



AiP708

Microprocessor Reset Circuit

Product Specification

Specification Revision History:

Version	Date	Description
2023-08-A1	2023-08	New
2025-03-A2	2025-03	Modify the content



Contents

1、General Description	3
2、Block Diagram And Pin Description	8
2.1、Block Diagram	8
2.2、Pin Configurations.....	8
2.3、Pin Description.....	8
3、Electrical characteristics.....	9
3.1、Limit parameters	9
3.2、Recommended conditions of use.....	9
3.3、Electrical characteristics.....	9
4、Function Description.....	10
4.1、Power Detection	10
4.2、External Reset	11
4.3、Independent Voltage Detection Function.....	11
5、Precautions For Use	11
5.1、Ensure Effective RESETN Reset Signal	11
5.2、Use Independent Voltage Detection Function To Set Additional DC Reset Voltage	11
5.3、Use Independent Voltage Detection Function To Set Negative Potential Detection.	12
5.4、Match Controller With Bidirectional Attribute Reset.....	13
6、Package Information.....	14
6.1、DIP8	14
6.2、SOP8	15
6.3、MSOP8.....	16
7、Statements And Notes	17
7.1、The name and content of Hazardous substances or Elements in the product	17
7.2、Notes	17



1、 General Description

AiP708 is microprocessor reset circuit. The circuit includes power supply voltage detection module, hardware reset module and an independent voltage detection module.

Features:

- Low level effective reset signal RESETN, High level effective reset signal RESET
- Provide hardware reset function
- Provide an independent voltage detection module
- RESETN and RESET port gives effective output signal when $VDD > 1V$.
- Power-on reset delay time is typically 200ms.
- Low power consumption
- ESD-HBM: 4000V
- Packaging form: DIP8/SOP8/MSOP8

Selection Table:

Model	Reset threshold voltage
AiP708L	4.63V
AiP708M	4.38V
AiP708J	4.00V
AiP708T	3.08V
AiP708S	2.93V
AiP708R	2.63V

**Order information:****Tube packing specifications:**

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP708LDA8.TB	DIP8	AiP708L	50 PCS/ tube	40 Tube/box	2000 PCS/ box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP708MDA8.TB	DIP8	AiP708M	50 PCS/ tube	40 Tube/box	2000 PCS/ box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP708JDA8.TB	DIP8	AiP708J	50 PCS/ tube	40 Tube/box	2000 PCS/ box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP708TDA8.TB	DIP8	AiP708T	50 PCS/ tube	40 Tube/box	2000 PCS/ box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP708SDA8.TB	DIP8	AiP708S	50 PCS/ tube	40 Tube/box	2000 PCS/ box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP708RDA8.TB	DIP8	AiP708R	50 PCS/ tube	40 Tube/box	2000 PCS/ box	Dimensions of plastic enclosure: 9.2mm×6.4mm Pin spacing: 2.54mm
AiP708LSA8.TB	SOP8	AiP708L	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708MSA8.TB	SOP8	AiP708M	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708JSA8.TB	SOP8	AiP708J	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708TSA8.TB	SOP8	AiP708T	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing:



						1.27mm
AiP708SSA8.TB	SOP8	AiP708S	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708RSA8.TB	SOP8	AiP708R	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708LMA8.TB	MSOP8	AiP708L	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708MMA8.TB	MSOP8	AiP708M	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708JMA8.TB	MSOP8	AiP708J	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708TMA8.TB	MSOP8	AiP708T	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708SMA8.TB	MSOP8	AiP708S	100 PCS/ tube	100 Tube/box	10000 PCS/ box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708RMA8.TB	MSOP8	AiP708R	100 PCS/ tube	100 Tube/box	10000 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
AiP708LSA8.TR	SOP8	AiP708L	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708MSA8.TR	SOP8	AiP708M	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708JSA8.TR	SOP8	AiP708J	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708TSA8.TR	SOP8	AiP708T	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708SSA8.TR	SOP8	AiP708S	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708RSA8.TR	SOP8	AiP708R	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 4.9mm×3.9mm Pin spacing: 1.27mm
AiP708LMA8.TR	MSOP8	AiP708L	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708MMA8.TR	MSOP8	AiP708M	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708JMA8.TR	MSOP8	AiP708J	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708TMA8.TR	MSOP8	AiP708T	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm



Tab: 835-12-B7

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AiP708SMA8.TR	MSOP8	AiP708S	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm Pin spacing: 0.65mm
AiP708RMA8.TR	MSOP8	AiP708R	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 3.0mm×3.0mm 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

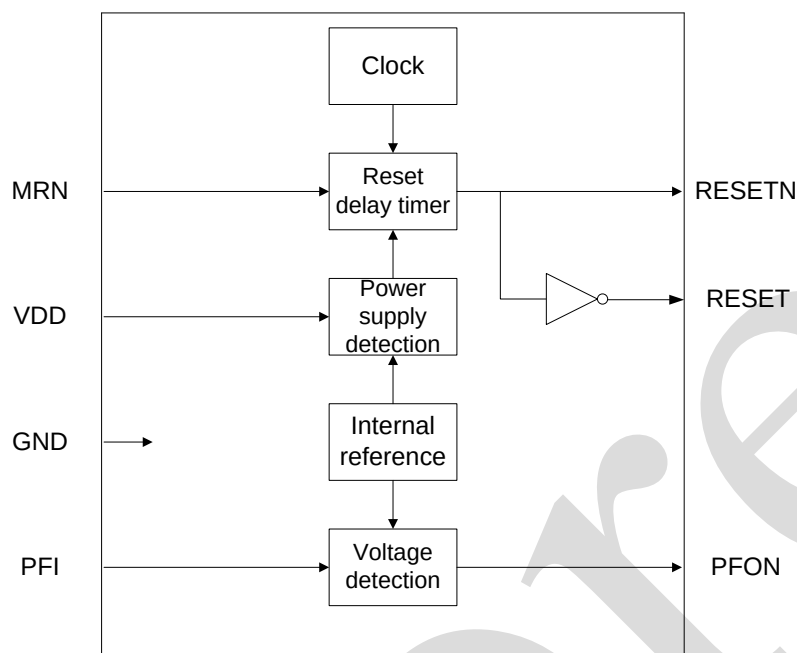


Figure 1. Block diagram

2.2、Pin Configurations

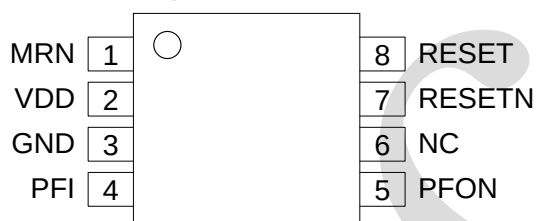


Figure 2-1. DIP8/SOP8

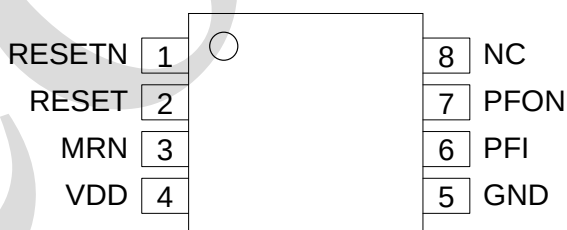


Figure 2-2. MSOP8

2.3、Pin Description

Pin No.		Pin Name	I/O	Description
DIP8/SOP8	MSOP8			
1	3	MRN	I	Hardware reset signal input, Low active
2	4	VDD	Power	Power Supply
3	5	GND	Power	Ground
4	6	PFI	I	Independent voltage detection input
5	7	PFON	O	Independent voltage detection result output
6	8	NC	-	Not connected
7	1	RESETN	O	Power supply detection reset output, Low active
8	2	RESET	O	Power supply detection reset output, High active



3、Electrical characteristics

3.1、Limit parameters

Unless otherwise specified, $T_{amb}=25^{\circ}\text{C}$

Characteristic	Symbol	Conditions		Value	Unit
Power supply voltage	VDD	-		-0.3 to 6.0	V
Input voltage range	VIN	-		-0.3 to VDD+0.3	V
Storage temperature	T_{stg}	-		-65 to +150	$^{\circ}\text{C}$
Soldering temperature	T_L	10s	DIP	250	$^{\circ}\text{C}$
			SOP/MSOP	260	

Note:

- 1) Operating above these specified values may cause permanent damage to the components. Extending the operation period under the absolute maximum condition may reduce the reliability of the component. These are only part of the specified values, and functional operations under other conditions outside the specifications are not supported.
- 2) All voltage values are based on the ground terminal as a reference point.

3.2、Recommended conditions of use

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	VDD	1	-	5.5	V
Working temperature	T_{amb}	-40	-	+125	$^{\circ}\text{C}$

3.3、Electrical characteristics

(unless otherwise specified, $T_{amb}=25^{\circ}\text{C}$, VDD=5V).

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Power supply voltage	VDD	-	1	-	5.5	V
Supply Current	IDD	AiP708L	-	50	150	μA
		AiP708M	-	50	150	μA
		AiP708J	-	50	150	μA
		AiP708T	-	50	150	μA
		AiP708S	-	50	150	μA
		AiP708R	-	50	150	μA
Power supply detection voltage	V_T	AiP708L	4.530	4.63	4.730	V
		AiP708M	4.285	4.38	4.475	V
		AiP708J	3.914	4	4.086	V
		AiP708T	3.013	3.08	3.147	V
		AiP708S	2.867	2.93	2.993	V
		AiP708R	2.573	2.63	2.687	V
Power supply detection hysteresis voltage	V_{hys}	-	-	40	-	mV
Power supply detection delay time	T_{RST}	-	120	200	280	ms
RESETN/RESET HIGH-level output	VO_R	$I_{LOAD}=800\mu\text{A}$	3.5	-	-	V

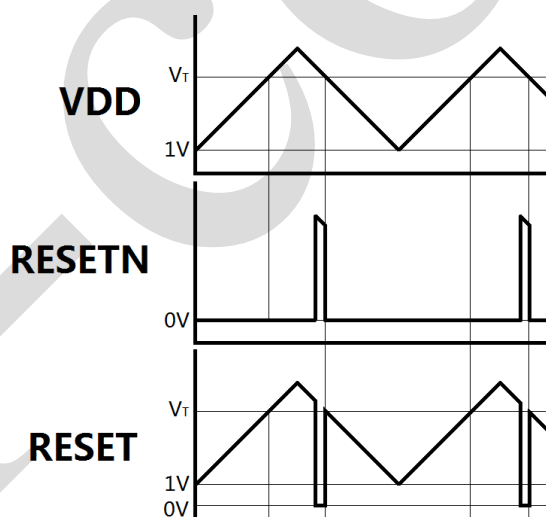


voltage						
RESETN/RESET LOW-level output voltage		$I_{LOAD}=3.2mA$	-	-	0.4	V
MRN LOW-level input current	I_{MRN}	MRN=0V	100	250	600	μA
MRN HIGH-level input voltage	V_{IMRN}	-	3	-	-	V
MRN LOW-level input voltage		-	-	-	0.8	V
PFI input detection voltage	V_{TP}	-	1.20	1.25	1.30	V
PFI input current	I_{PFI}	PFI=0 to VDD	-	-	0.1	μA
PFON output HIGH-level voltage	V_{OPFO}	$I_{load}=800\mu A$	3.5	-	-	V
PFON output LOW-level voltage		$I_{load}=3.2mA$	-	-	0.4	V

4、Function Description

4.1、Power Detection

The circuit detects the power supply (VDD) voltage. When the power supply voltage is lower than the "Reset threshold (V_T)", the RESETN port outputs a low level and RESET port outputs a high level. When the power supply voltage is higher than V_T , the time delay is fixed from the time when the power supply voltage exceeds V_T , typically 200ms, and the RESETN port outputs a high level, the RESET port outputs a low level. There is a hysteresis voltage during the rise and fall of the power supply voltage near V_T , typically 40mV.





4.2、 External Reset

The AiP708 provides an external hardware reset function, which is controlled by the MRN port. When the input voltage of the MRN port is low, the RESETN port will keep the output voltage low, and RESET port will keep the output voltage high.

When the power supply voltage is higher than the "Reset threshold (V_T)", when the input of the MRN port changes from low level to high level, the delay is fixed, typically 200ms, and the RESETN port outputs high level, the RESET port outputs a low level.

4.3、 Independent Voltage Detection Function

The AiP708 provides an independent voltage detection function, including voltage input port PFI and detection result output port PFON. This function is not affected by power supply detection, watchdog function or external reset. When the power supply voltage is higher than 1.8V, it always works.

This function compares the input voltage of PFI port with the fixed 1.25V internal reference voltage. When PFI input voltage is higher than 1.25V, PFON port outputs high level; when PFI input voltage is lower than 1.25V, PFON port outputs low level.

5、 Precautions For Use

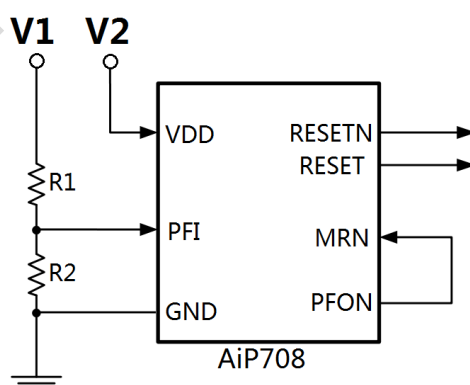
5.1、 Ensure Effective RESETN Reset Signal

When the power supply voltage is lower than 1V, the RESETN and RESET port of the AiP708 cannot ensure stable and effective low-level signal output. When the user has a clear reset signal requirement within the power supply voltage range of 0~1V, it is strongly recommended to add a pull-down resistor to the ground on the RESETN port, and add a pull-up resistor to the power supply on the RESET port. The value of the pull-up/down resistance shall be determined according to the requirements of the use environment of the whole system. It is recommended to use 100K Ω , which can meet the requirements of most conditions.

5.2、 Use Independent Voltage Detection Function To Set Additional DC Reset Voltage

When the whole system has two voltages that need to be monitored, the independent voltage detection function of the AiP708 can be used together with the power supply detection function. As shown in the figure below, in this scheme, V2 is monitored by the power supply detection function, and V1 is sampled by the resistor after voltage division, and monitored by the independent voltage detection function.

For example, if V2 is required to be higher than 2.93V and V1 is higher than 10V, V2 can be directly connected to the power supply of the AiP708S ($V_T=2.93V$), and $R1=700K\ \Omega$ and $R2=100K\ \Omega$ can be taken to meet the demand.



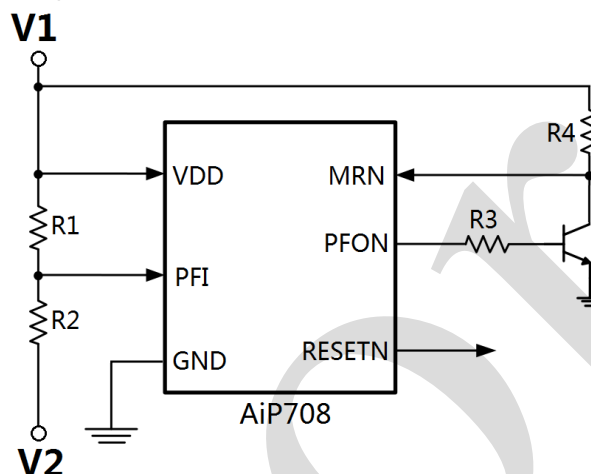


When designing the value of R1 and R2, the overall requirements for power consumption must be considered.

5.3、 Use Independent Voltage Detection Function To Set Negative Potential Detection.

When there is a monitoring demand for negative voltage (lower than GND) in the system, the independent voltage detection function of AiP708 can be used with appropriate peripheral components. As shown in the figure below, V1 is used as the system power supply in this scheme. At the same time, V2 is sampled after voltage division by resistance, and independent voltage detection function is used for detection.

For example, if the V1 power supply is 5V and the monitoring V2 is required to be lower than -10V, the demand can be realized by taking R1=300KΩ and R2=900KΩ.



The above scheme meets the following requirements: $(V1-1.25)/R1=(1.25-V2)/R2$

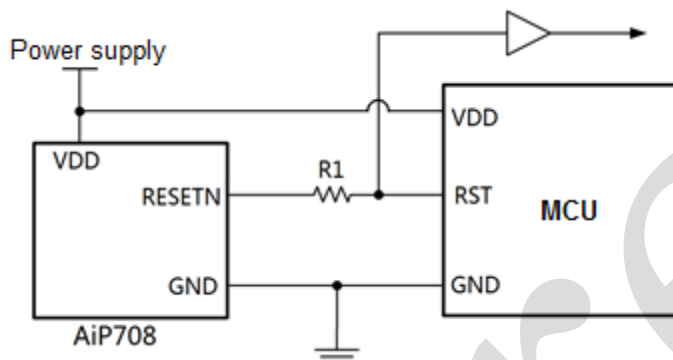
When designing the value of R1 and R2, the overall requirements for power consumption must be considered.

When designing the value of R3 and R4, we must consider the overall requirements for power consumption and the model requirements of peripheral transistors.

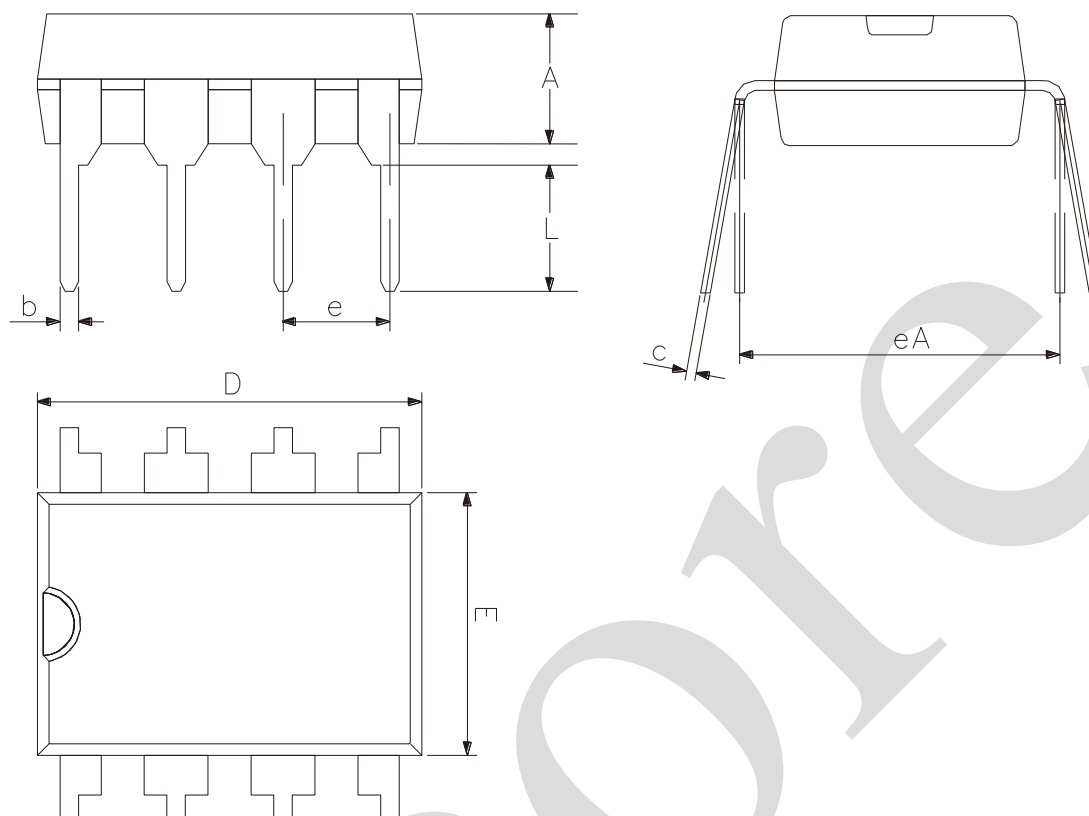


5.4、 Match Controller With Bidirectional Attribute Reset

The hardware reset pins of some microcontrollers have bidirectional properties (they can output signals under certain conditions). At this time, when using AiP708 to provide hardware reset signals for these devices, additional design is required on the interface. As shown in the figure below, this function can be achieved by serially connecting a resistor between the RESETN port of the AiP708 and the RST (IO attribute) of the controller.



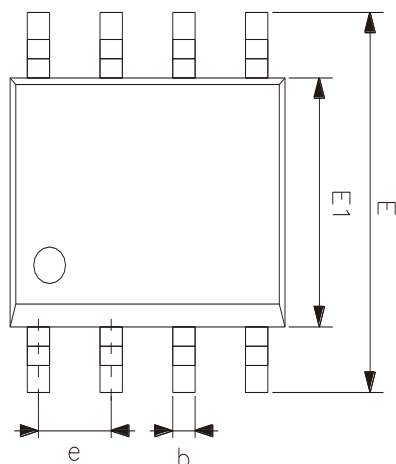
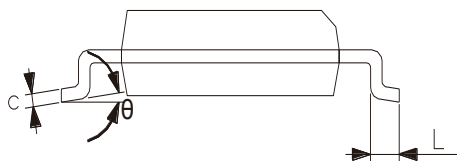
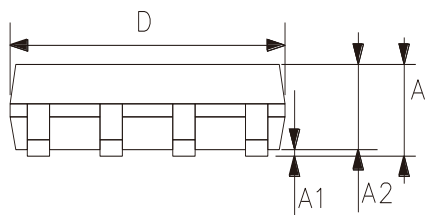
When designing the value of R1, the output driving ability of the microcontroller RST port must be considered. It is recommended to use 4.7K Ω , which can meet the requirements of most conditions.

**6、Package Information****6.1、DIP8**

2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	3.00	3.60
b	0.36	0.56
c	0.20	0.36
D	9.00	9.45
E	6.15	6.60
e	2.54	
eA	7.62	9.30
L	3.00	—



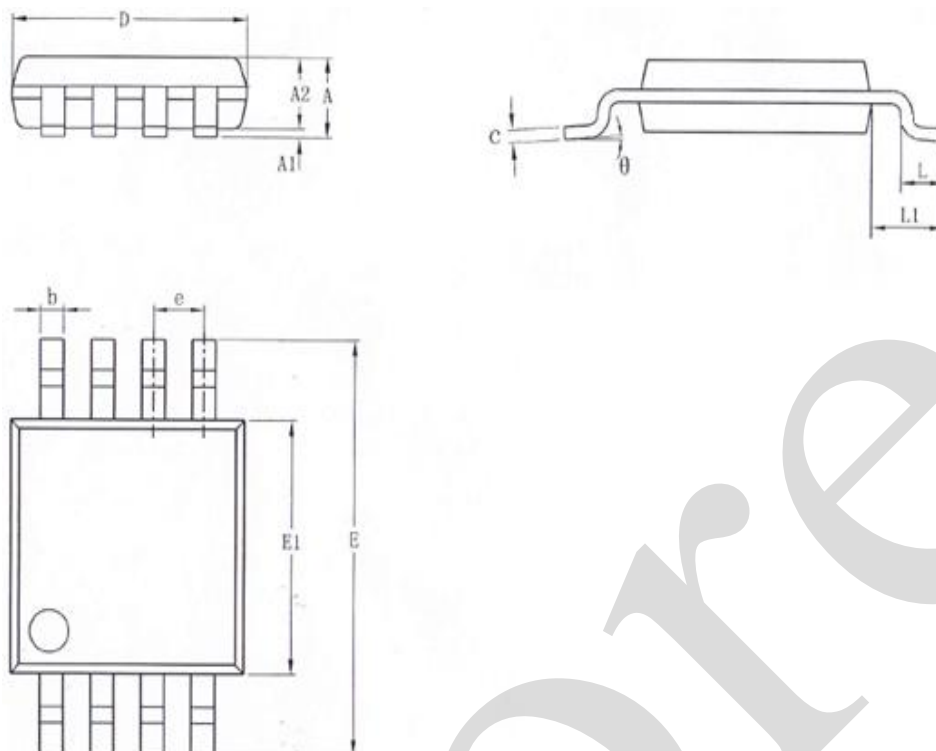
6.2、SOP8



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	1.35	1.80
A1	0.05	0.25
A2	1.25	1.55
D	4.70	5.10
E	5.80	6.30
E1	3.70	4.10
b	0.306	0.51
c	0.19	0.25
e	1.27	
L	0.40	0.89
θ	0°	8°



6.3、MSOP8



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.10
A1	0.05	0.15
A2	0.75	0.95
b	0.22	0.38
c	0.08	0.23
D	2.90	3.10
E	4.70	5.10
E1	2.90	3.10
e	0.65	
L	0.40	0.80
L1	0.95	
θ	0°	8°



7、Statements And Notes

7.1、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.									

7.2、Notes

We recommend you to read this chapter carefully before using this product.

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