



AiP74LVC2G38

Dual 2-Input Nand Gate (Open-Drain)

Product Specification

Specification Revision History:

Version	Date	Description
2025-08-A0	2025-08	New
2025-09-A1	2025-09	Modify the parameters



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1、General Description

The AiP74LVC2G38 provides dual 2-input NAND function.

Inputs can be driven from either 3.3V or 5V devices. This feature allows the use of these devices as translators 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:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC2G38TA8.TR	TSSOP8	AiPBP 2G38	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP74LVC2G38YA8.TR	VSSOP8	AiP BPXX	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 2.0mm×2.3mm Pin spacing: 0.50mm
AiP74LVC2G38EB8.TR	XSON8	BP 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

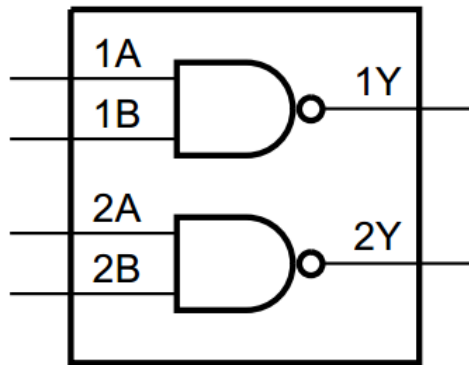
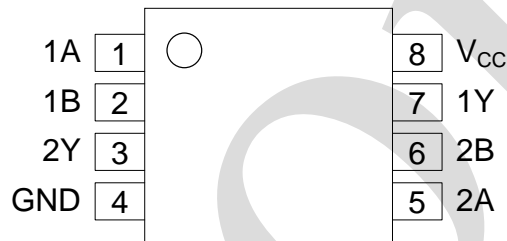


Figure 1. Logic symbol

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	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	Z
L	H	Z
H	L	Z
H	H	L

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

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



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 _{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V _{IH}	1.65V to 1.95V	-	0.65V _{CC}	-	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 _{CC}	-	-	V
LOW-level input voltage	V _{IL}	1.65V to 1.95V	-	-	-	0.35V _{CC}	V
		2.3V to 2.7V	-	-	-	0.7	V
		3V to 3.6V	-	-	-	0.8	V
		4.5V to 5.5V	-	-	-	0.3V _{CC}	V
LOW-level output voltage	V _{OL}	1.65V to 5.5V	I _O =100uA	-	-	0.10	V
		1.65V	I _O =4mA	-	0.08	0.45	V
		2.3V	I _O =8mA	-	0.14	0.30	V
		2.7V	I _O =12mA	-	0.19	0.40	V
		3.0V	I _O =24mA	-	0.37	0.55	V
4.5V	I _O =32mA	-	0.43	0.55	V		
input leakage current	I _I	0V to 5.5V	V _I =5.5V or GND	-	±0.1	±1	uA
OFF-state output current	I _{OZ}	5.5V	V _I =V _{IH} or V _{IL} ; V _O =5.5V or GND	-	±0.1	±2	uA
power-off leakage current	I _{OFF}	0V	V _I or V _O =5.5V	-	±0.1	±2	uA
supply current	I _{CC}	1.65V to 5.5V	V _I =5.5V or GND; I _O =0A	-	0.1	4	uA
additional supply current	ΔI _{CC}	2.3V to 5.5V	per input pin; V _I =V _{CC} -0.6V; I _O =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 _{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V _{IH}	1.65V to 1.95V	-	0.65V _{CC}	-	5.5	V
		2.3V to 2.7V	-	1.7	-	-	V
		3V to 3.6V	-	2	-	-	V
		4.5V to 5.5V	-	0.7V _{CC}	-	-	V
LOW-level input voltage	V _{IL}	1.65V to 1.95V	-	-	-	0.35V _{CC}	V
		2.3V to 2.7V	-	-	-	0.7	V
		3V to 3.6V	-	-	-	0.8	V
		4.5V to 5.5V	-	-	-	0.3V _{CC}	V
LOW-level output voltage	V _{OL}	1.65V to 5.5V	I _O =100uA	-	-	0.10	V
		1.65V	I _O =4mA	-	-	0.70	V
		2.3V	I _O =8mA	-	-	0.45	V
		2.7V	I _O =12mA	-	-	0.60	V
		3.0V	I _O =24mA	-	-	0.80	V
		4.5V	I _O =32mA	-	-	0.80	V
input leakage current	I _I	0V to 5.5V	V _I =5.5V or GND	-	-	±1	uA
OFF-state output current	I _{OZ}	5.5V	V _I =V _{IH} or V _{IL} ; V _O =5.5V or GND	-	±0.1	±2	uA
power-off leakage current	I _{OFF}	0V	V _I or V _O =5.5V	-	-	±2	uA
supply current	I _{CC}	1.65V to 5.5V	V _I =5.5V or GND; I _O =0A	-	-	4	uA
additional supply current	ΔI _{CC}	2.3V to 5.5V	one input at V _{CC} -0.6V; I _O =0A	-	-	500	uA



3.3.3、AC Characteristics 1

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit
nA,nB to nY OFF-state to LOW propagation delay	t _{pzl}	1.65V to 1.95V	see Figure 3	1.2	3	8.6	ns
		2.3V to 2.7V		0.7	1.8	4.8	ns
		2.7V		0.7	2.5	4.4	ns
		3V to 3.6V		0.7	2.1	4.1	ns
		4.5V to 5.5V		0.5	1.5	3.3	ns
nA,nB to nY LOW to OFF-state propagation delay	t _{plz}	1.65V to 1.95V	see Figure 3	1.2	3	8.6	ns
		2.3V to 2.7V		0.7	1.8	4.8	ns
		2.7V		0.7	2.5	4.4	ns
		3V to 3.6V		0.7	2.1	4.1	ns
		4.5V to 5.5V		0.5	1.5	3.3	ns

Note: Typical values are measured at $T_{amb}=25^{\circ}C$ and $V_{CC}=1.8V, 2.5V, 2.7V, 3.3V$ and $5.0V$ respectively.

3.3.4、AC Characteristics 2

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit
nA,nB to nY OFF-state to LOW propagation delay	t _{pzl}	1.65V to 1.95V	see Figure 3	1.2	-	10.8	ns
		2.3V to 2.7V		0.7	-	6	ns
		2.7V		0.7	-	5.5	ns
		3V to 3.6V		0.7	-	5.2	ns
		4.5V to 5.5V		0.5	-	4.2	ns
nA,nB to nY LOW to OFF-state propagation delay	t _{plz}	1.65V to 1.95V	see Figure 3	1.2	-	10.8	ns
		2.3V to 2.7V		0.7	-	6	ns
		2.7V		0.7	-	5.5	ns
		3V to 3.6V		0.7	-	5.2	ns
		4.5V to 5.5V		0.5	-	4.2	ns



4、Testing Circuit

4.1、AC Testing Circuit

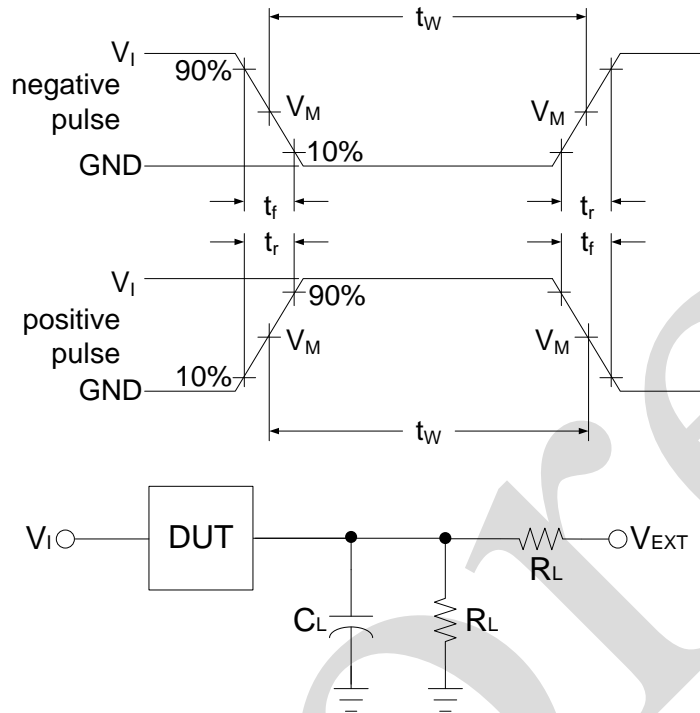


Figure 2. AC Testing Circuit

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_{EXT}
V_{CC}	V_I	t_r, t_f	C_L	R_L	t_{PLH}, t_{PHL}
1.65V to 1.95V	V_{CC}	$\leq 2ns$	30pF	1k Ω	open
2.3V to 2.7V	V_{CC}	$\leq 2ns$	30pF	500 Ω	open
2.7V	2.7V	$\leq 2.5ns$	50pF	500 Ω	open
3V to 3.6V	2.7V	$\leq 2.5ns$	50pF	500 Ω	open
4.5V to 5.5V	V_{CC}	$\leq 2.5ns$	50pF	500 Ω	open



4.3、AC Testing Waveforms

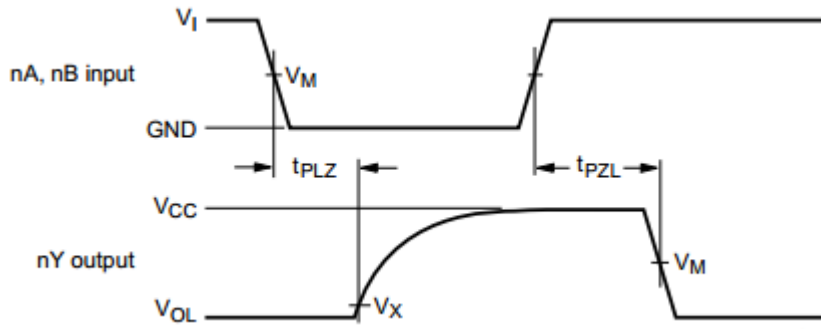


Figure 3. The data input (nA,nB) to output (nY) propagation delays

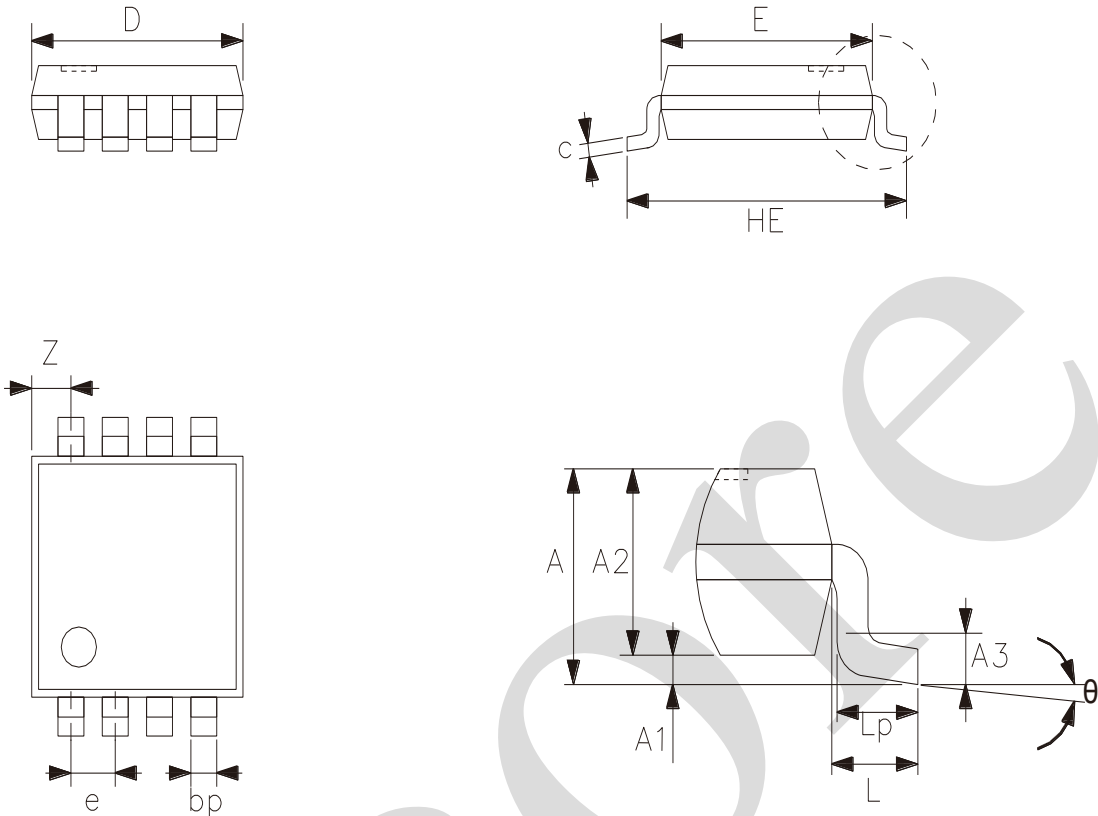
4.4、Measurement Points

Supply voltage	Input	Output	
V_{CC}	V_M	V_X	V_M
1.65V to 1.95V	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$0.5 \times V_{CC}$
2.3V to 2.7V	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$0.5 \times V_{CC}$
2.7V	1.5V	$V_{OL} + 0.3V$	1.5V
3V to 3.6V	1.5V	$V_{OL} + 0.3V$	1.5V
4.5V to 5.5V	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$0.5 \times V_{CC}$



5、Package Information

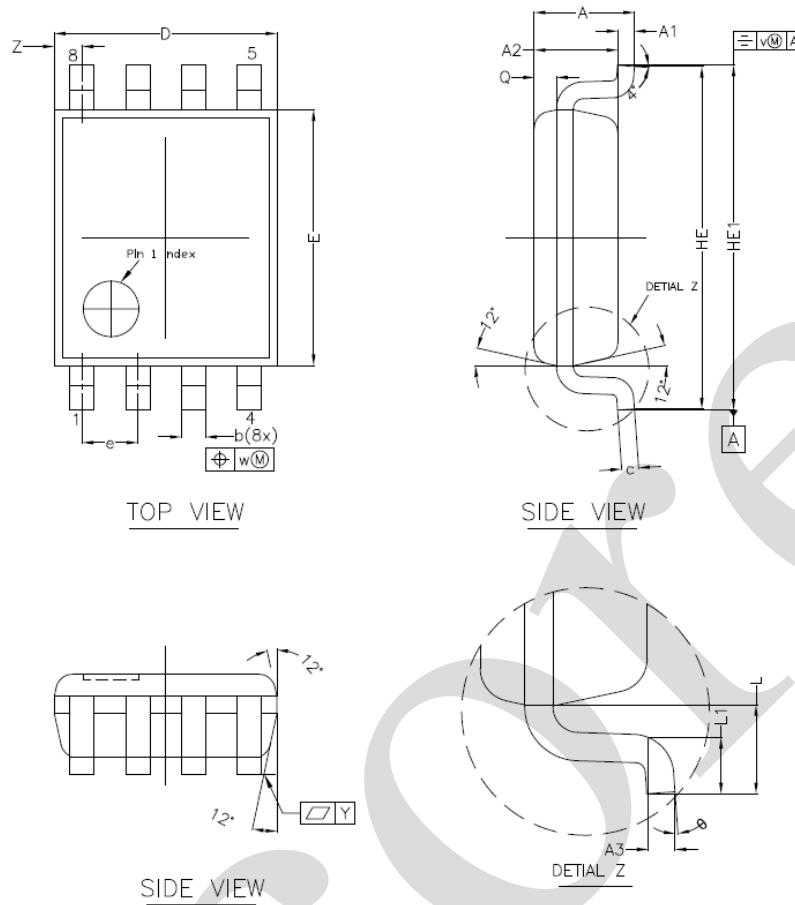
5.1、TSSOP8



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
θ	0°	8°



5.2、VSSOP8

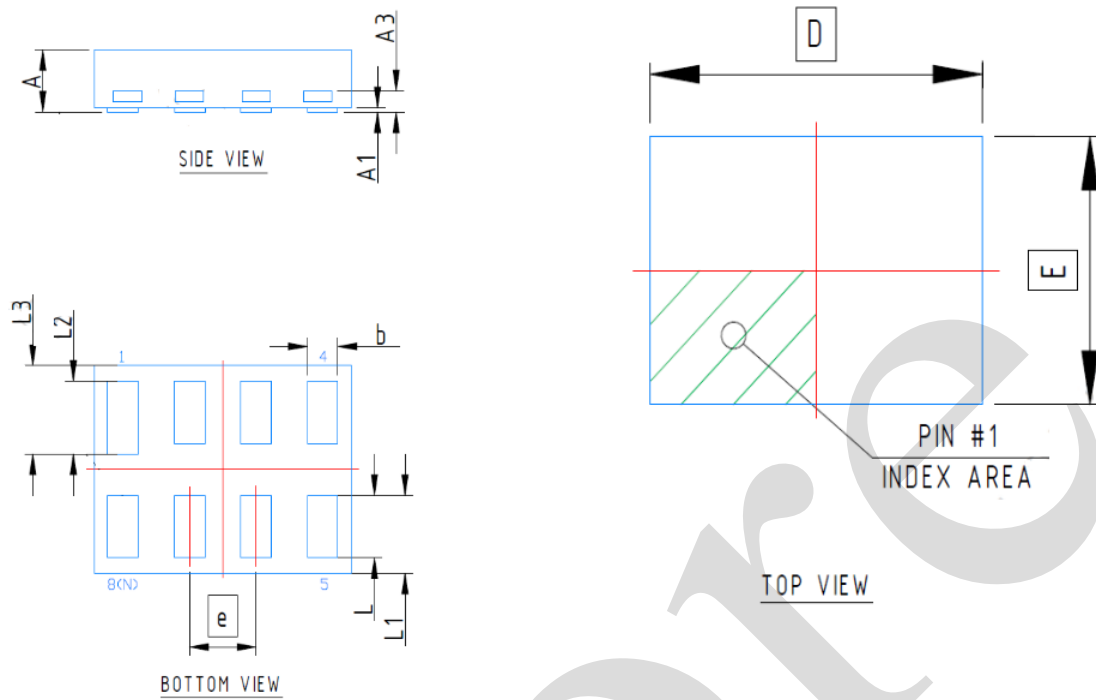


NOTES
1.0 COP
DIE ATTA
2.0 D E

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
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

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