

General Description

The MIC1810 is an inexpensive microprocessor supervisory circuit that monitors power supplies in microprocessor based systems.

The function of these devices is to assert a reset if the power supply drops below a designated reset threshold level. Several different reset threshold levels are available to accommodate 5%, 10%, or 15% drop in 5V powered systems.

The MIC1810 has an active low /RESET output. The reset output is guaranteed to remain asserted for a minimum of 100ms after V_{CC} has risen above the designated reset threshold level. The MIC1810 comes in a 3-pin SOT-23 package.

Features

- Precision voltage monitor for 5%, 10%, or 15% drop in 5V power supplies
- /RESET remains valid with V_{CC} as low as 1V
- 5 μ A supply current (typical)
- 100ms minimum reset pulse width
- No external components required
- Available in 3-pin SOT-23 package

Applications

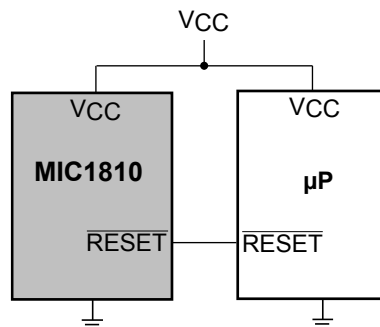
- Portable equipment
- Intelligent instruments
- Critical microprocessor power monitoring
- Printers/computers
- Embedded controllers

Ordering Information

Part Number	Marking*	Threshold Voltage	Operating Temp. Range	Package	Pb-Free
MIC1810-5U	NA	4.62V	-40°C to +85°C	SOT-23	No
MIC1810-10U	NB	4.37V	-40°C to +85°C	SOT-23	No
MIC1810-15U	NC	4.12V	-40°C to +85°C	SOT-23	No
MIC1810-5UY	<u>NA</u>	4.62V	-40°C to +85°C	SOT-23	Yes
MIC1810-10UY	<u>NB</u>	4.37V	-40°C to +85°C	SOT-23	Yes
MIC1810-15UY	<u>NC</u>	4.12V	-40°C to +85°C	SOT-23	Yes

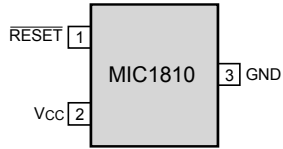
* Underbar symbol may not be to scale

Typical Application



Pin Configuration

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3-Lead SOT-23

Pin Description

Pin Number	Pin Name	Pin Function
1	/RESET	/RESET goes low if V_{CC} falls below the reset threshold and remains asserted for one reset timeout period (100ms min) after V_{CC} exceeds the reset threshold.
2	VCC	Power supply input.
3	GND	IC ground pin

Absolute Maximum Ratings(Note 1)

Terminal Voltage (V_{CC})	-0.3V to +6V
Input Current (V_{CC})	20mA
Output Current, /RESET	20mA
Rate of Rise (V_{CC})	100V/ μ s
Lead Temperature (soldering, 10 sec.)	300°C
Storage Temperature (T_S)	-65°C to 150°C
ESD Rating, Note 3	3kV

Operating Ratings(Note 2)

Operating Temperature Range	
MIC1810-5U	-40°C to +85°C
MIC1810-10U	-40°C to +85°C
MIC1810-15U	-40°C to +85°C
Power Dissipation ($T_A = +70^\circ\text{C}$)	320mW

Electrical Characteristics

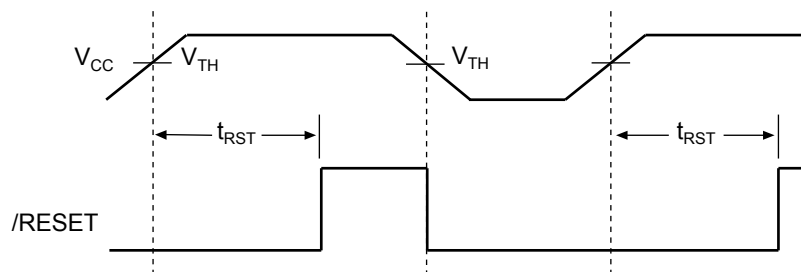
For typical values $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$; **bold** values indicate $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$; unless noted

Symbol	Parameter	Condition	Min	Typ	Max	Units
	Operating Voltage Range	$T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$	1		5.5	V
I_{CC}	Supply Current			5	20	μA
V_{TH}	Reset Voltage Threshold	MIC1810-5	4.50	4.62	4.75	V
		MIC1810-10	4.25	4.37	4.50	V
		MIC1810-15	4.00	4.12	4.24	V
t_{RST}	Reset Timeout Period		100	150	250	ms
V_{OH}	/RESET Output Voltage, High	$I_{SOURCE} = 800\mu\text{A}$	$V_{CC}-1.5$			V
V_{OL}	/RESET Output Voltage, Low	$V_{CC} = V_{TH} \text{ min.}, I_{SINK} = 10\text{mA}$			0.4	V
		$V_{CC} \geq 1\text{V}, I_{SINK} = 50\mu\text{A}$			0.3	V

Note 1. Exceeding the absolute maximum rating may damage the device.

Note 2. The device is not guaranteed to function outside its operating rating.

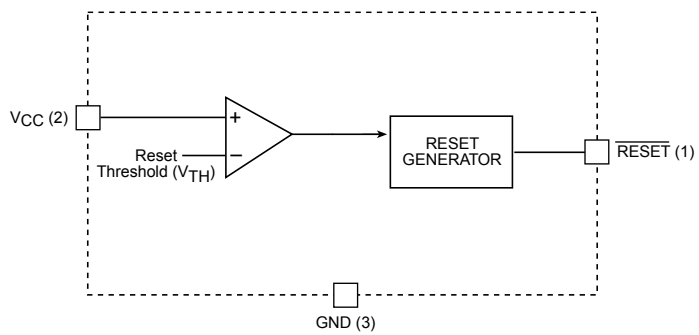
Note 3. Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

Timing Diagram

Reset Timing Diagram

Functional Diagram

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Applications Information

Microprocessor Reset

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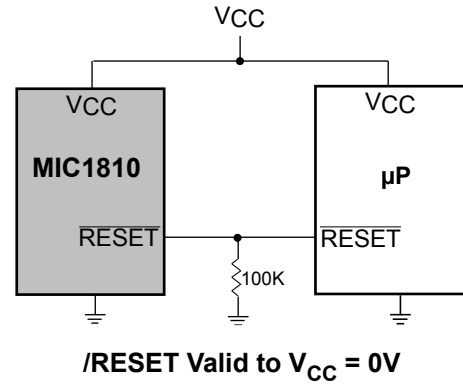
The $\overline{\text{RESET}}$ pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of t_{RST} after V_{CC} has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after a power failure. $\overline{\text{RESET}}$ will remain valid with V_{CC} as low as 1V.

V_{CC} Transients

The MIC1810 is relatively immune to negative-going V_{CC} glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20 μs or less will not cause an unwanted reset.

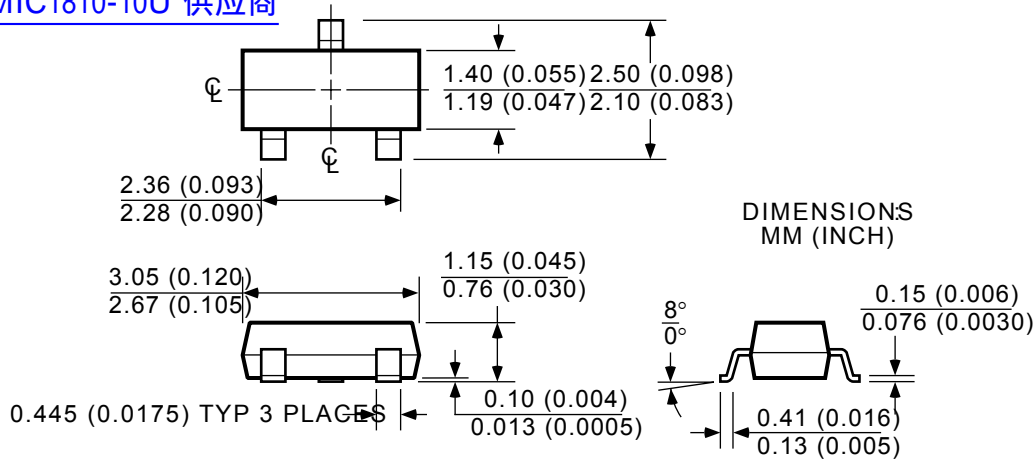
$\overline{\text{RESET}}$ Valid at Low Voltage

A resistor can be added from the $\overline{\text{RESET}}$ pin-to-ground to ensure the $\overline{\text{RESET}}$ output remains low with V_{CC} down to 0V. A 100k Ω resistor connected from $\overline{\text{RESET}}$ -to-ground is recommended. The resistor should be large enough not to load the $\overline{\text{RESET}}$ output and small enough to pull-down any stray leakage currents. See Figure below.



Package Information

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3-Pin SOT-23 Small Outline Transistor

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