

PRODUCT SPECIFICATION

C u s t o m e r : _____

Product Name : Buffer Gate

Part Number : SN74LVC1G125

I s s u e D a t e : _____

Prepared	Checked	Customer Check
ChenTT	Zelig	

SN74LVC1G125: Single Bus Buffer Gate With 3-State Output

DESCRIPTIONS

The single buffer is designed for 1.65V to 5.5V V_{CC} operation. The SN74LVC1G125 device is single line driver with 3-state output. The output is disabled when the output-enable ($\overline{OE}$) input is high.

This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

To ensure the high-impedance state during power up or power down, $\overline{OE}$ should be tied to V_{CC} through a pullup resistor, the minimum value of the resistor is determined by the current-sinking capability of the driver.

The SN74LVC1G125 is available in Green SOT23-5 and SC70-5 packages. It operates over an ambient temperature range of -40°C to 125°C.

FEATURES

- **Operating Voltage Range: 1.65V to 5.5V**
- **Low Power Consumption: 0.1µA (TYP)**
- **Operating Temperature Range: -40°C to 125°C**
- **Inputs Accept Voltage to 5.5V**
- **±24mA Output Drive at $V_{CC}=3.0V$**
- **Latch-up Performance Exceeds 100mA**
- **Micro SIZE PACKAGES: SOT23-5, SC70-5**

APPLICATIONS

- **AV Receiver**
- **Cable Modem Termination Systems**
- **Digital Picture Frame (DPF)**
- **High-Speed Data Acquisition and Generation**
- **Motor Controls: High-Voltage**
- **Personal Navigation Device (GPS)**
- **Portable Media Player**
- **Video Communication Systems**

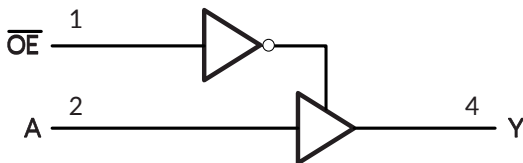
PACKAGE/ORDERING INFORMATION ⁽¹⁾

PRODUCT	ORDERING NUMBER	TEMPERATURE RANGE	PACKAGE LEAD	PACKAGE MARKING ⁽²⁾	MSL ⁽³⁾	PACKAGE OPTION
SN74LVC1G125	SN74LVC1G125DCKR	-40°C ~+125°C	SC70-5 ⁽⁴⁾	CM5	MSL3	Tape and Reel,3000
	SN74LVC1G125DBVR	-40°C ~+125°C	SOT23-5	C255	MSL3	Tape and Reel,3000

NOTE:

- (1) This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document.
- (2) There may be additional marking, which relates to the lot trace code information (data code and vendor code), the logo or the environmental category on the device.
- (3) MSL, The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications.
- (4) Equivalent to SOT353.

SIMPLIFIED SCHEMATIC



FUNCTION TABLE

INPUTS		OUTPUT
$\overline{OE}$	A	Y
L	H	H
L	L	L
H	X	Z

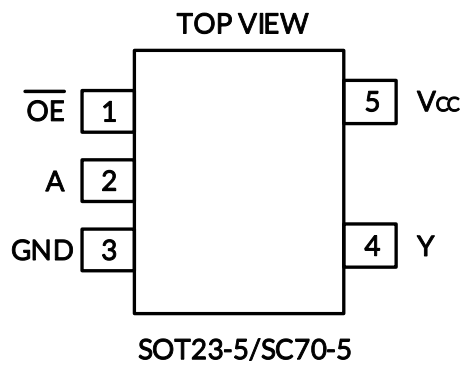
H=HIGH Logic Level

L =LOW Logic Level

X=Don't Care

Z=High-impedance OFF-state

PIN CONFIGURATION AND FUNCTIONS (TOP VIEW)



PIN	NAME	I/O	FUNCTION
1	$\overline{OE}$	I	$\overline{OE}$ Enable/Input
2	A	I	A Input
3	GND	-	Ground Pin
4	Y	O	Y Output
5	V _{CC}	-	Power Pin

REVISION HISTORY

Note: Page numbers for previous revisions may differ from page numbers in the current version.

VERSION	Change Date	Change Item
Rev A.1	2026/01/08	Initial version completed

Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾⁽²⁾

		MIN	MAX	UNIT
V _{CC}	Supply voltage range	-0.5	6.5	V
V _I	Input voltage range ⁽²⁾	-0.5	6.5	V
V _O	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾	-0.5	6.5	V
V _O	Voltage range applied to any output in the high or low state ⁽²⁾⁽³⁾	-0.5	V _{CC} +0.5	V
I _{IK}	Input clamp current	V _I <0		-50 mA
I _{OK}	Output clamp current	V _O <0		-50 mA
I _O	Continuous output current			±50 mA
Continuous current through V _{CC} or GND				±100 mA

Package Thermal Impedance

	PARAMETER	MIN	MAX	UNIT
θ _{JA}	Package thermal impedance ⁽⁴⁾	SOT23-5	230	°C/W
		SC70-5	380	

Temperature

	PARAMETER	MIN	MAX	UNIT
Temperature	Junction temperature, T _J ⁽⁵⁾	-65	150	°C
	Storage temperature, T _{stg}	-65	150	

ESD Ratings

The following ESD information is provided for handling of ESD-sensitive devices in an ESD protected area only.

	VALUE	UNIT	 ESD SENSITIVITY CAUTION ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.
Human-Body Model (HBM)	±4000	V	
Charged-Device Model (CDM)	±1000		
Machine Model (MM)	±200		

NOTE:

- (1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of V_{CC} is provided in the Recommended Operating Conditions table.
- (4) The package thermal impedance is calculated in accordance with JEDEC-51.
- (5) The maximum power dissipation is a function of T_{J(MAX)}, R_{θJA}, and T_A. The maximum allowable power dissipation at any ambient temperature is P_D = (T_{J(MAX)} - T_A) / R_{θJA}. All numbers apply for packages soldered directly onto a PCB.

ELECTRICAL CHARACTERISTICS

over recommended operating free-air temperature range (TYP values are at $T_A = +25^\circ\text{C}$, unless otherwise noted.) ⁽¹⁾

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Supply voltage	V_{CC}	Operating	1.65	5.5	V
		Data retention only	1.5	5.5	
High-level input voltage	V_{IH}	$V_{CC}=1.65\text{V to }1.95\text{V}$	$0.65 \times V_{CC}$		V
		$V_{CC}=2.3\text{V to }2.7\text{V}$	1.7		
		$V_{CC}=3\text{V to }3.6\text{V}$	2.2		
		$V_{CC}=4.5\text{V to }5.5\text{V}$	$0.7 \times V_{CC}$		
Low-level input voltage	V_{IL}	$V_{CC}=1.65\text{V to }1.95\text{V}$		$0.3 \times V_{CC}$	V
		$V_{CC}=2.3\text{V to }2.7\text{V}$		0.7	
		$V_{CC}=3\text{V to }3.6\text{V}$		0.8	
		$V_{CC}=4.5\text{V to }5.5\text{V}$		$0.3 \times V_{CC}$	
Input voltage	V_I		0	5.5	V
Output voltage	V_O		0	V_{CC}	V
Input transition rise or fall	t_r, t_f	$V_{CC}=1.8\text{V} \pm 0.15\text{V}, 2.5\text{V} \pm 0.2\text{V}$		20	ns/V
		$V_{CC}=3.3\text{V} \pm 0.3\text{V}$		10	
		$V_{CC}=5\text{V} \pm 0.5\text{V}$		5	
Operating temperature	T_A		-40	+125	$^\circ\text{C}$

Electrical Characteristics

PARAMETER		TEST CONDITIONS	V _{CC}	TEMP	MIN	TYP	MAX	UNIT
V _{OH}		I _{OH} = -100μA	1.65V to 5.5V		V _{CC} -0.1			V
		I _{OH} = -4mA	1.65V		1.2			
		I _{OH} = -8mA	2.3V	Full	1.9			
		I _{OH} = -16mA	3V		2.4			
		I _{OH} = -24mA			2.3			
		I _{OH} = -32mA	4.5V		3.8			
V _{OL}		I _{OL} = 100μA	1.65V to 5.5V				0.1	V
		I _{OL} = 4mA	1.65V				0.45	
		I _{OL} = 8mA	2.3V	Full			0.3	
		I _{OL} = 16mA	3V				0.4	
		I _{OL} = 24mA					0.55	
		I _{OL} = 32mA	4.5V				0.55	
I _I	A or $\overline{OE}$ inputs	V _I =5.5V or GND	0V to 5.5V	+25°C Full		±0.1	±5	μA
	I _{off}	V _I or V _O =5.5V	0V	+25°C Full		±0.1	±10	μA
	I _{OZ}	V _O =0V to 5.5V	3.6V	Full			10	μA
	I _{CC}	V _I =5.5V or GND, I _O =0	1.65V to 5.5V	+25°C Full		0.1	10	μA
	ΔI _{CC}	One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND	3V to 5.5V	Full			500	μA

Switching Characteristics, $C_L=30\text{pF}$ or 50pF

$T_A=25^\circ\text{C}$

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC}=1.8\text{V}$ $\pm 0.15\text{V}$ TYP	$V_{CC}=2.5\text{V}$ $\pm 0.2\text{V}$ TYP	$V_{CC}=3.3\text{V}$ $\pm 0.3\text{V}$ TYP	$V_{CC}=5\text{V}$ $\pm 0.5\text{V}$ TYP	UNIT
t_{pd}	A	Y	12	7	6	4.3	ns
t_{en}	$\overline{OE}$	Y	14.9	7.8	6.5	4.8	ns
t_{dis}	$\overline{OE}$	Y	11.4	7.4	5.7	5	ns

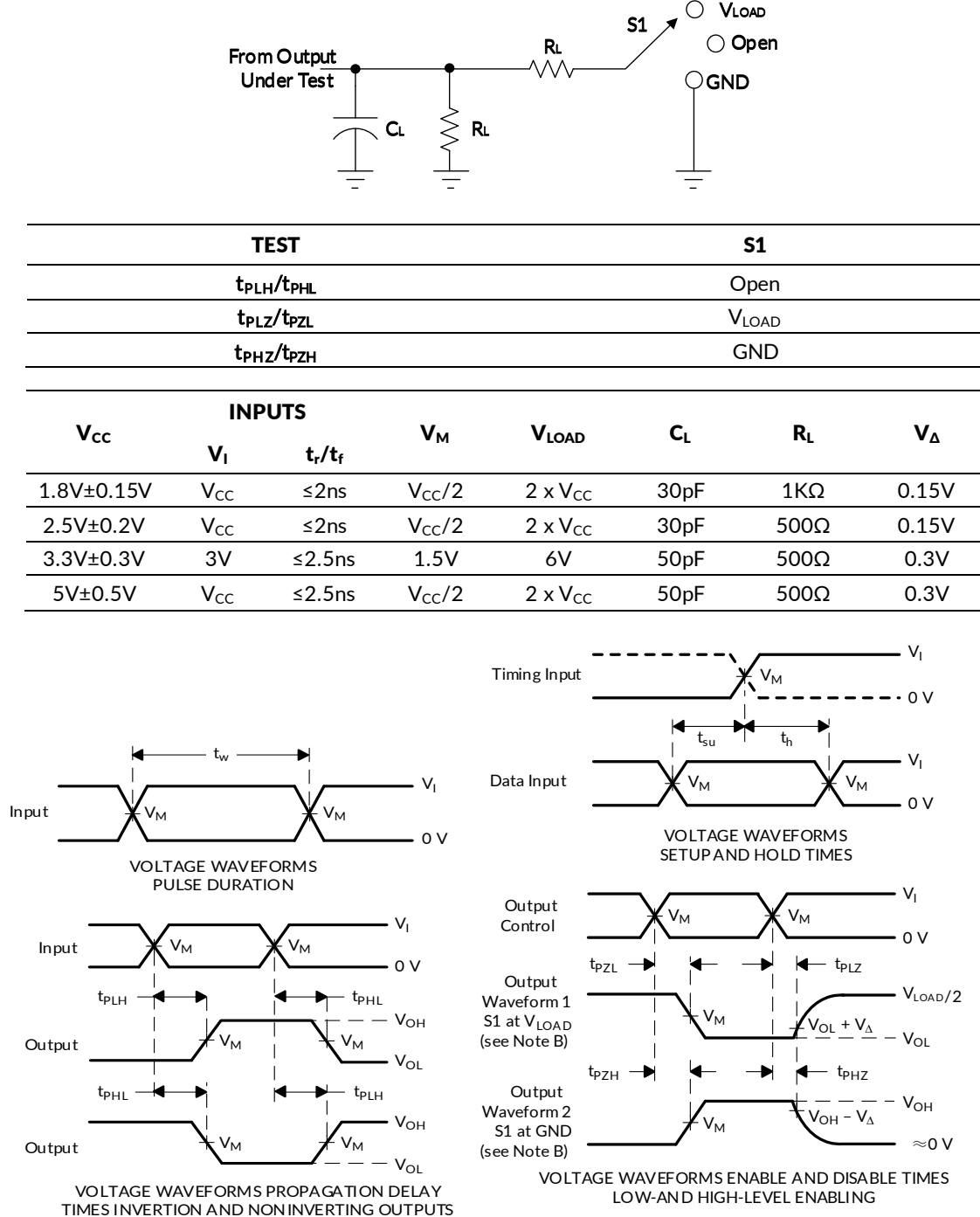
Operating Characteristics

$T_A=25^\circ\text{C}$

PARAMETER			TEST CONDITIONS	$V_{CC}=1.8\text{V}$ TYP	$V_{CC}=2.5\text{V}$ TYP	$V_{CC}=3.3\text{V}$ TYP	$V_{CC}=5\text{V}$ TYP	UNIT
C_{pd}	Power dissipation capacitance	Output enabled	$f=10\text{MHz}$	18	18	19	21	pF
		Output disabled		2	2	2	4	

(1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

PARAMETER MEASUREMENT INFORMATION

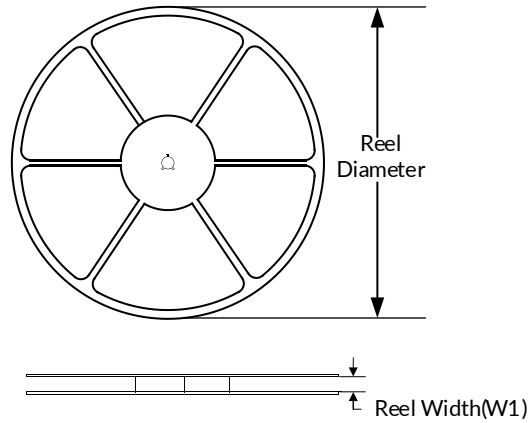


- NOTES:
- A. C_L includes probe and jig capacitance.
 - B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
 - C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$.
 - D. The outputs are measured one at a time, with one transition per measurement.
 - E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - F. t_{PZL} and t_{PZH} are the same as t_{err} .
 - G. t_{PLH} and t_{PHL} are the same as t_{pd} .
 - H. All parameters and waveforms are not applicable to all devices.

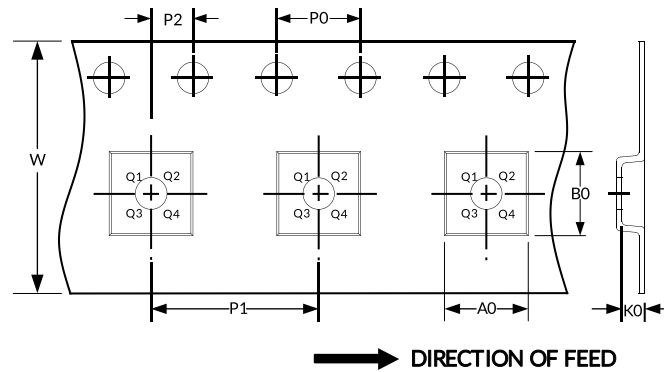
Figure 1. Load Circuit and Voltage Waveforms

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSION



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SC70-5	7"	9.5	2.25	2.55	1.20	4.0	4.0	2.0	8.0	Q3
SOT23-5	7"	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3

NOTE:

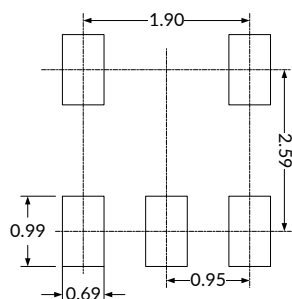
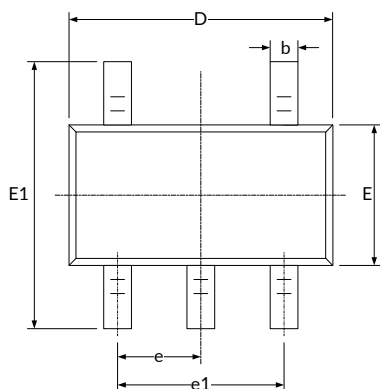
1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.

PACKAGE OUTLINE DIMENSIONS

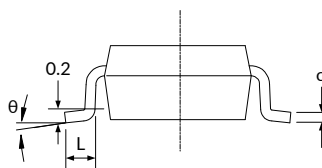
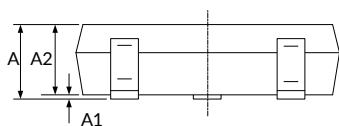
NOTE:

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. This drawing is subject to change without notice.

SOT23-5 ⁽³⁾



RECOMMENDED LAND PATTERN (Unit: mm)

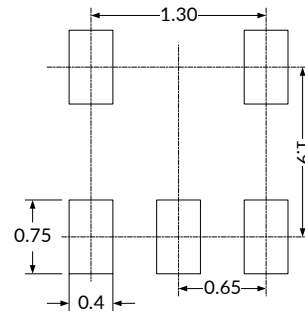
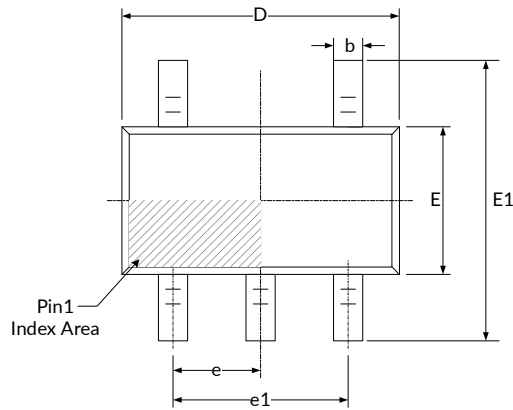


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A ⁽¹⁾	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D ⁽¹⁾	2.820	3.020	0.111	0.119
E ⁽¹⁾	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC) ⁽²⁾		0.037(BSC) ⁽²⁾	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

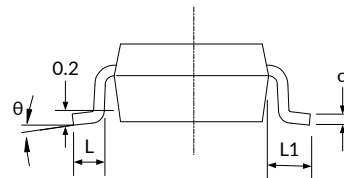
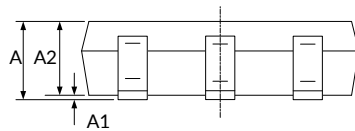
NOTE:

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. This drawing is subject to change without notice.

SC70-5⁽³⁾



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A ⁽¹⁾	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D ⁽¹⁾	2.000	2.200	0.079	0.087
E ⁽¹⁾	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650(BSC) ⁽²⁾		0.026(BSC) ⁽²⁾	
e1	1.300(BSC) ⁽²⁾		0.051(BSC) ⁽²⁾	
L	0.260	0.460	0.010	0.018
L1	0.525		0.021	
θ	0°	8°	0°	8°