PERICOM

PI74STX2GU04
PI74STX3GU04

SOTiny™ Logic STX Dual & Triple Unbuffered Inverters

Features

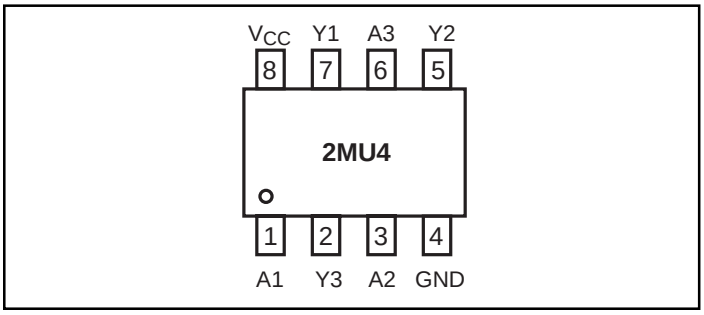
- Broad Operating Range: V_{CC} = 1.65V to 5.5V
- Power down high-impedance inputs/outputs
- Balanced Output Drive: ±8mA at 4.5V V_{CC}
- Package: 8-pin space saving MSOP
  6-pin space saving SC70

Description

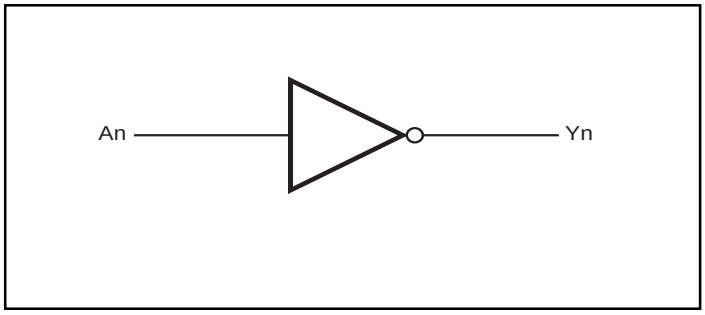
PI74STX2GU04 is a dual unbuffered inverter & the PI74STX3GU04 is a triple unbuffered inverter that operate over the 1.65V to 5.5V V_{CC} operating range.

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

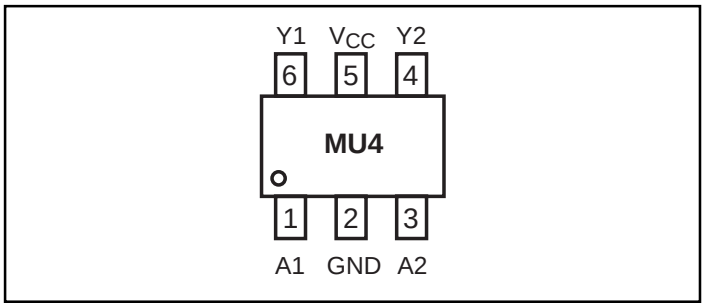
PI74STX3GU04



Block Diagram



PI74STX2GU04



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} = 1.8V, 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 +7V	DC Output Current (I_{OUT}) ..... ±50mA
DC Input Voltage (V_{IN}) ..... –0.5V to +7V	DC V_{CC}/GND Current (I_{CC}/I_{GND}) ..... ±50mA
DC Output Voltage (V_{OUT}) ..... –0.5V to +7V	Storage Temperature (T_{STG}) ..... –65°C to +150°C
DC Input Diode Current (I_{IK}) ..... –50mA to 20mA	Junction Lead Temperature (IOS) ..... 260°C
DC Output Diode Current (I_{OK}) ..... –50mA to 20mA	Power Dissipation 300mW

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	1.8-2.7 3.0-5.5			0.85V_{CC} 0.8V_{CC}			0.85V_{CC} 0.8V_{CC}		V
V_{IL}	LOW Level Input Voltage	1.8-2.7 3.0-5.5					0.15V_{CC} 0.2V_{CC}		0.15V_{CC} 0.2V_{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 1.6 2.1 2.7 4.0	1.65 1.8 2.3 3.0 4.5		1.55 1.6 2.1 2.7 4.0		
		1.65 2.3 3.0 3.0 4.5		I_{OH} = –2mA I_{OH} = –2mA I_{OH} = –4mA I_{OH} = –6mA I_{OH} = –8mA	1.26 1.9 2.4 2.3 3.8	1.52 2.19 2.82 2.73 4.24		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 0.01 0.01	0.2 0.2 0.2 0.3 0.5		0.2 0.2 0.2 0.3 0.5	
		1.65 2.3 3.0 3.0 4.5		I_{OL} = 2mA I_{OL} = 2mA I_{OL} = 4mA I_{OL} = 6mA I_{OL} = 8mA		0.10 0.12 0.19 0.29 0.29	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 to 5.5	V_{IN} = 5.5V, GND				±1		±10	µA
I_{CC}	Quiescent Supply Current	1.65-5.5	V_{IN} = 5.5V, GND				2.0		20	
I_{CCPEAK}	Peak Supply Current in Analog Operation	1.8 2.5 3.3 5.0	V_{OUT} = Open V_{IN} = Adjust for Peak I_{CC} Current			0.2 2 5 15				mA

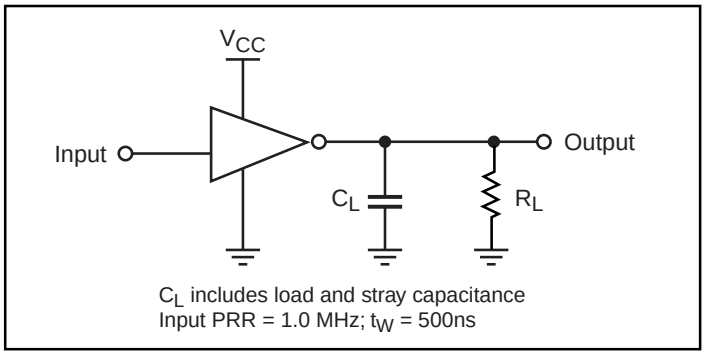
AC Electrical Characteristics

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	1.65 1.8 2.5 ±0.2 3.3 ±0.3 5.0 ±0.5	C_L = 15pF, R_L = 1MΩ	1.5 1.5 1.2 0.8 0.5	5.5 4.6 3.3 2.7 2.2	9.8 8.1 5.7 4.1 3.3	1.5 1.5 1.2 0.8 0.5	11.0 8.9 6.3 4.5 3.6	ns	1 3
t_{PLH}, t_{PHL}	Propagation Delay	3.3 ±0.3 5.0 ±0.5	C_L = 50pF, R_L = 500Ω	1.2 0.8	4.0 3.4	6.4 5.6	1.2 0.8	7.0 6.2		1 3
C_{IN}	Input Capacitance	0			3				pF	
C_{PD}	Power Dissipation Capacitance[3]	3.3 5.0			3.5 5.5					2

Notes:

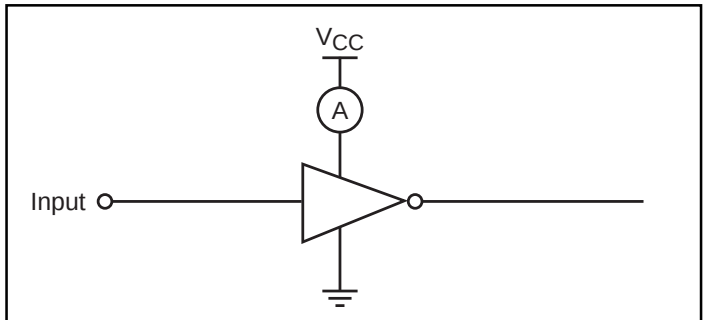
3. C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output loading and operating at 50% duty cycle (see Figure 2). C_{PD} is related to I_{CCD} dynamic operating current by the expression: $I_{CCD} = (C_{PD})(V_{CC})(f_{IN})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

AC Loading and Waveforms



C_L includes load and stray capacitance
Input PRR = 1.0 MHz; t_W = 500ns

Figure 1. AC Test Circuit



Application Note: When operating the PI74STX2G04's unbuffered output stage in its linear range, as in oscillator applications, carefully observe the device and package's maximum power rating. The design of the high drive's output stage will result in substantial simultaneous conduction currents when the stage is in the linear reqion.
See the I_{CCPEAK} specification on page 2.

Input = AC Waveform; t_r = t_f = 1.8ns;
PRR = Variable; Duty Cycle = 50%

Figure 2. I_{CCD} Test Circuit

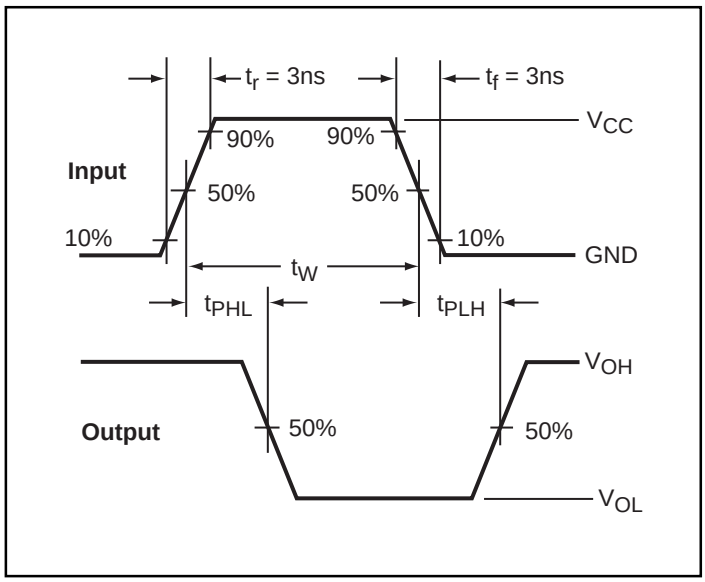
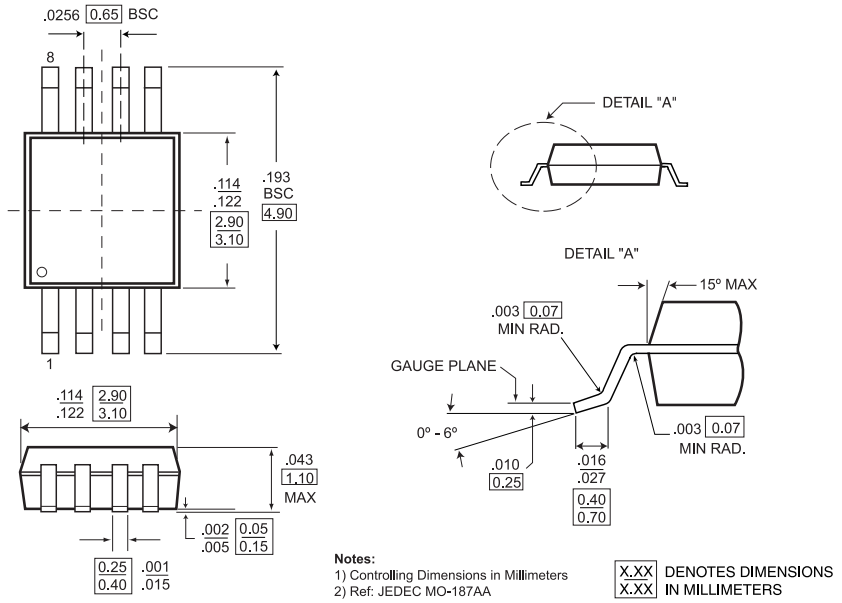
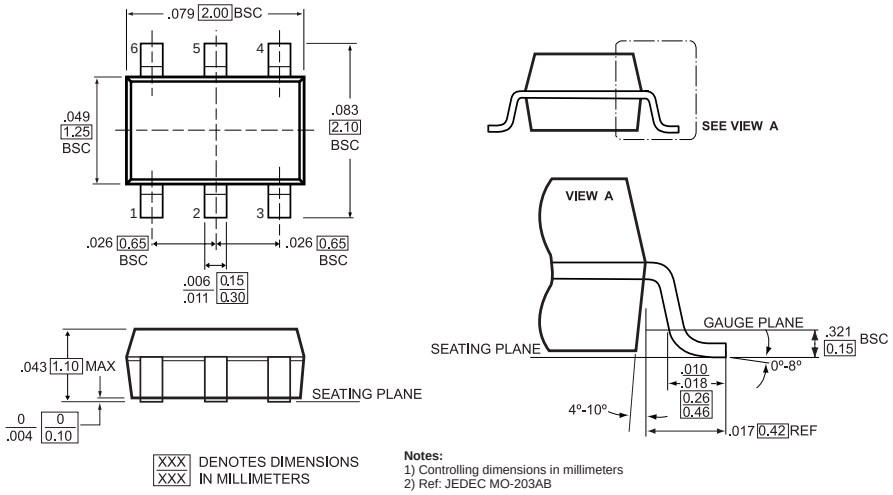


Figure 3. AC Waveforms

8-Pin MSOP (U) Package



6-Pin SC70 (C) Package



Ordering Information

Part	Pin-Package	Top Markting	Operating Range
PI74STX3GU04UX	8-Pin - MSOP	2MU04	–40°C to 85°C
PI74STX2GU04C6X	6-Pin - SC70	MU4	–40°C to 85°C