

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 from destruction when it is powered down.

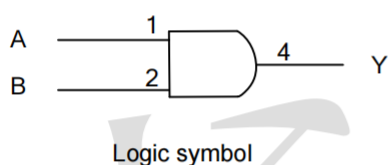
Applications

- 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

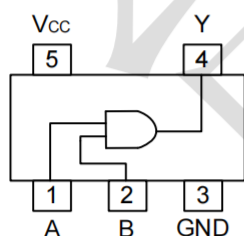
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
74LVC1G08W5-TP	SOT23-5	Tape and Reel,3000
74LVC1G08SE-TP	SOT353	Tape and Reel,3000

Logic Diagram



Pin Configuration



SOT-23-5
SOT-353

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
		$V_{CC}=5V \pm 0.5V$				ns/V
Operating Temperature	T_A		-40		+125	°C

Thermal Data

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

Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+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 _{CC} =3.0V~3.6V	2			2			
		V _{CC} =4.5V~5.5V	0.7× V _{CC}			0.7× V _{CC}			
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 _{CC} =3.0V~3.6V			0.8			0.8	
		V _{CC} =4.5V~5.5V			0.3× V _{CC}			0.3× V _{CC}	
High-Level Output Voltage	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} =3.0V I _{OH} =-16mA	2.4			2.1			
		I _{OH} =-24mA	2.3			2			
		V _{CC} =4.5V, I _{OH} =-32mA	3.8			3.4			
Low-Level Output Voltage	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} =3.0V I _{OL} =16mA			0.4			0.6	
		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} =0V ~ 5.5V, V _{IN} =5.5V or GND			±5			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V			±10			±10	μA
Quiescent Supply Current	I _Q	V _{CC} =1.65V~5.5V, V _{IN} =5.5V or GND I _{OUT} =0			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			500			500	μA

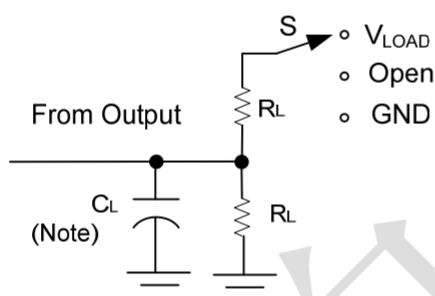
Dynamic Characteristics (Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output(Y)	t _{PLH} /t _{PHL}	C _L =15pF	V _{CC} =1.8V±0.15V	1.5	10			12.5	ns
			V _{CC} =2.5V±0.2V	0.7	8			10.5	ns
			V _{CC} =3.3V±0.3V	0.8	6			8.5	ns
			V _{CC} =5V±0.5V	0.8	4.2			6	ns
		C _L =30 or 50pF	V _{CC} =1.8V±0.15V	2.4	11			13.5	ns
			V _{CC} =2.5V±0.2V	1.1	9			11.5	ns
			V _{CC} =3.3V±0.3V	1	8			10.5	ns
			V _{CC} =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

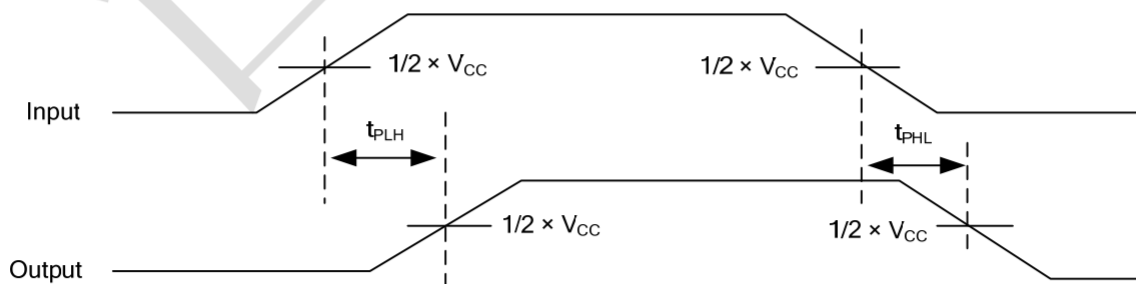
Test Circuit And Waveforms



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

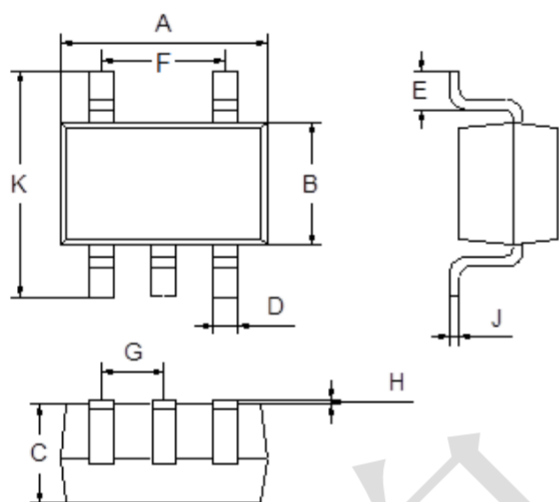
Note: C_L includes probe and jig capacitance.

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



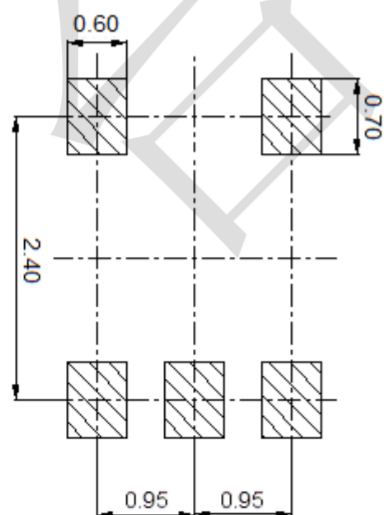
Package Outline Dimensions (Unit: mm)

SOT23-5



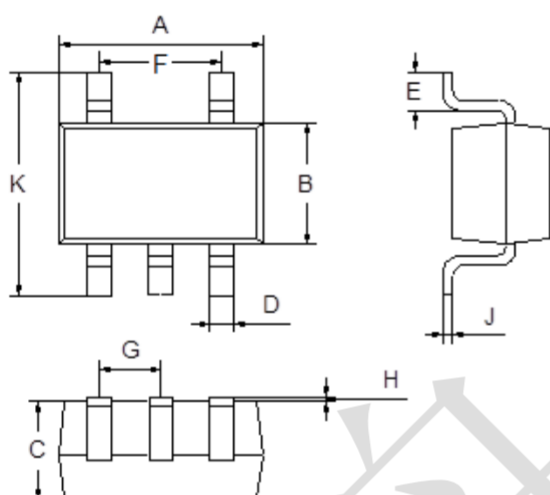
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

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)

