

Single Non-inverting Buffer with 3-state Output

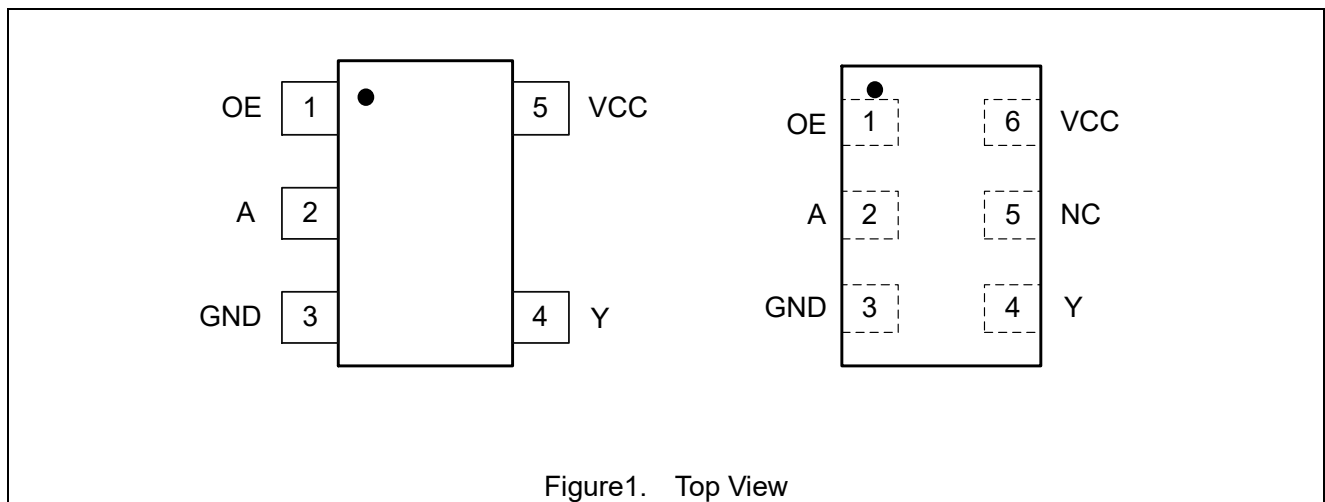
General Description

The ET74LVC1G126 is a high performance single non-inverting buffer 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 VCC Operation
- Over-voltage 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
- 3-State OE Input is Active-High
- Packages are SC70-5, SOT23-5 or small DFN6
- MSL1 (DFN6) , MSL3(SC70-5, SOT23-5)

Pin Configuration



Device Information

Part No.	Package	Size
ET74LVC1G126	SC70-5	1.3mm×2.1mm
ET74LVC1G126T	SOT23-5	1.6mm×2.9mm
ET74LVC1G126Y	DFN6	1.0mm×1.5mm

ET74LVC1G126

Pin Function

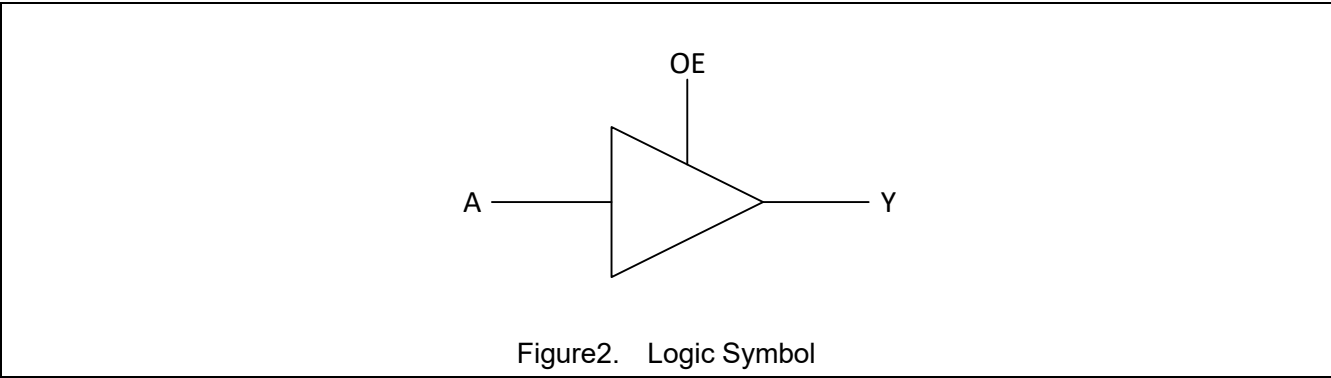
SC70-5/ SOT23-5

Pin No.	Pin Name	Function
1	OE	Enable input
2	A	Input
3	GND	Ground
4	Y	Output
5	VCC	Supply Voltage

DFN6

Pin No.	Pin Name	Function
1	OE	Enable input
2	A	Input
3	GND	Ground
4	Y	Output
5	NC	No connect
6	VCC	Supply Voltage

Block Diagram



Functional Description

Function Table

Input		Output
OE	A	Y
H	L	L
H	H	H
L	X	Z

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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 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
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 Operating		1.65	5.5	V
	Date Retention Voltage Operating		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 _{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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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

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

$t_r = t_f = 2.5ns$

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_{PD}	Propagation Delay (Figure3 and 4)	$R_L = 1M\Omega$ $C_L = 15pF$	1.65	2.0	10.1	12.9	2.0	13.9	ns
			1.8	2.0	9.1	11.6	2.0	12.4	
			2.5	0.2	6.0	7.7	0.8	8.2	
		$R_L = 1M\Omega$ $C_L = 15pF$	3.3	0.8	5.0	6.5	0.5	7.0	
				1.2	5.6	7.1	1.5	7.6	
		$R_L = 1M\Omega$ $C_L = 15pF$	5.0	0.5	4.4	5.6	0.5	6.1	
		$R_L = 500\Omega$ $C_L = 50pF$		0.8	4.8	6.1	0.8	6.6	
$t_{PZL},$ t_{PZH}	Output Enable Time (Figure5 and 6)	$R_L = 500\Omega$ $C_L = 50pF$	1.65	2.0	12.9	20.0	2.0	23.0	ns
			1.8	2.0	10.8	18.0	2.0	22.0	
			2.5	1.5	7.2	8.8	1.5	9.4	
			3.3	1.5	5.8	7.1	1.5	7.6	
			5.0	0.8	4.5	5.5	0.8	5.9	
$t_{PLZ},$ t_{PHZ}	Output Disable Time (Figure5 and 6)	$R_L = 500\Omega$ $C_L = 50pF$	1.65	2.0	11.5	20.0	2.0	23.0	ns
			1.8	2.0	9.8	18.0	2.0	22.0	
			2.5	1.5	7.7	9.5	1.5	10.1	
			3.3	1.0	7.2	8.8	1.0	9.4	
			5.0	0.5	5.4	6.8	0.5	7.3	

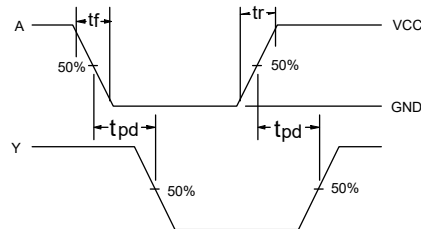
Capacitance Characteristics

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)	10MHz, $V_{CC} = 3.3V, V_I = 0V$ or V_{CC}	15	pF
		10MHz, $V_{CC} = 5.5V, V_I = 0V$ or V_{CC}	15	

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

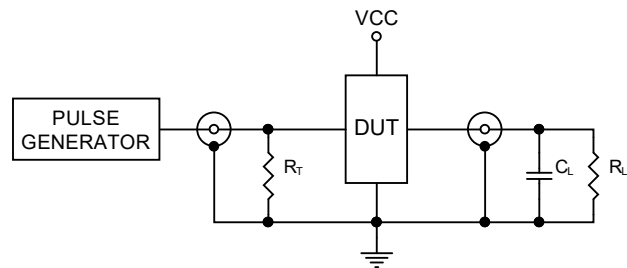
ET74LVC1G126

AC Test Circuit



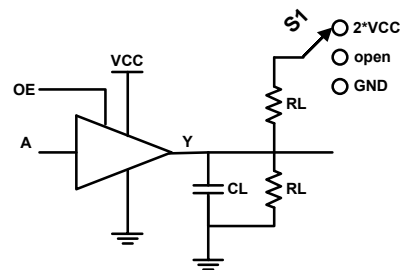
PROPAGATION DELAYS:
 $t_R=t_F=2.5\text{ns}$, 10% to 90%; $f=1\text{MHz}$;
 $t_W=500\text{ns}$

Figure3. Switch Waveform



$R_T=50\Omega(\text{typ})$

Figure4. Test Circuit



Test	Swth
tPD	Open
tPZL tPLZ	2*VCC
tPZH tPHZ	GND

Figure5. Output Enable/Disable Time Test Circuit

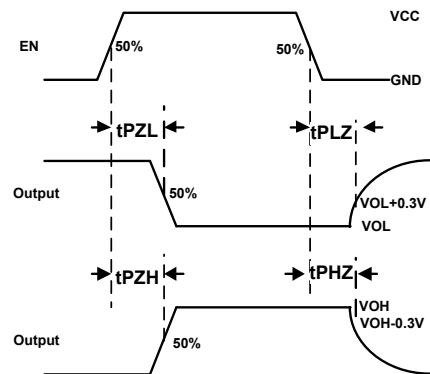
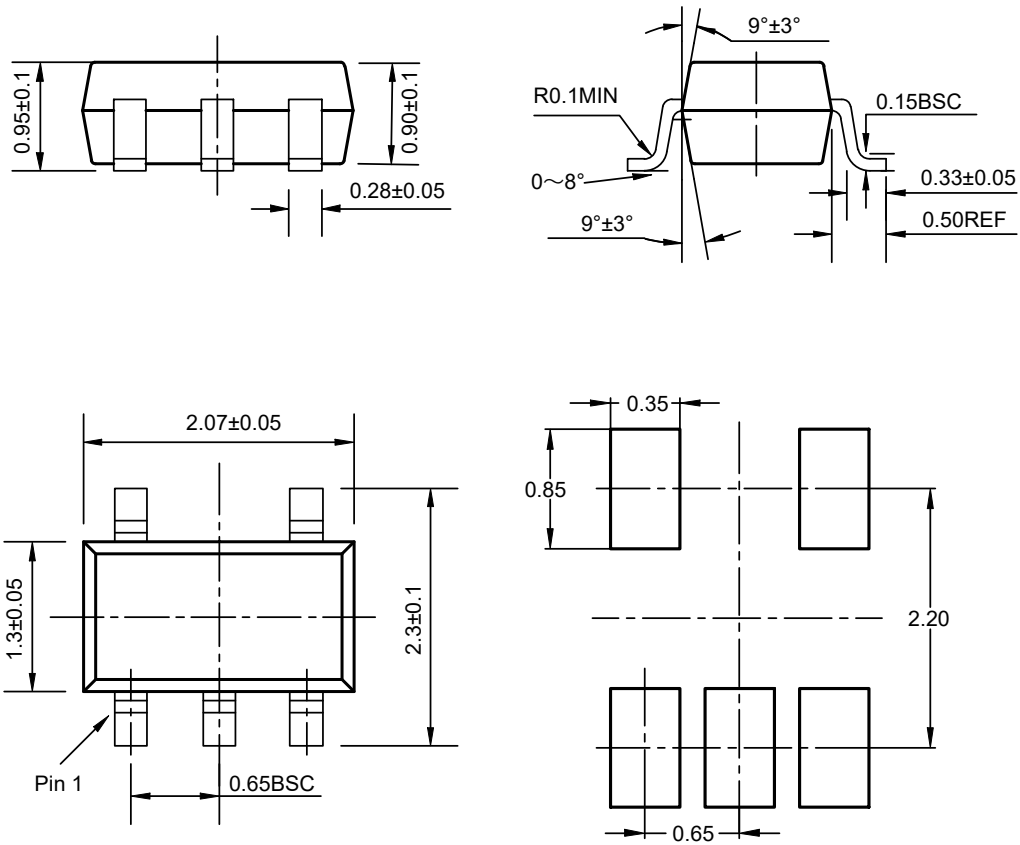


Figure6. Output Enable/Disable Waveform

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Package Dimension

SC70-5

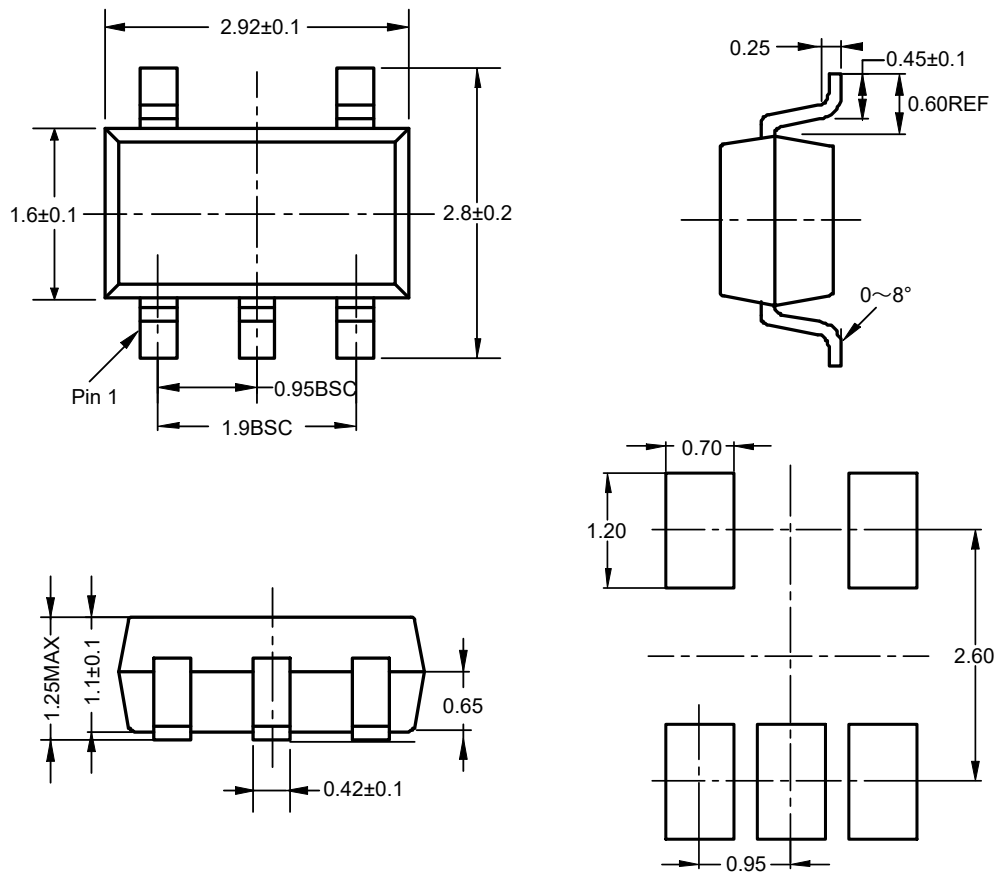


Recommended Land Pattern

Unit: mm

ET74LVC1G126

SOT23-5

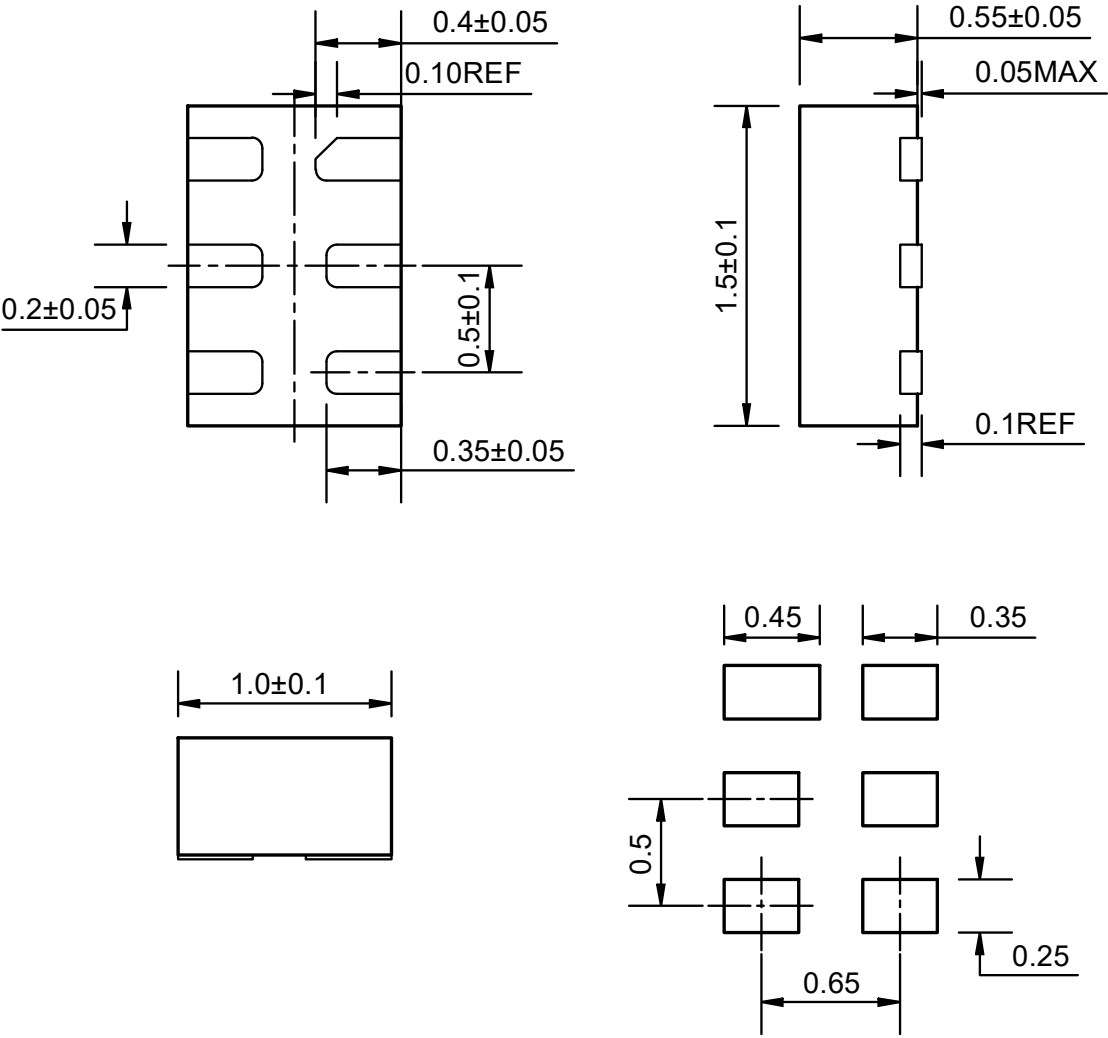


Recommended Land Pattern

Unit: mm

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DFN6 (1.0×1.5)



Recommended Land Pattern

Unit: mm

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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	2019-08-22	Add Output Enable/Disable Time & Test Circuit	Ma Yong jian	Ma Yong jian	Liu Jia Ying
1.3	2023-3-08	ESD Update	Shibo	Shibo	Zhuji