AiP74AHC2G04/AHCT2G04
Dual Inverter

Product Specification

Specification Revision History：

Version	Date	Description
2024-12-A0	2024-12	New
2025-03-A1	2025-03	Modify the parameters

Contents

1、General Description

The AiP74AHC2G04/AiP74AHCT2G04 is a dual inverter

The AiP74AHC2G04 is compatible with CMOS input level, supply voltage range is 2.0V to 5.5V.

The AiP74AHCT2G04 is compatible with TTL input level, supply voltage range is 4.5V to 5.5V.

Features:

- Low power consumption
- Temperature range:-40℃ to +125℃
- Packaging information: SOT363/SOT23-6/XSON6

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74AHC2G04GB236.TR	SOT23-6	AiP HA	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74AHC2G04GC363.TR	SOT363	HAXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing: 0.65mm
AiP74AHC2G04EA6.TR	XSON6	HA XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.45mm×1.0mm Pin spacing: 0.5mm
AiP74AHC2G04ED6.TR	XSON6	HA XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.0mm×1.0mm Pin spacing: 0.35mm
AiP74AHCT2G04GB236.TR	SOT23-6	AiP HL	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74AHCT2G04GC363.TR	SOT363	HLXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing: 0.65mm
AiP74AHCT2G04EA6.TR	XSON6	HL XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.45mm×1.0mm Pin spacing: 0.5mm
AiP74AHCT2G04ED6.TR	XSON6	HL XX	5000 PCS/reel	25000 PCS/box	Dimensions of plastic enclosure: 1.0mm×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

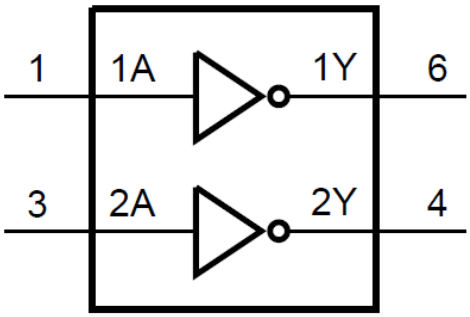
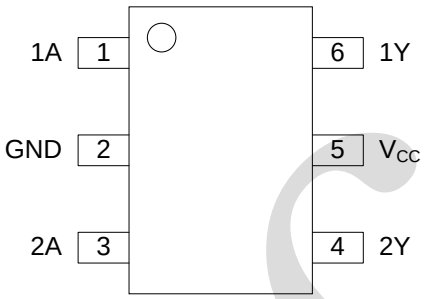


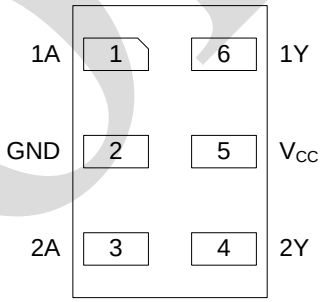
Figure 1. Logic symbol

Figure 2. Logic diagram (one gate)

2.2、Pin Configurations



SOT363/SOT23-6



XSON6

2.3、Pin Description

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

2.4、Function Table

Input	Output
nA	**nY**
L	H
H	L

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_{CC}	-	-0.5	+7	V
supply current	I_{CC}	-	-	50	mA
ground current	I_{GND}	-	-50	-	mA
input clamping current	I_{IK}	V_I < -0.5V	-	±20	mA
output clamping current	I_{OK}	V_O < -0.5V or V_O > V_{CC}+0.5V	-	±20	mA
output current	I_O	-0.5V < V_O < V_{CC}+0.5V	-	±25	mA
storage temperature	T_{stg}	-	-65	+150	℃
soldering temperature	T_L	10s	260		℃

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G04						
supply voltage	V_{CC}	-	2.0	5.0	5.5	V
input voltage	V_I	-	0	-	V_{CC}	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	+25	+125	℃
AiP74AHCT2G04						
supply voltage	V_{CC}	-	4.5	5.0	5.5	V
input voltage	V_I	-	0	-	V_{CC}	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	+25	+125	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G04							
HIGH-level input voltage	V_{IH}	2.0V	-	1.5	-	-	V
		3.0V	-	2.1	-	-	V
		5.5V	-	3.85	-	-	V
LOW-level input voltage	V_{IL}	2.0V	-	-	-	0.5	V
		3.0V	-	-	-	0.9	V
		5.5V	-	-	-	1.65	V
HIGH-level output voltage	V_{OH}	2.0V	I_O=-50uA	1.9	2.0	-	V
		3.0V	I_O=-50uA	2.9	3.0	-	V
		4.5V	I_O=-50uA	4.4	4.5	-	V
		3.0V	I_O=-4.0mA	2.48	-	-	V
		4.5V	I_O=-8.0mA	3.8	-	-	V
LOW-level output voltage	V_{OL}	2.0V	I_O=50uA	-	0	0.1	V
		3.0V	I_O=50uA	-	0	0.1	V
		4.5V	I_O=50uA	-	0	0.1	V
		3.0V	I_O=4.0mA	-	-	0.44	V
		4.5V	I_O=8.0mA	-	-	0.44	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	±1	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; I_O=0A	-	-	10	uA
AiP74AHCT2G04							
HIGH-level input voltage	V_{IH}	4.5V to 5.5V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	4.5V to 5.5V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	I_O=-50uA	4.4	4.5	-	V
			I_O=-8.0mA	3.8	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	0	0.1	V
			I_O=8.0mA	-	-	0.44	V
input leakage current	I_I	0V to 5.5V	V_I=V_{CC} or GND	-	-	±1	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; I_O=0A	-	-	10	uA
additional supply current	ΔI_{CC}	4.5V to 5.5V	One input at 3.4V; Other inputs at V_{CC} or GND; I_O=0A	-	-	1.35	mA

3.3.2、DC Characteristics 2

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

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G04							
HIGH-level input voltage	V_{IH}	2.0V	-	1.5	-	-	V
		3.0V	-	2.1	-	-	V
		5.5V	-	3.85	-	-	V
LOW-level input voltage	V_{IL}	2.0V	-	-	-	0.5	V
		3.0V	-	-	-	0.9	V
		5.5V	-	-	-	1.65	V
HIGH-level output voltage	V_{OH}	2.0V	I_O=-50uA	1.9	-	-	V
		3.0V	I_O=-50uA	2.9	-	-	V
		4.5V	I_O=-50uA	4.4	-	-	V
		3.0V	I_O=-4.0mA	2.4	-	-	V
		4.5V	I_O=-8.0mA	3.7	-	-	V
LOW-level output voltage	V_{OL}	2.0V	I_O=50uA	-	-	0.1	V
		3.0V	I_O=50uA	-	-	0.1	V
		4.5V	I_O=50uA	-	-	0.1	V
		3.0V	I_O=4.0mA	-	-	0.55	V
		4.5V	I_O=8.0mA	-	-	0.55	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	±2	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; I_O=0A	-	-	40	uA
AiP74AHCT2G04							
HIGH-level input voltage	V_{IH}	4.5V to 5.5V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	4.5V to 5.5V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	I_O=-50uA	4.4	-	-	V
			I_O=-8.0mA	3.7	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	-	0.1	V
			I_O=8.0mA	-	-	0.55	V
input leakage current	I_I	0V to 5.5V	V_I=V_{CC} or GND	-	-	±2	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; I_O=0A	-	-	40	uA
additional supply current	ΔI_{CC}	4.5V to 5.5V	One input at 3.4V; Other inputs at V_{CC} or GND;I_O=0A	-	-	1.35	mA

3.3.3、AC Characteristics 1

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

Parameter	Symbol	V_{CC}	Conditions		Min.	Typ.	Max.	Unit
AiP74AHC2G04								
nA to nY propagation delay	t_{PLH}, t_{PHL}	3.0V to 3.6V	C_L=15pF	see Figure 4	-	4.3	8.5	ns
			C_L=50pF		-	6.1	12.0	ns
		4.5V to 5.5V	C_L=15pF		-	3.1	6.5	ns
			C_L=50pF		-	4.5	8.5	ns
AiP74AHCT2G04								
nAn to nYn propagation delay	t_{PLH}, t_{PHL}	5.5V	C_L=15pF	see Figure 4	-	3.4	7.5	ns
			C_L=50pF		-	4.9	8.5	ns

3.3.4、AC Characteristics 2

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

Parameter	Symbol	V_{CC}	Conditions		Min.	Typ.	Max.	Unit
AiP74AHC2G04								
nA to nY propagation delay	t_{PLH}, t_{PHL}	3.0V to 3.6V	C_L=15pF	see Figure 4	-	-	11.0	ns
			C_L=50pF		-	-	14.5	ns
		4.5V to 5.5V	C_L=15pF		-	-	7.0	ns
			C_L=50pF		-	-	9.5	ns
AiP74AHCT2G04								
nAn to nYn propagation delay	t_{PLH}, t_{PHL}	5.5V	C_L=15pF	see Figure 4	-	-	8.5	ns
			C_L=50pF		-	-	10.0	ns

4、Testing Circuit

4.1、AC Testing Circuit

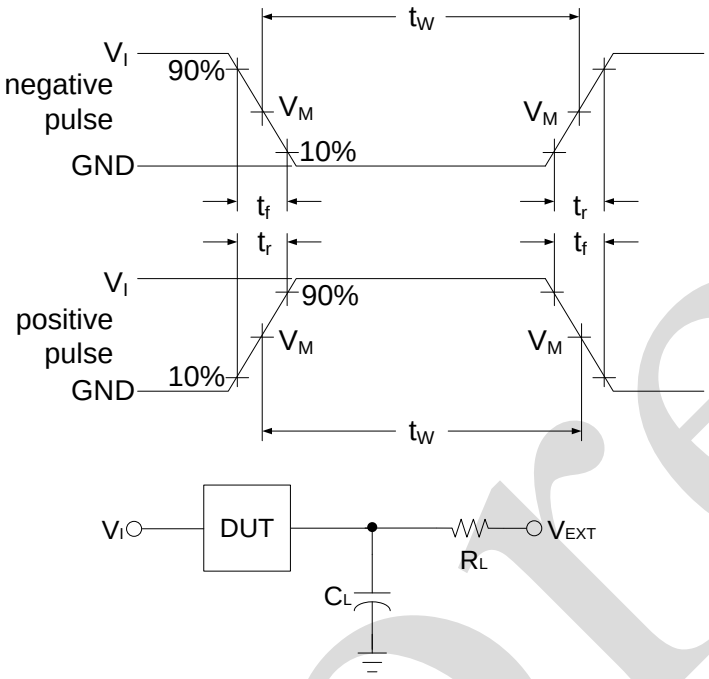


Figure 3. Test circuit for measuring switching times

C_L includes probe and jig capacitance.

4.2、Test Data

Type	Input		Load		V_{EXT}		
	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}/t_{PHL}	t_{PLZ}/t_{PZL}	t_{PHZ}/t_{PZH}
AiP74AHC2G04	V_{CC}	3.0ns	15pF, 50pF	1kΩ	Open	V_{CC}	GND
AiP74AHCT2G04	3.0V	3.0ns	15pF, 50pF	1kΩ	Open	V_{CC}	GND

4.3、AC Testing Waveforms

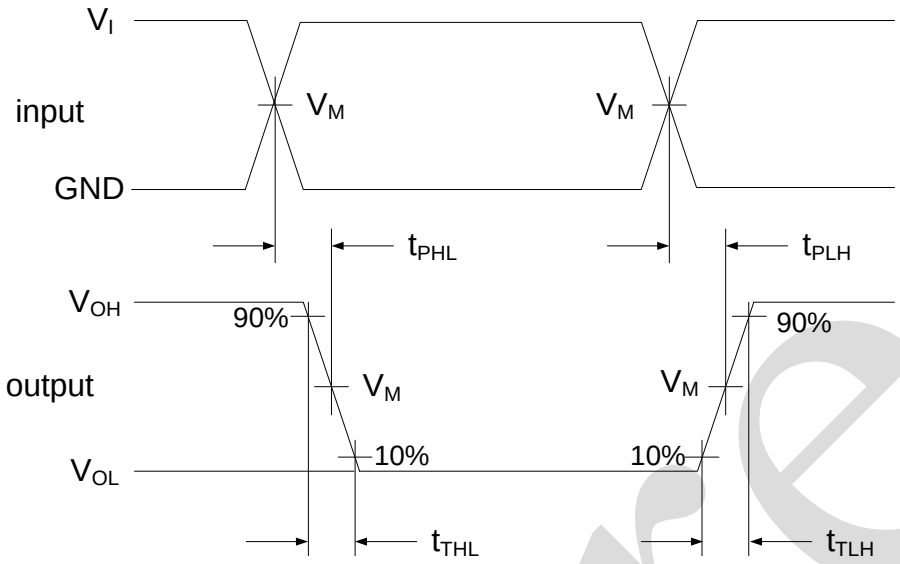


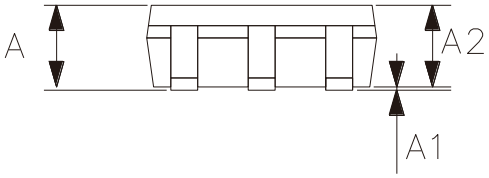
Figure 4. Propagation delay, output transition time

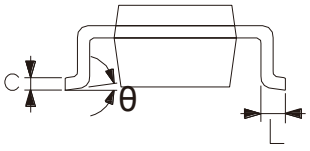
4.4、Measurement Points

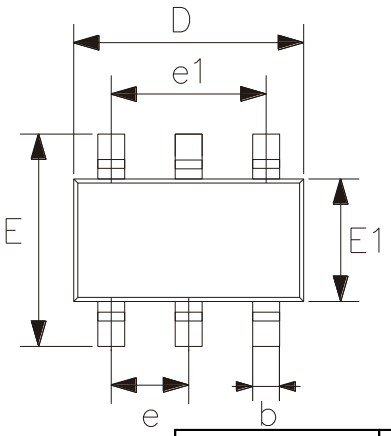
Type	Input	Output
	V_M	V_M
AiP74AHC2G04	$0.5\times V_{CC}$	$0.5\times V_{CC}$
AiP74AHCT2G04	1.5V	$0.5\times V_{CC}$

5、Package Information

5.1、SOT23-6

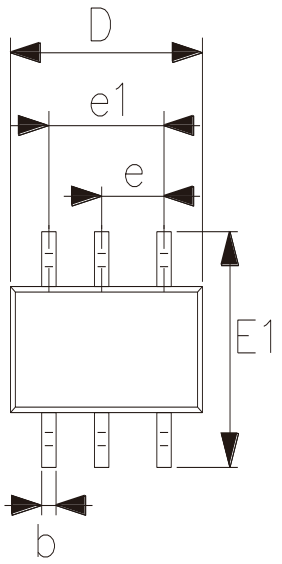


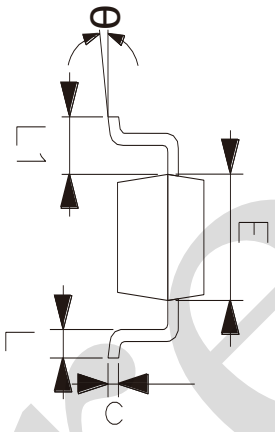


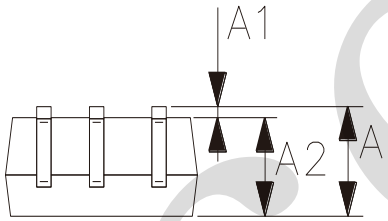


2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	—	1.25
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°

5.2、SOT363

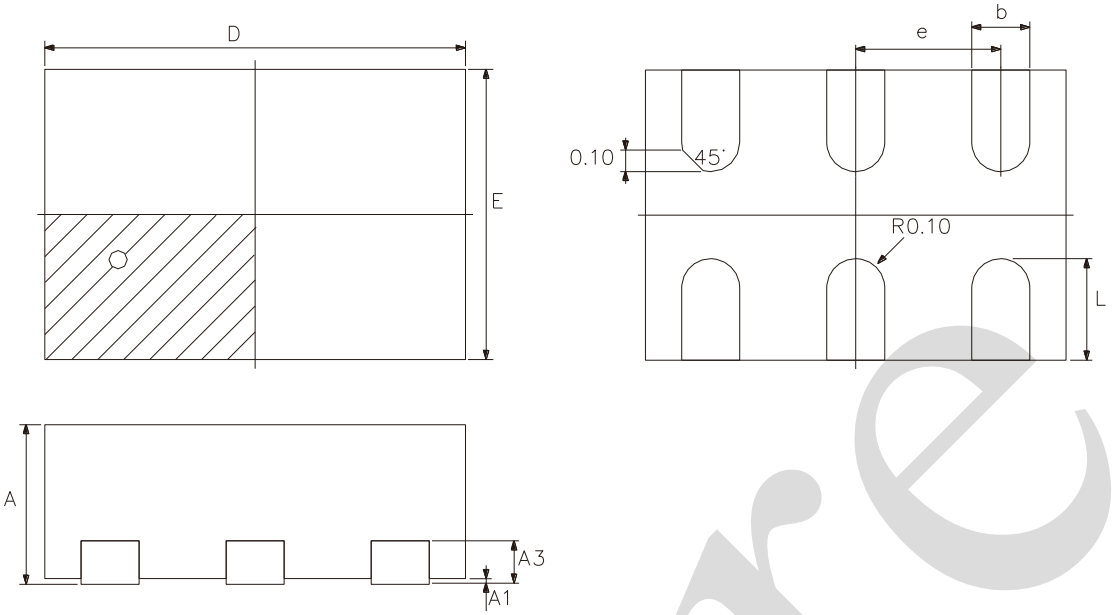






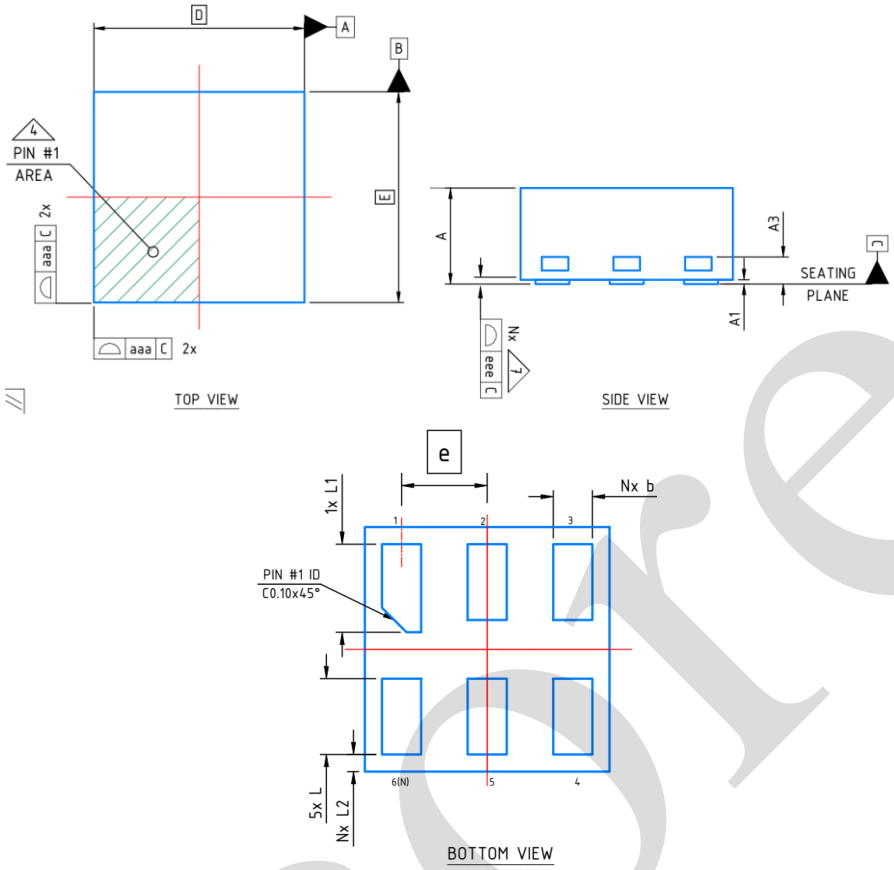
2023/12/A	Dimensions In Millimeters	
Symbol	**Min.**	**Max.**
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.15	0.35
c	0.11	0.175
D	2.00	2.20
E1	2.15	2.45
E	1.15	1.35
e	0.65	
e1	1.20	1.40
L	0.26	0.46
L1	0.525	
θ	0°	8°

5.3、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

5.4、XSON6(1*1*0.45-0.35)



2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	0.41	0.50
A1	0.00	0.05
A3	0.127	
b	0.11	0.21
D	1.00	
E	1.00	
e	0.35	
L	0.26	0.36
L1	0.31	0.41
L2	0.02	0.12

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

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