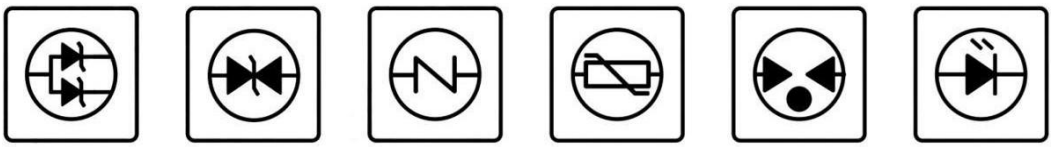
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SN74LVC1G125DBVR-MS/SN74LVC1G125DCKR-MS

Product specification

General Description

The operating voltage range of the bus buffer gate is 1.65-V to 5.5-V.
The SN74LVC1G125DBVR-MS/SN74LVC1G125DCKR-MS device is a single line driver with a 3-state output. The output is disabled when the output-enable (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.

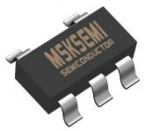
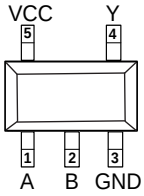
Features

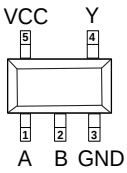
- 3-State output
- Wide supply voltage range from 1.65 to 5.5V
- Inputs accept voltages to 5.5 V
- Max tpd of 4.7 ns at 3.3 V
- ±24-mA output drive at 3.3 V
- I_{off} ssupports partial-power-down mode

Applications

- Cable modem termination system
- Video communications system
- High-speed data acquisition and generation
- Military: radar and sonar
- Motor control: high- voltage
- Power line communication modem
- SSD: Internal or external
- Video broadcasting and infrastructure
- Video broadcasting
- WiMAX and wireless infrastructure equipment

Pinning and Marking

SOT-23-5	Pin Configurations	Marking
		C25*

SC70-5	Pin Configurations	Marking
		C***

Pin Functions

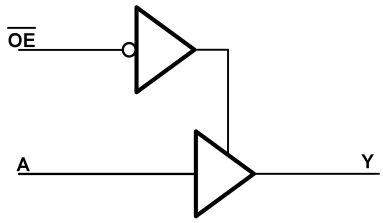
Pin		I/O	Description
Name	SOT23-5/SC70-5		
$\overline{OE}$	1	I	Enable Input
A	2	I	Input
GND	3	—	Ground
Y	4	O	Output
V_{CC}	5	—	Positive Supply

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Order information

Orderable Device	Package	Packing Option
SN74LVC1G125DBVR-MS	SOT23-5	3000PCS
SN74LVC1G125DCKR-MS	SC70-5	3000PCS

CircuitDiagram



Absolute Maximum Ratings

Parameters			Min	Max.	Unit
V_{CC}	Supply voltage range		-0.5	6.5	V
V_I	Input voltage range		-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
T_J	Junction temperature under bias			150	℃
T_{stg}	Storage temperature range		-65	150	℃

(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 output positive-voltage rating may be exceeded up to 6.5 V maximum if the output current rating is observed.

ESD Ratings

ESD			Value	Unit
V(ESD)	Electrostatic discharge	Human-Body Model (HBM)(1)	8 K	V
		Charge-Device Model (CDM)(2)	2 K	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
SOT23-5	250	81	°C/W
SC70-5	400	150	°C/W

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Electrical Specifications

All typical values are at V_{CC} = 3.3V, T_A = +25°C

Parameter		Test Conditions	Vcc	–40°C to 85°C			–40°C to 125°C			Unit
				Min	Typ	Max	Min	Typ	Max	
V_{OH}		I_{OH}=– 100 µA	1.65 V to 5.5 V	V_{CC}-0.1			V_{CC}-0.1			V
		I_{OH}=–4 mA	1.65 V	1.2			1.2			
		I_{OH}=–8 mA	2.3 V	1.9			1.9			
		I_{OH}=– 16 mA	3 V	2.4			2.4			
		I_{OH}=–24 mA		2.3			2.3			
		I_{OH}=–32 mA	4.5 V	3.8			3.8			
V_{OL}		I_{OL}=100 µA	1.65 V to 5.5 V			0.1			0.1	V
		I_{OL}=4 mA	1.65 V			0.45			0.45	
		I_{OL}=8 mA	2.3 V			0.3			0.3	
		I_{OL}=16 mA	3 V			0.4			0.4	
		I_{OL}=24 mA				0.55			0.55	
		I_{OL}=32 mA	4.5 V			0.55			0.55	
I_I	V_I=5.5 V or GND	V_I=5.5 V or GND	0 to 5.5 V			±5			±5	µA
	Input									
I_{off}		V_I or V_O=5.5 V	0			±10			±10	µA
I_{OZ}		VO=0 to 5.5 V	3.6 V			10			10	µA
I_{CC}		V_I=5.5 V or GND, I_O=0	1.65 V to 5.5 V			10			10	µA
ΔI_{CC}		One Input at V_{CC} – 0.6 V, Other Inputs at V_{CC} or GND	3 V to 5.5 V			500			500	µA
C_i		V_I=V_{CC} or GND	3.3 V		5			5		pF

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

Switching Characteristics

Typical Values at T_A=+25°C and nominal voltages 1.8V, 2.5V, 3.3V, and 5.0V.

Parameter	From (Input)	To (Output)	–40°C to 125°C								Unit
			V_{CC}=1.8 V ± 0.15 V		V_{CC}=2.5 V ± 0.15 V		V_{CC}=3.3 V ± 0.15 V		V_{CC}=5 V ± 0.15 V		
			Min	Max	Min	Max	Min	Max	Min	Max	
t_{pd}	A	Y	2.8	9.5	1.2	5.8	1	4.7	1	3.2	
t_{en}	$\overline{OE}$	Y	3.3	10.8	1.5	6.9	1	5.6	1	5.2	ns
t_{dis}	$\overline{OE}$	Y	1.3	11.8	1	5.2	1	5.2	1	4.4	ns

Operating Characteristics

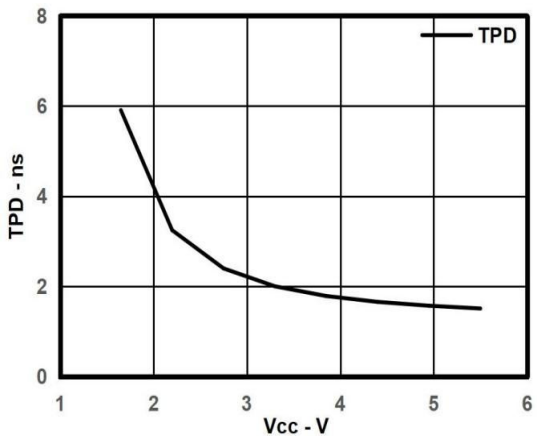
T_A=25°C

Parameter		Test Conditions	V_{CC}=1.8 V	V_{CC}=2.5 V	V_{CC}=3.3 V	V_{CC}=5 V	Unit
			Typ	Typ	Typ	Typ	
C_{pd}	Power Dissipation Capacitance	f=10 MHz	17	18	25	30	pF

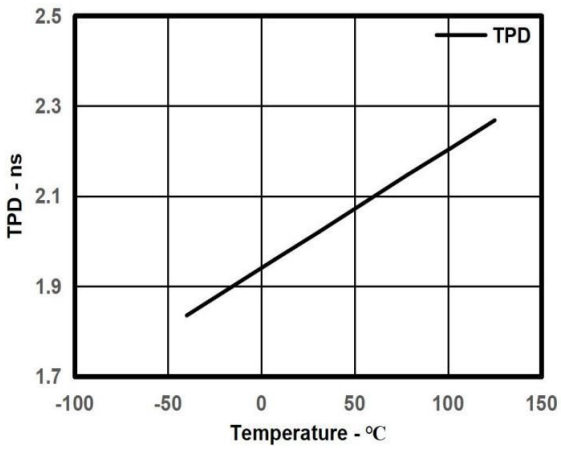
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Typical Characteristics

Typical values are at TA=+25°C (unless otherwise noted)

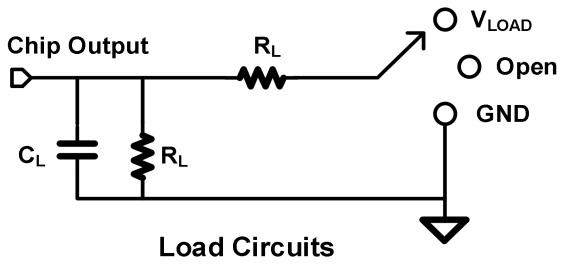


Typical Tpd vs Vcc



Typical Tpd vs Temp

Parameter Measurement Information



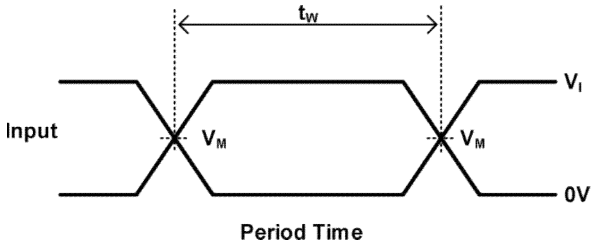
Load Circuits

TEST	S1
T_{PHL}/T_{PLH}	OPEN
T_{PLZ}/T_{PZL}	V_{LOAD}
T_{PHZ}/T_{PZH}	GND

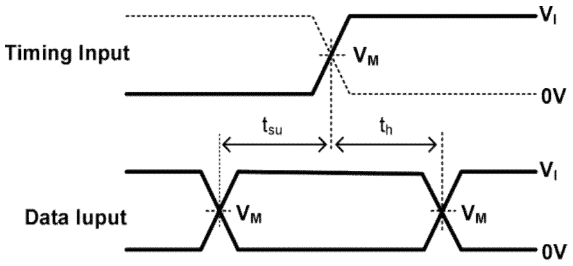
V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	T_r/T_f					
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	30pF	1kΩ	0.15V
2.5V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	30pF	500Ω	0.15V
3.3V±0.15V	3V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.15V	V_{CC}	≤2.5ns	$V_{CC}/2$	$2\times V_{CC}$	50pF	500Ω	0.3V

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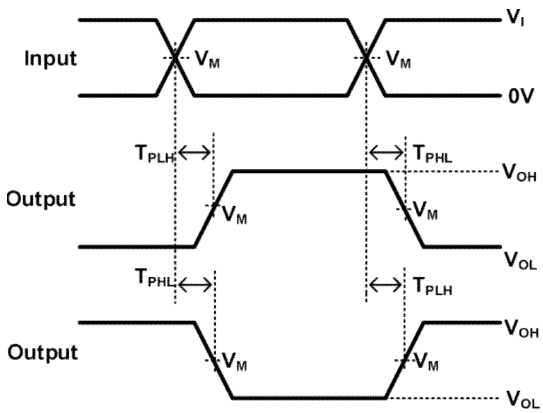
Parameter Measurement Information(Continued)



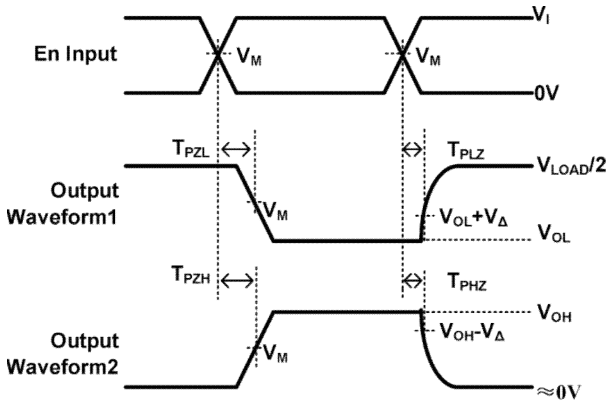
Period Time



Setup and Hold Times



Propagation Delay
for Output and Inverted Output



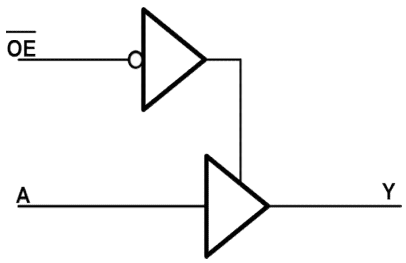
Enable and Disable Times
Low-And High-Level Enabling

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 10 MHz, Z = 50 .
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_{en} .
G. t_{PLH} and t_{PHL} are the same as t_{pd} .
H. All parameters and waveforms are not applicable to all devices.

Detailed Description

The SN74LVC1G125DBVR-MS/SN74LVC1G125DCKR-MS device contains one buffer gate device with output enable control and performs the Boolean function Y = A. This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disablesthe 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 minimumvalue of the resistor is determined by the current-sinking capability of the driver.

Functional Block Diagram



Feature Description

The SN74LVC1G125DBVR-MS/SN74LVC1G125DCKR-MS have wide operating voltage range from 1.65 V to 5.5 V , It Allows down voltage translation and I_{off} feature allows voltages on the inputs and outputs, when V_{CC} is 0 V.

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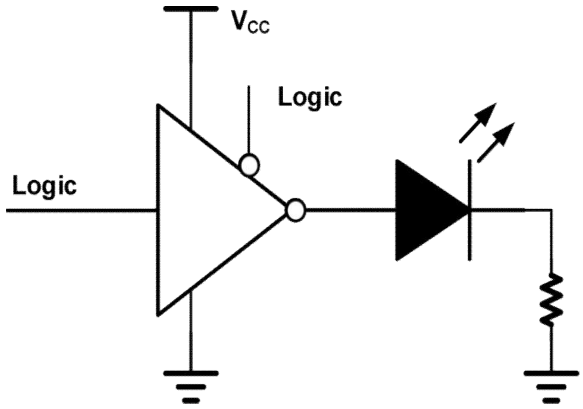
Device Functional Modes

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

Application Information

The SN74LVC1G125DBVR-MS/SN74LVC1G125DCKR-MS device is a high drive CMOS device that can be used as an output enabled buffer with a high output drive, such as an LED application. It can produce 24 mA of drive current at 3.3 V making it Ideal for driving multiple outputs and good for high-speed applications up to 100 MHz. The inputs are 5.5 V tolerant allowing it to translate down to V_{CC}.

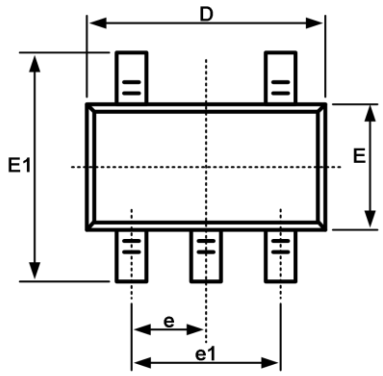
Typical Power Button Circuit

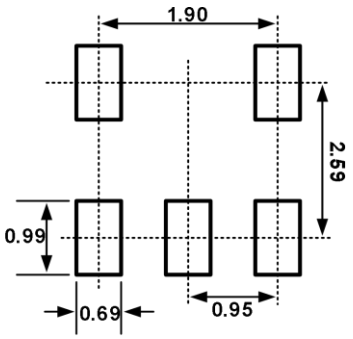


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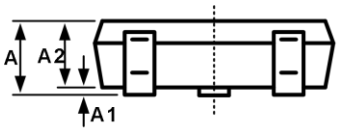
Package Outline

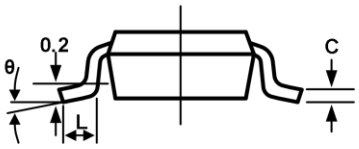
SOT23-5





Recommended Land Pattern (Unit: mm)



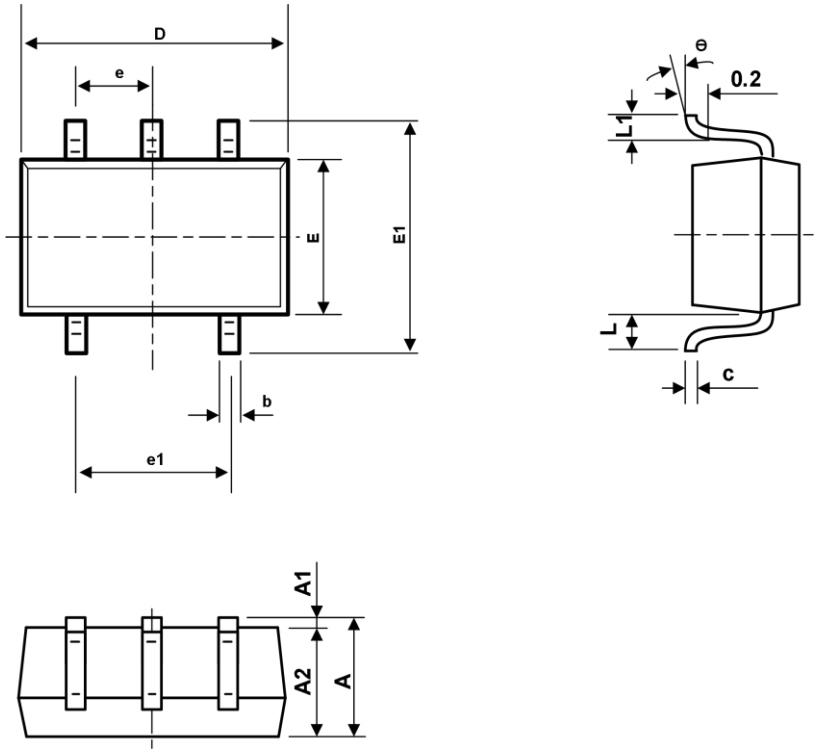


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950BSC		0.037BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600REF		0.024REF	
θ	0°	8°	0°	8°

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Package Outline

SC70-5



symbol	Dimension In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	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	0.110	0.175	0.004	0.007
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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