



AiP74LVC3G17

Triple Buffer Schmitt Trigger

Product Specification

Specification Revision History:

Version	Date	Description
2023-06-A0	2023-06	New
2023-10-A1	2023-10	Parameter modification



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1、General Description

The AiP74LVC3G17 provides three non-inverting buffers with Schmitt trigger input.

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: TSSOP8/VSSOP8/ XSON8

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74LVC3G17TA8.TB	TSSOP8	EYXX	100 PCS/tube	200 tube/box	20000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC3G17TA8.TR	TSSOP8	EYXX	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing:0.65mm
AiP74LVC3G17YA8.TR	VSSOP8	EYXX	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing:0.50mm
AiP74LVC3G17EB8.TR	XSON8	EYXX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.35mm×1.0mm Pin spacing:0.35mm

Note 1: “XX” refers to variable content, meaning year and 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

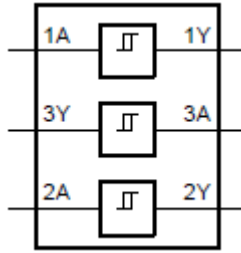


Figure 1. Logic symbol

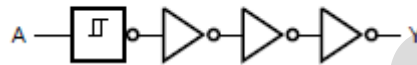
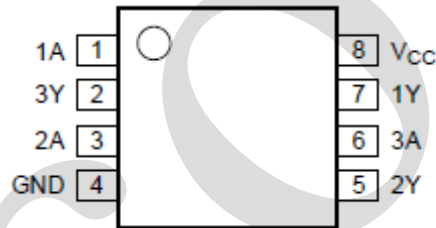


Figure 2. Logic diagram

2.2、Pin Configurations



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	Output
A	Y
L	L
H	H

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



3、Electrical Parameter

3.1、Absolute Maximum Ratings

($T_{amb}=25^{\circ}\text{C}$, All voltage referenced to V_{ss} , 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; $V_{CC}=0\text{V}$	-0.5	+6.5	V
supply current	I_{CC}	-	-	100	mA
ground current	I_{GND}	-	-100	-	mA
input clamping current	I_{IK}	$V_I < 0\text{V}$	-50	-	mA
output current	I_O	$V_O=0\text{V}$ to V_{CC}	-	± 50	mA
output clamping current	I_{OK}	$V_O > V_{CC}$ or $V_O < 0\text{V}$	-	± 50	mA
storage temperature	T_{stg}	-	-65	+150	$^{\circ}\text{C}$
Soldering temperature	T_L	10s	260		$^{\circ}\text{C}$

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; $V_{CC}=0\text{V}$	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	$^{\circ}\text{C}$



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	Vcc	Conditions	Min.	Typ.	Max.	Unit
positive-going threshold voltage	V_{T+}	1.8V		0.70	1.10	1.50	V
		2.3V		1.00	1.40	1.80	V
		3.0V		1.30	1.76	2.20	V
		4.5V		1.90	2.47	3.10	V
		5.5V		2.20	2.91	3.60	V
negative-going threshold voltage	V_{T-}	1.8V		0.25	0.61	0.9	V
		2.3V		0.40	0.80	1.15	V
		3.0V		0.60	1.04	1.50	V
		4.5V		1.00	1.55	2.00	V
		5.5V		1.20	1.86	2.30	V
hysteresis voltage	V_H	1.8V		0.15	0.49	1.00	V
		2.3V		0.25	0.60	1.10	V
		3.0V		0.40	0.73	1.50	V
		4.5V		0.60	0.92	2.00	V
		5.5V		0.70	1.02	2.30	V
HIGH-level output voltage	V_{OH}	1.65V to 5.5V	$I_O = -100\mu\text{A}$	$V_{CC} - 0.1$	-	-	V
		1.65V	$I_O = -4\text{mA}$	1.2	1.54	-	V
		2.3V	$I_O = -8\text{mA}$	1.9	2.15	-	V
		2.7V	$I_O = -12\text{mA}$	2.2	2.50	-	V
		3.0V	$I_O = -24\text{mA}$	2.3	2.62	-	V
		4.5V	$I_O = -32\text{mA}$	3.8	4.11	-	V
LOW-level output voltage	V_{OL}	1.65V to 5.5V	$I_O = 100\mu\text{A}$	-	-	0.10	V
		1.65V	$I_O = 4\text{mA}$	-	0.07	0.45	V
		2.3V	$I_O = 8\text{mA}$	-	0.12	0.30	V
		2.7V	$I_O = 12\text{mA}$	-	0.17	0.40	V
		3.0V	$I_O = 24\text{mA}$;	-	0.33	0.55	V
		4.5V	$I_O = 32\text{mA}$;	-	0.39	0.55	V
input leakage current	I_I	0V to 5.5V	5.5V or GND	-	-	± 1	μA
power-off leakage current	I_{OFF}	0V	V_I or $V_O = 5.5\text{V}$	-	-	± 2	μA
supply current	I_{CC}	1.65V to 5.5V	$V_I = 5.5\text{V}$ or GND; $I_O = 0\text{A}$;	-	-	4	μA
additional supply current	ΔI_{CC}	2.3V to 5.5V	$V_I = V_{CC} - 0.6\text{V}$; $I_O = 0\text{A}$;	-	-	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	Vcc	Conditions	Min.	Typ.	Max.	Unit
positive-going threshold voltage	V_{T+}	1.8V	-	0.70	-	1.70	V
		2.3V	-	1.00	-	2.00	V
		3.0V	-	1.30	-	2.40	V
		4.5V	-	1.90	-	3.30	V
		5.5V	-	2.20	-	3.80	V
negative-going threshold voltage	V_{T-}	1.8V	-	0.25	-	1.10	V
		2.3V	-	0.40	-	1.35	V
		3.0V	-	0.60	-	1.70	V
		4.5V	-	1.00	-	2.20	V
		5.5V	-	1.20	-	2.50	V
hysteresis voltage	V_H	1.8V	-	0.15	-	1.20	V
		2.3V	-	0.25	-	1.30	V
		3.0V	-	0.40	-	1.40	V
		4.5V	-	0.60	-	1.70	V
		5.5V	-	0.70	-	1.90	V
HIGH-level output voltage	V_{OH}	1.65V to 5.5V	$I_O = -100\mu\text{A}$	$V_{CC} - 0.1$	-	-	V
		1.65V	$I_O = -4\text{mA}$	0.95	-	-	V
		2.3V	$I_O = -8\text{mA}$	1.7	-	-	V
		2.7V	$I_O = -12\text{mA}$	1.9	-	-	V
		3.0V	$I_O = -24\text{mA}$	2.0	-	-	V
		4.5V	$I_O = -32\text{mA}$	3.4	-	-	V
LOW-level output voltage	V_{OL}	1.65V to 5.5V	$I_O = 100\mu\text{A}$	-	-	0.10	V
		1.65V	$I_O = 4\text{mA}$	-	-	0.70	V
		2.3V	$I_O = 8\text{mA}$	-	-	0.45	V
		2.7V	$I_O = 12\text{mA}$	-	-	0.60	V
		3.0V	$I_O = 24\text{mA}$;	-	-	0.80	V
		4.5V	$I_O = 32\text{mA}$;	-	-	0.80	V
input leakage current	I_I	0V to 5.5V	5.5V or GND	-	-	± 1	μA
power-off leakage current	I_{OFF}	0V	V_I or $V_O = 5.5\text{V}$	-	-	± 2	μA
supply current	I_{CC}	1.65V to 5.5V	$V_I = 5.5\text{V}$ or GND; $I_O = 0\text{A}$;	-	-	4	μA
additional supply current	ΔI_{CC}	2.3V to 5.5V	$V_I = V_{CC} - 0.6\text{V}$; $I_O = 0\text{A}$;	-	-	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	Vcc	Conditions	Min.	Typ. ^[1]	Max.	Unit
nA to nY propagation delay	t_{PLH}, t_{PHL}	1.65V to 1.95V	see Figure 4	1.5	5.6	10.5	ns
		2.3V to 2.7V		1.0	3.7	6.5	ns
		2.7V		1.0	3.8	6.5	ns
		3.0V to 3.6V		1.0	3.6	5.7	ns
		4.5V to 5.5V		1.0	2.7	4.3	ns

Note: Typical values are measured at $T_{amb} = 25^{\circ}\text{C}$ and $V_{CC} = 1.8\text{V}, 2.5\text{V}, 2.7\text{V}, 3.3\text{V}$ 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	Vcc	Conditions	Min.	Typ. ^[1]	Max.	Unit
nA to nY propagation delay	t_{PLH}, t_{PHL}	1.65V to 1.95V	see Figure 4	1.5	-	13.1	ns
		2.3V to 2.7V		1.0	-	8.5	ns
		2.7V		1.0	-	8.5	ns
		3.0V to 3.6V		1.0	-	7.1	ns
		4.5V to 5.5V		1.0	-	5.4	ns

4、Testing Circuit

4.1、AC Testing Circuit

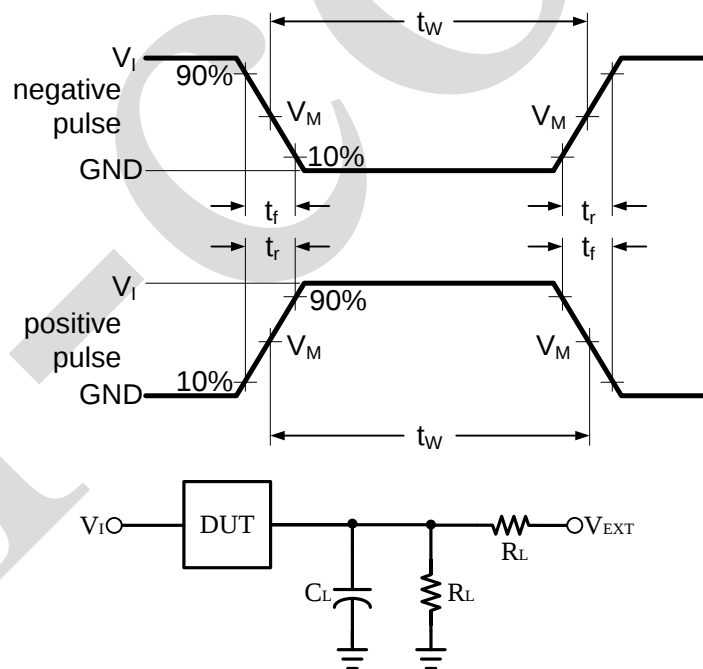


Figure 3. Load circuit

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

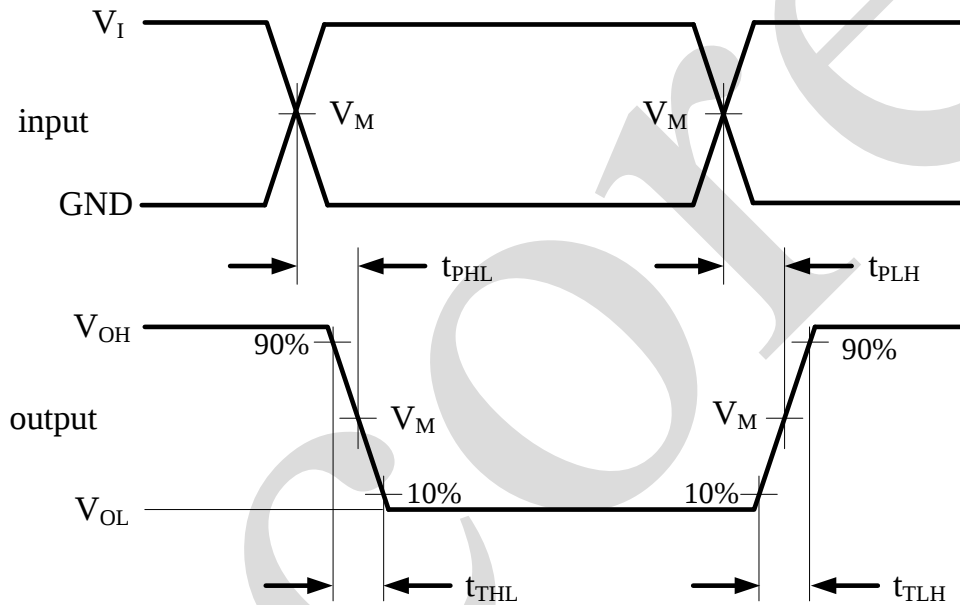


Figure 4. The data input (A) to output (Y) propagation delays

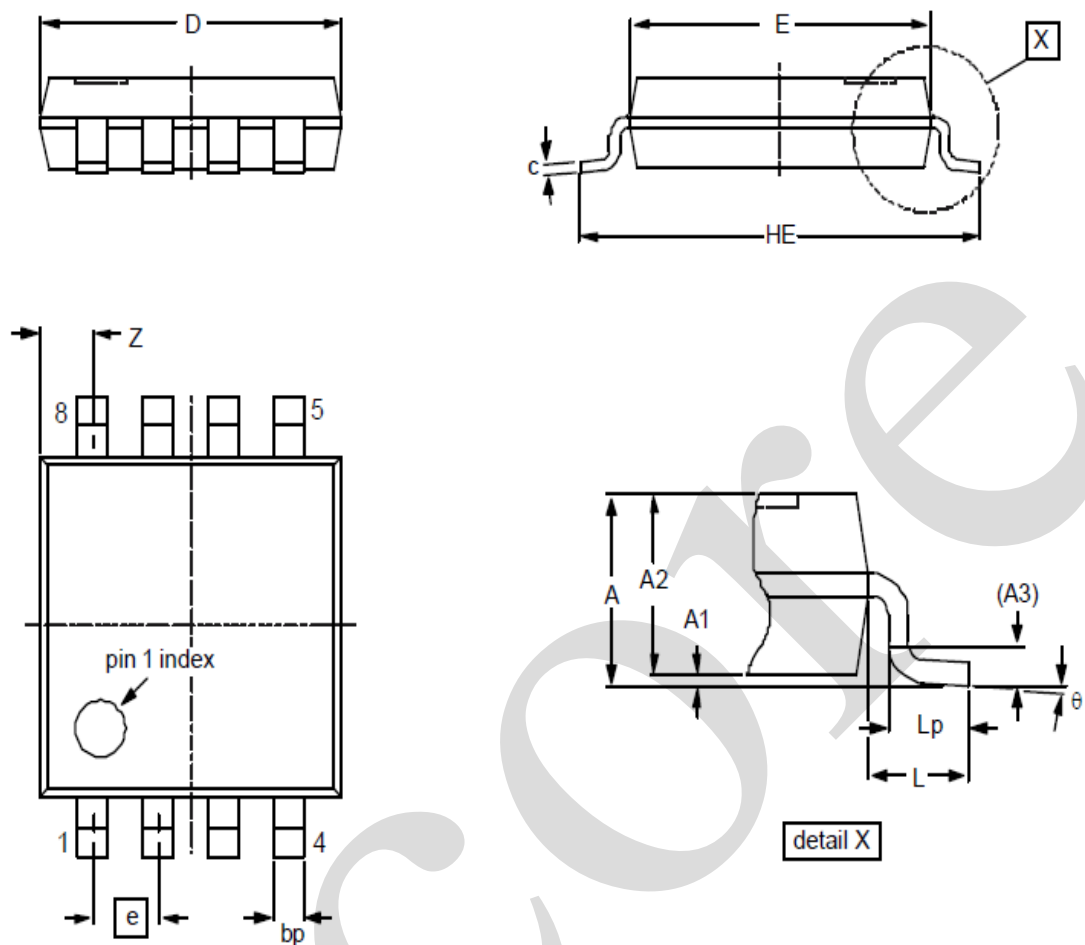
4.4、Measurement Points

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

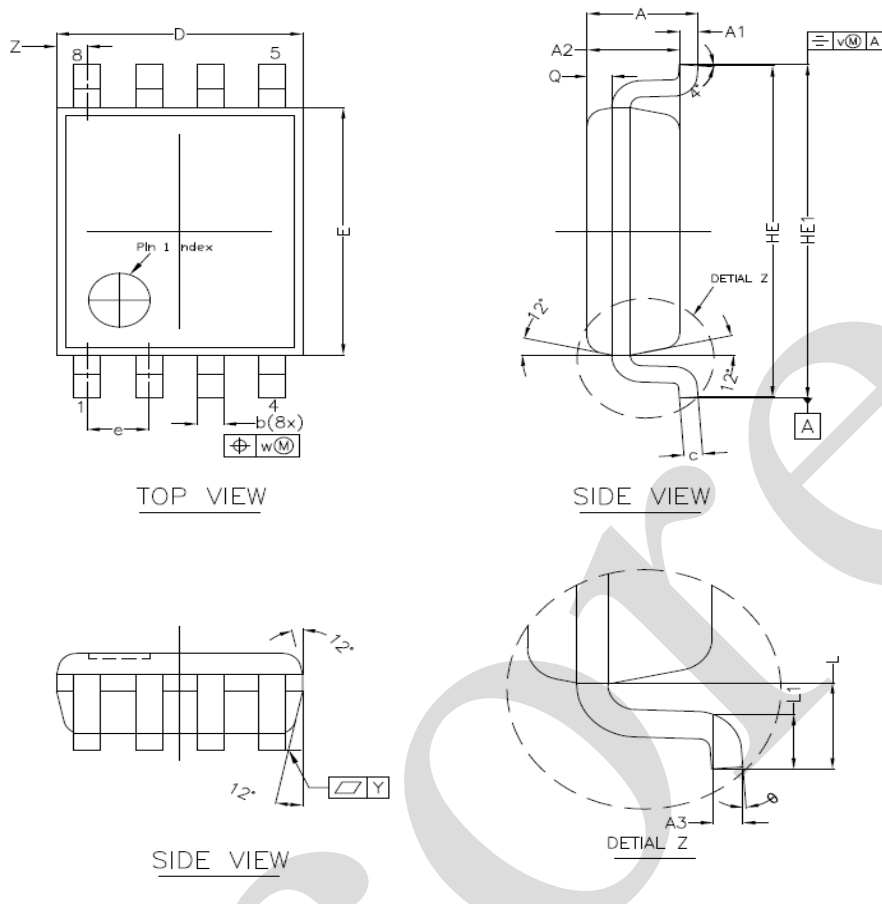
5.1、TSSOP8



Symbol	Dimensions (mm)	
	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

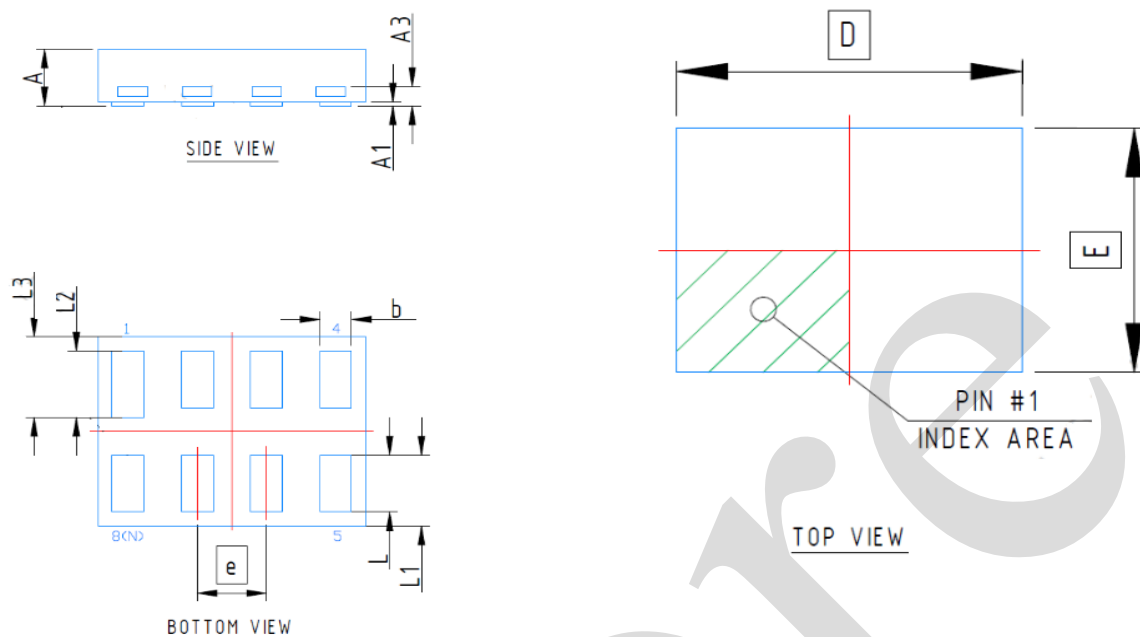


NOTES
1.0 COP
DIE ATTA
2.0 D E

Symbol	Dimensions (mm)	
	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



Symbol	Dimensions (mm)	
	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



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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