

### 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

### General Description

The 74LVC1G08 is a 2-input AND gate which provides the Function  $Y=A \times B$ .

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

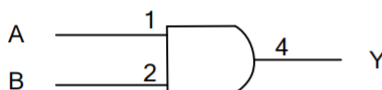
### Applications

- 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

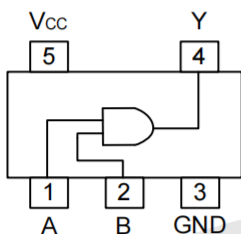
ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
74LVC1G08GV	SOT23-5	Tape and Reel,3000
74LVC1G08GW	SOT353	Tape and Reel,3000

### Logic Diagram



Logic symbol

### Pin Configuration



SOT-23-5

SOT-353

### Marking

**74LVC1G08GV Marking:V08**

**74LVC1G08GW Marking:VE**

### Function Table

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

### 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

- 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	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
Input Transition Rise or Fall Rate	$t_R / t_F$	$V_{CC}=1.8V \pm 0.15V$			20	ns/V
		$V_{CC}=2.5V \pm 0.2V$			10	ns/V
		$V_{CC}=3.3V \pm 0.3V$			5	ns/V
		$V_{CC}=5V \pm 0.5V$				
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 <sub>A</sub> =25°C			T <sub>A</sub> =-40°C~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =1.65V~1.95V	0.65× V <sub>CC</sub>			0.65× V <sub>CC</sub>			V	
		V <sub>CC</sub> =2.3V~2.7V	1.7			1.7				
		V <sub>CC</sub> =3.0V~3.6V	2			2				
		V <sub>CC</sub> =4.5V~5.5V	0.7× V <sub>CC</sub>			0.7× V <sub>CC</sub>				
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> =1.65V~1.95V			0.35× V <sub>CC</sub>			0.35× V <sub>CC</sub>	V	
		V <sub>CC</sub> =2.3V~2.7V			0.7			0.7		
		V <sub>CC</sub> =3.0V~3.6V			0.8			0.8		
		V <sub>CC</sub> =4.5V~5.5V			0.3× V <sub>CC</sub>			0.3× V <sub>CC</sub>		
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> =1.65V ~ 5.5V, I <sub>OH</sub> =-100μA	V <sub>CC</sub> - 0.1			V <sub>CC</sub> - 0.1			V	
		V <sub>CC</sub> =1.65V, I <sub>OH</sub> =-4mA	1.2			0.95				
		V <sub>CC</sub> =2.3V, I <sub>OH</sub> =-8mA	1.9			1.7				
		V <sub>CC</sub> =3.0V	I <sub>OH</sub> =-16mA	2.4			2.1			
			I <sub>OH</sub> =-24mA	2.3			2			
V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-32mA	3.8			3.4						
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =1.65V ~ 5.5V, I <sub>OL</sub> =100μA			0.1			0.1	V	
		V <sub>CC</sub> =1.65V, I <sub>OL</sub> =4mA			0.45			0.7		
		V <sub>CC</sub> =2.3V, I <sub>OL</sub> =8mA			0.3			0.45		
		V <sub>CC</sub> =3.0V	I <sub>OL</sub> =16mA			0.4				0.6
			I <sub>OL</sub> =24mA			0.55				0.8
V <sub>CC</sub> =4.5V, I <sub>OL</sub> =32mA				0.55			0.8			
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =0V ~ 5.5V, V <sub>IN</sub> =5.5V or GND			±5			±5	μA	
Power OFF Leakage Current	I <sub>OFF</sub>	V <sub>CC</sub> =0V, V <sub>IN</sub> or V <sub>OUT</sub> =5.5V			±10			±10	μA	
Quiescent Supply Current	I <sub>Q</sub>	V <sub>CC</sub> =1.65V~5.5V, V <sub>IN</sub> =5.5V or GND I <sub>OUT</sub> =0			10			10	μA	
Additional Quiescent Supply Current	ΔI <sub>Q</sub>	V <sub>CC</sub> =3V~5.5V, One input at V <sub>CC</sub> -0.6V, other inputs at V <sub>CC</sub> or GND			500			500	μA	

### Dynamic Characteristics (Input: t<sub>r</sub>, t<sub>f</sub>≤3ns; P<sub>RR</sub>≤1MHz)

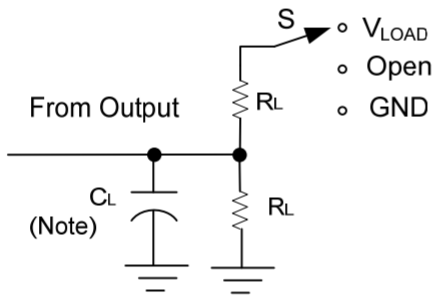
PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40°C~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
Propagation delay from input (A or B) to output(Y)	t <sub>PLH</sub> /t <sub>PHL</sub>	C <sub>L</sub> =15pF	V <sub>CC</sub> =1.8V±0.15V	1.5		10			12.5	ns
			V <sub>CC</sub> =2.5V±0.2V	0.7		8			10.5	ns
			V <sub>CC</sub> =3.3V±0.3V	0.8		6			8.5	ns
			V <sub>CC</sub> =5V±0.5V	0.8		4.2			6	ns
		C <sub>L</sub> =30 or 50pF	V <sub>CC</sub> =1.8V±0.15V	2.4		11			13.5	ns
			V <sub>CC</sub> =2.5V±0.2V	1.1		9			11.5	ns
			V <sub>CC</sub> =3.3V±0.3V	1		8			10.5	ns
			V <sub>CC</sub> =5V±0.5V	1		7			9.5	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		4		pF
Power Dissipation Capacitance	$C_{PD}$	$V_{CC}=1.8V$		21		pF
		$V_{CC}=2.5V$		24		pF
		$V_{CC}=3.3V$		26		pF
		$V_{CC}=5V$		31		pF

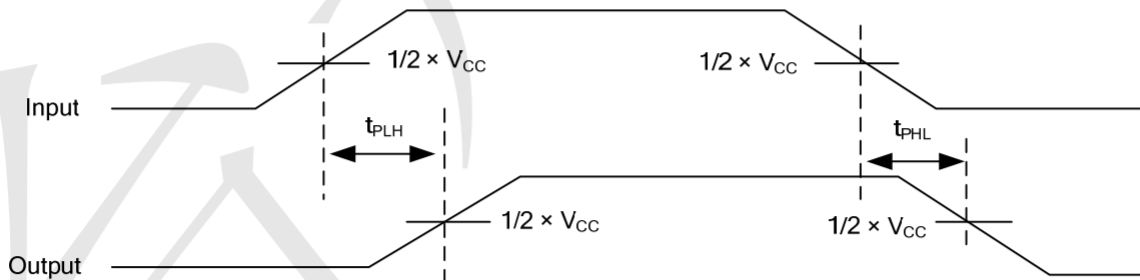
**Test Circuit And Waveforms**



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

Note:  $C_L$  includes probe and jig capacitance.

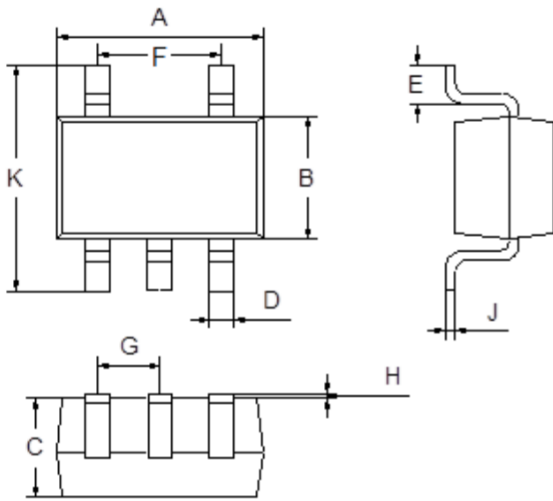
$V_{CC}$	$V_{IN}$	$t_R/t_F$	$V_M$	$V_{LOAD}$	$C_L$	$R_L$	$V_{\Delta}$
$1.8V \pm 0.15V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M $\Omega$	0.15V
$2.5V \pm 0.2V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M $\Omega$	0.15V
$3.3V \pm 0.3V$	3 V	$\leq 2.5ns$	1.5V	6V	15pF	1M $\Omega$	0.3V
$5V \pm 0.5V$	$V_{CC}$	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M $\Omega$	0.3V
$1.8V \pm 0.15V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	$2V_{CC}$	30pF	1K $\Omega$	0.15V
$2.5V \pm 0.2V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 $\Omega$	0.15V
$3.3V \pm 0.3V$	3 V	$\leq 2.5ns$	1.5V	6V	50pF	500 $\Omega$	0.3V
$5V \pm 0.5V$	$V_{CC}$	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 $\Omega$	0.3V





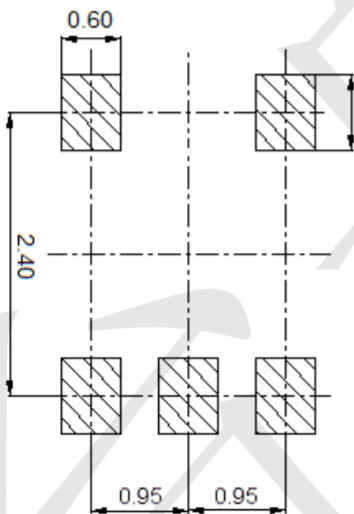
**Package Outline Dimensions** (Unit: mm)

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)





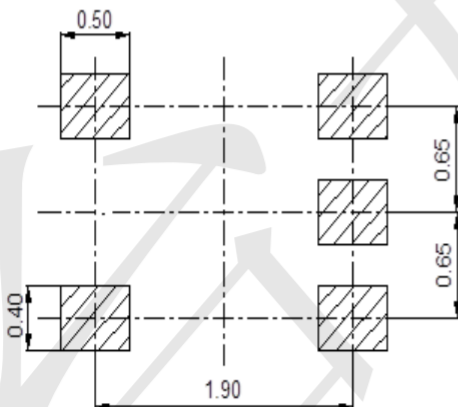
**Package Outline Dimensions** (Unit: mm)

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)



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