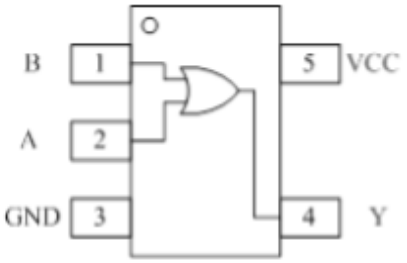
General Description

The SN74LVC1G32 is a single 2−input OR Gate in three tiny footprint packages. The device performs much as LCX multi−gate products in
speed and drive.

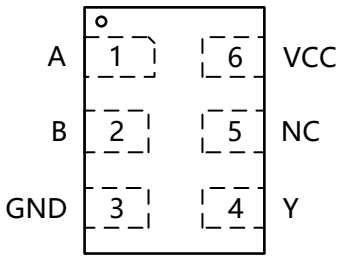
Features

- Tiny SC70-5 /SOT23-5/DFN Packages
- 2.4ns t_{PD} at 5V (typ)
- Source/Sink 24mA at 3.0V
- Over−Voltage Tolerant Inputs
- Designed for 1.65V to 5.5V V_{CC} Operation
- These Devices are Pb−Free and are RoHS Compliant

Pin Configuration



SC70-5/SOT23-5



DFN6

Figure1: Top View

Pin Function

(SC70 -5/ SOT23-5 /DFN6)

PIN	FUNCTION
1	IN B
2	INA
3	GND
4	Y
5	VCC

Block Diagram

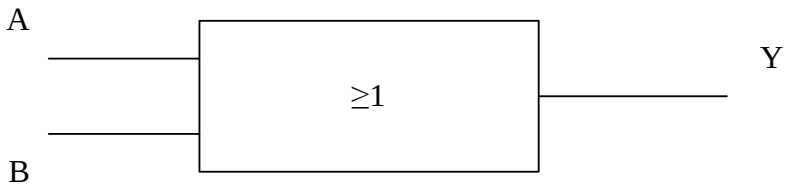


Figure2.Logic symbol

Functional Description

Function Table

Input		Output
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	−0.5 to 7.0	V
V_I	DC Input Voltage	$-0.5 \le V_I \le +7.0$	V
V_O	DC Output Voltage Output in Higher or Low State	−0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current V_I < GND	−50	mA
I_{OK}	DC Output Diode Current V_O<GND, V_O>V_{CC}	±50	mA
I_O	DC Output Sink Current	±50	mA
I_{CC}	DC Supply Current per Supply Pin	±100	mA
I_{GND}	DC Ground Current per Supply Pin	±100	mA
T_{STG}	Storage Temperature Range	−65 to 150	℃
T_L	Lead Temperature, 1 mm from Case for 10 Seconds	260	℃
T_J	Junction Temperature Under Bias	150	℃
θ_{JA}	Thermal Resistance SC70-5 SOT23-5	435 300 423	℃/W
P_D	Power Dissipation in Still Air at 85℃	200	mW
MSL	Moisture Sensitivity	Level 1	
ESD	ESD Classification Human Body Model (Note 2) Machine Model (Note 3) Charged Device Model (Note 4)	2000 200 N/A	V
$I_{Latchup}$	Latchup Performance Above V_{CC} and Below GND at 125℃ (Note 5)	±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. IO absolute maximum rating must be observed.
2. Tested to EIA/JESD22−A114− A, rated to EIA/JESD22−A114−B.
3. Tested to EIA/JESD22−A115− A, rated to EIA/JESD22−A115−A.
4. Tested to JESD22−C101−A.
5. Tested to EIA/JESD78.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{CC}	DC Supply Voltage Operating Date Retention	1.65 1.5	5.5 5.5	V
V_{IN}	DC Input Voltage	0	5.5	V
V_{OUT}	DC Output Voltage (High or Low State)	0	5.5	V
T_A	Operating Temperature Range	-40	85	℃
t_r, t_f	Input Rise and Fall Time V_{CC} = 2.5 V ±0.2 V V_{CC} = 3.0 V ±0.3 V V_{CC} = 5.0 V ±0.5 V	0 0 0	20 10 5	ns/V

Electrical Characteristics

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC}(V)	TA = 25℃			−40℃ ≤TA≤85℃		Unit
				Min	Typ	Max	Min	Max	
V_{IH}	High−Level Input Voltage		1.65to1.95 2.3 to 5.5	0.75Vcc 0.7Vcc			0.75Vcc 0.7Vcc		V
V_{IL}	Low−Level Input Voltage		1.65to1.95 2.3 to 5.5			0.25Vcc 0.3Vcc		0.25Vcc 0.3Vcc	V
V_{OH}	High−Level Output Voltage V_{IN} = V_{IL}	I_{OH} =−100uA	1.65to5.5	Vcc−0.1	Vcc		Vcc−0.1		V
		I_{OH} =−3mA	1.65	1.29	1.52		1.29		
		I_{OH} =−8mA	2.3	1.9	2.1		1.9		
		I_{OH} =−12mA	2.7	2.2	2.4		2.2		
		I_{OH} =−16mA	3.0	2.4	2.7		2.4		
		I_{OH} =−24mA	3.0	2.3	2..5		2.3		
		I_{OH} =-32mA	4.5	3.8	4.0		3.8		
V_{OL}	Low−Level Output Voltage V_{IN} = V_{IH}	I_{OH} =100uA	1.65to5.5		0.0	0.1		0.1	V
		I_{OL} =3mA	1.65		0.08	0.24		0.24	
		I_{OL} =8mA	2.3		0.20	0.3		0.3	
		I_{OL} =12mA	2.7		0.22	0.4		0.4	
		I_{OL} =16mA	3.0		0.28	0.4		0.4	
		I_{OL} =24mA	3.0		0.38	0.55		0.55	
		I_{OL} =32mA	4.5		0.42	0.55		0.55	
I_{IN}	Input Leakage Current	V_{IN} = 5.5V or GND	0 to 5.5		±0.1			±1.0	uA
I_{OFF}	Power Off Leakage Current	V_{IN} = 5.5V or V_{OUT} = 5.5V	0			1		10	uA
I_{CC}	Quiescent Supply Current	V_{IN} = 5.5V or GND	5.5					10	uA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS

tr=tf= 3ns;

Symbol	Parameter	Condition	V_{CC}(V)	TA = 25 ℃			−40℃ ≤TA≤85℃		Unit
				Min	Typ	Max	Min	Max	
t_{PD}	Propagation Delay (Figure3and4)	R_L= 1MΩ C_L= 15 pF	1.65	2.0	10.1	12.9	2.0	13.9	ns
			1.8	2.0	9.1	11.6	2.0	12.4	
		R_L= 1MΩ C_L= 15 pF	2.5	0.2	6.0	7.7	0.8	8.2	
		R_L= 1MΩ C_L= 15 pF	3.3	0.8	5.0	6.5	0.5	7.0	
		R_L= 500Ω C_L=50 pF		1.2	5.6	7.1	1.5	7.6	
		R_L= 1MΩ C_L= 15 pF	5.0	0.5	4.4	5.6	0.5	6.1	
		R_L= 500Ω C_E=50 pF		0.8	4.8	6.1	0.8	6.6	

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Condition	Typical	Unit
C_{IN}	Input Capacitance	V_{CC}= 5.5 V,V_I = 0 V or V_{CC}	>2.5	pF
C_{PD}	Power Dissipation Capacitance (Note 6)	10MHz,V_{CC} = 3.3 V,V_I = 0 V orV_{CC} 10MHz, V_{CC} = 5.5 V,V_I = 0 V orV_{CC}	21 21	pF

6. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation:
$I_{CC(OPR)}$=C_{PD}*V_{CC}*fin+I_{CC}*C_{PD} is used to determine the no−load dynamic power consumption;
P_D=C_{PD}*V_{CC}^2*fin+I_{CC}*V_{CC}*Fig.

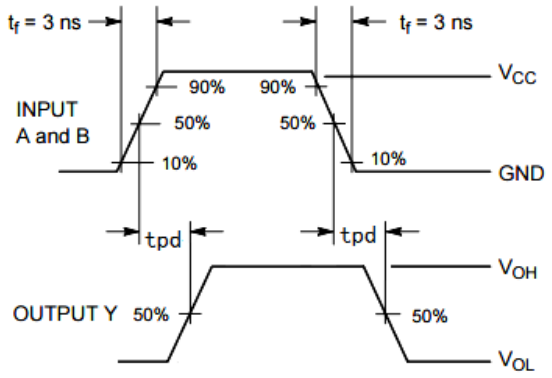


Figure 3. Switching Waveform

PROPAGATION DELAYS
tR = tF = 3ns, 10% to 90%;
f = 1 MHz; tW = 500 ns

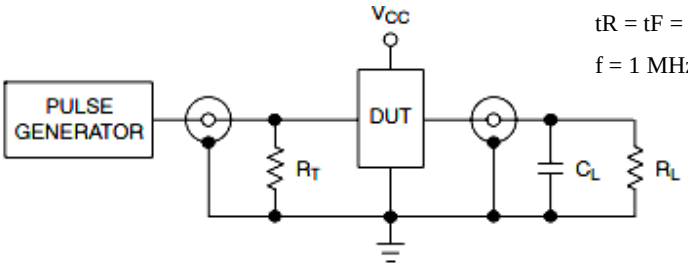
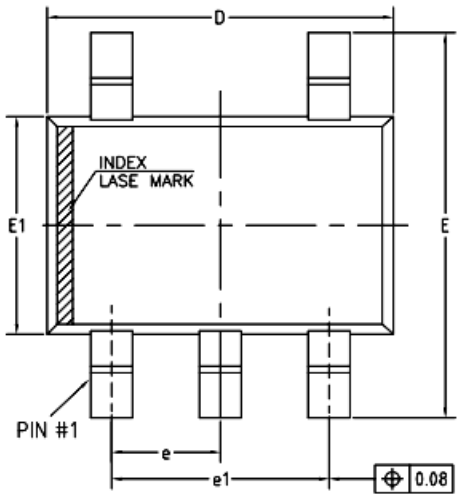
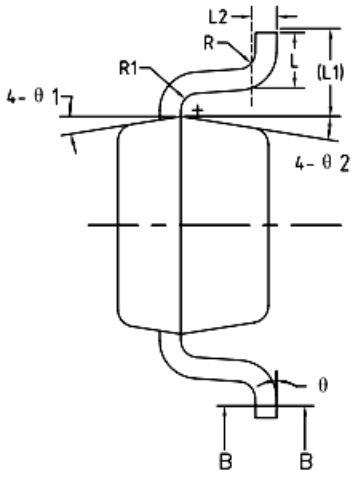


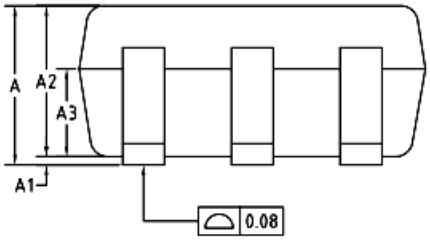
Figure 4. Test Circuit

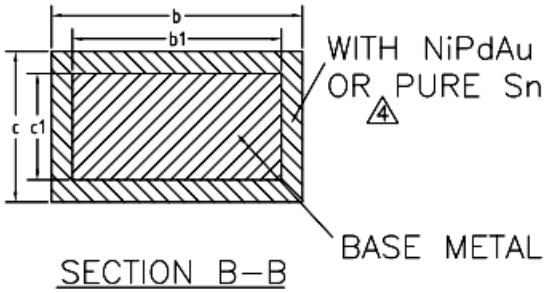
Package Dimension

SC70-5





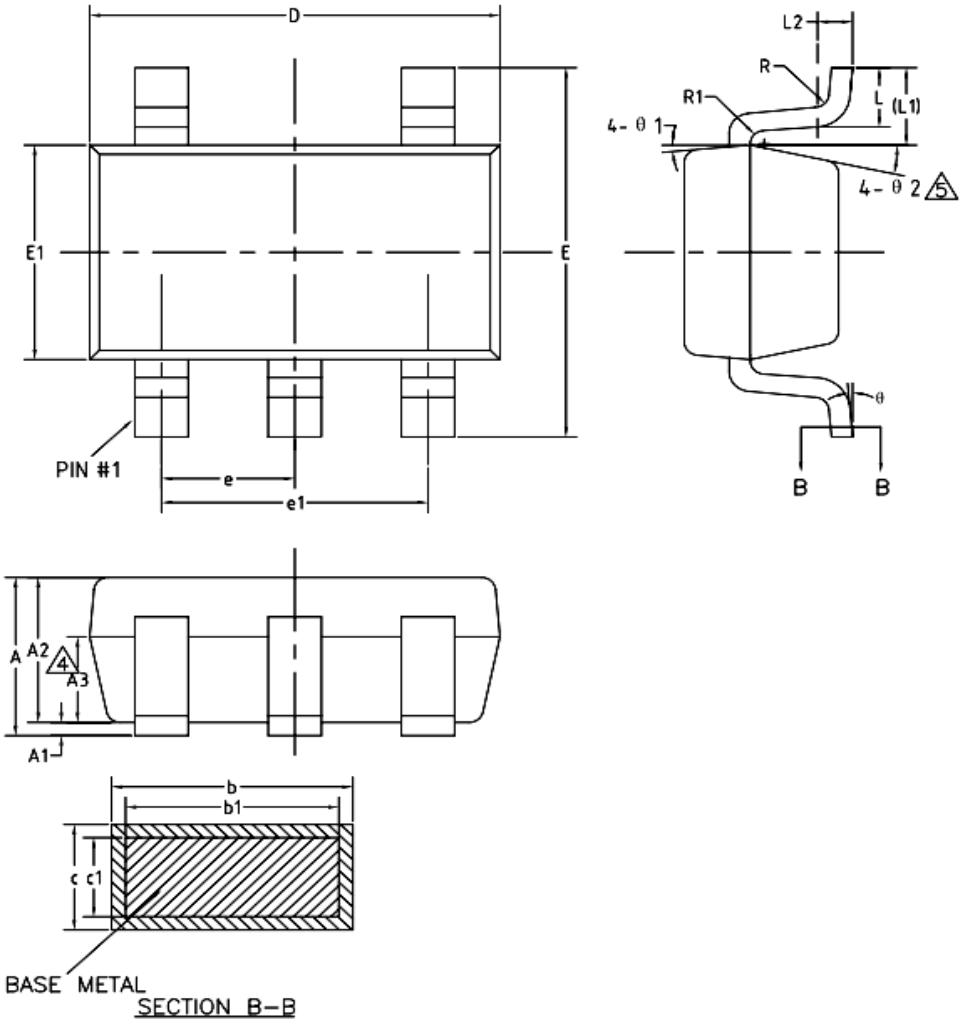




COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL		MIN	NOM	MAX
A		0.85	–	1.05
A1		0	–	0.10
A2		0.80	0.90	1.00
A3		0.47	0.52	0.57
b	NiPdAu	0.22	–	0.29
	PURE Sn	0.23	–	0.33
b1		0.22	0.25	0.28
c	NiPdAu	0.115	–	0.15
	PURE Sn	0.12	–	0.18
c1		0.115	0.13	0.14
D		2.02	2.07	2.12
E		2.20	2.30	2.40
E1		1.25	1.30	1.35
e		0.60	0.65	0.70
e1		1.20	1.30	1.40
L		0.28	0.33	0.38
L1		0.50REF		
L2		0.15BSC		
R		0.10	–	–
R1		0.10	–	0.25
θ		0°	–	8°
θ 1		6°	9°	12°
θ 2		6°	9°	12°

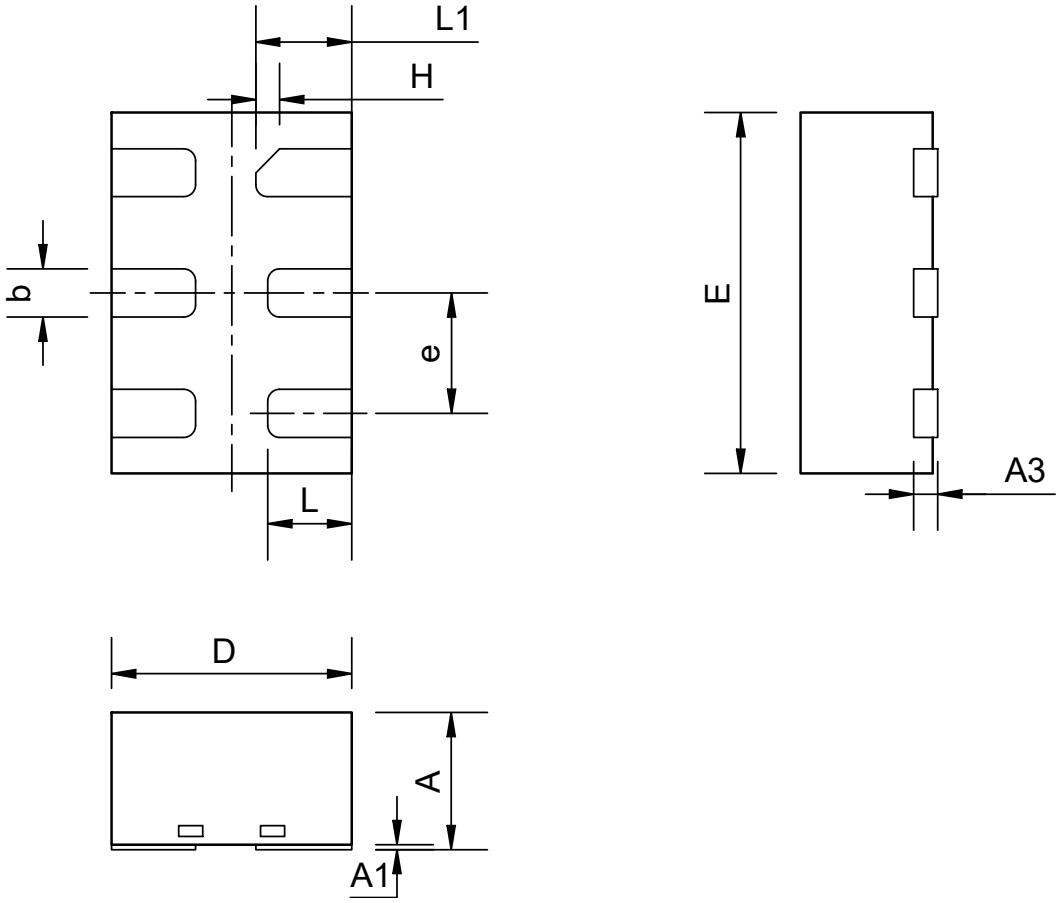
SOT23-5



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

	SYMBOL	MIN	NOM	MAX
	A	–	–	1.25
3	A1	0	–	0.15
	A2	1.00	1.10	1.20
	A3	0.60	0.65	0.70
	b	0.36	–	0.50
	b1	0.36	0.38	0.45
	c	0.14	–	0.20
	c1	0.14	0.15	0.16
	D	2.826	2.926	3.026
	E	2.60	2.80	3.00
	E1	1.526	1.626	1.726
5	e	0.90	0.95	1.00
5	e1	1.80	1.90	2.00
	L	0.35	0.45	0.60
	L1	0.59REF		
	L2	0.25BSC		
	R	0.10	–	–
	R1	0.10	–	0.25
	θ	0°	–	8°
	θ 1	3°	5°	7°
5	θ 2	6°	–	14°

DFN6(1.0×1.5)



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.50	--	0.60
A1	0	0.02	0.05
A3		0.10REF	
b	0.15	0.20	0.25
D	0.90	1.00	1.10
E	1.40	1.50	1.60
e	0.40	0.50	0.60
H		0.10REF	
L	0.30	0.35	0.40
L1	0.35	0.40	0.45

Orderinginformation

Order code	Marking code	Package	Baseqty	Deliverymode
SN74LVC1G32DBVR	C32R	SOT23-5	3000	Tape and reel
SN74LVC1G32DCKR	CG5	SC70-5	3000	Tape and reel
SN74LVC1G32DRYR	CG	DFN6	5000	Tape and reel