

Dual 2-Input Positive-NAND Gate

General Description

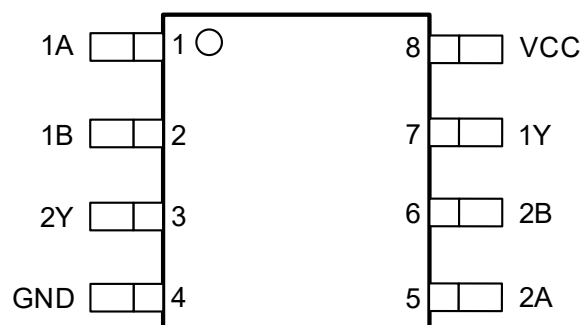
The ET74LVC2G00 is a dual 2-input positive-NAND gate operating from a 1.65V to 5.5V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

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

Part No.	Package	Packing Option	MSL
ET74LVC2G00U	VSSOP8 (2.0mm $\times$ 2.3mm)	Tape and Reel, 3K/Reel	3
ET74LVC2G00U1	MSOP8 (3.0mm $\times$ 3.0mm)	Tape and Reel, 3K/Reel	3

Pin Configuration



VSSOP8/MSOP8

Figure1. Pin Configuration

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Pin Function

VSSOP8/MSOP8

Pin No.	Pin Name	Function
1	1A	Channel 1, Input A
2	1B	Channel 1, Input B
3	2Y	Channel 2, Output Y
4	GND	Ground
5	2A	Channel 2, Input A
6	2B	Channel 2, Input B
7	1Y	Channel 1, Output Y
8	VCC	Supply Voltage

Block Diagram

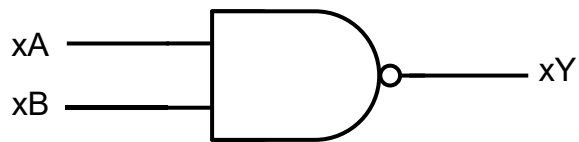


Figure2. Logic Symbol

Functional Table

Input		Output
xA	xB	xY
L	L	H
L	H	H
H	L	H
H	H	L

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Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage (VCC Pin)		-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		-50	mA
I _O	DC Output Sink Current, V _O = 0V to V _{CC}		±50	mA
I _{CC}	DC Supply Current per Supply Pin		100	mA
I _{GND}	DC Ground Current per Supply Pin		-100	mA
T _J	Max Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-65 to 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.

Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V _{CC}	DC Supply Voltage Operating		1.65	5.5	V
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} = 1.65V to 2.7V		20	ns/V
		V _{CC} = 2.7V to 5.5V		10	

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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 _{IH}	High-Level Input Voltage		1.65~1.95	0.65V _{CC}			0.65V _{CC}		V
			2.3~5.5	0.7V _{CC}			0.7V _{CC}		
V _{IL}	Low-Level Input Voltage		1.65~1.95			0.25V _{CC}		0.25V _{CC}	V
			2.3~5.5			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}		V _{CC} - 0.1		V
		I _{OH} = -4mA	1.65	1.2	1.53		0.95		
		I _{OH} = -8mA	2.3	1.9	2.13		1.7		
		I _{OH} = -12mA	2.7	2.2	2.5		1.9		
		I _{OH} = -24mA	3.0	2.3	2.6		2.0		
		I _{OH} = -32mA	3.0	3.8	4.1		3.4		
V _{OL}	Low-Level Output Voltage	I _{OL} = 100uA	4.5			0.1		0.1	V
		I _{OL} = 4mA	1.65~5.5		0.08	0.45		0.7	
		I _{OL} = 8mA	1.65		0.14	0.3		0.45	
		I _{OL} = 12mA	2.3		0.19	0.4		0.6	
		I _{OL} = 24mA	2.7		0.37	0.55		0.8	
		I _{OL} = 32mA	3.0		0.43	0.55		0.8	
I _I	Input Leakage Current	V _I = 5.5V or GND	0~5.5		±0.1	±1		±1	μA
I _{OFF}	Power Off Leakage Current	V _I = 5.5V or V _O = 5.5V	0		±0.1	±2		±2	μA
I _{CC}	Quiescent Supply Current	V _I = 5.5V or GND	5.5		0.1	4		4	μA
ΔI _{CC}	Additional Supply Current	Per Pin: V _I = V _{CC} - 0.6V; I _O = 0mA	2.3~5.5		5	500		500	μA

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AC Electrical Characteristics

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

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_{PLH} t_{PHL}	Propagation Delay (Figure 3 and 4)	$R_L = 1\text{k}\Omega$, $C_L = 30\text{pF}$	1.65~1.95	1.2	10.6	14	1.2	17	ns
		$R_L = 500\Omega$, $C_L = 30\text{pF}$	2.3~2.7	0.7	6.2	8	0.7	10.4	
		$R_L = 500\Omega$, $C_L = 50\text{pF}$	2.7	0.7	5.6	7.3	0.7	9.2	
		$R_L = 500\Omega$, $C_L = 50\text{pF}$	3.0~3.6	0.7	5.2	6.7	0.7	8.6	
		$R_L = 500\Omega$, $C_L = 50\text{pF}$	4.5~5.5	0.5	3.6	4.7	0.5	6.4	

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}	5	pF
C_{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, $V_{CC} = 3.3\text{V}$, $V_I = 0\text{V}$ or V_{CC}	25	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

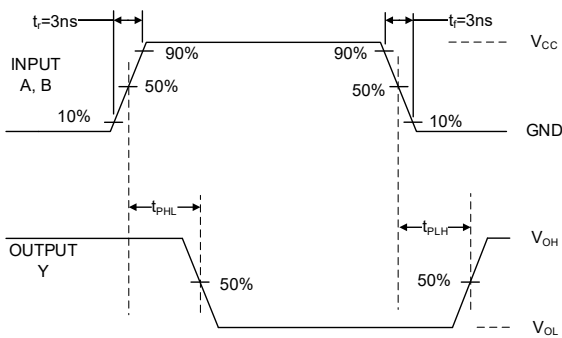


Figure3. Switching Waveform

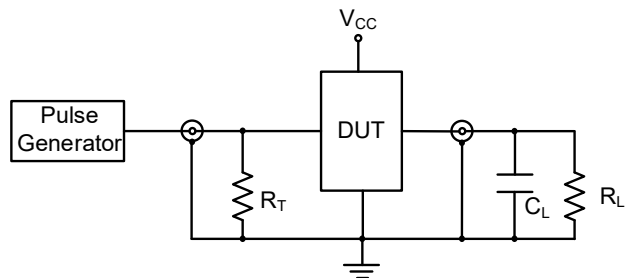
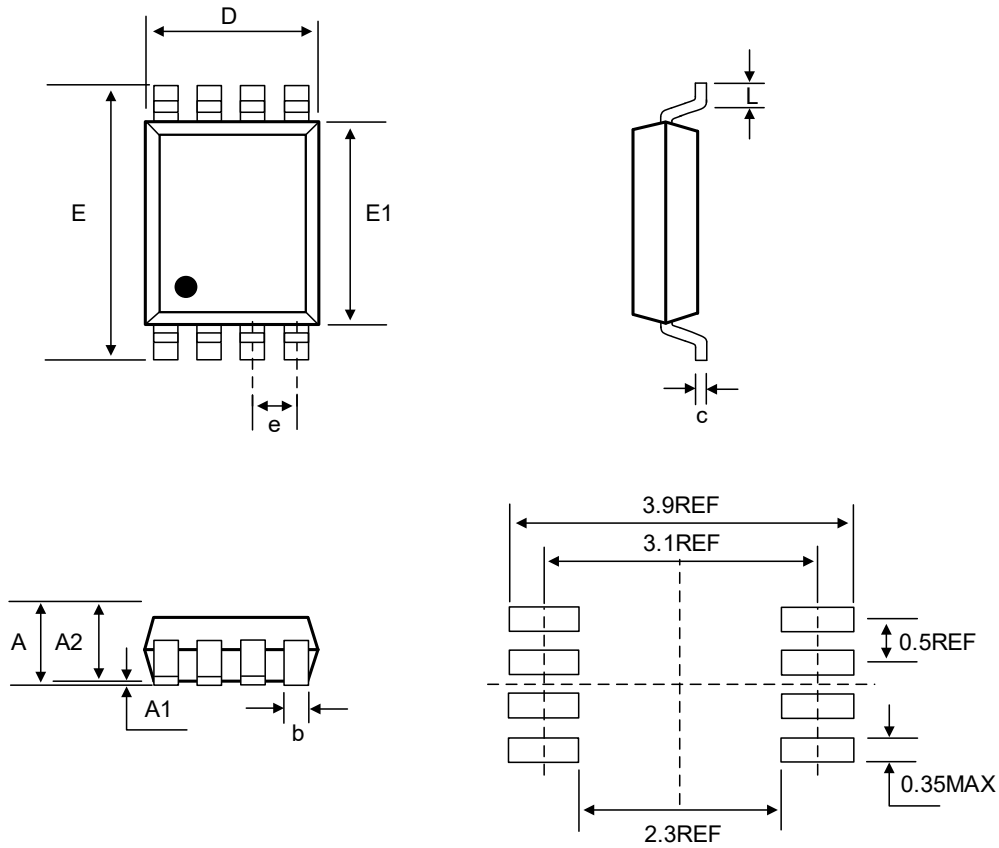


Figure4. Test Circuit

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Package Dimension

VSSOP8 (2.0mm × 2.3mm)



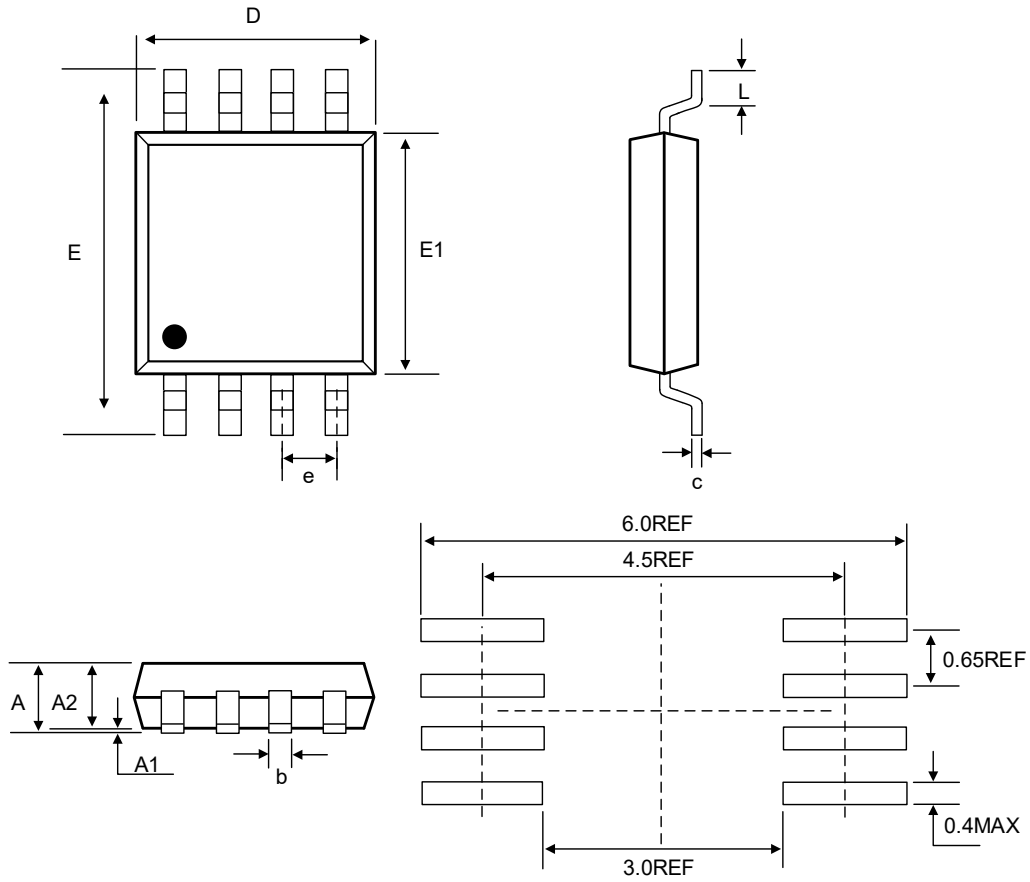
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	-	-	0.90
A1	0.00	-	0.10
A2	0.65	0.75	0.80
b	0.17	-	0.27
c	0.08	-	0.20
D	1.90	2.00	2.10
E	3.00	3.10	3.20
E1	2.20	2.30	2.40
e	0.50BSC		
L	0.20	-	0.35

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MSOP8 (3.0mm × 3.0mm)



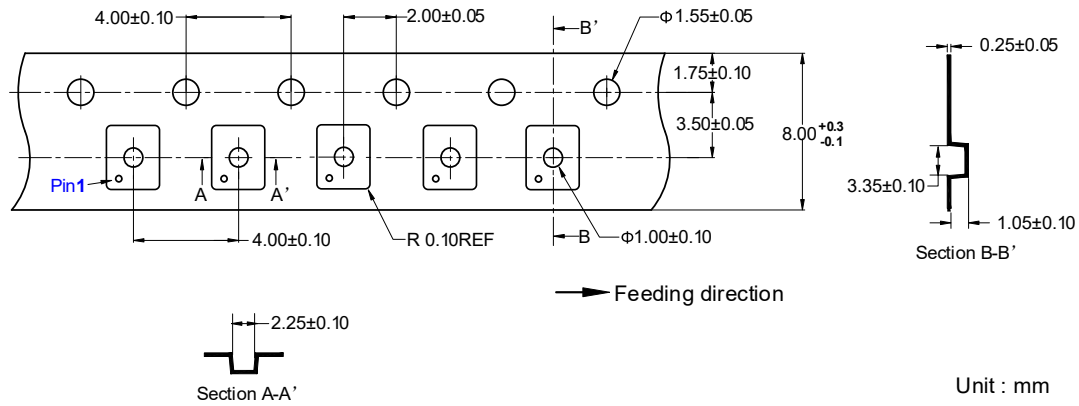
COMMON DIMENSIONS
(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	-	-	1.10
A1	0.00	-	0.15
A2	0.75	0.85	0.95
b	0.22	0.30	0.38
c	0.08	0.1	0.20
D	2.90	3.00	3.10
E	3.90	-	5.10
E1	2.90	3.00	3.10
e	0.65BSC		
L	0.33	-	0.7

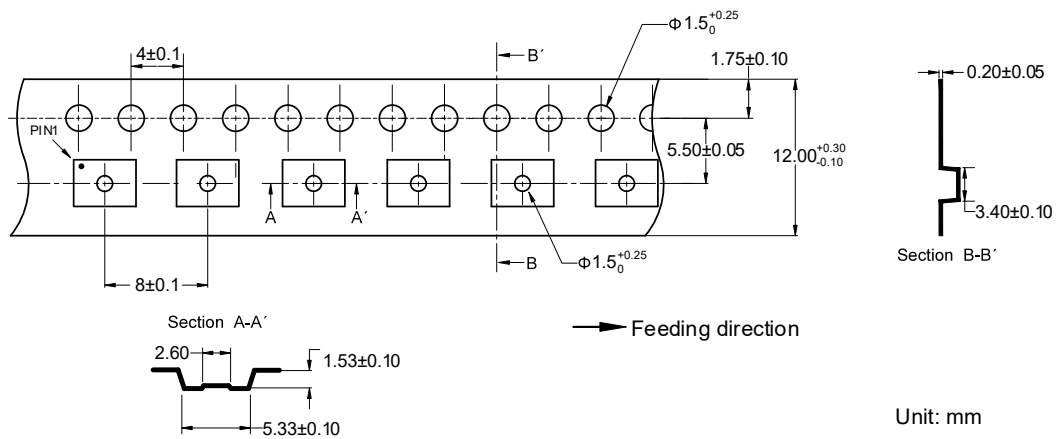
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Tape Information

VSSOP8 (2.0mm × 2.3mm)

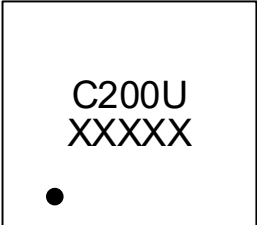


MSOP8 (3.0mm × 3.0mm)



ET74LVC2G00

Marking Information

	
ET74LVC2G00U	ET74LVC2G00U1
2G00U = Part Number	C200U1 = Part Number
XXXXX = Tracking Number	XXXXX = Tracking Number

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2025-10-29	Original Version	Xu tao	Yang xiaoxu	Liu jiaying
1.0	2025-12-11	Official Version	Lu shaojie	Yang xiaoxu	Liu jiaying