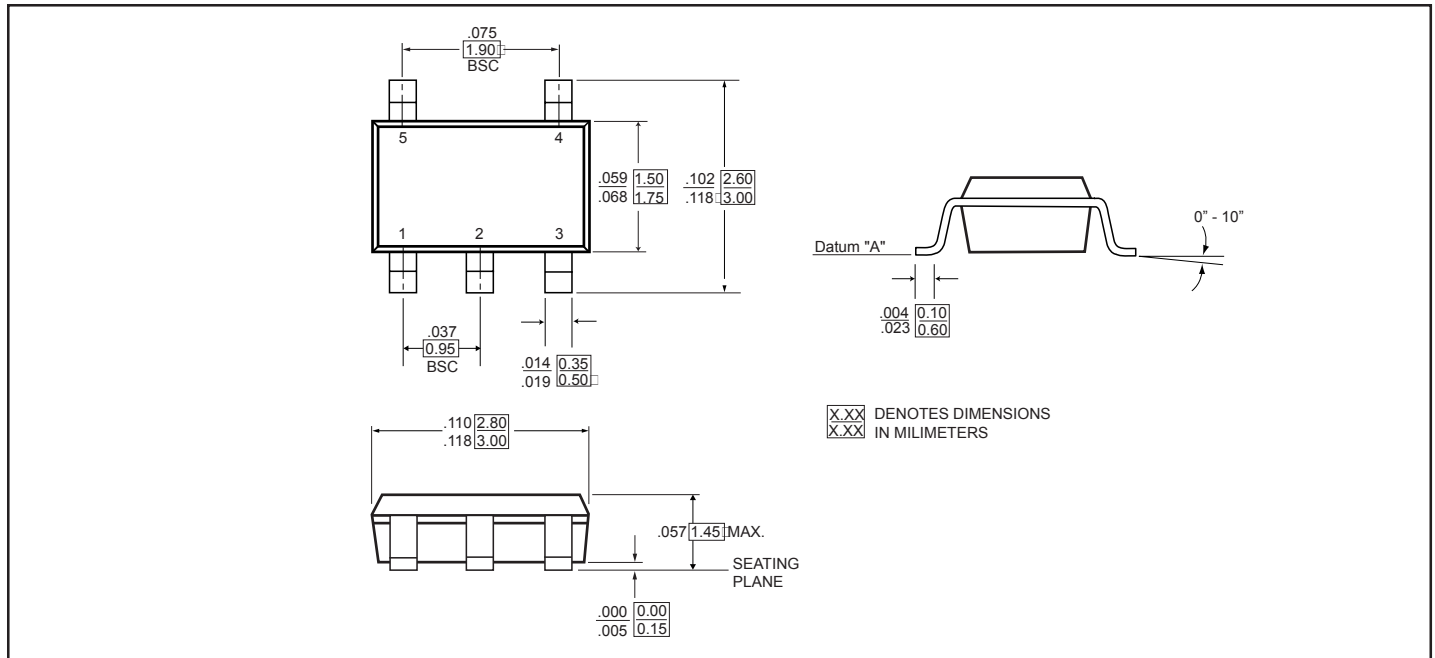
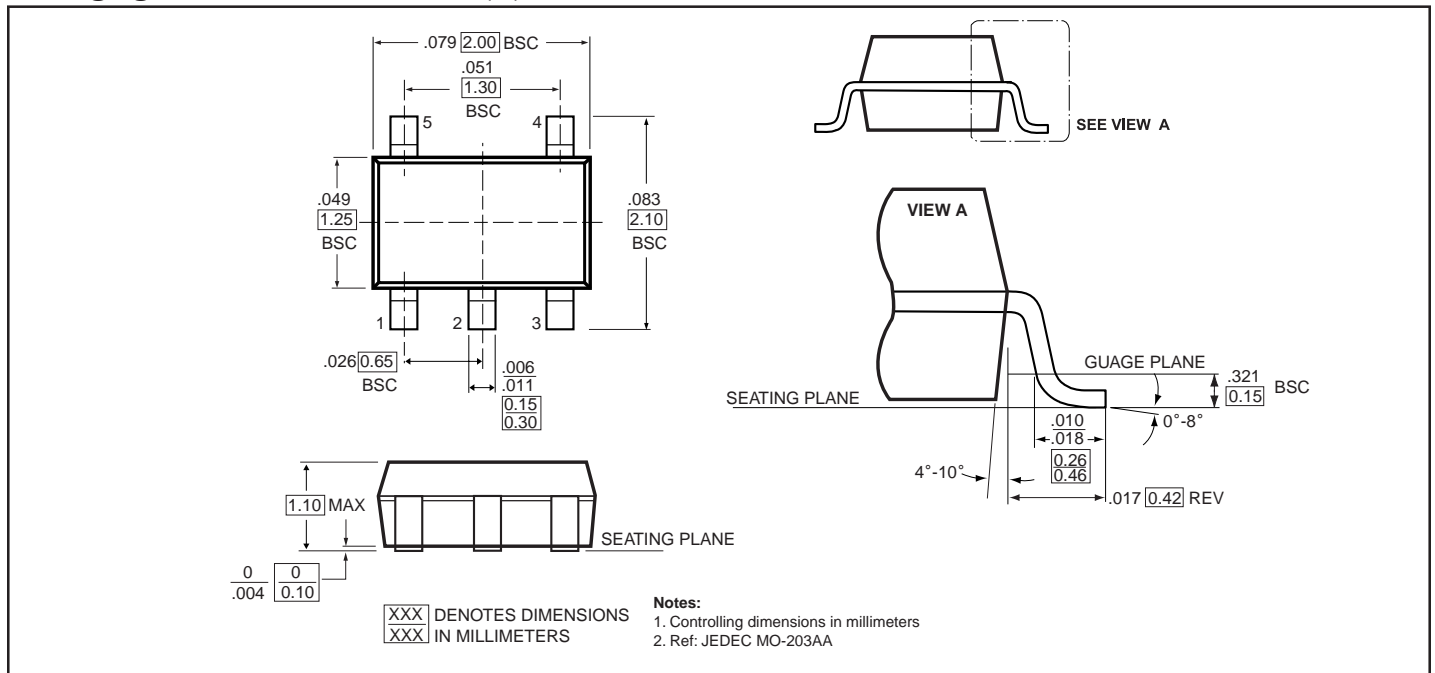


Figure 3. AC Waveforms

Packaging Mechanical: 5-Pin SOT23 (T)



Packaging Mechanical: 5-Pin SC70 (C)



Thermal Characteristics can be found on the web: <http://www.pericom.com/packaging/mechanicals.php>

Ordering Information

Part	Pin-Package	Top Marking	Operating Range
PI74STX1GT00TX	5-Pin - SOT23	N00	-40°C to 85°C
PI74STX1GT00CX	5-Pin - SC70	N00	-40°C to 85°C

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