

Features

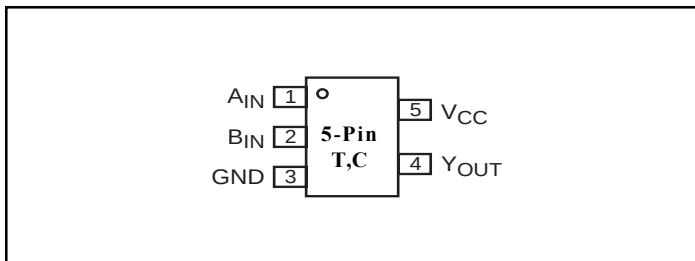
- High-speed: $t_{PD} = 1.8\text{ns}$ typical
- Broad operating range: $V_{CC} = 1.8\text{V} - 3.6\text{V}$
- Power down high-impedance inputs/outputs
- High output drive: $\pm 24\text{mA}$ at $3\text{V } V_{CC}$
- Package: 5-pin space saving SOT23 and SC70

Description

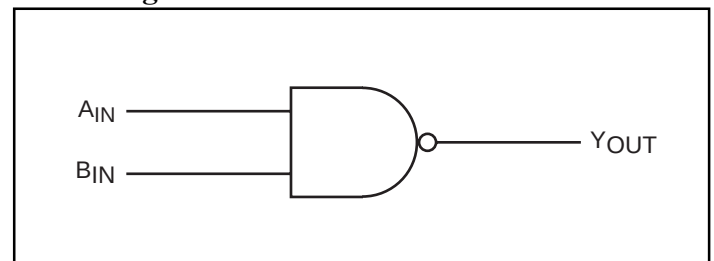
The PI74ST1G00 is a 2-input NAND gate that operates over the 1.8V to 3.6V V_{CC} operating range.

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	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})		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	

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		$T_A = +25^\circ C$			$T_A = -40^\circ C$ to $+85^\circ C$		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	$V_{IN} = V_{IL}$	$I_{OH} = -100\mu A$	1.7	1.79		1.7		
		2.3			2.2	2.29		2.2		
		3.0			2.9	2.99		2.9		
		2.3		$I_{OH} = -8mA$	1.9	2.13		1.9		
		3.0		$I_{OH} = -16mA$	2.4	2.71		2.4		
		3.0		$I_{OH} = -24mA$	2.3	2.55		2.3		
V_{OL}	LOW Level Output Voltage	1.8	$V_{IN} = V_{IH}$	$I_{OL} = 100\mu A$		0.01	0.1		0.1	
		2.3				0.01	0.1		0.1	
		3.0				0.00	0.1		0.1	
		2.3		$I_{OL} = 8mA$		0.10	0.3		0.3	
		3.0		$I_{OL} = 16mA$		0.18	0.4		0.4	
		3.0		$I_{OL} = 24mA$		0.28	0.55		0.55	
I_{IN}	Input Leakage Current	0-3.6	$V_{IN} = 5.5V, GND$		-1		1	-1	1	μA
I_{OFF}	Power Off Leakage Current	0.0	V_{IN} or $V_{OUT} = 5.5V$		-1		1	-1	1	
I_{CC}	Quiescent Supply Current	1.8-3.6	$V_{IN} = 5.5V, GND$				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	2.9 1.8 1.3	3.8 2.4 1.7	2.0 0.8 0.5	4.1 2.6 1.9	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	4.1		1 3
C _{IN}	Input Capacitance	0	V _{IN} = 0		4				pF	
C _{PD}	Power Dissipation Capacitance	3.3	Note 3		24					2

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

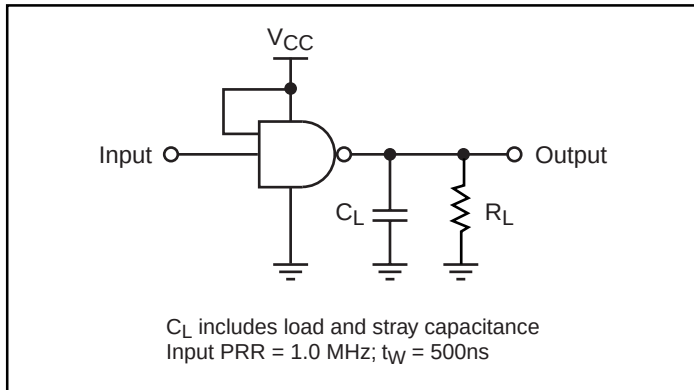


Figure 1. AC Test Circuit

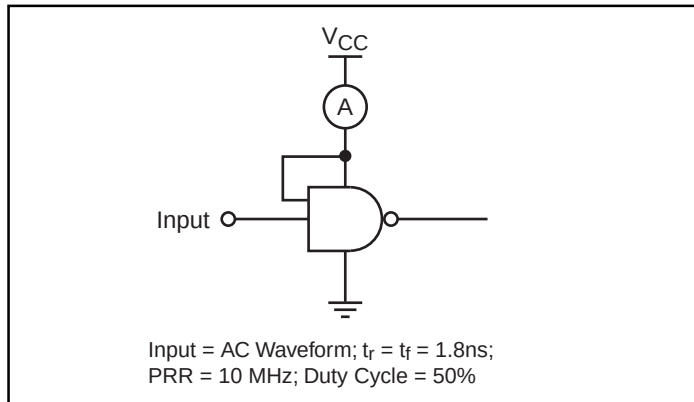


Figure 2. I_{CCD} Test Circuit

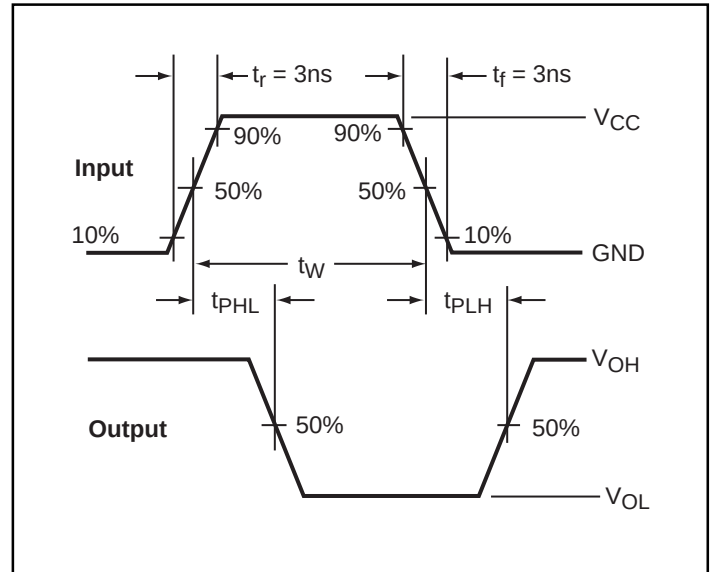


Figure 3. AC Waveforms

Technical drawing of a component with multiple views and dimensions. The drawing includes a top view, a side view, and a cross-sectional view.

Top View Dimensions:

- Overall width: $\frac{.110}{.118}$ $\frac{2.80}{3.00}$
- Overall height: $\frac{.102}{.118}$ $\frac{2.60}{3.00}$
- Feature 1 (Top Left): $\frac{.075}{.190}$ BSC
- Feature 2 (Bottom Left): $\frac{.037}{.095}$ BSC
- Feature 3 (Bottom Right): $\frac{.014}{.019}$ $\frac{0.35}{0.50}$
- Feature 4 (Top Right): $\frac{.059}{.068}$ $\frac{1.50}{1.75}$
- Feature 5 (Top Center): $\frac{.059}{.068}$ $\frac{1.50}{1.75}$

Side View Dimensions:

- Overall height: $\frac{.057}{.145}$ MAX.
- Seating Plane: Indicated by a horizontal line and an arrow pointing to the bottom of the component.
- Bottom dimensions: $\frac{.000}{.005}$ $\frac{0.00}{0.15}$

Cross-sectional View Dimensions:

- Datum "A": Indicated by a horizontal line and an arrow pointing to the top surface of the component.
- Feature 1 (Top Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 2 (Top Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 3 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 4 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 5 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 6 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 7 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 8 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 9 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 10 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 11 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 12 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 13 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 14 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 15 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 16 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 17 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 18 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 19 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 20 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 21 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
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- Feature 24 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
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- Feature 27 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
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- Feature 69 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 70 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 71 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 72 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 73 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 74 (Bottom Center): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 75 (Bottom Right): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 76 (Bottom Left): $\frac{.004}{.023}$ $\frac{0.10}{0.60}$
- Feature 77 (Bottom Center): $\frac{.004$

[illegible]

Part	Pin-Package	Top Marking	Operating Range
PI74ST1G00TX	5-Pin - SOT23	L00	−40°C to 85°C
PI74ST1G00CX	5-Pin - SC70	L00	−40°C to 85°C