TP74LVC2G14 Series

DUAL SCHMITT-TRIGGER INVERTER WITH 5V TOLERANT INPUT

Features

- Operation Voltage Range: 1.65V ~ 5.5V
- 5V Tolerant Input/Output for Interfacing with 5V logic
- ±24mA Output Drive (VCC=3.0V)
- CMOS Low-Power Consumption and High Noise Immunity
- ESD Protection Exceeds JESD 22
  -2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  -1000-V Charged-Device Model (C101)

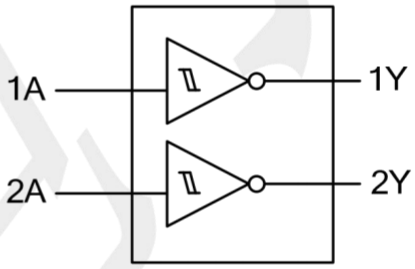
Applications

- 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 TP74LVC2G14 is a high-performance, low-power, low-voltage, Si-gate CMOS device which provides two inverters with Schmitt trigger action. It is capable of transforming slowly changed input signals into sharply defined, jitter-free output signals.

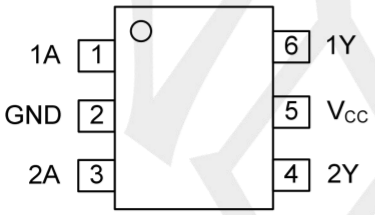
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	Marking
TP74LVC2G14S6	SOT23-6	Tape and Reel,3000	S214
TP74LVC2G14C6	SOT363	Tape and Reel,3000	C214

Pin Configuratio



SOT23-6

SOT363

Function Table

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

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

Absolute Maximum Ratings (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +6.5	V
Input Voltage	V_{IN}		-0.5 ~ +6.5	V
Output Voltage	V_{OUT}	High-impedance	-0.5 ~ +6.5	V
		Power-off	-0.5 ~ +6.5	V
		High State	-0.5 ~ $V_{CC+0.5}$	V
		Low State	-0.5 ~ $V_{CC+0.5}$	V
VCC or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_O		±50	mA
Input Clamp Current	I_{IK}		-50	mA
Output Clamp Current	I_{OK}		-50	mA
Storage Temperature Range	T_{STG}		-65 ~ +150	℃
Junction to Ambient	θ_{JA}	SOT-23-6	230	℃/W
		SOT363	280	℃/W

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

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	--	VCC	V
High Level Output Current	I_{OH}	V_{CC} =1.65V	--	--	-4	V
		V_{CC} =2.3V	--	--	-8	mA
		V_{CC} =3V	--	--	-16	mA
		V_{CC} =3V	--	--	-24	mA
		V_{CC} =4.5V	--	--	-32	mA
Low Level Output Current	I_{OL}	V_{CC} =1.65V	--	--	4	mA
		V_{CC} =2.3V	--	--	8	mA
		V_{CC} =3V	--	--	16	mA
		V_{CC} =3V	--	--	24	mA
		V_{CC} =4.5V	--	--	32	mA
Operating Temperature	T_A		-40	--	125	℃

Electrical Characteristics (unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	TA =25°C			TA =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V_{T+}	VCC=1.65V	0.7	1.24	1.5	0.7	--	1.7	V
		VCC=2.3V	1.0	1.54	1.8	1.0	--	2.0	V
		VCC=3V	1.3	1.86	2.2	1.3	--	2.4	V
		VCC=4.5V	1.9	2.59	3.1	1.9	--	3.3	V
		VCC=5.5V	2.2	3.08	3.7	2.2	--	3.8	V
Negative-Going Input Threshold Voltage	V_{T-}	V_{CC}=1.65V	0.25	0.61	0.9	0.25	--	1.1	V
		V_{CC}=2.3V	0.4	0.82	1.15	0.4	--	1.35	V
		V_{CC}=2.7V	0.6	1.15	1.5	0.6	--	1.7	V
		V_{CC}=4.5V	1.0	1.73	2.0	1.0	--	2.2	V
		V_{CC}=5.5V	1.2	2.13	2.5	1.2	--	2.5	V
Hysteresis Voltage (V_{T+}-V_{T-})	$\triangle V_T$	V_{CC}=1.65V	0.15	0.67	1.0	0.15	--	1.2	V
		V_{CC}=2.3V	0.25	0.72	1.1	0.25	--	1.3	V
		V_{CC}=2.7V	0.4	0.73	1.2	0.4	--	1.4	V
		V_{CC}=4.5V	0.6	0.92	1.5	0.6	--	1.7	V
		V_{CC}=5.5V	0.7	1.02	1.7	0.7	--	1.9	V
High-Level Output Voltage	V_{OH}	V_{CC}=1.65 ~ 5.5V, I_{OH}=-100μA	**V_{CC}-0.1**	**--**	**--**	**V_{CC}-0.1**	--	--	V
		V_{CC}=1.65V, I_{OH}=-4mA	1.2	--	--	0.95	--	--	V
		V_{CC}=2.3V, I_{OH}=-8mA	1.9	--	--	1.7	--	--	V
		V_{CC}=3.0V,I_{OH}=-16mA	2.2	--	--	1.9	--	--	V
		V_{CC}=3.0V,I_{OH}=-24mA	2.3	--	--	2.0	--	--	V
		V_{CC}=4.5V, I_{OH}=-32mA	3.8	--	--	3.4	--	--	V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65 ~ 5.5V, I_{OL}=100μA	--	--	0.1	--	--	0.1	V
		V_{CC}=1.65V, I_{OL}=4mA	--	--	0.45	--	--	0.7	V
		V_{CC}=2.3V, I_{OL}=8mA	--	--	0.3	--	--	0.45	V
		V_{CC}=3.0V,I_{OH}=16mA	--	--	0.4	--	--	0.6	V
		V_{CC}=3.0V,I_{OH}=24mA	--	--	0.55	--	--	0.8	V
		V_{CC}=4.5V, I_{OH}=32mA	--	--	0.55	--	--	0.8	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 5.5V, V_{IN}=5.5V or GND	--	--	±5	--	--	±5	uA
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V	--	±0.1	±10	--	--	±10	uA
Quiescent Supply Current	I_Q	VCC=1.65 ~ 5.5V, VIN=VCC or GND, IOUT=0A	--	0.1	10	--	--	10	uA
Additional Quiescent Supply ent Per Input Pin	ΔI_Q	V_{CC}=3 ~ 5.5V, One input at V_{CC}-0.6V, Other inputs at V_{CC} or GND， IOUT=0A	--	5	500	--	--	500	uA

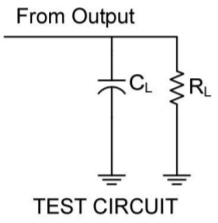
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=V_{CC} or GND	--	4	--	pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V,f=10MHz	--	16	--	pF
		V_{CC}=2.5V,f=10MHz	--	17	--	pF
		V_{CC}=3.3V,f=10MHz	--	18	--	pF
		V_{CC}=5V,f=10MHz	--	21	--	pF

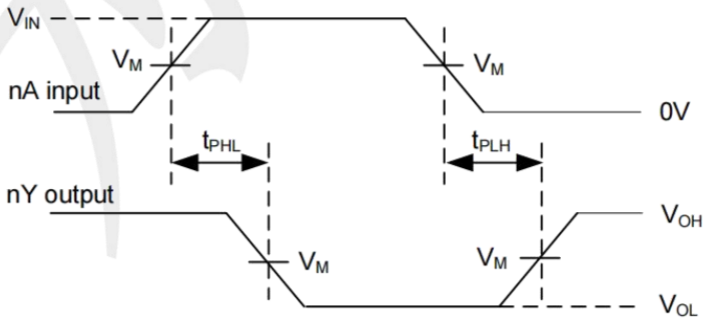
SWITCHING CHARACTERISTICS (TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	TA =25°C			TA =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output(Y)	t_{PLH} / t_{PHL}	V_{CC} =1.8V±0.15V, V_{IN}=V_{CC}, C_L=30pF, R_L=1KΩ	3.9	--	13	1.0	--	15	nS
		V_{CC}=2.5V±0.2V, V_{IN}=V_{CC},C_L=30pF, R_L=500Ω	1.9	--	6.5	1.0	--	8.5	nS
		V_{CC} =3.3V±0.3V, V_{IN}=3V,C_L=50pF, R_L=500Ω	2.0	--	6.1	1.0	--	8.1	nS
		V_{CC}=5V±0. 5V, V_{IN}=V_{CC},C_L=50pF, R_L=500Ω	1.5	--	5	0.5	--	6.0	nS

TEST CIRCUIT AND WAVEFORMS



V_{CC}	Inputs		V_M	C_L	R_L
	V_{IN}	t_R, t_F			
1.8V±0.15V	V_{CC}	≤2ns	V_{CC}/2	30pF	1kΩ
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0. 5V	V_{CC}	≤2.5ns	V_{CC}/2	50pF	500Ω

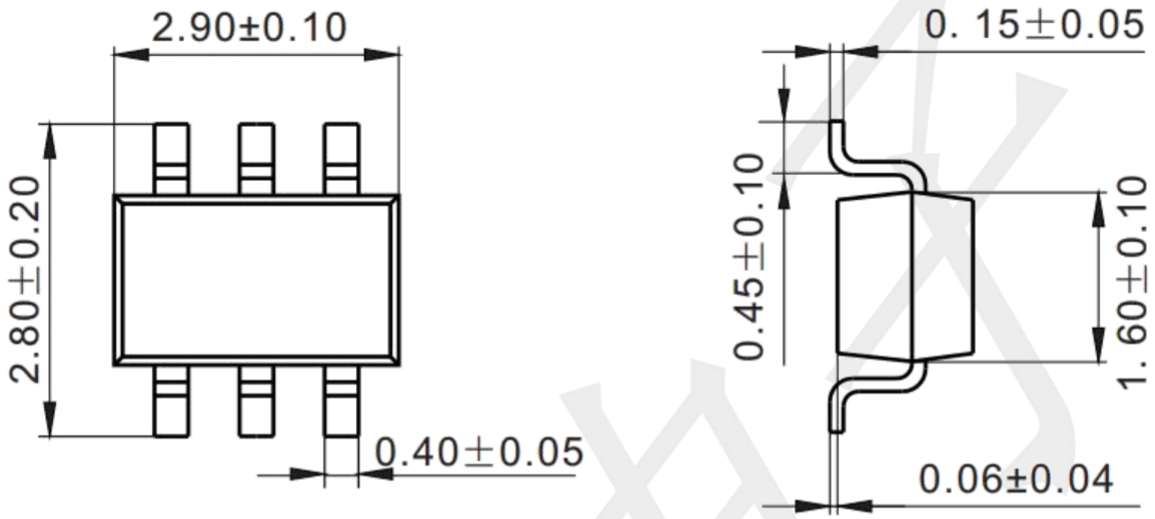


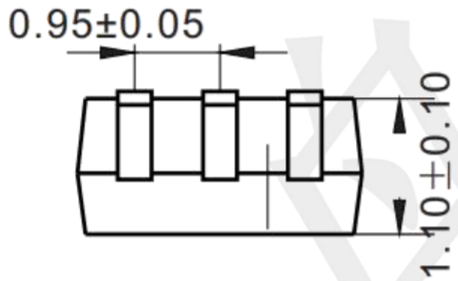
PROPAGATION DELAY TIMES

Note: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics:
PRR≤1MHz, Z_O = 50Ω: t_R≤2ns, t_F ≤2ns (V_{CC}=1.8V±0.15V and V_{CC}=2.5V±0.2V)
t_R ≤2.5ns, t_F ≤2.5ns (V_{CC} =3.3V±0.3V and V_{CC}=5V±0. 5V)

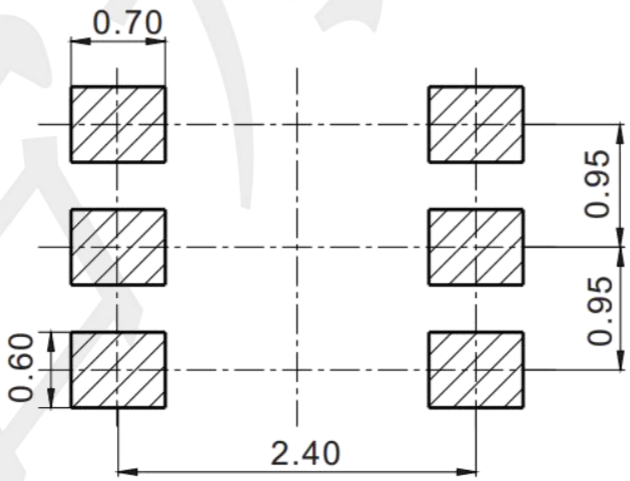
Package information

SOT23-6 (Unit: mm)



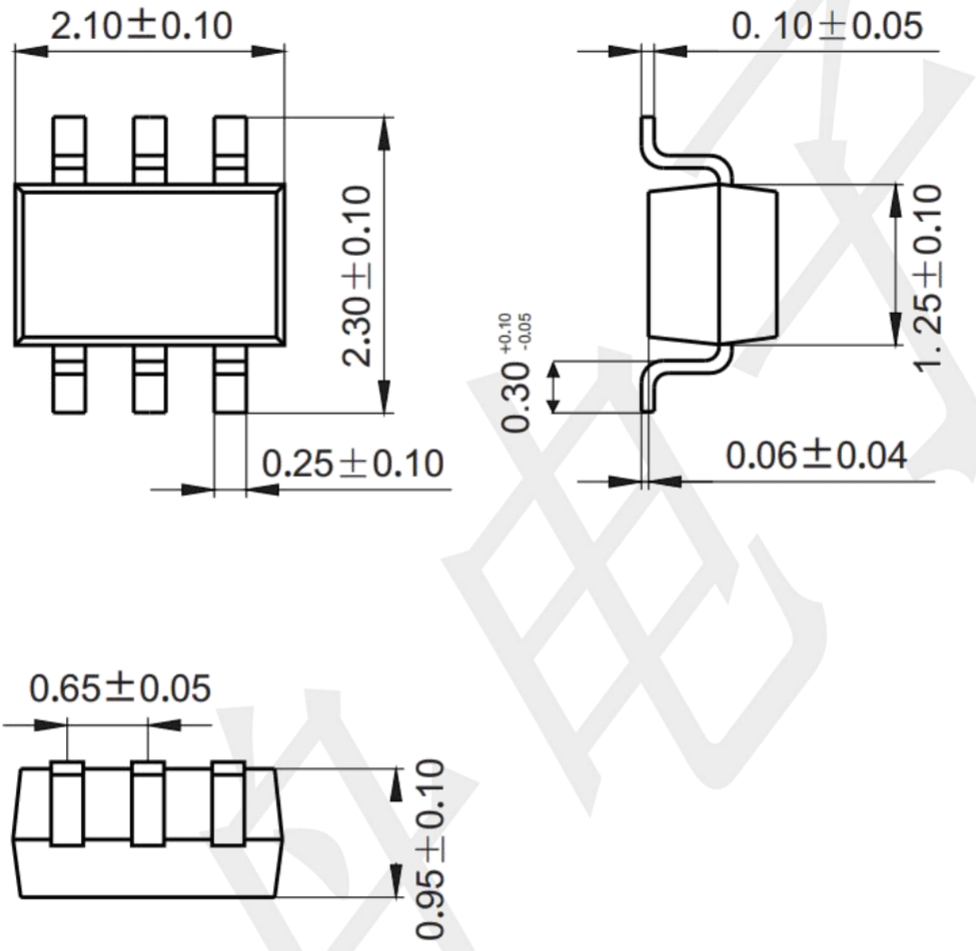


Mounting Pad Layout (unit: mm)



Package information

SOT363 (Unit: mm)



Mounting Pad Layout (unit: mm)