

Features

- Operation Voltage Range: 1.65V ~ 5.5V
- Low power current: $I_{CC}=10\mu A(\text{Max})$
- $\pm 24\text{mA}$ output drive ($V_{CC}=3.0\text{V}$)
- 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

General Description

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

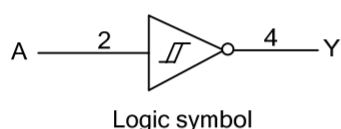
The device have different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals because of the Schmitt-trigger action in the input.

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

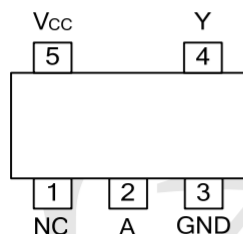
Ordering Information

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



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	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	ΔI _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

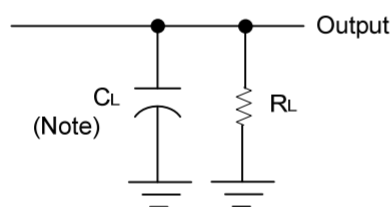
Dynamic Characteristics (Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

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

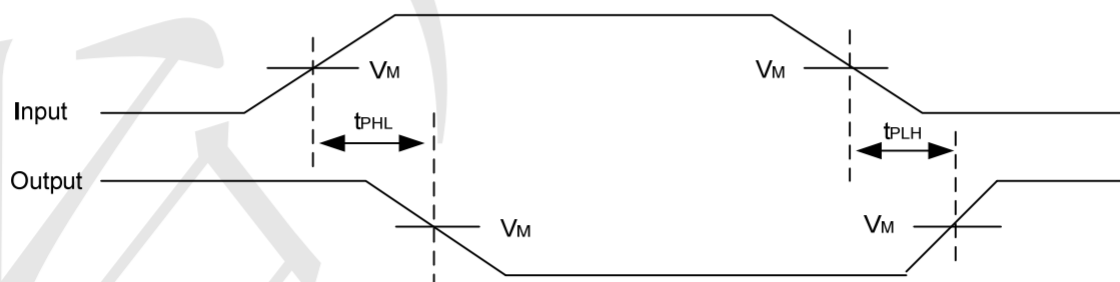
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC}=3.3V, V_{IN}=V_{CC}$ or GND		5		pF
Power Dissipation Capacitance	C_{PD}	$V_{CC}=3.3V, V_{IN}=GND$ to V_{CC}		15.4		pF

Test Circuit And Waveforms



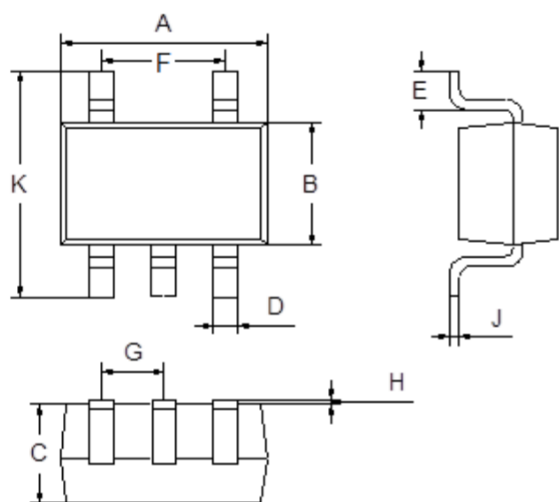
Note: C_L includes probe and jig capacitance.

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



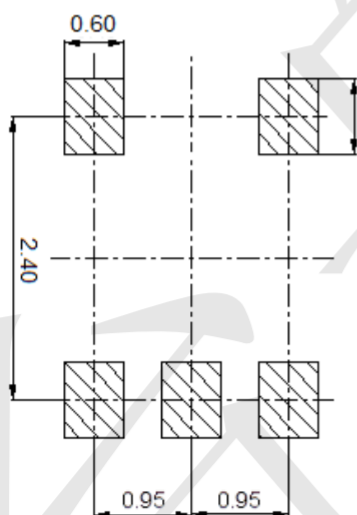
Package Outline Dimensions (Unit: mm)

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)





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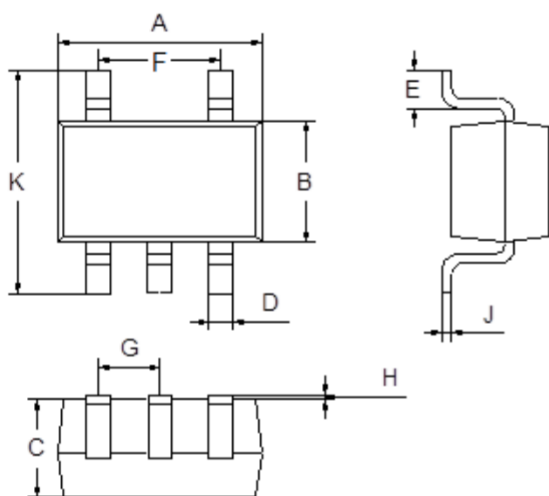
SN74LVC1G14

SINGLE SCHMITT-TRIGGER INVERTER

www.sot23.com.tw

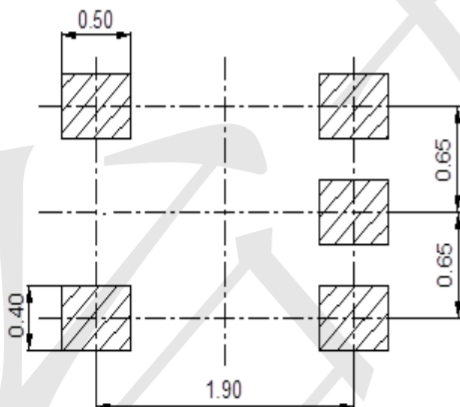
Package Outline Dimensions (Unit: mm)

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)





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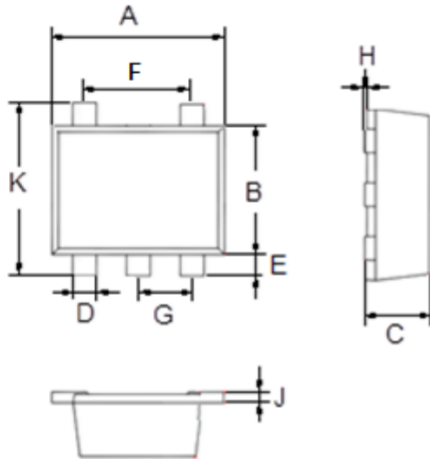
SN74LVC1G14

SINGLE 2-INPUT EXCLUSIVE-OR GATE

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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)

