

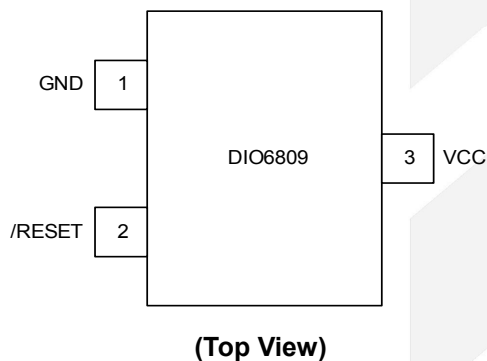
## DIO6809

# Ultra Low Power Microprocessor Reset Circuit

### Features

- 140ms min Reset Pulse Width
- 10 $\mu$ A Typ Supply Current @ $V_{CC}=3V$
- Guaranteed Reset Valid to  $V_{CC} = +1.0V$
- Power Supply Transient Immunity
- Operating Temperature Range  
-40°C to +85°C
- Available in SOT-23 and SOT-23-3L

### Block Diagram



### Descriptions

DIO6809 series are micro-processor( $\mu$ P) supervisory circuits used to monitor the power supplies in  $\mu$ P and digital systems. They provide excellent circuit reliability and low cost by eliminating external components.

These circuits perform a single function: they assert a reset signal whenever the  $V_{CC}$  supply voltage declines below a preset threshold, keeping it asserted for at least 140ms after  $V_{CC}$  has risen above the reset threshold.

The DIO6809 has CMOS outputs. The DIO6809 has an active-low /RESET output, The reset comparator is designed to ignore fast transients on  $V_{CC}$ , and the outputs are guaranteed to be in the correct logic state for  $V_{CC}$  down to 1.0V over the temperature range.

The device is available in 3 pin SOT-23 and SOT-23-3L package.

### Applications

- Computers
- Controllers
- Intelligent Instruments
- Portable/Battery-Powered Equipment

### Ordering Information

Order Part Number		$T_A$	Package	
DIO6809XST3	RoHS	-40 to +85°C	SOT-23	Tape & Reel, 3000
DIO6809XSU3	RoHS	-40 to +85°C	SOT-23-3L	Tape & Reel, 3000



# DIO6809

## Ordering Information Complimentary Note

Ordering Code = Part No. + Package Code

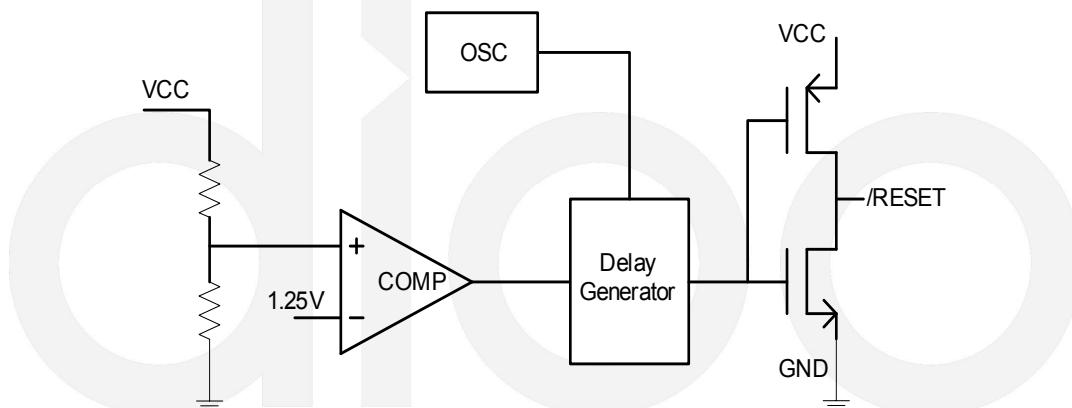
ST3: stands for SOT-23  
SU3: stands for SOT-23-3L

X: Refer to Device Function Reference Table on Page 2

## Device Function Reference Table

Part No.	Reset threshold	Reset active Low or High	Output Type	Marking
DIO6809L	4.63V	Low	CMOS	AAAA
DIO6809M	4.38V	Low	CMOS	ABAA
DIO6809J	4.00V	Low	CMOS	CWAA
DIO6809T	3.08V	Low	CMOS	ACAA
DIO6809S	2.93V	Low	CMOS	ADAA
DIO6809R	2.63V	Low	CMOS	AFAA
DIO6809Z	2.32V	Low	CMOS	AEAA

## Block Diagram





# DIO6809

## Pin Descriptions

Pin No.	Symbol	Description
1	GND	Ground terminal
2	/RESET	CMOS output. This output remains low if $V_{CC}$ drops below $V_{RES}-V_{HYST}$ , and for at least 140ms after $V_{CC}$ rises above $V_{RES}$ .
3	$V_{CC}$	Analog input. This pin is both the power supply to internal circuit and the voltage to be monitored

## 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 maximum rating conditions for extended periods may affect device reliability.

Parameter		Rating	Units
Terminal Voltage (With respect to GND)	$V_{CC}$	-0.3 to 6.0	V
	/RESET	-0.3 to 6.0	
Input Current	$V_{CC}$	20	mA
	/RESET	20	
Thermal Resistance		300	°C/W
Operating Temperature		-40 to 85	°C
Lead Temperature Range (soldering 10s)		300	°C
Storage Temperature		-65 to 150	°C
ESD HBM, JEDEC: JESD22-A114		4500	V



# DIO6809

Ultra Low Power Microprocessor Reset Circuit

## DC Electrical Characteristics

Typical value:  $V_{CC}=3V$ ,  $T_A=25^{\circ}C$ , unless otherwise noted.

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum input voltage	$V_{CCMAX}$				5.5	V
Minimum input voltage	$V_{CCMIN}$		1.0			V
Supply current	$I_{VCC}$	$V_{CC}=2.0V$		8		uA
		$V_{CC}=3.0V$		10		
		$V_{CC}=5.0V$		14		
Reset Threshold	$V_{RES}$	DIO6809L	4.51	4.63	4.75	V
		DIO6809M	4.25	4.38	4.5	
		DIO6809J	3.9	4.00	4.1	
		DIO6809T	3.0	3.08	3.15	
		DIO6809S	2.75	2.93	3.05	
		DIO6809R	2.56	2.63	2.7	
		DIO6809Z	2.26	2.32	2.38	
Temperature coefficient of reset threshold	$T_C$				$\pm 100$	ppm
Reset Threshold hysteresis	$V_{HYST}$			$0.05V_{RES}$		V
$V_{CC}$ to /RESET Delay		$V_{CC}$ transitions from $V_{RES}+0.1V$ to $V_{RES}-0.1V$		23		us
/RESET Output Voltage Low	$V_{OL}$	$V_{CC}=2V, V_{RES}>2V, I_{SINK}=1.5mA$			0.3	V
		$V_{CC}=3V, V_{RES}>3V, I_{SINK}=3.2mA$			0.3	
		$V_{CC}=4V, V_{RES}>4V, I_{SINK}=5mA$			0.3	
/RESET Output Voltage High	$V_{OH}$	$V_{CC}=3V, V_{RES}<3V, I_{SOURCE}=1.2mA$	$V_{CC}-0.4$			V
		$V_{CC}=4V, V_{RES}<4V, I_{SOURCE}=2mA$	$V_{CC}-0.4$			
		$V_{CC}=5V, V_{RES}<5V, I_{SOURCE}=2.5mA$	$V_{CC}-0.4$			
Reset Pulse Width	$T_{RES}$		140	240	500	ms

Specifications subject to change without notice.



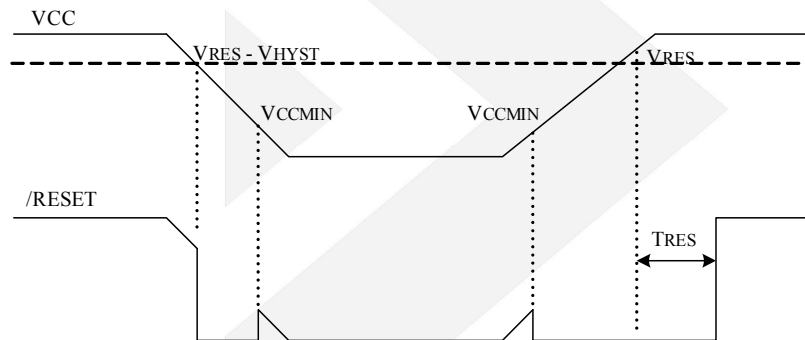
## DIO6809

### Detailed Description

A microprocessor's ( $\mu\text{P}$ 's) reset input starts the  $\mu\text{P}$  in a known state. The DIO6809 series assert reset to prevent code-execution errors during power-up, power-down, or brownout conditions. The device consists of a comparator, a low current high precision voltage reference, voltage divider, output delay circuit and output driver. They assert a reset signal whenever the  $V_{\text{CC}}$  supply voltage declines below a preset threshold, keeping it asserted for at least 140ms after  $V_{\text{CC}}$  has risen above the reset threshold.

The DIO6809 have a CMOS output stage. The DIO6809 have an active-low  $\text{/RESET}$  output, The reset comparator is designed to ignore fast transients on  $V_{\text{CC}}$ , and the outputs are guaranteed to be in the correct logic state for  $V_{\text{CC}}$  down to 1.0V over the temperature range.

The operation of the device can be best understood by referring to figure 2.



### Applications Information

#### Negative-Going $V_{\text{CC}}$ Transients

In addition to issuing a reset to the  $\mu\text{P}$  during power-up, power-down, and brownout conditions, the DIO6809 series are relatively immune to short-duration negative-going  $V_{\text{CC}}$  transients (glitches). As the magnitude of the transient increases (goes farther below the reset threshold), the maximum allowable pulse width decreases. Typically, a  $V_{\text{CC}}$  transient that goes 100mV below the reset threshold and lasts 10 $\mu\text{s}$  or less will not cause a reset pulse. A 0.1 $\mu\text{F}$  bypass capacitor mounted as close as possible to the  $V_{\text{CC}}$  pin provides additional transient immunity.

#### Ensuring a Valid Reset Output Down to $V_{\text{CC}} = 0$

When  $V_{\text{CC}}$  falls below 1.0V, the DIO6809  $\text{/RESET}$  output no longer sinks current—it becomes an open circuit. Therefore, high-impedance CMOS logic inputs connected to  $\text{/RESET}$  can drift to undetermined voltages. This presents no problem in most applications, since most  $\mu\text{P}$  and other circuitry is inoperative with  $V_{\text{CC}}$  below 1.0V.

## DIO6809

However, in applications where /RESET must be valid down to 0V, a pull-down resistor is needed from /RESET pin to GND as shown in Figure 3, then /RESET output will be held at low state. The resistor's value is not critical, it should be about 100K $\Omega$ , large enough not to load /RESET, small enough to pull /RESET to ground.

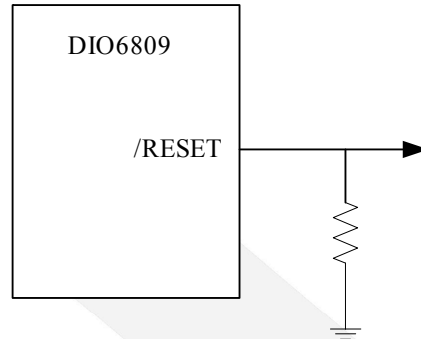


Figure 3 RESET Valid to Ground Circuit

dioo

## Typical Performance Characteristics

All typical value:  $V_{CC}=5V$ ,  $T_A=25^{\circ}C$ , unless otherwise specified.

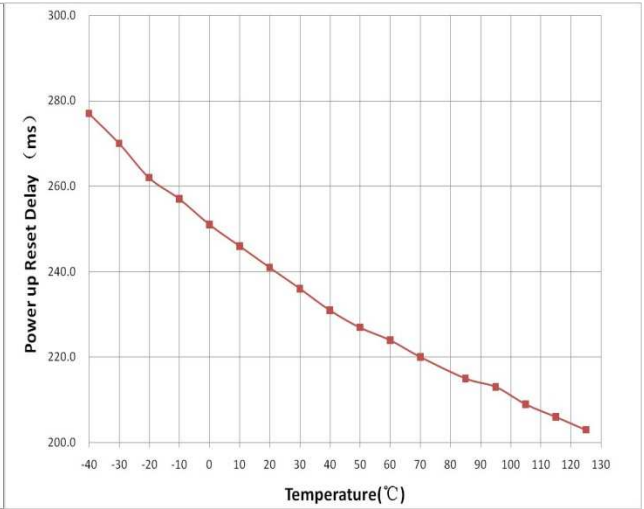
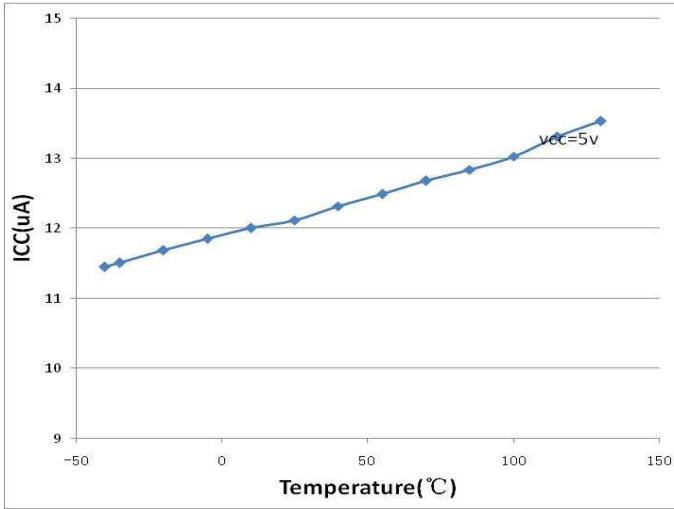


Figure 4 Figure 5

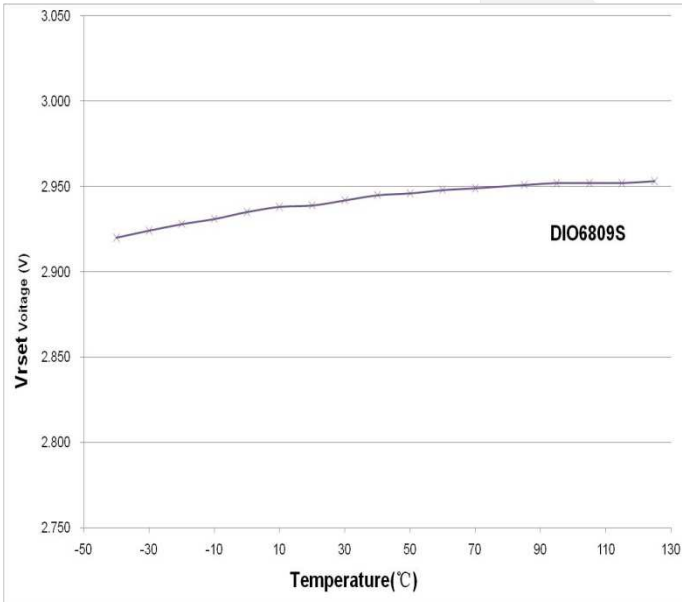


Figure 6

## 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 equipments 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.

