TECH PUBLIC
台舟电子

SN74LVC1G04

Single Inverter Gate

www.sot23.com.tw

Features

- Operation voltage range: 1.65~5.5V
- Low power current: I_{CC}=10μA(Max)
- ±24mA output drive (V_{CC}=3.3V)
- High noise immunity
- 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

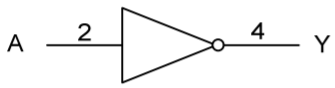
The **SN74LVC1G04** is a single inverter gate, it provides the function Y = A .

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

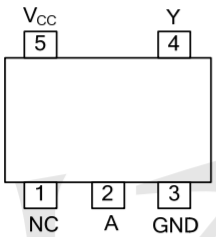
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74LVC1G04DBVR	SOT23-5	Tape and Reel,3000
SN74LVC1G04DCKR	SOT353	Tape and Reel,3000
SN74LVC1G04DRLR	SOT553	Tape and Reel,4000

Logic Diagram



Pin Configuration



SOT23-5
SOT353
SOT553

Marking

SN74LVC1G04DBVR Marking:C04F
SN74LVC1G04DCKR Marking:CC5
SN74LVC1G04DRLR Marking:CC7

Function Table

INPUT	OUTPUT
A	Y
H	L
L	H

Absolute Maximum Ratings

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5 ~ 6.5	V
Input Voltage		V_{IN}	-0.5 ~ 6.5	V
Output Voltage(Active Mode)		V_{OUT}	-0.5 ~ V_{CC}+0.5	V
Output Voltage(Power-Down Mode)		V_{OUT}	-0.5 ~ 6.5	V
Input Clamp Current(V_{IN}<0)		I_{IK}	-50	mA
Output Clamp Current(V_{OUT}<0)		I_{OK}	-50	mA
Output Current		I_{OUT}	±50	mA
V_{CC} or GND Current		I_{CC}	±100	mA
Power Dissipation (T_A=-40~+125°C)	SOT-23-5	P_D	300	mW
	SOT-353		250	mW
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-65 ~ +150	°C

Notes: 1. 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.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Thermal Data

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	SOT-23-5	θ_{JC}	75	°C/W
	SOT-353		145	

Recommended Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
		Data retention only	1.5			
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F	V_{CC} =1.8V±0.15V,2.5V±0.2V			20	ns/V
		V_{CC} =3.3V±0.3V			10	ns/V
		V_{CC} =5V±0.5V			5	ns/V
Operating Temperature	T_A		-40		+125	°C

Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Voltage High-Level	V_{IH}	V_{CC}= 1.65V~1.95V	0.65× V_{CC}			0.65× V_{CC}			V
		V_{CC}= 2.3V~2.7V	1.7			1.7			
		V_{CC}= 2.7V~3.6V	2			2			
		V_{CC}= 4.5V~5.5V	0.7× V_{CC}			0.7× V_{CC}			
Input Voltage Low-Level	V_{IL}	V_{CC}= 1.65V~1.95V			0.35× V_{CC}			0.35× V_{CC}	V
		V_{CC}= 2.3V~2.7V			0.7			0.7	
		V_{CC}= 2.7V~3.6V			0.8			0.8	
		V_{CC}= 4.5V~5.5V			0.3× V_{CC}			0.3× V_{CC}	
Output Voltage High-Level	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			0.95			
		V_{CC}= 2.3V, I_{OH}=-8mA	1.9			1.7			
		V_{CC}= 3V, I_{OH}=-16mA	2.2			1.9			
		V_{CC}= 3V, I_{OH}=-24mA	2.3			2.0			
		V_{CC}= 4.5V, I_{OH}=-32mA	3.8			3.4			
Output Voltage Low-Level	V_{OL}	V_{CC}= 1.65V~5.5V, I_{OL}=100μA			0.1			0.1	V
		V_{CC}= 1.65V, I_{OL}=4mA			0.45			0.7	
		V_{CC}= 2.3V, I_{OL}=8mA			0.3			0.45	
		V_{CC}= 3V, I_{OL}=16mA			0.4			0.6	
		V_{CC}= 3V, I_{OL}=24mA			0.55			0.8	
		V_{CC}= 4.5V, I_{OL}=32mA			0.55			0.8	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}= 0~5.5V, V_{IN}=5.5V or GND		±0.1	±5			±5	μA
Power OFF Leakage Current	I_{OFF}	V_{CC}= 0V, V_{IN} or V_{OUT} =5.5V		±0.1	±10			±10	μA
Quiescent Supply Current	I_Q	V_{CC}= 1.65V~5.5V, V_{IN}=5.5 or GND, I_{OUT}=0		0.1	10			10	μA
Additional Quiescent Supply Current	ΔI_Q	V_{CC}= 3V~5.5V, One input at V_{CC}- 0.6V, other inputs at V_{CC} or GND		5	500			500	μA

Note: All typical values are measured at V_{CC}=3.3V and T_A=25°C.

Dynamic Characteristics

(Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

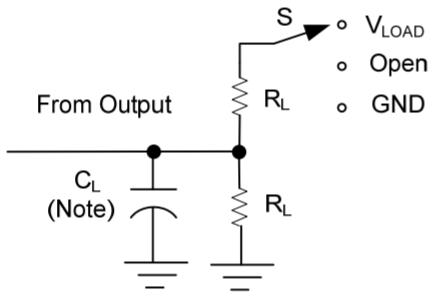
PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (A or B) to Output (Y)	t_{PLH} / t_{PHL}	V_{CC}= 1.8V±0.15V, C_L=15 pF	1.0		11			14	ns
		V_{CC}= 2.5V±0.2V, C_L=15 pF	0.5		8			10.5	ns
		V_{CC}= 3.3V±0.3V, C_L=15 pF	0.5		6			8	ns
		V_{CC}= 5V±0.5V, C_L=15 pF	0.5		5			6	ns
		V_{CC}= 1.8V±0.15V, C_L=30pF	1.0		12			15	ns
		V_{CC}= 2.5V±0.2V, C_L=30pF	0.5		9			11.5	ns
		V_{CC}= 3.3V±0.3V, C_L=50 pF	0.5		7			9	ns
		V_{CC}= 5V±0.5V, C_L=50 pF	0.5		6			7	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		3.5		pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V, f=10MHz		16		pF
		V_{CC}=2.5V, f=10MHz		18		pF
		V_{CC}=3.3V, f=10MHz		18		pF
		V_{CC}=5V, f=10MHz		20		pF

Note: All typical values are measured at T_A=25°C.

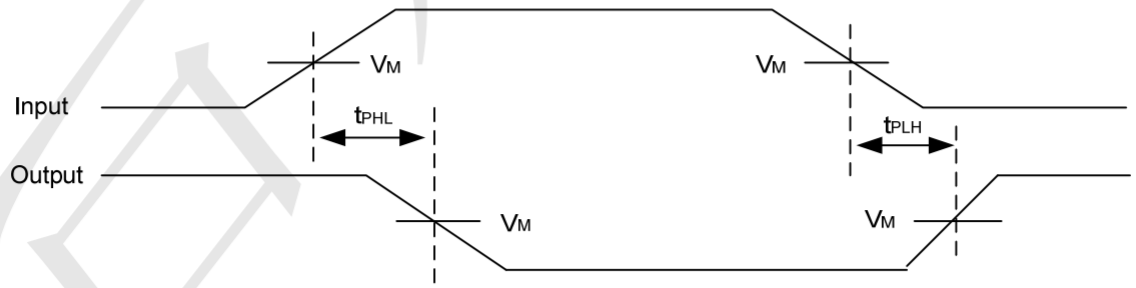
Test Circuit And Waveforms



TEST	S
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

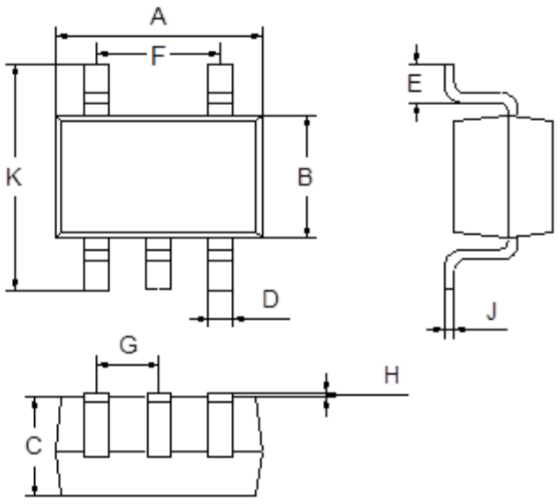
Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R, t_F	V_M	V_{LOAD}	C_L	R_L	V_Δ
1.8V±0.15V	V_{CC}	≤2ns	V_{CC}/2	2×V_{CC}	15pF	1MΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	2×V_{CC}	15pF	1MΩ	0.15V
3.3V±0.3V	3 V	≤2.5ns	1.5V	6V	15pF	1MΩ	0.3V
5V±0.5V	V_{CC}	≤2.5ns	V_{CC}/2	2×V_{CC}	15pF	1MΩ	0.3V
1.8V±0.15V	V_{CC}	≤2ns	V_{CC}/2	2×V_{CC}	30pF	1kΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	2×V_{CC}	30pF	500Ω	0.15V
3.3V±0.3V	3 V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.5V	V_{CC}	≤2.5ns	V_{CC}/2	2×V_{CC}	50pF	500Ω	0.3V



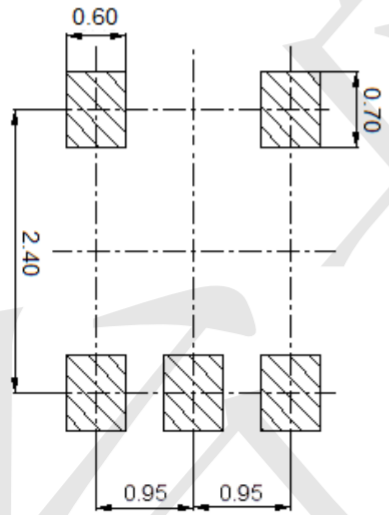
Package Outline Dimensions (Unit: mm)

SOT23-5



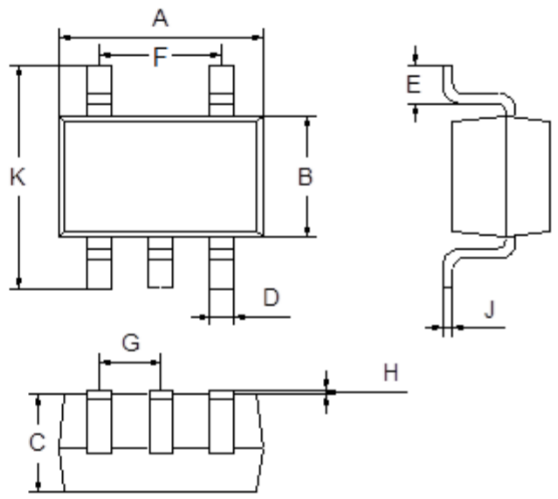
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)



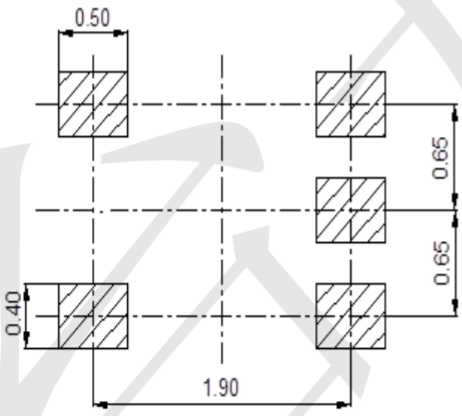
Package Outline Dimensions (Unit: mm)

SOT353



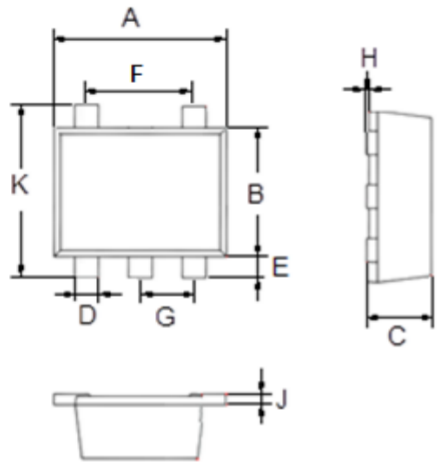
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
F	1.20	1.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

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)