

SOTiny™ Gate ST Buffer with 3-State Output

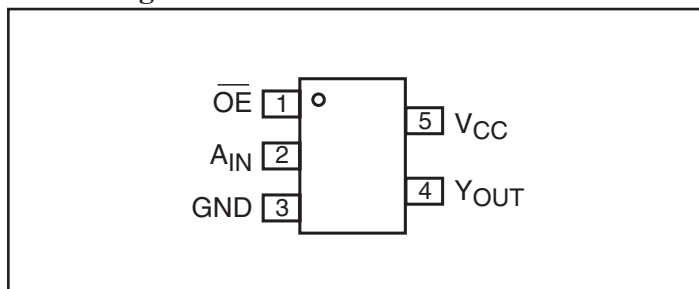
Features

- 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)

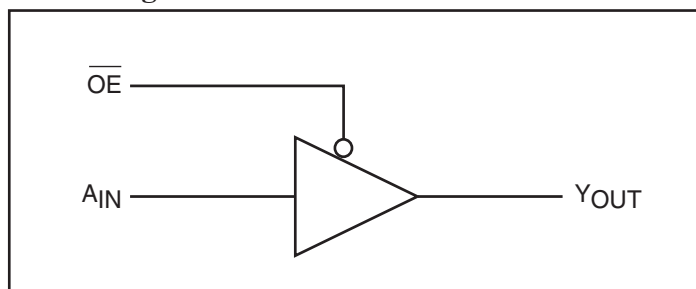
Description

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	V _{IN} = V _{IL}	I _{OL} = 100μA							
		3.0			I _{OH} = -16mA	2.4	2.71		2.4		
		3.0			I _{OH} = -24mA	2.3	2.55		2.3		
		1.8				0.01	0.1		0.1		
		2.3				0.01	0.1		0.1		
		3.0				0.00	0.1		0.1		
I _{IN}	Input Leakage Current	0-3.6	V _{IN} = 5.5V, GND		-1		1	-1	1	μA	
		0.0	V _{IN} or V _{OUT} = 5.5V		-1		1	-1	1		
		1.8-3.6	V _{IN} = 5.5V, GND				2.0		20		
		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:

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

AC Loading and Waveforms

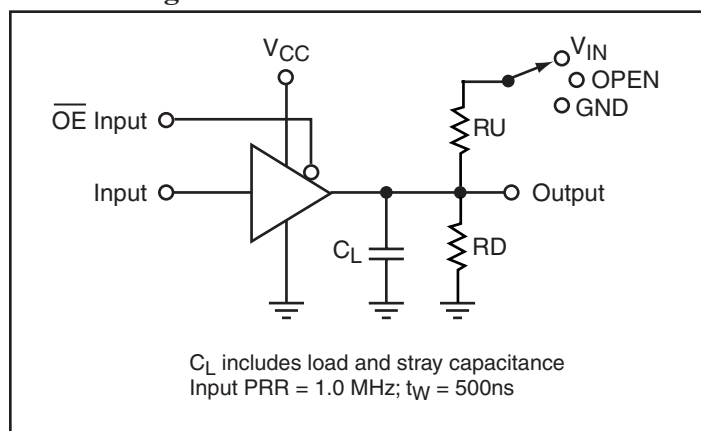


Figure 1. AC Test Circuit

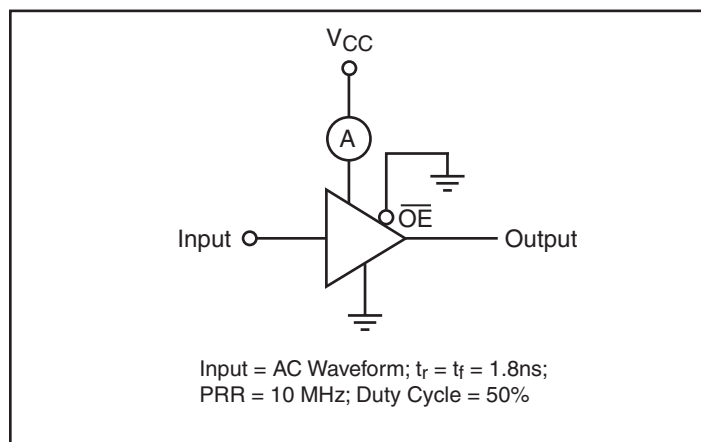


Figure 2. ICCD Test Circuit

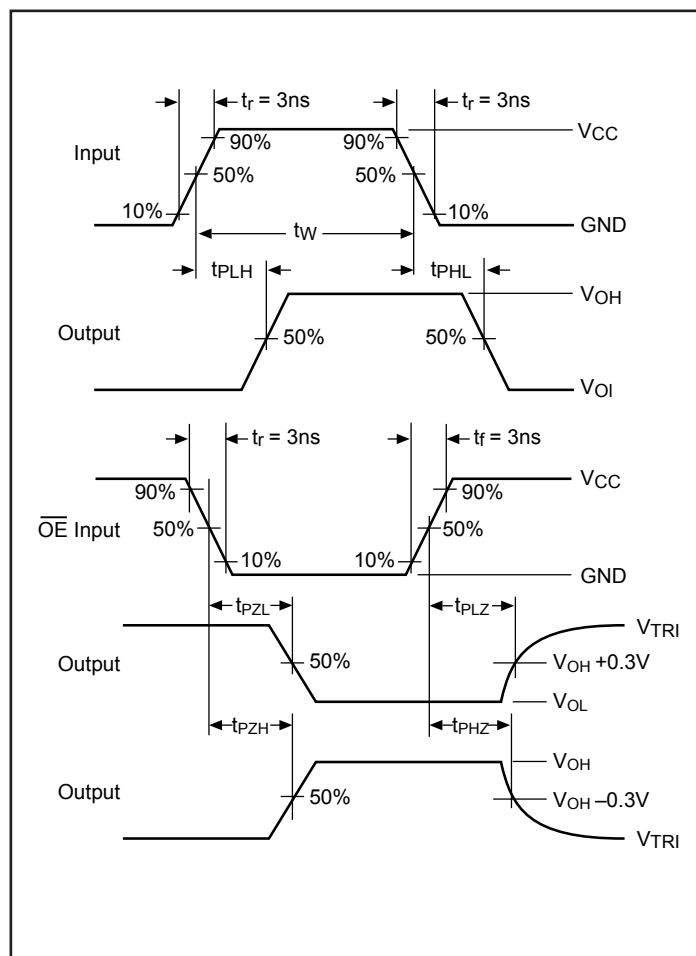


Figure 3. AC Waveforms

Technical drawing of a rectangular component with mounting tabs. The top view shows a central rectangle with four mounting tabs (1, 2, 3, 4) and two additional tabs (5, 6) on the left and right sides. Dimensions are provided in millimeters (X.XX) and inches (X.XX). The bottom view shows the component's profile with a seating plane and a maximum height of 1.45 mm (0.057 inches). A cross-sectional view on the right shows the component's profile with a 0° to 10° angle and a datum "A" reference.

Top View Dimensions:

- Overall Width: 1.90 (0.075)
- Overall Height: 3.00 (0.102)
- Tab 1 Width: 0.95 (0.037)
- Tab 2 Width: 0.35 (0.014)
- Tab 3 Width: 0.50 (0.019)
- Tab 4 Width: 0.60 (0.023)
- Tab 5 Width: 0.10 (0.004)
- Tab 6 Width: 0.10 (0.004)
- Tab 1 Position: 0.95 (0.037) BSC
- Tab 2 Position: 0.35 (0.014)
- Tab 3 Position: 0.50 (0.019)
- Tab 4 Position: 0.60 (0.023)
- Tab 5 Position: 0.10 (0.004)
- Tab 6 Position: 0.10 (0.004)

Bottom View Dimensions:

- Overall Width: 3.00 (0.118)
- Overall Height: 1.45 (0.057) MAX.
- Seating Plane: 0.00 (0.000)
- Seating Plane Tolerance: 0.15 (0.005)

Cross-sectional View Dimensions:

- Angle: 0° - 10°
- Datum "A": 0.10 (0.004)
- Seating Plane: 0.60 (0.023)

Legend:

- X.XX DENOTES DIMENSIONS IN MILLIMETERS

Technical drawing of a mechanical part showing top, side, and cross-sectional views with dimensions in inches and millimeters.

Top View:

- Overall width: $.079 \left[\begin{smallmatrix} 2.00 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance between mounting holes 1 and 2: $.026 \left[\begin{smallmatrix} 0.65 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance between mounting holes 2 and 3: $.006 \left[\begin{smallmatrix} .011 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance between mounting holes 3 and 4: $.051 \left[\begin{smallmatrix} 1.30 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance between mounting holes 4 and 5: $.079 \left[\begin{smallmatrix} 2.00 \\ \text{BSC} \end{smallmatrix} \right]$
- Overall height: $.083 \left[\begin{smallmatrix} 2.10 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance from top edge to mounting holes 1, 2, 3: $.049 \left[\begin{smallmatrix} 1.25 \\ \text{BSC} \end{smallmatrix} \right]$

Side View:

- Overall height: 1.10 MAX
- Distance from bottom edge to mounting holes 1, 2, 3: $0 \left[\begin{smallmatrix} 0 \\ 0.10 \end{smallmatrix} \right]$
- Seating Plane

Cross-sectional View (View A):

- Seating Plane
- Guage Plane
- Distance from Seating Plane to Guage Plane: $.017 \left[\begin{smallmatrix} 0.42 \\ \text{REV} \end{smallmatrix} \right]$
- Distance from Guage Plane to top edge: $.321 \left[\begin{smallmatrix} 0.15 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance from Seating Plane to top edge: $.010 \left[\begin{smallmatrix} .018 \\ \text{BSC} \end{smallmatrix} \right]$
- Distance from Seating Plane to bottom edge: $.026 \left[\begin{smallmatrix} 0.46 \\ \text{BSC} \end{smallmatrix} \right]$
- Angle: $0^\circ - 8^\circ$
- Angle: $4^\circ - 10^\circ$

Legend:

- XXX DENOTES DIMENSIONS
- XXX IN MILLIMETERS

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	AA
PI74ST1G125CX	C	5-pin SC70	AA
PI74ST1G125CEX	C	5-pin SC70, Pb-free & Green	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