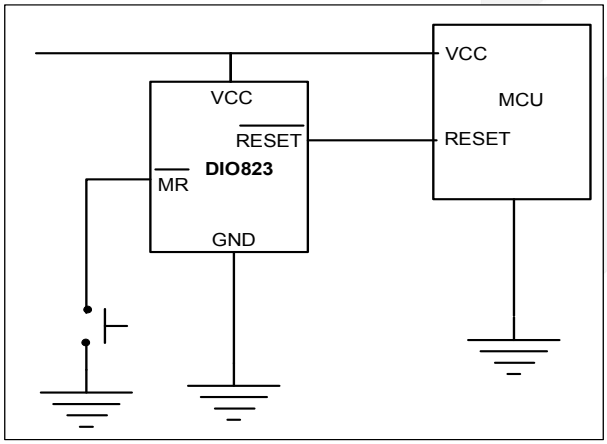
DIO823

Low Power Microprocessor Supervisory Circuits

Features

- Guaranteed reset valid at VCC=1.15V
- Reset threshold can be from 2.6V to 5.0V with 0.1V step.
- Low operating current: 52uA@5V
- Reset pulse width:200ms
- Voltage monitor for low battery warning
- Pin-to-Pin compatible with industry standard
- Available in Package of SOT23-5

Typical Application



Descriptions

DIO823 series is a family of microprocessor (μP) supervisory circuit that monitors microprocessor's supply voltage and battery voltage. The series integrates μP reset circuit with 200ms delay. These devices reduce system complexity, hence improve system reliability.

DIO823 series has several functional options. Each device generates a reset signal when VCC is lower than reset threshold. DIO823 provide active low reset.

DIO823 series is ideal for applications in automotive systems, computers, controllers and intelligent instruments. All devices are available in SOT23-5 package.

Applications

- Computers
- Controllers
- Intelligent instruments
- Automotive systems

Ordering Information

Order Part Number	Top Marking	Green	T_A	Package	
DIO823XCST5	YWCX	Yes	-40 to +85°C	SOT23-5	Tape & Reel, 3000

Ordering Code = Part No. + Package Code;

CST: Stands for SOT23-5

X: Refer to Device Function Reference Table as Below

Device Function Reference Table

Part No.	Reset Threshold	Reset Active Low or High
DIO823	4.4V	Low
DIO823J	4.0V	Low
DIO823T	3.08V	Low
DIO823S	2.93V	Low
DIO823R	2.63V	Low
DIO823P	2.63V	High

Pin Assignments

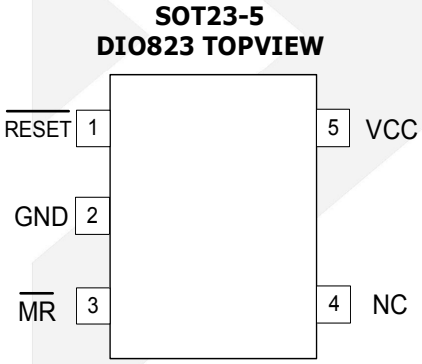


Figure 1 Pin Assignment

Pin Description

Pin No.	Name	Function
1	$\overline{\text{RESET}}$	Active low reset output. *$\overline{RESET}$ stays in low if VCC is lower than reset threshold; it remains in low for 200ms after VCC becomes higher than reset threshold or $\overline{MR}$ goes from low to high.*
2	GND	Negative supply input
3	$\overline{\text{MR}}$	Manual reset input. *When voltage at $\overline{MR}$ is pulled low, a reset pulse will be triggered. The active low input has a pull up current. It can be driven by TTL or CMOS logic as well as shorted to GND with a switch*
4	NC	No connect.
5	VCC	Positive supply input

Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Rating” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maxim rating conditions for extended periods may affect device reliability.

Parameter		Rating	Unit
Terminal Voltage(With respect to GND)	VCC	-0.3 to 6.0	V
	Other Inputs	-0.3 to 6.0	
Terminal Current	VCC	20	mA
	GND	20	mA
	All Input Pins	20	mA
	All Output Pins	20	mA
Power Dissipation (SOT23-5)		190	°C/W
Maximum Junction Temperature		150	°C
Operating Temperature/T_A		-40 to 85	°C
Storage Temperature/T_{STO}		-65 to 150	°C
Lead Temperature Rating		300	°C
ESD Rating	HBM	2	KV

Electrical Characteristics

Typical value: T_A = 25°C, VCC=5V, unless otherwise specified.

Symbol	Parameters	Conditions		Min	Typ.	Max	Unit
VCC	Operating Voltage Range			1.15		5.5	V
I_{VCC}	Supply Current				52	105	uA
V_{RES}	Reset Threshold	DIO823		4.25	4.4	4.5	V
		DIO823J		3.9	4.0	4.1	
		DIO823T		3.0	3.08	3.15	
		DIO823S		2.85	2.93	3.0	
		DIO823P/823R		2.55	2.63	2.70	
H_{VRES}	Reset Threshold Hysteresis				$0.01V_{RES}$		V
t_{RES}	Reset Pulse Width			140	200	280	ms
V_{OH1}	$\overline{\text{RESET}}$ Output Voltage	I_{SOURCE}=800uA		VCC-1.2			V
V_{OH1}		I_{SOURCE}=8uA, VCC=1.2V		1.0			V
V_{OL1}		I_{SINK}=3.2mA				0.3	V
		I_{SINK}=150uA, VCC =1.2V				0.3	V
	MR Pull up Current	MR=0V, VCC =5V		100	250	600	uA
		MR=0V, VCC =4V		60	152	360	
		MR=0V, VCC =3V		32	75	180	
		MR=0V, VCC =2.5V		20	44	105	
T_{MR}	MR Pulse Width	VCC =5V				250	ns
		VCC <4.5V				750	
	MR Input Threshold	VCC =5V	Low			0.8	
			High	2.0			
		VCC <4.5V	Low		0.16 VCC		
			High	0.65VCC			
t_{MD}	MR's Delay to RESET	VCC =5V				250	ns
		VCC <4.5V				750	ns

Specifications subject to change without notice.

Block Diagram

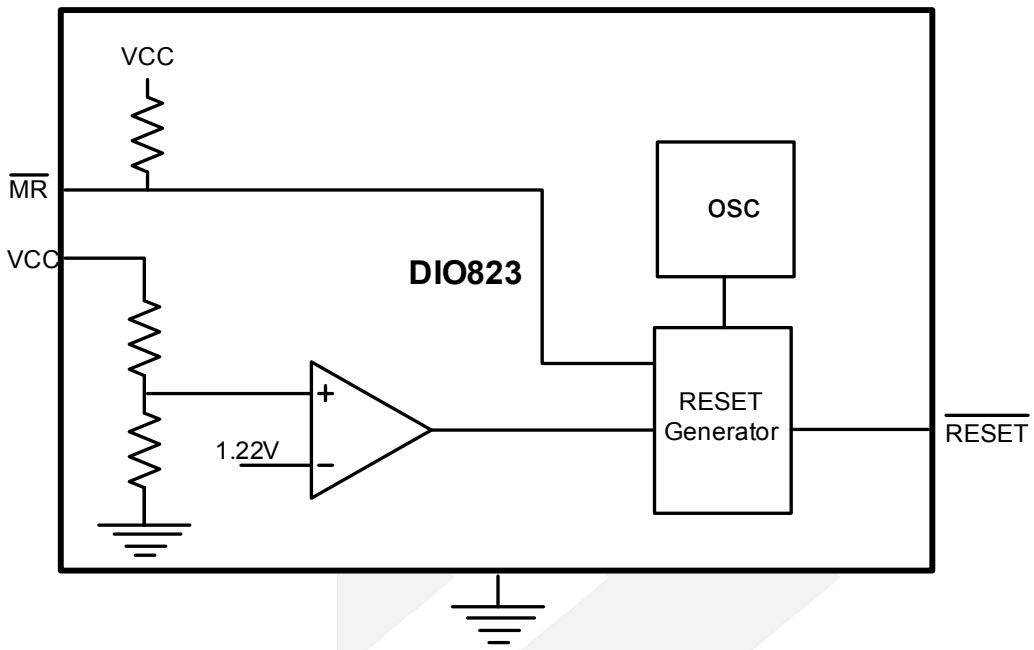
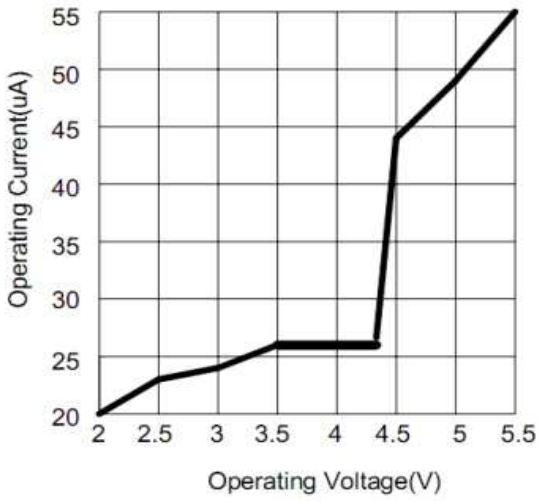


Figure 2 DIO823 Block Diagram

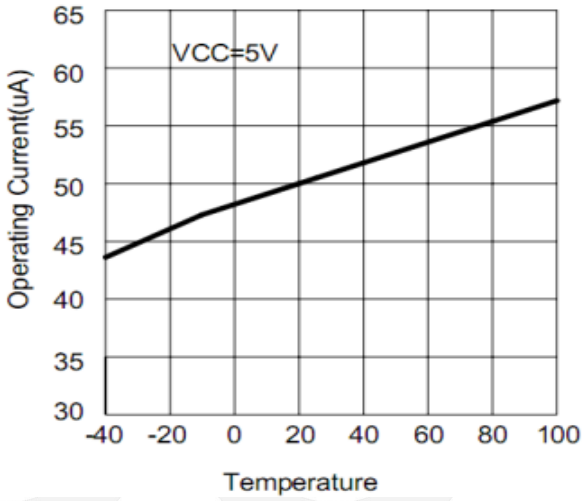
Typical Operating Characteristics

All typical value are at V+=5V, T_A = 25°C, unless otherwise specified.

DIO823 Operating Current Vs. Operating Voltage



DIO823 Operating Current Vs. Temperature



Application Information

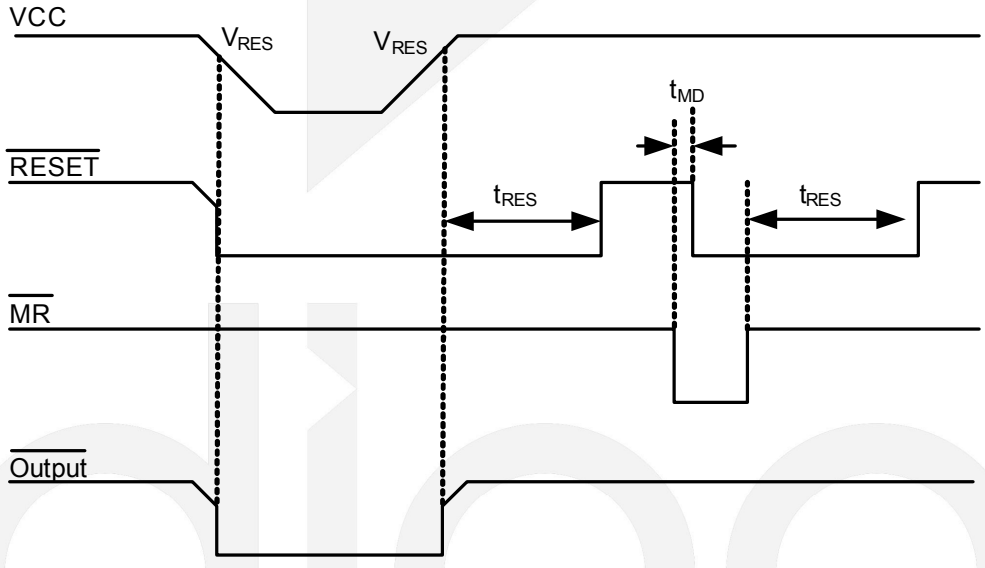
DIO823 series is a microprocessor supervisory circuit that monitors the power supply to digital circuits such as microprocessor, controller and memory. These devices assert reset during power up, power down or brownout condition to prevent code execution errors.

RESET Output

On power up, once VCC reaches 1.15V, DIO823 series output a reset signal. As VCC increases, the reset signal stays valid; When VCC rises above reset threshold, an internal timer releases RESET ($\overline{RESET}$) after 200ms. RESET ($\overline{RESET}$) becomes valid once VCC dips below reset threshold during power down or in brownout condition. If brownout occurs in the middle of a previously initiated reset pulse, the pulse will continue for at least another 140ms. On power down, once VCC falls below reset threshold, RESET stays valid and is guaranteed in the correct logic state until VCC drops below 1.15V for the whole temperature range. Please refer to Figure 4. DIO823 series provide active low $\overline{RESET}$ signal.

Manual Reset

Manual reset input allows reset signal to be triggered by push button or switch. The push button or switch is effectively denounced by 140ms minimum reset pulse width. $\overline{MR}$ is TTL/CMOS logic compatible. Please refer to Figure 4.



Note:Active high RESET is the inverse of the $\overline{RESET}$ shown

Figure 4 RESET, MR and Output timing

Ensuring a Valid RESET Output Down to VCC=0V

When VCC falls below 1.15V, the DIO823 series $\overline{\text{RESET}}$ output no longer sinks current, it becomes an open circuit, and hence $\overline{\text{RESET}}$ output is at undetermined voltage. If a pull-down resistor is added from $\overline{\text{RESET}}$ pin to GND as shown in Figure 5, then $\overline{\text{RESET}}$ output will be held at low state. The resistor's value is not critical. it should be about 100KΩ, large enough not to load, small enough to pull $\overline{\text{RESET}}$ to ground.

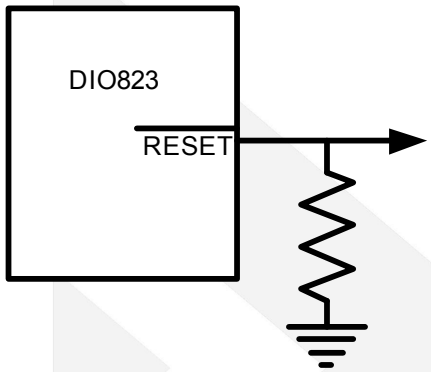


Figure 5 RESET Valid to Ground Circuit

Interfacing to µPs with Bidirectional Reset Pins

µPs with bi-directional reset pins, such as the MOTOROLA 68HC11 series, can contend with DIO823 series RESET output. For example, if the RESET output is driven high and µP wants to pull it low, indeterminate logic levels may result. To correct this, connect a 4.7KΩ resistor between the RESET output and the µP reset I/O as shown in Figure 6. Buffer the RESET output to other system components.

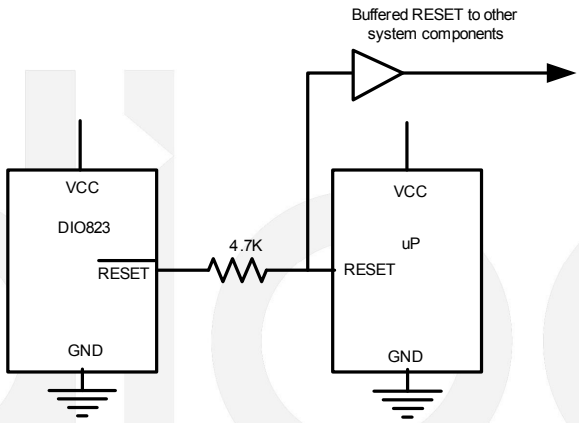


Figure 6 Interfacing to µPs with Bidirectional Reset I/O

CONTACT US

Dioo is a professional design and sales corporation for high-quality and performance analog semiconductors. The company focuses on industry markets, such as, cell phone, handheld products, laptop, and medical equipment and so on. Dioo's product families include analog signal processing and amplifying, LED drivers and charger IC. Go to http://www.dioo.com for a complete list of Dioo product families.

For additional product information, or full datasheet, please contact with our Sales Department or Representatives.