



AiP823

Microprocessor Reset Circuit

Product Specification

Specification Revision History:

Version	Date	Description
2020-08-A1	2020-08	New
2023-03-B1	2023-03	Update the template
2023-05-B2	2023-05	Modify the parameters
2023-10-B3	2023-10	Modify the content
2025-06-B4	2025-06	Add the RESETN port output drive parameters; Update package information



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1、General Description

The AiP823 is a microprocessor reset circuit with watchdog function. The circuit integrates the function of power supply voltage detection, watchdog, and hardware reset.

Features:

- Low active level reset signal RESETN
- RESETN port presents active output signal when VDD>1V
- Power-on reset delay time: typical 200ms
- Watchdog reset delay time: typical 1.6s
- Low power
- ESD-HBM: 4000V
- Package information: SOT23-5

Selection Table

Model number	Reset threshold voltage
AiP823L	4.63V
AiP823M	4.38V
AiP823J	4.00V
AiP823T	3.08V
AiP823S	2.93V
AiP823R	2.63V

**Ordering Information:****Reel packing specifications:**

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP823LGB235.TR	SOT23-5	823LXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP823MGB235.TR	SOT23-5	823MXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP823JGB235.TR	SOT23-5	823JXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP823TGB235.TR	SOT23-5	823TXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP823SGB235.TR	SOT23-5	823SXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP823RGB235.TR	SOT23-5	823RXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm

Note 1: "XX" refers to variable content, meaning 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

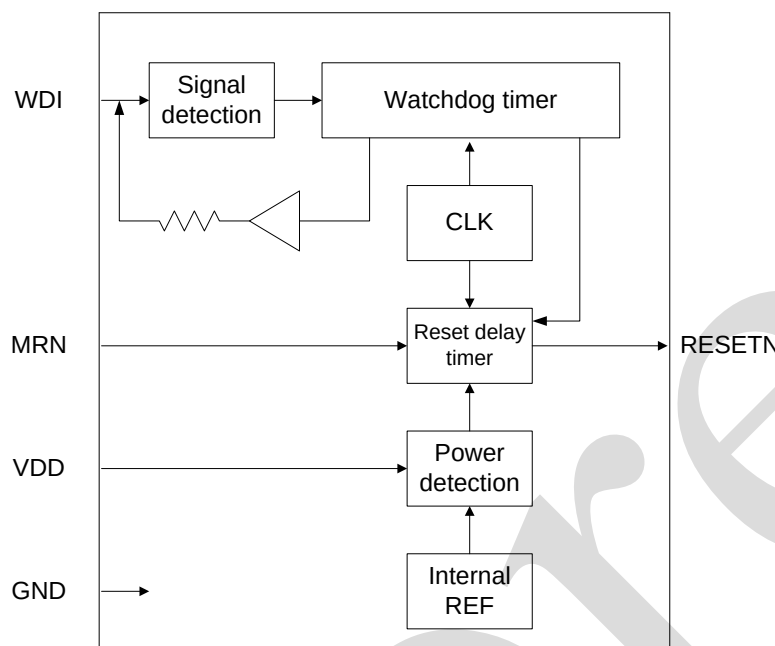


Figure 1. Block diagram

2.2、 Pin Configurations

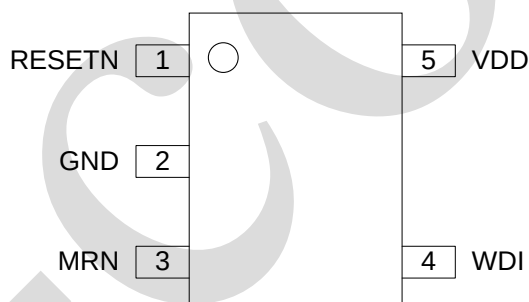


Figure 2. Pin configurations

2.3、 Pin Description

Pin No.	Symbol	I/O	Description
1	RESETN	O	Power detection reset output
2	GND	Power	Ground
3	MRN	I	Hardware reset signal input, LOW active
4	WDI	I	Watchdog input
5	VDD	Power	Power



3、Electrical Parameter

3.1、Absolute Maximum Ratings

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

Parameter	Symbol	Rated value	Unit
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 (10s)	T_L	260	$^{\circ}\text{C}$

Note:

1) Operations 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 specification are not supported.

2) All voltage values are based on the ground terminal as a reference point.

3.2、Recommended Operating Conditions

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

3.3、Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	VDD	-	1	-	5.5	V
supply current	IDD	AiP823L	-	30	60	μA
		AiP823M	-	30	60	μA
		AiP823J	-	30	60	μA
		AiP823T	-	30	60	μA
		AiP823S	-	30	60	μA
		AiP823R	-	30	60	μA
power detection voltage	V_T	AiP823L	4.530	4.63	4.730	V
		AiP823M	4.285	4.38	4.475	V
		AiP823J	3.914	4	4.086	V
		AiP823T	3.013	3.08	3.147	V
		AiP823S	2.867	2.93	2.993	V
		AiP823R	2.573	2.63	2.687	V
power detection hysteresis voltage	V_{hys}	-	-	40	-	mV
power detection delay time	T_{RST}	-	120	200	600	ms
RESETN output high-level voltage	V_{OHRSTN}	Iload=800 μA	3.5	-	-	V
RESETN output low-level voltage	V_{OLRSTN}	Iload=3.2mA	-	-	0.4	V
watchdog reset time	T_{WD}	-	1.0	1.6	2.3	s

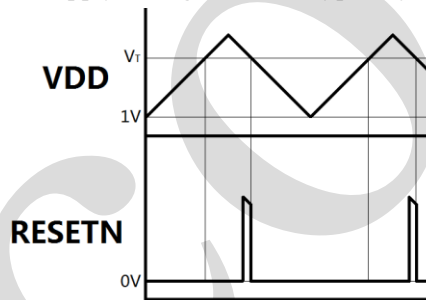


WDI high-level input current	I_{WDI}	WDI=VDD	-	100	150	μA
WDI low-level input current		WDI=0V	-10	-1	-	μA
WDI input high-level voltage	V_{IWDI}	-	3.5	-	-	V
WDI input low-level voltage		-	-	-	0.8	V
MRN low-level input current	I_{MRN}	MRN=0V	-	100	-	μA
MRN high-level input voltage	V_{IMRN}	-	$0.7 \times VDD$	-	-	V
MRN low-level input voltage		-	-	-	$0.3 \times VDD$	V

4、Function Description

4.1、Power Supply Detect

When the power supply voltage is lower than the power supply detection voltage (V_T), the RESETN port outputs a low level. When the power supply voltage exceeds V_T , reset delay timer controls delay fixed time, typically 200ms, the RESETN port outputs a high level. There is a certain hysteresis voltage during the rise and fall process of the power supply voltage near V_T , typically around 40mV.



4.2、Watchdog Timer Function

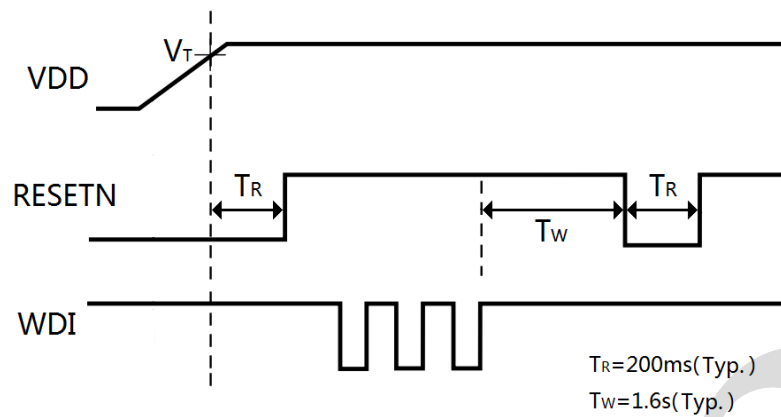
The circuit provides an optional watchdog module, including an input port WDI.

When the supply voltage falls below the power detection voltage (V_T), the internal watchdog timer is reset and the WDI input signal is invalidated.

When the supply voltage exceeds the power detection voltage (V_T), the internal watchdog timer starts counting. When the WDI port remains static (high or low) for 1.6s (typical value), the internal watchdog timer overflows, the reset delay timer is reset, and the RESETN port outputs a low level. The reset delay timer restarts counting for 200ms.

When the RESETN port outputs a low level or WDI is in a floating state, the watchdog function is disabled, and the internal watchdog timer is reset.

When the RESETN port outputs a high level, the watchdog timer starts counting. Whenever a signal transition (rising or falling edge) occurs on the WDI port, it resets the watchdog timer, and maintains the WDON output at a high level.



4.3、External Reset

The circuit provides an external hardware reset function, controlled by the MRN port. When the MRN port input is at a low-level, the RESET port will maintain a low-level output, and the watchdog function is reset.

When the supply voltage exceeds the power detection voltage (V_T), if the MRN port input transitions from low level to high level, the reset delay timer controls a fixed delay time (typically 200ms), and the RESETN port outputs a high level.



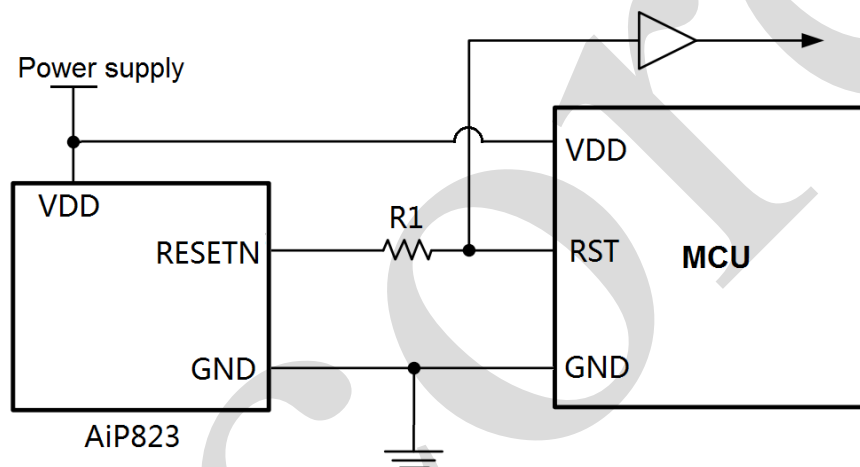
5、Application Note

5.1、Ensure A Reliable RESETN Reset Signal

When the supply voltage is below 1V, the circuit's RESETN port cannot guarantee a stable and valid low-level output signal. When users require a definite reset signal within the supply voltage range of 0~1V, it is highly recommended to add a pull-down resistor to ground on the RESETN port. The resistance value of the pull-down resistor should be determined based on the system's operating environment requirements. 100K Ω is recommended, as this value accommodates most operating conditions.

5.2、Match Controllers with Bidirectional Reset Ports

Some microcontrollers have hardware reset pins with bidirectional capability (capable of outputting signals under certain conditions). When using AiP823 to provide hardware reset signals to such devices, additional interface design is required. As shown in the figure below, connect a series resistor between the RESETN port of AiP823 and the controller's RST pin (with I/O capability) to implement this function.

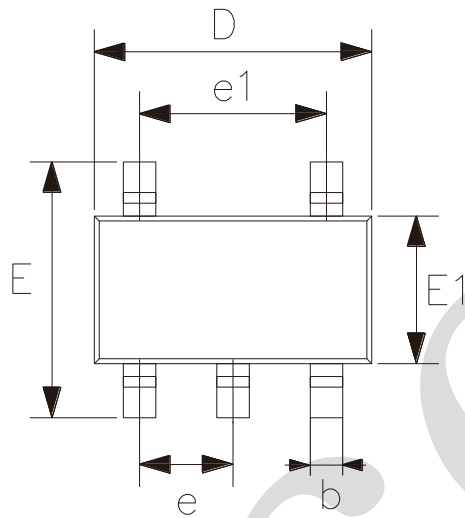
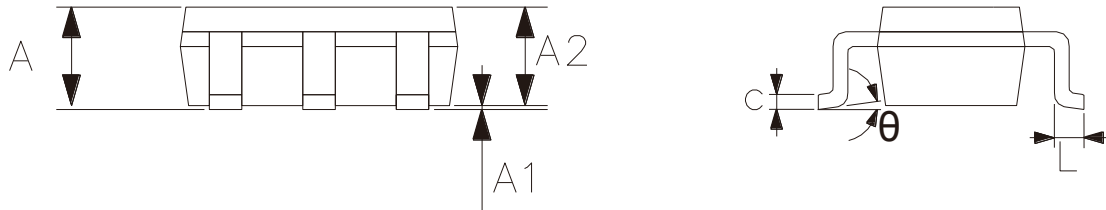


When designing the value of R1, the output drive capability of the microcontroller's RST port must be considered. 4.7K Ω is recommended, as this value accommodates most operating conditions.



6、Package Information

6.1、SOT23-5



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	—	1.26
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
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

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