



CD4076
Quad D-type Register
with 3-state Outputs

Product Specification

Specification Revision History:

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



Contents

1、General Description.....	3
2、Block Diagram And Pin Description	4
2.1、Block Diagram	4
2.2、Pin Configurations.....	4
2.3、Pin Description.....	5
2.4、Function Table.....	5
3、Electrical Parameter	6
3.1、Absolute Maximum Ratings.....	6
3.2、Recommended Operating Conditions.....	6
3.3、Electrical Characteristics.....	6
3.3.1、DC Characteristics 1	6
3.3.2、DC Characteristics 2.....	7
3.3.3、AC Characteristics 1.....	8
3.3.4、AC Characteristics 2.....	9
4、Testing Circuit.....	10
4.1、AC Testing Circuit	10
4.2、Test Data	10
4.3、AC Testing Waveforms.....	10
4.4、Measurement Points	11
5、Package Information.....	12
5.1、DIP16	12
5.2、SOP16	13
5.3、TSSOP16.....	14
6、Statements And Notes	15
6.1、The name and content of Hazardous substances or Elements in the product	15
6.2、Notes	15



1、General Description

The CD4076 are quad D-type register with 3-state outputs.

It operates over a recommended VDD power supply range of 3V to 15V referenced to GND (usually ground). Unused inputs must be connected to VDD, GND, or another input.

Features:

- Supply voltage range: 3V to 15V
- Temperature range: -40°C to +125°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
CD4076DA16.TB	DIP16	CD4076	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
CD4076SA16.TR	SOP16	CD4076	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
CD4076TA16.TR	TSSOP16	CD4076	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

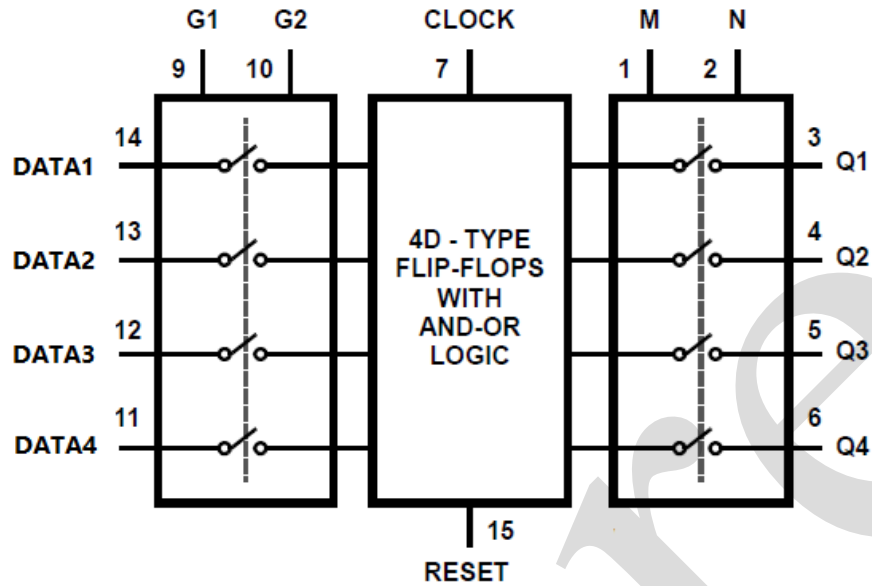
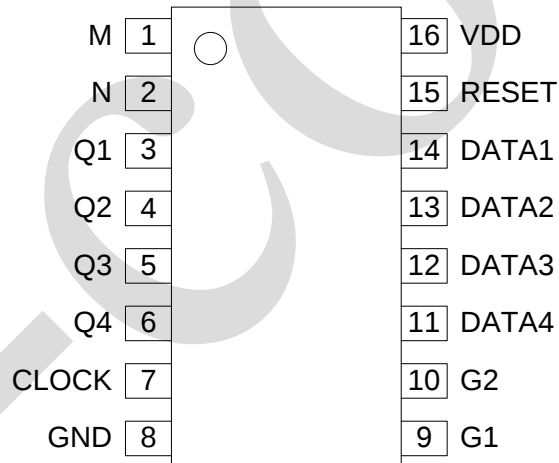


Figure 1. Block Diagram

2.2、Pin Configurations





2.3、Pin Description

Pin No.	Pin Name	Description
1	M	output enable input (active LOW)
2	N	output enable input (active LOW)
3	Q1	3-state flip-flop output
4	Q2	3-state flip-flop output
5	Q3	3-state flip-flop output
6	Q4	3-state flip-flop output
7	CLOCK	clock input (LOW-to HIGH, edge-triggered)
8	GND	ground (0V)
9	G1	input enable
10	G2	input enable
11	DATA4	data input
12	DATA3	data input
13	DATA2	data input
14	DATA1	data input
15	RESET	asynchronous master reset input (active LOW)
16	VDD	supply voltage

2.4、Function Table

Input							Output
M	N	RESET	CLOCK	G1	G2	DATA _n	Q _n
H	X	X	X	X	X	X	Z
X	H	X	X	X	X	X	Z
L	L	H	X	X	X	X	L
L	L	L	↑	H	X	X	NC
L	L	L	↑	X	H	X	NC
L	L	L	↑	L	L	H	H
L	L	L	↑	L	L	L	L
L	L	L	L	X	X	X	NC
L	L	L	H	X	X	X	NC
L	L	L	↓	X	X	X	NC

Note: H=HIGH voltage level; L=LOW voltage level; X= Don't care; NC= No change.



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	VDD	-	-0.5	+18	V
input voltage	V _I	all inputs	-0.5	VDD+0.5	V
DC input current	I _{IK}	any one input	-	±10	mA
storage temperature	T _{stg}	-	-65	+150	°C
soldering temperature	T _L	10s	DIP	245	°C
			SOP/TSSOP	260	

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	VDD	-	3	-	15	V
ambient temperature	T _{amb}	in free air	-40	-	+125	°C

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	VDD	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 <1uA	4.95	-	-	V
		10V	I _O <1uA	9.95	-	-	V
		15V	I _O <1uA	14.95	-	-	V
LOW-level output voltage	V _{OL}	5V	I _O <1uA	-	-	0.05	V
		10V	I _O <1uA	-	-	0.05	V
		15V	I _O <1uA	-	-	0.05	V
HIGH-level output current	I _{OH}	5V	V _O =4.6V	-	-	-0.42	mA
		5V	V _O =2.5V	-	-	-1.3	mA
		10V	V _O =9.5V	-	-	-1.1	mA
		15V	V _O =13.5V	-	-	-2.8	mA
LOW-level output current	I _{OL}	5V	V _O =0.4V	0.42	-	-	mA
		10V	V _O =0.5V	1.1	-	-	mA
		15V	V _O =1.5V	2.8	-	-	mA
input leakage current	I _I	15V	V _I =15V or GND	-	-	±1	uA
supply current	I _{DD}	5V	V _I =5V or GND; I _O =0A	-	-	150	uA
		10V	V _I =10V or GND; I _O =0A	-	-	300	uA
		15V	V _I =15V or GND; I _O =0A	-	-	600	uA



3.3.2、DC Characteristics 2

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

Parameter	Symbol	VDD	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 <1uA	4.95	-	-	V
		10V	I _O <1uA	9.95	-	-	V
		15V	I _O <1uA	14.95	-	-	V
LOW-level output voltage	V _{OL}	5V	I _O <1uA	-	-	0.05	V
		10V	I _O <1uA	-	-	0.05	V
		15V	I _O <1uA	-	-	0.05	V
HIGH-level output current	I _{OH}	5V	V _O =4.6V	-	-	-0.36	mA
		5V	V _O =2.5V	-	-	-1.15	mA
		10V	V _O =9.5V	-	-	-0.9	mA
		15V	V _O =13.5V	-	-	-2.4	mA
LOW-level output current	I _{OL}	5V	V _O =0.4V	0.36	-	-	mA
		10V	V _O =0.5V	0.9	-	-	mA
		15V	V _O =1.5V	2.4	-	-	mA
input leakage current	I _I	15V	V _I =15V or GND	-	-	±1	uA
supply current	I _{DD}	5V	V _I =5V or GND; I _O =0A	-	-	150	uA
		10V	V _I =10V or GND; I _O =0A	-	-	300	uA
		15V	V _I =15V or GND; I _O =0A	-	-	600	uA



3.3.3、AC Characteristics 1

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

Parameter	Symbol	VDD	Conditions	Min.	Typ.	Max.	Unit
propagation delay time	t _{PHL} , t _{PLH}	5V	C _L =50pF, R _L =200kΩ	-	300	600	ns
		10V		-	125	250	ns
		15V		-	90	180	ns
transition time	t _{THL} , t _{TLH}	5V	C _L =50pF, R _L =200kΩ	-	100	200	ns
		10V		-	50	100	ns
		15V		-	40	80	ns
propagation delay time Reset	t _{PHL}	5V	C _L =50pF, R _L =200kΩ	-	230	460	ns
		10V		-	100	200	ns
		15V		-	75	150	ns
propagation delay time 3-state	t _{PHZ} , t _{PLZ}	5V	C _L =50pF, R _L =1kΩ	-	150	300	ns
		10V		-	75	150	ns
		15V		-	60	120	ns
propagation delay time 3-state	t _{PZH} , t _{PZL}	5V	C _L =50pF, R _L =1kΩ	-	150	300	ns
		10V		-	75	150	ns
		15V		-	60	120	ns
Maximum clock input frequency	f _{CL}	5V	C _L =50pF, R _L =200kΩ	3	-	-	MHz
		10V		6	-	-	MHz
		15V		8	-	-	MHz
Minimum clock pulse width	t _w	5V	C _L =50pF, R _L =200kΩ	-	100	200	ns
		10V		-	50	100	ns
		15V		-	40	80	ns
Maximum clock input rise or fall time	t _{rcl} , t _{fcl}	5V	C _L =50pF, R _L =200kΩ	15	-	-	us
		10V		10	-	-	us
		15V		5	-	-	us
Minimum reset pulse width	t _w	5V	C _L =50pF, R _L =200kΩ	-	60	120	ns
		10V		-	25	50	ns
		15V		-	20	40	ns
Minimum data setup time	t _s	5V	C _L =50pF, R _L =200kΩ	-	90	180	ns
		10V		-	50	100	ns
		15V		-	35	70	ns



3.3.4、AC Characteristics 2

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

Parameter	Symbol	VDD	Conditions	Min.	Typ.	Max.	Unit
propagation delay time	t _{PHL} , t _{PLH}	5V	C _L =50pF, R _L =200kΩ	-	-	720	ns
		10V		-	-	300	ns
		15V		-	-	216	ns
transition time	t _{THL} , t _{TLH}	5V	C _L =50pF, R _L =200kΩ	-	-	240	ns
		10V		-	-	120	ns
		15V		-	-	96	ns
propagation delay time Reset	t _{PHL}	5V	C _L =50pF, R _L =200kΩ	-	-	552	ns
		10V		-	-	240	ns
		15V		-	-	180	ns
propagation delay time 3-state	t _{PHZ} , t _{PLZ}	5V	C _L =50pF, R _L =1kΩ	-	-	360	ns
		10V		-	-	180	ns
		15V		-	-	144	ns
propagation delay time 3-state	t _{PZH} , t _{PZL}	5V	C _L =50pF, R _L =1kΩ	-	-	360	ns
		10V		-	-	180	ns
		15V		-	-	144	ns
Maximum clock input frequency	f _{CL}	5V	C _L =50pF, R _L =200kΩ	3.6	-	-	MHz
		10V		7.2	-	-	MHz
		15V		9.6	-	-	MHz
Minimum clock pulse width	t _w	5V	C _L =50pF, R _L =200kΩ	-	-	240	ns
		10V		-	-	120	ns
		15V		-	-	96	ns
Maximum clock input rise or fall time	t _{rcl} , t _{fcl}	5V	C _L =50pF, R _L =200kΩ	18	-	-	us
		10V		12	-	-	us
		15V		6	-	-	us
Minimum reset pulse width	t _w	5V	C _L =50pF, R _L =200kΩ	-	-	144	ns
		10V		-	-	60	ns
		15V		-	-	48	ns
Minimum data setup time	t _s	5V	C _L =50pF, R _L =200kΩ	-	-	216	ns
		10V		-	-	120	ns
		15V		-	-	84	ns



4、Testing Circuit

4.1、AC Testing Circuit

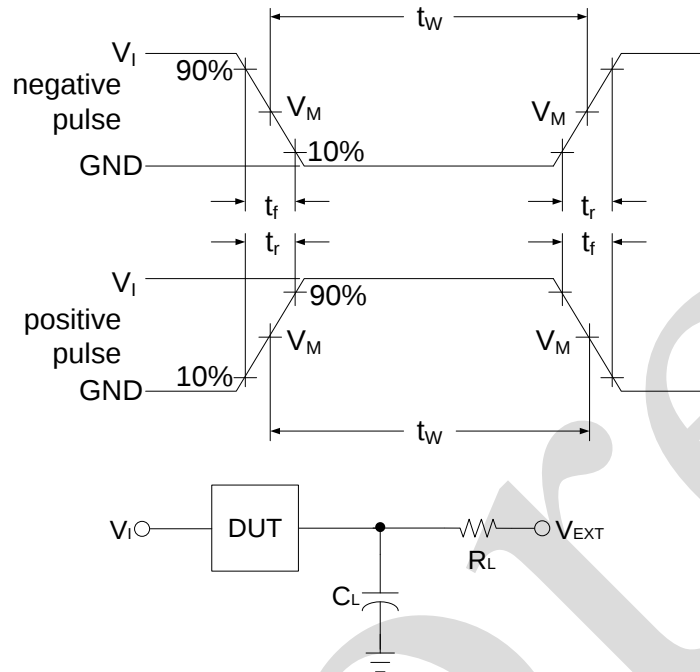


Figure 3. Load circuit

C_L includes probe and jig capacitance.

4.2、Test Data

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	VDD	$\leq 3ns$	50pF	200k Ω	Open	VDD	GND

4.3、AC Testing Waveforms

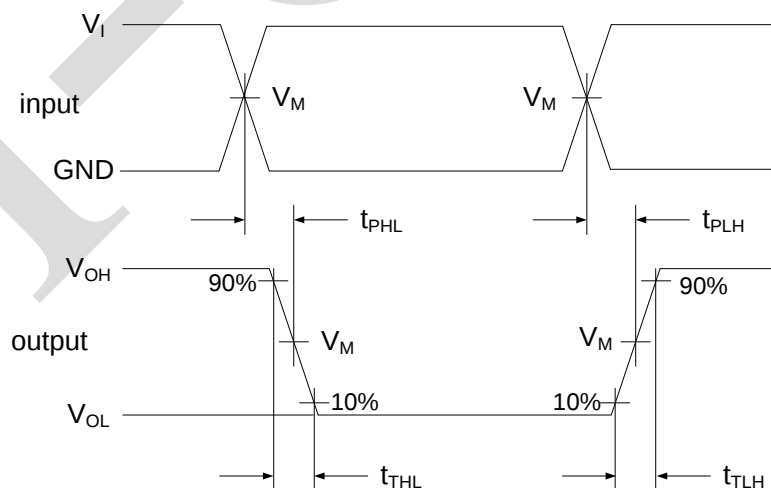


Figure 4. Propagation delay, output transition time

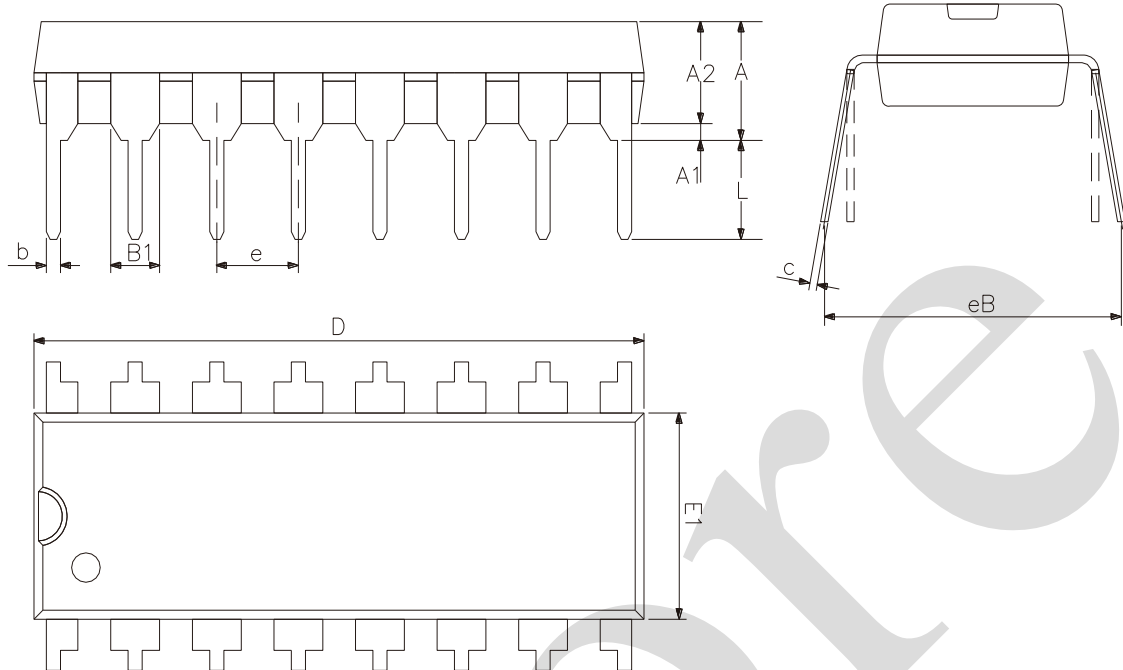


Supply voltage	Input	Output		
V _{DD}	V _M	V _M	V _X	V _Y
5V to 15V	0.5×V _{DD}	0.5×V _{DD}	0.1×V _{DD}	0.9×V _{DD}



5、Package Information

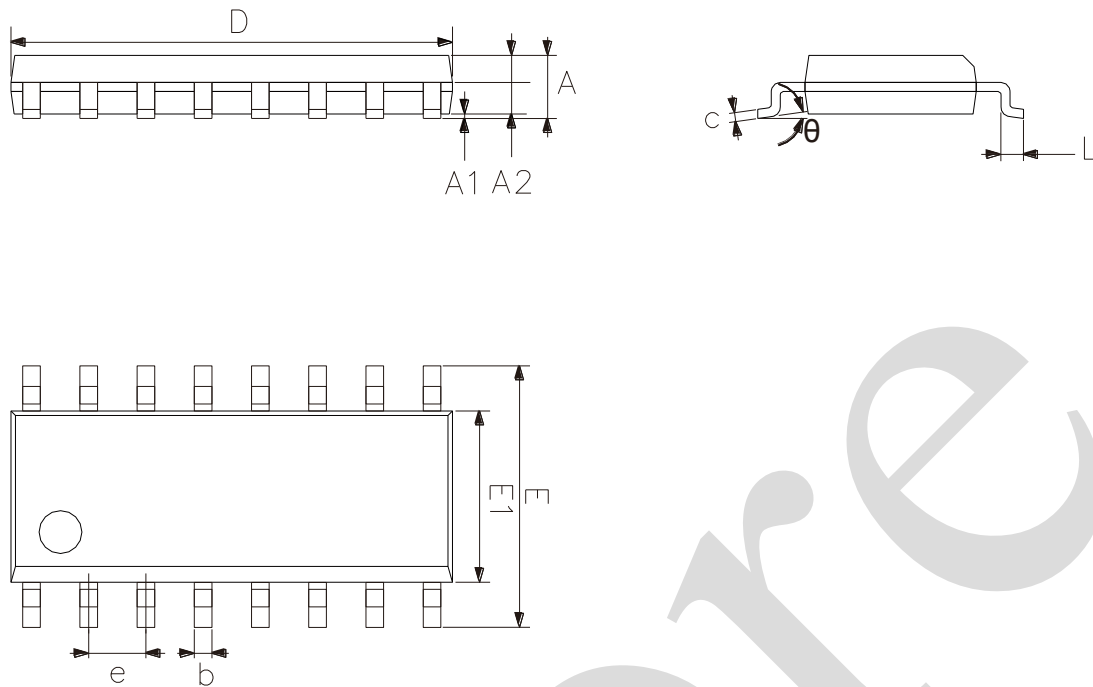
5.1、DIP16



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



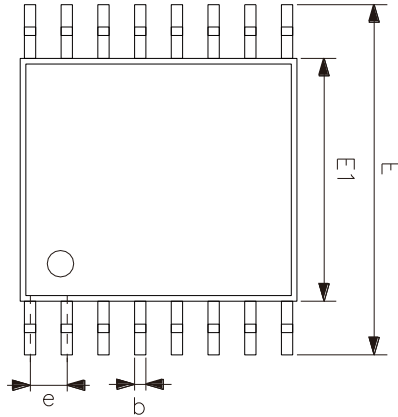
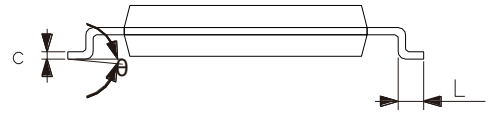
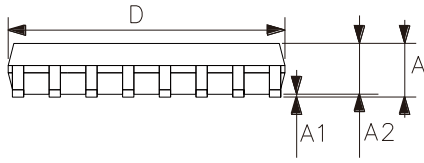
5.2、SOP16



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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