



# AiP74LVC2G241

## Dual Buffer/Line Driver; 3-State

### Product Specification

**Specification Revision History:**

Version	Date	Description
2025-06-A0	2025-06	New
2025-08-A1	2025-08	Modify the parameters



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## 1、General Description

The AiP74LVC2G241 is a dual non-inverting buffer/line driver with 3-state outputs. The 3-state outputs are controlled by the output enable inputs  $\overline{1OE}$  and 2OE.

The input 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
- 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:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Packaging information: TSSOP8/VSSOP8/XSON8

### Ordering Information:

#### Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC2G241TA8.TR	TSSOP8	AiPHT 2G241	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP74LVC2G241YA8.TR	VSSOP8	AiP HTXX	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing: 0.50mm
AiP74LVC2G241EB8.TR	XSON8	HT XX	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

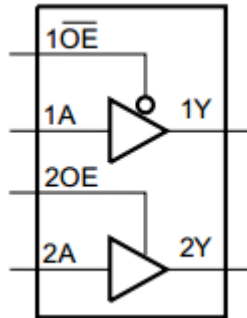
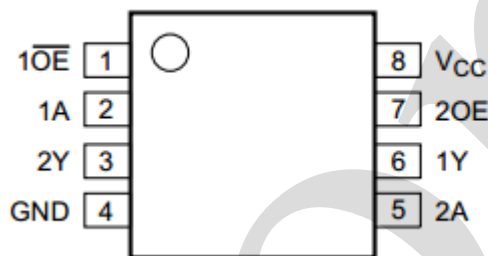


Figure 1. Logic symbol

### 2.2、Pin Configurations



### 2.3、Pin Description

Pin No.	Pin Name	Description
1	1 $\overline{OE}$	output enable input(active LOW)
2	1A	data input
3	2Y	data output
4	GND	ground (0V)
5	2A	data input
6	1Y	data output
7	2OE	output enable input(active HIGH)
8	V <sub>CC</sub>	supply voltage



## 2.4、Function Table

Input				Output	
1OE	1A	2OE	2A	1Y	2Y
L	L	H	L	L	L
L	H	H	H	H	H
H	X	L	X	Z	Z

Note: H=HIGH voltage level; L=LOW voltage level; X=Don't care.

## 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 <sub>CC</sub>	-	-0.5	+6.5	V
input voltage	V <sub>I</sub>	-	-0.5	+6.5	V
output voltage	V <sub>O</sub>	Active mode	-0.5	V <sub>CC</sub> +0.5	V
		Power-down mode; V <sub>CC</sub> =0V	-0.5	+6.5	V
supply current	I <sub>CC</sub>	-	-	100	mA
ground current	I <sub>GND</sub>	-	-100	-	mA
input clamping current	I <sub>IK</sub>	V <sub>I</sub> < 0V	-50	-	mA
output current	I <sub>O</sub>	V <sub>O</sub> =0V to V <sub>CC</sub>	-	±50	mA
output clamping current	I <sub>OK</sub>	V <sub>O</sub> > V <sub>CC</sub> or V <sub>O</sub> < 0V	-	±50	mA
storage temperature	T <sub>stg</sub>	-	-65	+150	°C
soldering temperature	T <sub>L</sub>	10s	260		°C

### 3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V <sub>CC</sub>	-	1.65	-	5.5	V
input voltage	V <sub>I</sub>	-	0	-	5.5	V
output voltage	V <sub>O</sub>	-	0	-	V <sub>CC</sub>	V
ambient temperature	T <sub>amb</sub>	-	-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	V <sub>CC</sub>	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V <sub>IH</sub>	1.65V to 1.95V	-	0.65V <sub>CC</sub>	-	5.5	V
		2.3V to 2.7V	-	1.7	-	-	V
		2.7V to 3.6V	-	2	-	-	V
		4.5V to 5.5V	-	0.7V <sub>CC</sub>	-	-	V
LOW-level input voltage	V <sub>IL</sub>	1.65V to 1.95V	-	-	-	0.35V <sub>CC</sub>	V
		2.3V to 2.7V	-	-	-	0.7	V
		3V to 3.6V	-	-	-	0.8	V
		4.5V to 5.5V	-	-	-	0.3V <sub>CC</sub>	V
HIGH-level output voltage	V <sub>OH</sub>	1.65V to 5.5V	I <sub>O</sub> =-100uA	V <sub>CC</sub> -0.1	-	-	V
		1.65V	I <sub>O</sub> =-4mA	1.2	-	-	V
		2.3V	I <sub>O</sub> =-8mA	1.9	-	-	V
		2.7V	I <sub>O</sub> =-12mA	2.4	-	-	V
		3.0V	I <sub>O</sub> =-24mA	2.3	-	-	V
		4.5V	I <sub>O</sub> =-32mA	3.8	-	-	V
LOW-level output voltage	V <sub>OL</sub>	1.65V to 5.5V	I <sub>O</sub> =100uA	-	-	0.10	V
		1.65V	I <sub>O</sub> =4mA	-	-	0.45	V
		2.3V	I <sub>O</sub> =8mA	-	-	0.30	V
		2.7V	I <sub>O</sub> =12mA	-	-	0.40	V
		3.0V	I <sub>O</sub> =24mA	-	-	0.55	V
		4.5V	I <sub>O</sub> =32mA	-	-	0.55	V
input leakage current	I <sub>I</sub>	0V to 5.5V	V <sub>I</sub> =5.5V or GND	-	±0.1	±1	uA
OFF-state output current	I <sub>OZ</sub>	3.6V	V <sub>I</sub> =V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> =5.5V or GND	-	±0.1	±2	uA
power-off leakage current	I <sub>OFF</sub>	0V	V <sub>I</sub> or V <sub>O</sub> =5.5V	-	±0.1	±2	uA
supply current	I <sub>CC</sub>	1.65V to 5.5V	V <sub>I</sub> =V <sub>CC</sub> or GND; I <sub>O</sub> =0A	-	0.1	4	uA
additional supply current	ΔI <sub>CC</sub>	2.3V to 5.5V	per input pin; V <sub>I</sub> =V <sub>CC</sub> -0.6V; I <sub>O</sub> =0A	-	5	500	uA

Note: All 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	V <sub>CC</sub>	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V <sub>IH</sub>	1.65V to 1.95V	-	0.65V <sub>CC</sub>	-	5.5	V
		2.3V to 2.7V	-	1.7	-	-	V
		3V to 3.6V	-	2	-	-	V
		4.5V to 5.5V	-	0.7V <sub>CC</sub>	-	-	V
LOW-level input voltage	V <sub>IL</sub>	1.65V to 1.95V	-	-	-	0.35V <sub>CC</sub>	V
		2.3V to 2.7V	-	-	-	0.7	V
		3V to 3.6V	-	-	-	0.8	V
		4.5V to 5.5V	-	-	-	0.3V <sub>CC</sub>	V
HIGH-level output voltage	V <sub>OH</sub>	1.65V to 5.5V	I <sub>O</sub> =-100uA	V <sub>CC</sub> -0.1	-	-	V
		1.65V	I <sub>O</sub> =-4mA	0.95	-	-	V
		2.3V	I <sub>O</sub> =-8mA	1.7	-	-	V
		2.7V	I <sub>O</sub> =-12mA	1.9	-	-	V
		3.0V	I <sub>O</sub> =-24mA	2.0	-	-	V
		4.5V	I <sub>O</sub> =-32mA	3.4	-	-	V
LOW-level output voltage	V <sub>OL</sub>	1.65V to 5.5V	I <sub>O</sub> =100uA	-	-	0.10	V
		1.65V	I <sub>O</sub> =4mA	-	-	0.70	V
		2.3V	I <sub>O</sub> =8mA	-	-	0.45	V
		2.7V	I <sub>O</sub> =12mA	-	-	0.60	V
		3.0V	I <sub>O</sub> =24mA	-	-	0.80	V
		4.5V	I <sub>O</sub> =32mA	-	-	0.80	V
input leakage current	I <sub>I</sub>	0V to 5.5V	V <sub>I</sub> =5.5V or GND	-	-	±1	uA
OFF-state output current	I <sub>OZ</sub>	3.6V	V <sub>I</sub> =V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> =5.5V or GND	-	-	±2	uA
power-off leakage current	I <sub>OFF</sub>	0V	V <sub>I</sub> or V <sub>O</sub> =5.5V	-	-	±2	uA
supply current	I <sub>CC</sub>	1.65V to 5.5V	V <sub>I</sub> =5.5V or GND; I <sub>O</sub> =0A	-	-	4	uA
additional supply current	ΔI <sub>CC</sub>	2.3V to 5.5V	one input at V <sub>CC</sub> -0.6V; I <sub>O</sub> =0A	-	-	500	uA



### 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	V <sub>CC</sub>	Conditions	Min.	Typ.	Max.	Unit
A to Y propagation delay	t <sub>pd</sub>	1.8V±0.15V	see Figure 3	3.3	-	8.8	ns
		2.5V±0.2V		1.5	-	4.8	ns
		3.3V±0.3V		1.4	-	4.3	ns
		5V±0.5V		1	-	3.7	ns
1 $\overline{\text{OE}}$ to 1Y enable time	t <sub>en</sub>	1.8V±0.15V	see Figure 4	4	-	9.9	ns
		2.5V±0.2V		1.9	-	5.6	ns
		3.3V±0.3V		1.2	-	4.7	ns
		5V±0.5V		1.2	-	3.8	ns
2OE to 2Y enable time	t <sub>en</sub>	1.8V±0.15V	see Figure 5	1.5	-	11.6	ns
		2.5V±0.2V		1	-	5.8	ns
		3.3V±0.3V		1.4	-	5.4	ns
		5V±0.5V		1	-	3.4	ns
1 $\overline{\text{OE}}$ to 1Y disable time	t <sub>dis</sub>	1.8V±0.15V	see Figure 4	3.2	-	8.8	ns
		2.5V±0.2V		1.5	-	4.7	ns
		3.3V±0.3V		1.6	-	4.1	ns
		5V±0.5V		1.1	-	3.3	ns
2OE to 2Y disable time	t <sub>dis</sub>	1.8V±0.15V	see Figure 5	1.7	-	12.5	ns
		2.5V±0.2V		1	-	5.2	ns
		3.3V±0.3V		1	-	4.2	ns
		5V±0.5V		1	-	3.3	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  $5.0\text{V}$  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	V <sub>CC</sub>	Conditions	Min.	Typ.	Max.	Unit
A to Y propagation delay	t <sub>pd</sub>	1.8V±0.15V	see Figure 3	3.3	-	9.8	ns
		2.5V±0.2V		1.5	-	5.8	ns
		3.3V±0.3V		1.4	-	5.3	ns
		5V±0.5V		1	-	4.2	ns
1 $\overline{\text{OE}}$ to 1Y enable time	t <sub>en</sub>	1.8V±0.15V	see Figure 4	4	-	10.9	ns
		2.5V±0.2V		1.9	-	6.6	ns
		3.3V±0.3V		1.2	-	5.7	ns
		5V±0.5V		1.2	-	4.3	ns
2OE to 2Y enable time	t <sub>en</sub>	1.8V±0.15V	see Figure 5	1.5	-	12.6	ns
		2.5V±0.2V		1	-	6.8	ns
		3.3V±0.3V		1.4	-	4.4	ns
		5V±0.5V		1	-	4.4	ns
1 $\overline{\text{OE}}$ to 1Y disable time	t <sub>dis</sub>	1.8V±0.15V	see Figure 4	3.2	-	9.8	ns
		2.5V±0.2V		1.5	-	5.7	ns
		3.3V±0.3V		1.6	-	5.1	ns
		5V±0.5V		1.1	-	3.8	ns



2OE to 2Y disable time	1.8V±0.15V	see Figure 5	1.7	-	13.5	ns
	2.5V±0.2V		1	-	6.2	ns
	3.3V±0.3V		1	-	5.2	ns
	5V±0.5V		1	-	4.3	ns

## 4、Testing Circuit

### 4.1、AC Testing Circuit

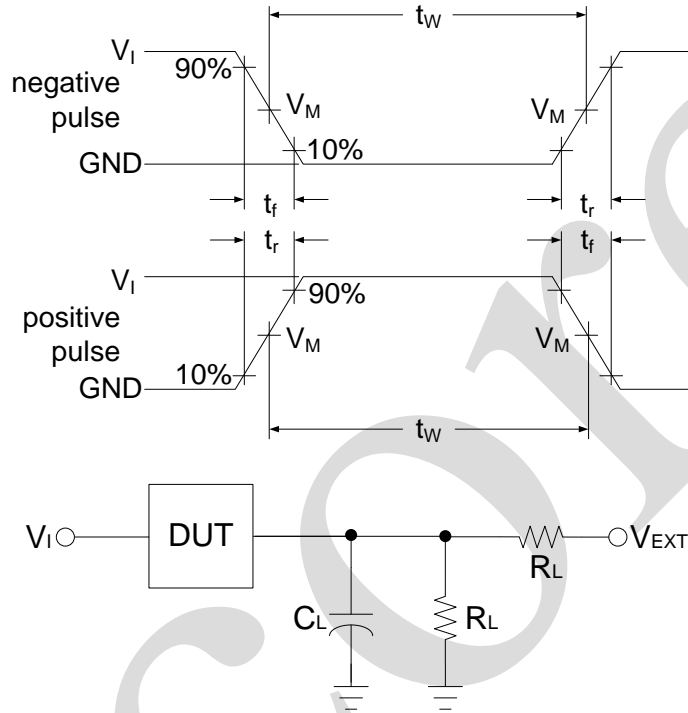


Figure 2. AC Testing Circuit

Definitions for test circuit:

$R_L$ =Load resistance.

$C_L$ =Load capacitance including jig and probe capacitance.



4.2、Test Data

Supply voltage	Input		Load		V <sub>EXT</sub>
V <sub>CC</sub>	V <sub>I</sub>	t <sub>r</sub> , t <sub>f</sub>	C <sub>L</sub>	R <sub>L</sub>	t <sub>PLH</sub> , t <sub>PHL</sub>
1.8V ±0.15V	V <sub>CC</sub>	≤ 2ns	30pF	1kΩ	open
2.5V ±0.2V	V <sub>CC</sub>	≤ 2ns	30pF	500Ω	open
3.3V ±0.3V	3V	≤ 2.5ns	50pF	500Ω	open
5V ±0.5V	V <sub>CC</sub>	≤ 2.5ns	50pF	500Ω	open

4.3、AC Testing Waveforms

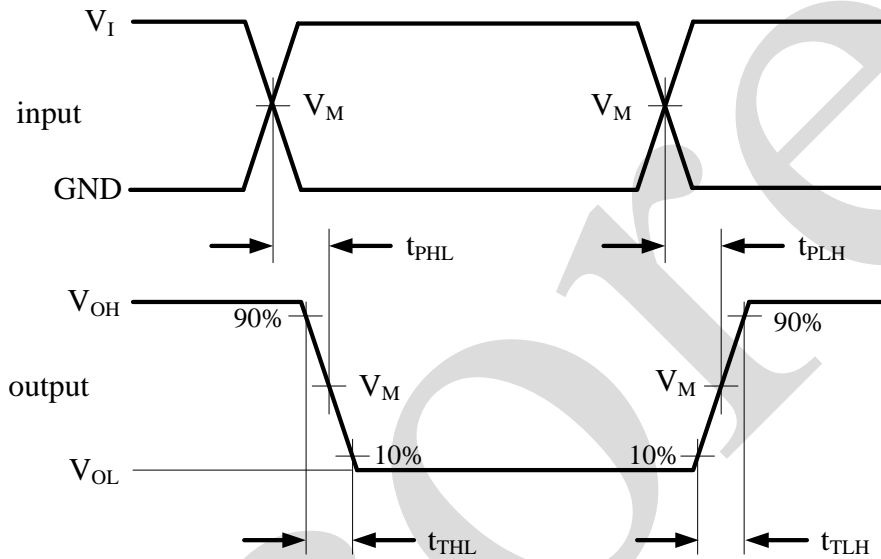


Figure 3. The data input (nA) to output (nY) propagation delays

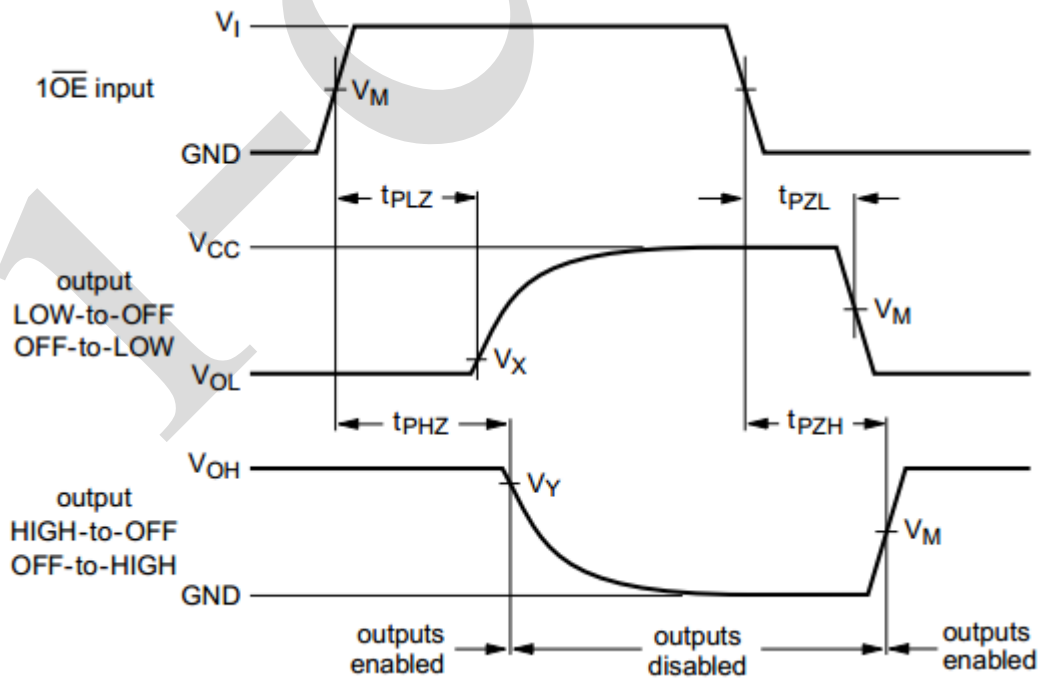


Figure 4. enable and disable times for input ( $\overline{1OE}$ )

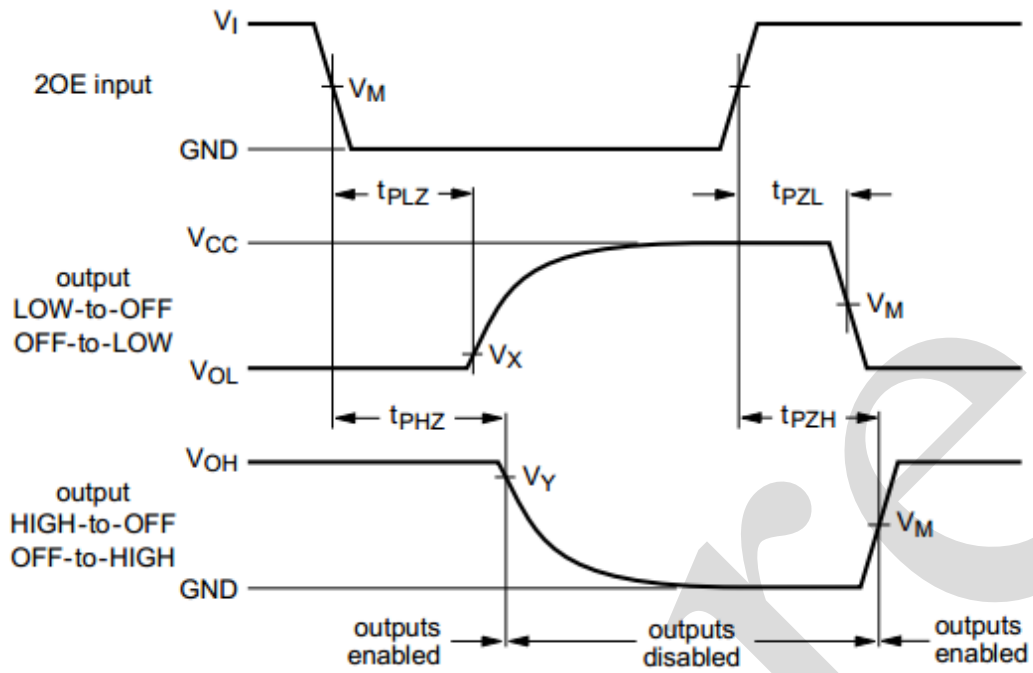


Figure 5. enable and disable times for input (2OE)

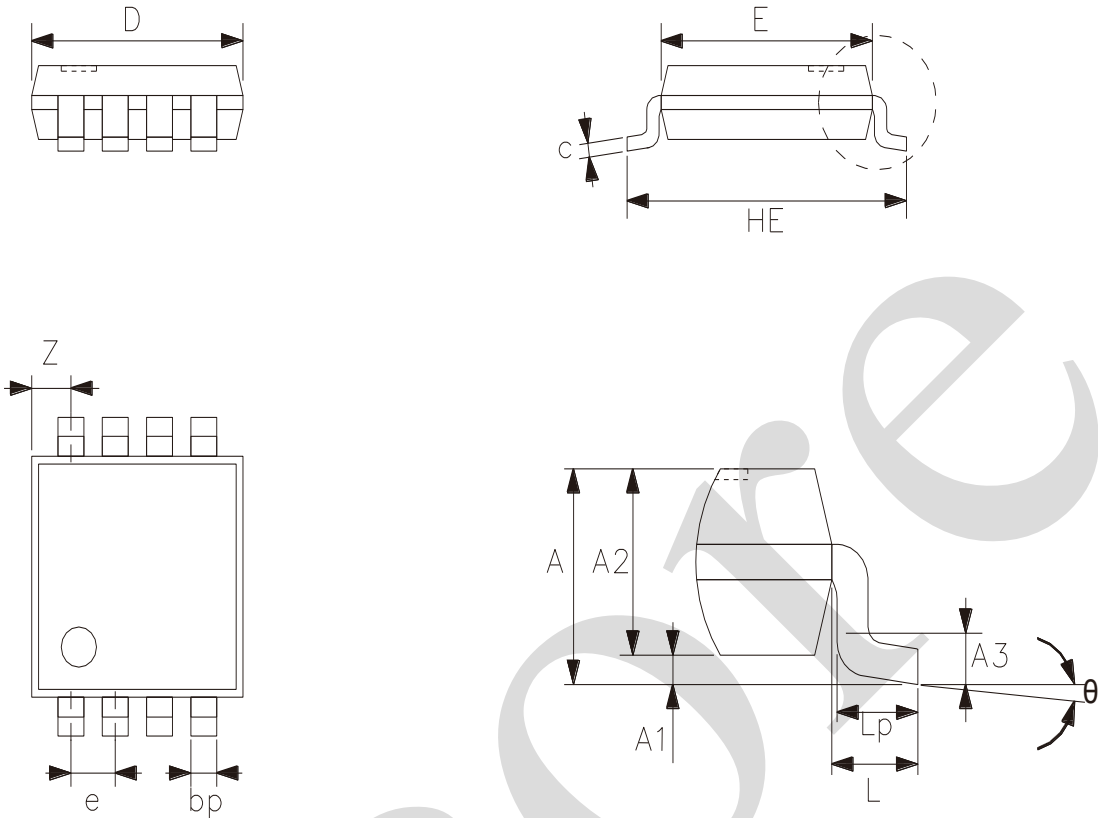
#### 4.4、 Measurement Points

Supply voltage	Input	Output
$V_{CC}$	$V_M$	$V_M$
$1.8V \pm 0.15V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
$2.5V \pm 0.2V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
$3.3V \pm 0.3V$	1.5V	1.5V
$5V \pm 0.5V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$



## 5、Package Information

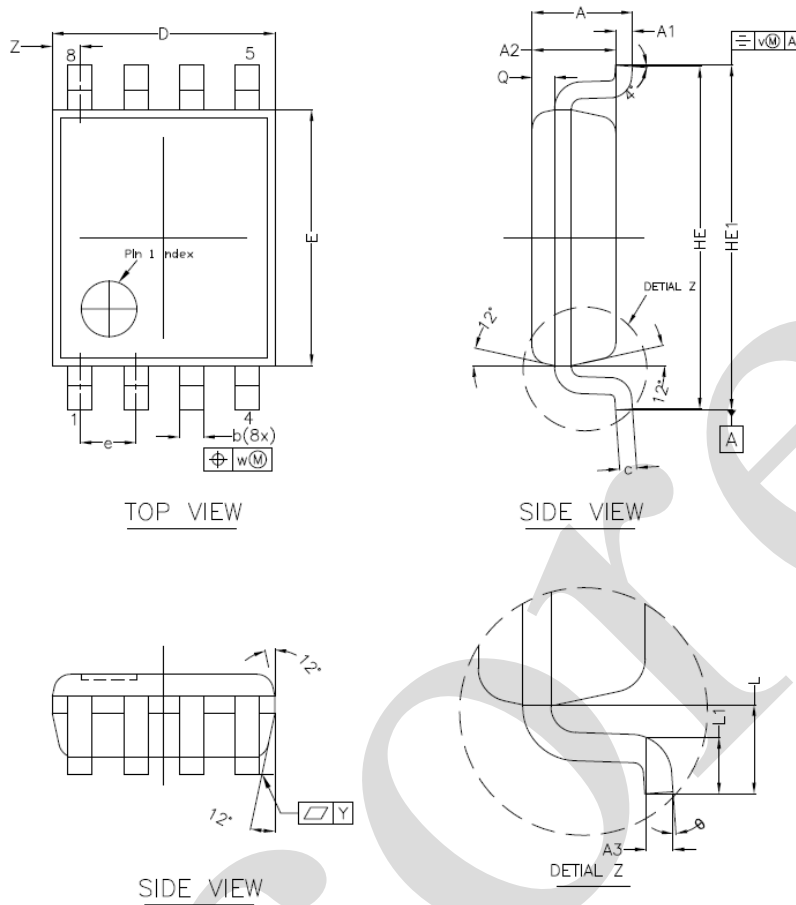
### 5.1、TSSOP8



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
$\theta$	0°	8°



5.2、VSSOP8

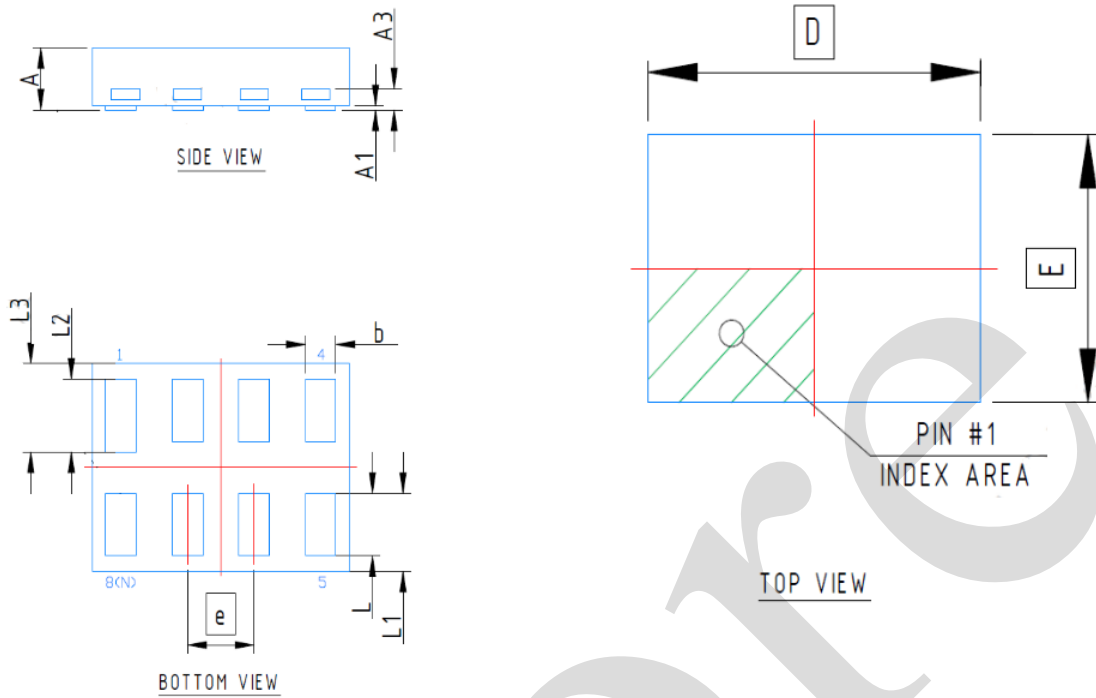


NOTES  
 1.0 COP  
 DIE ATTA  
 2.0 D E

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
$\theta$	0°	8°



## 5.3、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



## 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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