



AiP74CB3Q3305

Dual Bus Switch with Charge Pump

Product specification

Manual release resume:

Version	Date	Description
2025-11-A0	2025-11	New
2026-05-A1	2026-05	Modify the parameters
2026-06-A2	2026-06	Add TSSOP8 (3*4.4) package form



Contents

1、General Description	3
2、Block Diagram and Pin Description	4
2.1、Block Diagram	4
2.2、Pin Configurations.....	4
2.3、Pin Description.....	4
2.4、Function Table	5
3、Electrical Parameter	5
3.1、Absolute Maximum Ratings.....	5
3.2、Recommended Operating Conditions.....	5
3.3、Electrical Characteristics	6
3.3.1、DC Characteristics.....	6
3.3.2、AC Characteristics.....	6
4、Characteristic curve	7
5、Testing Circuit	7
5.1、AC Testing Circuit.....	7
5.2、Test data.....	7
5.3、AC Testing Waveforms	8
5.4、Measurement Points	8
6、Package Information.....	9
6.1、TSSOP8(3*3)	9
6.2、TSSOP8(3*4,4)	10
6.3、VSSOP8	11
6.4、XSON8.....	12
7、Statements And Notes	13
7.1、The name and content of Hazardous substances or Elements in the product	13
7.2、Notes	13



1、General Description

AiP74CB3Q3245 is a dual bus switch with charge pump. A built-in charge pump is used to increase the gate voltage of the NMOS pass transistor, enabling the circuit to transmit 5.5V switching signals when $V_{CC}=3.3V$.

Features:

- supply voltage range: 2.3V to 3.6V
- overvoltage transmission characteristics:
 $V_{CC}=2.5V$, $V_{sw}=0V$ to 5.5V
 $V_{CC}=3.3V$, $V_{sw}=0V$ to 5.5V
- low power consumption: $I_{CC}=0.5mA$ (Typical)
- rail-to-rail switching on I/O ports
- temperature range: $-40^{\circ}C$ to $+125^{\circ}C$
- packaging information: TSSOP8(3*3)/ TSSOP8(3*4.4)/VSSOP8/XSON8

Ordering information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes	Moisture sensitivity level
AiP74CB3Q3305TA8.TR	TSSOP8	AiPLE	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm	MSL3
AiP74CB3Q3305TB8.TR	TSSOP8	AiPLE	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×4.4mm Pin spacing: 0.65mm	MSL3
AiP74CB3Q3305YA8.TR	VSSOP8	AiP LEXX	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing: 0.50mm	MSL3
AiP74CB3Q3305EB8.TR	XSON8	LE XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.35mm×1.0mm Pin spacing: 0.35mm	MSL3

Note: If the material object is inconsistent with the ordering information, please take the material object as the standard.



2、Block Diagram and Pin Description

2.1、Block Diagram

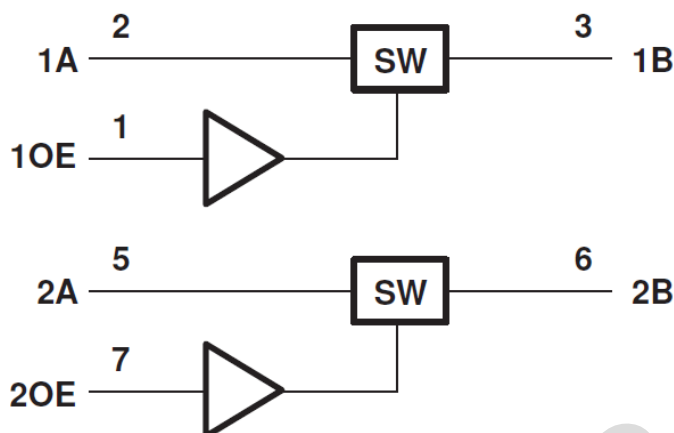
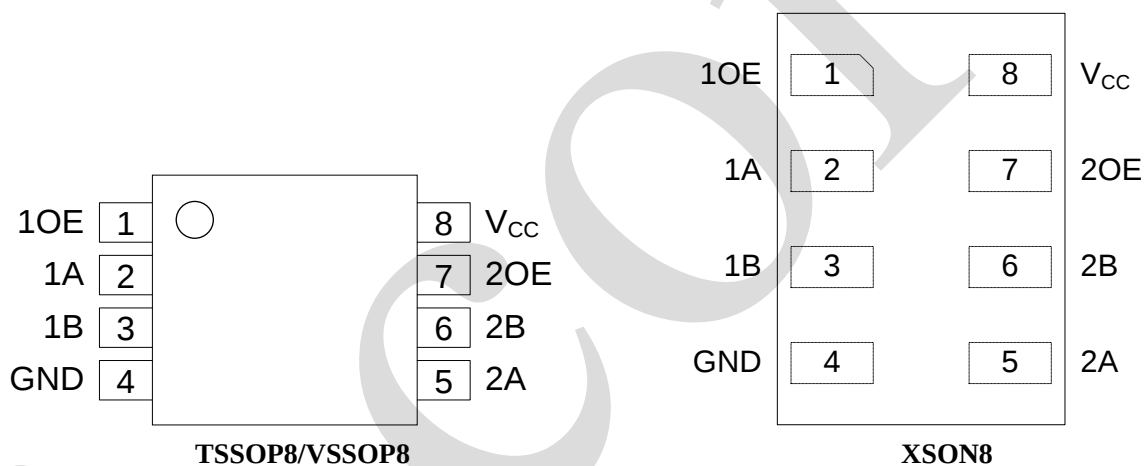


Figure 1. Logic diagram

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	1OE	output enable input (active HIGH)
2	1A	1A input/output
3	1B	1B input/output
4	GND	ground (0V)
5	2A	2A input/output
6	2B	2B input/output
7	2OE	output enable input (active HIGH)
8	V _{CC}	supply voltage

**2.4、Function Table**

Input	Function switch
OE	
L	An=Bn
H	Z

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

3、Electrical Parameter**3.1、Absolute Maximum Ratings**

Parameter	Symbol	Conditions	Min	Max	Unit
supply voltage	V_{CC}	-	-0.5	+4.6	V
input voltage	V_I	input port OE	-0.5	+7.0	V
switch voltage	V_{SW}	-	-0.5	+7.0	V
input clamping current	I_{IK}	$V_I < -0.5V$	-50	-	mA
switch clamping current	I_{SK}	$V_I < -0.5V$	-50	-	mA
switch current	I_{SW}	-	-	±120	mA
supply current	I_{CC}	-	-	+100	mA
ground current	I_{GND}	-	-100	-	mA
storage temperature	T_{stg}	-	-65	+150	°C
soldering temperature	T_L	10s	260		°C
Electrostatic discharge	ESD[d1]	HBM	2000		V

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	2.3	-	3.6	V
input voltage	V_I	input port OE	0	-	5.5	V
switch voltage	V_{SW}	-	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	°C
input transition rise and fall rate	$\Delta t/\Delta V$	input port OE; $V_{CC}=2.3V$ to $2.7V$	0	-	20	ns/V
		input port OE; $V_{CC}=2.7V$ to $3.6V$	0	-	10	ns/V



3.3、Electrical Characteristics

3.3.1、DC Characteristics

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V _{IH}	2.3V to 2.7V	-	1.7	-	-	V
		2.7V to 3.6V	-	2.0	-	-	V
LOW-level input voltage	V _{IL}	2.3V to 2.7V	-	-	-	0.7	V
		2.7V to 3.6V	-	-	-	0.8	V
input clamping voltage	V _{IK}	3.6V	An, Bn pins; I _I =-18mA	-	-	-1.8	V
input leakage current	I _I	3.6V	OE pin; V _I =GND to 5.5V	-	-	±1	uA
OFF-state leakage current	I _S (OFF)	3.6V	An, Bn pins	-	-	±1	uA
power-off leakage current	I _{OFF}	0V	V _{SW} or V _I =0V to 5.5V	-	-	±1	uA
supply current	I _{CC}	3.6V	V _I =V _{CC} or GND; I _O =0A; V _{SW} =GND or V _{CC}	-	0.25	0.7	mA
additional supply current	ΔI _{CC}	3.6V	OE pin; one input at V _I =3V; other inputs at V _{CC} or GND	-	-	30	uA
On resistance	R _{ON}	2.3V	I _{sw} =30mA; V _I =0V	-	2.7	6	Ω
			I _{sw} =-15mA; V _I =1.7V	-	2.9	6	Ω
		3.0V	I _{sw} =30mA; V _I =0V	-	2.7	6	Ω
			I _{sw} =-15mA; V _I =2.4V	-	3.1	6	Ω

Note:

[1] All typical values are measured at V_{CC}=2.5V, 3.3V (unless otherwise specified) and T_{amb}=25°C.

3.3.2、AC Characteristics

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Max.	Unit
propagation delay	t _{PLH} , t _{PHL}	2.3V to 2.7V	An to Bn Bn to An see Figure 4	-	0.15	ns
		3.0V to 3.6V		-	0.20	ns
enable time	t _{PZH} , t _{PZL}	2.3V to 2.7V	OE to An/Bn see Figure 5	1.5	9.0	ns
		3.0V to 3.6V		1.5	7.5	ns
disable time	t _{PLZ} , t _{PHZ}	2.3V to 2.7V	OE to An/Bn see Figure 5	1.5	9.0	ns
		3.0V to 3.6V		1.5	7.5	ns
maximum frequency	f _{max}	2.3V to 2.7V	OE pin; V _O >V _{CC} ; V _I =5V; R _L ≥1MΩ; C _L =0pF	-	5	MHz
		3.0V to 3.6V		-	18	MHz



4、Characteristic curve

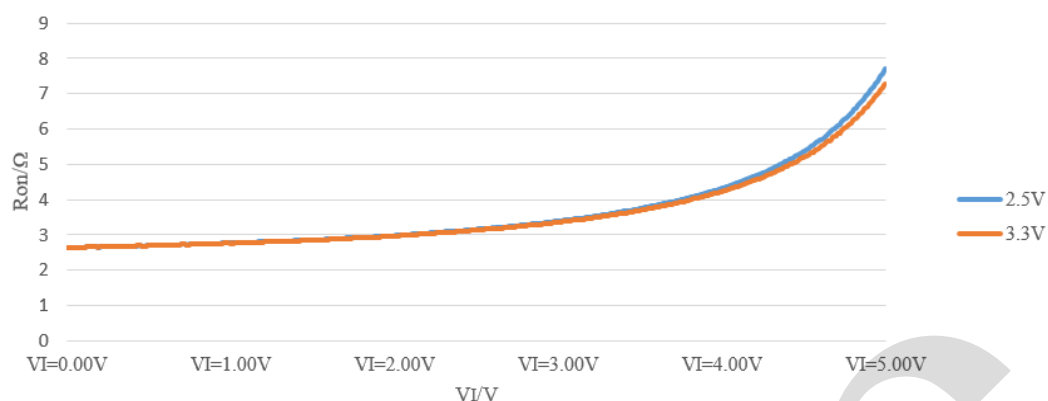


Figure 2. ON resistance as a function of input voltage

5、Testing Circuit

5.1、AC Testing Circuit

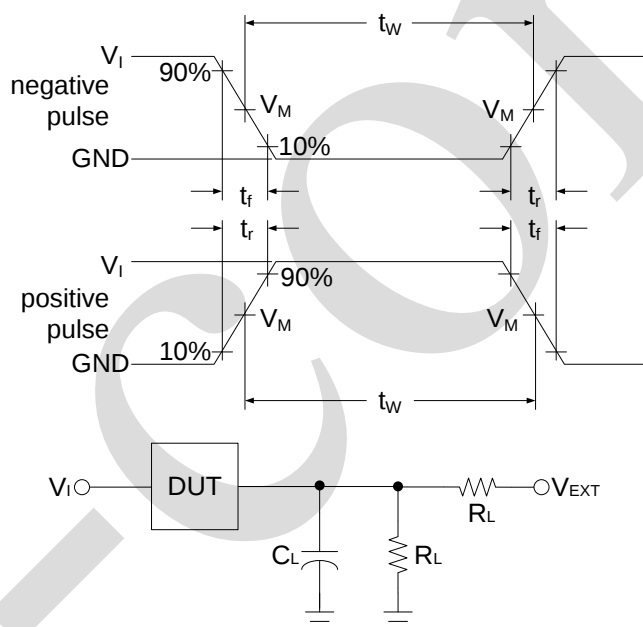


Figure 3. Load circuit

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.

5.2、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_{PHZ}, t_{PZH}	t_{PLZ}, t_{PZL}
2.3V to 2.7V	V_{CC}	$\leq 2.5ns$	30pF	500Ω	open	GND	$2 \times V_{CC}$
3.0V to 3.6V	V_{CC}	$\leq 2.5ns$	50pF	500Ω	open	GND	$2 \times V_{CC}$

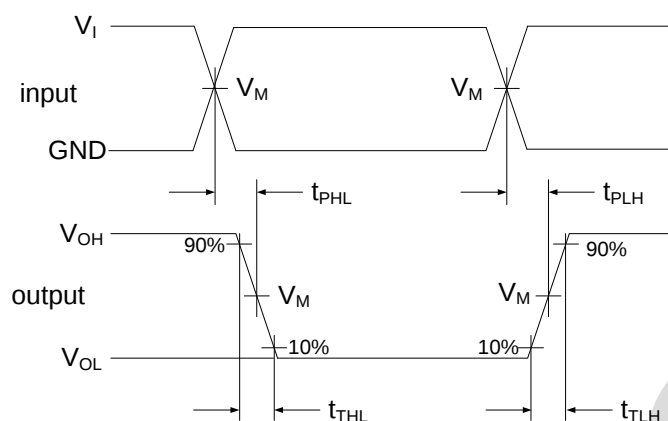
**5.3、AC Testing Waveforms**

Figure 4. Input (An/Bn) to output (Bn/An) propagation delays

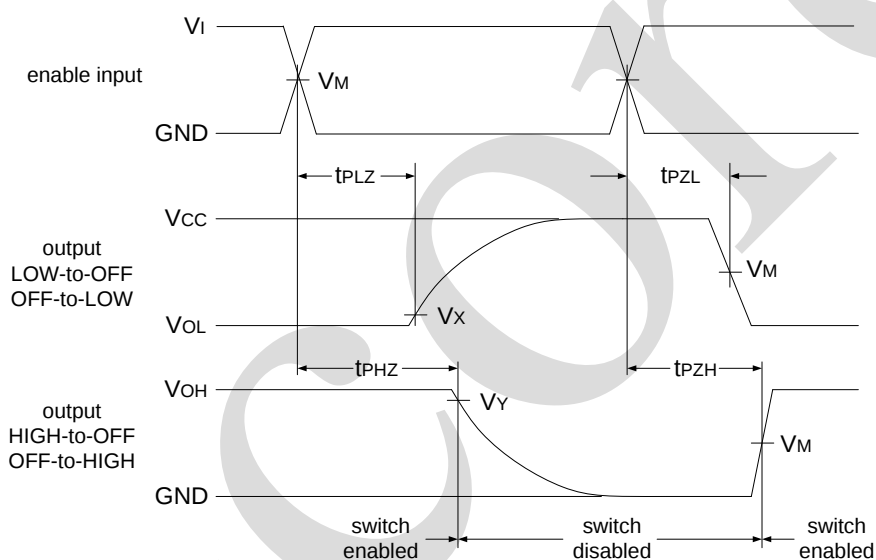
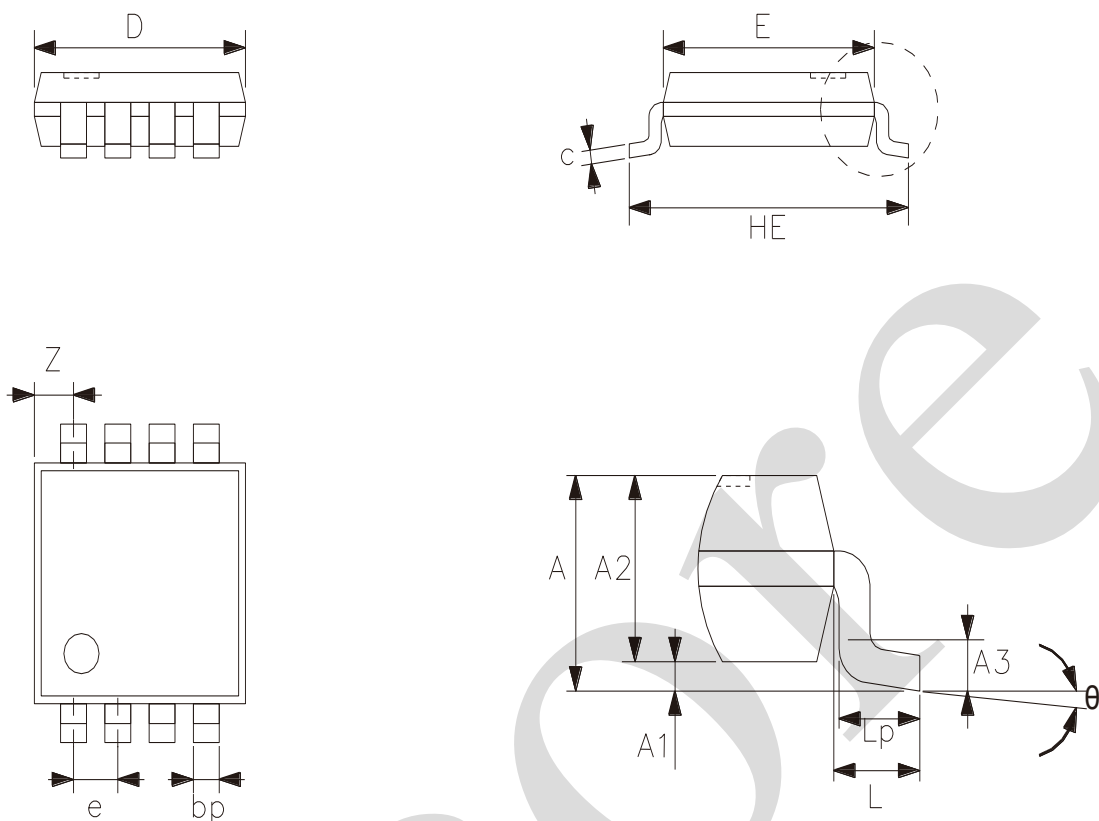


Figure 5. Enable and disable times

5.4、Measurement Points

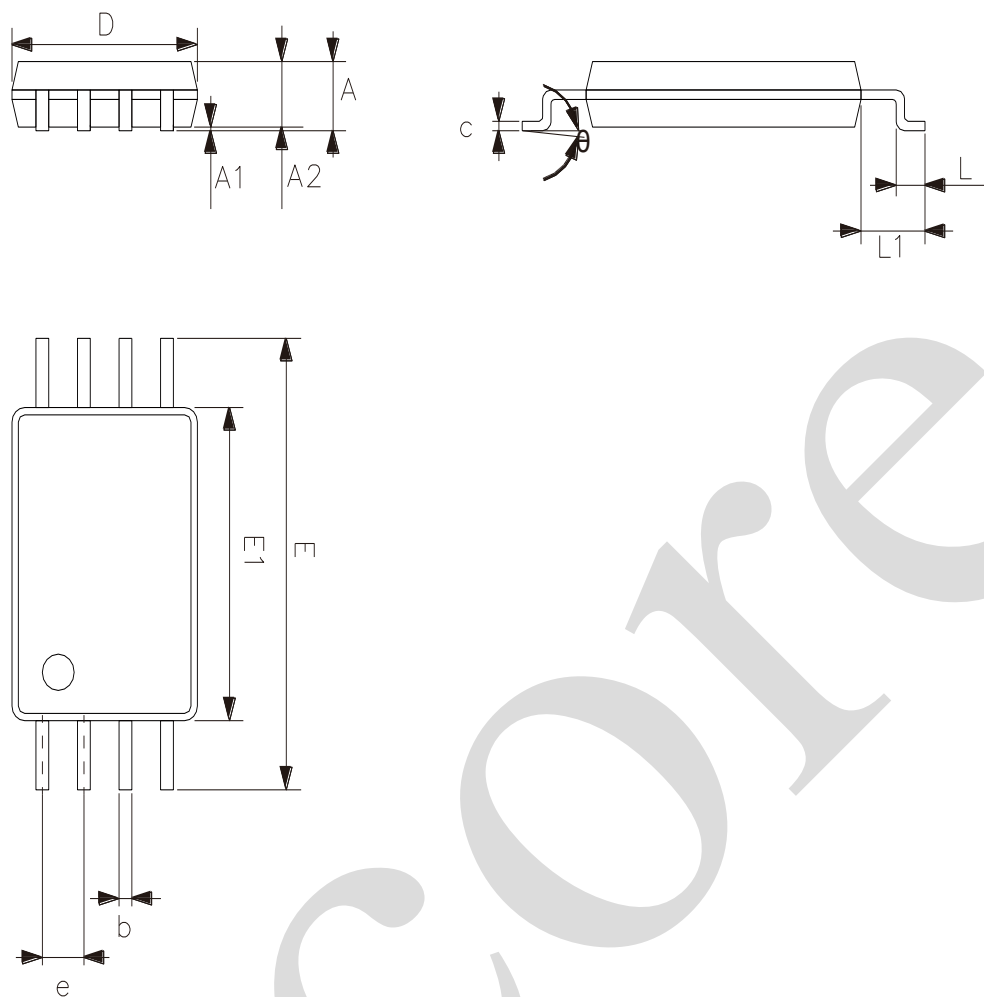
Supply Voltage	Input	Output		
V_{CC}	V_M	V_M	V_X	V_Y
2.3V to 2.7V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
3.0V to 3.6V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$

**6、Package Information****6.1、TSSOP8(3*3)**

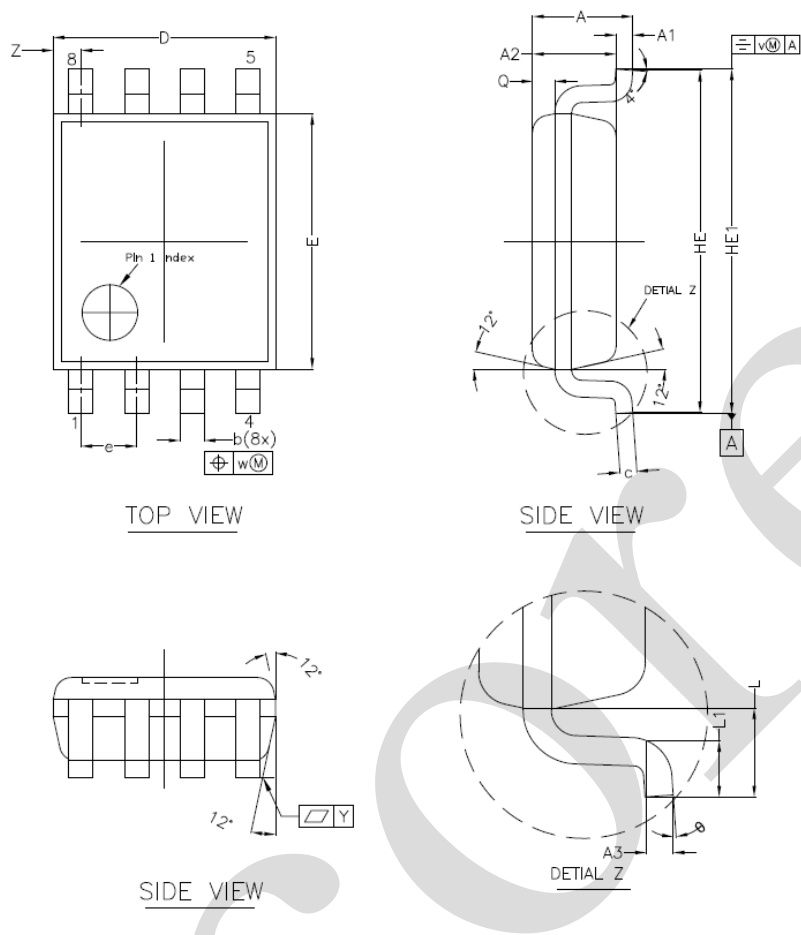
2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.10
A1	0	0.15
A2	0.75	0.95
A3	0.25	
bp	0.22	0.38
c	0.08	0.18
D	2.90	3.10
E	2.90	3.10
HE	3.90	4.10
L	0.50	
Lp	0.33	0.47
e	0.65	
Z	0.35	0.70
θ	0°	8°



6.2、TSSOP8(3*4.4)



2023/12/A Symbol	Dimensions In Millimeters	
	Min	Max
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	2.90	3.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°

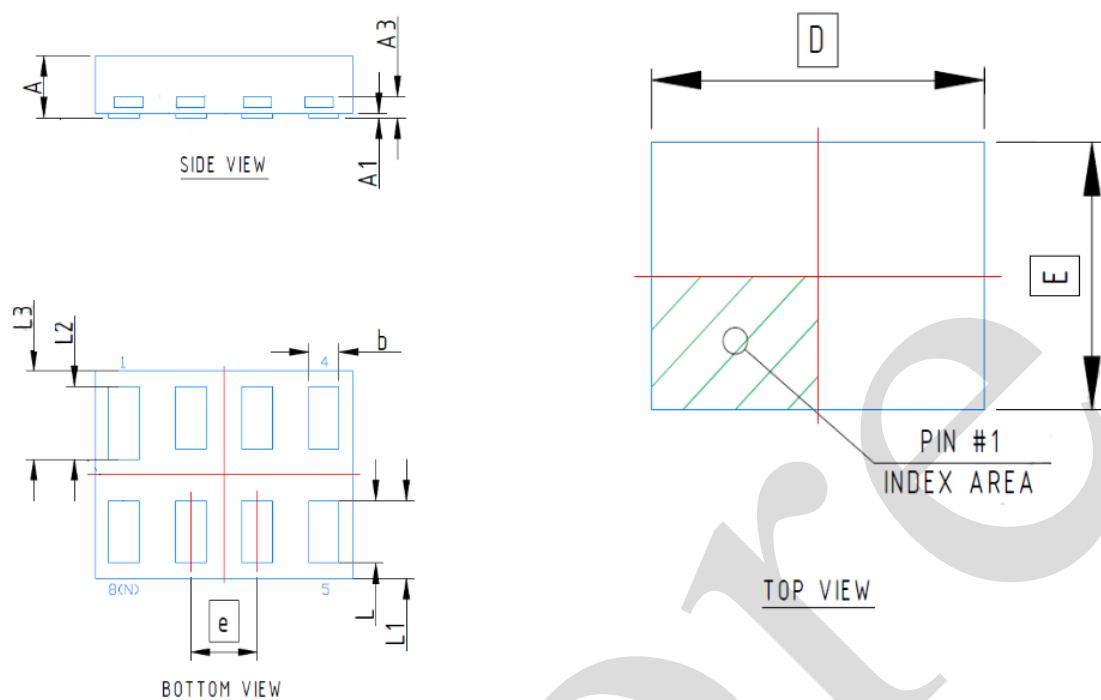
**6.3、VSSOP8**

NOTES
1.0 COP
DIE ATTA
2.0 D E

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°



6.4、XSON8



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



7、Statements And Notes

7.1、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.									

7.2、Notes

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

The information in this chapter is provided for reference only and i-Core disclaims any express or implied warranties, including but not limited to applicability, special application or non-infringement of third party rights.

This product is not suitable for critical equipment such as life-saving, life-sustaining or safety equipment. It is also not suitable for applications that may result in personal injury, death, or serious property or environmental damage due to product malfunction or failure. I-Core will not be liable for any damages incurred by the customers at their own risk for such applications.

The customer is responsible for conducting all necessary tests i-Core's application to avoid failure in the application or the application of the customer's third party users. I-Core does not accept any liability.

The Company reserves the right to change or improve the information published in this chapter at any time. The information in this chapter are subject to change without notice. We recommend the customer to consult our sales staff before purchasing.

Please obtain related materials from i-Core's regular channels and we are not responsible for its content if it is provided by sources other than our company.

In case of any conflict between the Chinese and English version, the version is subject to the Chinese one.