TECH PUBLIC
台舟电子

SN74LVC1G00

SINGLE 2-INPUT NAND GATE

www.sot23.com.tw

Features

- Operate from 1.65V to 5.5V
- Inputs accept voltages to 5.5V
- High Noise Immunity
- Low power dissipation
- 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 Descrition

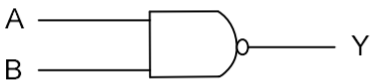
The SN74LVC1G00 is a 2-input NAND gate device which provides the Function $Y=\overline{A \bullet B}$ or $Y=\overline{A}+\overline{B}$ in positive logic.

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

Ordering Information

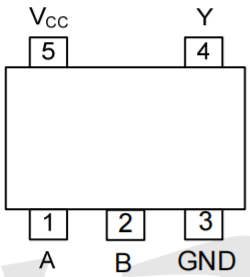
ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74LVC1G00DBVR	SOT23-5	Tape and Reel,3000
SN74LVC1G00DCKR	SOT353	Tape and Reel,3000
SN74LVC1G00DRLR	SOT553	Tape and Reel,4000

Logic Diagram



Logic symbol

Pin Configuration



SOT-23-5
SOT-353
SOT-553

Marking

SN74LVC1G00DBVR Marking:C00F
SN74LVC1G00DCKR Marking:CA5
SN74LVC1G00DRLR Marking:CA7

Function Table

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

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

Absolute Maximum Ratings

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}	Output in the Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ V_{CC}+0.5	V
V_{CC} or GND Current	I_{CC}	Output in the Power-off state	±100	mA
Continuous Output Current	I_{OUT}	V_{OUT}=0~V_{CC}	±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.

Thermal Data

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

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
High-level Output Current	I_{OH}	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
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
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~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	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
		V_{CC}=3V~3.6V	2			2			V
		V_{CC}=4.5V~5.5V	0.7 ×V_{CC}			0.7 ×V_{CC}			V
Low-Level Input Voltage	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
		V_{CC}=3V~3.6V			0.8			0.8	V
		V_{CC}=4.5V~5.5V			0.3 ×V_{CC}			0.3 ×V_{CC}	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	2.4			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_{OL}=16mA			0.4			0.6	V
		V_{CC}=3.0V, I_{OL}=24mA			0.55			0.80	V
		V_{CC}=4.5V, I_{OL}=32mA			0.55			0.80	V
Input Leakage Current	$I_{I(LEAK)}$	V_{IN}=5.5V or GND, V_{CC}=0 ~ 5.5V			±5			±5	μA
Power OFF Leakage Current	I_{OFF}	V_{IN} or V_{OUT}=5.5V, V_{CC}=0V			±10			±10	μA
Quiescent Supply Current	I_Q	V_{IN}=V_{CC} or GND, I_{OUT}=0, V_{CC}=1.65~5.5V			10			10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_Q	V_{CC}=3~5.5V, One input at V_{CC}-0.6V, Other inputs at V_{CC} or GND			500			500	μA

Dynamic Characteristics

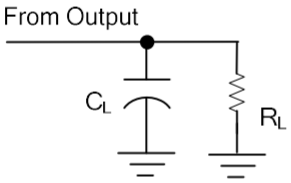
(Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS		T_A=25°C			T_A=--40~+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}=1.8±0.15V	C_L=15pF R_L=1MΩ	1.0		8.2	1.0		9.7	ns
		V_{CC}=2.5±0.2V		0.5		5.4	0.5		6.9	ns
		V_{CC}=3.3±0.3V		0.5		4.8	0.5		6.3	ns
		V_{CC}=5±0.5V		0.5		4.4	0.5		5.9	ns
		V_{CC}=1.8±0.15V, R_L=1KΩ	C_L=30pF	1.0		11	1.0		12	ns
		V_{CC}=2.5±0.2V, R_L=500Ω		0.5		7	0.5		9	ns
		V_{CC}=3.3±0.3V, R_L=500Ω		0.5		6.2	0.5		8.2	ns
		V_{CC}=5±0.5V, R_L=500Ω		0.5		5.1	0.5		6.5	ns

Operating Characteristics

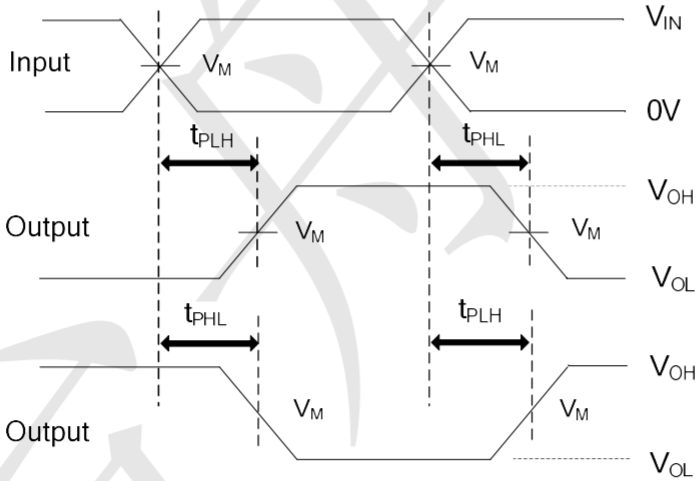
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=V_{CC} or GND		4		pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V		22		pF
		V_{CC}=2.5V		22		pF
		V_{CC}=3.3V		23		pF
		V_{CC}=5.0V		25		pF

Test Circuit And Waveforms



TEST CIRCUIT

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	15pF	1MΩ
2.5V±0.2V	V_{CC}	≤2ns	V_{CC}/2	15pF	1MΩ
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
5V±0.5V	V_{CC}	≤2.5ns	V_{CC}/2	15pF	1MΩ

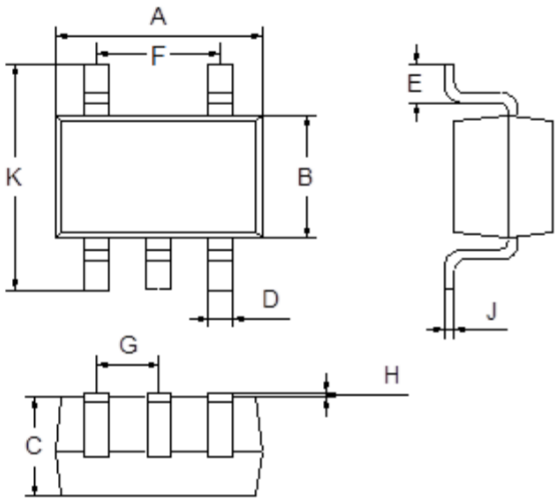


PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.
All input pulses are supplied by generators having the following characteristics: P_{RR} ≤10MHz, Z_O = 50Ω.

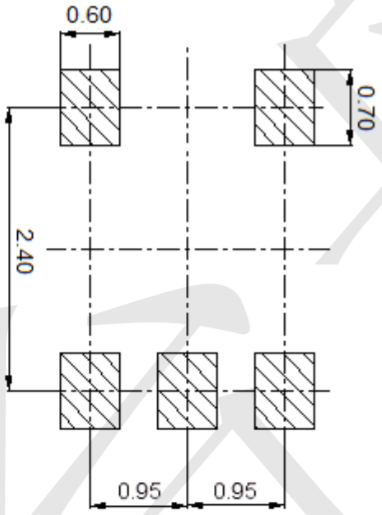
Package Outline Dimensions (Unit: mm)

SOT23-5



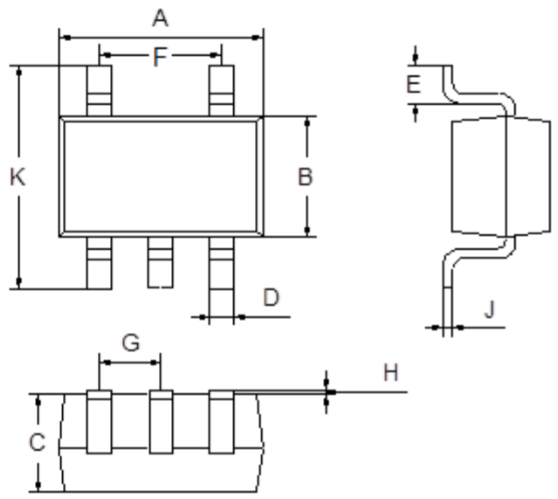
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)



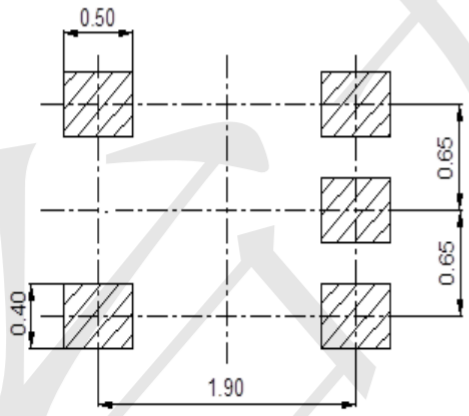
Package Outline Dimensions (Unit: mm)

SOT353



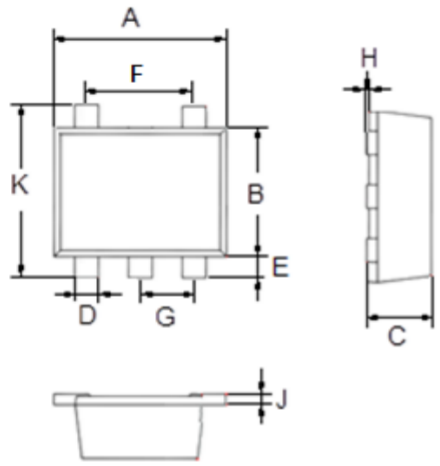
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
F	1.20	1.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

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)