MIC1810



Microprocessor Reset Circuit

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 $V_{\rm CC}$ 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
- 5µA supply current (typical)
- 100ms minimum reset pulse width
- No external components required
- Available in 3-pin SOT-23 package

Applications

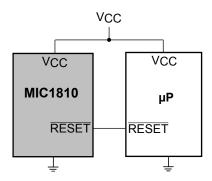
- · Portable equipment
- · Intelligent instruments
- · Critical microprocessor power monitoring
- · Printers/computers
- · Embedded controllers

Ordering Information

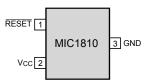
Part Number	Marking*	Threshold Voltage	Operating Temp. Range	Package	Pb-Free
MIC1810-5U	NA	4.62V	–40°C to +85°C	SOT-23	No
MIC1810-10U	NB	4.37V	–40°C to +85°C	SOT-23	No
MIC1810-15U	NC	4.12V	–40°C to +85°C	SOT-23	No
MIC1810-5UY	<u>NA</u>	4.62V	-40°C to +85°C	SOT-23	Yes
MIC1810-10UY	<u>NB</u>	4.37V	-40°C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



3-Lead SOT-23

Pin Description

Pin Number	Pin Name	Pin Function
1	/RESET	/RESET goes low if $V_{\rm CC}$ falls below the reset threshold and remains asserted for one reset timeout period (100ms min) after $V_{\rm CC}$ 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})	
Output Current, /RESET	
Rate of Rise (V _{CC})	100V/µs
Lead Temperature (soldering, 10 sec.)	
Storage Temperature (T _S)	–65°C to 150°C
ESD Rating, Note 3	

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 ($T_A = +70^{\circ}C$)	320mW

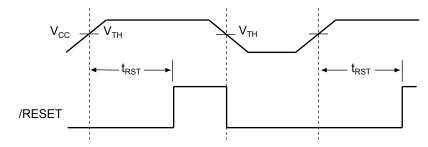
Electrical Characteristics

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

Symbol	Parameter	Condition	Min	Тур	Max	Units
	Operating Voltage Range	$T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$	1		5.5	V
$\overline{I_{CC}}$	Supply Current			5	20	μA
$\overline{V_{TH}}$	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
$\overline{V_{OH}}$	/RESET Output Voltage, High	I _{SOURCE} = 800μA	V _{cc} -1.5			V
V_{OL}	/RESET Output Voltage, Low	V _{CC} = V _{TH} min., I _{SINK} = 10mA			0.4	V
		V _{CC} ≥ 1V, I _{SINK} = 50μA			0.3	V

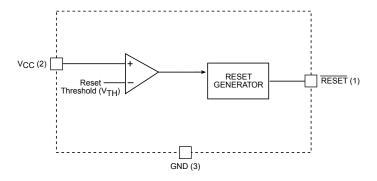
- Note 1. Exceeding the absolute maximum rating may damage the device.
- Note 2. The device is not guaranteed to function outside its operating rating.
- Note 3. Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

Timing Diagram



Reset Timing Diagram

Functional Diagram



Applications Information

Microprocessor Reset

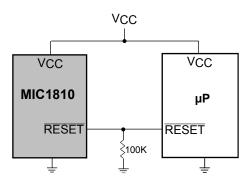
The /RESET pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of t_{RST} after V_{CC} has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after a power failure. /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 20µs or less will not cause an unwanted reset.

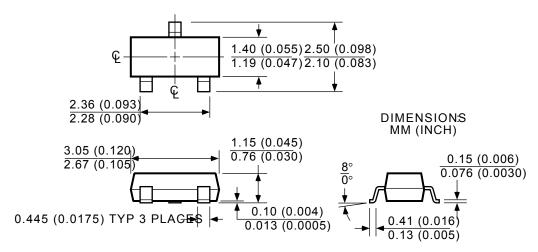
/RESET Valid at Low Voltage

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



/RESET Valid to $V_{CC} = 0V$

Package Information



3-Pin SOT-23 Small Outline Transistor

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