TECH PUBLIC
台舟电子

SN74LVC1G14

SINGLE SCHMITT-TRIGGER INVERTER

www.sot23.com.tw

Features

- Operation Voltage Range: 1.65V ~ 5.5V
- Low power current: I_{CC}=10μA(Max)
- ±24mA output drive (V_{CC}=3.0V)
- Power down protection
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 1000-V Charged-Device Model (C101)
- SOT23-5 Package Available
- SOT353 Package Available
- SOT553 Package Available

Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, Networking, Notebooks, Netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer Peripherals, Hard Drives, CD/DVD ROM
  - TV, DVD, DVR, Set-Top Box
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders

General Description

The SN74LVC1G14 is a single Schmitt-trigger inverter, it provides the function $\overline{Y} = A$.

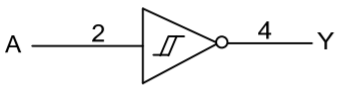
The device have different input threshold levels for positive-going (V_{T+}) and negative-going(V_{T-}) signals because of the Schmitt-trigger action in the input.

This device has power-down protective circuit, preventing device destruction when it is powered down.

Ordering Information

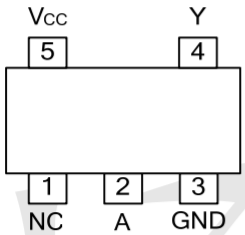
ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74LVC1G14DBVR	SOT23-5	Tape and Reel,3000
SN74LVC1G14DCKR	SOT353	Tape and Reel,3000
SN74LVC1G14DRLR	SOT553	Tape and Reel,4000

Logic Diagram



Logic symbol

Pin Configuration



SOT23-5
SOT353
SOT553

Marking

SN74LVC1G14DBVR Marking:C14F

SN74LVC1G14DCKR Marking:CFJ

SN74LVC1G14DRLR Marking:CFJ

Function Table

INPUT	OUTPUT
A	Y
L	H
H	L

Absolute Maximum Ratings

PARAMETER	SYMBOL	TEST 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}	Output in the high or low state	-0.5 ~ V_{CC}+0.5	V
		Output in the power-off state	-0.5 ~ 6.5	V
Continuous V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}		±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	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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
		Data retention only	1.5			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Ambient Operating Temperature	T_A		-40		+125	°C

Thermal Data

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-5	θ_{JC}	280	°C/W
	SOT-353		350	

Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Output Voltage	V_{OH}	V_{CC}=1.65V ~ 5.5V, I_{OH}=-100μA	V_{CC}-0.1			V_{CC}-0.1			V
		V_{CC}=1.65V, I_{OH}=-4mA	1.2	1.54		0.95			V
		V_{CC}=2.3V, I_{OH}=-8mA	1.9	2.15		1.7			V
		V_{CC}=2.7V, I_{OH}=-12mA	2.2	2.5		1.9			V
		V_{CC}=3.0V, I_{OH}=-24mA	2.3	2.62		2			V
		V_{CC}=4.5V, I_{OH}=-32mA	3.8	4.11		3.4			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65V ~ 5.5V, I_{OL}=100μA			0.1			0.1	V
		V_{CC}=1.65V, I_{OL}=4mA		0.07	0.45			0.7	V
		V_{CC}=2.3V, I_{OL}=8mA		0.12	0.3			0.45	V
		V_{CC}=2.7V, I_{OL}=12mA		0.17	0.4			0.6	V
		V_{CC}=3.0V, I_{OL}=24mA		0.33	0.55			0.8	V
		V_{CC}=4.5V, I_{OL}=32mA		0.39	0.55			0.8	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0V ~ 5.5V, V_{IN}=V_{CC} or GND		±0.1	±5			±5	μA
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{CC}=5.5V		±0.1	±10			±10	μA
Quiescent Supply Current	I_Q	V_{CC}=1.65V ~ 5.5V, V_{IN}=5.5V or GND, I_{OUT}=0		0.1	10			10	μA
Additional Quiescent Supply Current	$\triangle I_Q$	V_{CC}=2.3~5.5V, One input at V_{CC}-0.6V, other inputs at V_{CC} or GND		5	500			500	μA

Dynamic Characteristics

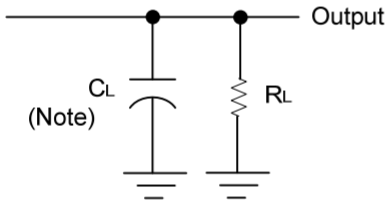
(Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-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}=1.65~1.95V, C_L=30pF, R_L=1kΩ	1	8	13			15	ns
		V_{CC}=2.3~2.7V, C_L=30pF, R_L=500Ω	0.7	5	9			11	ns
		V_{CC}=2.7V, C_L=50pF, R_L=500Ω	0.7	5	8			10	ns
		V_{CC}=3.0~3.6V, C_L=50pF, R_L=500Ω	0.7	4.5	7			9	ns
		V_{CC}=4.5~5.5V, C_L=50pF, R_L=500Ω	0.7	4	6			8	ns

Operating Characteristics

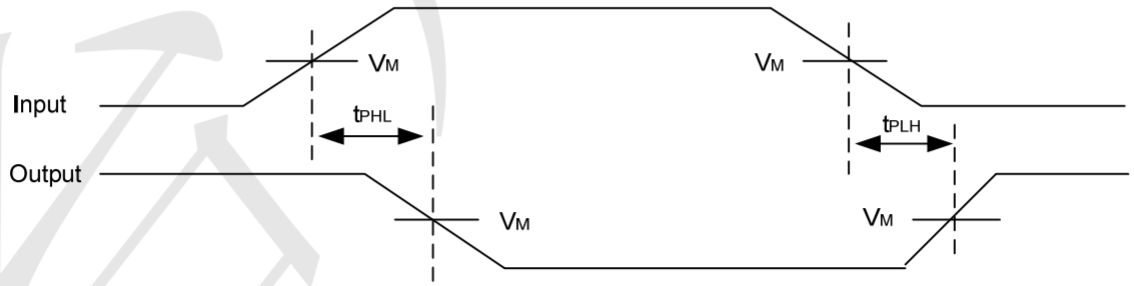
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	V_{CC} =3.3V, V_{IN}=V_{CC} or GND		5		pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=3.3V, V_{IN}= GND to V_{CC}		15.4		pF

Test Circuit And Waveforms



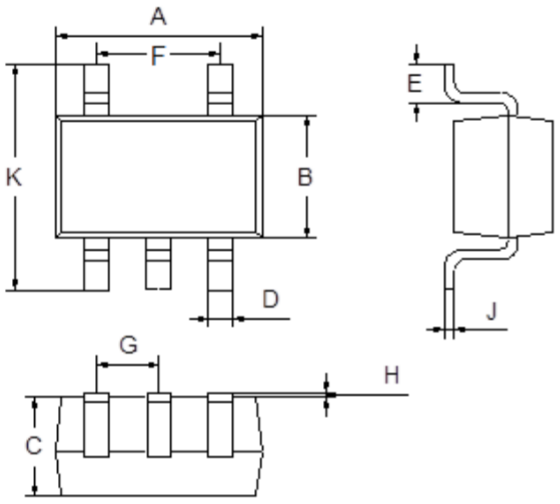
Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R, t_F	V_M	C_L	R_L
1.65V~1.95V	V_{CC}	≤2ns	$\frac{V_{CC}}{2}$	30pF	1kΩ
2.3V~2.7V	V_{CC}	≤2ns	$\frac{V_{CC}}{2}$	30pF	500Ω
2.7V	2.7V	≤2.5ns	1.5V	50pF	500Ω
3.0V~3.6V	2.7V	≤2.5ns	1.5V	50pF	500Ω
4.5V~5.5V	V_{CC}	≤2.5ns	$\frac{V_{CC}}{2}$	50pF	500Ω



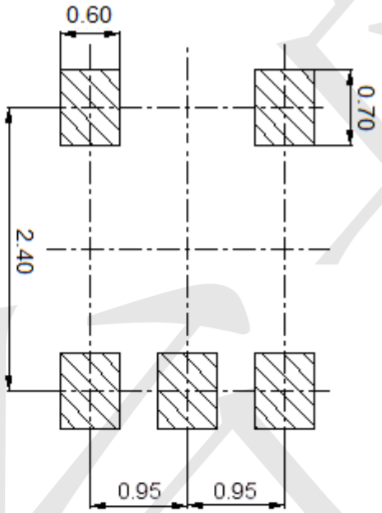
Package Outline Dimensions (Unit: mm)

SOT23-5



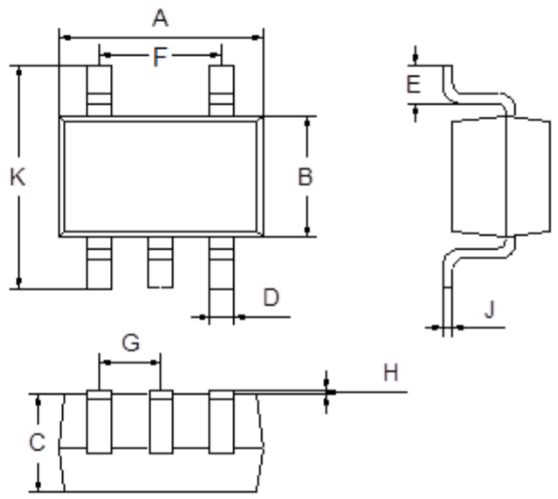
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)



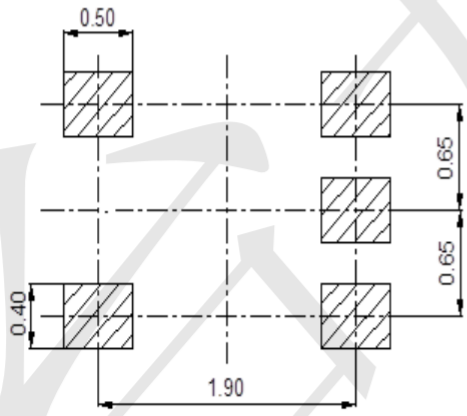
Package Outline Dimensions (Unit: mm)

SOT353



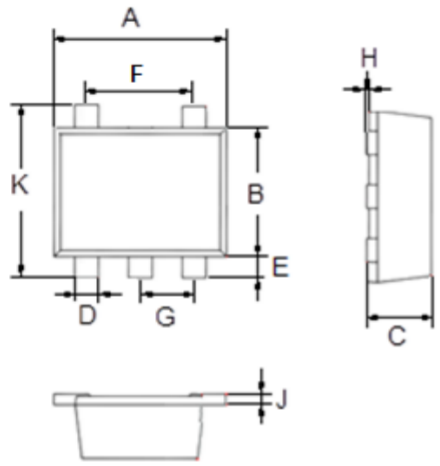
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
F	1.20	1.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

Mounting Pad Layout (Unit: mm)



Package Outline Dimensions (Unit: mm)

SOT553



Dimension	Min.	Max.
A	1.500	1.700
B	1.100	1.300
C	0.525	0.600
D	0.170	0.270
E	0.100	0.300
F	0.400	0.600
G	0.450	0.550
H	0.000	0.050
J	0.090	0.160
K	1.500	1.700

Mounting Pad Layout (Unit: mm)