

Single Non-inverting Buffer with Open Drain Output

General Description

The ET74LVC1G07 is a high performance single non-inverting buffer with open drain outputs operating from a 1.65V to 5.5V supply. The Output stage is open drain with Over Voltage Tolerance.

This allows the ET74LVC1G07 to be used to interface 5.0V circuits to circuits of any voltage between 0V and +7.0V.

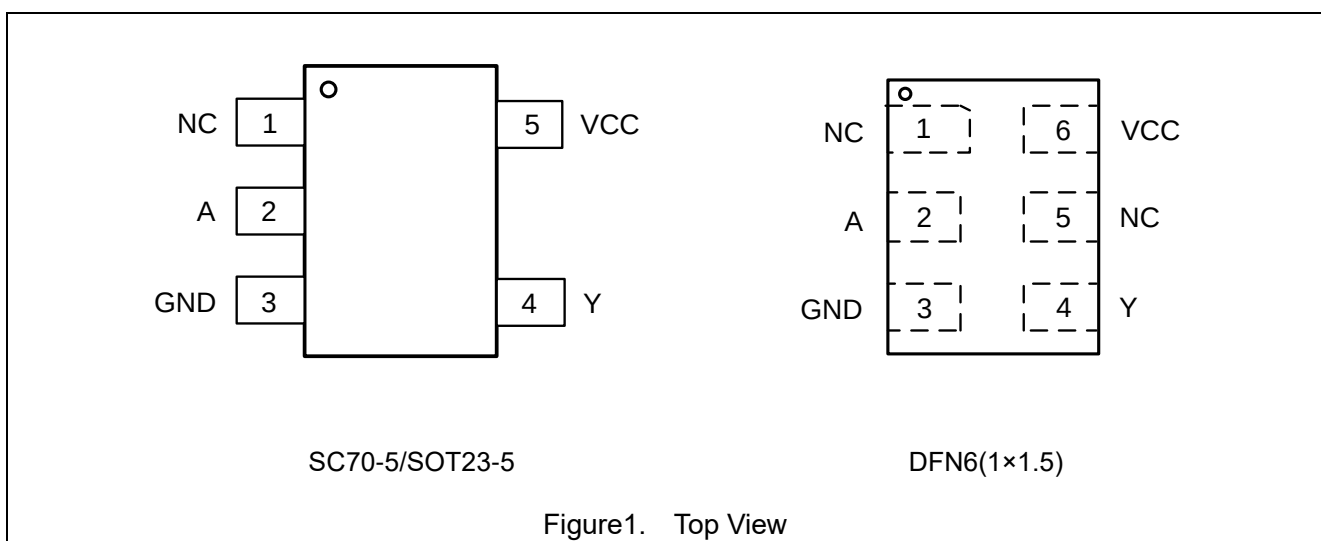
Features

- Designed for 1.65V to 5.5V VCC Operation
- Overvoltage Tolerant Inputs
- 24 mA Balanced Output Sink and Source Capability
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free and are RoHS Compliant

Device Information

Part No.	Package	Packing Option	MSL
ET74LVC1G07	SC70-5 (1.3mm×2.1mm)	Tape and Reel, 3K	1
ET74LVC1G07T	SOT23-5 (1.6mm×2.9mm)	Tape and Reel, 3K	3
ET74LVC1G07Y	DFN6 (1.0mm×1.5mm)	Tape and Reel, 3K	1

Pin Configuration



ET74LVC1G07

Pin Function

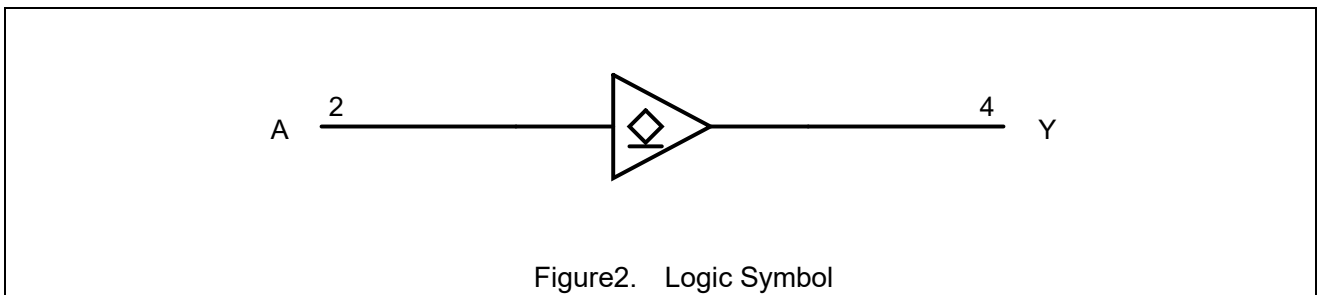
(SC70-5/ SOT23-5)

Pin No.	Pin Name	Function
1	NC	No connect
2	A	Input
3	GND	Ground
4	Y	Output
5	VCC	Supply Voltage

DFN6

Pin No.	Pin Name	Function
1	NC	No connect
2	A	Input
3	GND	Ground
4	Y	Output
5	NC	No connect
6	VCC	Supply Voltage

Block Diagram



Functional Description

Function Table

Input A	Output Y
L	L
H	Z

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Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to 7.0	V
V _I	DC Input Voltage ⁽¹⁾		-0.5 ≤ V _I ≤ +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	°C
T _L	Lead Temperature, Soldering 10 Seconds		260	°C
T _J	Max Junction Temperature		150	°C
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±1000	
I _{LU}	Max Latch up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±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.

Notes:

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

Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
R _{θJA}	SC70-5	Thermal Characteristics, Thermal Resistance, Junction-to-Air	300	°C/W
	SOT23-5		250	
	DFN6(1.0×1.5)		440	
P _D	SC70-5	Power Dissipation in Still Air at 85°C	215	mW
	SOT23-5		260	
	DFN6(1.0×1.5)		150	

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Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V _{CC}	DC Supply Voltage		1.65	5.5	V
	Operating 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	125	°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	V _{CC} (V)	T _A = 25 °C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		1.65to1.95 2.3 to 5.5	0.75V _{CC} 0.7V _{CC}			0.75V _{CC} 0.7V _{CC}		V
V _{IL}	Low-Level Input Voltage		1.65to1.95 2.3 to 5.5			0.25V _{CC} 0.3V _{CC}		0.25V _{CC} 0.3V _{CC}	V
V _{OL}	Low-Level Output Voltage	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.

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AC Electrical Characteristics

$t_r = t_f = 2.5\text{ns}$

Symbol	Parameter	Condition	$V_{CC}(\text{V})$	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
t_{PZL}	Propagation Delay (Figure3 and 4)	$R_L = 500\Omega$ $C_L = 15\text{pF}$	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 (Figure3 and 4)	$R_L = 500\Omega$ $C_L = 15\text{pF}$	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	

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C_{IN}	Input Capacitance	$V_{CC} = 5.5\text{ V}$, $V_I = 0\text{ V}$ or V_{CC}	>2.5	pF
C_{PD}	Power Dissipation Capacitance ⁽⁵⁾	10 MHz, $V_{CC} = 3.3\text{ V}$, $V_I = 0\text{ V}$ or V_{CC}	26	pF
		10 MHz, $V_{CC} = 5.5\text{ V}$, $V_I = 0\text{ V}$ or V_{CC}	30	

Note5. 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: $I_{CC(OPR)} = C_{PD} \times V_{CC} \times f_{in} + I_{CC} \times C_{PD}$ is used to determine the no-load dynamic power consumption; $P_D = C_{PD} \times V_{CC}^2 \times f_{in} + I_{CC} \times V_{CC} \times Fig.$

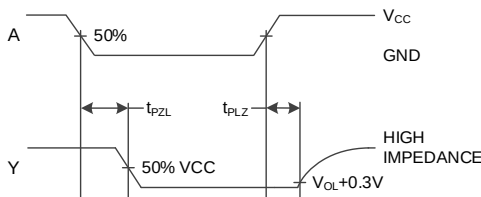


Figure 3. Switching Waveform

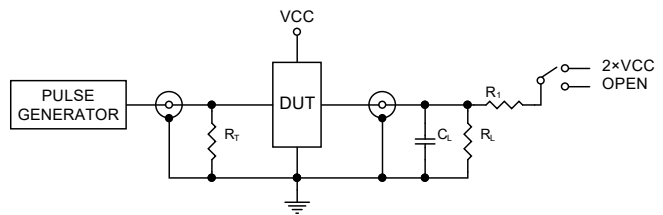
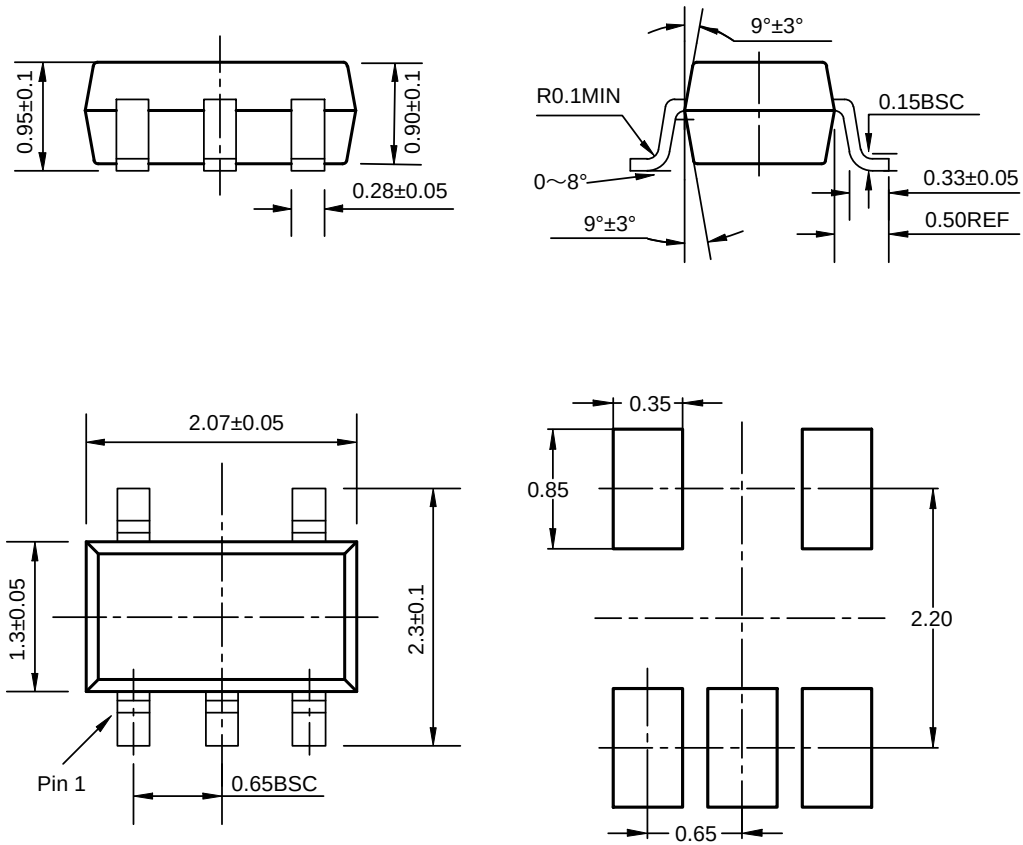


Figure4. Test Circuit $R_T = 50\Omega(\text{typ})$

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Package Dimension

SC70-5

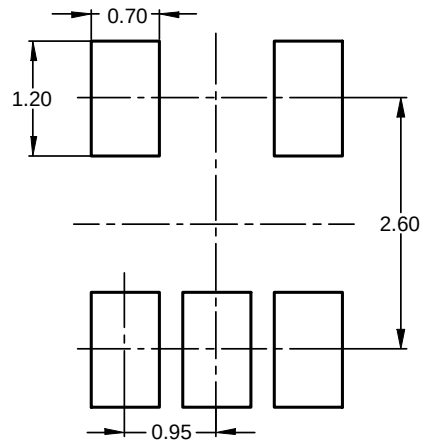
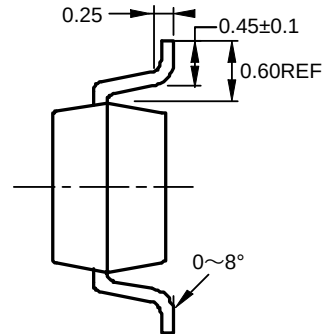
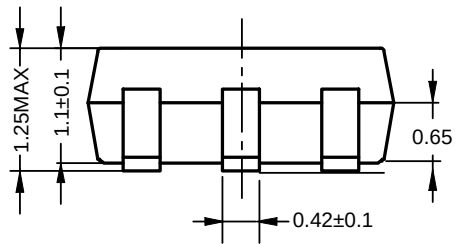
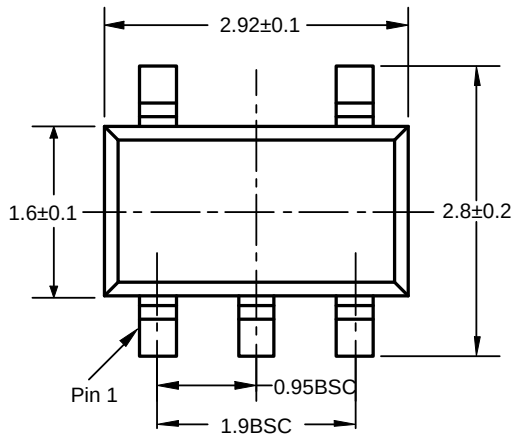


Recommended Land Pattern

Unit: mm

ET74LVC1G07

SOT23-5

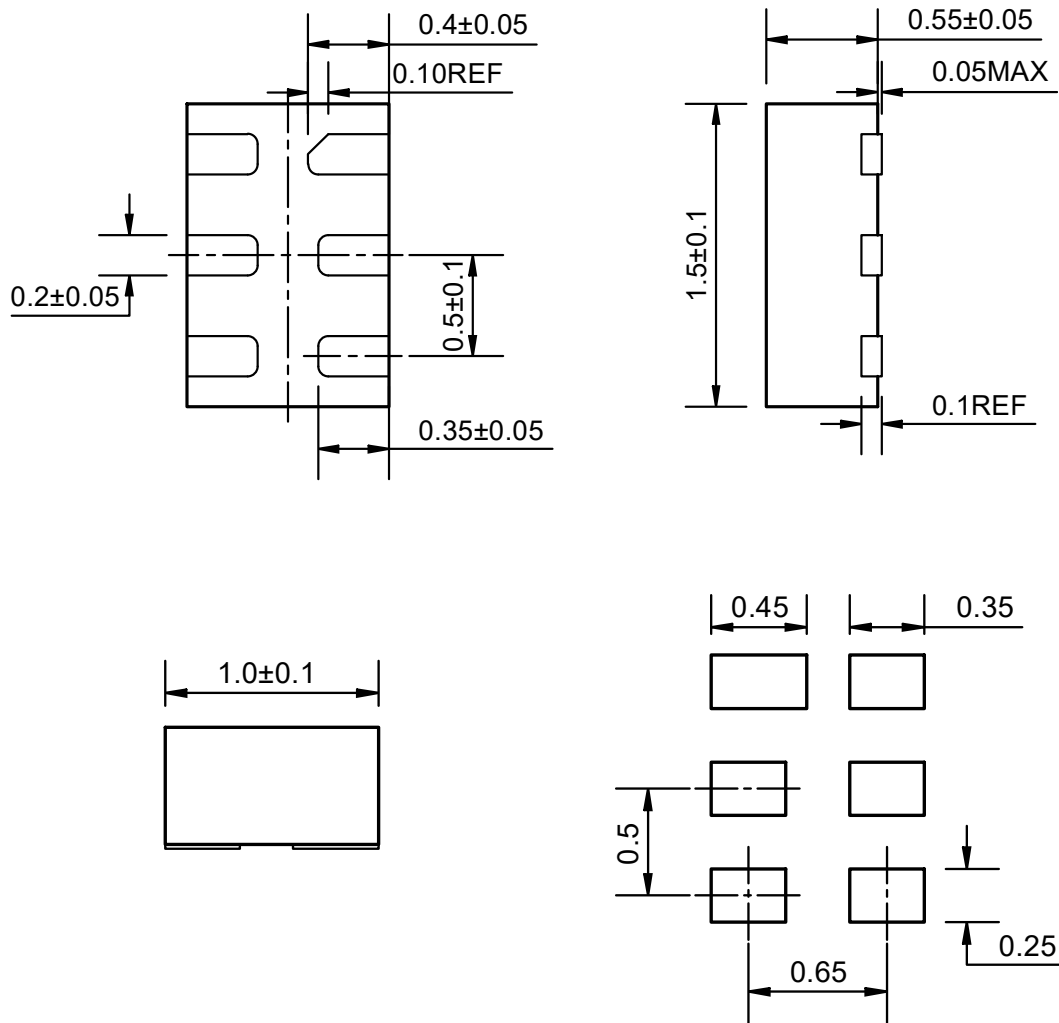


Recommended Land Pattern

Unit: mm

ET74LVC1G07

DFN6(1.0×1.5)



Recommended Land Pattern

Unit: mm

ET74LVC1G07

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2017-10-23	Original Version	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.1	2019-07-18	Update AC Table and Device Information	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.2	2021-07-02	Update DC&AC Table	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.3	2022-06-10	ESD Update	Shibo	Shibo	Zhuji
1.4	2022-08-08	Update Typesetting	Shibo	Shibo	Zhuji
1.5	2022-08-16	Update TA to 125°C	Shibo	Shibo	Zhuji
1.6	2022-10-14	Update format and Thermal Characteristics	Wuhan	Shibo	Zhuji
1.7	2023-11-29	Update Typeset /ESD	Shibo	Shibo	Shibo
1.8	2025-05-27	Add Packing Option	Yang xiaoxu	Yang xiaoxu	Liu jiaying