TP74LVC1G11 Series

SINGLE 3-INPUT POSITIVE-AND GATE

Features

- Supports 5-V VCC Operation
- Inputs Accept Voltages to 5.5V
- Max tpd of 4.1ns 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)

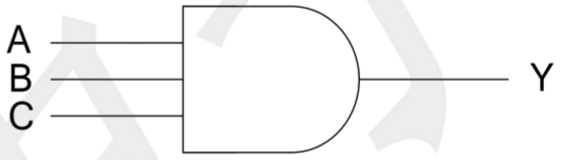
Applications

- 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

General Description

The TP74LVC1G11 performs the Boolean function $Y = A \bullet B \bullet C$ or $Y = \overline{A} + \overline{B} + \overline{C}$ 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.

Logic Diagram



Logic symbol

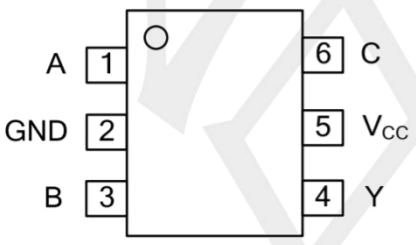


IEC logic symbol

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74LVC1G11S6	SOT23-6	Tape and Reel,3000
TP74LVC1G11C6	SOT363	Tape and Reel,3000

Pin Configuratio



SOT23-6 / SOT363

Function Table

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

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

ABSOLUTE MAXIMUM RATINGS (T_A=25°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	V_{OUT}	-0.5 ~ 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	°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}=1.65V to 1.95V	0.65×V_{CC}	--	--	V
		V_{CC}=2.3V to 2.7V	1.7	--	--	
		V_{CC}=3V to 3.6V	2	--	--	
		V_{CC}=4.5V to 5.5V	0.7×V_{CC}	--	--	
Low-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V	--	--	0.35×V_{CC}	V
		V_{CC}=2.3V to 2.7V	--	--	0.7	
		V_{CC}=3V to 3.6V	--	--	0.8	
		V_{CC}=4.5V to 5.5V	--	--	0.3×V_{CC}	
Input Transition Rise or Fall Rate	Δt/Δv	V_{CC}=1.8V±0.15V, 2.5V±0.2V	--	--	20	ns/V
		V_{CC}=3.3V±0.3V	--	--	10	
		V_{CC}=5V±0.5V	--	--	10	
Operating Temperature	T_A		-40	--	+125	°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 ~ 5.5V, I_{OH}=-100μA	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 ~ 5.5V, I_{OL}=100μA	--	--	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 ~ 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 ~ 5.5V	--	--	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	V_{CC}=3 V~ 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	2.6	--	15.2	ns
			C_L=30pF	2.9	--	17.2	
		V_{CC}=2.5V±0.2V	C_L=15pF	1.6	--	5.6	ns
			C_L=30pF	1.4	--	6.2	
		V_{CC}=3.3V±0.3V	C_L=15pF	1.2	--	4.1	ns
			C_L=50pF	1.3	--	4.9	
		V_{CC}=5V±0.5V, C_L=50pF	C_L=15pF	1	--	3.1	ns
			C_L=50pF	1	--	3.5	

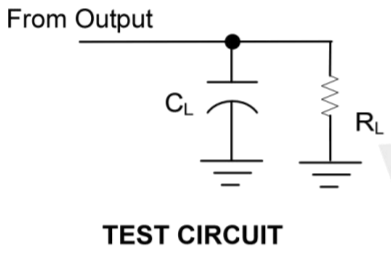
OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	f=10MHZ	V_{CC}=1.8V	--	18	--	pF
			V_{CC}=2.5V	--	19	--	pF
			V_{CC}=3.3V	--	20	--	pF
			V_{CC}=5.0V	--	23	--	pF

THERMAL DATA

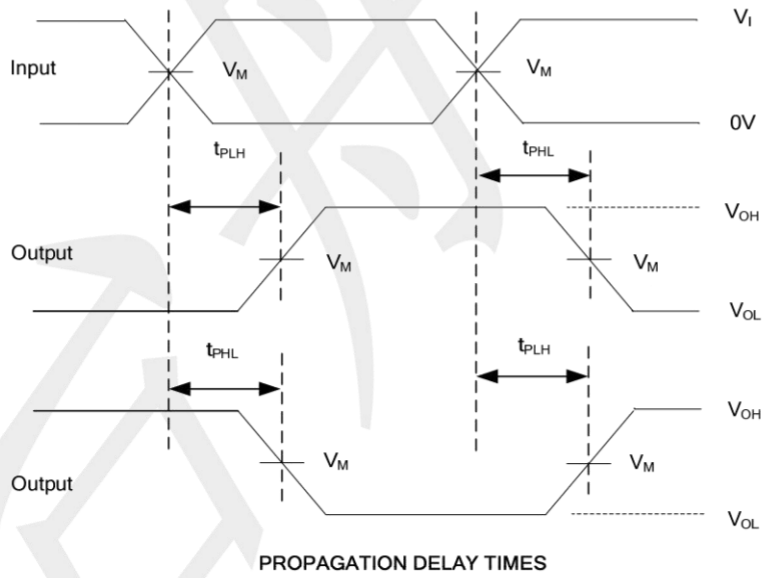
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT23-6	θ_{JA}	230	°C/W
	SOT-363		350	°C/W

TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	INPUTS V_I	INPUTS t_r / t_f	V_M	C_L	R_L
1.8V±0.15V	V_{CC}	≤2ns	V_{CC}/2	15pF	1MΩ
				30pF	1KΩ
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	15pF	1MΩ
				30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
				50pF	500Ω
5V±0.5V	V_{CC}	≤2.5ns	V_{CC}/2	15pF	1MΩ
				50pF	500Ω



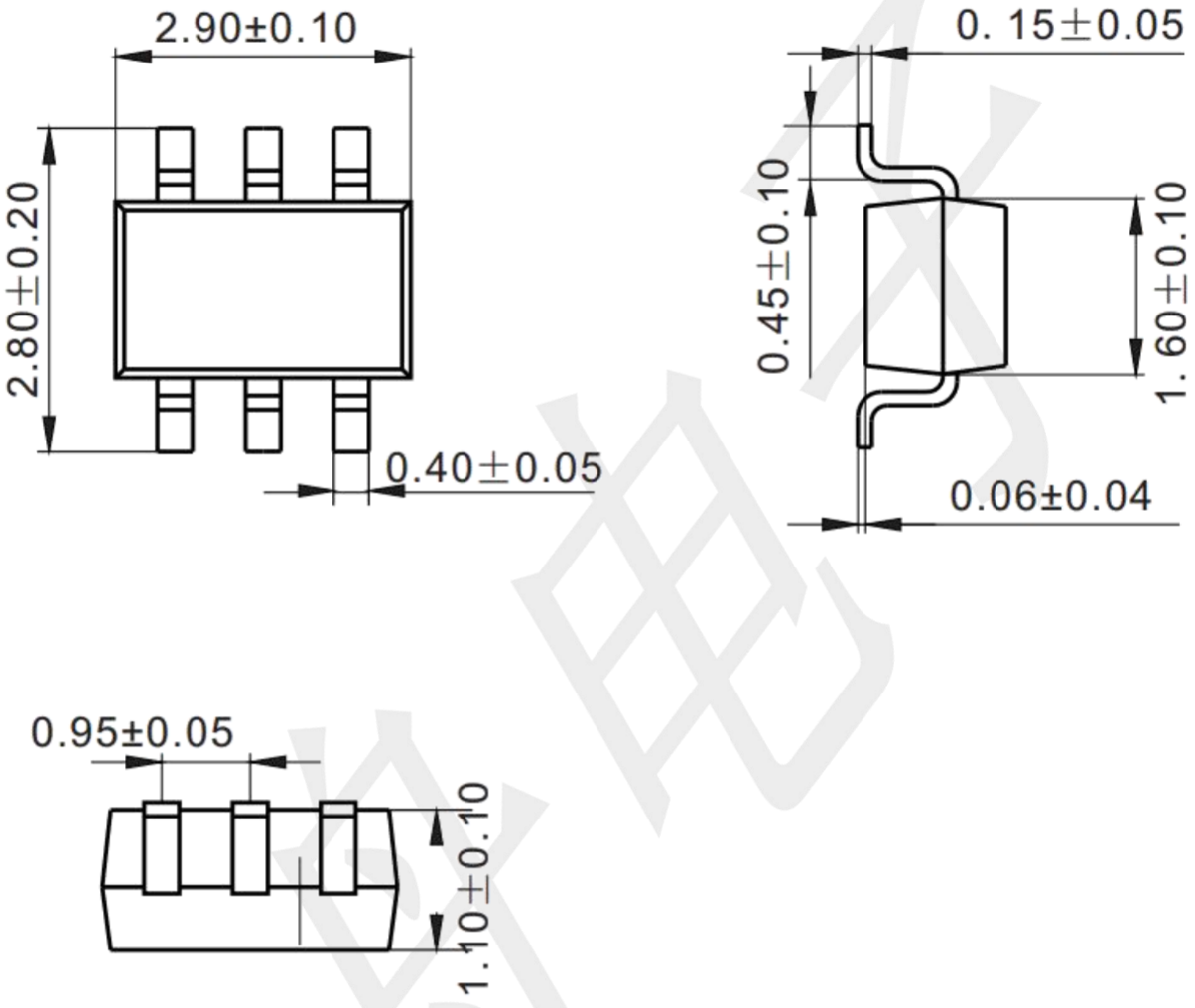
PROPAGATION DELAY TIMES

Figure 1. Test Circuit and Voltage Waveforms

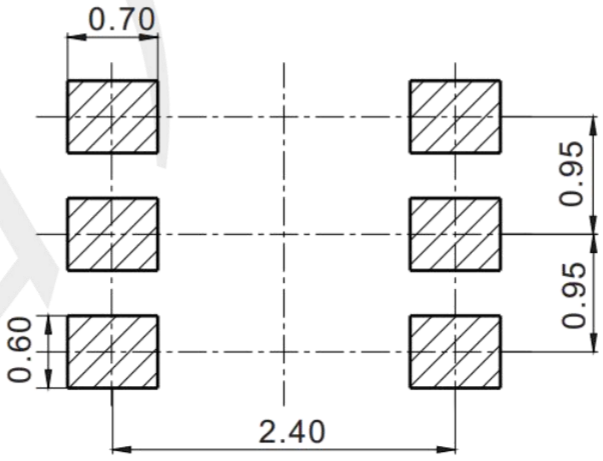
Note: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_O=50Ω.

Package information

SOT23-6 (Unit: mm)

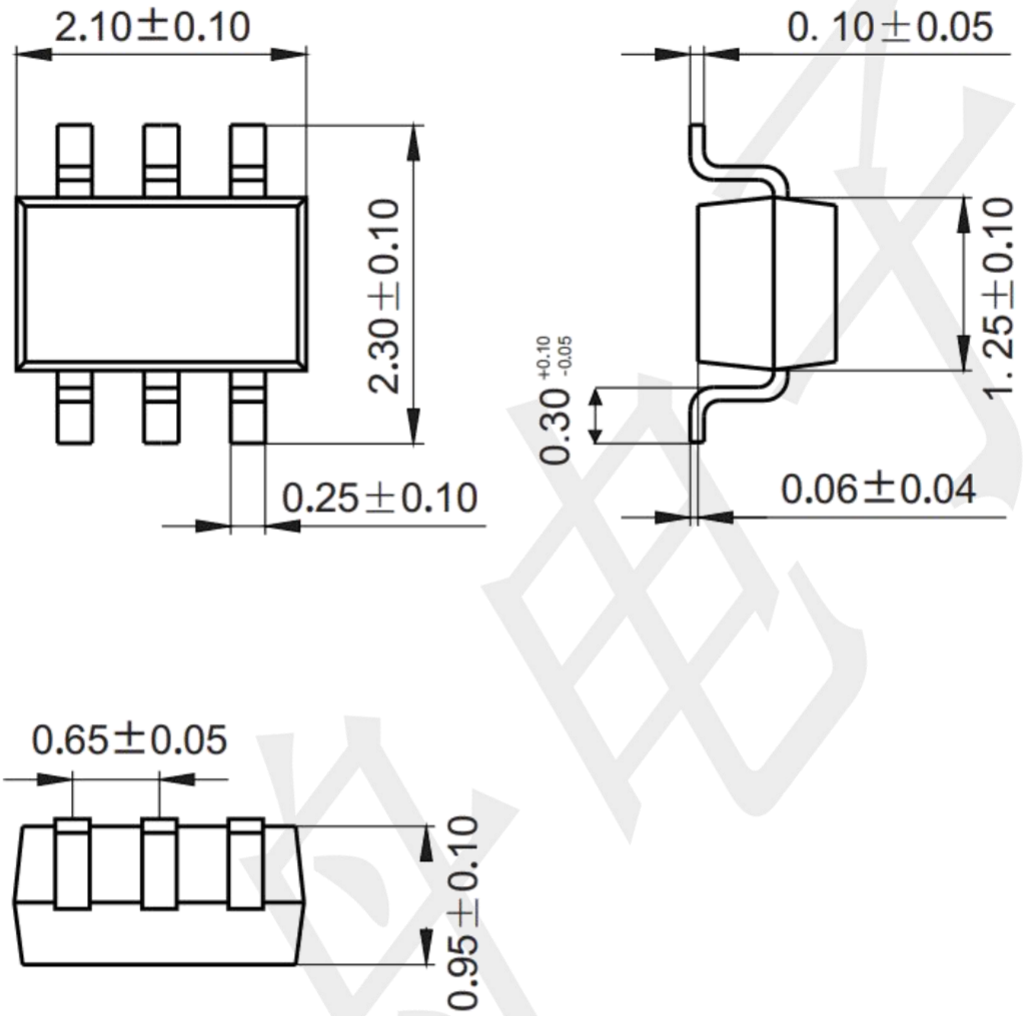


Mounting Pad Layout (unit: mm)



Package informantion

SOT363 (Unit: mm)



Mounting Pad Layout (unit: mm)

