AiP74AUP3G06
Low Power Triple Inverter
(Open-Drain)

Product Specification

Specification Revision History：

Version	Date	Description
2025-09-A0	2025-09	New
2025-11-A1	2025-11	Modify the parameters

Contents

1、General Description 1
2、Block Diagram And Pin Description 2
2.1、Block Diagram 2
2.2、Pin Configurations 2
2.3、Pin Description 3
2.4、Function Table 3
3、Electrical Parameter 3
3.1、Absolute Maximum Ratings 3
3.2、Recommended Operating Conditions 3
3.3、Electrical Characteristics 4
3.3.1、DC Characteristics 1 4
3.3.2、DC Characteristics 2 5
3.3.3、AC Characteristics 1 6
3.3.5、AC Characteristics 2 7
4、Testing Circuit 8
4.1、AC Testing Circuit 8
4.2、AC Testing Waveforms 8
4.3、Measurement Points 8
4.4、Test Data 8
5、Package Information 9
5.1、TSSOP8 9
5.2、VSSOP8 10
5.3、XSON8-1.35*1-0.35 11
5.4、XSON8-1.95*1-0.5 12
6、Statements And Notes 13
6.1、The name and content of Hazardous substances or Elements in the product 13
6.2、Notes 13

1、General Description

The AiP74AUP3G06 provides a triple inverter with open-drain output. This device ensures a very low static and dynamic power consumption across the entire V_{CC} range from 0.8V to 3.6V.

Features:

- Wide supply voltage range from 0.8V to 3.6V
- Low static power consumption; I_{CC}=1uA (maximum)
- Inputs accept voltages up to 3.6V
- Specified from -40℃ to +125℃
- Packaging information: TSSOP8/VSSOP8/XSON8

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74AUP3G06 TA8.TR	TSSOP8	AiPKC 3G06	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP74AUP3G06 YA8.TR	VSSOP8	AiP KCXX	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing: 0.50mm
AiP74AUP3G06 EB8.TR	XSON8	KC XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.35mm×1.0mm Pin spacing: 0.35mm
AiP74AUP3G06 EC8.TR	XSON8	KC XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.95mm×1.0mm 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

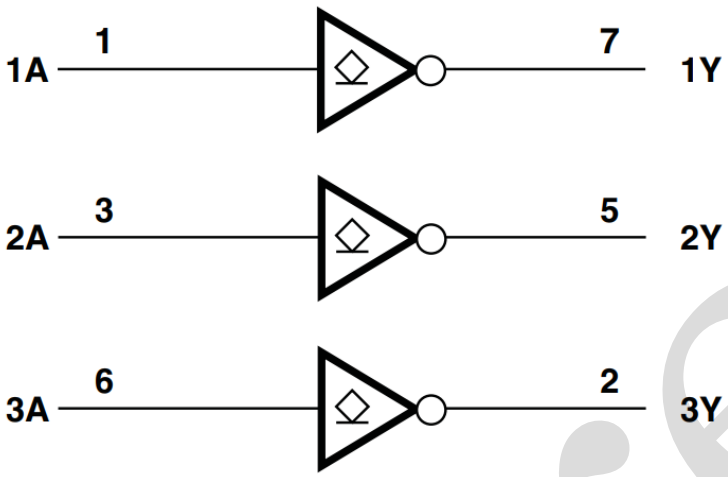


Figure 1. Logic symbol

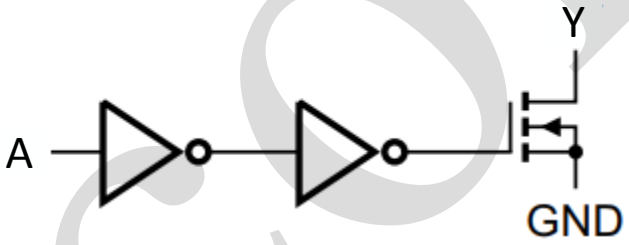
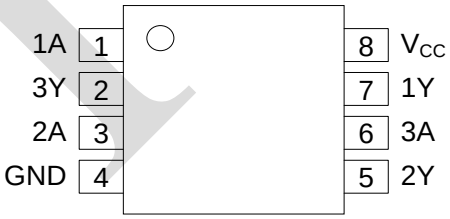
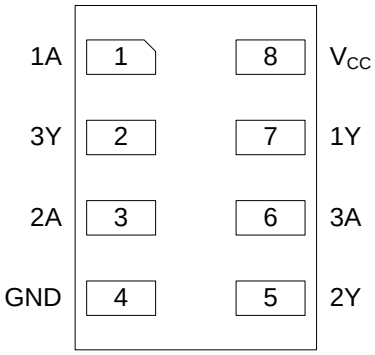


Figure 2. Logic diagram (one gate)

2.2、Pin Configurations



TSSOP8/VSSOP8



XSON8

2.3、Pin Description

Pin No.	Pin Name	Description
1	1A	data input
2	3Y	data output
3	2A	data input
4	GND	ground (0V)
5	2Y	data output
6	3A	data input
7	1Y	data output
8	V_{CC}	supply voltage

2.4、Function Table

Input nA	Output nY
H	L
L	Z

Note: H=HIGH voltage level; L=LOW voltage level; Z = HIGH-impedance OFF-state.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, all voltage referenced to GND, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+4.6	V
input clamping current	I_{IK}	V_I<0V	-50	-	mA
input voltage	V_I	-	-0.5	+4.6	V
output clamping current	I_{OK}	V_O<0V	-50	-	mA
output voltage	V_O	Active mode and Power-down mode	-0.5	+4.6	V
output current	I_O	V_O=0V to V_{CC}	-	±20	mA
supply current	I_{CC}	-	-	+50	mA
ground current	I_{GND}	-	-50	-	mA
storage temperature	T_{stg}	-	-65	+150	℃
total power dissipation	P_{tot}	-	-	250	mW
soldering temperature	T_L	10s	260		℃
Electrostatic discharge	ESD	HBM	8000		V

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	0.8	-	3.6	V
input voltage	V_I	-	0	-	3.6	V
output voltage	V_O	Active mode	0	-	V_{CC}	V
		Power-down mode; V_{CC}=0V	0	-	3.6	V
ambient temperature	T_{amb}	-	-40	-	+125	℃
input transition rise and fall rate	Δt/ΔV	V_{CC}=0.8V to 3.6V	0	-	200	ns/V

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

(T_{amb}=25℃, voltages are referenced to GND (ground=0V), unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=0.8V		0.72	-	-	V
		V_{CC}=0.9V to 1.95V		0.75×V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.6	-	-	V
		V_{CC}=3.0V to 3.6V		2.0	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=0.8V		-	-	0	V
		V_{CC}=0.9V to 1.95V		-	-	0.35×V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=3.0V to 3.6V		-	-	0.9	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=20uA; V_{CC}=0.8V to 3.6V	-	-	0.1	V
			I_O=1.1mA; V_{CC}=1.1V	-	-	0.3×V_{CC}	V
			I_O=1.7mA; V_{CC}=1.4V	-	-	0.31	V
			I_O=1.9mA; V_{CC}=1.65V	-	-	0.31	V
			I_O=2.3mA; V_{CC}=2.3V	-	-	0.31	V
			I_O=3.1mA; V_{CC}=2.3V	-	-	0.44	V
			I_O=2.7mA; V_{CC}=3.0V	-	-	0.31	V
			I_O=4.0mA; V_{CC}=3.0V	-	-	0.44	V
input leakage current	I_I	V_I=GND to 3.6V; V_{CC}=0V to 3.6V		-	-	±1	uA
OFF-state output current	I_{OZ}	V_I=V_{IH} or V_{IL}; V_O=V_{CC} or GND; V_{CC}=3.6V		-	-	±1	uA
power-off leakage current	I_{OFF}	V_I or V_O=0V to 3.6V; V_{CC}=0V		-	-	±1	uA
additional power-off leakage current	ΔI_{OFF}	V_I or V_O=0V to 3.6V; V_{CC}=0V to 0.2V		-	-	±1	uA
supply current	I_{CC}	V_I=GND or V_{CC}; I_O=0A; V_{CC}=0.8V to 3.6V		-	-	1	uA
additional supply current	ΔI_{CC}	V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=3.3V		-	-	40	uA
input capacitance	C_I	V_{CC}=0V to 3.6V; V_I=GND or V_{CC}		-	1.5	-	pF
output capacitance	C_O	V_O=GND; V_{CC}=0V		-	3	-	pF

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=0.8V		0.75	-	-	V
		V_{CC}=0.9V to 1.95V		0.80×V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.6	-	-	V
		V_{CC}=3.0V to 3.6V		2.0	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=0.8V		-	-	0	V
		V_{CC}=0.9V to 1.95V		-	-	0.30×V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=3.0V to 3.6V		-	-	0.9	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=20uA; V_{CC}=0.8V to 3.6V	-	-	0.11	V
			I_O=1.1mA; V_{CC}=1.1V	-	-	0.3×V_{CC}	V
			I_O=1.7mA; V_{CC}=1.4V	-	-	0.41	V
			I_O=1.9mA; V_{CC}=1.65V	-	-	0.39	V
			I_O=2.3mA; V_{CC}=2.3V	-	-	0.36	V
			I_O=3.1mA; V_{CC}=2.3V	-	-	0.50	V
			I_O=2.7mA; V_{CC}=3.0V	-	-	0.36	V
			I_O=4.0mA; V_{CC}=3.0V	-	-	0.50	V
input leakage current	I_I	V_I=GND to 3.6V; V_{CC}=0V to 3.6V		-	-	±4	uA
OFF-state output current	I_{OZ}	V_I=V_{IH} or V_{IL}; V_O=V_{CC} or GND; V_{CC}=3.6V		-	-	±4	uA
power-off leakage current	I_{OFF}	V_I or V_O=0V to 3.6V; V_{CC}=0V		-	-	±4	uA
additional power-off leakage current	ΔI_{OFF}	V_I or V_O=0V to 3.6V; V_{CC}=0V to 0.2V		-	-	±4	uA
supply current	I_{CC}	V_I=GND or V_{CC}; I_O=0A; V_{CC}=0.8V to 3.6V		-	-	4	uA
additional supply current	ΔI_{CC}	V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=3.3V		-	-	75	uA

3.3.3、AC Characteristics 1

(T_{amb}=25℃, voltages are referenced to GND (ground=0V), unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
propagation delay	t_{pd}	nA to nY; see Figure 4	C_L=5pF				
			V_{CC}=0.8V	-	12.4	-	ns
			V_{CC}=1.1V to 1.3V	2.7	12.0	9.9	ns
			V_{CC}=1.4V to 1.6V	2.1	3.5	6.2	ns
			V_{CC}=1.65V to 1.95V	2.1	3.1	4.7	ns
			V_{CC}=2.3V to 2.7V	1.4	2.2	3.2	ns
			V_{CC}=3.0V to 3.6V	1.3	2.2	3.3	ns
			C_L=10pF				
			V_{CC}=0.8V	-	15.1	-	ns
			V_{CC}=1.1V to 1.3V	3.6	12.0	11.2	ns
			V_{CC}=1.4V to 1.6V	2.9	4.3	7.0	ns
			V_{CC}=1.65V to 1.95V	2.7	3.9	5.4	ns
			V_{CC}=2.3V to 2.7V	2.1	2.9	3.8	ns
			V_{CC}=3.0V to 3.6V	1.7	3.0	4.5	ns
			C_L=15pF				
			V_{CC}=0.8V	-	17.4	-	ns
			V_{CC}=1.1V to 1.3V	4.9	12.0	12.2	ns
			V_{CC}=1.4V to 1.6V	3.5	5.0	7.7	ns
			V_{CC}=1.65V to 1.95V	3.2	4.8	6.6	ns
			V_{CC}=2.3V to 2.7V	2.5	3.5	4.5	ns
			V_{CC}=3.0V to 3.6V	2.0	3.8	6.0	ns
			C_L=30pF				
			V_{CC}=0.8V	-	25.3	-	ns
			V_{CC}=1.1V to 1.3V	7.6	12.0	16	ns
			V_{CC}=1.4V to 1.6V	3.5	7.6	12.3	ns
			V_{CC}=1.65V to 1.95V	4.8	7.4	10.7	ns
			V_{CC}=2.3V to 2.7V	3.7	5.4	7.1	ns
			V_{CC}=3.0V to 3.6V	3.2	6.5	10.5	ns
power dissipation capacitance	C_{PD}	f=1MHz; V_I=GND to V_{CC}	V_{CC}=0.8V	-	4.0	-	pF
			V_{CC}=1.1V to 1.3V	-	4.0	-	pF
			V_{CC}=1.4V to 1.6V	-	4.0	-	pF
			V_{CC}=1.65V to 1.95V	-	4.0	-	pF
			V_{CC}=2.3V to 2.7V	-	4.1	-	pF
			V_{CC}=3.0V to 3.6V	-	4.3	-	pF

3.3.5、AC Characteristics 2

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
propagation delay	tpd	nA to nY; see Figure 4	C_L=5pF				
			V_{CC}=1.1V to 1.3V	2.0	-	12.8	ns
			V_{CC}=1.4V to 1.6V	1.5	-	7.6	ns
			V_{CC}=1.65V to 1.95V	1.2	-	5.9	ns
			V_{CC}=2.3V to 2.7V	1.0	-	3.9	ns
			V_{CC}=3.0V to 3.6V	0.8	-	3.6	ns
			C_L=10pF				
			V_{CC}=1.1V to 1.3V	2.7	-	14.1	ns
			V_{CC}=1.4V to 1.6V	2.2	-	8.6	ns
			V_{CC}=1.65V to 1.95V	1.8	-	6.7	ns
			V_{CC}=2.3V to 2.7V	1.4	-	4.5	ns
			V_{CC}=3.0V to 3.6V	1.2	-	4.9	ns
			C_L=15pF				
			V_{CC}=1.1V to 1.3V	3.4	-	15.2	ns
			V_{CC}=1.4V to 1.6V	2.7	-	9.4	ns
			V_{CC}=1.65V to 1.95V	2.2	-	7.3	ns
			V_{CC}=2.3V to 2.7V	1.7	-	5.1	ns
			V_{CC}=3.0V to 3.6V	1.5	-	6.5	ns
			C_L=30pF				
			V_{CC}=1.1V to 1.3V	5.6	-	19.3	ns
			V_{CC}=1.4V to 1.6V	3.0	-	13.0	ns
			V_{CC}=1.65V to 1.95V	3.6	-	11.0	ns
			V_{CC}=2.3V to 2.7V	2.8	-	7.8	ns
			V_{CC}=3.0V to 3.6V	2.5	-	10.8	ns

4、Testing Circuit

4.1、AC Testing Circuit

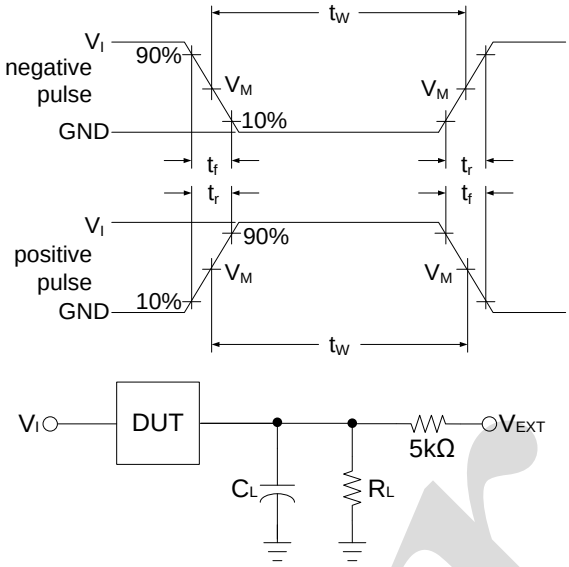


Figure 3. Test circuit for measuring switching times

C_L includes probe and jig capacitance.

R_L=Load resistance.

4.2、AC Testing Waveforms

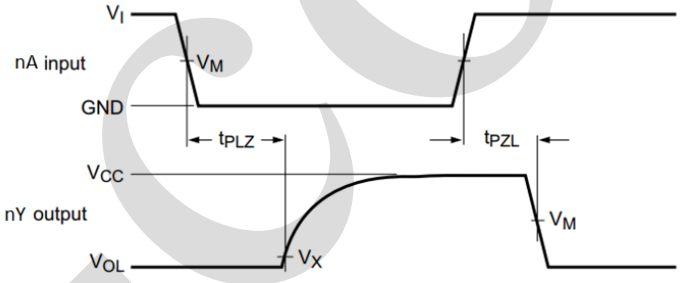


Figure 4. The input nA to output nY propagation delays

4.3、Measurement Points

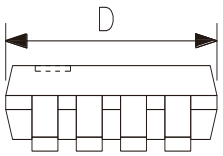
Supply voltage	Input	Output	
V_{CC}	V_M	V_M	V_X
0.8V to 1.6V	$0.5\times V_{CC}$	$0.5\times V_{CC}$	V_{OL}+0.1 V
1.65V to 2.7V	$0.5\times V_{CC}$	$0.5\times V_{CC}$	V_{OL}+0.15 V
3.0V to 3.6V	$0.5\times V_{CC}$	$0.5\times V_{CC}$	V_{OL}+0.3 V

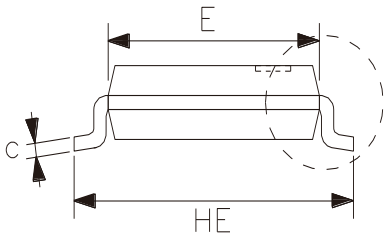
4.4、Test Data

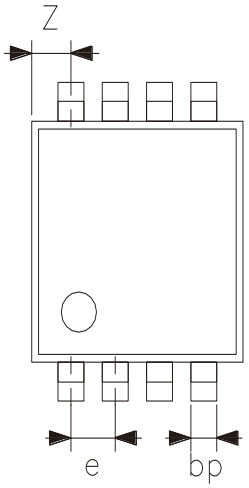
Supply voltage	Load		V_{EXT}		
V_{CC}	C_L	R_L	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
0.8V to 3.6V	5pF, 10pF, 15pF and 30pF	5kΩ or 1MΩ	open	GND	$2\times V_{CC}$

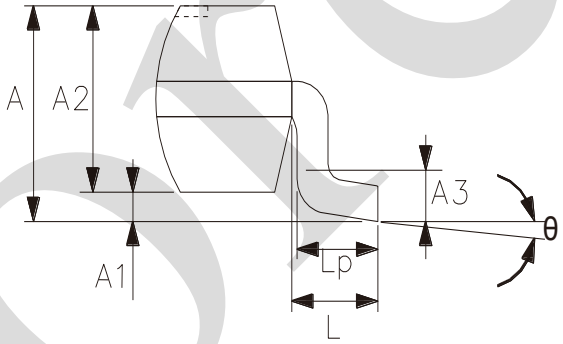
5、Package Information

5.1、TSSOP8



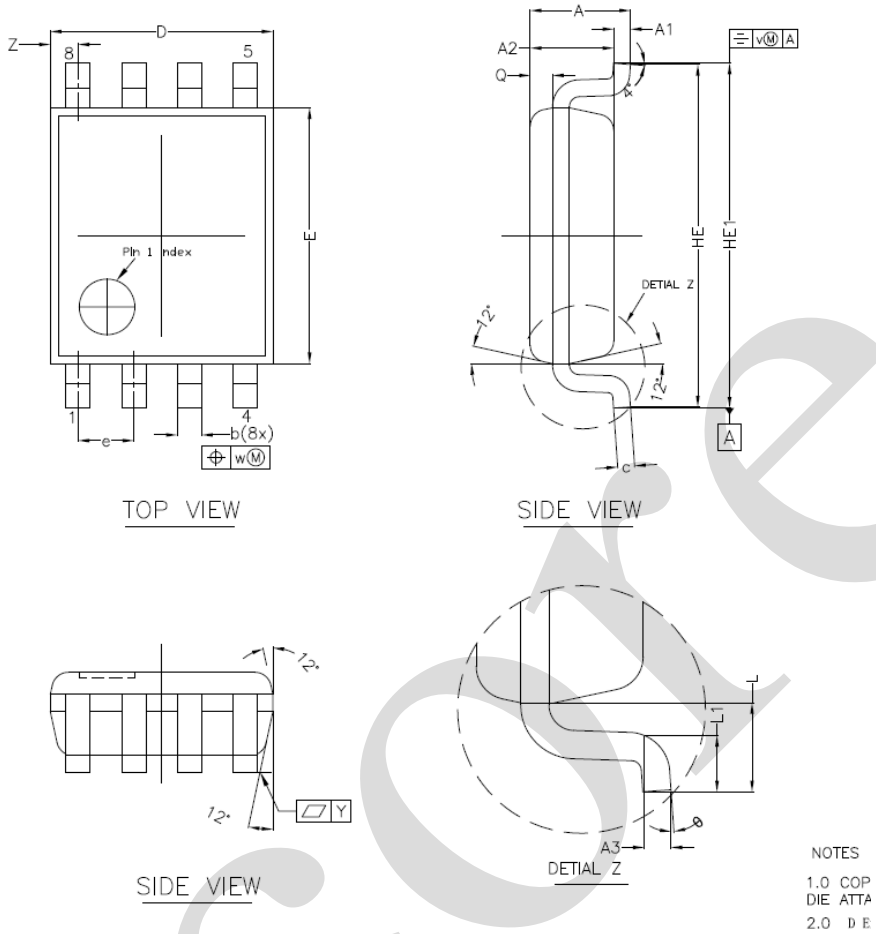






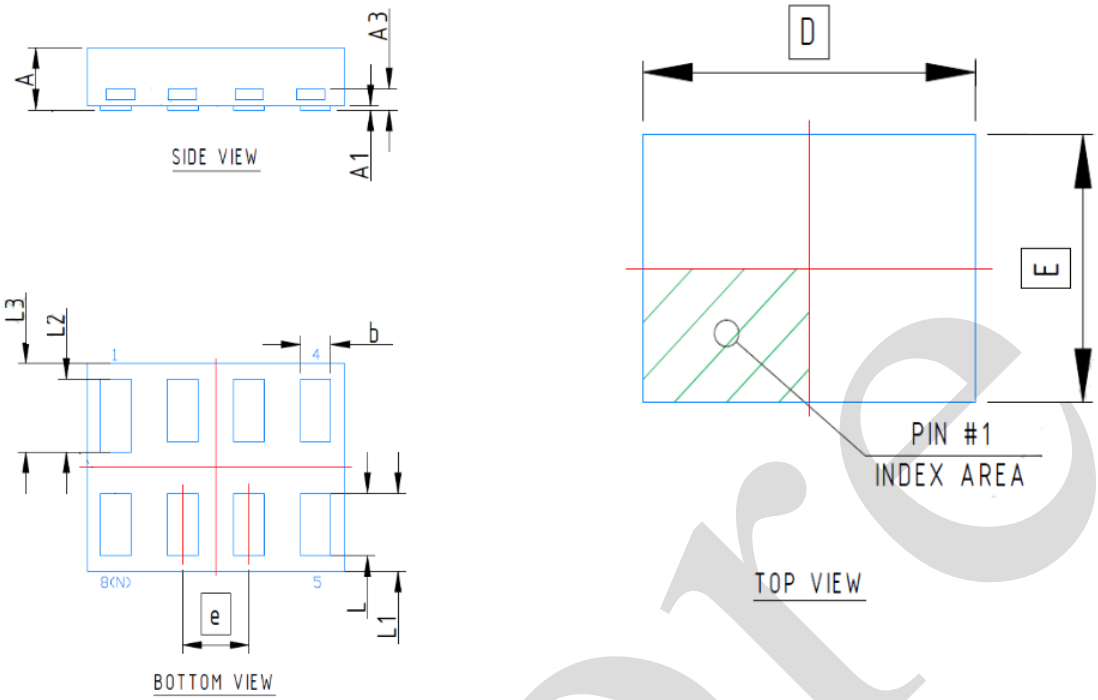
2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	—	1.10
A1	0	0.15
A2	0.75	0.95
A3	0.25	
bp	0.22	0.38
c	0.08	0.18
D	2.90	3.10
E	2.90	3.10
HE	3.90	4.10
L	0.50	
Lp	0.33	0.47
e	0.65	
Z	0.35	0.70
θ	0°	8°

5.2、VSSOP8



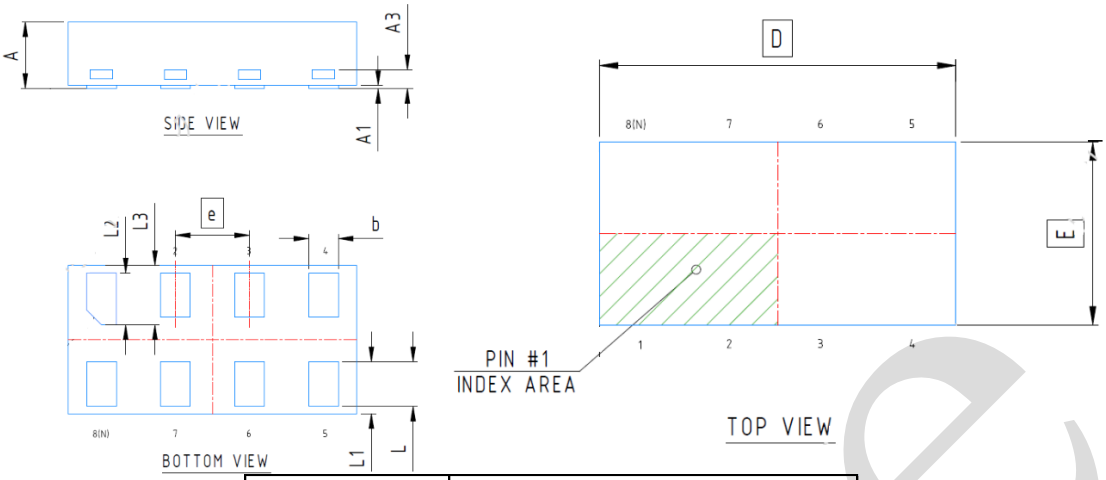
2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	—	1.00
A1	0.00	0.15
A2	0.60	0.85
A3	0.12	
Q	0.19	0.21
b	0.17	0.27
c	0.08	0.23
D	1.90	2.10
E	2.20	2.40
HE	3.00	3.20
HE1	3.00	3.40
e	0.50	
L	0.40	
L1	0.15	0.40
Y	0.10	
Z	0.10	0.40
θ	0°	8°

5.3、XSON8-1.35*1-0.35



2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	0.28	0.32
A1	0.00	0.05
A3	0.10	
b	0.11	0.21
D	1.35	
E	1.00	
e	0.35	
L	0.25	0.35
L1	0.275	0.475
L2	0.30	0.40
L3	0.325	0.525

5.4、XSON8-1.95*1-0.5



2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	0.45	0.55
A1	0	0.05
A3	0.127	
b	0.15	0.25
D	1.95	
E	1.00	
e	0.50	
L	0.25	0.35
L1	0.25	0.45
L2	0.30	0.40
L3	0.30	0.50

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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