



AiP74LVC1G08

Single 2-input And Gate

Product Specification

Specification Revision History:

Version	Date	Description
2017-07-A1	2017-07	New
2023-04-B1	2023-04	Update the template
2023-10-B2	2023-10	Additional package
2024-03-B3	2024-03	Add SOT553 package form
2025-05-B4	2025-05	Add XSON6 (1*1.45*0.55)-0.5 package form
2025-11-B5	2025-11	Add DFN4 package form



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1、General Description

The AiP74LVC1G08 provides one 2-input AND function.

Inputs can be driven from either 3.3V or 5V devices. This feature allows the use of these devices as translators in mixed 3.3V and 5V applications.

Features:

- Wide supply voltage range from 1.65V to 5.5V
- $\pm 24\text{mA}$ output drive ($V_{DD}=3.0\text{V}$)
- CMOS low power consumption
- Input accepts voltages up to 5V
- Specified from -40°C to $+125^{\circ}\text{C}$
- Packaging information:
SOT-23-5/SOT-353/XSON6 (1*1*0.45)-0.35/XSON6 (1*1.45*0.55)-0.5/SOT553/DFN4

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC1G08GB235.TR	SOT-23-5	AEXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing:0.95mm
AiP74LVC1G08GC353.TR	SOT-353	AEXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing:0.65mm
AiP74LVC1G08ED6.TR	XSON6	AE XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.0mm×1.0mm Pin spacing: 0.35mm
AiP74LVC1G08EA6.TR	XSON6	AE XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.45mm×1.0mm Pin spacing: 0.50mm
AiP74LVC1G08GG553.TR	SOT553	AEXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 1.6mm×1.2mm Pin spacing: 0.50mm
AiP74LVC1G08XD4.TR	DFN4	AEX	12000 PCS/reel	120000 PCS/box	Dimensions of plastic enclosure: 0.8mm×0.8mm Pin spacing: 0.50mm

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

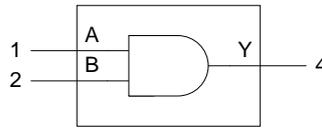


Figure 1. Logic symbol



Figure 2. IEC logic symbol

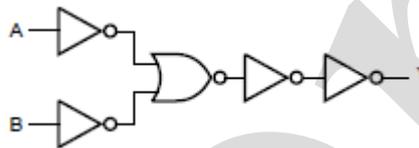
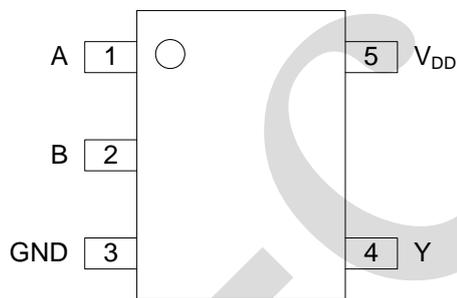
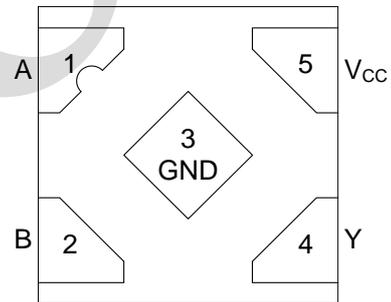


Figure 3. Logic diagram

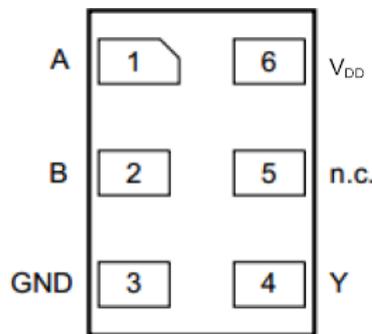
2.2、Pin Configurations



SOT23-5/SOT353/SOT553



DFN4



XSON6



2.3、Pin Description

Pin No.	Pin No.	Pin Name	Description
SOT23-5/SOT353/SOT553/DFN4	XSON6		
1	1	A	data input
2	2	B	data input
3	3	GND	ground (0V)
4	4	Y	data output
-	5	n.c.	not connected
5	6	V _{DD}	supply voltage

2.4、Function Table

Input		Output
A	B	Y
L	L	L
L	H	L
H	L	L
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 _{DD}	-	-0.5	+6.5	V
input clamping current	I _{IK}	V _I < 0V	-50	-	mA
input voltage	V _I	-	-0.5	+6.5	V
output clamping current	I _{OK}	V _O > V _{DD} or V _O < 0V	-	±50	mA
output voltage	V _O	Active mode	-0.5	V _{DD} +0.5	V
		Power-down mode	-0.5	+6.5	V
output current	I _O	V _O =0V to V _{DD}	-	±50	mA
supply current	I _{DD}	-	-	100	mA
ground current	I _{GND}	-	-100	-	mA
storage temperature	T _{stg}	-	-65	+150	°C
total power dissipation	P _{tot}	-	-	250	mW
soldering temperature	T _L	10s	260		°C



3.2、Recommended Operating Conditions

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

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
HIGH-level input voltage	V_{IH}	$V_{DD}=1.65V$ to $1.95V$	$0.65 \times V_{DD}$	-	-	V	
		$V_{DD}=2.3V$ to $2.7V$	1.7	-	-	V	
		$V_{DD}=2.7V$ to $3.6V$	2.0	-	-	V	
		$V_{DD}=4.5V$ to $5.5V$	$0.7 \times V_{DD}$	-	-	V	
LOW-level input voltage	V_{IL}	$V_{DD}=1.65V$ to $1.95V$	-	-	$0.35 \times V_{DD}$	V	
		$V_{DD}=2.3V$ to $2.7V$	-	-	0.7	V	
		$V_{DD}=2.7V$ to $3.6V$	-	-	0.8	V	
		$V_{DD}=4.5V$ to $5.5V$	-	-	$0.3 \times V_{DD}$	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL}	$I_O=-100\mu A$; $V_{DD}=1.65V$ to $5.5V$	$V_{DD}-0.1$	-	-	V
			$I_O=-4mA$; $V_{DD}=1.65V$	1.2	-	-	V
			$I_O=-8mA$; $V_{DD}=2.3V$	1.9	-	-	V
			$I_O=-12mA$; $V_{DD}=2.7V$	2.2	-	-	V
			$I_O=-24mA$; $V_{DD}=3.0V$	2.3	-	-	V
			$I_O=-32mA$; $V_{DD}=4.5V$	3.8	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL}	$I_O=100\mu A$; $V_{DD}=1.65V$ to $5.5V$	-	-	0.1	V
			$I_O=4mA$; $V_{DD}=1.65V$	-	-	0.45	V
			$I_O=8mA$; $V_{DD}=2.3V$	-	-	0.3	V
			$I_O=12mA$; $V_{DD}=2.7V$	-	-	0.4	V
			$I_O=24mA$; $V_{DD}=3.0V$	-	-	0.55	V
			$I_O=32mA$; $V_{DD}=4.5V$	-	-	0.55	V
input leakage current	I_I	$V_I=5.5V$ or GND; $V_{DD}=0V$ to $5.5V$	-	-	± 1	μA	
power-off leakage current	I_{OFF}	V_I or $V_O=5.5V$; $V_{DD}=0V$	-	-	± 2	μA	
supply current	I_{DD}	$V_I=5.5V$ or GND; $I_O=0A$; $V_{DD}=1.65V$ to $5.5V$	-	-	4	μA	
additional supply current	ΔI_{DD}	per pin; $V_I=V_{DD}-0.6V$; $I_O=0A$; $V_{DD}=2.3V$ to $5.5V$	-	-	500	μA	
input	C_I	$V_{DD}=3.3V$; $V_I=GND$ to V_{DD}	-	5	-	pF	



capacitance						
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Note: All typical values are measured at $V_{DD}=3.3V$ and $T_{amb}=25^{\circ}C$.

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
HIGH-level input voltage	V_{IH}	$V_{DD}=1.65V$ to $1.95V$	$0.65 \times V_{DD}$	-	-	V	
		$V_{DD}=2.3V$ to $2.7V$	1.7	-	-	V	
		$V_{DD}=2.7V$ to $3.6V$	2.0	-	-	V	
		$V_{DD}=4.5V$ to $5.5V$	$0.7 \times V_{DD}$	-	-	V	
LOW-level input voltage	V_{IL}	$V_{DD}=1.65V$ to $1.95V$	-	-	$0.35 \times V_{DD}$	V	
		$V_{DD}=2.3V$ to $2.7V$	-	-	0.7	V	
		$V_{DD}=2.7V$ to $3.6V$	-	-	0.8	V	
		$V_{DD}=4.5V$ to $5.5V$	-	-	$0.3 \times V_{DD}$	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL}	$I_O=-100\mu A$; $V_{DD}=1.65V$ to $5.5V$	$V_{DD}-0.1$	-	-	V
			$I_O=-4mA$; $V_{DD}=1.65V$	0.95	-	-	V
			$I_O=-8mA$; $V_{DD}=2.3V$	1.7	-	-	V
			$I_O=-12mA$; $V_{DD}=2.7V$	1.9	-	-	V
			$I_O=-24mA$; $V_{DD}=3.0V$	2.0	-	-	V
		$I_O=-32mA$; $V_{DD}=4.5V$	3.4	-	-	V	
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL}	$I_O=100\mu A$; $V_{DD}=1.65V$ to $5.5V$	-	-	0.1	V
			$I_O=4mA$; $V_{DD}=1.65V$	-	-	0.70	V
			$I_O=8mA$; $V_{DD}=2.3V$	-	-	0.45	V
			$I_O=12mA$; $V_{DD}=2.7V$	-	-	0.60	V
			$I_O=24mA$; $V_{DD}=3.0V$	-	-	0.80	V
		$I_O=32mA$; $V_{DD}=4.5V$	-	-	0.80	V	
input leakage current	I_I	$V_I=5.5V$ or GND; $V_{DD}=0V$ to $5.5V$	-	-	± 1	μA	
power-off leakage current	I_{OFF}	V_I or $V_O=5.5V$; $V_{DD}=0V$	-	-	± 2	μA	
supply current	I_{DD}	$V_I=5.5V$ or GND; $I_O=0A$; $V_{DD}=1.65V$ to $5.5V$	-	-	4	μA	
additional supply current	ΔI_{DD}	per pin; $V_I=V_{DD}-0.6V$; $I_O=0A$; $V_{DD}=2.3V$ to $5.5V$	-	-	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, B to Y propagation delay	t_{PHL}	see Figure 5	$V_{CC}=1.65\text{V}$ to 1.95V	-	12.5	18.8	ns
			$V_{CC}=2.3\text{V}$ to 2.7V	-	10.5	15.8	ns
			$V_{CC}=2.7\text{V}$	-	10	15	ns
			$V_{CC}=3.0\text{V}$ to 3.6V	-	9.5	14.3	ns
			$V_{CC}=4.5\text{V}$ to 5.5V	-	9	13.5	ns
A, B to Y propagation delay	t_{PLH}	see Figure 5	$V_{CC}=1.65\text{V}$ to 1.95V	-	14	21	ns
			$V_{CC}=2.3\text{V}$ to 2.7V	-	10	15	ns
			$V_{CC}=2.7\text{V}$	-	9.5	14.3	ns
			$V_{CC}=3.0\text{V}$ to 3.6V	-	8.5	12.8	ns
			$V_{CC}=4.5\text{V}$ to 5.5V	-	7.5	11.3	ns

Note:

[1] Typical values are measured at $T_{amb}=25^{\circ}\text{C}$ and $V_{DD}=1.8\text{V}$, 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, B to Y propagation delay	t_{PHL}	see Figure 5	$V_{CC}=1.65\text{V}$ to 1.95V	-	-	20.8	ns
			$V_{CC}=2.3\text{V}$ to 2.7V	-	-	17.8	ns
			$V_{CC}=2.7\text{V}$	-	-	17	ns
			$V_{CC}=3.0\text{V}$ to 3.6V	-	-	16.3	ns
			$V_{CC}=4.5\text{V}$ to 5.5V	-	-	15.5	ns
A, B to Y propagation delay	t_{PLH}	see Figure 5	$V_{CC}=1.65\text{V}$ to 1.95V	-	-	23	ns
			$V_{CC}=2.3\text{V}$ to 2.7V	-	-	17	ns
			$V_{CC}=2.7\text{V}$	-	-	16.3	ns
			$V_{CC}=3.0\text{V}$ to 3.6V	-	-	14.8	ns
			$V_{CC}=4.5\text{V}$ to 5.5V	-	-	13.3	ns



4、Testing Circuit

4.1、AC Testing Circuit

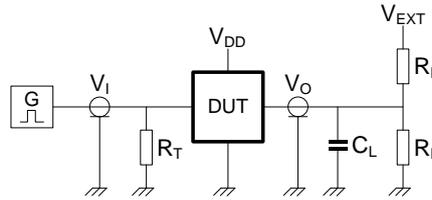


Figure 4. Test circuit for measuring switching times

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.

R_T =Termination resistance; should be equal to the output impedance Z_o of the pulse generator.

V_{EXT} =External voltage for measuring switching times.

4.2、AC Testing Waveforms

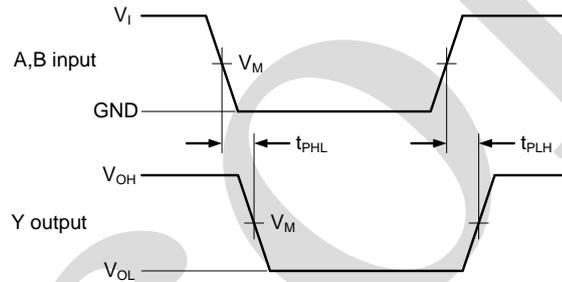


Figure 5. The input A, B to output Y propagation delays

4.3、Measurement Points

Supply voltage	Input	Output
V_{DD}	V_M	V_M
1.65V to 1.95V	$0.5 \times V_{DD}$	$0.5 \times V_{DD}$
2.3V to 2.7V	$0.5 \times V_{DD}$	$0.5 \times V_{DD}$
2.7V	1.5V	1.5V
3.0V to 3.6V	1.5V	1.5V
4.5V to 5.5V	$0.5 \times V_{DD}$	$0.5 \times V_{DD}$

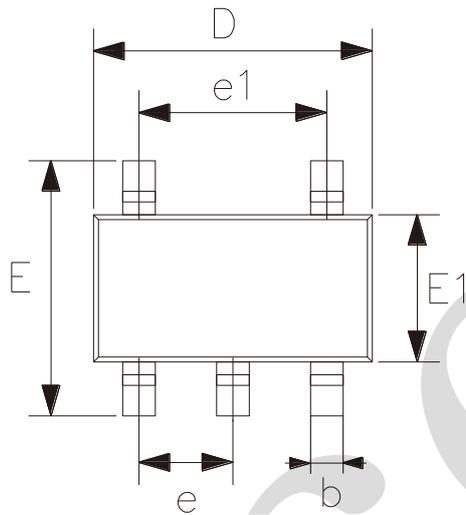
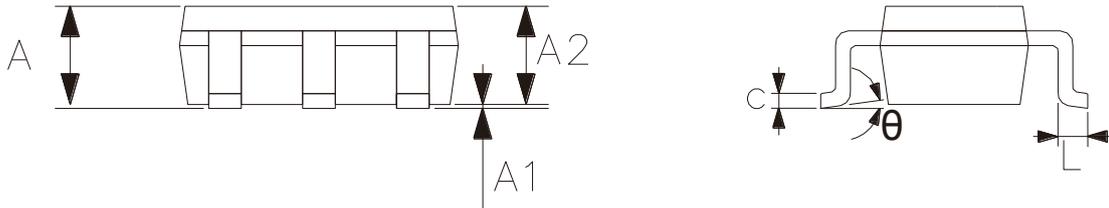
4.4、Test Data

Supply voltage	Input		Load		V_{EXT}
	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}, t_{PHL}
1.65V to 1.95V	V_{DD}	$\leq 3ns$	30pF	1k Ω	open
2.3V to 2.7V	V_{DD}	$\leq 3ns$	30pF	500 Ω	open
2.7V	2.7V	$\leq 3ns$	50pF	500 Ω	open
3.0V to 3.6V	2.7V	$\leq 3ns$	50pF	500 Ω	open
4.5V to 5.5V	V_{DD}	$\leq 3ns$	50pF	500 Ω	open



5、Package Information

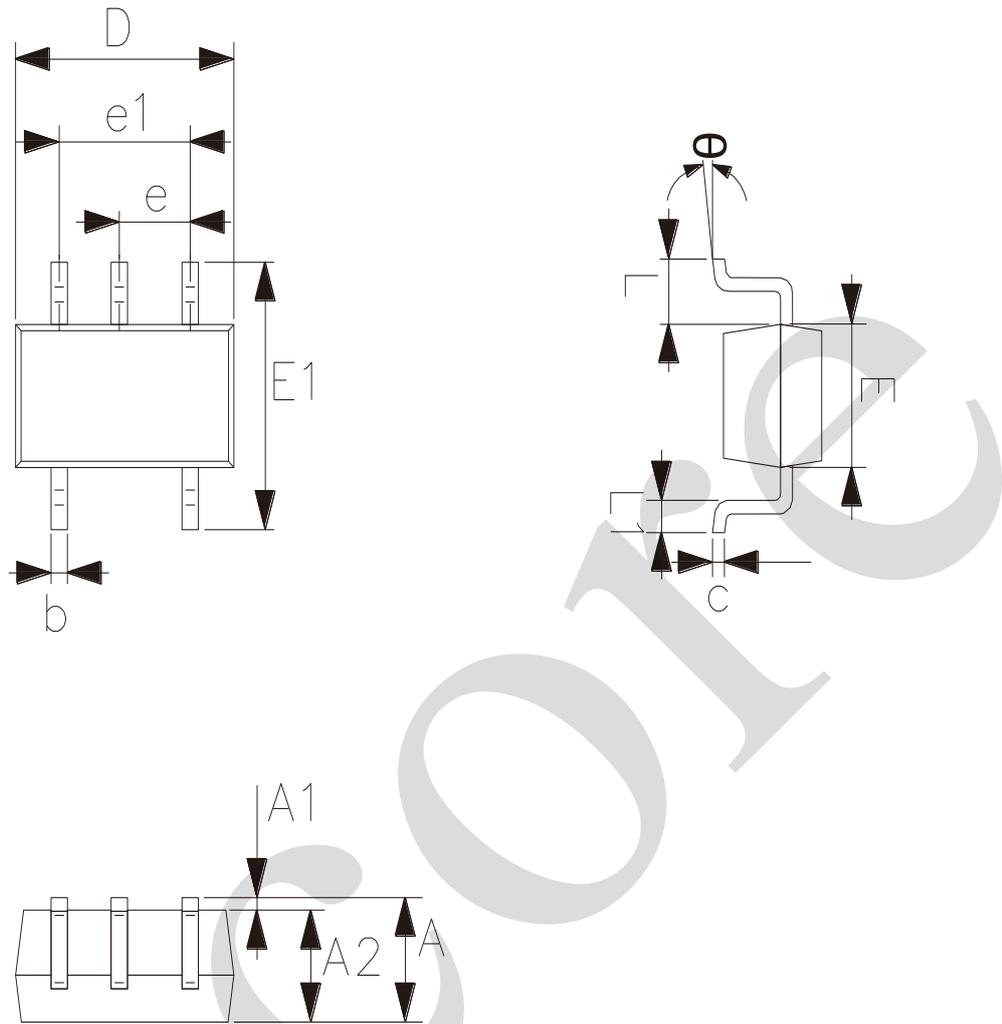
5.1、SOT23-5



2023/12/A	Dimensions In Millimeters		
	Symbol	Min.	Max.
A	—		1.26
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°



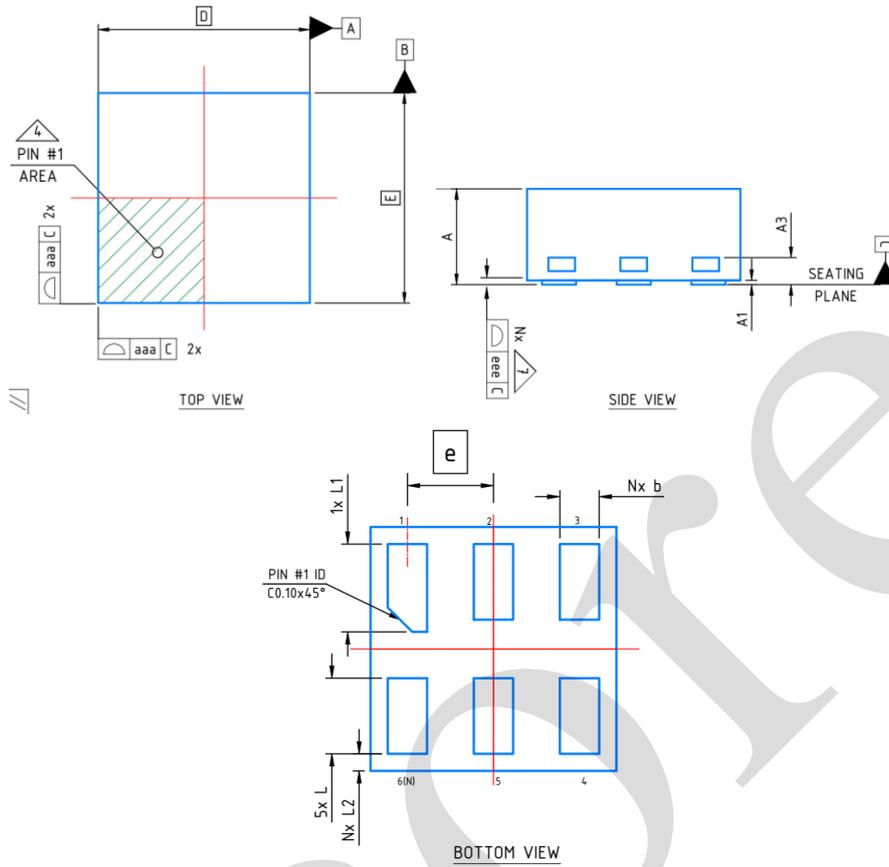
5.2、SOT353



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
E	1.15	1.35
E1	2.15	2.45
e	0.65	
e1	1.20	1.40
L	0.525	
L1	0.26	0.46
θ	0°	8°



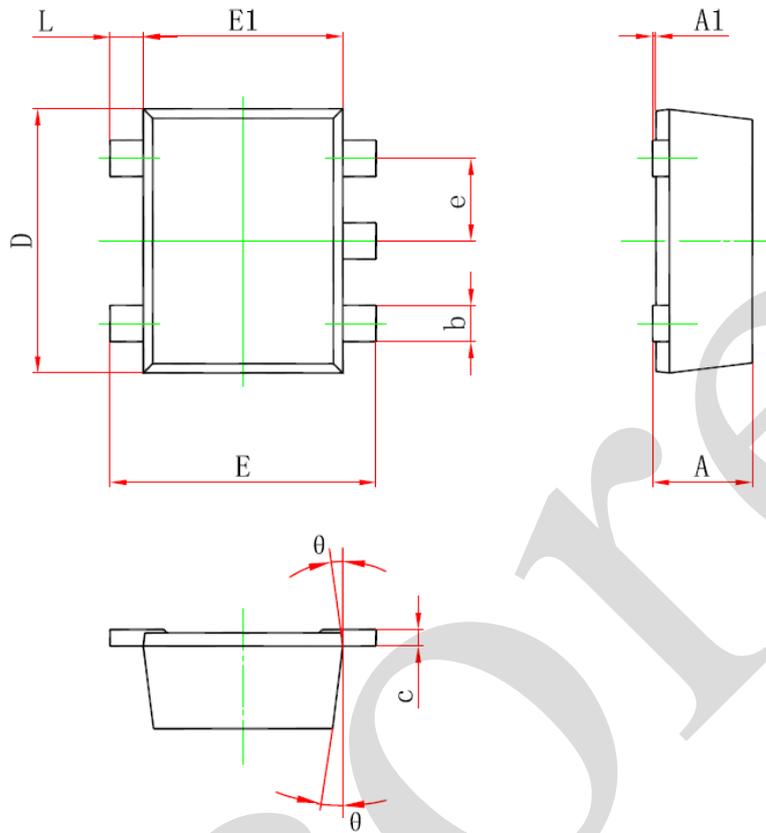
5.3、XSON6 (1*1*0.45)-0.35



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



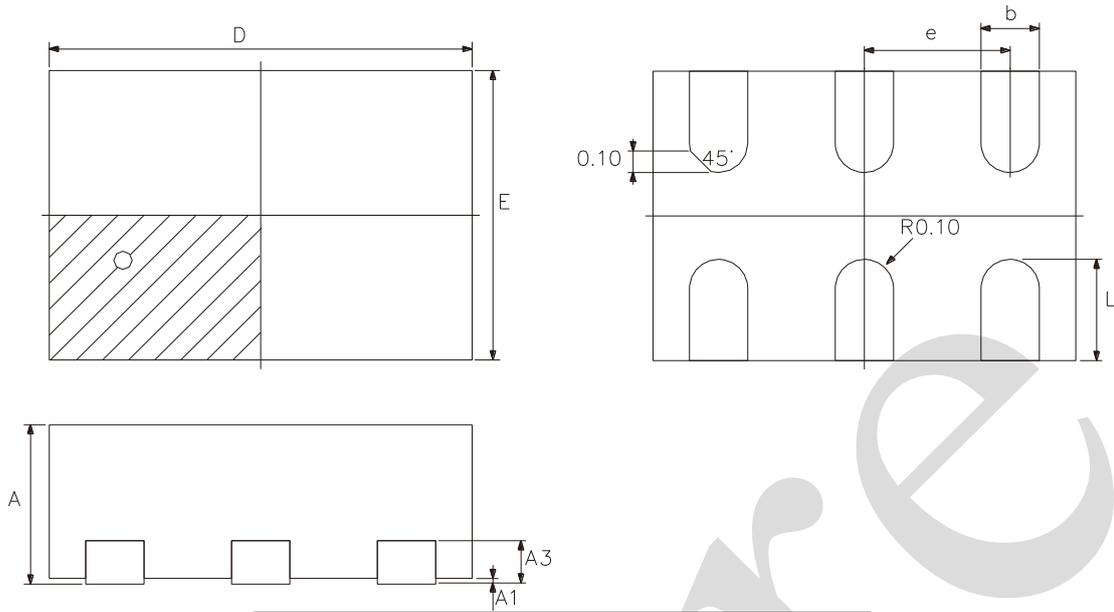
5.4. SOT553



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
E1	1.10	1.30
E	1.50	1.70
L	0.10	0.30
θ	7°	



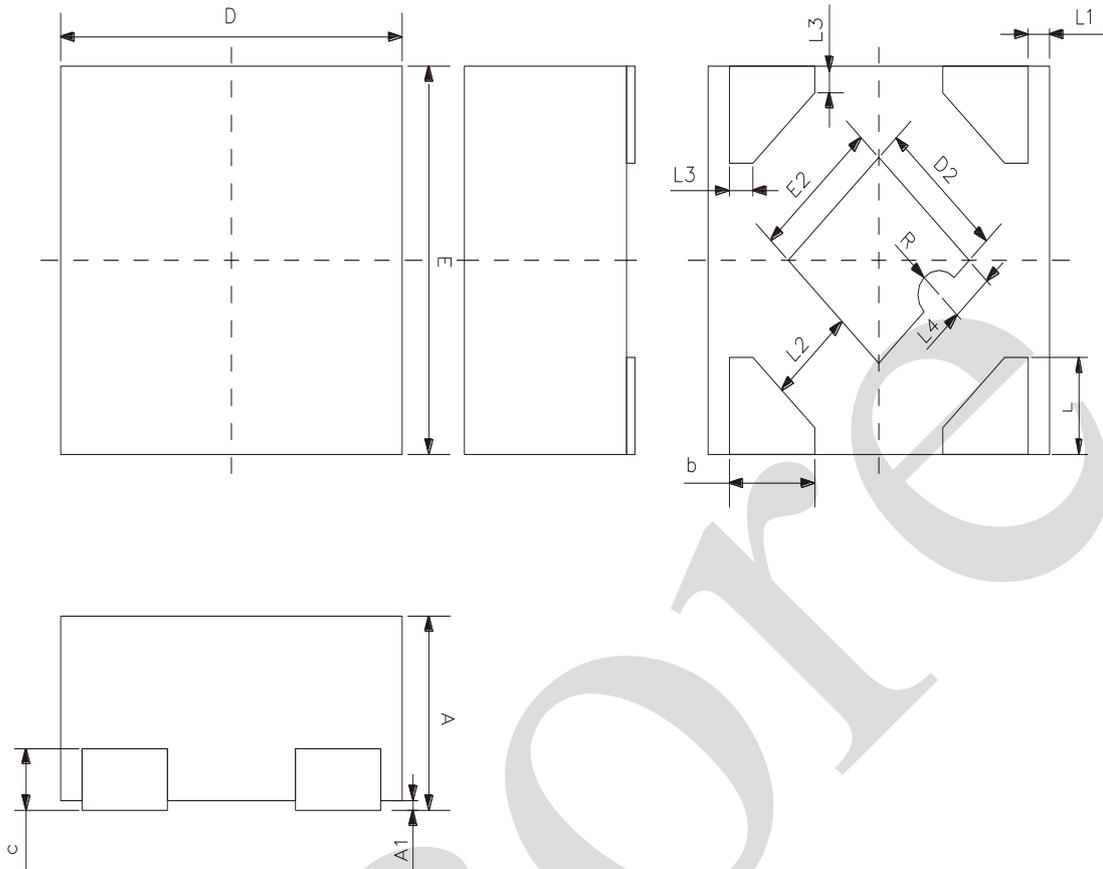
5.5、XSON6 (1*1.45*0.55)-0.5



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



5.6、DFN4



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	0.37	0.43
A1	0.00	0.05
b	0.15	0.25
c	0.127	
D	0.75	0.85
D2	0.20	0.40
E	0.75	0.85
E2	0.20	0.40
e	0.50	
L	0.15	0.25
L1	0.05	
L2	0.20	
L3	0.055	
L4	0.10	
R	0.05	



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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