

Single Non-inverting Schmitt Trigger Buffer

General Description

The ET74LVC1G17 is a single Non-inverting Schmitt Trigger Buffer in three tiny footprint packages. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output driver.

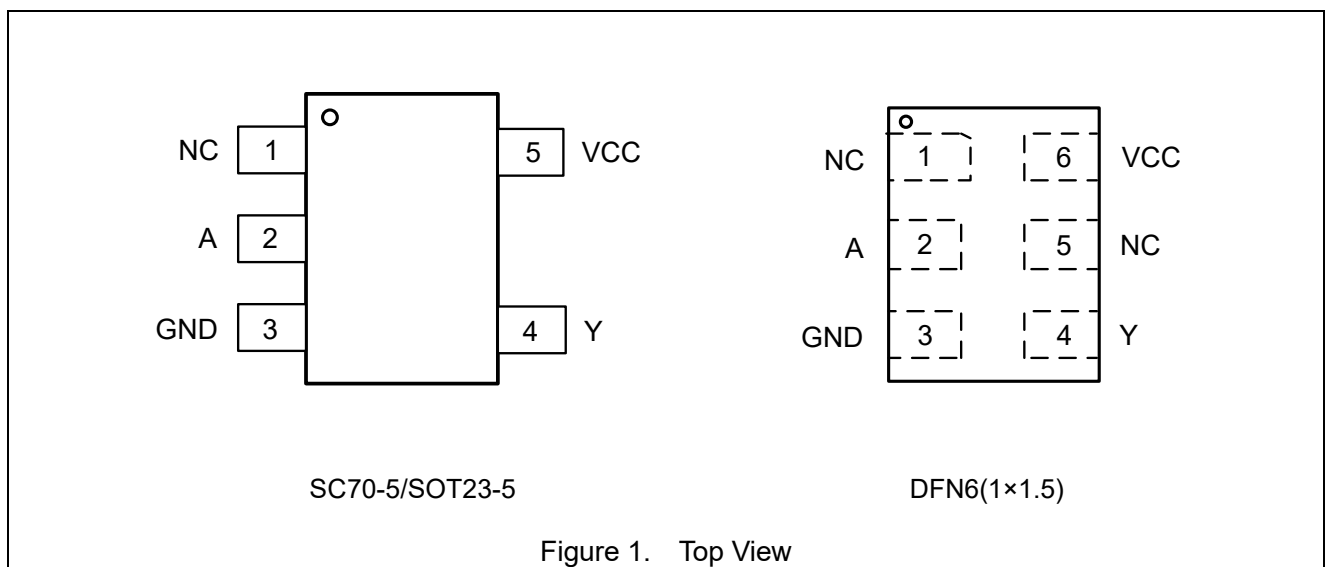
Features

- Designed for 1.65 V to 5.5 V 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
- Packages are SC70-5, SOT23-5 or small DFN6
- MSL1 (DFN6) , MSL3(SC70-5, SOT23-5)

Device Information

Part No.	Package	Size
ET74LVC1G17	SC70-5	1.3mm×2.1mm
ET74LVC1G17T	SOT23-5	1.6mm×2.9mm
ET74LVC1G17Y	DFN6	1.0mm×1.5mm

Pin Configuration



ET74LVC1G17

Pin Function

Pin No.			Pin Name	Pin Function
SC70-5	SOT23-5	DFN6		
1	1	1	NC	No connect
2	2	2	A	Input
3	3	3	GND	Ground
4	4	4	Y	Output
/	/	5	NC	No connect
5	5	6	VCC	Supply Voltage

Block Diagram

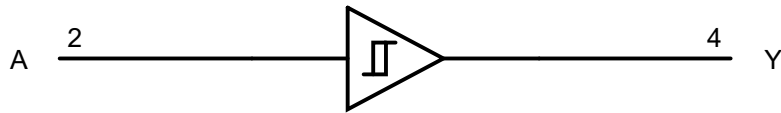


Figure 2. Logic Symbol

Functional Description

Function Table

Input A	Output Y
L	L
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 ⁽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

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Absolute Maximum Ratings (Continued)

Symbol	Parameter		Value	Unit
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±1500	V
I _{LU}	Max Latch up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±200	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		1.65-1.95 2.3-5.5	0.75V _{CC} 0.7V _{CC}			0.75V _{CC} 0.7V _{CC}		V
V _{IL}	Low-Level Input Voltage		1.65-1.95 2.3-5.5			0.25V _{CC} 0.3V _{CC}		0.25V _{CC} 0.3V _{CC}	V
V _{OH}	High-Level Output Voltage	I _{OH} = -100uA	1.65-5.5	V _{CC} -0.1	V _{CC}		V _{CC} -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	I _{OH} = 100uA	1.65-5.5		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	0-5.5		±0.1			±1.0	uA

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DC Electrical Characteristics (Continued)

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25 °C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
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

t_r = t_f = 5ns

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25 °C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay (Figure3 and4)	R _L = 1MΩ C _L = 15pF	1.65	2.0	12	16	2.0	20	ns
			1.8	2.0	10.1	14	2.0	17	
		R _L = 1MΩ C _L = 15pF	2.5	0.2	6.2	9.1	0.8	11.1	
		R _L = 1MΩ C _L = 15pF	3.3	0.8	5.0	7.5	0.5	8	
		R _L = 500Ω C _L =50pF		1.2	5.6	8.1	1.5	8.6	
		R _L = 1MΩ C _L = 15pF	5.0	0.5	4.4	5.6	0.5	6.1	
		R _L = 500Ω C _L =50pF		0.8	4.8	6.1	0.8	6.6	

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C _{IN}	Input Capacitance	V _{CC} = 5.5V, V _I = 0V or V _{CC}	>2.5	pF
C _{PD}	Power Dissipation Capacitance ⁽⁵⁾	10 MHz, V _{CC} = 3.3V, V _I = 0V or V _{CC}	20	pF
		10 MHz, V _{CC} = 5.5V, V _I = 0V or V _{CC}	24	

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}×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.

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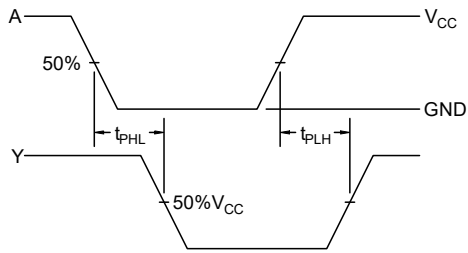


Figure 3. Switching Waveform

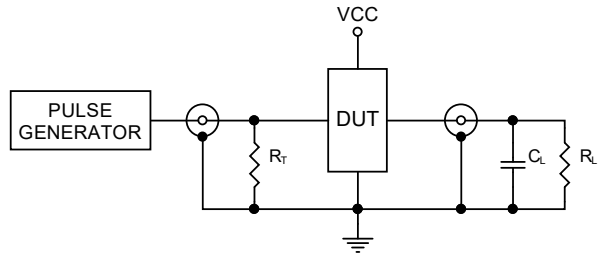
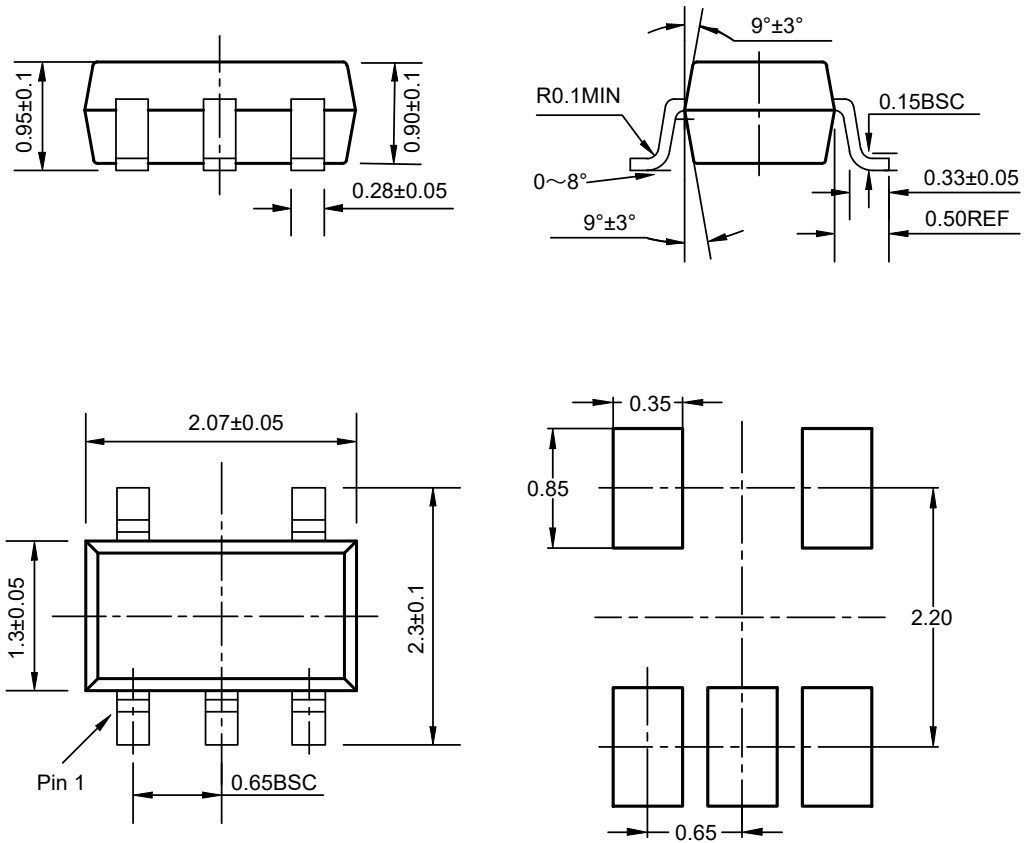


Figure 4. Test Circuit

Package Dimension

SC70-5

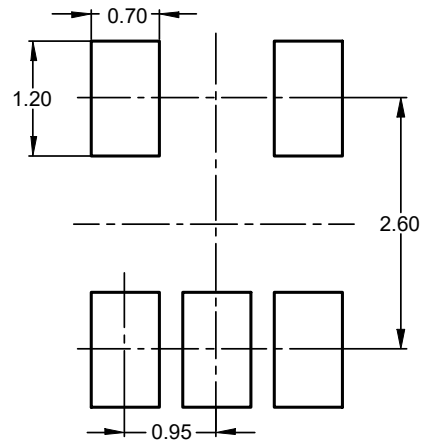
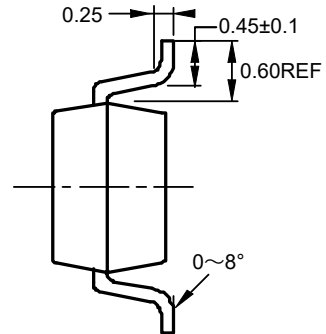
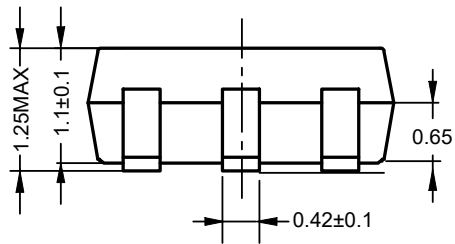
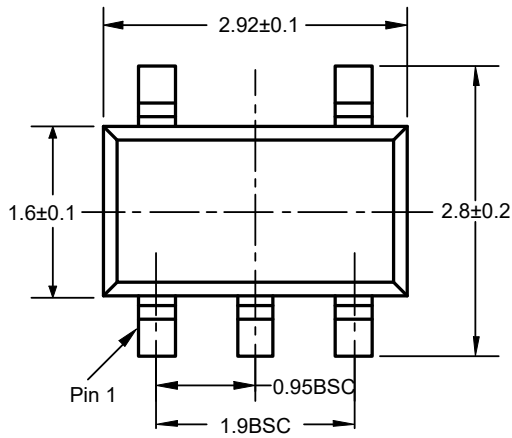


Recommended Land Pattern

Unit: mm

ET74LVC1G17

SOT23-5

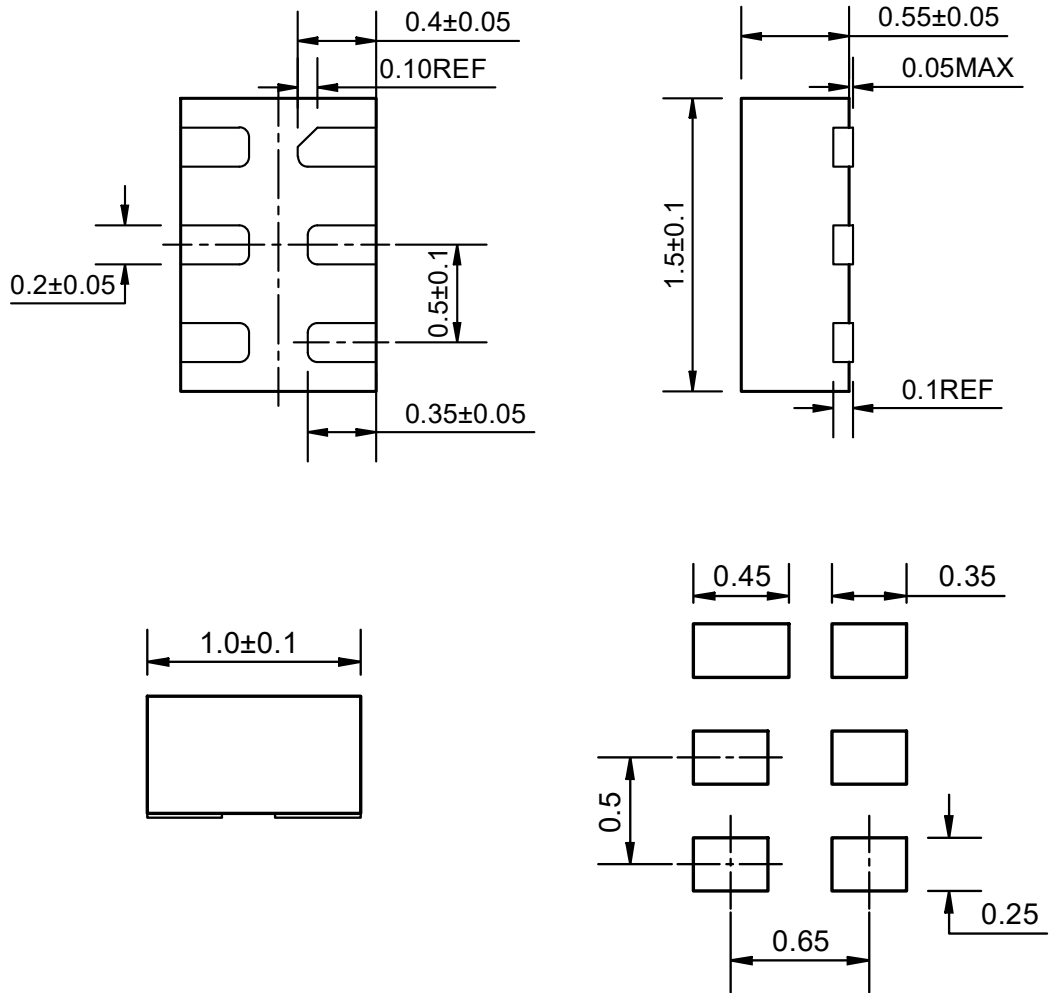


Recommended Land Pattern

Unit: mm

ET74LVC1G17

DFN6(1.0×1.5)



Recommended Land Pattern

Unit: mm

ET74LVC1G17

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	2022-08-01	Update Typeset	Shibo	Shibo	Shibo
1.3	2022-10-14	Update format and Thermal Characteristics	Wuhan	Shibo	Shibo
1.4	2023-11-29	Update Typeset /ESD	Shibo	Shibo	Shibo
1.5	2024-1-24	Update AC Electrical Characteristics	Shibo	Shibo	Shibo