

Features

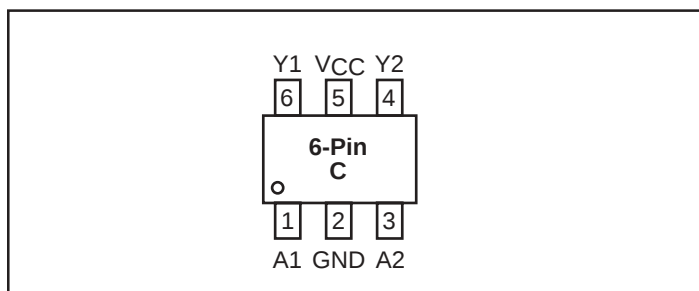
- High-Speed: $t_{PD} = 3.2\text{ns}$ typical into 50pF @ $5\text{V } V_{CC}$
- Broad Operating Range: $V_{CC} = 1.65\text{V}$ to 5.5V
- Power down high-impedance inputs/outputs
- High Output Drive: $\pm 24\text{mA}$ at $3\text{V } V_{CC}$
- Package: 6-pin space saving SC70 (C)

Description

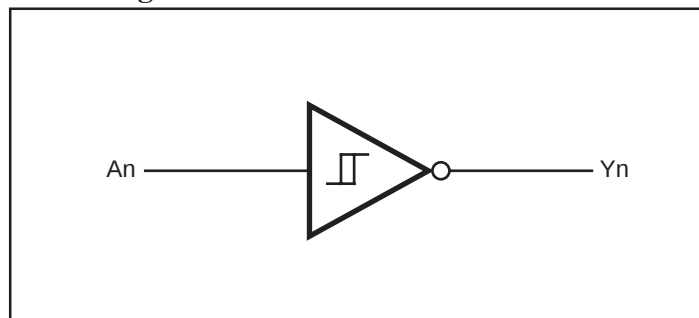
The PI74STX2G14 is a Dual Schmitt-Trigger inverter that operates over the 1.65V to $5.5\text{V } V_{CC}$ operating range.

Pericom's PI74STX series of products are produced using the Company's advanced submicron technology.

PI74STX2G14



Block Diagram



Pin Description

Pin Names	Description
An	Inputs
Yn	Outputs

Function Table

Inputs	Output
A	Y
L	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})		1.65	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)	$V_{CC} = 1.8\text{V}, 2.5\text{V} \pm 0.2\text{V}$	0	20	ns/V
	$V_{CC} = 3.3\text{V}, \pm 0.3\text{V}$	0	10	
	$V_{CC} = 5.0\text{V}, \pm 0.5\text{V}$	0	5	

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})	±50mA
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})	±100mA
Voltage Range Applied to Any Output in the High or Low State, $V_{OUT}^{(1)}$	-0.5V to $V_{CC}+0.5V$	Storage Temperature (T_{STG})	-65°C to +150°C
DC Input Diode Current (I_{IK})	-50mA to 20mA	Junction Lead Temperature (I_{OS})	260°C
		Power Dissipation 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.

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	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_P	Positive Threshold Voltage	1.65		0.6	1.05	1.4	0.6	1.4	V
		1.8		0.7	1.11	1.5	0.7	1.5	
		2.3		1.0	1.32	1.8	1.0	1.8	
		3.0		1.3	1.61	2.2	1.3	2.2	
		4.5		1.9	2.26	3.1	1.9	3.1	
		5.5		2.2	2.49	3.6	2.2	3.6	
V_N	Negative Threshold Voltage	1.65		0.2	0.65	0.8	0.2	0.8	
		1.8		0.25	0.70	0.9	0.25	0.9	
		2.3		0.40	0.86	1.15	0.40	1.15	
		3.0		0.6	1.05	1.5	0.6	1.5	
		4.5		1.0	1.42	2.0	1.0	2.0	
		5.5		1.2	1.54	2.3	1.2	2.3	
V_H	Hysteresis Voltage	1.65		0.1	0.40	0.9	0.1	0.9	
		1.8		0.15	0.41	1.0	0.15	1.0	
		2.3		0.25	0.46	1.1	0.25	1.1	
		3.0		0.4	0.56	1.2	0.4	1.2	
		4.5		0.6	0.85	1.5	0.6	1.5	
		5.5		0.7	0.96	1.7	0.7	1.7	
V_{OH}	HIGH Level Output Voltage	1.65	$V_{IN} = V_{IL}$	$I_{OH} = -100\mu A$	1.55	1.65		1.55	
		1.8			1.7	1.8		1.7	
		2.3			2.2	2.3		2.2	
		3.0			2.9	3.0		2.9	
		4.5			4.4	4.5		4.4	
		1.65		$I_{OH} = -4mA$	1.29	1.48		1.29	
		2.3			1.9	2.09		1.9	
		3.0			2.4	2.67		2.4	
		3.0			2.3	2.48		2.3	
		4.5			3.8	4.00		3.8	
		1.65		$I_{OH} = -8mA$	1.29	1.48		1.29	
		2.3			1.9	2.09		1.9	
		3.0			2.4	2.67		2.4	
		3.0			2.3	2.48		2.3	
		4.5			3.8	4.00		3.8	
		1.65		$I_{OH} = -16mA$	1.29	1.48		1.29	
		2.3			1.9	2.09		1.9	
		3.0			2.4	2.67		2.4	
		3.0			2.3	2.48		2.3	
		4.5			3.8	4.00		3.8	
		1.65		$I_{OH} = -24mA$	1.29	1.48		1.29	
		2.3			1.9	2.09		1.9	
		3.0			2.4	2.67		2.4	
		3.0			2.3	2.48		2.3	
		4.5			3.8	4.00		3.8	
		1.65		$I_{OH} = -32mA$	1.29	1.48		1.29	
		2.3			1.9	2.09		1.9	
		3.0			2.4	2.67		2.4	
		3.0			2.3	2.48		2.3	
		4.5			3.8	4.00		3.8	

DC Electrical Characteristics

(Over supply voltage and operating temperature ranges, unless otherwise specified) (continued)

Symbol	Parameter	V _{CC} (V)	Conditions	T _A = +25°C			T _A = -40 to +85°C		Units
				Min.	Typ.	Max.	Min.	Max.	
V _{OL}	LOW Level Output Voltage	1.65	V _{IN} = V _{IH} I _{OL} = 100μA		0.0	0.1		0.1	V
		1.8			0.0	0.1		0.1	
		2.3			0.0	0.1		0.1	
		3.0			0.0	0.1		0.1	
		4.5			0.0	0.1		0.1	
		1.65	I _{OL} = 4mA I _{OL} = 8mA I _{OL} = 16mA I _{OL} = 24mA I _{OL} = 32mA		0.06	0.24		0.24	
		2.3			0.10	0.3		0.3	
		3.0			0.17	0.4		0.4	
		3.0			0.26	0.55		0.55	
		4.5			0.29	0.55		0.55	
I _{IN}	Input Leakage Current	0 to 5.5	V _{IN} = 5.5V, GND			±0.1		±1.0	μA
I _{OFF}	Power Off Leakage Current	0.0	V _{IN} or V _{OUT} = 5.5V			±1		±10	
I _{CC}	Quiescent Supply Current	1.65-5.5	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	1.65	C _L = 15pF, R _L = 1MΩ	2.5		13.1	2.5	14.5	ns	1 3
		1.8		2.5		10.9	2.5	12.0		
		2.5 ±0.2		1.8		7.4	1.8	8.1		
		3.3 ±0.3		1.5		5.0	1.5	5.5		
		5.0 ±0.5		1.0		4.1	1.0	4.5		
t _{PLH} , t _{PHL}	Propagation Delay	3.3 ±0.3 5.0 ±0.5	C _L = 50pF, R _L = 500Ω	1.8 1.2		6.0 4.9	1.8 1.2	6.6 5.4		1 3
C _{IN}	Input Capacitance	0			2.5				pF	
C _{PD}	Power Dissipation Capacitance ⁽³⁾	3.3 5.0			15.0 19.0					2

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

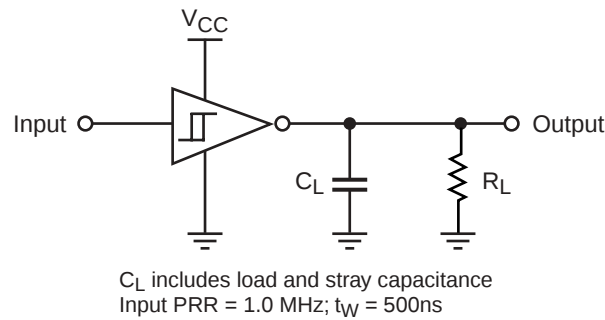


Figure 1. AC Test Circuit

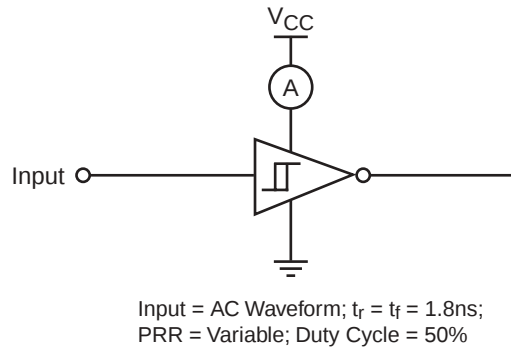


Figure 2. I_{CCD} Test Circuit

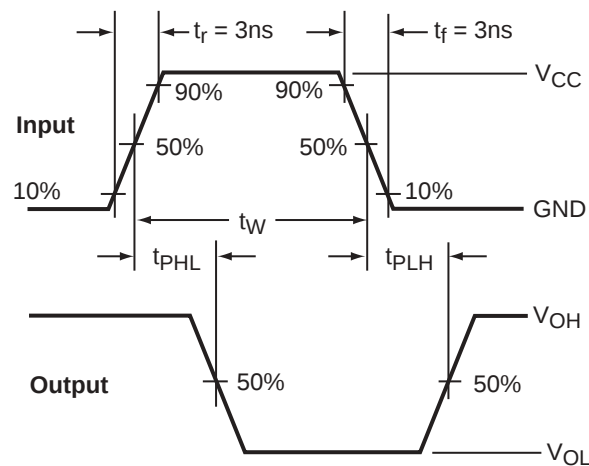
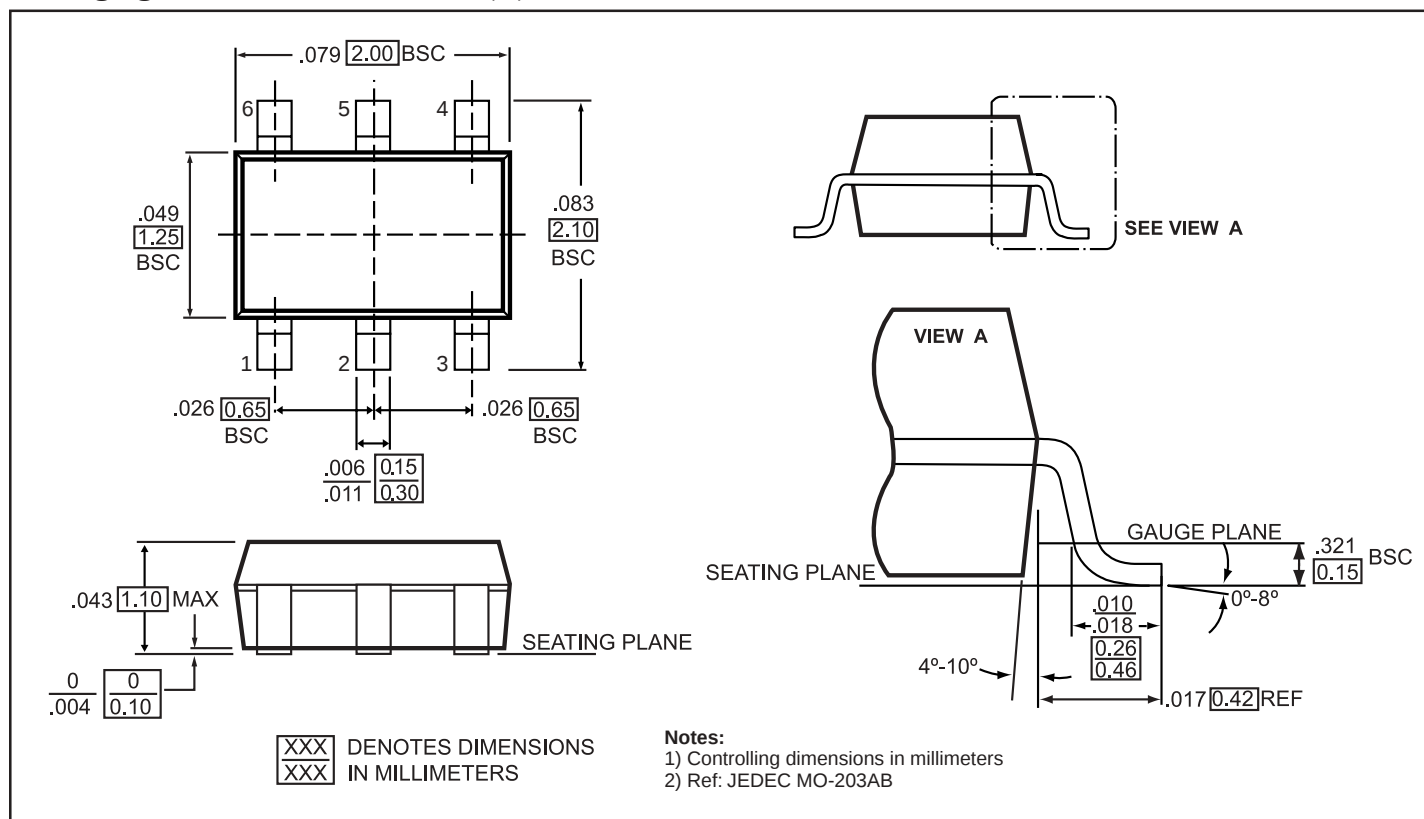


Figure3. AC Waveforms

Packaging Mechanical: 6-Pin SC70 (C)

Ordering Information

Part	Pin-Package	Top Marking	Operating Range
PI74ST2G14CX	6-Pin - SC70	MME	-40°C to 85°C