General Description

The SN74LVC1G07 is a high performance single non−inverting buffer with open drain outputs operating from a 1.65 to 5.5V supply. The Output stage is open drain with Over Voltage Tolerance. This allows the SN74LVC1G07 to be used to interface 5.0V circuits to circuits of any voltage between 0 and +7.0V.

Features

● Tiny SC70-5, SOT23-5 and DFN6-1.0mm*1.5mm and DFN6-1.5mm*1.5mm Packages
● Designed for 1.65V to 5.5V V_{CC} Operation
● 24 mA Output Sink Capability, Pullup may be between 0 and 7.0V
● Near Zero Static Supply Current Substantially Reduces System Power Requirements
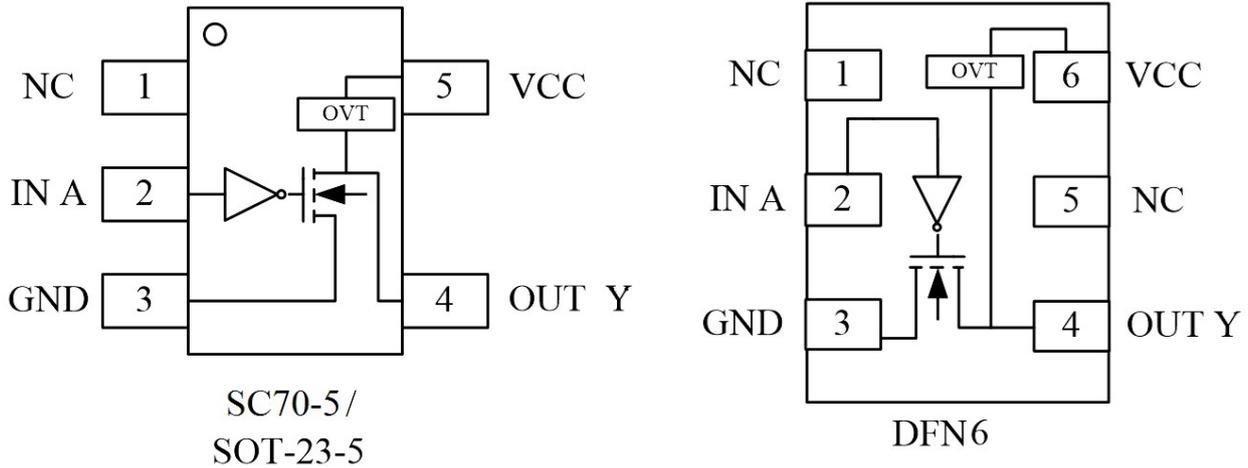● TheseDevic esarePb−Free and RoHS Compliant

Pin Configuration

Figure1, Top View

Pin Function

(SC70-5/ SOT23-5)

PIN	FUNCTION
1	NC
2	IN A
3	GND
4	OUT
5	VCC

（**DFN6**）

PIN	FUNCTION
1	NC
2	IN A
3	GND
4	OUT
5	NC
6	VCC

Block Diagram
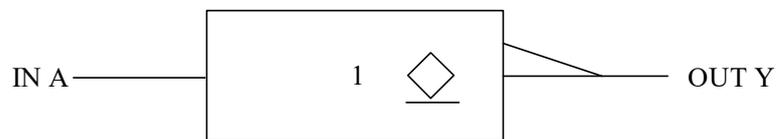
Figure 2. Logic Symbol

Functional Description

Function Table

Input	Output
A	Y
L	L
H	Z

Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		−0.5 to 7.0	V
V_I	DC Input Voltage		$−0.5 \leq V_I \leq +7.0$	V
V_O	DC Output Voltage Output in Higher or Low State (Note 1)		$−0.5$ 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	°C
T_L	Lead Temperature, 1 mm from Case for 10 Seconds		260	°C
T_J	Junction Temperature Under Bias		150	°C
θ_{JA}	Thermal Resistance	SC70-6	333	°C/W
		SOT23-6	225	
		DFN6	423	
P_D	Power Dissipation in Still Air at 85°C		200	mW
MSL	Moisture Sensitivity		Level 1	
ESD	ESD Classification Human	Body Model (Note 2)	2000	V
		Machine Model (Note3)	200	
		Charged Device Model (Note 4)	N/A	
$I_{Latchup}$	Latchup Performance Above V_{CC} and Below GND at 125°C (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		1.65	5.5	V
	Date Retention		1.5	5.5	
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	°C
t_r, t_f	Input Rise and Fall Time	$V_{CC} = 2.5$ V ± 0.2 V	0	20	ns/V
		$V_{CC} = 3.0$ V ± 0.3 V	0	10	
		$V_{CC} = 5.0$ V ± 0.5 V	0	5	

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied.

Electrical Characteristics

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	VCC(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_{OL}	Low−Level Output Voltage V_{IN} = V_{IL}	I_{OL}=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} = 5.5 V or GND	0 to 5.5			±0.1		±1.0	uA
I_{OFF}	Power Off Leakage Current	V_{IN} = 5.5 V or V_{OUT} = 5.5 V	0			1		10	uA
I_{CC}	Quiescent Supply Current	V_{IN} = 5.5 V or GND	5.5			1		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= 2.5ns;

Symbol	Parameter	Condition	V_{CC}(V)	TA = 25 ℃			−40℃ ≤TA≤85℃		Unit
				Min	Typ	Max	Min	Max	
t_{PZL}	Propagation Delay (Figure3and4)	R_L= 500Ω C_L= 15 pF	1.8	2.0	9.1	11.1	2.0	12.8	ns
			2.5	1.5	6.1	7.5	1.5	8.5	
			3.3	1.2	4.9	6.0	1.5	6.9	
			5.0	0.8	3.9	4.9	0.8	5.5	
t_{PLZ}	Propagation Delay (Figure3and4)	R_L= 500Ω C_L= 15 pF	1.8	2.0	9.1	11.1	2.0	12.8	ns
			2.5	1.5	5.9	7.3	1.5	8.3	
			3.3	1.2	3.9	4.9	1.5	5.5	
			5.0	0.8	3.0	3.7	0.8	4.2	

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)	10 MHz, V_{CC} = 3.3 V, V_I = 0 V or V_{CC}	26	pF
		10 MHz, V_{CC}= 5.5 V, V_I = 0 V or V_{CC}	30	

6. CPD 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:

ICC(OPR)=CPD*VCC*fin+ICC*CPD is used to determine the no−load dynamic power consumption;

PD=CPD*VCC2*fin+ICC*VCC*Fig.

Package Dimension

SC70-5
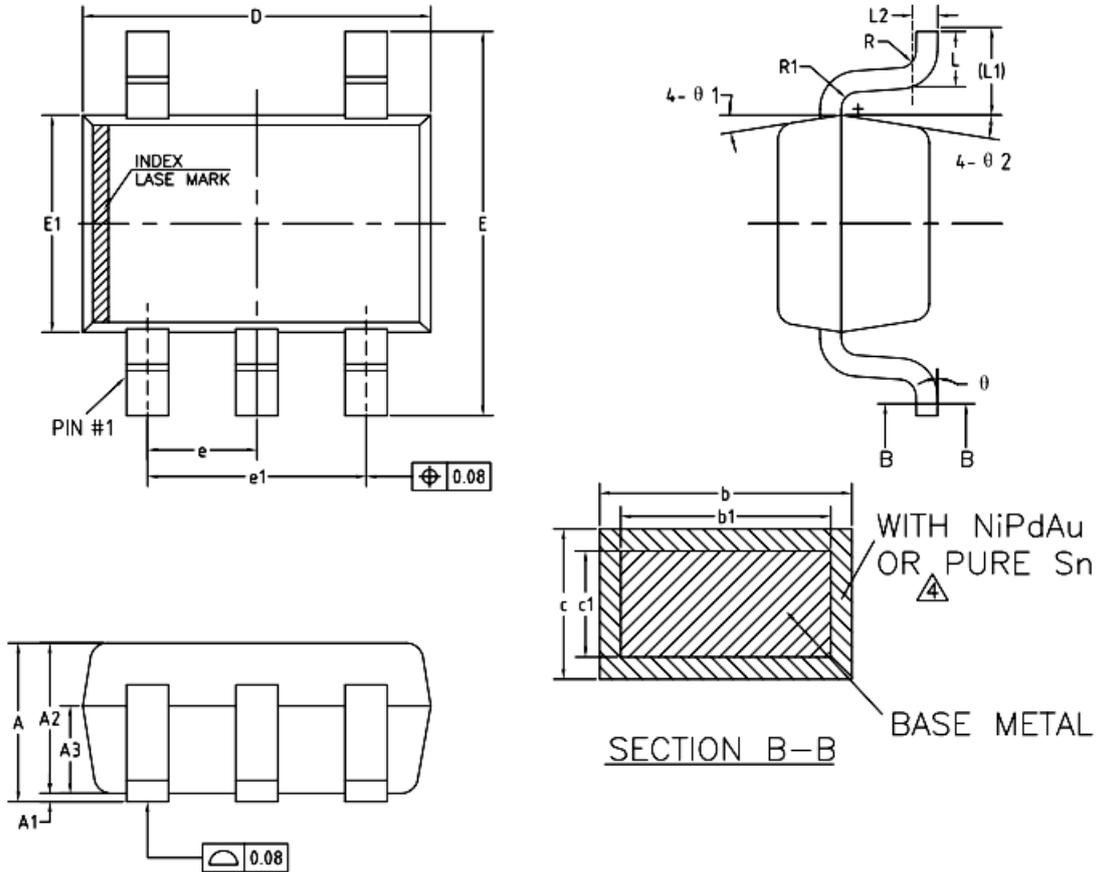
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

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°
$\theta 1$		6°	9°	12°
$\theta 2$		6°	9°	12°

SOT23-5
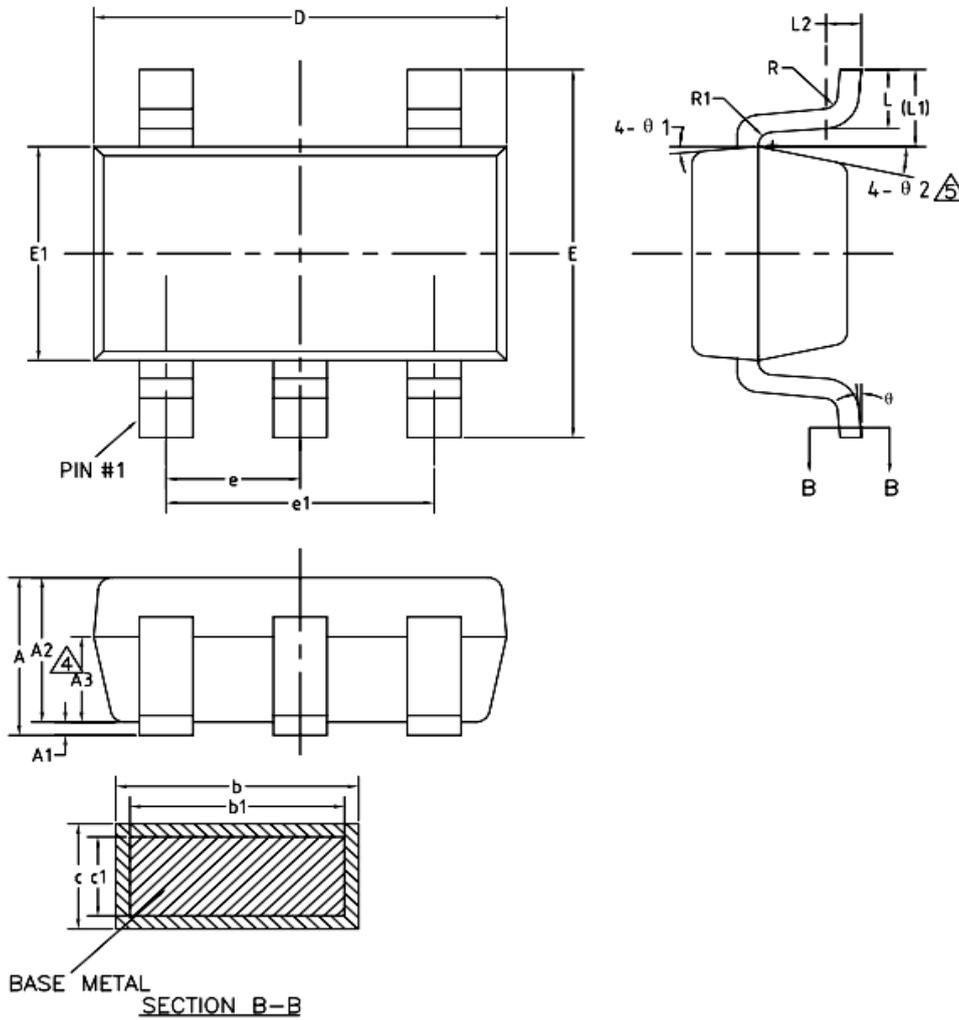
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	–	–	1.25
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
e	0.90	0.95	1.00
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°
θ 2	6°	–	14°

DFN-6(1*1.5)

TOP VIEW

SIDE VIEW

BOTTOM VIEW

SIDE VIEW
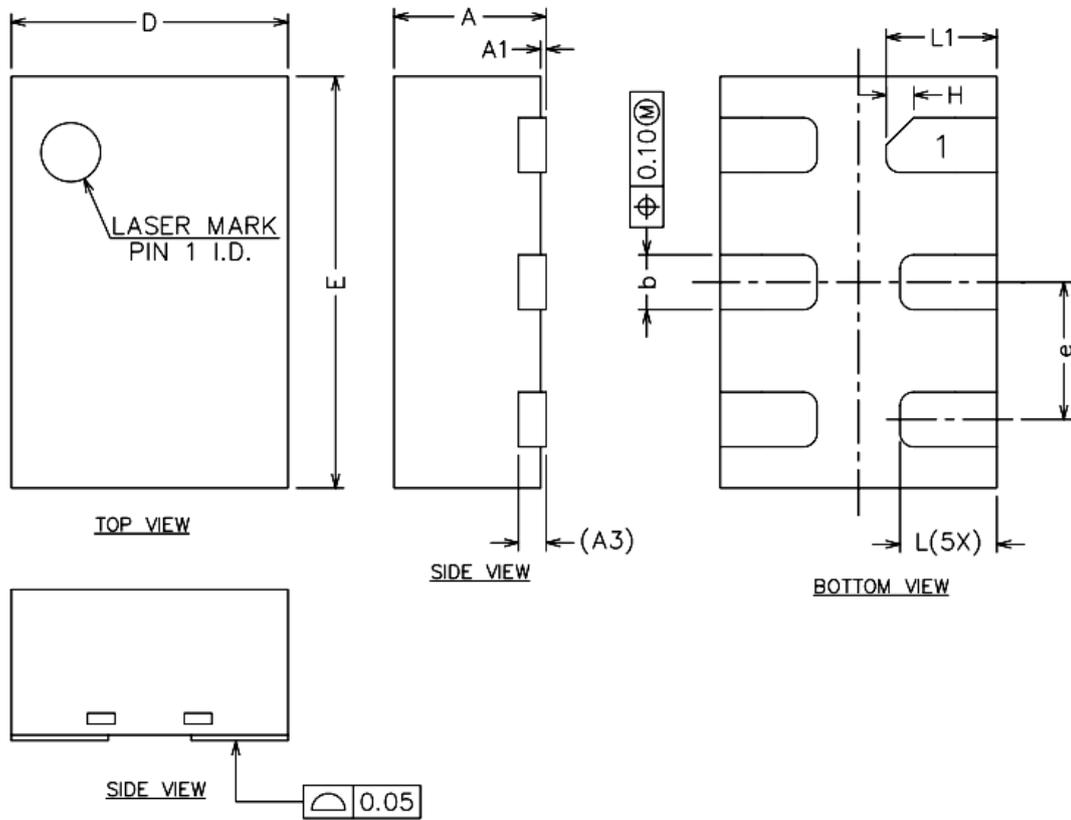
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.50	–	0.60
A1	0.00	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

DFN-6(1*1)
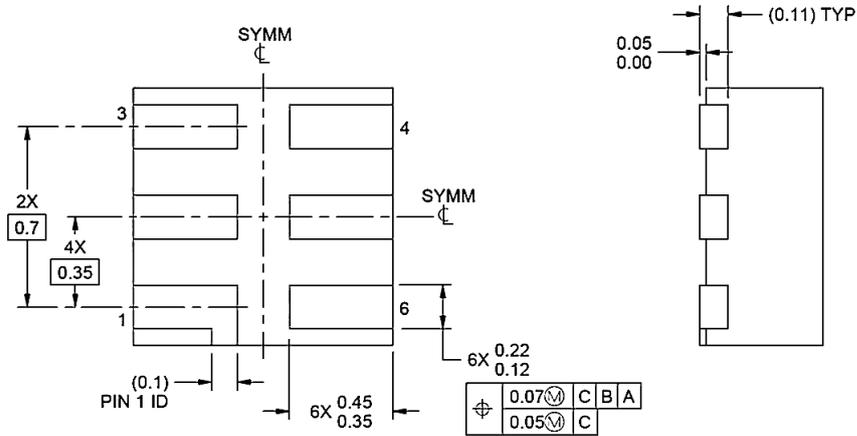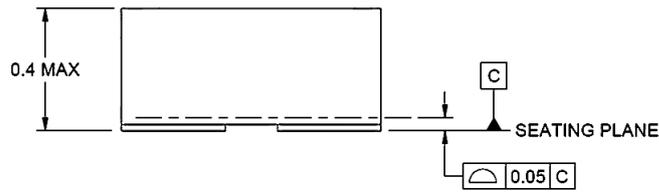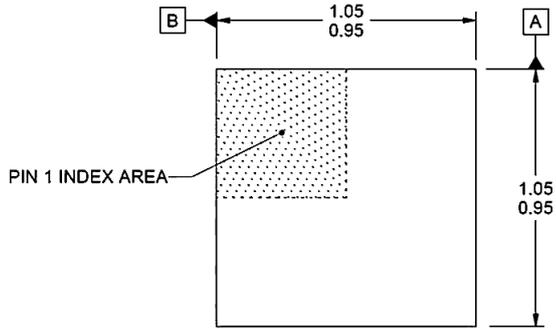
Orderingnformation

Order code	Marking code	Package	Baseqty	Deliverymode
UMW SN74LVC1G07DBVR	C075	SOT23-5	3000	Tape and reel
UMW SN74LVC1G07DCKR	CV5	SC70-5	3000	Tape and reel
UMW SN74LVC1G07DRYR	CV	DFN6(1*1.5)	5000	Tape and reel
UMW SN74LVC1G07DSFR	CV	DFN-6(1*1)	10000	Tape and reel