

Non-inverting 1-to-2 Demultiplexer / Decoder

General Description

The ET74LVC1G19 is a high-performance non-inverting 1-to-2 demultiplexer. With the Select input [S] at Low, data at A is passed to Y0 and Y1 is set to high impedance. With the Select input [S] at High, data at A is passed to Y1 and Y0 is set to high impedance. The device operates over the voltage range from 1.65V to 5.5V.

This device has been optimized for on-board buffering applications and offers mixed (1.65V, 2.3V, 3.0V and 5.5V) voltage capability by providing over voltage tolerance (OVT) circuitry on I/O pins.

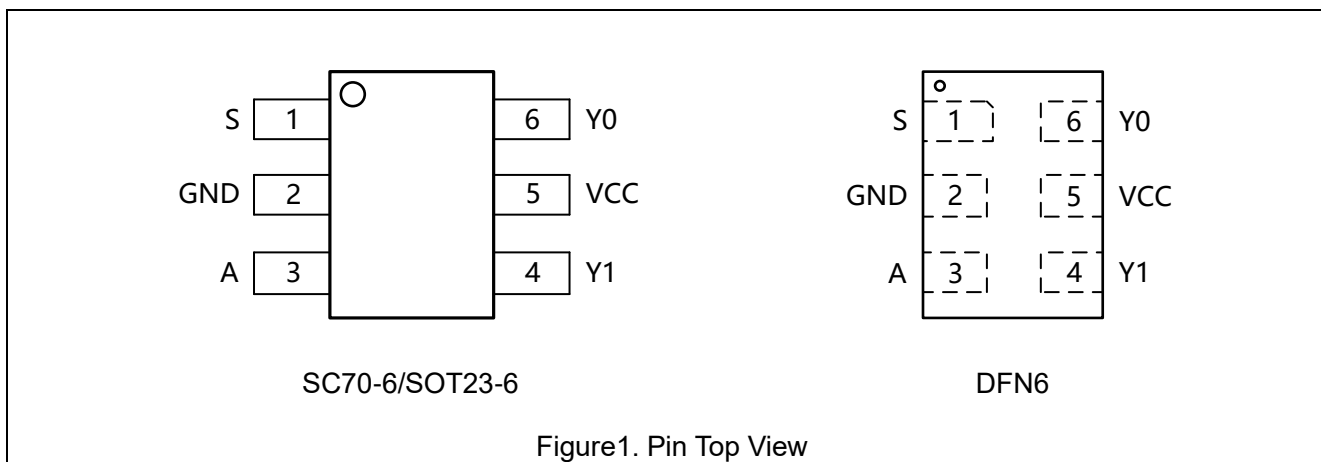
Features

- Designed for 1.65V to 5.5V VCC Operation
- High-Speed Propagation Delay t_{PD} 2.5nS (Typ)@3.3V, Load 50pF
- Power Down Impedance Outputs in High-Z
- Output Drive Capability 32mA
- These Devices are Pb-Free and are RoHS Compliant

Device Information

Part No.	Package	Packing Option	MSL
ET74LVC1G19	SC70-5 (1.3mm×2.1mm)	Tape and Reel, 3K	1
ET74LVC1G19T	SOT23-5 (1.6mm×2.9mm)	Tape and Reel, 3K	3
ET74LVC1G19Y	DFN6 (1.0mm×1.5mm)	Tape and Reel, 3K	1

Pin Configuration

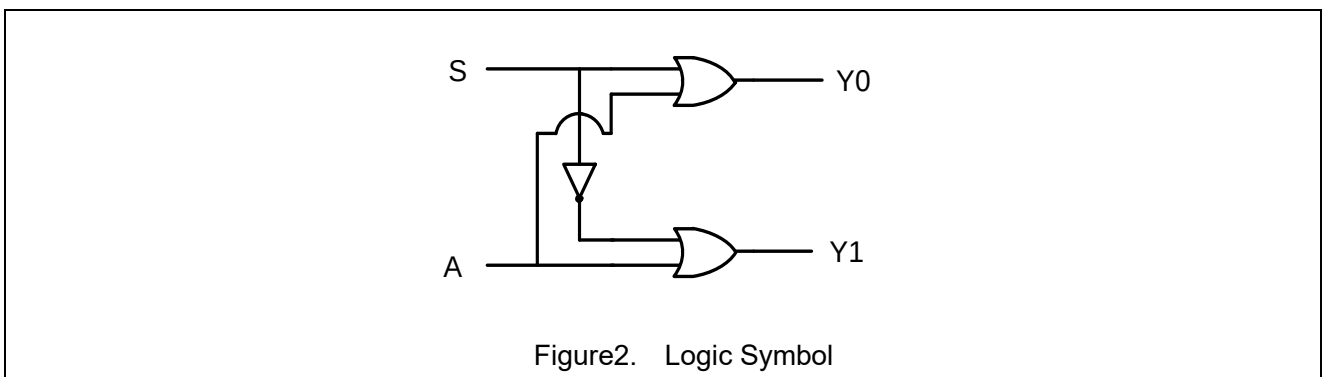


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Pin Function

Pin No.	Pin Name	Pin Function
1	S	Demultiplexer Select
2	GND	Ground
3	A	Data Input
4	Y1	Output 2
5	VCC	Power
6	Y0	Output 1

Block Diagram



Functional Description

Function Table

Input		Output	
A	S	$Y0=A+S$	$Y1=A+\bar{S}$
L	L	L	H
L	H	H	L
H	L	H	H
H	H	H	H

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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 this 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.

Note1. IO absolute maximum rating must be observed.

Note2. Tested to EIA/JESD22-A114-A.

Note3. Tested to JESD22-C101-A.

Note4. Tested to EIA/JESD78.

Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
R _{θJA}	SC70-6	Thermal Characteristics, Thermal Resistance, Junction-to-Air	280	°C/W
	SOT23-6		180	
	DFN6(1.0×1.5)		440	
P _D	SC70-6	Power Dissipation in Still Air at 85°C	230	mW
	SOT23-6		360	
	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	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	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°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 _{OL} =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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I_{OFF}	Power Off Leakage Current	$V_{IN}=5.5V$ or $V_{OUT}=5.5V$	0			1		10	μA
I_{CC}	Quiescent Supply Current	$V_{IN}=5.5V$ or GND	5.5					10	μA

AC Electrical Characteristics

$t_r = t_f = 2.5ns$

Symbol	Parameter	Condition	$V_{CC}(V)$	$T_A = 25^\circ C$			$-40^\circ C \leq T_A \leq 85^\circ C$		Unit
				Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay (Figure 3/4)	$R_L = 1M\Omega$ $C_L = 15pF$	1.65	2.0	5.3	11.4	2.0	12.0	ns
			1.8	2.0	4.4	9.5	2.0	10.0	
		$R_L = 1M\Omega$ $C_L = 15pF$	2.5 ± 0.2	0.2	3.5	6.5	0.8	7.0	
		$R_L = 1M\Omega$ $C_L = 15pF$	3.3 ± 0.3	0.8	2.1	4.5	0.5	4.7	
		$R_L = 500\Omega$ $C_L = 50pF$		1.2	2.9	5.5	1.5	5.2	
		$R_L = 1M\Omega$ $C_L = 15pF$	5.0 ± 0.5	0.5	1.8	3.9	0.5	4.1	
		$R_L = 500\Omega$ $C_L = 50pF$		0.8	2.4	4.3	0.8	4.5	

Capacitive Characteristics

Symbol	Parameter	Condition	Typical	Unit
C_{IN}	Input Capacitance	$V_{CC} = 5.5V$, $V_I = 0V$ or V_{CC}	>2.5	pF
C_{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, $V_{CC} = 3.3V$, $V_I = 0V$ or V_{CC}	9	pF
		10MHz, $V_{CC} = 5.5V$, $V_I = 0V$ or V_{CC}	11	

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; $P_D = C_{PD} \times V_{CC}^2 \times f_{in} + I_{CC} \times V_{CC} \times Fig.$

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Test Waveform

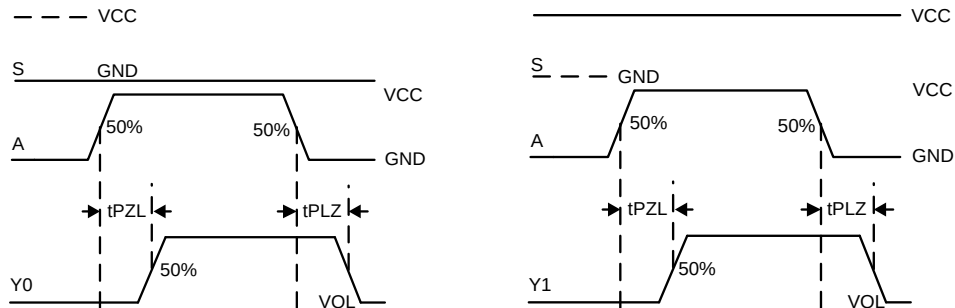


Figure 3/4 Switching Waveform

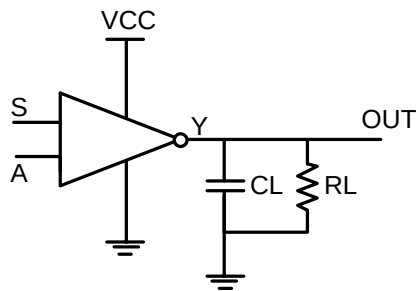
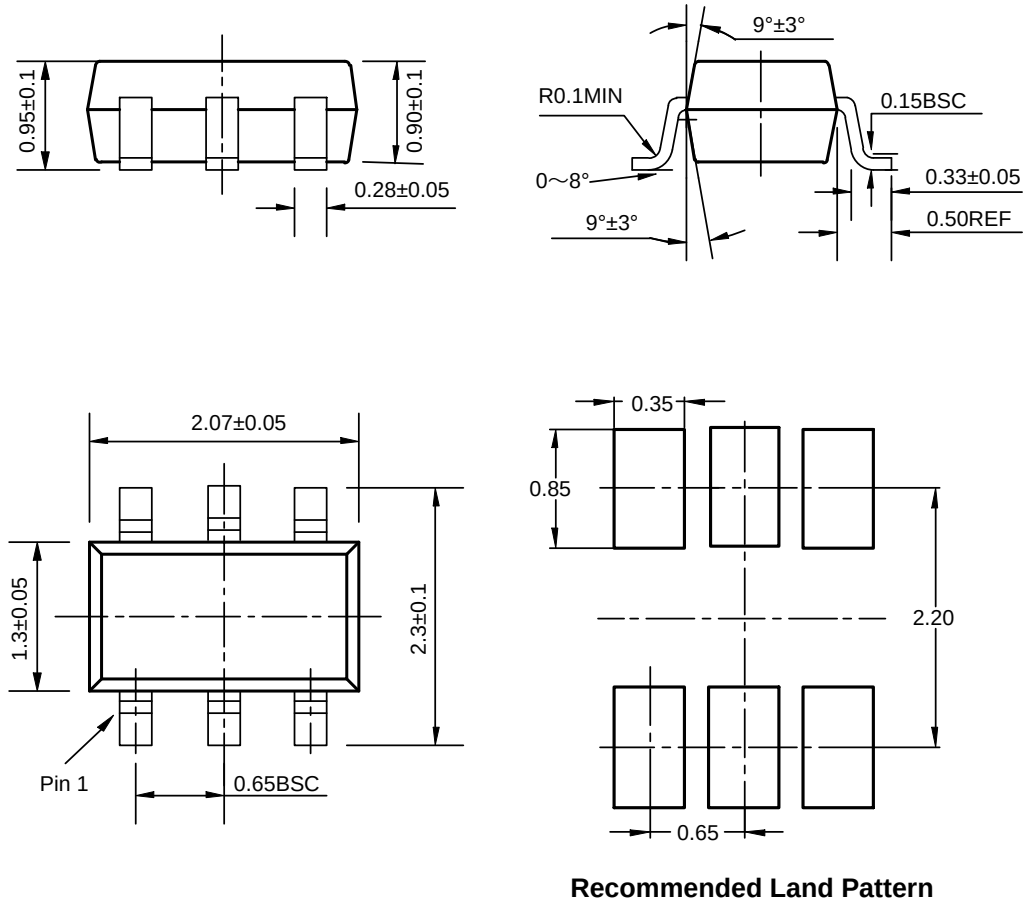


Figure 5. Test Circuit

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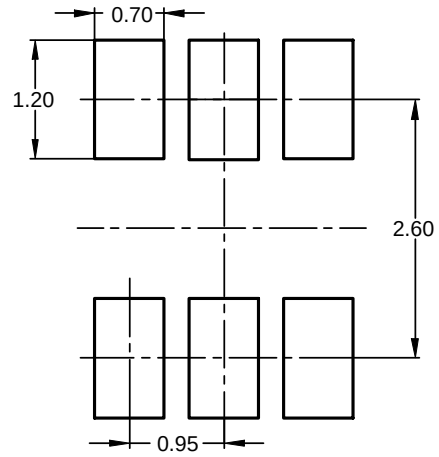
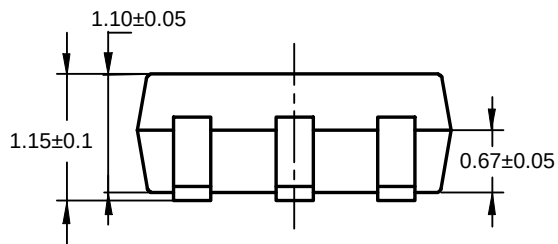
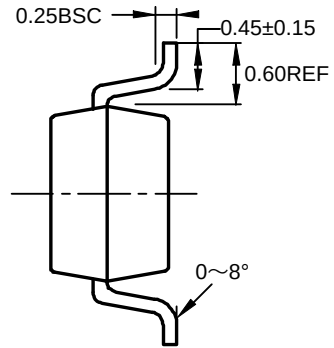
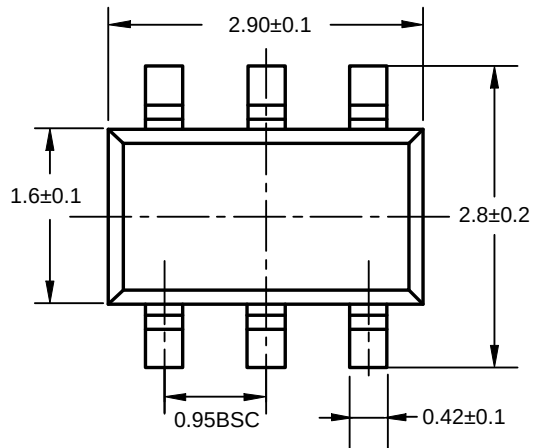
Package Dimension

SC70-6



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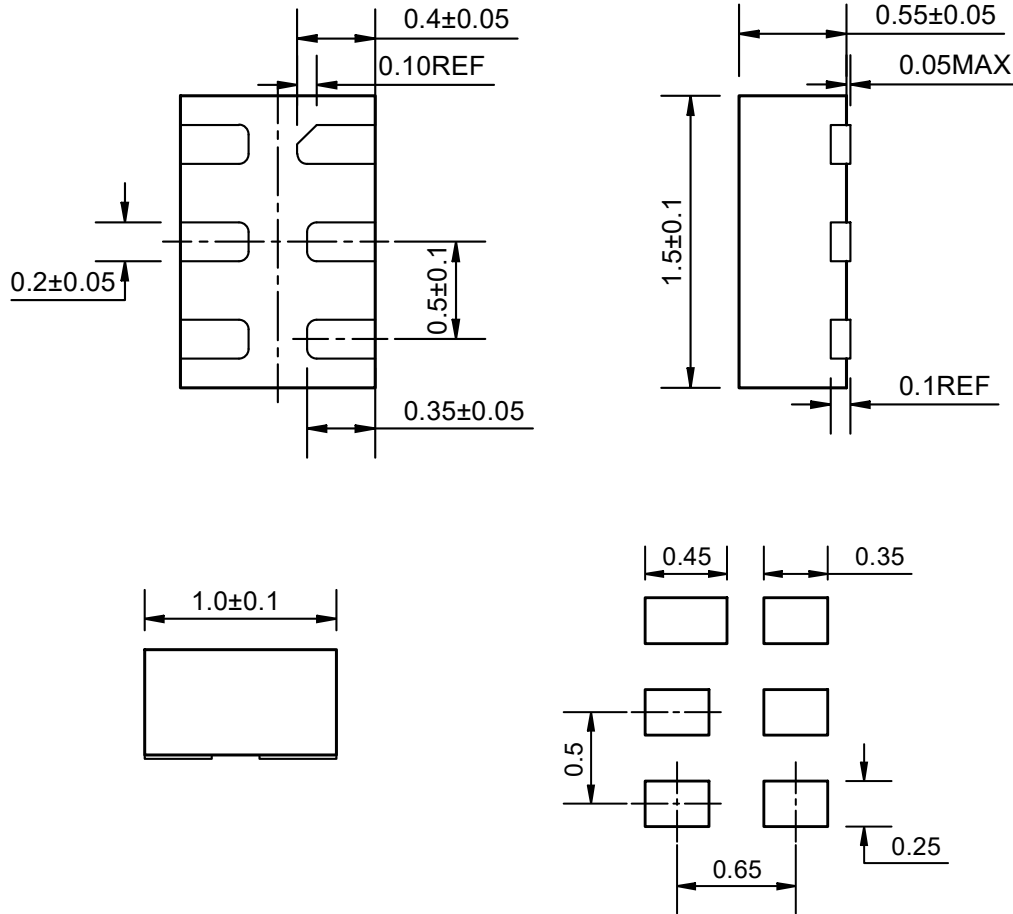
SOT23-6



Recommended Land Pattern

ET74LVC1G19

DFN6



Recommended Land Pattern

Unit: mm

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2017-07-19	Original Version	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.1	2023-12-19	Update Typeset and Thermal Characteristics	Shibo	Shibo	Shibo
1.2	2025-05-27	Add Packing Option	Yang xiaoxu	Yang xiaoxu	Liu jiaying