

### Features

- Operation voltage range: 1.65~5.5V
- Inputs Accept Voltages To 5.5V
- High noise immunity
- Low Power Dissipation
- Max  $t_{PD}$  Of 3.2 ns At 5V
- SOT23-6 Package Available
- SOT363 Package Available

### General Description

The SN74LVC2G04 is a dual inverter gate and it provides the Boolean function  $Y = \bar{A}$  in positive logic.

This device has power-down protective circuit to prevent the device from destruction when it is powered down.

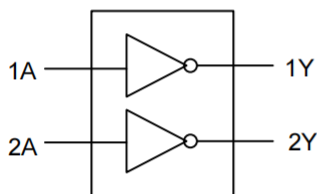
### Applications

- 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

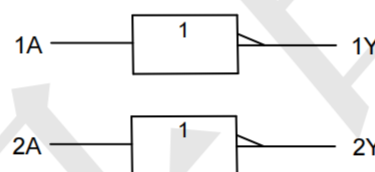
### Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74LVC2G04DBVR	SOT23-6	Tape and Reel,3000
SN74LVC2G04DCKR	SOT363	Tape and Reel,3000

### Logic Diagram

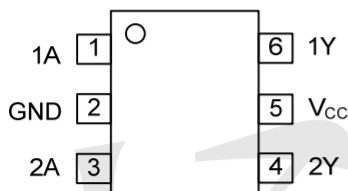


Logic symbol



IEC logic symbol

### Pin Configuration



### Marking

SN74LVC2G04DBVR Marking:C04R

SN74LVC2G04DCKR Marking:CCR

### Function Table

INPUT(nA)	OUTPUT(nY)
H	L
L	H

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

## 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
	Power-Down Mode		-0.5 ~ +6.5	V
$V_{CC}$ or GND Current		$I_{CC}$	±100	mA
Continuous Output Current ( $V_{OUT}=0$ to $V_{CC}$ )		$I_{OUT}$	±50	mA
Input Clamp Current ( $V_{IN}<0$ )		$I_{IK}$	-50	mA
Output Clamp Current ( $V_{OUT}>V_{CC}$ or $V_{OUT}<0$ )		$I_{OK}$	-50	mA
Power Dissipation ( $T_A=-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ )		$P_D$	300	mW
Operating Junction Temperature		$T_J$	-40 ~ +125	$^{\circ}\text{C}$
Storage Temperature		$T_{STG}$	-65 ~ +150	$^{\circ}\text{C}$

- 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.

## Recommended Operating Conditions

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage		$V_{CC}$	1.65		5.5	V
Input Voltage		$V_{IN}$	0		5.5	V
Output Voltage	Active Mode	$V_{OUT}$	0		$V_{CC}$	V
	Power-Down Mode		0		5.5	V
Input Transition Rise or Fall Rate	$V_{CC}=1.65\text{V to }2.7\text{V}$	$t_R / t_F$	0		20	ns/V
	$V_{CC}=2.7\text{V to }5.5\text{V}$		0		10	ns/V

**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

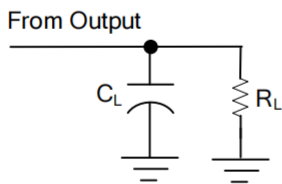
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	$V_{IH}$	$V_{CC}=1.65\text{V} \sim 1.95\text{V}$	$0.65 \times V_{CC}$			V
		$V_{CC}=2.3\text{V} \sim 2.7\text{V}$	1.7			V
		$V_{CC}=2.7\text{V} \sim 3.6\text{V}$	2			V
		$V_{CC}=4.5\text{V} \sim 5.5\text{V}$	$0.7 \times V_{CC}$			V
Low-level Input Voltage	$V_{IL}$	$V_{CC}=1.65\text{V} \sim 1.95\text{V}$			$0.35 \times V_{CC}$	V
		$V_{CC}=2.3\text{V} \sim 2.7\text{V}$			0.7	V
		$V_{CC}=2.7\text{V} \sim 3.6\text{V}$			0.8	V
		$V_{CC}=4.5\text{V} \sim 5.5\text{V}$			$0.3 \times V_{CC}$	V
High-Level Output Voltage	$V_{OH}$	$V_{CC}=1.65 \sim 5.5\text{V}$ , $I_{OH}=-100\mu\text{A}$	$V_{CC}-0.1$			V
		$V_{CC}=1.65\text{V}$ , $I_{OH}=-4\text{mA}$	1.2			V
		$V_{CC}=2.3\text{V}$ , $I_{OH}=-8\text{mA}$	1.9			V
		$V_{CC}=2.7\text{V}$ , $I_{OH}=-12\text{mA}$	2.2			V
		$V_{CC}=3.0\text{V}$ , $I_{OH}=-24\text{mA}$	2.3			V
		$V_{CC}=4.5\text{V}$ , $I_{OH}=-32\text{mA}$	3.8			V
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=1.65 \sim 5.5\text{V}$ , $I_{OL}=100\mu\text{A}$			0.1	V
		$V_{CC}=1.65\text{V}$ , $I_{OL}=4\text{mA}$			0.45	V
		$V_{CC}=2.3\text{V}$ , $I_{OL}=8\text{mA}$			0.3	V
		$V_{CC}=2.7\text{V}$ , $I_{OL}=12\text{mA}$			0.4	V
		$V_{CC}=3.0\text{V}$ , $I_{OL}=24\text{mA}$			0.55	V
		$V_{CC}=4.5\text{V}$ , $I_{OL}=32\text{mA}$			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=5.5\text{V}$ , $V_{IN}=5.5\text{V}$ or GND		$\pm 0.1$	$\pm 5$	$\mu\text{A}$
Power OFF Leakage Current	$I_{OFF}$	$V_{CC}=0\text{V}$ , $V_{IN}$ or $V_{OUT}=5.5\text{V}$		$\pm 0.1$	$\pm 10$	$\mu\text{A}$
Quiescent Supply Current	$I_Q$	$V_{CC}=5.5\text{V}$ , $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$		0.1	10	$\mu\text{A}$
Additional Quiescent Supply Current Per Input Pin	$\Delta I_{CC}$	$V_{CC}=2.3 \sim 5.5\text{V}$ , One input at $V_{CC}-0.6\text{V}$ , Other inputs at $V_{CC}$ or GND		5	500	$\mu\text{A}$

**Switching Characteristics** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input (A) to output(Y)	$t_{PLH}$ $t_{PHL}$	$C_L=30\text{pF}$	$V_{CC}=1.8 \pm 0.15\text{V}$ , $R_L=1\text{K}\Omega$	1.0	3.5	8.0	ns
			$V_{CC}=2.5 \pm 0.2\text{V}$ , $R_L=500\Omega$	1.0	2.2	4.4	ns
		$C_L=50\text{pF}$	$V_{CC}=2.7\text{V}$ , $R_L=500\Omega$	1.0	2.7	5.2	ns
			$V_{CC}=3.3 \pm 0.3\text{V}$ , $R_L=500\Omega$	0.5	2.7	4.1	ns
			$V_{CC}=5 \pm 0.5\text{V}$ , $R_L=500\Omega$	1.0	1.9	3.2	ns

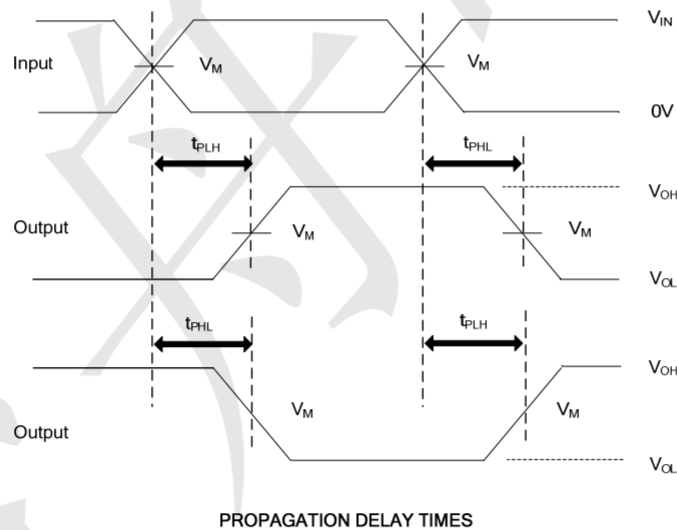


**TEST CIRCUIT AND WAVEFORMS**



**TEST CIRCUIT**

$V_{CC}$	Inputs		$V_M$	$C_L$	$R_L$
	$V_{IN}$	$t_R, t_F$			
$1.8V \pm 0.15V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	30pF	1K $\Omega$
$2.5V \pm 0.2V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	30pF	500 $\Omega$
2.7V	2.7V	$\leq 2.5ns$	1.5V	50pF	500 $\Omega$
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	50pF	500 $\Omega$
$5V \pm 0.5V$	$V_{CC}$	$\leq 2.5ns$	$V_{CC}/2$	50pF	500 $\Omega$



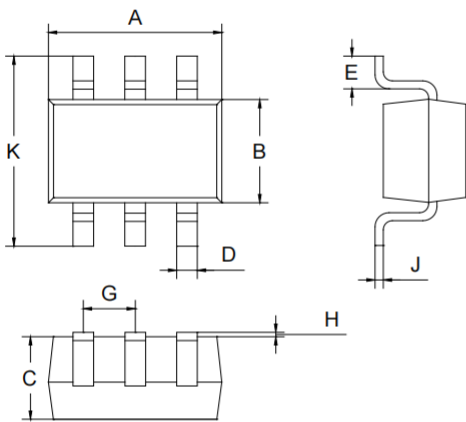
Notes: 1.  $C_L$  includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10MHz$ ,  $Z_0=50\Omega$ .



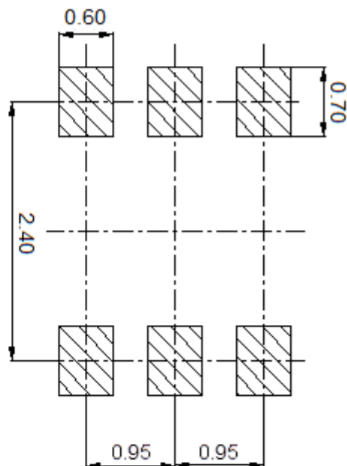
**Package Outline Dimensions** (Unit: mm)

SOT23-6



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
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

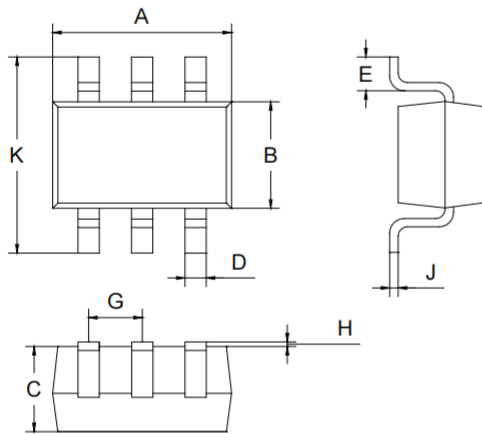
**Mounting Pad Layout** (Unit: mm)





**Package Outline Dimensions** (Unit: mm)

SOT363



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
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)

