

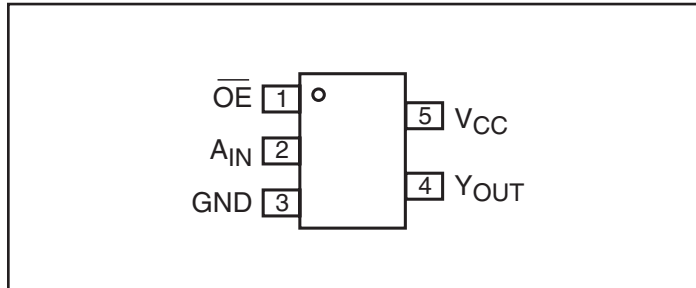
Features

- 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 $3\text{V } V_{CC}$
- Packaging (Pb-free & Green available):
 - 5-pin SOT23 (T)
 - 5-pin SC70 (C)

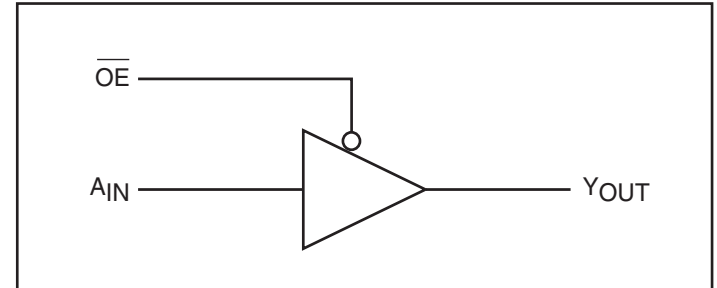
Description

The PI74ST1G125 is a buffer with 3-state output that operates over the 1.8V to $3.6\text{V } V_{CC}$ operating range.

Pin Configuration



Block Diagram



Pin Description

Pin Name	Description
A_{IN}	Input
$\overline{OE}$	Input
Y_{OUT}	Output

Function Table

Inputs		Outputs
$\overline{OE}$	A_{IN}	Y_{OUT}
L	L	L
L	H	H
H	X	X

Notes:

H = HIGH Logic Level
 L = LOW Logic Level
 X = Don't Care
 Z = HIGH Impedance State

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	

Notes:

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 (I _{OS})		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° C to +85°C		Units
					Min.	Typ.	Max.	Min.	Max	
V _{IH}	HIGH Level Input Voltage	1.8 2.3-3.6			0.75V _{CC} 0.70V _{CC}			0.75V _{CC} 0.70V _{CC}		V
V _{IL}	LOW Level Input Voltage	1.8 2.3-3.6					0.25V _{CC} 0.30V _{CC}		0.25V _{CC} 0.30V _{CC}	
V _{OH}	HIGH Level Output Voltage	1.8	V _{IN} = V _{IH}	I _{OH} = -100μA	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		
V _{OL}	LOW Level Out-put Voltage	3.0		I _{OH} = -16mA	2.4	2.71		2.4		
		3.0		I _{OH} = -24mA	2.3	2.55		2.3		
		1.8	V _{IN} = V _{IL}	I _{OL} = 100μA		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 _{OH} = 8mA		0.10	0.3		0.3			
3.0		I _{OH} = 16mA		0.18	0.4		0.4			
3.0		I _{OH} = 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	
I _{OZ}	3-State Output Leakage	1.8-3.6	V _{IN} = V _{IH} or V _{IL} V _O = V _{CC} or GND				±1		±10	

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	2.8 1.8 1.3	3.7 2.5 2.0	2.0 0.8 0.5	4.1 2.8 2.2	ns	1 3
t _{PLH} t _{PHL}	Propagation Delay	3.3±0.3	C _L = 50pF, R _L = 500Ω	1.5	2.6	3.4	1.5	3.7		1 3
t _{PZL} t _{PZH}	Output Enable Time	1.8 2.5±0.2 3.3±0.3	C _L = 50pF, R _D = 500Ω, R _U = 500Ω, S ₁ = GND for t _{PZH} S ₁ = V _{IN} for t _{PZL} V _{IN} = 2 x V _{CC}	2 1.5 1.5	5.8 4.1 3.1	7.5 5.4 4.1	2 1.5 1.5	8.3 5.9 4.5		1 3
t _{PLZ} t _{PHZ}	Output Disable Time	1.8 2.5±0.2 3.3±0.3	C _L = 50pF, R _D = 500Ω, R _U = 500Ω, S ₁ = GND for t _{PHZ} S ₁ = V _{IN} for t _{PLZ} V _{IN} = 2 x V _{CC}	2 1.5 1.5	4.9 3.6 2.8	5.9 4.8 3.4	2 1.5 1.0	6.5 5.3 3.7		1 3
C _{IN}	Input Capacitance	V _{IN} = 0			4				pF	
C _{OUT}	Output Capacitance	V _{IN} = 0			8					
C _{PD} ⁽¹⁾	Power Dissipation Capacitance	3.3			17					2

Notes:

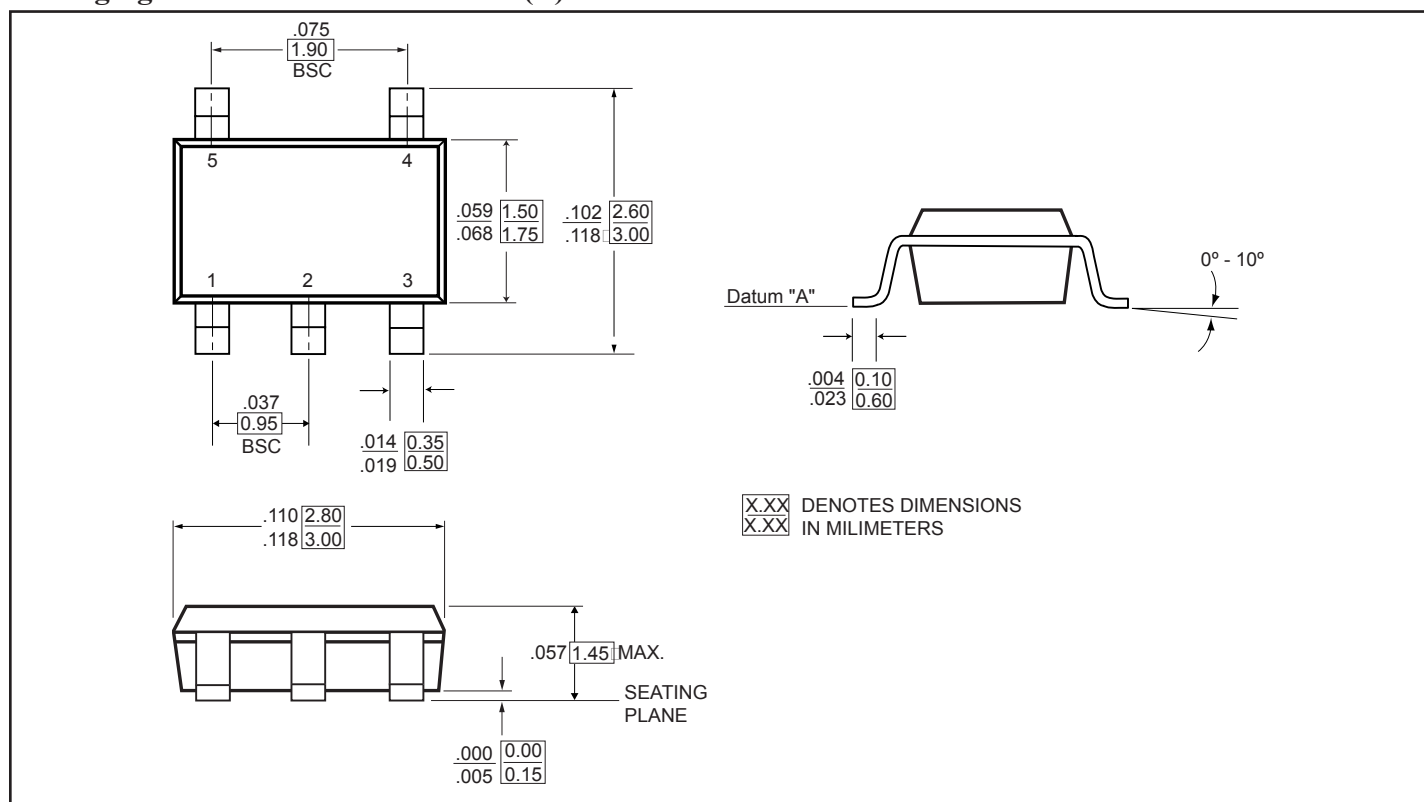
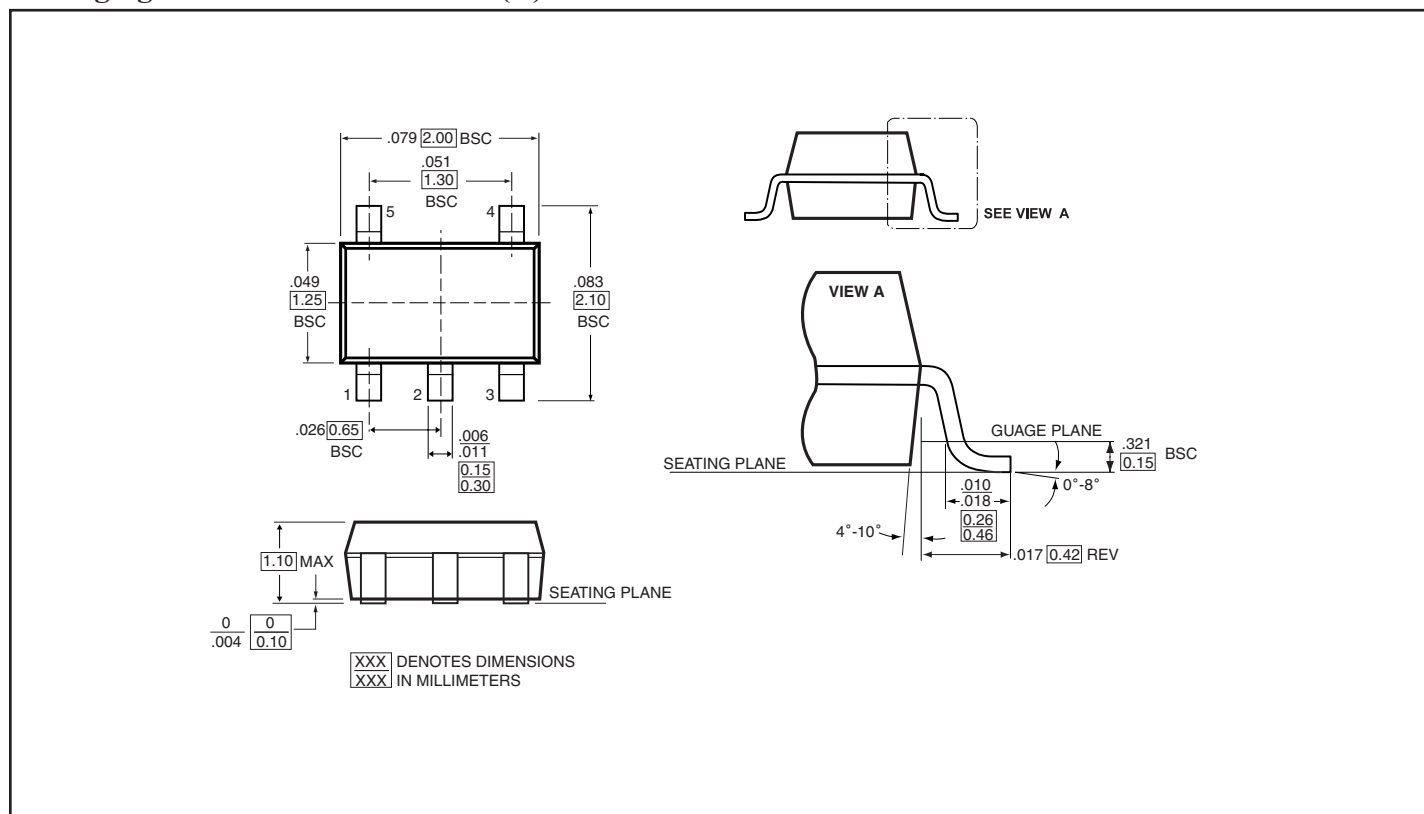
- C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output loading and operating at 50% duty cycle (see Figure 2). C_{PD} is related to I_{CCD} dynamic operating current by the expression:

$$I_{CCD} = (C_{PD})(V_{CC})(f_{IN}) + (I_{CC} \text{ static}).$$

C_L includes load and stray capacitance
 Input PRR = 1.0 MHz; $t_W = 500\text{ns}$

The figure displays two timing diagrams for a 74VHC04 inverter. The top diagram shows a standard CMOS inverter configuration. The input signal is a square wave with a rise time $t_r = 3\text{ns}$ and a pulse width t_w . The output signal is a square wave with a propagation delay t_{PLH} and t_{PHL} , and a rise time $t_r = 3\text{ns}$. The output voltage levels are V_{OH} and V_{OL} . The bottom diagram shows the same inverter with a tri-state output. The input signal is an active-low OE input with a rise time $t_r = 3\text{ns}$. The output signal has a propagation delay t_{PZL} and t_{PHZ} , and a rise time $t_r = 3\text{ns}$. The output voltage levels are V_{OH} , V_{OL} , and V_{TRI} .

PS8521H 06/07/06

Packaging Mechanical: 5-Pin SOT23 (T)

Packaging Mechanical: 5-Pin SC70 (C)


Ordering Information

Ordering Code	Packaging Code	Package Type	Package Top Marking
PI74ST1G125TX	T	5-pin SOT23	AA
PI74ST1G125TEX	T	5-pin SOT23, Pb-free & Green	$\overline{AA}$
PI74ST1G125CX	C	5-pin SC70	AA
PI74ST1G125CEX	C	5-pin SC70, Pb-free & Green	$\overline{AA}$

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- X suffix = Tape/Reel