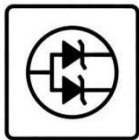


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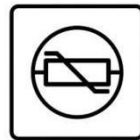
ESD



TVS



TSS



MOV



GDT



PLED

SN74LVC2G17

Product specification

Description

The operating voltage range of the SN74LVC2G17 Dual Schmitt-Trigger buffer is 1.65 V to 5.5 V.

The SN74LVC2G17 device contains two buffers and performs the Boolean function $Y=A$. Because of the Schmitt-Trigger inputs, the device may have different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals, to provide hysteresis (ΔV_T) which makes the device tolerant to slow or noisy input signals.

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

- Schmitt-Trigger inputs provide hysteresis
- Supports 5 V V_{CC} Operation
- Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 5.4 ns at 3.3 V
- ± 24 -mA Output Drive at 3.3 V
- I_{off} Supports Partial-Power-Down Mode

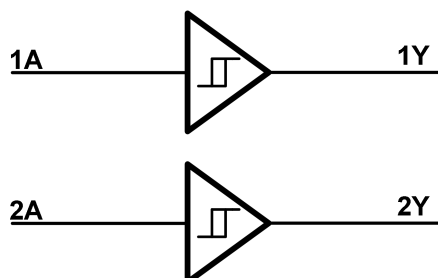
Application

- AV Receivers
- Audio Docks: Portable
- Blu-ray Players and Home Theater
- MP3 Players/Recorders
- Personal Digital Assistants (PDAs)
- Power: Telecom/Server AC/DC Supply
- Solid State Drives (SSDs): Client and Enterprise
- TVs: LCD/Digital and High-Definition (HDTVs)
- Tablets: Enterprise
- Wireless Headsets, Keyboards, and Mice

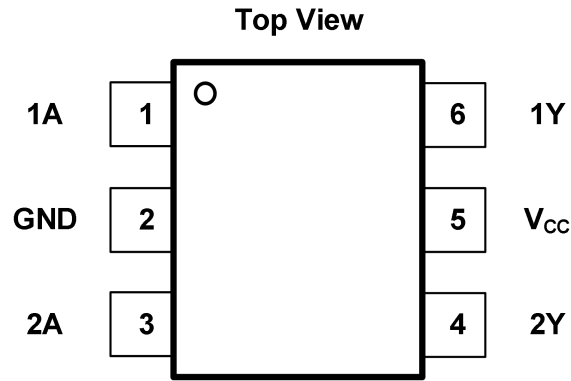
Device Summary, Pin and Packages

Serial Name	Part Name	Package	Marking	Package Qty
SN74LVC2G17	SN74LVC2G17DBVR-MS	SOT23-6		Tape and Reel 3000
	SN74LVC2G17DCKR-MS	SOT-363		Tape and Reel 3000

CircuitDiagram



Device Summary, Pin and Packages



SN74LVC2G17DBVR-MS(SOT23-6)Package

SN74LVC2G17DCKR-MS(SOT-363)Package

Pin		Type	Description
Name	SOT23-6/SOT-363		
1A	1	I	Input1
1Y	6	O	Output1
2A	3	I	Input2
2Y	4	O	Output2
GND	2	—	Ground
V _{CC}	5	—	Power Pin

Voltage, Temperature, ESD and Thermal Ratings

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	-0.5	6.5	V
V _O	Voltage range applied to any output in the high or low state	-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	°C
T _{stg}	Storage temperature range	-65	150	°C

(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 negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

ESD Ratings

ESD		Value	Unit
V(ESD)	Electrostatic discharge	Human-body model (HBM)	6 K V
		Charge Device Model (CDM)	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.

Voltage, Temperature, ESD and Thermal Ratings(Continued)
Recommended Operating Conditions

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

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply voltage	1.65	5.5	V
V_I	Input voltage	0	5.5	V
V_O	Output voltage	0	V_{CC}	V
I_{OH}	High-level output current	$V_{CC}=1.65V$	-4	mA
		$V_{CC}=2.3V$	-8	
		$V_{CC}=3V$	-16	
		$V_{CC}=4.5V$	-24	
		$V_{CC}=4.5V$	-32	
I_{OL}	Low-level output current	$V_{CC}=1.65V$	4	mA
		$V_{CC}=2.3V$	8	
		$V_{CC}=3V$	16	
		$V_{CC}=3V$	24	
		$V_{CC}=4.5V$	32	
T_A	Operating free-air temperature	-40	125	°C

Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
SOT23-6	250	81	°C/W
SOT-363	400	150	°C/W

Electrical Specifications

V_{CC}=5.0V or 3.3V, FULL=-40°C to +85°C, Typical values are at T_A=+25°C. (unless otherwise noted)

Parameter	Test Conditions	V _{CC}	-40°C to 85°C			-40°C to 125°C			Unit
			Min	Typ	Max	Min	Typ	Max	
V _{T+} Positive-going input threshold voltage		1.65 V	0.7		1.4	0.7		1.4	V
		2.3 V	1		1.7	1		1.7	
		3 V	1.3		2	1.3		2	
		4.5 V	1.9		3.1	1.9		3.1	
		5.5 V	2.2		3.7	2.2		3.7	
V _{T-} Negative-going input threshold voltage		1.65 V	0.25		0.7	0.25		0.7	V
		2.3 V	0.4		1	0.4		1	
		3 V	0.8		1.3	0.8		1.3	
		4.5 V	1.1		2	1.1		2	
		5.5 V	1.4		2.5	1.4		2.5	
ΔV _T Hysteresis (V _{T+} - V _{T-})		1.65 V	0.3		1	0.3		1	V
		2.3 V	0.4		1	0.4		1	
		3 V	0.5		1	0.5		1	
		4.5 V	0.6		1	0.6		1	
		5.5 V	0.7		1.1	0.7		1.1	
V _{OH}	I _{OH} =- 100 μA I _{OH} =-4 mA I _{OH} =-8 mA I _{OH} =- 16 mA I _{OH} =-24 mA I _{OH} =-32 mA	1.65 V to 5.5 V	V _{CC} -0.1			V _{CC} -0.1			V
		1.65 V	1.2			1.2			
		2.3 V	1.9			1.9			
		3 V	2.4			2.4			
			2.3			2.3			
		4.5 V	3.8			3.8			
V _{OL}	I _{OL} =100 μA I _{OL} =4 mA I _{OL} =8 mA I _{OL} =16 mA I _{OL} =24 mA I _{OL} =32 mA	1.65 V to 5.5 V			0.1			0.1	V
		1.65 V			0.45			0.45	
		2.3 V			0.3			0.3	
		3 V	0.4			0.4			
			0.55			0.55			
		4.5 V	0.55			0.55			
I _I	A input	V _I =5.5 V or GND	0 to 5.5 V			±5		±5	μA
I _{bff}		V _I or V _O =5.5 V	0			±10		±10	μA
I _{CC}		V _I =5.5 V or GND, I _b =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

Electrical Specifications

V_{CC}=5.0V or 3.3V, FULL=-40°C to +85°C, Typical values are at T_A=+25°C. (unless otherwise noted)

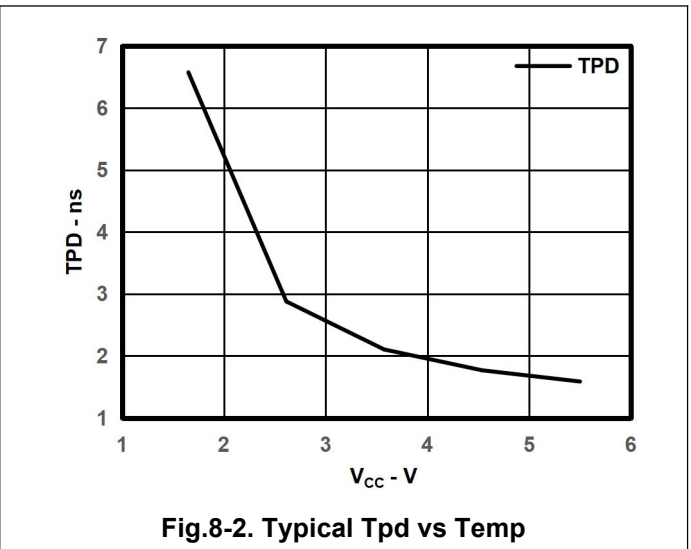
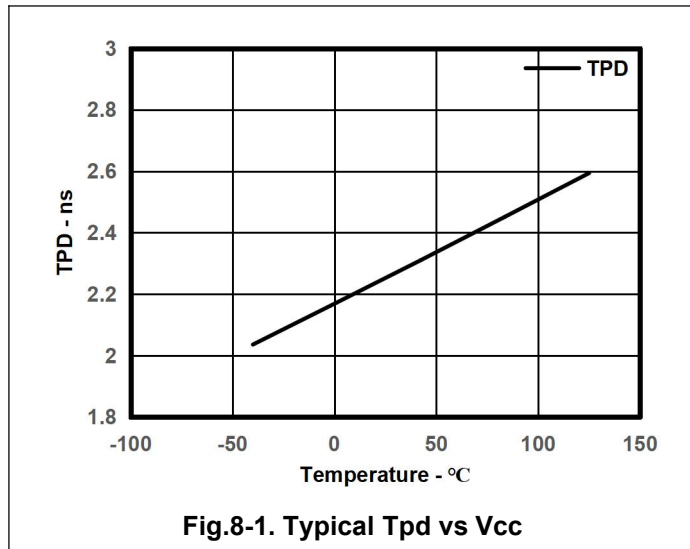
Parameter	From (Input)	To (Output)	-40°C to 125°C								Unit
			V _{CC} =1.8 V ± 0.15 V		V _{CC} =2.5 V ± 0.2 V		V _{CC} =3.3 V ± 0.3 V		V _{CC} =5 V ± 0.5 V		
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	A	Y	3.9	10.4	1.9	6.2	2.2	5.9	1.5	4.8	ns

T_A=25°C

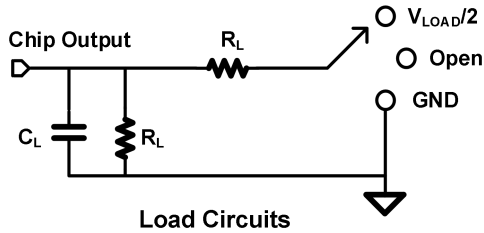
Parameter		Test Conditions	V _{CC} =1.8 V	V _{CC} =2.5 V	V _{CC} =3.3 V	V _{CC} =5 V	Unit
			Typ	Typ	Typ	Typ	
C _{pd}	Powerdissipation capacitance	f=10 MHz	20	30	35	50	pF

Typical Characteristics

Over recommended operating free-air temperature range, C_L=30 pF or 50 pF (unless otherwise noted).

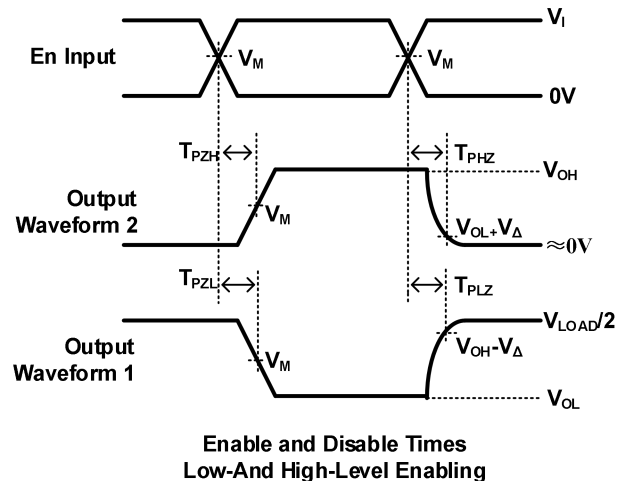
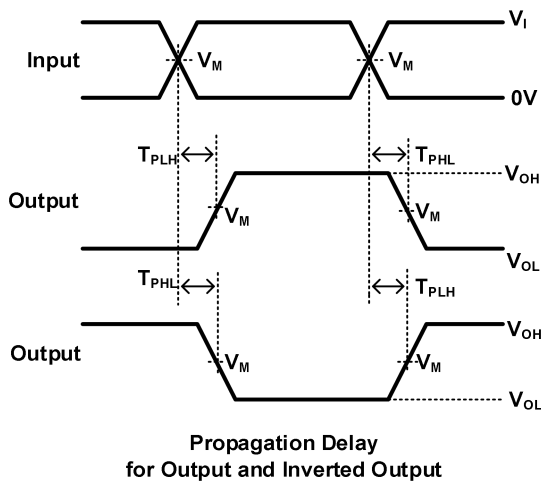
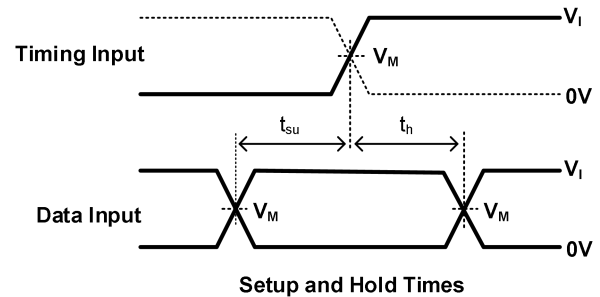
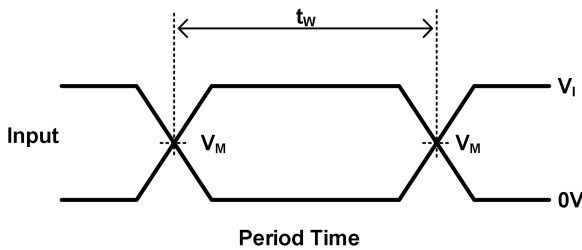


Parameter Measurement Information



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					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1k Ω	0.15V
$2.5V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
$3.3V \pm 0.15V$	3V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$5V \pm 0.15V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V



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} .

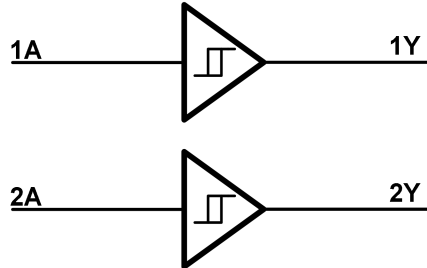
H. All parameters and waveforms are not applicable to all device.

Detailed Description

Overview

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

Functional Block Diagram



Feature Description

The device is designed for 1.65V to 5.5V V_{CC} operation and it allows down voltage translation from 5V to 3.3V, or 3.3V to 1.8V. The input voltage of SN74LVC2G17 accepts to 5.5V.

The SN74LVC2G17 has power-down protection (I_{off}) and Schmitt-trigger input.

I_{off} feature allows voltage on the inputs and outputs when V_{CC} is 0V, and is able to reduce leakage when V_{CC} is 0V.

Schmitt-Trigger input can improve the noise immunity capability

Device Functional Modes

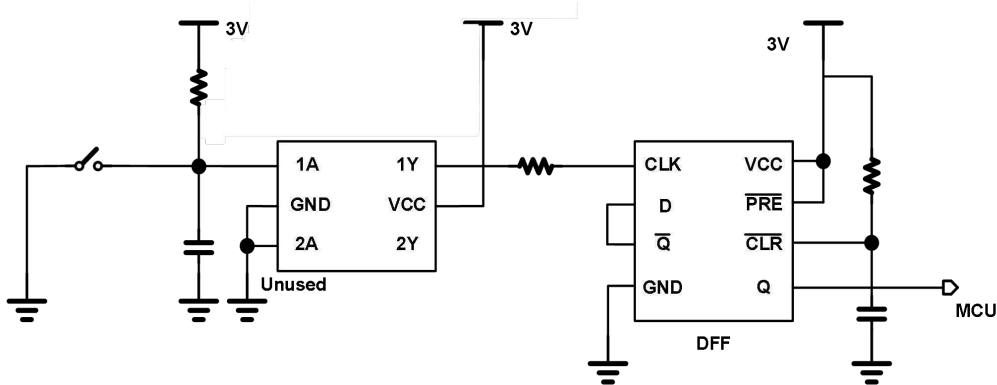
Input A	Output Y
H	H
L	L

Application Note

Application Information

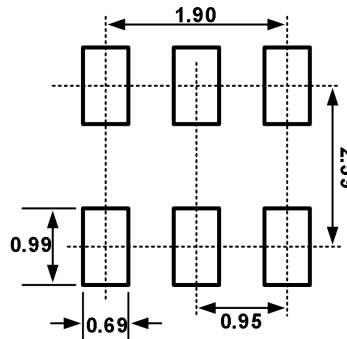
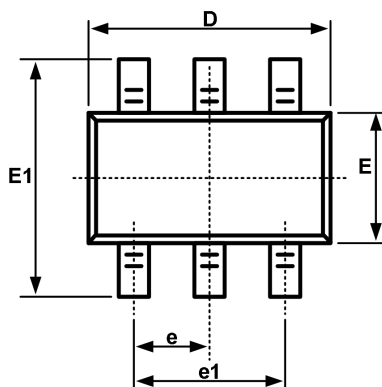
Mechanical input elements, such as push buttons or rotary knobs, offer simple ways to interact with electronic systems. Typically, these elements have recoil or bouncing, where the mechanical element makes and breaks contact multiple times during human interaction. This bouncing can cause one or more repeated signals to be passed, triggering multiple actions when only a single input was intended. One potential solution to mitigating these multiple inputs is by utilizing a Schmitt-trigger to create a debounce circuit.

Typical Power Button Circuit

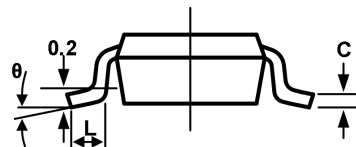
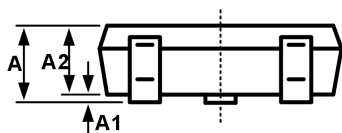


Package Outline Dimension

SOT23-6



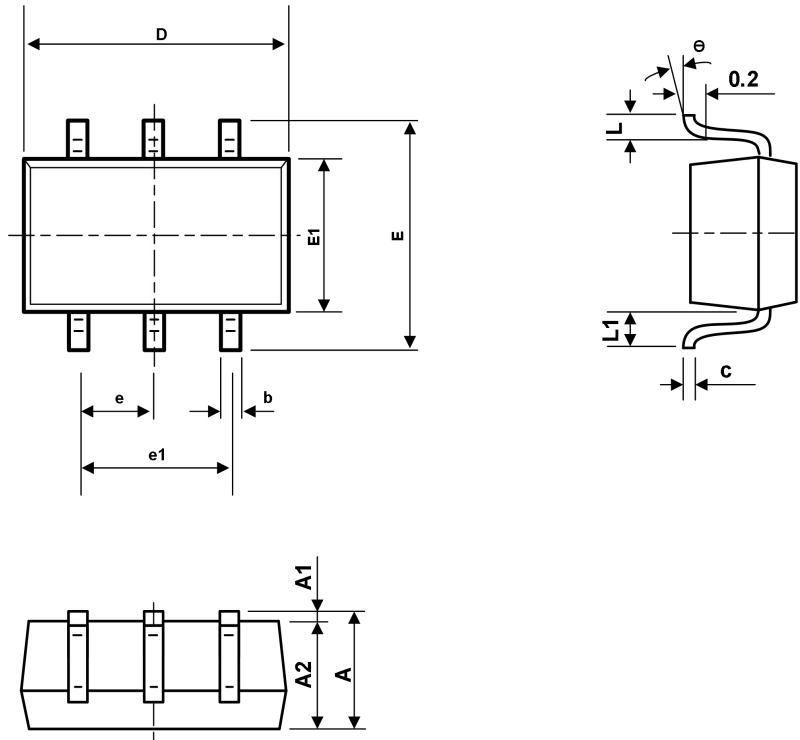
Recommended Land Pattern (Unit: mm)



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	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
theta	0°	8°	0°	8°

Package Outline Dimension(Continued)

SOT-363



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	2.150	2.450	0.085	0.096
E1	1.150	1.350	0.045	0.053
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.260	0.460	0.010	0.018
L1	0.525REF		0.021REF	
e	0°	8°	0°	8°

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