AiP74AHC/AHCT2G32
Dual 2-Input Or Gate

Product Specification

Specification Revision History：

Version	Date	Description
2023-06-A0	2023-06	New
2023-09-A1	2023-09	Modify parameters

Contents

1、General Description

AiP74AHC2G32/AiP74AHCT2G32 is a dual 2-input or gate.

Features:

- Supply voltage range:
  AiP74AHC2G32: 2V to 5.5V
  AiP74AHCT2G32: 4.5V to 5.5V
- Low power dissipation
- Specified from -40℃ to +125℃
- Package information: VSSOP8/TSSOP8/XSON8

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74AHC2G32TA8.TB	TSSOP8	EWXX	100 PCS/tube	200 tube/box	20000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP74AHCT2G32TA8.TB	TSSOP8	GAXX	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
AiP74AHC2G32 TA8.TR	TSSOP8	EWXX	3000PCS/reel	3000PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing:0.65mm
AiP74AHCT2G32 TA8.TR	TSSOP8	GAXX	3000PCS/reel	3000PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing:0.65mm
AiP74AHC2G32 YA8.TR	VSSOP8	EWXX	3000PCS/reel	3000PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing:0.50mm
AiP74AHCT2G32 YA8.TR	VSSOP8	GAXX	3000PCS/reel	3000PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing:0.50mm
AiP74AHC2G32 EB8.TR	XSON8	EWXX	5000PCS/reel	25000PCS/box	Dimensions of plastic enclosure: 1.35mm×1.0mm Pin spacing:0.35mm
AiP74AHCT2G32 EB8.TR	XSON8	GAXX	5000PCS/reel	25000PCS/box	Dimensions of plastic enclosure: 1.35mm×1.0mm Pin spacing:0.35mm

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

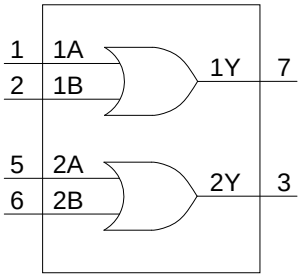


Figure 1. Logic symbol

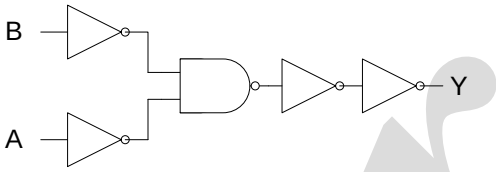
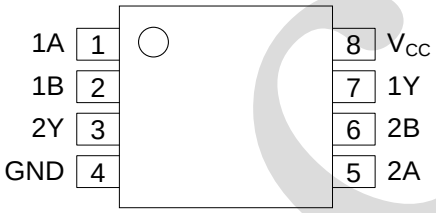
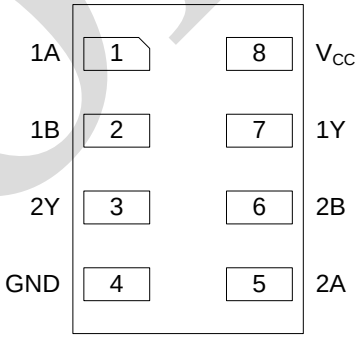


Figure 2. Logic diagram

2.2、Pin Configurations



TSSOP8/VSSOP8



XSON8

2.3、Pin Description

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

2.4、Function Table

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

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

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, GND=0V, unless otherwise specified)

Characteristic	Symbol	Conditions	Min.	Max.	Unit
power supply voltage	V_{CC}	-	-0.5	+7.0	V
input voltage	V_I	-	-0.5	+7.0	V
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
supply current	I_{CC}	-	-	75	mA
ground current	I_{GND}	-	-75	-	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
AiP74AHC2G32						
power supply voltage	V_{CC}	-	2.0	5.0	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	℃
AiP74AHCT2G32						
power supply voltage	V_{CC}	-	4.5	5.0	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G32							
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=-4mA	2.48	-	-	V
		4.5V	I_O=-8mA	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=4mA	-	-	0.44	V
		4.5V	I_O=8mA	-	-	0.44	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	1.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; Io=0A	-	-	10	uA
AiP74AHCT2G32							
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
		4.5V	I_O=-8mA	3.8	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	0	0.1	V
		4.5V	I_O=8mA	-	-	0.44	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	1.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; Io=0A	-	-	10	uA
additional supply current	ΔI_{CC}	5.5V	single input pin; V_I=3.4V; other inputs at V_{CC} or GND	-	-	1.5	mA

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G32							
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=-4mA	2.4	-	-	V
		4.5V	I_O=-8mA	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=4mA	-	-	0.55	V
		4.5V	I_O=8mA	-	-	0.55	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	2.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; Io=0A	-	-	40	uA
AiP74AHCT2G32							
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
		4.5V	I_O=-8mA	3.7	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	-	0.1	V
		4.5V	I_O=8mA	-	-	0.55	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	2.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; Io=0A	-	-	40	uA
additional supply current	ΔI_{CC}	5.5V	single input pin; V_I=3.4V; other inputs at V_{CC} or GND	-	-	1.5	mA

3.3.3、AC Characteristics 1

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

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G32							
A and B to Y propagation delay	t_{PLH}, t_{PHL}	3.0V to 3.6V[1]	C_L=15pF see Figure 4	-	4.4	9.5	ns
		3.0V to 3.6V[1]	C_L=50pF see Figure 4	-	6.3	13.0	ns
		4.5V to 5.5V[2]	C_L=15pF see Figure 4	-	3.2	6.5	ns
		4.5V to 5.5V[2]	C_L=50pF see Figure 4	-	4.6	8.5	ns
AiP74AHCT2G32							
A and B to Y propagation delay	t_{PLH}, t_{PHL}	4.5V to 5.5V[2]	C_L=15pF see Figure 4	-	3.3	8.0	ns
		4.5V to 5.5V[2]	C_L=50pF see Figure 4	-	4.8	9.0	ns

Note:

[1] Typical values are measured at V_{CC}=3.3V.

[2] Typical values are measured at V_{CC}=5V.

3.3.4、AC Characteristics 2

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

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC2G32							
A and B to Y propagation delay	t_{PLH}, t_{PHL}	3.0V to 3.6V[1]	C_L=15pF see Figure 4	-	-	10.0	ns
		3.0V to 3.6V[1]	C_L=50pF see Figure 4	-	-	14.5	ns
		4.5V to 5.5V[2]	C_L=15pF see Figure 4	-	-	7.0	ns
		4.5V to 5.5V[2]	C_L=50pF see Figure 4	-	-	9.5	ns
AiP74AHCT2G32							
A and B to Y propagation delay	t_{PLH}, t_{PHL}	4.5V to 5.5V[2]	C_L=15pF see Figure 4	-	-	9.0	ns
		4.5V to 5.5V[2]	C_L=50pF see Figure 4	-	-	10	ns

4、Testing Circuit

4.1、AC Testing Circuit

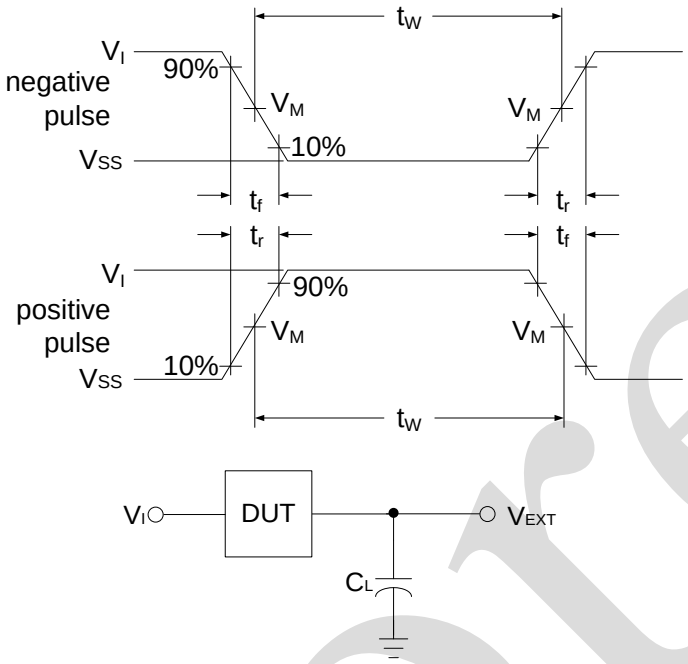


Figure 3. Load circuit

Definitions for test circuit:

C_L=Load capacitance including jig and probe capacitance.

4.2、Test Data

Type	Input		Load	V_{EXT}		
	V_I	$t_r = t_f$	C_L	t_{PLH}/t_{PHL}	t_{PLZ}/t_{PZL}	t_{PHZ}/t_{PZH}
AiP74AHC2G32	V_{CC}	3.0ns	15pF, 50pF	Open	V_{CC}	GND
AiP74AHCT2G32	3.0V	3.0ns	15pF, 50pF	Open	V_{CC}	GND

4.3、AC Testing Waveforms

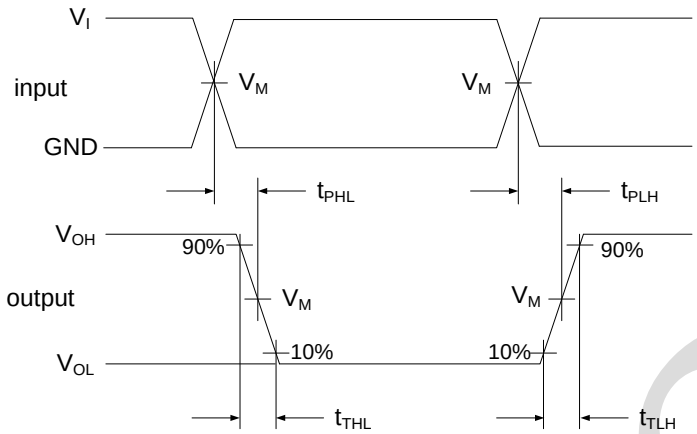
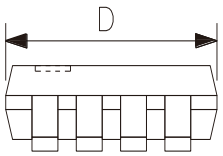
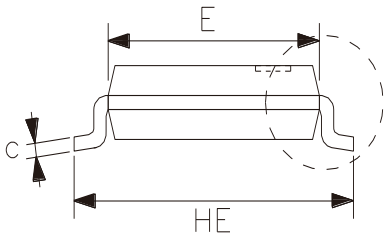


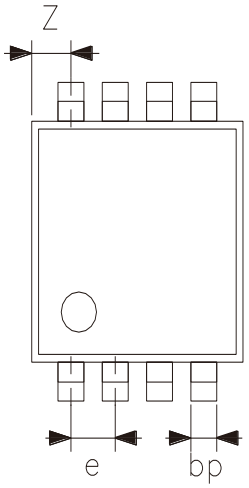
Figure 4. The input (A and B) to output (Y) propagation delays

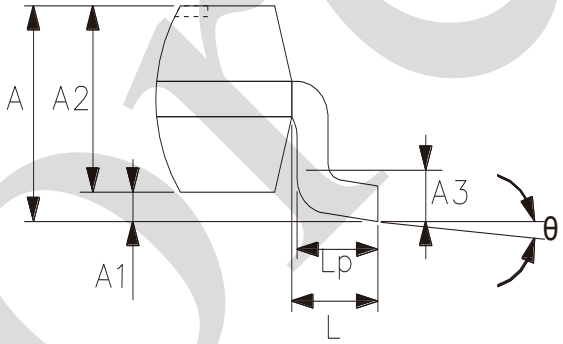
5、Package Information

5.1、TSSOP8



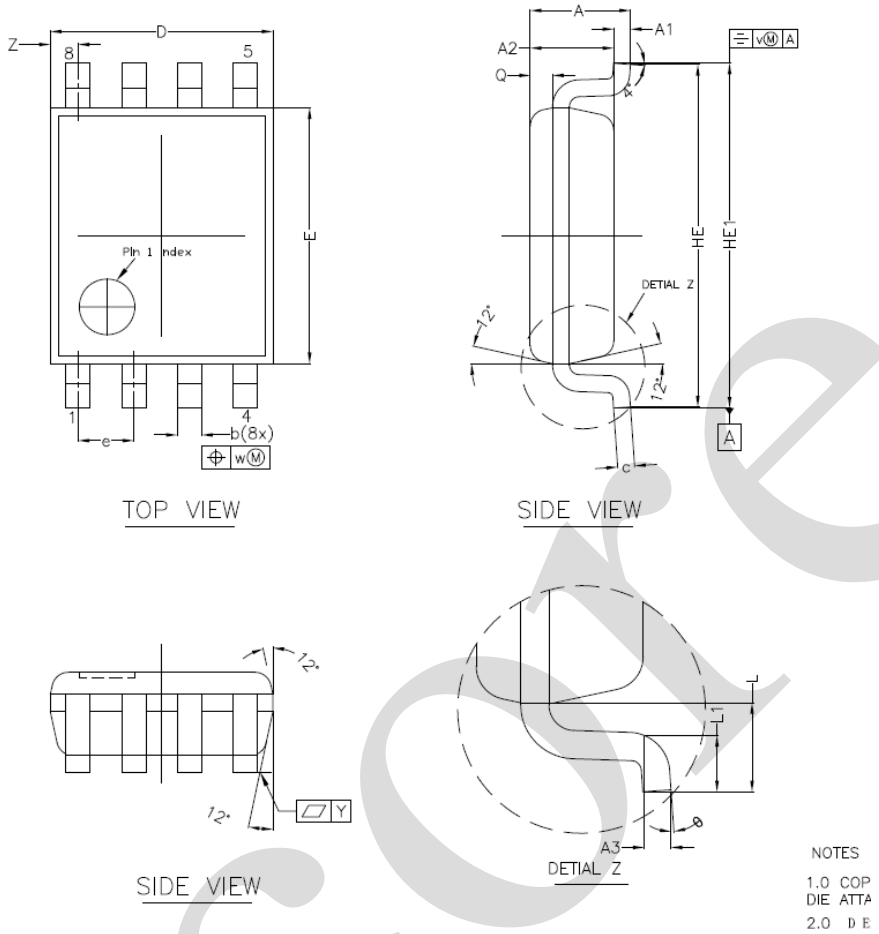






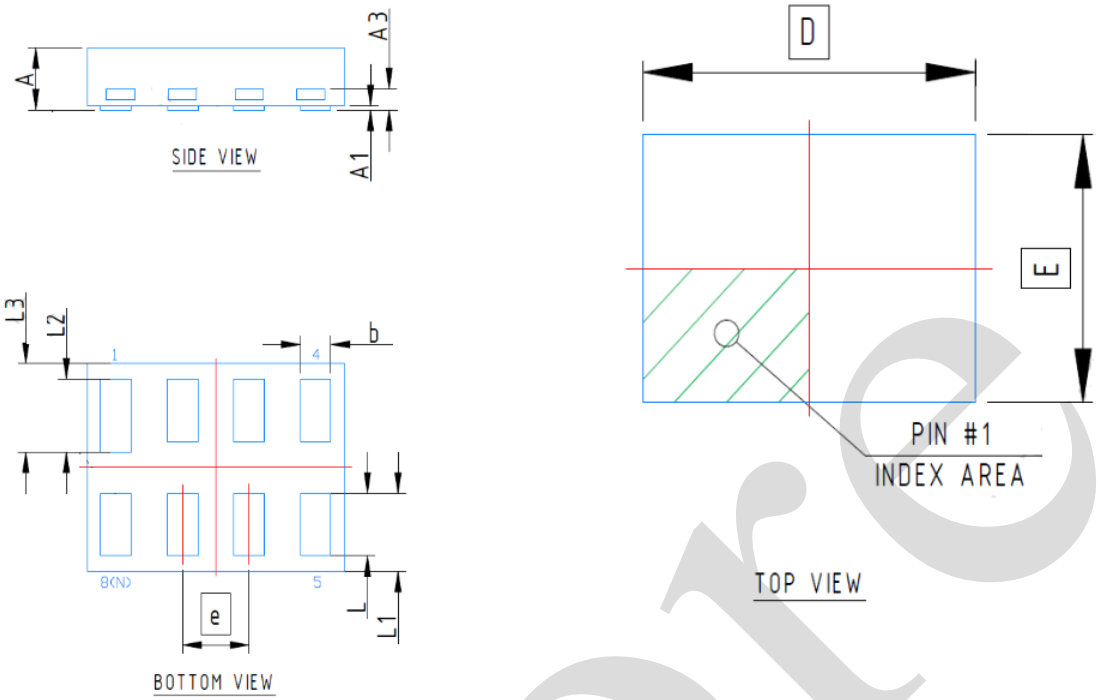
2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	—	1.10
A1	0	0.15
A2	0.75	0.95
A3	0.25	
bp	0.22	0.38
c	0.08	0.18
D	2.90	3.10
E	2.90	3.10
HE	3.90	4.10
L	0.50	
Lp	0.33	0.47
e	0.65	
Z	0.35	0.70
θ	0°	8°

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



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.

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 form 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.