



CD4019(LX) Quad And/Or Select Gate

Product Specification

Specification Revision History:

Version	Date	Description
2024-12-A0	2024-12	New
2025-05-A1	2025-05	Modify the parameters



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1、General Description

The CD4019 is a quad AND/OR select gate.

It operates over a recommended V_{DD} power supply range of 3V to 15V referenced to V_{SS} (usually ground).

Unused inputs must be connected to V_{DD} , V_{SS} , or another input.

Features:

- Supply voltage range: 3V to 15V
- Temperature range: -40°C to $+125^{\circ}\text{C}$
- Packaging information: DIP16/SOP16/TSSOP16

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
CD4019BE(LX)	DIP16	CD4019BE	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
CD4019BM(LX)	SOP16	CD4019BM	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
CD4019BPW(LX)	TSSOP16	CD4019BPW	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

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

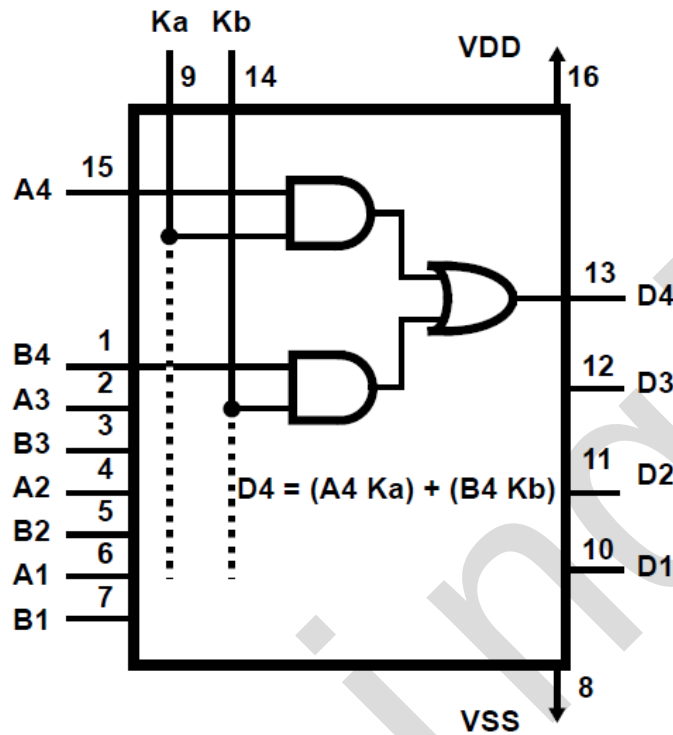
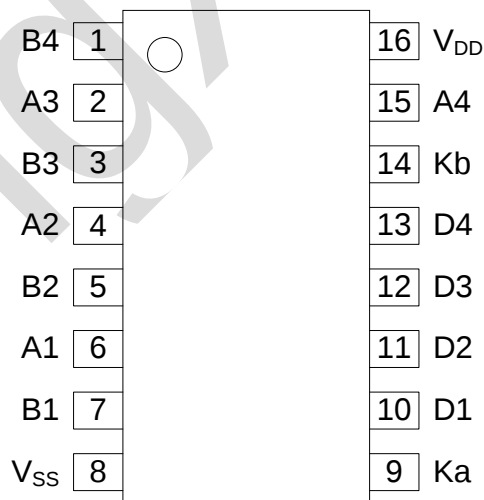


Figure 1. Functional diagram

2.2、Pin Configurations





2.3、Pin Description

Pin No.	Pin Name	Description
1	B4	data input
2	A3	data input
3	B3	data input
4	A2	data input
5	B2	data input
6	A1	data input
7	B1	data input
8	V _{SS}	ground (0V)
9	Ka	select input
10	D1	data output
11	D2	data output
12	D3	data output
13	D4	data output
14	Kb	select input
15	A4	data input
16	V _{DD}	supply voltage

2.4、Function Table

Inputs				Output
Ka	Kb	An	Bn	Dn
1	0	1	X	1
1	0	0	X	0
0	1	X	1	1
0	1	X	0	0
0	0	X	X	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Note: X=don't care



3、Electrical Parameter

3.1、Absolute Maximum Ratings

($T_{amb}=25^{\circ}\text{C}$, All voltage referenced to V_{ss} , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{DD}	-	-0.5	+18	V
input voltage	V_I	all inputs	-0.5	$V_{DD}+0.5$	V
DC input current	I_{IK}	any one input	-	± 10	mA
storage temperature	T_{stg}	-	-65	+150	$^{\circ}\text{C}$
soldering temperature	T_L	10s	DIP	245	$^{\circ}\text{C}$
			SOP/TSSOP	260	

3.2、Electrical Characteristics

3.2.1、DC Characteristics 1

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

Parameter	Symbol	V_{DD}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	5V	-	3.5	-	-	V
		10V	-	7	-	-	V
		15V	-	11	-	-	V
LOW-level input voltage	V_{IL}	5V	-	-	-	1.5	V
		10V	-	-	-	3	V
		15V	-	-	-	4	V
HIGH-level output voltage	V_{OH}	5V	$ I_O < 1\mu\text{A}$	4.95	-	-	V
		10V	$ I_O < 1\mu\text{A}$	9.95	-	-	V
		15V	$ I_O < 1\mu\text{A}$	14.95	-	-	V
LOW-level output voltage	V_{OL}	5V	$ I_O < 1\mu\text{A}$	-	-	0.05	V
		10V	$ I_O < 1\mu\text{A}$	-	-	0.05	V
		15V	$ I_O < 1\mu\text{A}$	-	-	0.05	V
HIGH-level output current	I_{OH}	5V	$V_O=4.6\text{V}$	-	-	-0.42	mA
		5V	$V_O=2.5\text{V}$	-	-	-1.3	mA
		10V	$V_O=9.5\text{V}$	-	-	-1.1	mA
		15V	$V_O=13.5\text{V}$	-	-	-2.8	mA
LOW-level output current	I_{OL}	5V	$V_O=0.4\text{V}$	0.42	-	-	mA
		10V	$V_O=0.5\text{V}$	1.1	-	-	mA
		15V	$V_O=1.5\text{V}$	2.8	-	-	mA
input leakage current	I_I	15V	$V_I=15\text{V}$ or V_{ss}	-	-	± 2	μA
supply current	I_{DD}	5V	$V_I=5\text{V}$ or V_{ss} ; $I_O=0\text{A}$	-	-	7.5	μA
		10V	$V_I=10\text{V}$ or V_{ss} ; $I_O=0\text{A}$	-	-	15	μA
		15V	$V_I=15\text{V}$ or V_{ss} ; $I_O=0\text{A}$	-	-	30	μA



3.2.2、DC Characteristics 2

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

Parameter	Symbol	V_{DD}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	5V	-	3.5	-	-	V
		10V	-	7	-	-	V
		15V	-	11	-	-	V
LOW-level input voltage	V_{IL}	5V	-	-	-	1.5	V
		10V	-	-	-	3	V
		15V	-	-	-	4	V
HIGH-level output voltage	V_{OH}	5V	$ I_O < 1\mu\text{A}$	4.95	-	-	V
		10V	$ I_O < 1\mu\text{A}$	9.95	-	-	V
		15V	$ I_O < 1\mu\text{A}$	14.95	-	-	V
LOW-level output voltage	V_{OL}	5V	$ I_O < 1\mu\text{A}$	-	-	0.05	V
		10V	$ I_O < 1\mu\text{A}$	-	-	0.05	V
		15V	$ I_O < 1\mu\text{A}$	-	-	0.05	V
HIGH-level output current	I_{OH}	5V	$V_O = 4.6\text{V}$	-	-	-0.36	mA
		5V	$V_O = 2.5\text{V}$	-	-	-1.15	mA
		10V	$V_O = 9.5\text{V}$	-	-	-0.9	mA
		15V	$V_O = 13.5\text{V}$	-	-	-2.4	mA
LOW-level output current	I_{OL}	5V	$V_O = 0.4\text{V}$	0.36	-	-	mA
		10V	$V_O = 0.5\text{V}$	0.9	-	-	mA
		15V	$V_O = 1.5\text{V}$	2.4	-	-	mA
input leakage current	I_I	15V	$V_I = 15\text{V}$ or V_{SS}	-	-	± 4	μA
supply current	I_{DD}	5V	$V_I = 5\text{V}$ or V_{SS} ; $I_O = 0\text{A}$	-	-	7.5	μA
		10V	$V_I = 10\text{V}$ or V_{SS} ; $I_O = 0\text{A}$	-	-	15	μA
		15V	$V_I = 15\text{V}$ or V_{SS} ; $I_O = 0\text{A}$	-	-	30	μA

3.3.3、AC Characteristics 1

($T_{amb} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{SS} = 0\text{V}$, unless otherwise specified.)

Parameter	Symbol	V_{DD}	Conditions	Min.	Typ.	Max.	Unit
propagation delay time	t_{PHL} , t_{PLH}	5V	$C_L = 50\text{pF}$, $R_L = 200\text{k}\Omega$ see Figure 3	-	150	300	ns
		10V		-	60	120	ns
		15V		-	50	100	ns
transition time	t_{THL} , t_{TLH}	5V	$C_L = 50\text{pF}$, $R_L = 200\text{k}\Omega$ see Figure 3	-	100	200	ns
		10V		-	50	100	ns
		15V		-	40	80	ns



3.3.4、AC Characteristics 2

($T_{amb} = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{SS} = 0\text{V}$, unless otherwise specified.)

Parameter	Symbol	V_{DD}	Conditions	Min.	Typ.	Max.	Unit
propagation delay time	t_{PHL} , t_{PLH}	5V	$C_L = 50\text{pF}$, $R_L = 200\text{k}\Omega$ see Figure 3	-	-	360	ns
		10V		-	-	144	ns
		15V		-	-	120	ns
transition time	t_{THL} , t_{TLH}	5V	$C_L = 50\text{pF}$, $R_L = 200\text{k}\Omega$ see Figure 3	-	-	240	ns
		10V		-	-	120	ns
		15V		-	-	96	ns

4、Testing Circuit

4.1、DC Testing Circuit

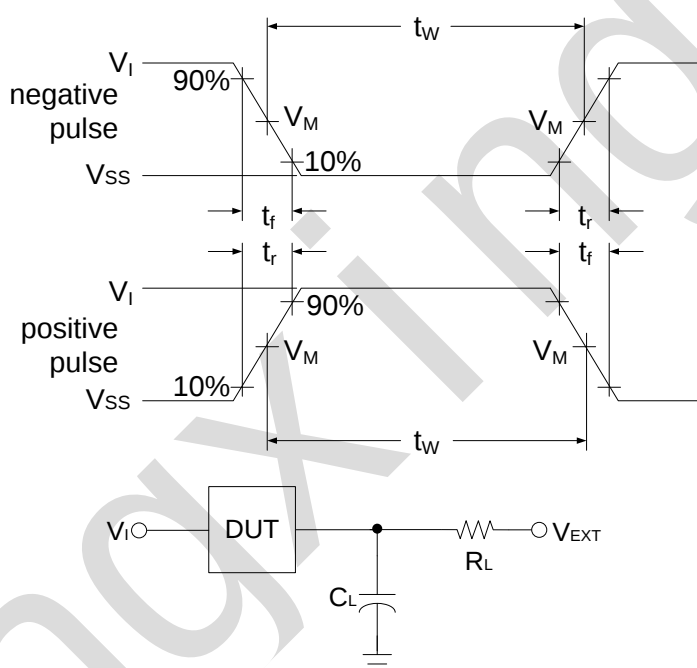


Figure 2. Load circuit

C_L includes probe and jig capacitance.

4.2、AC Testing Circuit

Supply voltage	Input		Load		V_{EXT}		
V_{DD}	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}/t_{PHL}	t_{PLZ}/t_{PZL}	t_{PHZ}/t_{PZH}
5V to 15V	V_{DD}	20ns	50pF	200k Ω	Open	V_{DD}	V_{SS}



4.3、AC Testing Waveforms

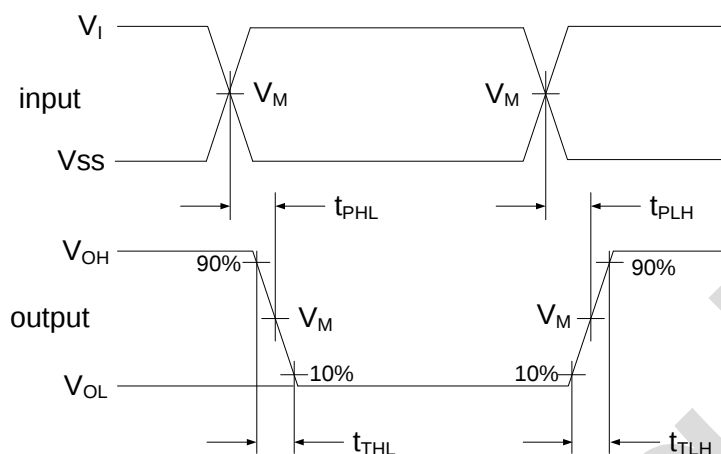


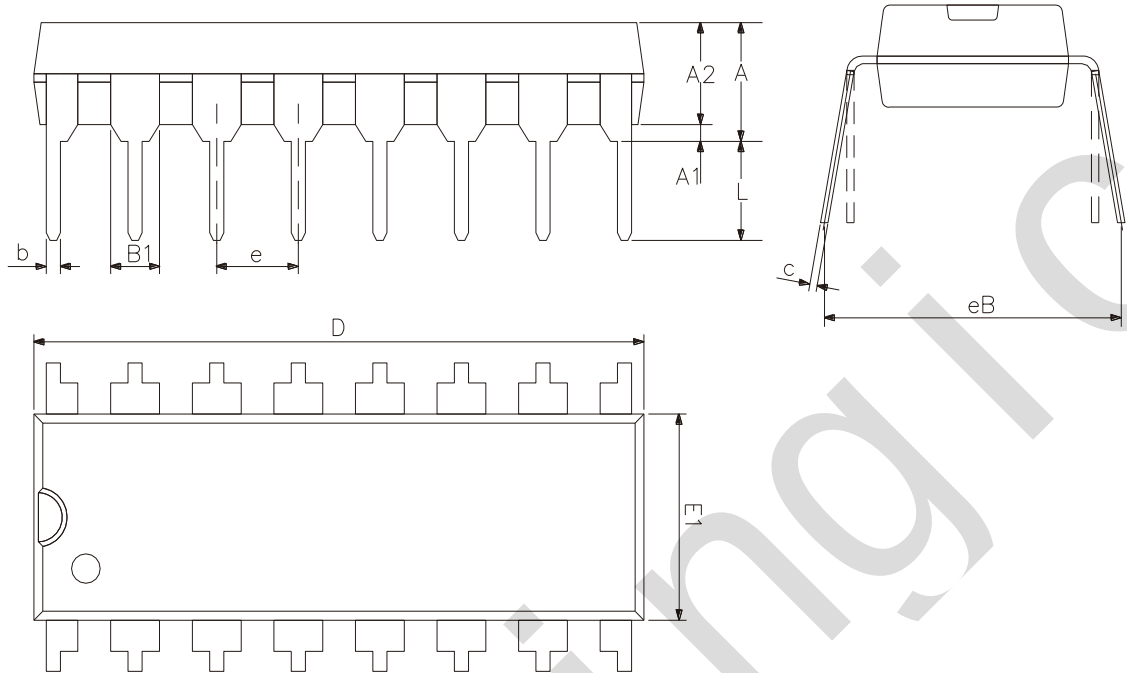
Figure 3. Propagation delay, output transition time

4.4、Measurement Points

Supply voltage	Input	Output		
V_{DD}	V_M	V_M	V_X	V_Y
5V to 15V	$0.5 \times V_{DD}$	$0.5 \times V_{DD}$	$0.1 \times V_{DD}$	$0.9 \times V_{DD}$

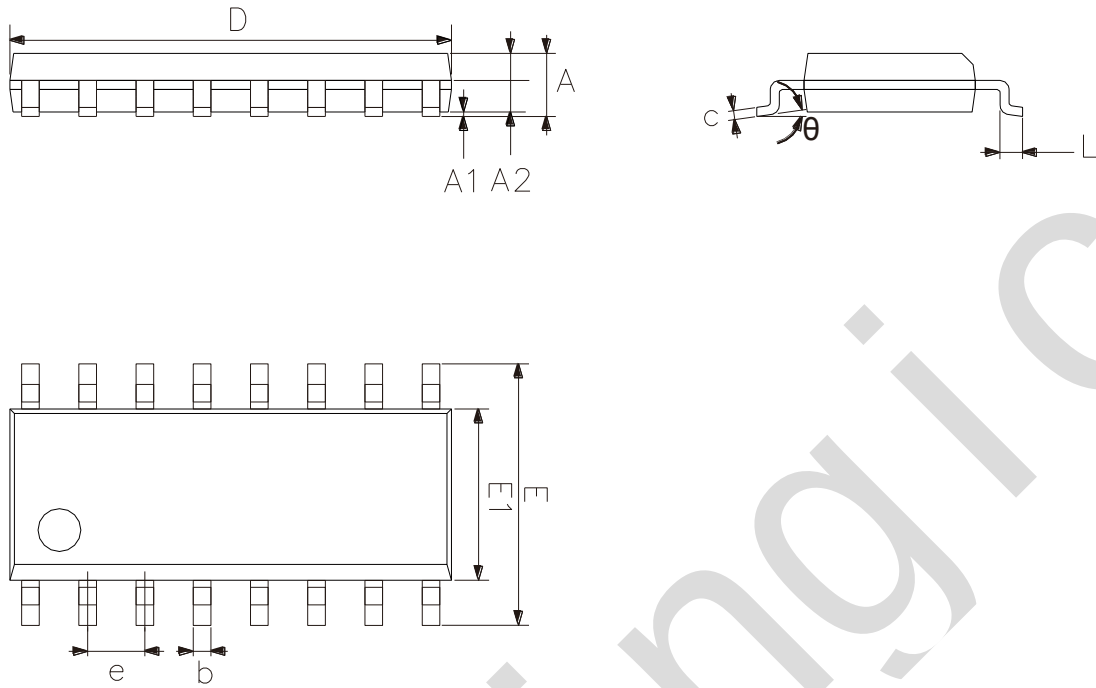
5、Package Information

5.1、DIP16



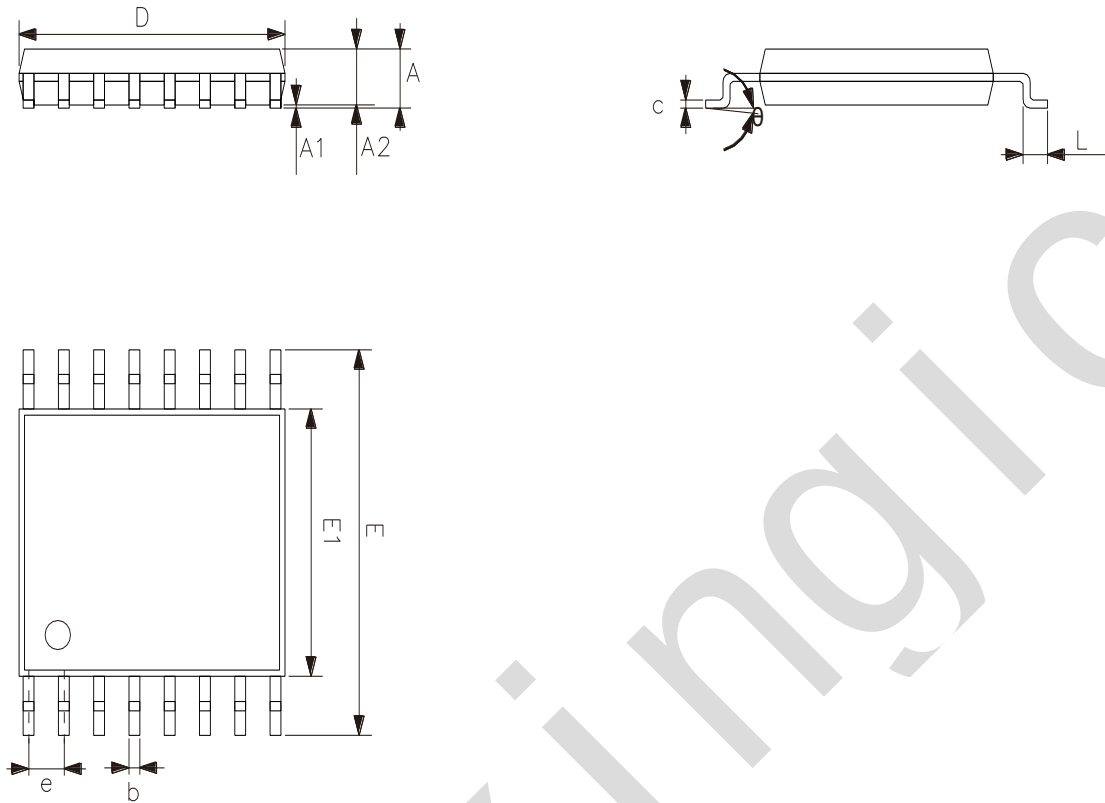
2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A2	3.00	3.60
A1	0.51	—
A	3.60	5.33
L	3.00	3.60
b	0.36	0.56
B1	1.52	
D	18.80	19.94
E1	6.20	6.60
e	2.54	
c	0.20	0.36
eB	7.62	9.30

5.2、SOP16



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	1.35	1.80
A1	0.10	0.25
A2	1.25	1.55
b	0.33	0.51
c	0.19	0.25
D	9.50	10.10
E	5.80	6.30
E1	3.70	4.10
e	1.27	
L	0.35	0.89
θ	0°	8°

5.3、TSSOP16



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
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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