



AiP74LVC1G97

Low-power Configurable Multiple Function Gate

Product Specification

Specification Revision History:

Version	Date	Description
2023-05-A1	2023-05	New
2026-07-A2	2026-07	Add XSON6(1*1*0.45)-0.35 package form; update package information



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1、General Description

The 74LVC1G97 is a configurable multiple function gate with Schmitt-trigger inputs.

The input can be driven from either 3.3V or 5V devices. This feature allows the use of this device in a mixed 3.3V and 5V environment.

Features:

- Wide supply voltage range from 1.65V to 5.5V
- Inputs accept voltages to 5.5 V
- $\pm 24\text{mA}$ output drive at 3.0V
- High-impedance when $V_{CC}=0\text{V}$
- Temperature range: -40°C to $+125^{\circ}\text{C}$
- Packaging information: SOT23-6/SOT363/XSON6/SOT563

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC1G97GB236.TR	SOT23-6	EDXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74LVC1G97GC363.TR	SOT363	EDXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing: 0.65mm
AiP74LVC1G97EA6.TR	XSON6	EDXX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.45mm×1.0mm Pin spacing: 0.5mm
AiP74LVC1G97ED6.TR	XSON6	EDXX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.0mm×1.0mm Pin spacing: 0.35mm
AiP74LVC1G97GI563.TR	SOT563	EDXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 1.6mm×1.2mm Pin spacing: 0.5mm

Note 1: “XX” refers to variable content, meaning package batch serial number.

Note 2: If the physical information is inconsistent with the ordering information, please refer to the actual product.



2、Block Diagram And Pin Description

2.1、Block Diagram

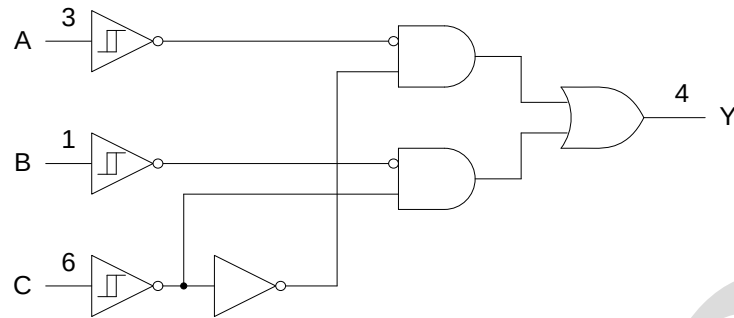


Figure 1. Logic diagram

2.2、Pin Configurations

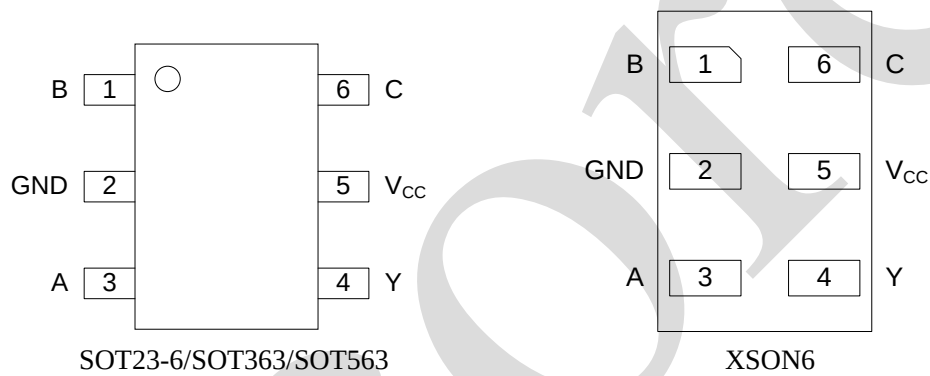


Figure 2. Pin configurations

2.3、Pin Description

Pin No.	Pin Name	Description
1	B	data input
2	GND	ground (0V)
3	A	data input
4	Y	data output
5	V _{CC}	supply voltage
6	C	data input



2.4、Function Table

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

Note: H=HIGH voltage level; L=LOW voltage level.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(Voltages are referenced to GND (ground = 0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+6.5	V
input voltage	V_I	-	-0.5	+6.5	V
output voltage	V_O	Active mode	-0.5	$V_{CC}+0.5$	V
		Power-down mode; $V_{CC}=0V$	-0.5	+6.5	V
supply current	I_{CC}	-	-	100	mA
ground current	I_{GND}	-	-100	-	mA
input clamping current	I_{IK}	$V_I < 0V$	-50	-	mA
output current	I_O	$V_O=0V$ to V_{CC}	-	± 50	mA
output clamping current	I_{OK}	$V_O > V_{CC}$ or $V_O < 0V$	-	± 50	mA
storage temperature	T_{stg}	-	-65	+150	°C
soldering temperature	T_L	10s	260		°C

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	1.65	-	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	Active mode	0	-	V_{CC}	V
		Power-down mode; $V_{CC}=0V$	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	°C



3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

($T_{amb} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, voltages are referenced to GND (ground = 0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
positive-going threshold voltage	V_{T+}	$V_{CC}=1.8\text{V}$	0.82	1.02	1.2	V
		$V_{CC}=2.3\text{V}$	1.03	1.25	1.45	V
		$V_{CC}=3.0\text{V}$	1.29	1.5	1.71	V
		$V_{CC}=4.5\text{V}$	1.84	2.15	2.41	V
		$V_{CC}=5.5\text{V}$	2.19	2.6	2.91	V
negative-going threshold voltage	V_{T-}	$V_{CC}=1.8\text{V}$	0.45	0.6	0.75	V
		$V_{CC}=2.3\text{V}$	0.64	0.8	0.96	V
		$V_{CC}=3.0\text{V}$	0.86	1.1	1.34	V
		$V_{CC}=4.5\text{V}$	1.35	1.75	2.09	V
		$V_{CC}=5.5\text{V}$	1.61	2.15	2.59	V
hysteresis voltage	V_H	$V_{CC}=1.8\text{V}$	0.24	0.4	0.54	V
		$V_{CC}=2.3\text{V}$	0.26	0.4	0.57	V
		$V_{CC}=3.0\text{V}$	0.27	0.42	0.64	V
		$V_{CC}=4.5\text{V}$	0.28	0.45	0.65	V
		$V_{CC}=5.5\text{V}$	0.29	0.47	0.75	V
HIGH-level output voltage	V_{OH}	$I_O = -100\mu\text{A}; V_{CC}=1.65\text{V to } 5.5\text{V}$	$V_{CC} - 0.1$	-	-	V
		$I_O = -4\text{mA}; V_{CC}=1.65\text{V}$	1.2	1.54	-	V
		$I_O = -8\text{mA}; V_{CC}=2.3\text{V}$	1.9	2.15	-	V
		$I_O = -12\text{mA}; V_{CC}=2.7\text{V}$	2.2	2.50	-	V
		$I_O = -24\text{mA}; V_{CC}=3.0\text{V}$	2.3	2.62	-	V
		$I_O = -32\text{mA}; V_{CC}=4.5\text{V}$	3.8	4.11	-	V
LOW-level output voltage	V_{OL}	$I_O = 100\mu\text{A}; V_{CC}=1.65\text{V to } 5.5\text{V}$	-	-	0.10	V
		$I_O = 4\text{mA}; V_{CC}=1.65\text{V}$	-	0.07	0.45	V
		$I_O = 8\text{mA}; V_{CC}=2.3\text{V}$	-	0.12	0.30	V
		$I_O = 12\text{mA}; V_{CC}=2.7\text{V}$	-	0.17	0.40	V
		$I_O = 24\text{mA}; V_{CC}=3.0\text{V}$	-	0.33	0.55	V
		$I_O = 32\text{mA}; V_{CC}=4.5\text{V}$	-	0.39	0.55	V
input leakage current	I_I	$V_I = 5.5\text{V or GND}; V_{CC} = 0\text{V to } 5.5\text{V}$	-	-	± 1	μA
power-off leakage current	I_{OFF}	$V_I \text{ or } V_O = 5.5\text{V}; V_{CC} = 0\text{V}$	-	-	± 2	μA
supply current	I_{CC}	$V_I = 5.5\text{V or GND}; I_O = 0\text{A}; V_{CC} = 1.65\text{V to } 5.5\text{V}$	-	-	4	μA
additional supply current	ΔI_{CC}	$V_I = V_{CC} - 0.6\text{V}; I_O = 0\text{A}; V_{CC} = 2.3\text{V to } 5.5\text{V}$	-	-	500	μA

Note: Typical values are measured at $T_{amb} = 25^{\circ}\text{C}$.



3.3.2、DC Characteristics 2

($T_{amb} = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground = 0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
positive-going threshold voltage	V_{T+}	$V_{CC}=1.8\text{V}$	0.79	-	1.2	V
		$V_{CC}=2.3\text{V}$	1.00	-	1.45	V
		$V_{CC}=3.0\text{V}$	1.26	-	1.71	V
		$V_{CC}=4.5\text{V}$	1.81	-	2.41	V
		$V_{CC}=5.5\text{V}$	2.16	-	2.91	V
negative-going threshold voltage	V_{T-}	$V_{CC}=1.8\text{V}$	0.45	-	0.78	V
		$V_{CC}=2.3\text{V}$	0.64	-	0.99	V
		$V_{CC}=3.0\text{V}$	0.86	-	1.37	V
		$V_{CC}=4.5\text{V}$	1.35	-	2.12	V
		$V_{CC}=5.5\text{V}$	1.61	-	2.62	V
hysteresis voltage	V_H	$V_{CC}=1.8\text{V}$	0.17	-	0.54	V
		$V_{CC}=2.3\text{V}$	0.20	-	0.57	V
		$V_{CC}=3.0\text{V}$	0.21	-	0.64	V
		$V_{CC}=4.5\text{V}$	0.22	-	0.65	V
		$V_{CC}=5.5\text{V}$	0.23	-	0.75	V
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O = -100\mu\text{A}; V_{CC}=1.65\text{V to } 5.5\text{V}$	$V_{CC} - 0.1$	-	V
			$I_O = -4\text{mA}; V_{CC}=1.65\text{V}$	0.95	-	V
			$I_O = -8\text{mA}; V_{CC}=2.3\text{V}$	1.7	-	V
			$I_O = -12\text{mA}; V_{CC}=2.7\text{V}$	1.9	-	V
			$I_O = -24\text{mA}; V_{CC}=3.0\text{V}$	2.0	-	V
			$I_O = -32\text{mA}; V_{CC}=4.5\text{V}$	3.4	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O = 100\mu\text{A}; V_{CC}=1.65\text{V to } 5.5\text{V}$	-	-	0.10 V
			$I_O = 4\text{mA}; V_{CC}=1.65\text{V}$	-	-	0.70 V
			$I_O = 8\text{mA}; V_{CC}=2.3\text{V}$	-	-	0.45 V
			$I_O = 12\text{mA}; V_{CC}=2.7\text{V}$	-	-	0.60 V
			$I_O = 24\text{mA}; V_{CC}=3.0\text{V}$	-	-	0.80 V
			$I_O = 32\text{mA}; V_{CC}=4.5\text{V}$	-	-	0.80 V
input leakage current	I_I	$V_I = 5.5\text{V or GND}; V_{CC} = 0\text{V to } 5.5\text{V}$	-	-	± 1	μA
power-off leakage current	I_{OFF}	$V_I \text{ or } V_O = 5.5\text{V}; V_{CC} = 0\text{V}$	-	-	± 2	μA
supply current	I_{CC}	$V_I = 5.5\text{V or GND}; I_O = 0\text{A}; V_{CC} = 1.65\text{V to } 5.5\text{V}$	-	-	4	μA
additional supply current	ΔI_{CC}	$V_I = V_{CC} - 0.6\text{V}; I_O = 0\text{A}; V_{CC} = 2.3\text{V to } 5.5\text{V}$	-	-	500	μA



3.3.3、AC Characteristics 1

($T_{amb}=-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, voltages are referenced to GND (ground = 0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ. ^[1]	Max.	Unit
A to Y propagation delay	t_{PLH} , t_{PHL}	see Figure 4	$V_{CC}=1.65\text{V to }1.95\text{V}$	-	6.0	14.4	ns
			$V_{CC}=2.3\text{V to }2.7\text{V}$	-	3.5	8.3	ns
			$V_{CC}=2.7\text{V}$	-	4.2	8.5	ns
			$V_{CC}=3.0\text{V to }3.6\text{V}$	-	3.8	6.3	ns
			$V_{CC}=4.5\text{V to }5.5\text{V}$	-	3.0	5.1	ns

Note: Typical values are measured at $T_{amb}=25^{\circ}\text{C}$ and $V_{CC}=1.8\text{V}$, 2.5V , 2.7V , 3.3V and 5.0V respectively.

3.3.4、AC Characteristics 2

($T_{amb}=-40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground = 0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
A to Y propagation delay	t_{PLH} , t_{PHL}	see Figure 4	$V_{CC}=1.65\text{V to }1.95\text{V}$	-	-	18	ns
			$V_{CC}=2.3\text{V to }2.7\text{V}$	-	-	10.4	ns
			$V_{CC}=2.7\text{V}$	-	-	10.6	ns
			$V_{CC}=3.0\text{V to }3.6\text{V}$	-	-	7.9	ns
			$V_{CC}=4.5\text{V to }5.5\text{V}$	-	-	6.4	ns

4、Testing Circuit

4.1、AC Testing Circuit

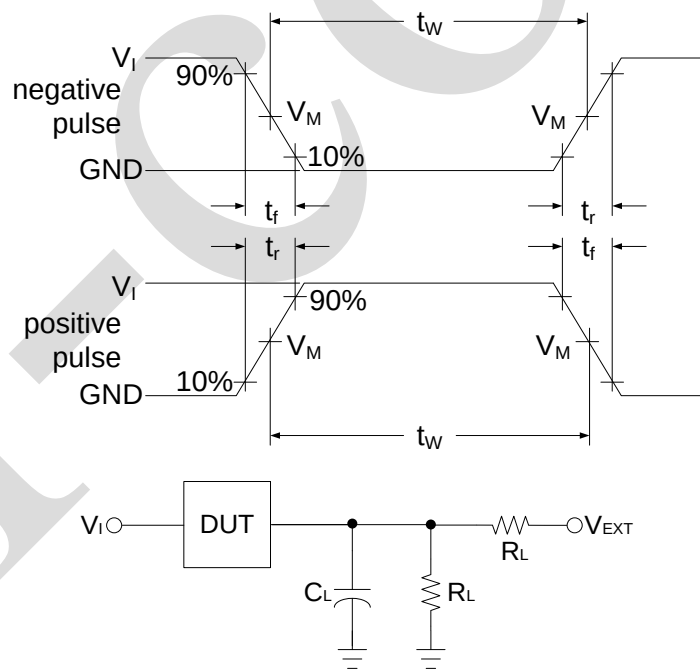


Figure 3. Load circuit

C_L includes probe and jig capacitance.

R_L =Load resistance.

4.2、 Test Data

Supply voltage	Input		Load		V _{EXT}		
V _{CC}	V _I	t _r = t _f	C _L	R _L	t _{PLH} /t _{PHL}	t _{PLZ} /t _{PZL}	t _{PHZ} /t _{PZH}
1.65V to 1.95V	V _{CC}	≤ 3ns	30pF	1kΩ	Open	2×V _{CC}	GND
2.3V to 2.7V	V _{CC}	≤ 3ns	30pF	500Ω	Open	2×V _{CC}	GND
2.7V	V _{CC}	≤ 3ns	50pF	500Ω	Open	2×V _{CC}	GND
3.0V to 3.6V	V _{CC}	≤ 3ns	50pF	500Ω	Open	2×V _{CC}	GND
4.5V to 5.5V	V _{CC}	≤ 3ns	50pF	500Ω	Open	2×V _{CC}	GND

4.3、 AC Testing Waveforms

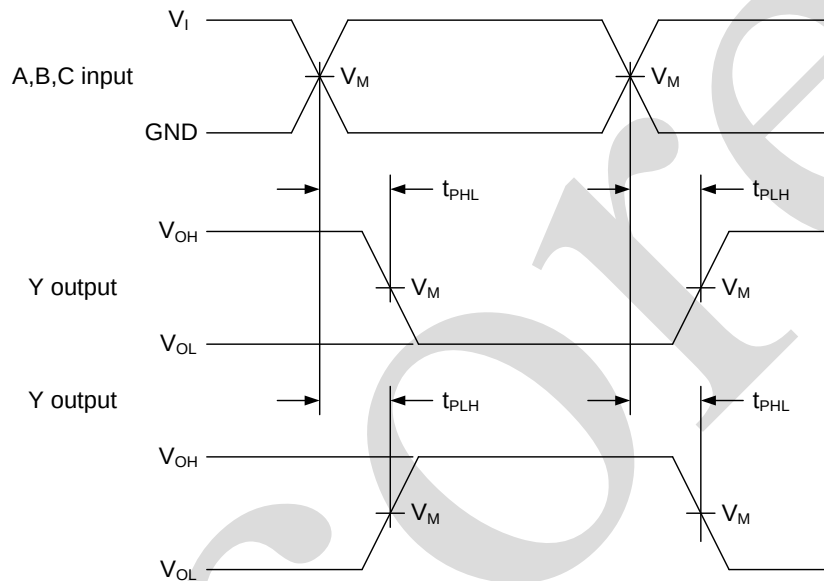


Figure 4. The data input (A, B, C) to output (Y) propagation delays

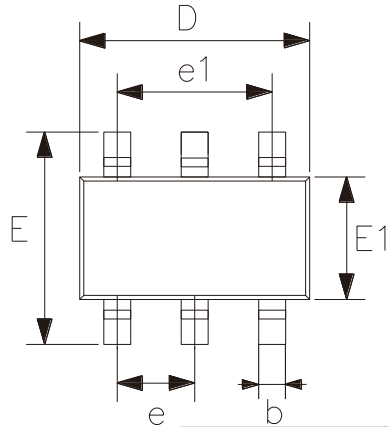
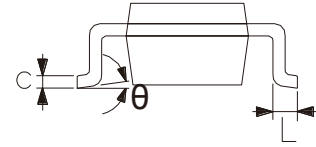
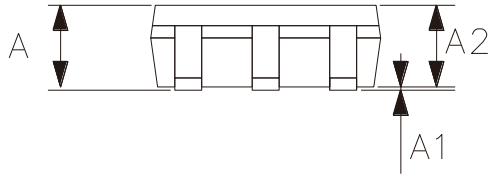
4.4、 Measurement Points

Supply voltage	Input	Output
V _{CC}	V _M	V _M
1.65V to 1.95V	0.5 × V _{CC}	0.5 × V _{CC}
2.3V to 2.7V	0.5 × V _{CC}	0.5 × V _{CC}
2.7V	0.5 × V _{CC}	0.5 × V _{CC}
3.0V to 3.6V	0.5 × V _{CC}	0.5 × V _{CC}
4.5V to 5.5V	0.5 × V _{CC}	0.5 × V _{CC}



5、Package Information

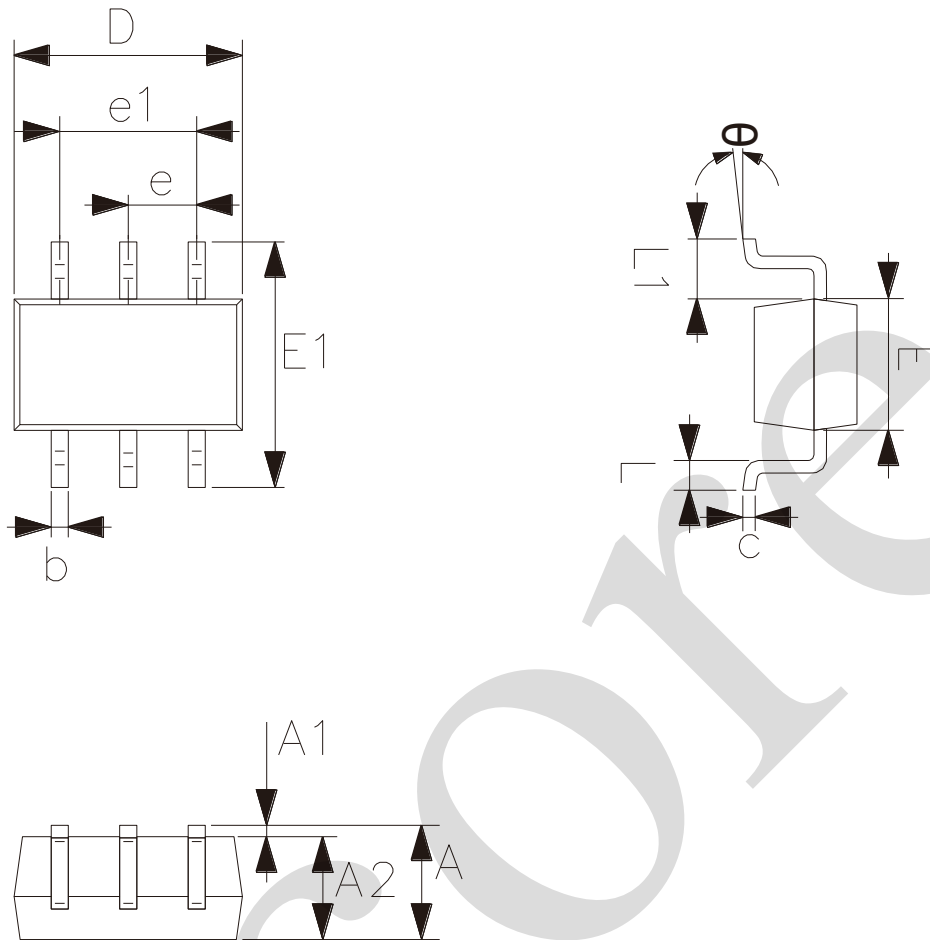
5.1、SOT23-6



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	—	1.25
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°



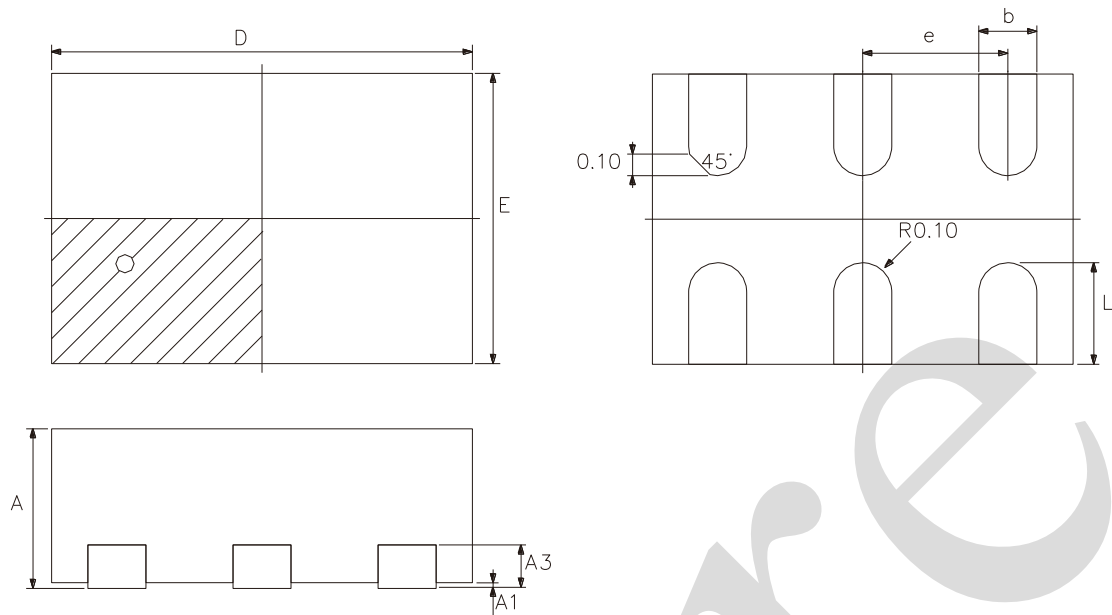
5.2、SOT363



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.15	0.35
c	0.11	0.175
D	2.00	2.20
E1	2.15	2.45
E	1.15	1.35
e	0.65	
e1	1.20	1.40
L	0.26	0.46
L1	0.525	
θ	0°	8°



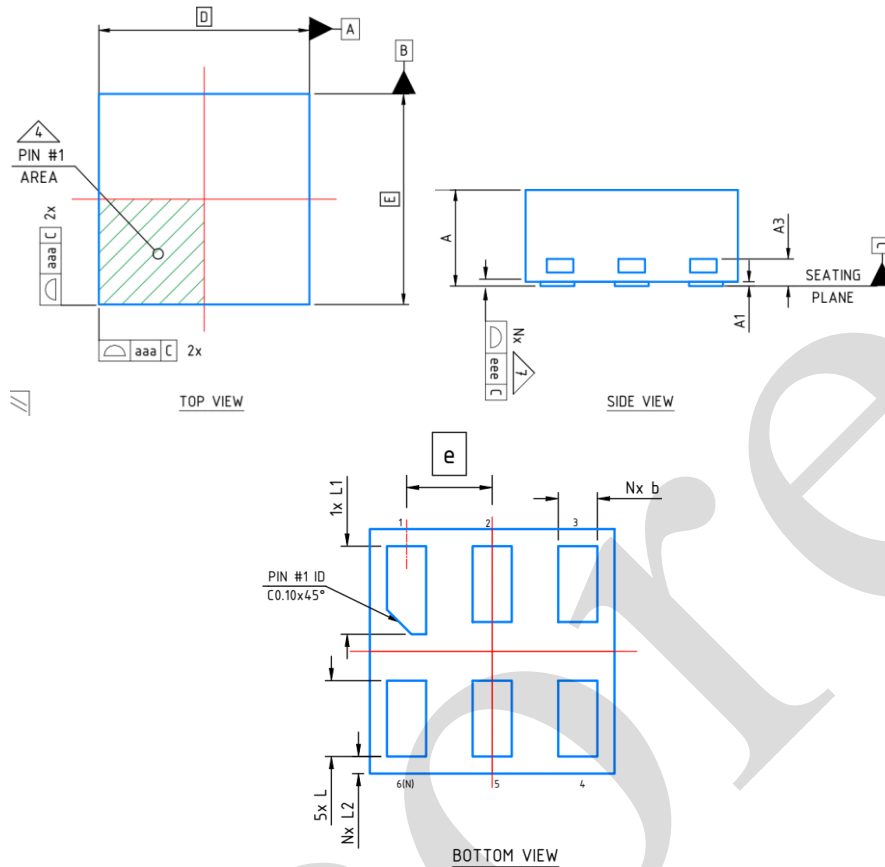
5.3、XSON6(1*1.45*0.55-0.5)



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	0.51	0.60
A1	0.00	0.05
A3	0.15	
b	0.15	0.25
D	1.45	
E	1.00	
e	0.50	
L	0.25	0.45



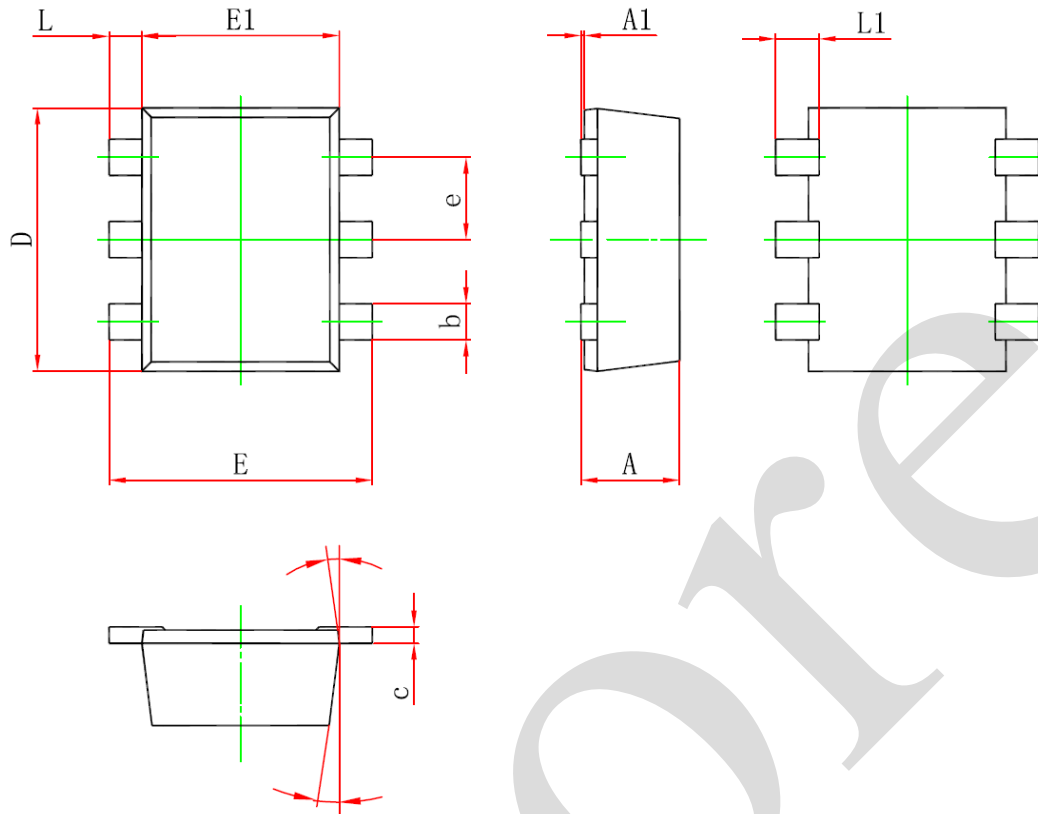
5.4、XSON6(1*1*0.45-0.35)



2025/03/B	Dimensions In Millimeters	
Symbol	Min	Max
A	0.32	0.50
A1	0	0.05
A3	0.1-0.13 REF	
b	0.10	0.21
D	1.00	
E	1.00	
e	0.35	
L	0.25	0.36
L1	0.30	0.41
L2	0.02	0.12



5.5、SOT563



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	0.525	0.60
A1	0	0.05
e	0.45	0.55
c	0.09	0.16
D	1.50	1.70
b	0.17	0.27
E	1.50	1.70
E1	1.10	1.30
L	0.10	0.30
L1	0.20	0.40
θ	7°	



6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、Notes

We recommend you to read this chapter carefully before using this product.

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