TECH PUBLIC
台舟电子

SN74LVC1G02

SINGLE 2-INPUT NOR GATE

www.sot23.com.tw

Features

* Operation Voltage Range: 1.6V ~ 5.5V
* Low Power Current: I_{CC}=10μA (Max.)
* ±24mA Output Drive (V_{CC}=3.0V)
* Power Down Protection

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

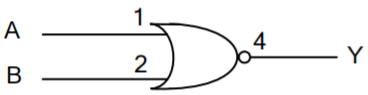
The SN74LVC1G02 is a 2-input NOR gate device which provides the Function $Y=\overline{A+B}$ in positive logic.

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

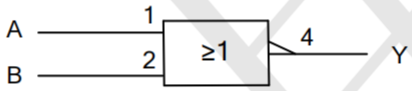
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74LVC1G02DBVR	SOT23-5	Tape and Reel,3000
SN74LVC1G02DCKR	SOT353	Tape and Reel,3000

Logic Diagram

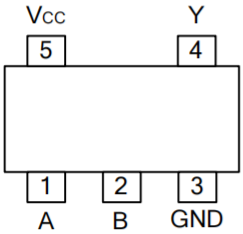


Logic Symbol



IEC Logic Symbol

Pin Configuration



SOT23-5/ SOT353

Marking

SN74LVC1G02DBVR Marking:C02F

SN74LVC1G02DCKR Marking:CB5

Function Table

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

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

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}	V_{OUT}=0 to 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 date

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-25	θ_{JA}	230	°C/W
	SOT-353		350	°C/W

Recommended Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0	5.0	5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	V_{CC}=3.3V±0.3V			100	ns/V
		V_{CC}=5V±0.5V			20	ns/V
Operating Temperature	T_A		-40		+125	°C

Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}=1.65V ~ 1.95V		0.65xV_{CC}			V
		V_{CC}=2.3V ~ 2.7V		1.7			V
		V_{CC}=3V ~ 3.6V		2			V
		V_{CC}=4.5V ~ 5.5V		0.7xV_{CC}			V
Low-Level Input Voltage	V_{IL}	V_{CC}=1.65V ~ 1.95V				0.35xV_{CC}	V
		V_{CC}=2.3V ~ 2.7V				0.7	V
		V_{CC}=3V ~ 3.6V				0.8	V
		V_{CC}=4.5V ~ 5.5V				0.3xV_{CC}	V
High-Level Output Voltage	V_{OH}	V_{CC}=1.65 ~ 5.5V, I_{OH}=-100μA		V_{CC}-0.1			V
		V_{CC}=1.65V, I_{OH}=-4mA		1.2			V
		V_{CC}=2.3V, I_{OH}=-8mA		1.9			V
		V_{CC}=3.0V	I_{OH}=-16mA	2.4			V
			I_{OH}=-24mA	2.3			V
		V_{CC}=4.5V, I_{OH}=-32mA		3.8			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65 ~ 5.5V, I_{OL}=100μA				0.1	V
		V_{CC}=1.65V, I_{OL}=4mA				0.45	V
		V_{CC}=2.3V, I_{OL}=8mA				0.3	V
		V_{CC}=3.0V	I_{OL}=16mA			0.4	V
			I_{OL}=24mA			0.55	V
		V_{CC}=4.5V, I_{OL}=32mA				0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 5.5V, V_{IN}=5.5V or GND				±5	μA
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V				±10	μA
Quiescent Supply Current	I_Q	V_{CC}=1.65 ~ 5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0A				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	μA
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=V_{CC} or GND			4		pF

Dynamic Characteristics

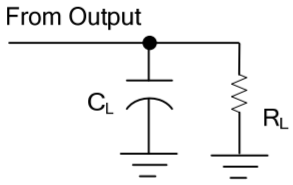
(Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH} / t_{PHL}	C_L=15pF R_L=1MΩ	V_{CC}=1.8±0.15V	1.9		7.2	ns
			V_{CC}=2.5±0.2V	0.8		4.4	ns
			V_{CC}=3.3±0.3V	0.8		3.6	ns
			V_{CC}=5±0.5V	0.8		3.4	ns
	t_{PLH} / t_{PHL}	C_L=30pF	V_{CC}=1.8±0.15V, R_L=1KΩ	2.8		8	ns
			V_{CC}=2.5±0.2V, R_L=500Ω	1.2		5.5	ns
		C_L=50pF R_L=500Ω	V_{CC}=3.3±0.3V	1		4.5	ns
			V_{CC}=5±0.5v	1		4	ns

Operating Characteristics

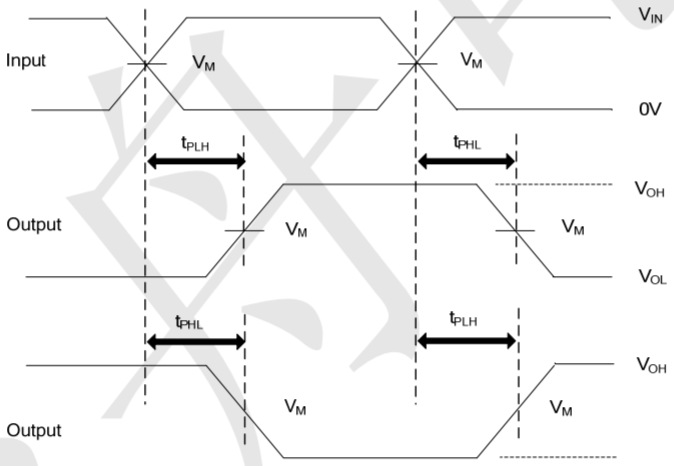
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V		23		pF
		V_{CC}=2.5V		23		pF
		V_{CC}=3.3V		23		pF
		V_{CC}=5.0V		25		pF

Test Circuit And Waveforms



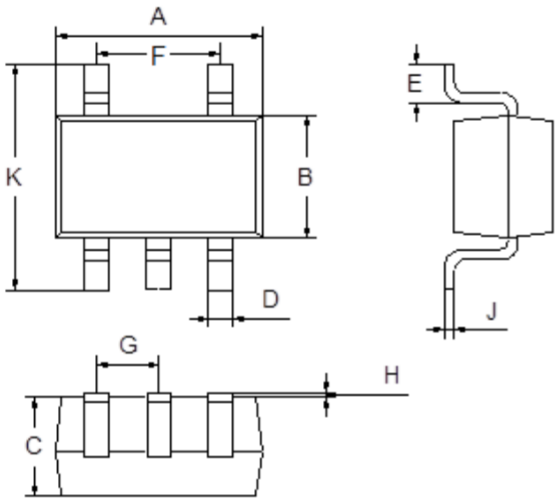
TEST CIRCUIT

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
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



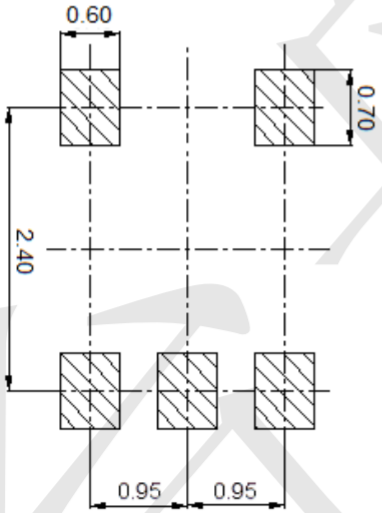
Package Outline Dimensions (Unit: mm)

SOT23-5



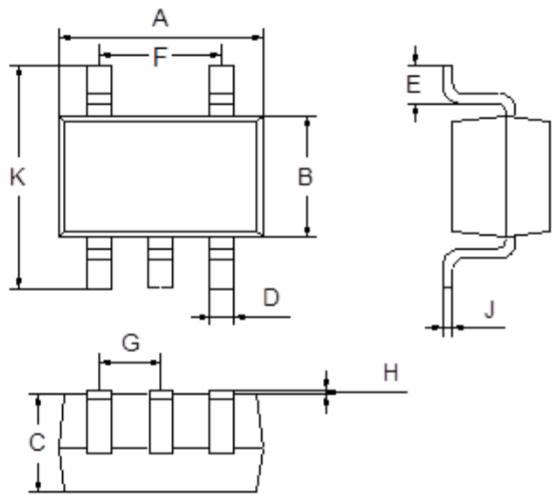
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

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)

