

# EVVOSEMI<sup>®</sup>

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LDO



Diode



Sensor



DC-DC

## Product Specification

▶ Domestic	Part Number	SN74AHCT1G125
▶ Overseas	Part Number	SN74AHCT1G125
▶ Equivalent	Part Number	SN74AHCT1G125

EV is the abbreviation of name EVVO

## Single Bus Buffer Gate with 3-state Output

### General Description

The SN74AHCT1G125 device is a single bus buffer gate/line driver with 3-state output. The output is disabled when the output-enable ( $\overline{OE}$ ) input is high. When  $\overline{OE}$  is low, data is passed from the A input to the Y output.

### Features

- Operating Range of 4.5 V to 5.5 V
- Max tpd of 10 ns at 5 V
- Low Power Consumption, 10  $\mu$ A Max ICC
- $\pm 8$ mA Output Drive at 5 V
- Inputs are TTL-Voltage Compatible
- Packages are SC70-5, SOT23-5 or small DFN6
- MSL3(SC70-5, SOT23-5, DFN6(1\*1.5))

### Pin Configuration

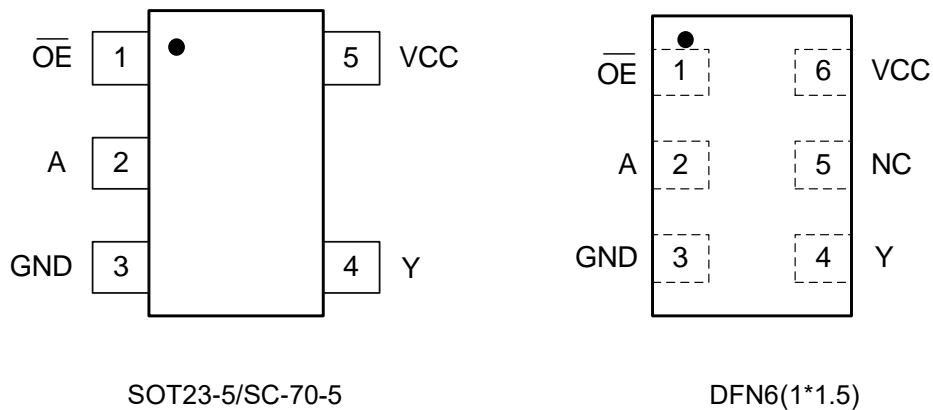


Figure1. Top View

## Single Bus Buffer Gate with 3-state Output

### Pin Function

#### SC70-5/ SOT23-5

Pin No.	Pin Name	Function
1	$\overline{OE}$	Enable input
2	A	Input
3	GND	Ground
4	Y	Output
5	VCC	Supply Voltage

#### DFN6

Pin No.	Pin Name	Function
1	$\overline{OE}$	Enable input
2	A	Input
3	GND	Ground
4	Y	Output
5	NC	No connect
6	VCC	Supply Voltage

### Block Diagram

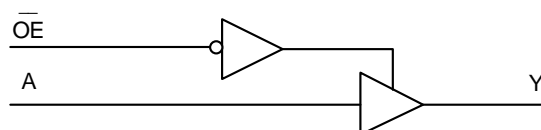


Figure2. Logic Symbol

### Functional Description

#### Function Table

Input		Output
$\overline{OE}$	A	Y
L	L	L
L	H	H
H	X	Z

## Single Bus Buffer Gate with 3-state Output

## Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V <sub>CC</sub>	Supply Voltage Range		-0.5 to 7.0	V
V <sub>I</sub>	Input Voltage Range <sup>(1)</sup>		-0.5 ≤ V <sub>I</sub> ≤ +7.0	V
V <sub>O</sub>	Output Voltage Range <sup>(1)</sup>		-0.5 to V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input Clamp Current	V <sub>I</sub> < 0	-20	mA
I <sub>OK</sub>	Output Clamp Current	V <sub>O</sub> < GND, V <sub>O</sub> > V <sub>CC</sub>	±20	mA
I <sub>O</sub>	Continuous Output Current V <sub>O</sub> = 0 to V <sub>CC</sub>		±25	mA
	Continuous channel current through V <sub>CC</sub> or GND		±50	mA
T <sub>STG</sub>	Storage Temperature Range		-65 to 150	°C
T <sub>J</sub>	Junction Temperature Under Bias		150	°C
V <sub>ESD</sub>	ESD Classification	Human Body Model <sup>(2)</sup>	±4000	V
		Charged Device Model <sup>(3)</sup>	±1000	
I <sub>LU</sub>	Max Latch up Current Above V <sub>CC</sub> and GND at 125°C <sup>(4)</sup>		±100	mA

## Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
R <sub>θJA</sub>	SC70-5	Thermal Characteristics, Thermal Resistance, Junction-to-Air	300	°C/W
	SOT23-5		250	
	DFN6(1.0×1.5)		440	
P <sub>D</sub>	SC70-5	Power Dissipation in Still Air at 85°C	215	mW
	SOT23-5		260	
	DFN6(1.0×1.5)		150	

## Single Bus Buffer Gate with 3-state Output

### Recommended Operating Conditions

Over operating free-air temperature range (unless otherwise noted)<sup>(5)</sup>

Symbol	Parameter	Min	Max	Unit
V <sub>CC</sub>	Supply Voltage	4.5	5.5	V
V <sub>IH</sub>	High-level Input Voltage	2		V
V <sub>IL</sub>	Low-level Input Voltage		0.8	V
V <sub>I</sub>	Input Voltage	0	5.5	V
V <sub>O</sub>	Output Voltage	0	V <sub>CC</sub>	V
I <sub>OH</sub>	High-level Output Current		-8	mA
I <sub>OL</sub>	Low-level Output Current		8	mA
Δt/Δv	Input Transition Rise or Fall Rate		20	ns/V
T <sub>A</sub>	Operating Free-air Temperature	-40	125	°C

**Note5:** All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation.

### Electrical Characteristics

Over recommended operating free-air temperature range (unless otherwise noted)

Symbol	Parameter	Condition	V <sub>CC</sub>	T <sub>A</sub> = 25 °C			-40°C to 85°C		-40°C to 125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V <sub>OH</sub>	High-Level Output Voltage	I <sub>OH</sub> = -50μA	4.5 V	4.4	4.5		4.4		4.4		V
		I <sub>OH</sub> = -8mA		3.94			3.8		3.8		
V <sub>OL</sub>	Low-Level Output Voltage	I <sub>OH</sub> = 50μA	4.5 V			0.1		0.1		0.1	V
		I <sub>OL</sub> = 8mA				0.36		0.44		0.44	
I <sub>I</sub>	Input Leakage Current	V <sub>I</sub> = 5.5 V or GND	0V to 5.5V			±0.1		±1		±1	μA
I <sub>oz</sub>	OFF-state Output Current	V <sub>O</sub> = V <sub>CC</sub> or GND	5.5 V			±0.25		±2.5		±2.5	μA
I <sub>CC</sub>	Quiescent Supply Current	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V			1		10		10	μA
ΔI <sub>CC</sub> <sup>(6)</sup>	Additional Supply Current	One input at 3.4 V, Other input at V <sub>CC</sub> or GND	5.5 V			1.35		1.5		1.5	mA
C <sub>I</sub>	Input Capacitance	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V		3	10		10		10	pF
C <sub>O</sub>	Output Capacitance	V <sub>O</sub> = V <sub>CC</sub> or GND	5 V		8						pF

**Note6:** This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0 V or V<sub>CC</sub>.

## Single Bus Buffer Gate with 3-state Output

### Switching Characteristics

Over recommended operating free-air temperature range,  $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$  (unless otherwise noted)

	Parameter	Condition	$T_A = 25\text{ }^\circ\text{C}$			$-40\text{ }^\circ\text{C to } 85\text{ }^\circ\text{C}$		$-40\text{ }^\circ\text{C to } 125\text{ }^\circ\text{C}$		Unit
			Min	Typ	Max	Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay	$C_L = 15\text{ pF}$		3.8	5.7	1	10	1	11	ns
$t_{PHL}$		$C_L = 50\text{ pF}$		5.3	8.0	1	11	1	12	
$t_{PZL}$ , $t_{PZH}$	Output Enable Time	$C_L = 15\text{ pF}$		3.6	5.5	1	9	1	10	ns
		$C_L = 50\text{ pF}$		4.3	7.5	1	10	1	11	
$t_{PLZ}$ , $t_{PHZ}$	Output Disable Time	$C_L = 15\text{ pF}$		7.1	12	1	15	1	17	ns
		$C_L = 50\text{ pF}$		8.5	13	1	16	1	18	

### Operating Characteristics

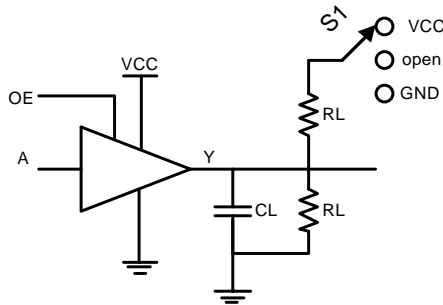
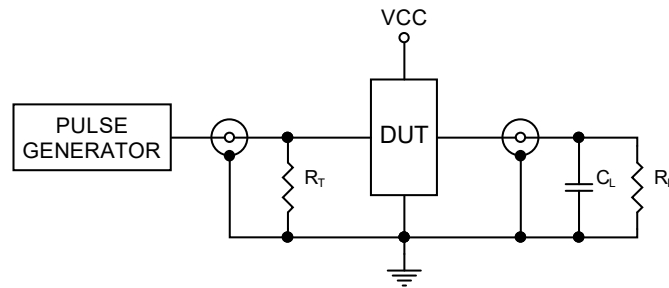
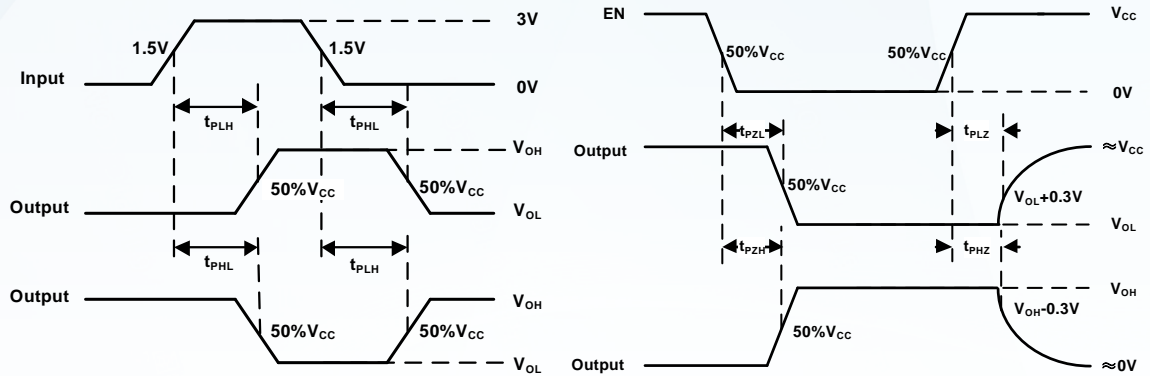
$V_{CC} = 5\text{ V}$ ,  $T_A = 25\text{ }^\circ\text{C}$

Symbol	Parameter	Condition	Typ	Unit
$C_{PD}$	Power Dissipation Capacitance	No load, $f = 1\text{ MHz}$	10	pF

**Note7:**  $C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation:  $I_{CC(OPR)} = C_{PD} \times V_{CC} \times f_{in} + I_{CC} \times C_{PD}$  is used to determine the no-load dynamic power consumption;  $P_D = C_{PD} \times V_{CC}^2 \times f_{in} + I_{CC} \times V_{CC} \times Fig.$

Single Bus Buffer Gate with 3-state Output

Parameter Measurement Information



Test	Switch
tPD	Open
tPZL tPLZ	VCC
tPZH tPHZ	GND

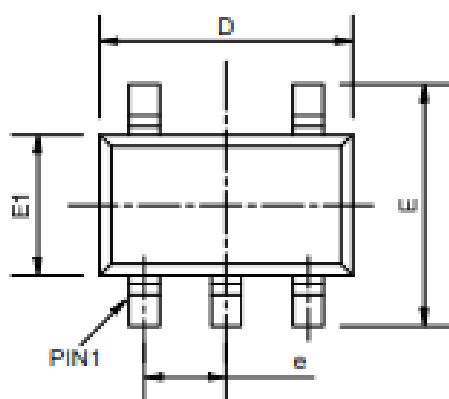
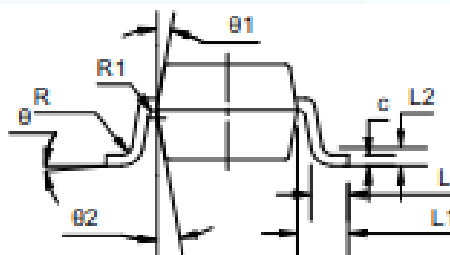
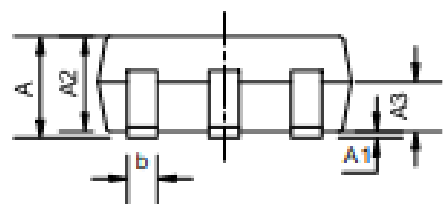
CL includes probe and jig capacitance

All input pulses are supplied by generators having the following characteristics: PRR ≤ 1MHz, ZO=50Ω, tr ≤ 3ns, tf ≤ 3ns.

The outputs are measured one at a time with one input transition per measurement.

All parameters and waveforms are not applicable to all devices.

Figure3. Load Circuit and Voltage Waveforms

**Single Bus Buffer Gate with 3-state Output**
**Package Dimension**
**SC70-5**

**COMMON DIMENSIONS**

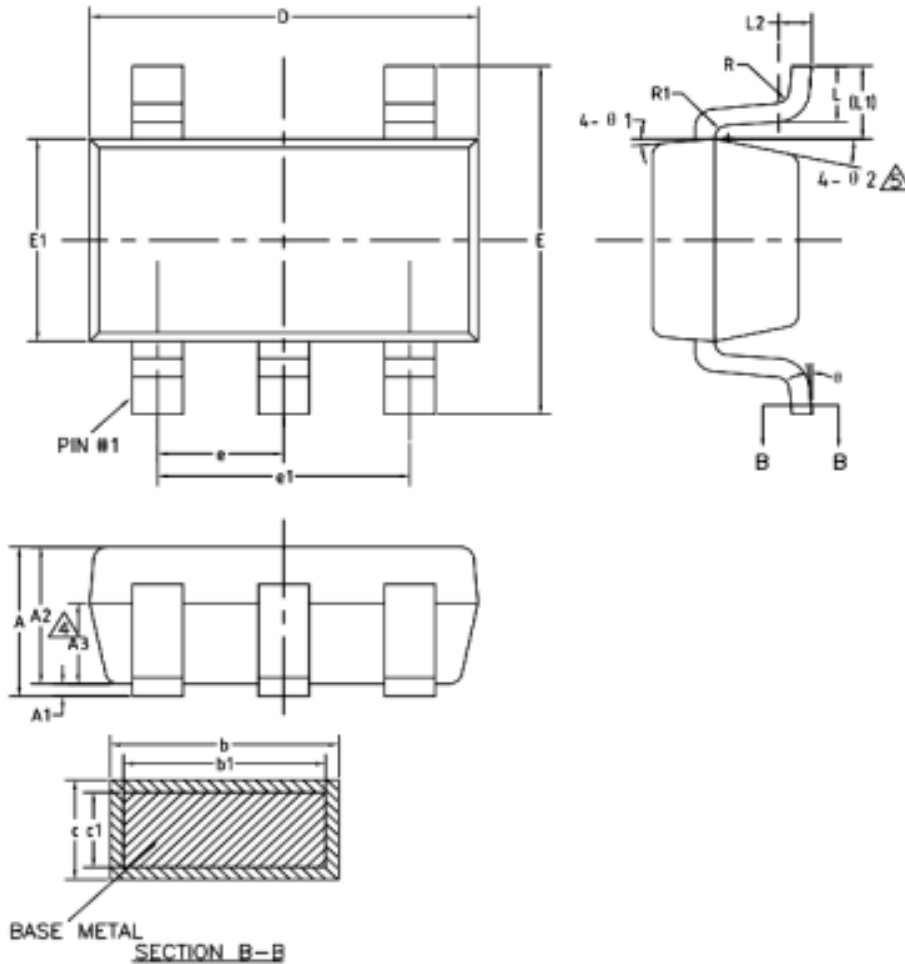
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.85	--	1.05
A1	0	--	0.10
A2	0.80	0.90	1.00
A3	0.47	0.52	0.57
b	0.23	--	0.33
c	0.12	--	0.18
D	2.02	2.07	2.12
E	2.20	2.30	2.40
E1	1.25	1.30	1.35
e	0.60	0.65	0.70
L	0.28	0.33	0.38
L1	0.50REF		
L2	0.15BSC		
R	0.10	--	--
R1	0.10	--	0.25
θ	0°	--	8°
θ1	6°	9°	12°
θ2	6°	9°	12°



Single Bus Buffer Gate with 3-state Output

SOT23-5

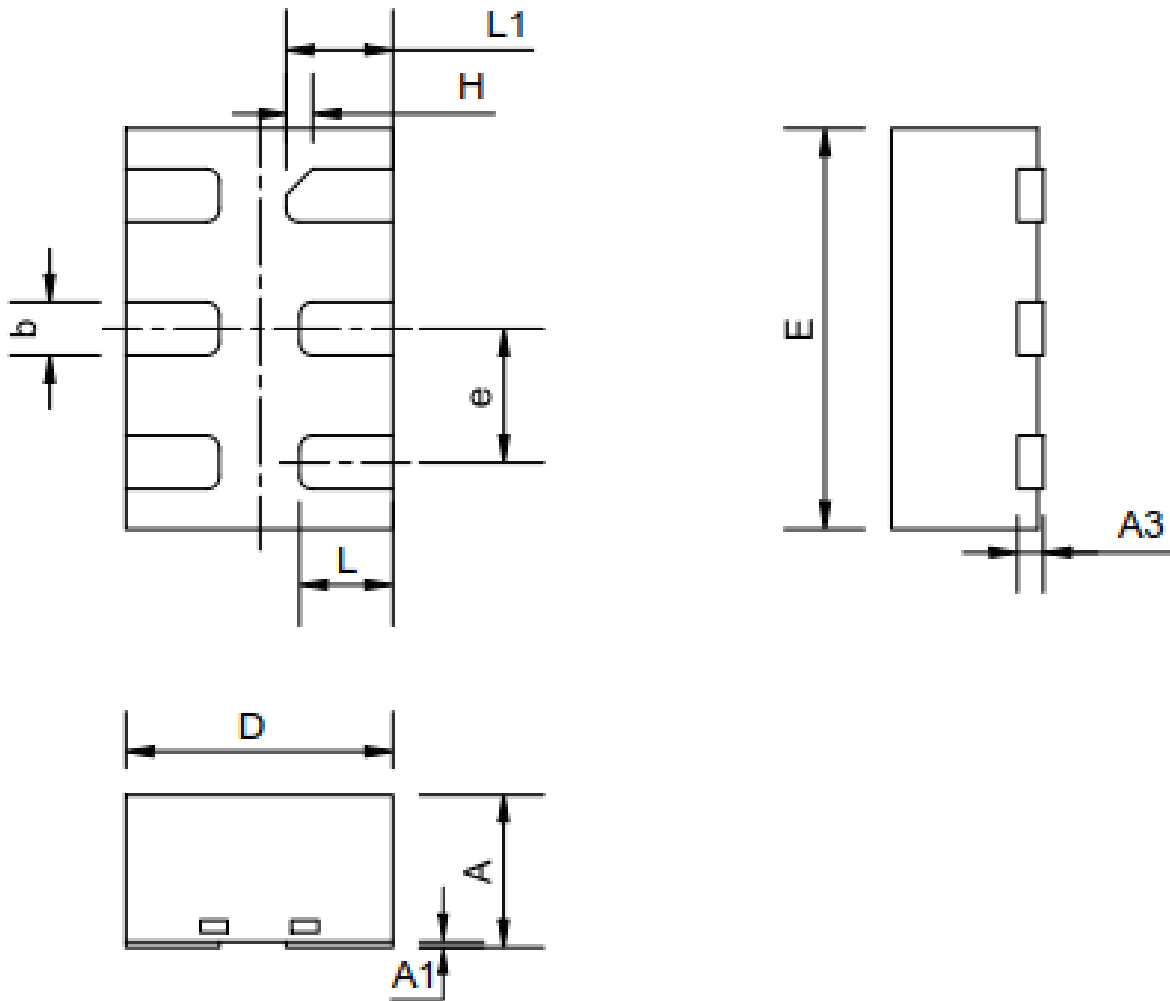


COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	—	—	1.25
A1	0	—	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	—	0.50
b1	0.36	0.38	0.45
c	0.14	—	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	—	—
R1	0.10	—	0.25
θ	0°	—	8°
θ1	3°	5°	7°
θ2	6°	—	14°

Single Bus Buffer Gate with 3-state Output

DFN6(1.0x1.5)



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.50	--	0.60
A1	0	0.02	0.05
A3	0.10REF		
b	0.15	0.20	0.25
D	0.90	1.00	1.10
E	1.40	1.50	1.60
e	0.40	0.50	0.60
H	0.10REF		
L	0.30	0.35	0.40
L1	0.35	0.40	0.45

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