

Features

- Operate from 1.65V to 5.5V
- Inputs accept voltages to 5.5V
- $\pm 24\text{mA}$ output drive at 3.3V
- Low power consumption, $I_{CC}=10\mu\text{A}$ (Max)
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 1000-V Charged-Device Model (C101)

General Description

The TP74LVC1G132 contains one 2-input NAND gate with Schmitt-trigger inputs designed for 1.65-V to 5.5V VCC operation and performs the Boolean function $Y=A \cdot B$ or $Y = A+B$ in positive logic.

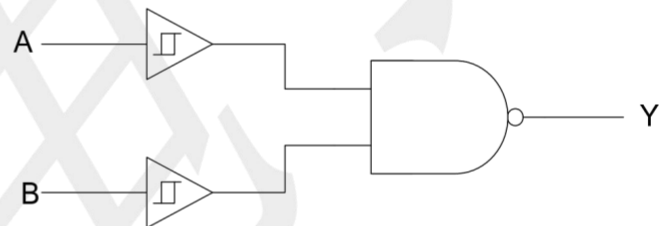
Because of Schmitt action, this device has different input threshold levels for positive-going (VT+) and negative-going (VT-) signals.

This device can be triggered from the slowest of input ramps and still give clean jitter-free output signals.

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
- Solid State Drive(SSD): Client and Enterprise
- Wireless Headset, Keyboard, and Mouse

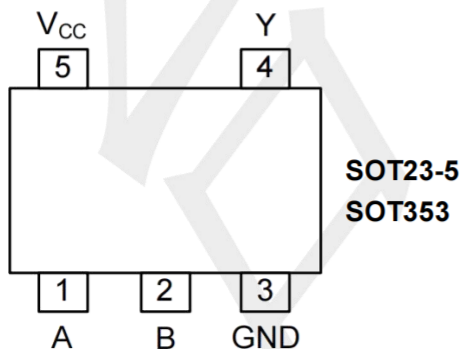
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74LVC1G132S5	SOT23-5	Tape and Reel, 3000
TP74LVC1G132C5	SOT353	Tape and Reel, 3000

Pin Configuratio



Function Table

INPUT(A)	INPUT(B)	OUTPUT(Y)
L	L	H
L	H	H
H	L	H
H	H	L

Note: H: HIGH voltage level; L: LOW voltage level.

Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	VCC		-0.5 ~ +6.5	V
Input Voltage	VIN		-0.5 ~ +6.5	V
Output Voltage	VOUT	Output in the Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ VCC+0.5	V
VCC or GND Current	ICC	Output in the Power-off state	±100	mA
Continuous Output Current	IOUT	VOUT=0~VCC	±50	mA
Input Clamp Current	I _{IK}	V _{IN} <0	-50	mA
Output Clamp Current	I _{OK}	V _{OUT} <0	-50	mA
Storage Temperature Range	TSTG		-65 ~ +150	°C
Junction to Ambient	θ_{JA}	SOT23-5	230	°C/W
		SOT353	280	°C/W

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	VCC	Operating	1.65	--	5.5	V
		Data retention only	1.5	--	--	V
Input Voltage	VIN		0	--	5.5	V
Output Voltage	VOUT	High or low state	0	--	VCC	V
Operating Temperature	TA		-40	--	125	°C

Electrical Characteristics (TA = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-going input threshold voltage	V_{T+}	$V_{CC}=1.65V$	0.79	--	1.16	V
		$V_{CC}=2.3V$	1.11	--	1.56	V
		$V_{CC}=3V$	1.5	--	1.87	V
		$V_{CC}=4.5V$	2.16	--	2.74	V
		$V_{CC}=5.5V$	2.61	--	3.33	V
Negative-going input threshold voltage	V_{T-}	$V_{CC}=1.65V$	0.39	--	0.62	V
		$V_{CC}=2.3V$	0.58	--	0.87	V
		$V_{CC}=3V$	0.84	--	1.14	V
		$V_{CC}=4.5V$	1.41	--	1.79	V
		$V_{CC}=5.5V$	1.87	--	2.29	V
Hysteresis ($V_{T+} - V_{T-}$)	ΔV_T	$V_{CC}=1.65V$	0.37	--	0.62	V
		$V_{CC}=2.3V$	0.48	--	0.77	V
		$V_{CC}=3V$	0.56	--	0.87	V
		$V_{CC}=4.5V$	0.71	--	1.04	V
		$V_{CC}=5.5V$	0.71	--	1.11	V
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	--	--	--
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, $V_{CC}=1.65V \sim 5.5V$	--	--	± 1	μA
Power OFF Leakage Current	I_{off}	V_{IN} or $V_{OUT}=5.5V, V_{CC}=0V$	--	--	± 10	μA
Quiescent Supply Current	I_{CC}	$V_{IN}=V_{CC}$ 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 (TA =25°C , unless otherwise specified)

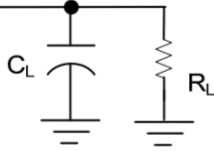
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t _{PLH} /t _{PHL}	V _{CC} =1.8V±0.15V	C _L =15pF	4	--	16	ns
			C _L =30pF	4	--	16	ns
		V _{CC} =2.5V±0.2V	C _L =15pF	2.5	--	7	ns
			C _L =30pF	3	--	7.5	ns
		V _{CC} =3.3V±0.3V	C _L =15pF	2	--	5.3	ns
			C _L =50pF	2	--	6	ns
		V _{CC} =5V±0.5V	C _L =15pF	1.5	--	4.4	ns
			C _L =50pF	2	--	5	ns

OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	f=10MHZ	V _{CC} =1.8V	--	17	--	pF
			V _{CC} =2.5V	--	18	--	pF
			V _{CC} =3.3V	--	18	--	pF
			V _{CC} =5.0V	--	20	--	pF

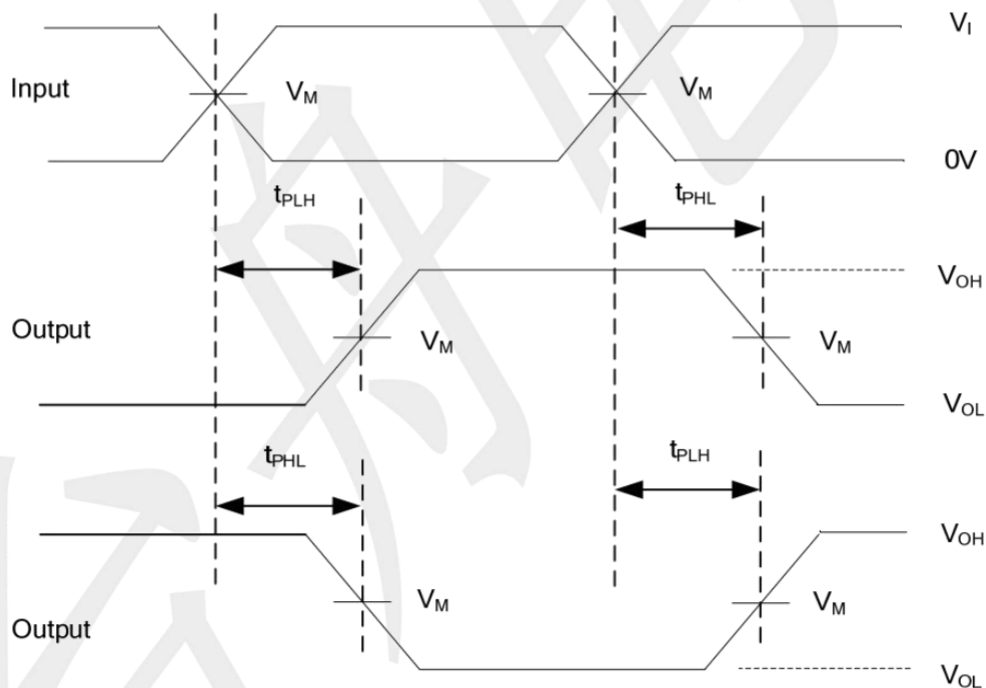
TEST CIRCUIT AND WAVEFORMS

From Output



TEST CIRCUIT

V_{CC}	INPUTS		V_M	C_L	R_L
	V_I	t_r / t_f			
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
				30pF	1K Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
				30pF	500 Ω
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	15pF	1M Ω
				50pF	500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	15pF	1M Ω
				50pF	500 Ω



PROPAGATION DELAY TIMES

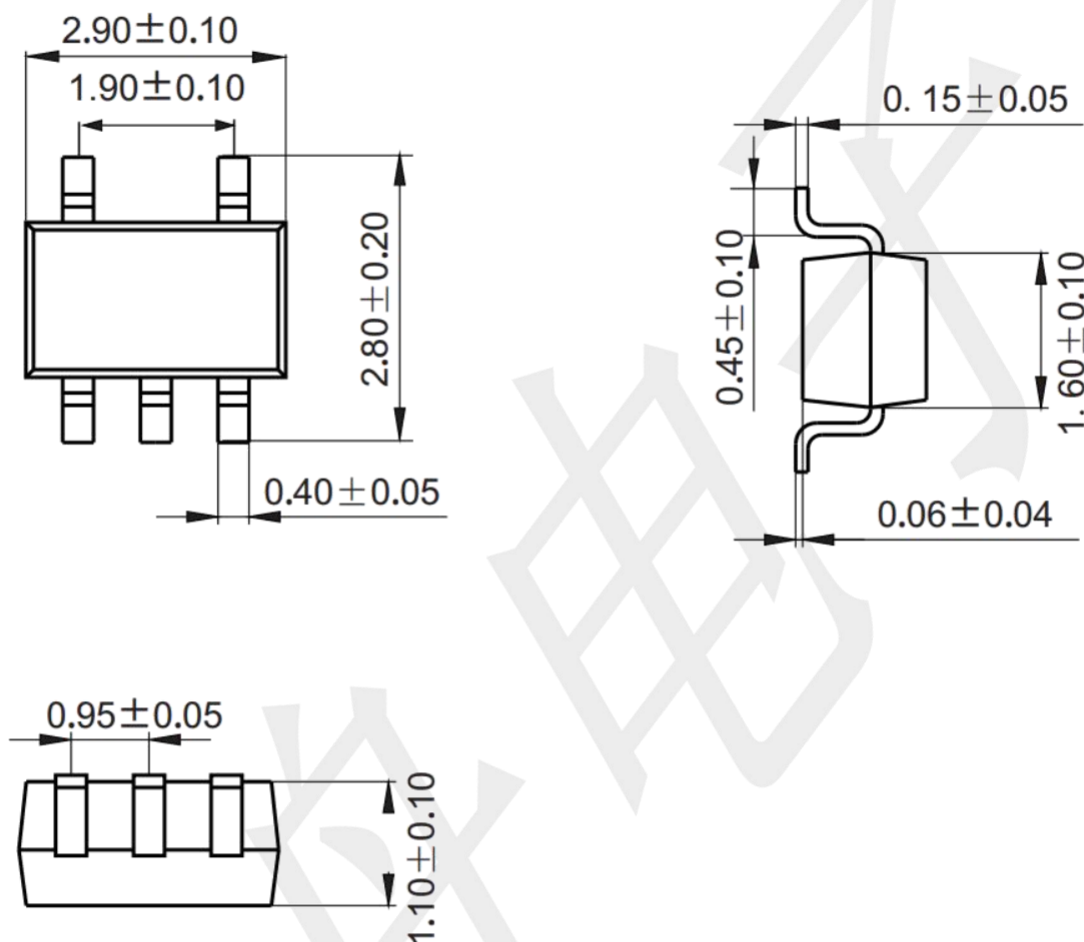
Figure 1. Test Circuit and Voltage Waveforms

Note: C_L includes probe and jig capacitance.

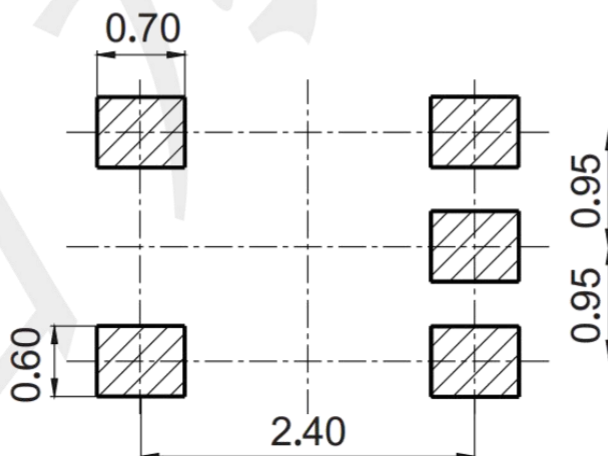
All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_O = 50\Omega$.

Package information

SOT23-5 (Unit: mm)

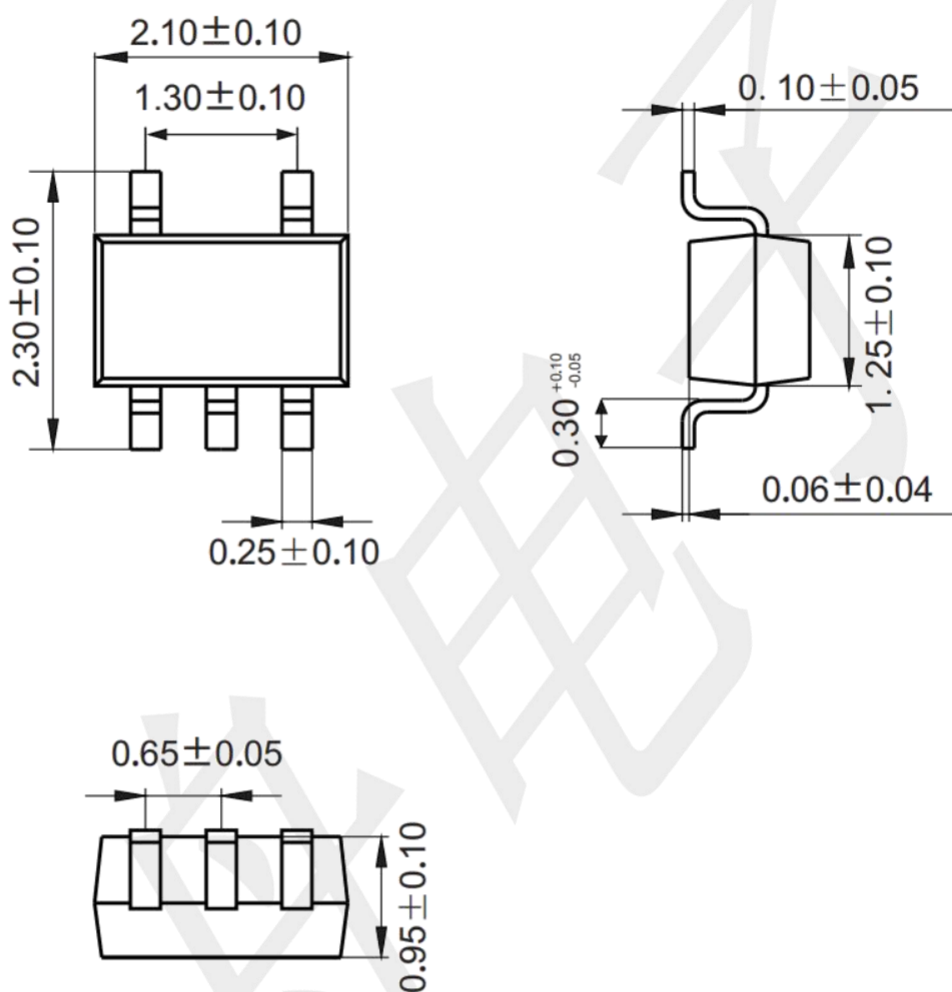


Mounting Pad Layout (Unit: mm)



Package information

SOT353 (Unit: mm)



Mounting Pad Layout (Unit: mm)

