Single 3-Input OR Gate

General Description

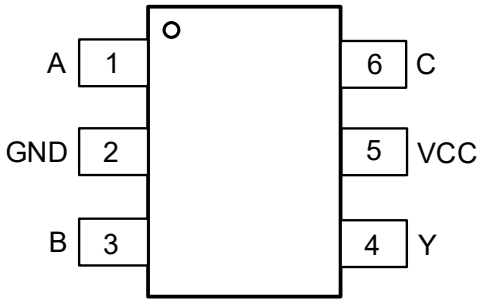
The ET74LVC1G332 is a single 3-input OR gate operating from a 1.65V to 5.5V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

- Designed for 1.65V to 5.5V V_{CC} Operation
- Over-voltage Tolerant Inputs Accept Voltages to 5.5V
- ±32mA 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: ±4000V Pass (JEDEC JS-001)
  -- CDM: ±1000V Pass (JEDEC JS-002)
- Latch-up Performance Exceeds ±100mA per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74LVC1G332T	SOT23-6 (1.6mm × 2.9mm)	Tape and Reel, 3K/Reel	3

Pin Configuration



SOT23-6

Figure1. Pin Configuration

Pin Function

SOT23-6

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

Block Diagram

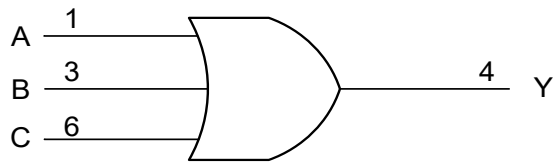


Figure2. Logic Symbol

Functional Table

Input			Output
A	**B**	**C**	**Y**
H	X	X	H
X	H	X	H
X	X	H	H
L	L	L	L

H = HIGH voltage level;

L = LOW voltage level;

X = Don’t care.

Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		-0.5 to 6.5	V
V_I	DC Input Voltage (1)		-0.5 ≤ V_I ≤ 6.5	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		250	°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.

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
$R_{\theta JA}$	SOT23-6	Thermal Characteristics, Thermal Resistance, Junction-to-Air	250	°C/W
P_D	SOT23-6	Power Dissipation in Still Air at 85°C	260	mW

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_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} = 1.8V ± 0.15V, 2.5V ± 0.2V	0	20	ns/V
		V_{CC} = 3.0V ± 0.3V	0	10	
		V_{CC} = 5.0V ± 0.5V	0	10	

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	0.65V_{CC}			0.65V_{CC}		V
			2.3~2.7	1.7			1.7		
			3.0~3.6	2.0			2.0		
			4.5~5.5	0.7V_{CC}			0.7V_{CC}		
V_{IL}	Low-Level Input Voltage		1.65~1.95			0.35V_{CC}		0.35V_{CC}	V
			2.3~2.7			0.7		0.7	
			3.0~3.6			0.8		0.8	
			4.5~5.5			0.3V_{CC}		0.3V_{CC}	
V_{OH}	High-Level Output Voltage	I_{OH} = -100uA	1.65~5.5	V_{CC} - 0.1			V_{CC} - 0.1		V
		I_{OH} = -4mA	1.65	1.2			0.95		
		I_{OH} = -8mA	2.3	1.9			1.7		
		I_{OH} = -12mA	2.7	2.2			1.9		
		I_{OH} = -24mA	3.0	2.3			2.3		
		I_{OH} = -32mA	4.5	3.8			3.4		
V_{OL}	Low-Level Output Voltage	I_{OL} = 100uA	1.65~5.5			0.1		0.1	V
		I_{OL} = 4mA	1.65			0.45		0.70	
		I_{OL} = 8mA	2.3			0.3		0.45	
		I_{OL} = 12mA	2.7			0.4		0.60	
		I_{OL} = 24mA	3.0			0.55		0.80	
		I_{OL} = 32mA	4.5			0.55		0.80	
I_I	Input Leakage Current	V_I = 5.5V or GND	0~5.5		±0.1	±1.0		±1.0	uA
I_{OFF}	Power Off Leakage Current	V_I = 5.5V or V_O = 5.5V	0		±0.1	±2.0		±2.0	uA
I_{CC}	Quiescent Supply Current	V_I = 5.5V or GND	1.65~5.5		0.1	4		4	uA
ΔI_{CC}	Additional Supply Current	Per Pin:V_I = V_{CC} - 0.6V; I_O = 0mA	2.3~5.5		5	500		500	uA

AC Electrical Characteristics

$t_r = t_f = 3ns$

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 3 and 4)	R_L = 1kΩ, C_L = 30pF	1.65~1.95	1.5	8.3	16.2	1.5	22.5	ns
		R_L = 500Ω, C_L = 30pF	2.3~2.7	1.0	4.5	8.8	1.0	12.5	
		R_L = 500Ω, C_L = 50pF	2.7	1.0	4.1	7.5	1.0	8.1	
		R_L = 500Ω, C_L = 50pF	3.0~3.6	1.0	3.7	7.1	1.0	9.8	
		R_L = 500Ω, C_L = 50pF	4.5~5.5	1.0	2.8	5.4	1.0	7.2	

Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C_{IN}	Input Capacitance	V_{CC} = 3.3V, V_I = 0V or V_{CC}	3	pF
C_{PD}	Power Dissipation Capacitance (5)	10MHz, V_{CC} = 3.3V, V_I = 0V or V_{CC}	17	pF

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

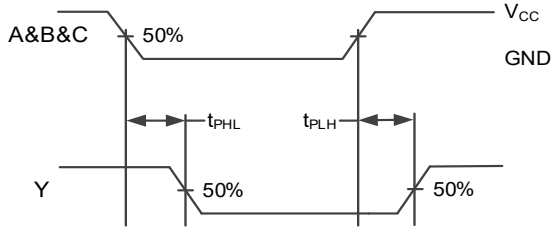


Figure3. Switching Waveform

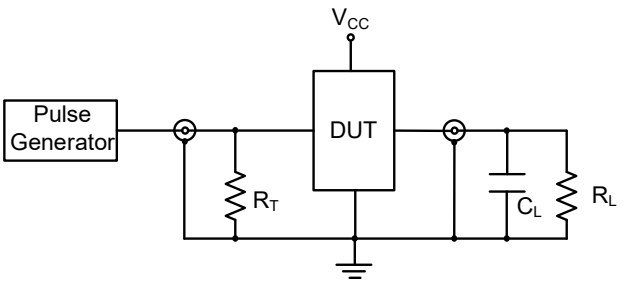
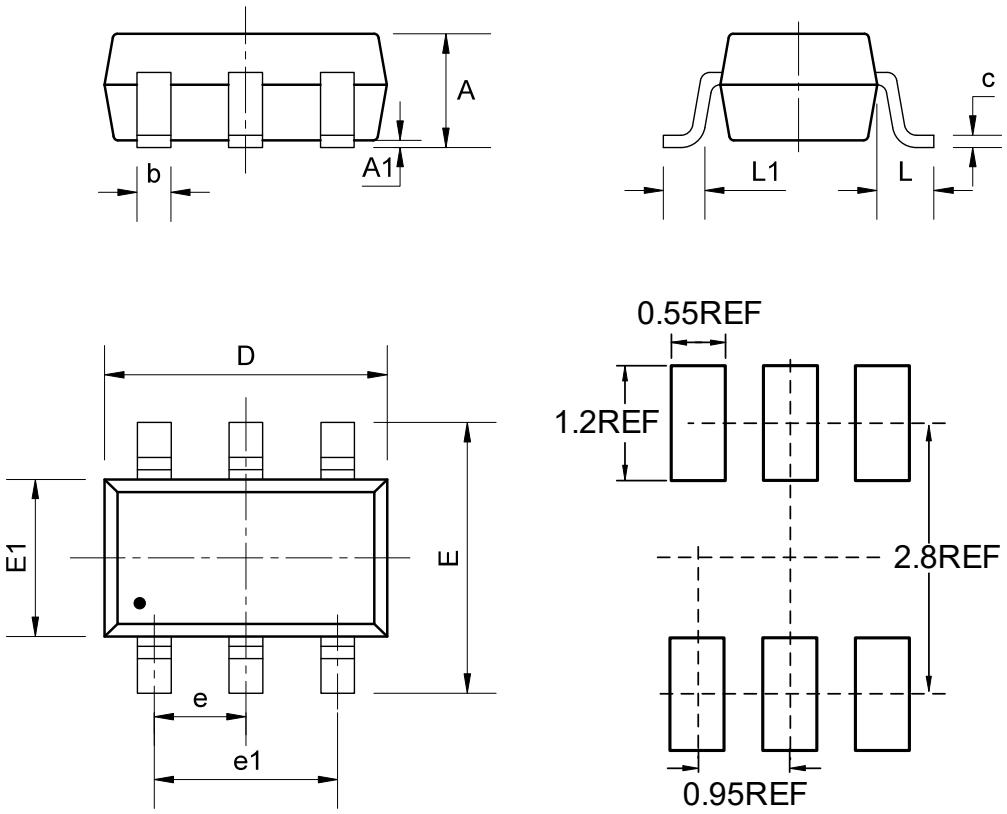


Figure4. Test Circuit

Package Dimension

SOT23-6 (1.6mm × 2.9mm)



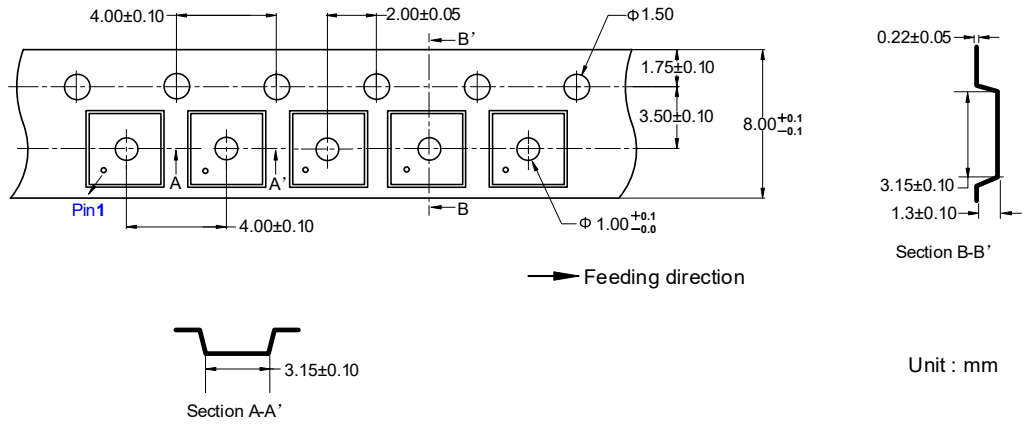
COMMON DIMENSIONS

(Unit: mm)

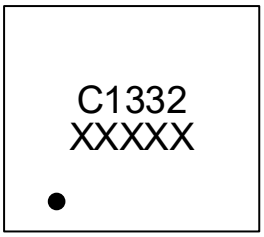
SYMBOL	MIN	NOM	MAX
A	-	-	1.45
A1	0.00	-	0.15
b	0.28	0.35	0.50
c	0.08	0.15	0.22
D	2.75	2.9	3.05
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
E	2.60	2.80	3.00
E1	1.45	1.6	1.75
L	0.60REF		
L1	0.30	0.45	0.60

Tape Information

SOT23-6 (1.6mm × 2.9mm)



Marking Information



ET74LVC1G332T

C1332 = Part Number

XXXXX = Tracking Number

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2024-04-29	Original Version	Zhang wang	Yang xiaoxu	Liu Jiaying
0.1	2025-11-21	Update Format and Package	Xu tao	Yang xiaoxu	Liu Jiaying
1.0	2025-12-25	Official Version	Xu tao	Yang xiaoxu	Liu Jiaying