



AiP74AVC16244

16-Bit Buffer/Line Driver; 3-State

Product Specification

Specification Revision History:

Version	Date	Description
2024-04-A0	2024-04	New
2024-09-A1	2024-09	Modify the parameters



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1、General Description

The AiP74AVC16244 is a 16-bit non-inverting buffer/line driver with 3-state outputs. This device can be used as four 4-bit buffers, two 8-bit buffers or one 16-bit buffer.

Features:

- Supply voltage range: 1.2V to 3.6V
- CMOS low power consumption
- Input/output tolerant up to 3.6 V
- Temperature range: -40°C to +125°C
- Packaging information: TSSOP48

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74AVC16244TA48.TR	TSSOP48	74AVC16244	2000 PCS/reel	2000 PCS/box	Dimensions of plastic enclosure: 12.5mm×6.1mm Pin spacing: 0.5mm

Note: 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

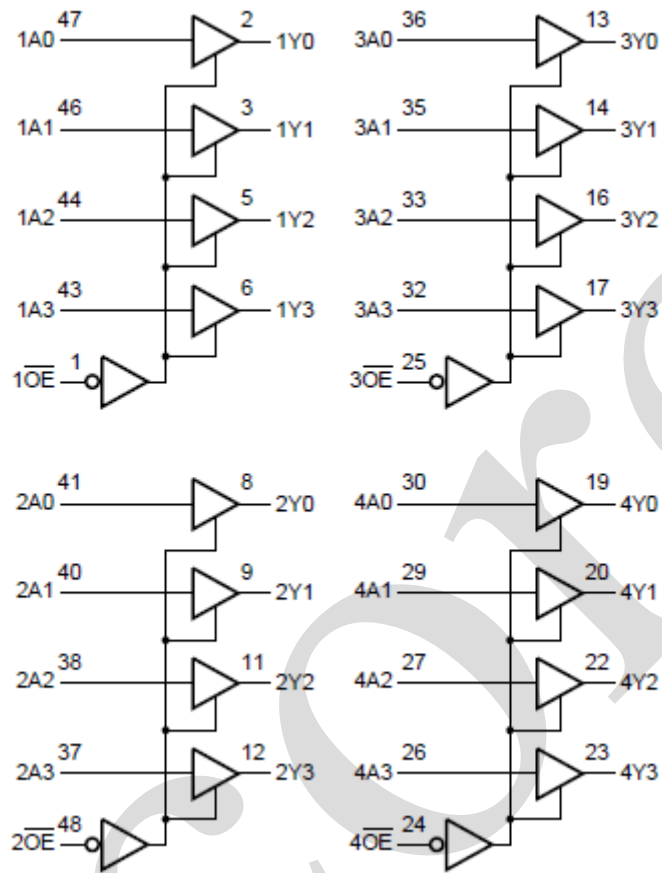
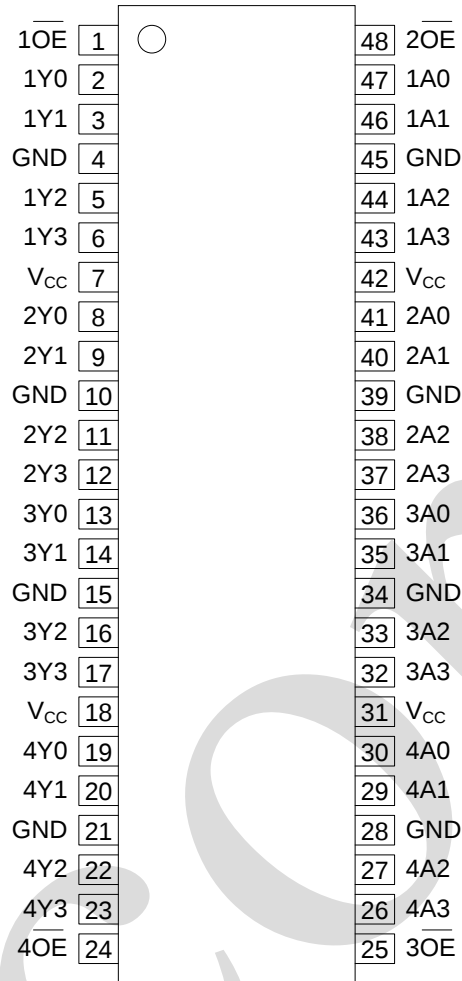


Figure 1. Block Diagram



2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1OE, 2OE, 3OE, 4OE	1, 48, 25, 24	output enable inputs (active LOW)
1A0, 1A1, 1A2, 1A3	47, 46, 44, 43	data inputs
2A0, 2A1, 2A2, 2A3	41, 40, 38, 37	data inputs
3A0, 3A1, 3A2, 3A3	36, 35, 33, 32	data inputs
4A0, 4A1, 4A2, 4A3	30, 29, 27, 26	data inputs
1Y0, 1Y1, 1Y2, 1Y3	2, 3, 5, 6	data outputs
2Y0, 2Y1, 2Y2, 2Y3	8, 9, 11, 12	data outputs
3Y0, 3Y1, 3Y2, 3Y3	13, 14, 16, 17	data outputs
4Y0, 4Y1, 4Y2, 4Y3	19, 20, 22, 23	data outputs
GND	4, 10, 15, 21, 28, 34, 39, 45	ground (0V)
Vcc	7, 18, 31, 42	supply voltage



2.4、Function Table

INPUT		OUTPUT
nOE	nAn	nYn
L	L	L
L	H	H
H	X	Z

H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, All voltage referenced to GND, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V _{CC}	-	-0.5	+4.6	V
input voltage	V _I	-	-0.5	+4.6	V
output voltage	V _O	output HIGH or LOW	-0.5	V _{CC} +0.5	V
		output 3-state	-0.5	+4.6	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	℃
soldering temperature	T _L	10s	260		℃

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V _{CC}	-	1.2	-	3.6	V
input voltage	V _I	-	0	-	3.6	V
output voltage	V _O	output HIGH or LOW	0	-	V _{CC}	V
		output 3-state	0	-	3.6	V
ambient temperature	T _{amb}	-	-40	-	+125	℃



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
HIGH-level input voltage	V_{IH}	1.2V	-	1.08	-	-	V
		1.65V to 1.95V	-	$0.65 \times V_{CC}$	0.9	-	V
		2.3V to 2.7V	-	1.7	1.2-	-	V
		3.0V to 3.6V	-	2.0	1.5	-	V
LOW-level input voltage	V_{IL}	1.2V	-	-	-	0.12	V
		1.65V to 1.95V	-	-	0.9	$0.35 \times V_{CC}$	V
		2.3V to 2.7V	-	-	1.2	0.7	V
		3.0V to 3.6V	-	-	1.5	0.8	V
HIGH-level output voltage	V_{OH}	1.65V to 3.6V	$I_O = -100\mu\text{A}$	$V_{CC} - 0.2$	V_{CC}	-	V
		1.65V	$I_O = -4\text{mA}$	$V_{CC} - 0.45$	$V_{CC} - 0.10$	-	V
		2.3V	$I_O = -8\text{mA}$	$V_{CC} - 0.55$	$V_{CC} - 0.28$	-	V
		3.0V	$I_O = -12\text{mA}$	$V_{CC} - 0.70$	$V_{CC} - 0.32$	-	V
LOW-level output voltage	V_{OL}	1.65V to 3.6V	$I_O = 100\mu\text{A}$	-	GND	0.2	V
		1.65V	$I_O = 4\text{mA}$	-	0.10	0.45	V
		2.3V	$I_O = 8\text{mA}$	-	0.26	0.55	V
		3.0V	$I_O = 12\text{mA}$	-	0.36	0.7	V
input leakage current	I_I	1.65V to 3.6V	$V_I = V_{CC}$ or GND	-	-	2.5	μA
OFF-state output current	I_{OZ}	1.65V to 2.7V	$V_O = V_{CC}$ or GND	-	-	5	μA
		3.0V to 3.6V	$V_O = V_{CC}$ or GND	-	-	10	μA
power-off leakage current	I_{OFF}	0V	V_I or $V_O = 3.6\text{V}$	-	-	± 10	μA
supply current	I_{CC}	1.65V to 2.7V	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}$			20	μA
		3.0V to 3.6V	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}$	-	-	40	μA

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



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
HIGH-level input voltage	V_{IH}	1.2V	-	1.08	-	-	V
		1.65V to 1.95V	-	$0.65 \times V_{CC}$	-	-	V
		2.3V to 2.7V	-	1.7	-	-	V
		3.0V to 3.6V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	1.2V	-	-	-	0.12	V
		1.65V to 1.95V	-	-	-	$0.35 \times V_{CC}$	V
		2.3V to 2.7V	-	-	-	0.7	V
		3.0V to 3.6V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	1.65V to 3.6V	$I_O=-100\mu\text{A}$	$V_{CC}-0.2$	-	-	V
		1.65V	$I_O=-4\text{mA}$	$V_{CC}-0.55$	-	-	V
		2.3V	$I_O=-8\text{mA}$	$V_{CC}-0.65$	-	-	V
		3.0V	$I_O=-12\text{mA}$	$V_{CC}-0.80$	-	-	V
LOW-level output voltage	V_{OL}	1.65V to 3.6V	$I_O=100\mu\text{A}$	-	-	0.2	V
		1.65V	$I_O=4\text{mA}$	-	-	0.55	V
		2.3V	$I_O=8\text{mA}$	-	-	0.65	V
		3.0V	$I_O=12\text{mA}$	-	-	0.8	V
input leakage current	I_I	1.65V to 3.6V	$V_I=V_{CC}$ or GND	-	-	2.5	μA
OFF-state output current	I_{OZ}	1.65V to 2.7V	$V_O=V_{CC}$ or GND	-	-	5	μA
		3.0V to 3.6V	$V_O=V_{CC}$ or GND	-	-	10	μA
power-off leakage current	I_{OFF}	0V	V_I or $V_O=3.6\text{V}$	-	-	± 10	μA
supply current	I_{CC}	1.65V to 2.7V	$V_I=V_{CC}$ or GND; $I_O=0\text{A}$			20	μA
		3.0V to 3.6V	$V_I=V_{CC}$ or GND; $I_O=0\text{A}$	-	-	40	μA

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



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.	Max.	Unit
nAn to nYn propagation delay	t_{PLH}, t_{PHL}	1.2V	see Figure 3	-	2.6	-	ns
		1.4V to 1.6V		-	1.8	-	ns
		1.65V to 1.95V		0.7	1.7	3.1	ns
		2.3V to 2.7V		0.6	1.3	1.9	ns
		3.0V to 3.6V		0.5	1.1	1.7	ns
$\overline{\text{nOE}}$ to nYn enable time	t_{PZH}, t_{PZL}	1.2V	see Figure 4	-	5.2	-	ns
		1.4V to 1.6V		-	3.3	-	ns
		1.65V to 1.95V		1.3	2.7	5.5	ns
		2.3V to 2.7V		0.9	1.9	4.3	ns
		3.0V to 3.6V		0.7	1.7	3.5	ns
$\overline{\text{nOE}}$ to nYn disable time	t_{PLZ}, t_{PHZ}	1.2V	see Figure 4	-	5.7	-	ns
		1.4V to 1.6V		-	4.3	-	ns
		1.65V to 1.95V		2.0	3.2	6.2	ns
		2.3V to 2.7V		1.0	1.9	4.0	ns
		3.0V to 3.6V		1.2	1.8	3.5	ns

Note: Typical values are measured at $T_{amb}=25^{\circ}\text{C}$ and $V_{CC}=1.8\text{V}$, 2.5V , 2.7V , and 3.3V 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.	Max.	Unit
nAn to nYn propagation delay	t_{PLH}, t_{PHL}	1.65V to 1.95V	see Figure 3	-	-	3.7	ns
		2.3V to 2.7V		-	-	2.3	ns
		3.0V to 3.6V		-	-	2.0	ns
$\overline{\text{nOE}}$ to nYn enable time	t_{PZH}, t_{PZL}	1.65V to 1.95V	see Figure 4	-	-	6.6	ns
		2.3V to 2.7V		-	-	5.2	ns
		3.0V to 3.6V		-	-	4.2	ns
$\overline{\text{nOE}}$ to nYn disable time	t_{PLZ}, t_{PHZ}	1.65V to 1.95V	see Figure 4	-	-	7.4	ns
		2.3V to 2.7V		-	-	4.8	ns
		3.0V to 3.6V		-	-	4.2	ns



4、Testing Circuit

4.1、AC Testing Circuit

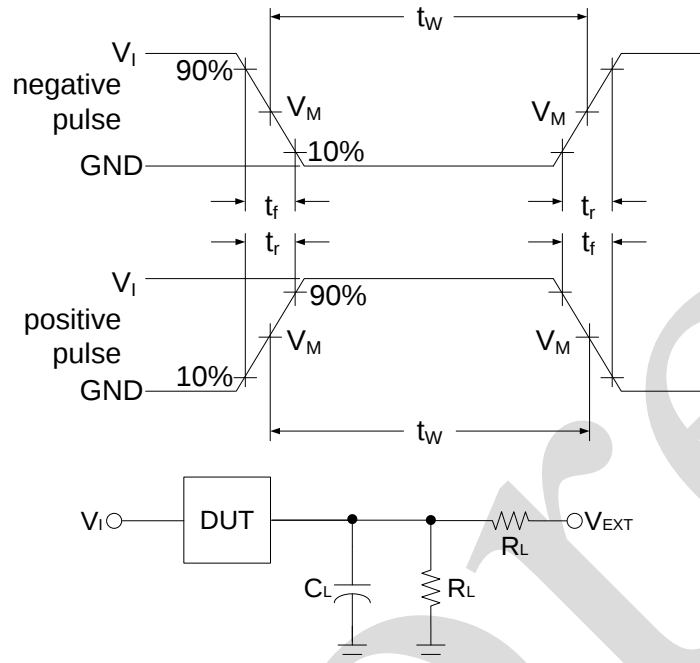


Figure 2. Load circuit

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}
1.2V	V_{CC}	$\leq 3ns$	30pF	1k Ω	Open	$2 \times V_{CC}$	GND
1.65V to 1.95V	V_{CC}	$\leq 3ns$	30pF	1k Ω	Open	$2 \times V_{CC}$	GND
2.3V to 2.7V	V_{CC}	$\leq 3ns$	30pF	500 Ω	Open	$2 \times V_{CC}$	GND
2.7V	V_{CC}	$\leq 3ns$	30pF	500 Ω	Open	$2 \times V_{CC}$	GND
3.0V to 3.6V	V_{CC}	$\leq 3ns$	30pF	500 Ω	Open	$2 \times V_{CC}$	GND



4.3、AC Testing Waveforms

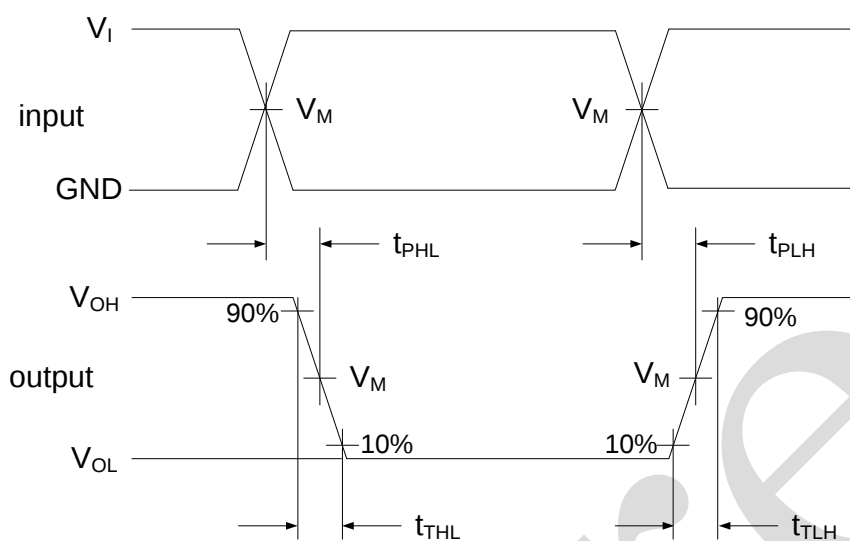


Figure 3. The data input (nAn) to output (nYn) propagation delays

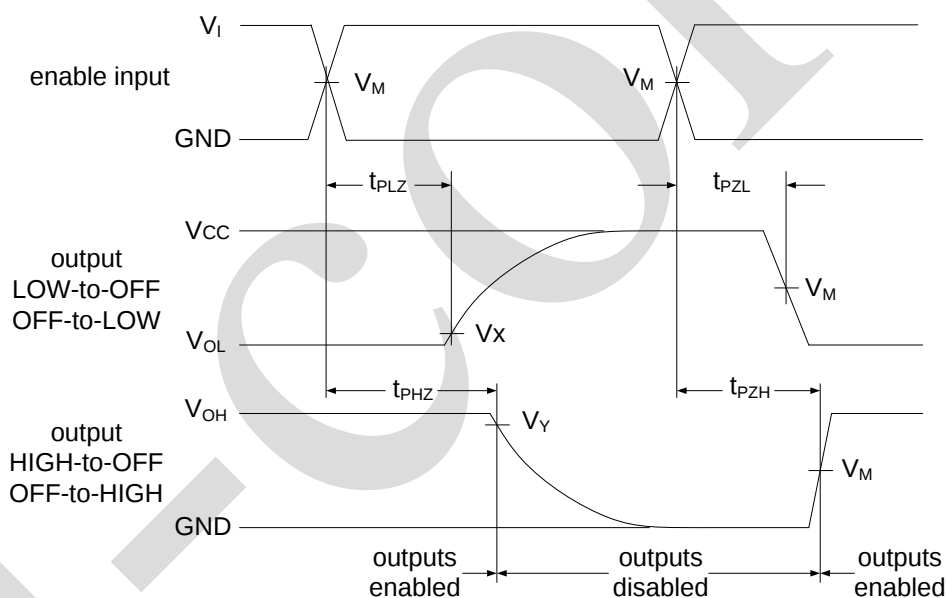


Figure 4. 3-state enable and disable times

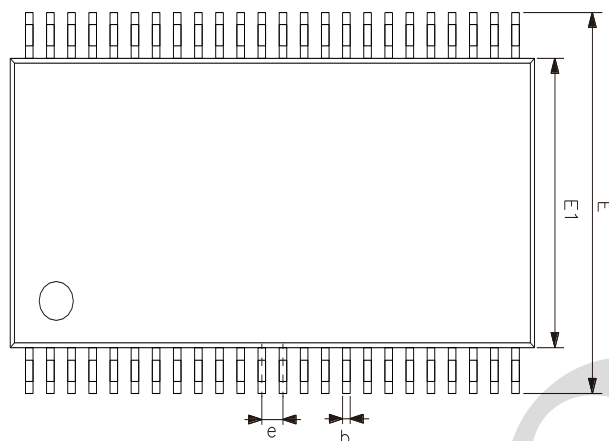
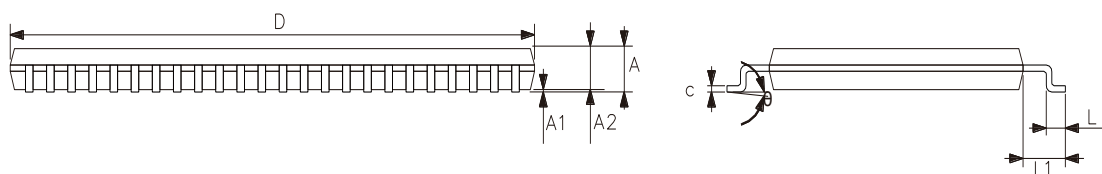
4.4、Measurement Points

Supply voltage	Input	Output		
V_{CC}	V_M	V_M	V_X	V_Y
1.2V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
1.65V to 1.95V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
2.3V to 2.7V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
3.0V to 3.6V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$



5、Package Information

5.1、TSSOP48



2023/12/A	Dimensions In Millimeters	
	Min	Max
A	—	1.20
A1	0.03	0.15
A2	0.82	1.05
b	0.17	0.27
c	0.12	0.22
D	12.40	12.60
E	7.90	8.30
E1	6.00	6.20
e	0.50	
L	0.35	0.75
L1	1.00	
θ	0°	8°



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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