

Features

- Supports 5-V VCC Operation
- Inputs Accept Voltages to 5.5V
- Max tpd of 3.8ns at 3.3V
- Low power consumption, ICC=10μA (Max)
- ±24mA output drive at 3.3V
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

General Description

The SN74LVC1G10DBVR performs the Boolean function $Y = A \cdot B \cdot C$ or $Y = \bar{A} + \bar{B} + \bar{C}$ in positive logic.

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

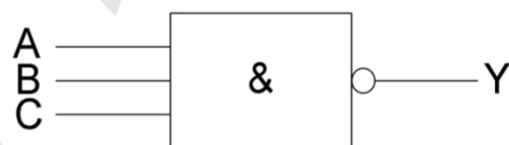
Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital

Logic Diagram



Logic symbol

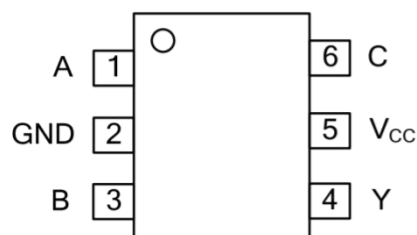


IEC logic symbol

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74LVC1G10DBVR	SOT23-6	Tape and Reel, 3000

Pin Configuratio



SOT23-6

Function Table

INPUTS			OUTPUT Y
A	B	C	
H	H	H	L
L	X	X	H
X	L	X	H
X	X	L	H

Note: H: HIGH voltage level; L: LOW voltage level; X: Don't care.

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ +6.5	V
Input Voltage	V_{IN}	-0.5 ~ +6.5	V
Output Voltage	Output in the high or low state	$-0.5 \sim V_{CC}+0.5$	V
	Output in the high-impedance or power-off state	-0.5 ~ +6.5	V
V_{CC} or GND Current	I_{CC}	± 100	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})	I_{OUT}	± 50	mA
Input Clamp Current ($V_{IN}<0$)	I_{IK}	-50	mA
Output Clamp Current ($V_{OUT}<0$)	I_{OK}	-50	mA
Storage Temperature Range	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65	--	5.5	V
Input Voltage	V_{IN}		0	--	5.5	V
Output Voltage	V_{OUT}	High or low state	0	--	V_{CC}	V
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	--	--	
		$V_{CC}=4.5\text{V to }5.5\text{V}$	$0.7 \times V_{CC}$	--	--	
Low-level input voltage	V_{IL}	$V_{CC}=1.65\text{V to }1.95\text{V}$	--	--	$0.35 \times V_{CC}$	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 Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8\text{V} \pm 0.15\text{V}, 2.5\text{V} \pm 0.2\text{V}$	--	--	20	ns/V
		$V_{CC}=3.3\text{V} \pm 0.3\text{V}$	--	--	10	
		$V_{CC}=5\text{V} \pm 0.5\text{V}$	--	--	10	
Operating Temperature	T_A		-40	--	+125	$^{\circ}\text{C}$

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

ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65 \sim 5.5V, I_{OH}=-100\mu A$	$V_{CC}-0.1$	--	--	V
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2	--	--	V
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.9	--	--	V
		$V_{CC}=3.0V, I_{OH}=-16mA$	2.4	--	--	V
		$V_{CC}=3.0V, I_{OH}=-24mA$	2.3	--	--	V
		$V_{CC}=4.5V, I_{OH}=-32mA$	3.8	--	--	V
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65 \sim 5.5V, I_{OL}=100\mu A$	--	--	0.1	V
		$V_{CC}=1.65V, I_{OL}=4mA$	--	--	0.45	V
		$V_{CC}=2.3V, I_{OL}=8mA$	--	--	0.30	V
		$V_{CC}=3.0V, I_{OL}=16mA$	--	--	0.40	V
		$V_{CC}=3.0V, I_{OL}=24mA$	--	--	0.55	V
		$V_{CC}=4.5V, I_{OL}=32mA$	--	--	0.55	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{IN}=5.5V$ or GND, $V_{CC}=0 \sim 5.5V$	--	--	± 5	μA
Power OFF Leakage Current	I_{off}	V_{IN} or $V_{OUT}=5.5V, V_{CC}=0V$	--	--	± 10	μA
Quiescent Supply Current	I_{CC}	$V_{IN}=5.5V$ or GND, $I_{OUT}=0, V_{CC}=1.65 \sim 5.5V$	--	--	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	$V_{CC}=3V \sim 5.5V$, One input at $V_{CC}-0.6V$, Other inputs at V_{CC} or GND	--	--	500	μA
Input Capacitance	C_i	$V_{CC}=3.3V, V_{IN}=V_{CC}$ or GND	--	3.5	--	pF

SWITCHING CHARACTERISTICS (Unless otherwise specified) (see Figure 1)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (A,B or C) to output(Y)	t _{PLH} /t _{PHL}	V _{CC} =1.8V±0.15V	C _L =15pF	2	--	14.8	ns
			C _L =30pF	2.5	--	18	
		V _{CC} =2.5V±0.2V	C _L =15pF	1.3	--	5.5	ns
			C _L =30pF	1.6	--	6.5	
		V _{CC} =3.3V±0.3V	C _L =15pF	0.8	--	3.8	ns
			C _L =50pF	1.4	--	5	
		V _{CC} =5V±0.5V, C _L =50pF	C _L =15pF	0.6	--	2.7	ns
			C _L =50pF	1	--	3.6	

OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$f=10\text{MHz}$	$V_{CC}=1.8\text{V}$	--	17	pF
			$V_{CC}=2.5\text{V}$	--	18	pF
			$V_{CC}=3.3\text{V}$	--	19	pF
			$V_{CC}=5.0\text{V}$	--	22	pF

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	230	$^{\circ}\text{C/W}$

TEST CIRCUIT AND WAVEFORMS

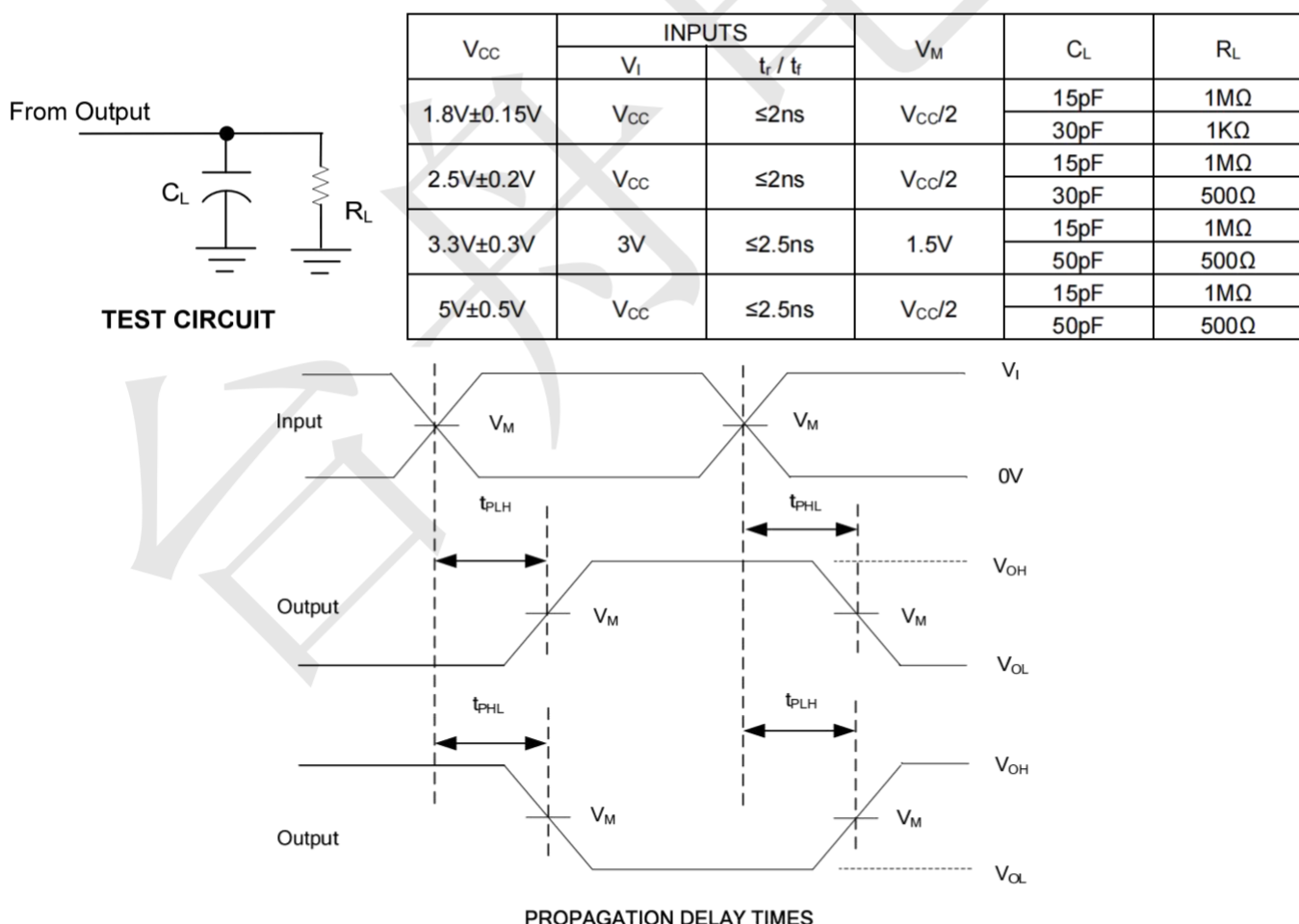


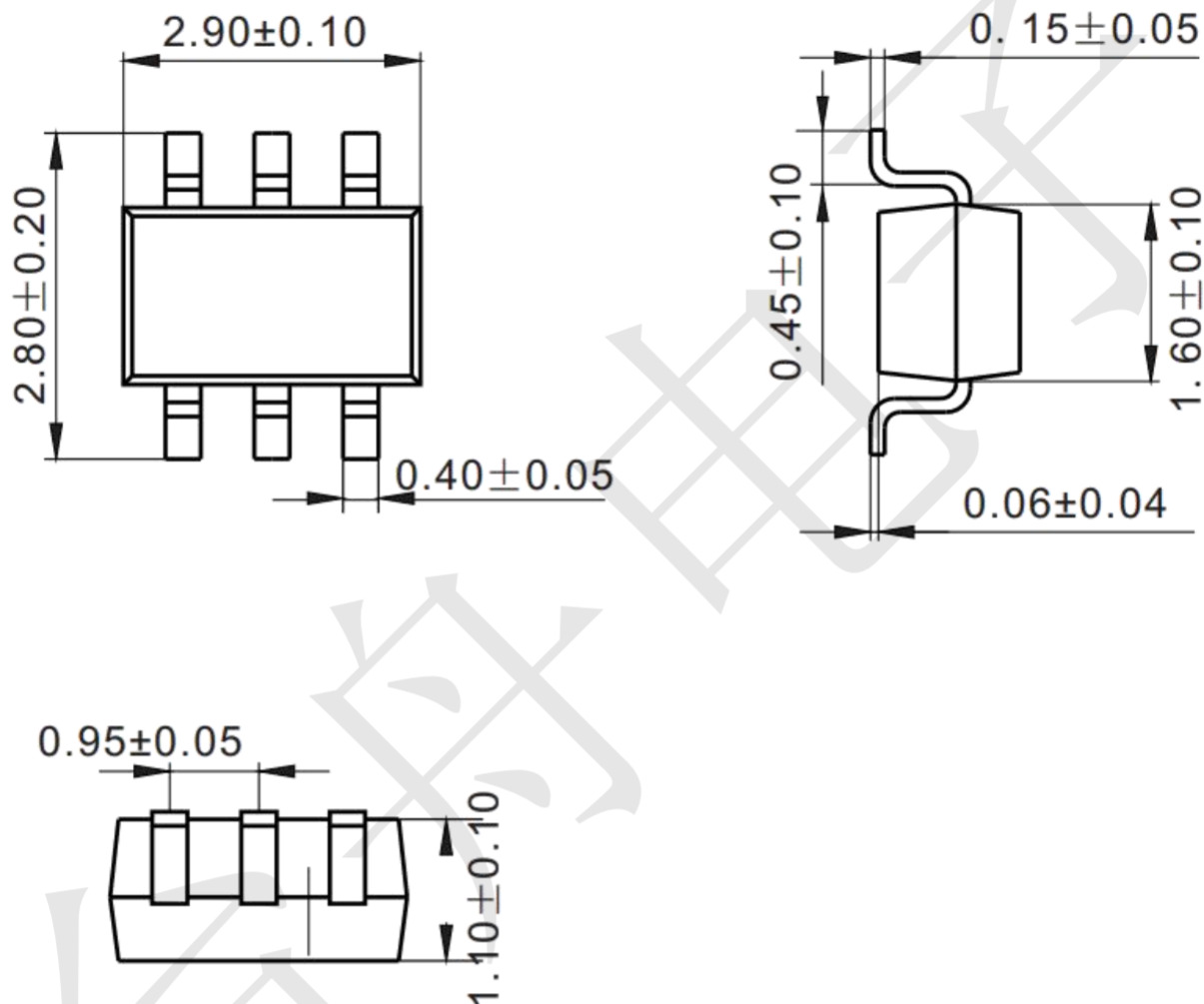
Figure 1. Test Circuit and Voltage Waveforms

Note: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: $\text{PRR} \leq 10\text{MHz}$, $Z_0 = 50\Omega$.

Package information

SOT23-6 (Unit: mm)



Mounting Pad Layout (unit: mm)

