

Single Non-inverting Schmitt Trigger Buffer

General Description

The ET74LVC1G17Y1 is a single Non-inverting Schmitt Trigger Buffer. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output driver.

Features

- Designed for 1.65V to 5.5V V_{CC} Operation
- Over-Voltage Tolerant Inputs
- $\pm 32\text{mA}$ Balanced Output Sink and Source Capability
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free and RoHS Compliant
- ESD Protection Complies with JESD22 Standard
 - HBM: $\pm 4000\text{V}$ Pass (JEDEC JS-001)
 - CDM: $\pm 1500\text{V}$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 200\text{mA}$ per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74LVC1G17Y1	DFN4 (0.8mm × 0.8mm)	Tape and Reel, 10K/Reel	1

Pin Configuration

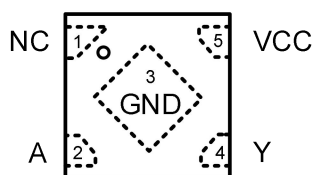


Figure1. Pin Configuration

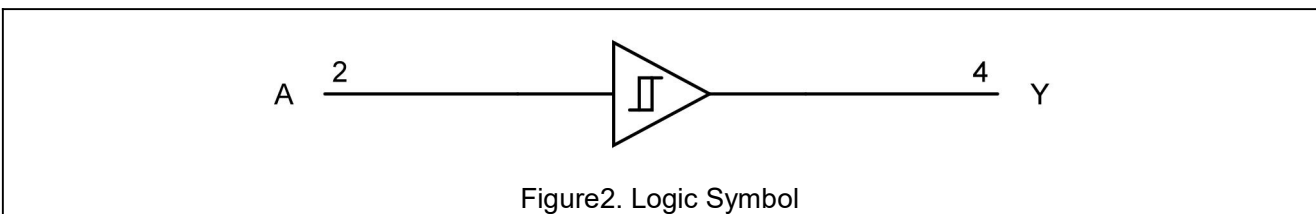
Note*: This electric circuit only supplies for reference. It is recommended to ground the unused I/O ports and ensure they are **not left floating**.

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Pin Function

Pin No.	Pin Name	Pin Function
DFN4		
1	NC	No Connect
2	A	Input
3	GND	Ground
4	Y	Output
5	VCC	Supply Voltage

Block Diagram



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⁾	$-0.5 \leq V_I \leq 7.0$	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 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: I_O absolute maximum rating must be observed.

Note2: HBM tested per JEDEC JS-001.

Note3: CDM tested per JEDEC JS-002.

Note4: Latch Up Current Maximum Rating tested per JEDEC JESD78F.

Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
$R_{\theta JA}$	DFN4	Thermal Characteristics, Thermal Resistance, Junction-to-Air	285	°C/W
P_D	DFN4	Power Dissipation in Still Air at 85°C	350	mW

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_I	DC Input Voltage		0	V_{CC}	V
V_O	DC Output Voltage (High or Low State)		0	V_{CC}	V
T_A	Operating Temperature Range		-40	125	°C
t_r, t_f	Input Rise and Fall Time	$V_{CC} = 2.5V \pm 0.2V$	0	20	ns/V
		$V_{CC} = 3.0V \pm 0.3V$	0	10	
		$V_{CC} = 5.0V \pm 0.5V$	0	5	

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

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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 _{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 _I = 5.5V or GND	0~5.5		±0.1			±1.0	uA
I _{OFF}	Power Off Leakage Current	V _I = 5.5V or V _O = 5.5V	0			1		10	uA
I _{CC}	Quiescent Supply Current	V _I = 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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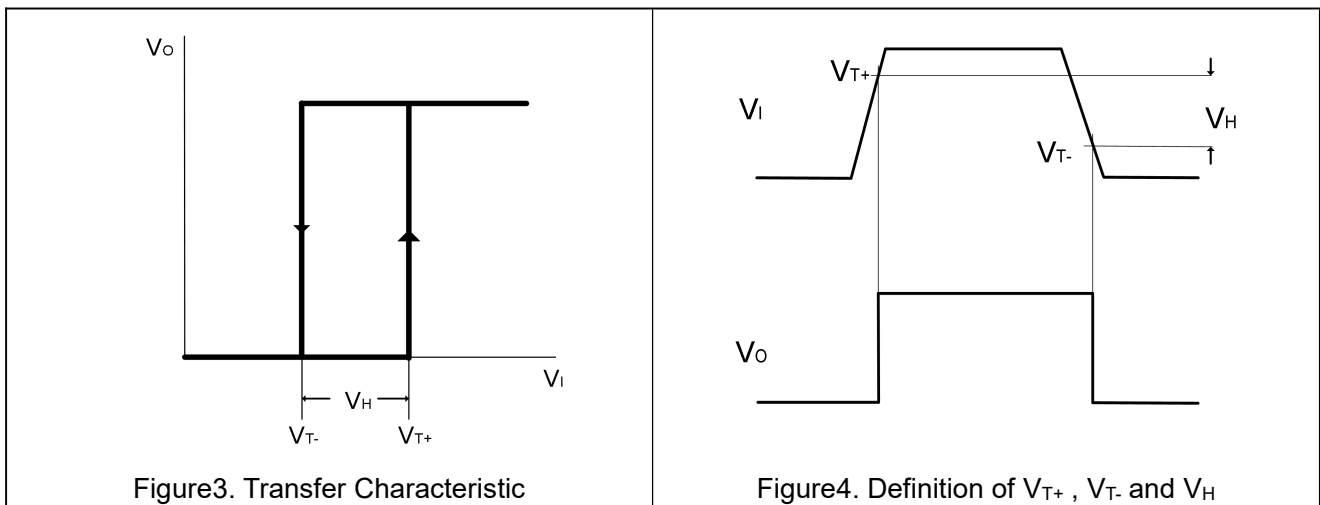
Electrical Characteristics (Continued)

Transfer Characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0V).

Symbol	Parameters	Conditions	T _A = 25°C			-40°C ≤ T _A ≤ 125°C		Unit
			Min	Typ	Max	Min	Max	
V _{T+}	Positive-going Threshold Voltage	See Figure3, 4						
		V _{CC} = 1.8V	0.95	1.15	1.32	0.90	1.37	V
		V _{CC} = 2.3V	1.20	1.45	1.68	1.15	1.73	V
		V _{CC} = 3.0V	1.57	1.80	2.13	1.52	2.18	V
		V _{CC} = 4.5V	2.20	2.56	2.95	2.15	3.00	V
		V _{CC} = 5.5V	2.73	3.06	3.47	2.68	3.52	V
V _{T-}	Negative-going Threshold Voltage	See Figure3, 4						
		V _{CC} = 1.8V	0.45	0.58	0.73	0.40	0.78	V
		V _{CC} = 2.3V	0.51	0.76	0.94	0.46	0.99	V
		V _{CC} = 3.0V	0.72	1.03	1.20	0.67	1.25	V
		V _{CC} = 4.5V	1.16	1.53	1.75	1.11	1.80	V
		V _{CC} = 5.5V	1.47	1.83	2.07	1.42	2.12	V
V _H	Hysteresis Voltage	(V _{T+} - V _{T-}) See Figure3, 4						
		V _{CC} = 1.8V	0.43	0.57	0.67	0.38	0.72	V
		V _{CC} = 2.3V	0.55	0.69	0.85	0.50	0.90	V
		V _{CC} = 3.0V	0.64	0.77	1.13	0.59	1.18	V
		V _{CC} = 4.5V	0.94	1.03	1.43	0.89	1.48	V
		V _{CC} = 5.5V	1.14	1.23	1.61	1.09	1.66	V

Wave-forms Transfer Characteristics



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AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$

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 (Figure 5 & 6)	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	8.0	
		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}	4.5	pF
C _{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, V _{CC} = 3.3V, V _I = 0V or V _{CC}	20	pF
		10MHz, V _{CC} = 5.5V, V _I = 0V or V _{CC}	24	

Note5: C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

AC Test Circuit

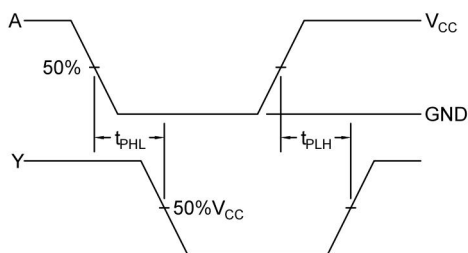


Figure5. Switching Waveform

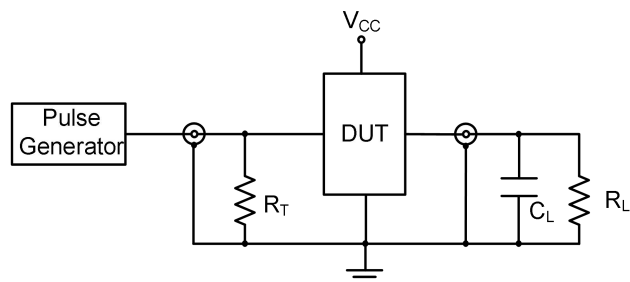
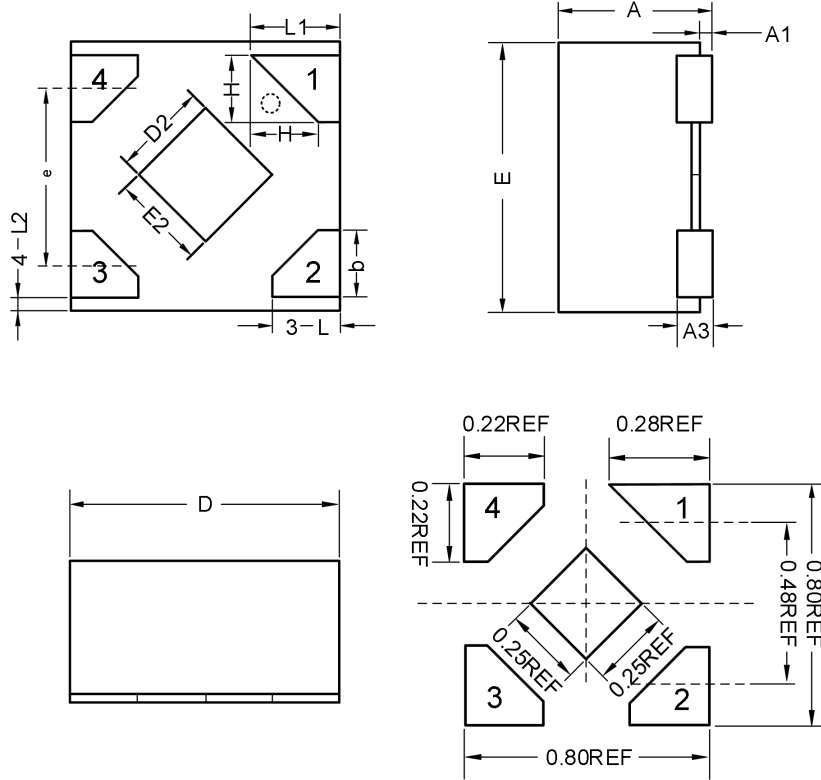


Figure6. Test Circuit

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Package Dimension

DFN4 (0.8mm × 0.8mm)



COMMON DIMENSIONS

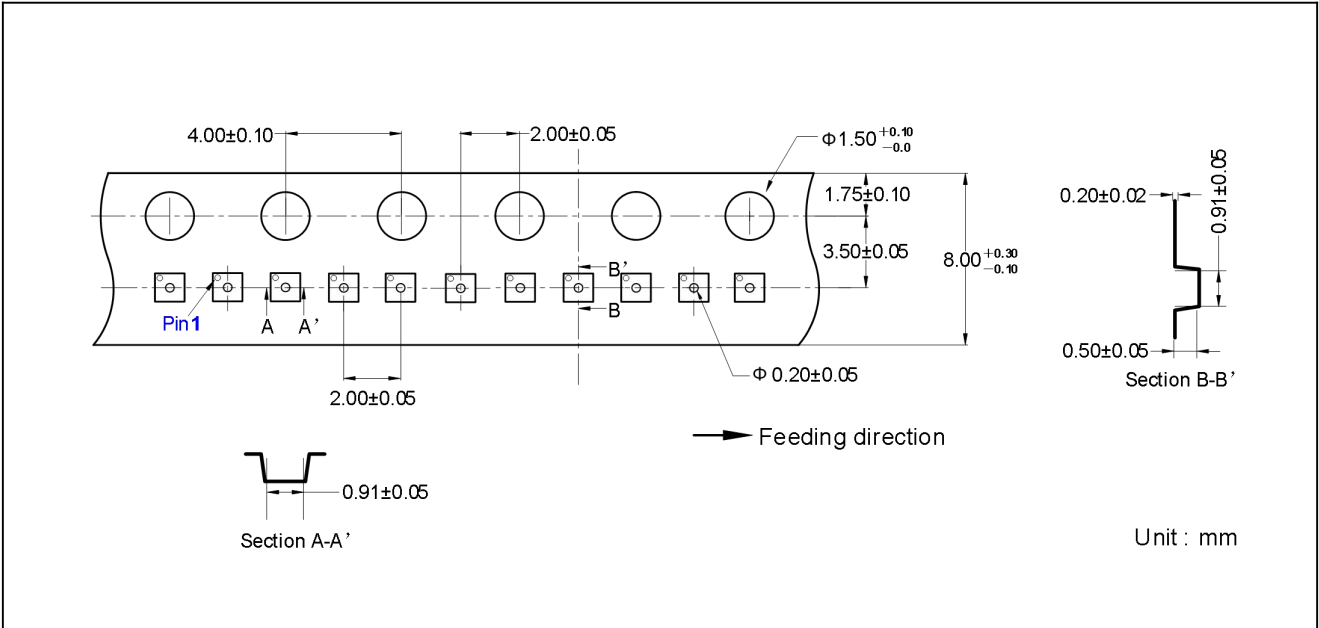
(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	0.34	0.37	0.40
A1	0.00	0.02	0.05
A3	0.10REF		
b	0.17	0.22	0.27
D	0.75	0.80	0.85
E	0.75	0.80	0.85
D2	0.20	0.25	0.30
E2	0.20	0.25	0.30
e	0.43	0.48	0.53
H	0.22REF		
L	0.17	0.22	0.27
L1	0.18	0.28	0.38
L2	0.05REF		

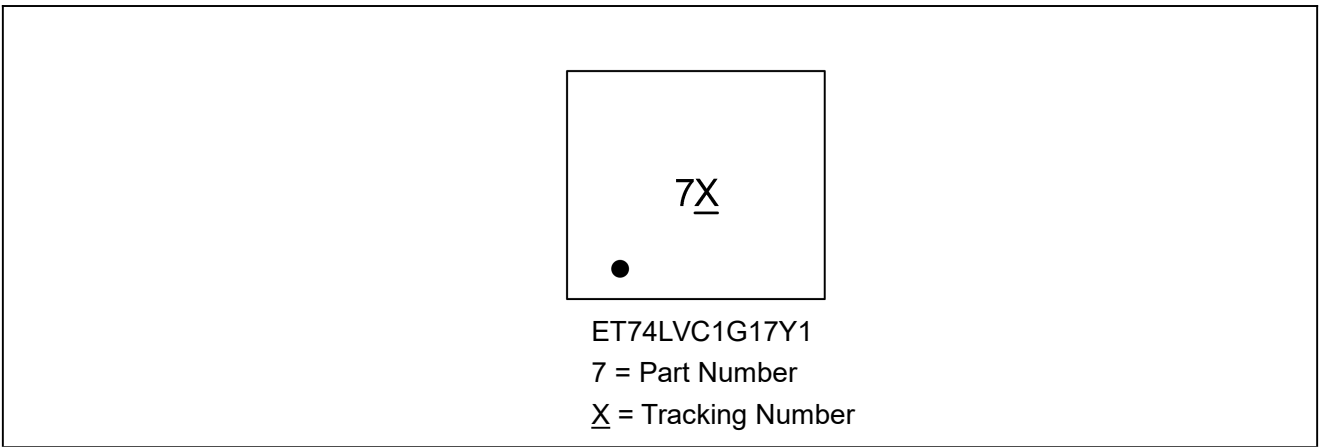
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Tape Information

DFN4 (0.8mm × 0.8mm)



Marking Information



Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2025-10-23	Original Version	Shibo	Shibo	Shibo