PI74STX1G86

SOTiny™ Gate STX
2-Input Exclusive OR

Features

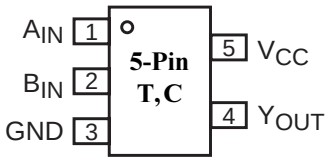
- High-speed: t_{PD} = 2.6ns typical into 50pF @ 5V V_{CC}
- Broad operating range: V_{CC} = 1.65V –5.5V
- Power down high-impedance inputs/outputs
- High output drive: ±24mA at 3V V_{CC}
- Package: 5-pin space saving SOT23 and SC70

Description

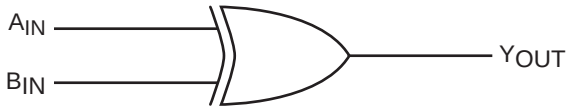
The PI74STX1G86 is a 2-input exclusive OR gate that operates over the 1.65V to 5.5V V_{CC} operating range.

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	L
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})		1.65	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} = 1.8V, 2.5V±0.2V	0	20	ns/V
	V_{CC} = 3.3V, ±0.3V	0	10	
	V_{CC} =5.0V, ±0.5V	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 +6V
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°C			T_A = –40 to +85°C		Units
					Min.	Typ.	Max.	Min.	Max.	
V_{IH}	HIGH Level Input Voltage	1.65-1.95 2.3-5.5			0.75V_{CC} 0.70V_{CC}			0.75V_{CC} 0.70V_{CC}		V
V_{IL}	LOW Level Input Voltage	1.65-1.95 2.3-5.5					0.25V_{CC} 0.30V_{CC}		0.25V_{CC} 0.30V_{CC}	
V_{OH}	HIGH Level Output Voltage	1.65 1.8 2.3 3.0 4.5	V_{IN} = V_{IL}	I_{OH} = –100µA	1.55 1.7 2.2 2. 4.4	1.65 1.79 2.29 2.99 4.5		1.55 1.9 2.4 2.3 4.4		
		1.65 2.3 3.0 3.0 4.5		I_{OH} = –4mA I_{OH} = –8mA I_{OH} = –16mA I_{OH} = –24mA I_{OH} = –32mA	1.29 1.9 2.4 2.3 3.8	1.52 2.13 2.71 2.55 4.20		1.29 1.9 2.4 2.3 3.8		
V_{OL}	LOW Level Output Voltage	1.65 1.8 2.3 3.0 4.5	V_{IN} = V_{IH}	I_{OL} = 100µA		0.01 0.01 0.01 0.00 0.00	0.1 0.1 0.1 0.1 0.1		0.1 0.1 0.1 0.1 0.1	
		1.65 2.3 3.0 3.0 4.5		I_{OL} = 4mA I_{OL} = 8mA I_{OL} = 16mA I_{OL} = 24mA I_{OL} = 32mA		0.08 0.10 0.18 0.28 0.28	0.24 0.3 0.4 0.55 0.55		0.24 0.3 0.4 0.55 0.55	
I_{IN}	Input Leakage Current	0-5.5	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	1.65-5.5	V_{IN} = 5.5V, GND				2.0		20	

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	Conditions	T_A = +25°C			T_A = –40 to +85°C		Units	Fig. No.
				Min.	Typ.	Max.	Min.	Max.		
t_{PLH}, t_{PHL}	Propagation Delay	1.8	C_L = 15pF,	0.7	8.1	11.2	0.7	12.3	ns	1
		2.5 ±0.2	R_L = 1Mohm	0.5	3.5	4.4	0.5	4.8		3
		3.3 ±0.3		0.5	2.6	3.4	0.5	3.7		
		5.0 ±0.5		0.5	2.0	2.5	0.5	2.8		
t_{PLH}, t_{PHL}	Propagation Delay	3.3 ±0.3	C_L = 50pF,	0.5	3.4	4.7	1.5	5.2		1
		5.0 ±0.5	R_L = 500 ohms	0.5	2.6	3.6	0.8	4.0		3
C_{IN}	Input Capacitance	0	V_{IN} = 0		4				pF	
C_{PD}	Power Dissipation Capacitance (3)	3.3			24					2
		5.0			30					

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

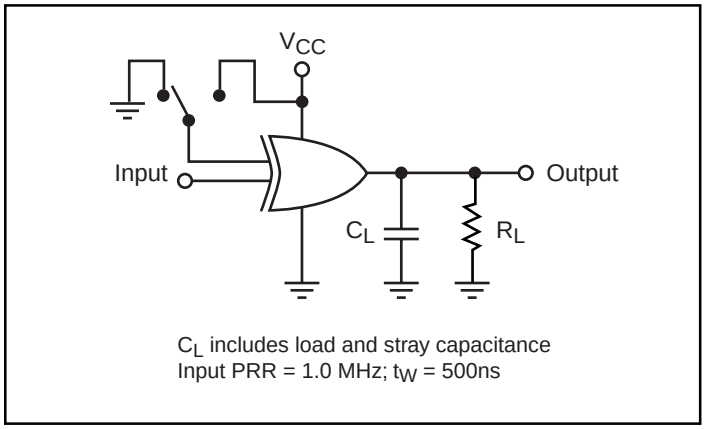


Figure 1. AC Test Circuit

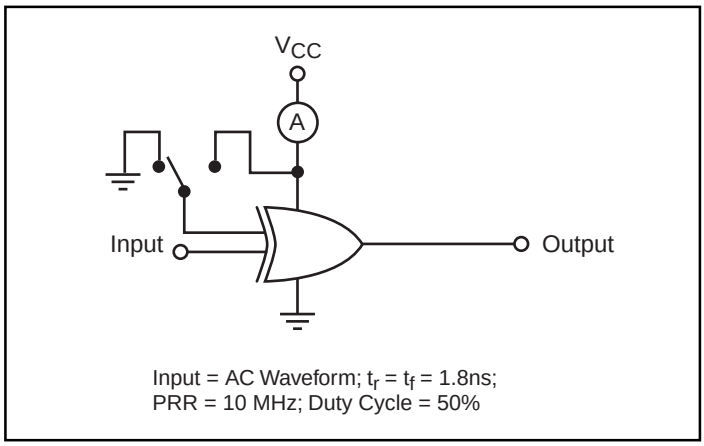


Figure 2. I_{CCD} Test Circuit

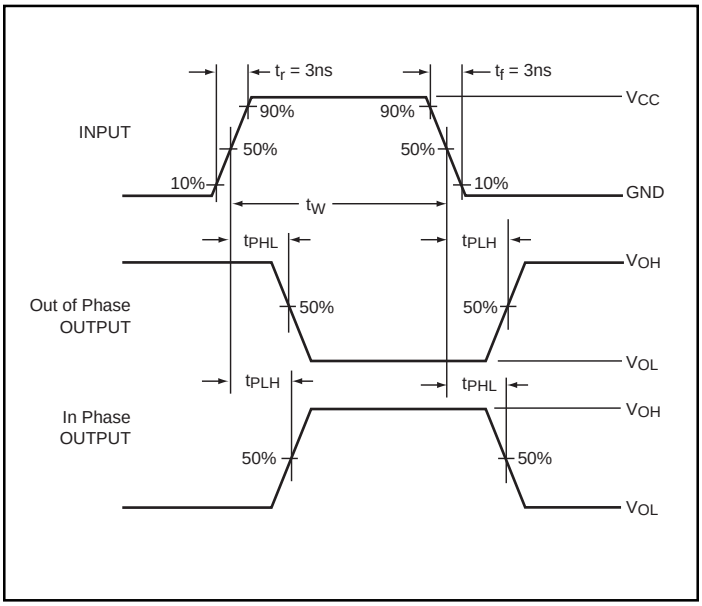
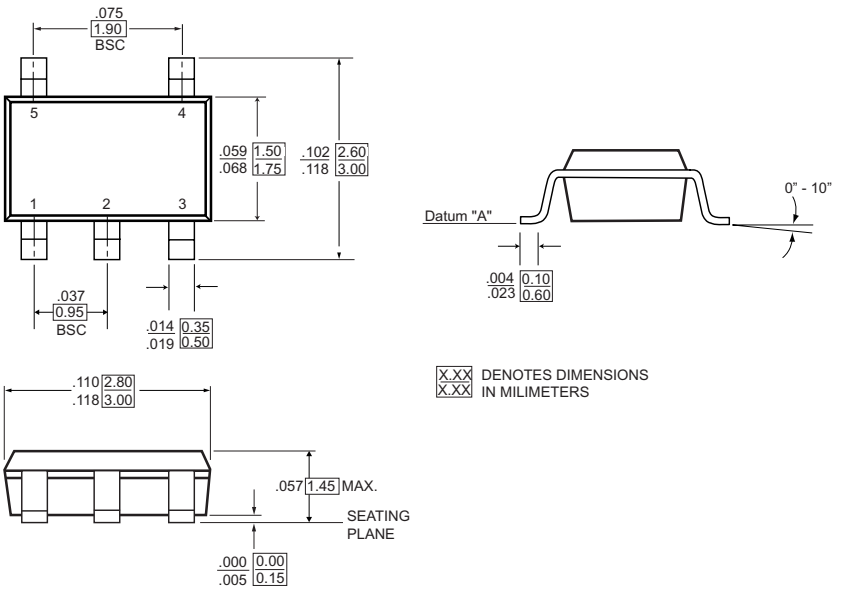
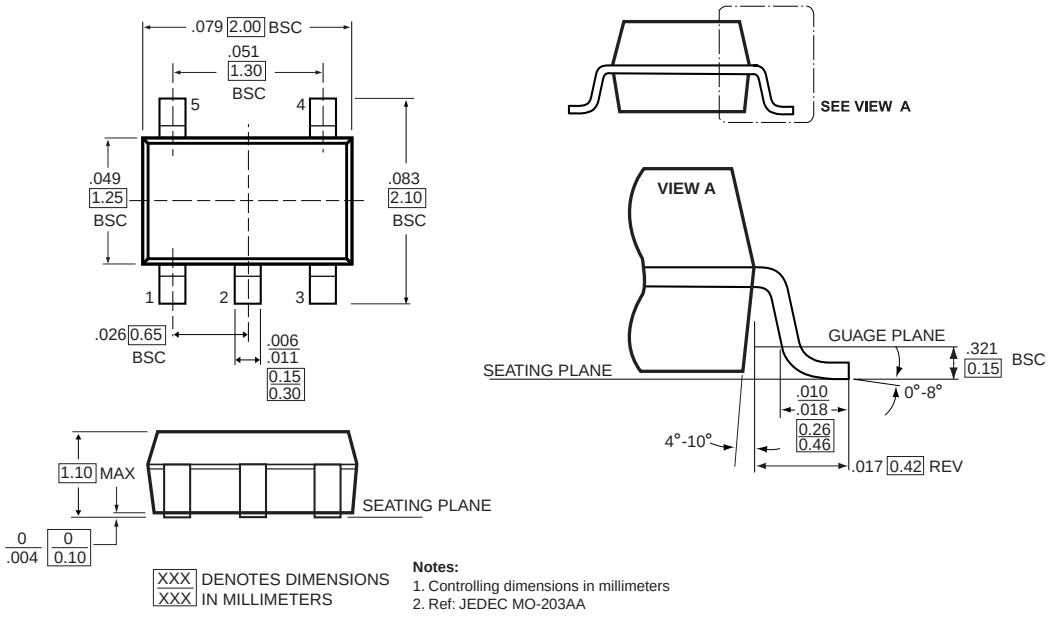


Figure 3. AC Waveforms

5-Pin SOT23 (T) Package



5-Pin SC70 Package (C)



Notes:
1. Controlling dimensions in millimeters
2. Ref: JEDEC MO-203AA

Ordering Information

Part	Pin-Package	Top Marking	Operating Range
PI74STX1G86TX	5-Pin - SOT23	M56	–40ºC to 85ºC
PI74STX1G86CX	5-Pin - SC70	M56	–40ºC to 85ºC