The Infinite Bandwidth Company™

MIC1810

Microprocessor Reset Circuit

Description

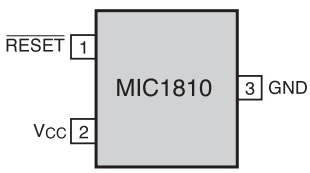
The MIC1810 is an inexpensive microprocessor supervisory circuits that monitor power supplies in microprocessor based systems.

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 accomodate 5%, 10%, or 15% drop in 5V powered systems.

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

Pin Configuration

Top View



Typical Applications

- Portable Equipment
- Intelligent Instruments
- Critical Microprocessor Power Monitoring
- Printers/Computers
- Controllers

Reset Threshold Voltage (V)	Device Suffix
4.62	-5
4.37	-10
4.12	-15

Features

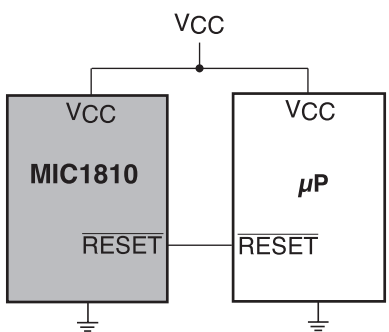
- $\overline{\text{RESET}}$ Remains Valid with VCC as Low as 1.4V
- Precision Voltage Monitor for 5%, 10%, or 15% drop in 5V Power Supplies
- Available in 3-Pin SOT23 Package
- 9µA Supply Current (typical)
- 100ms Minimum Reset Pulse Width
- No External Components Required

Ordering Information

Part	Package	Temp. Range
MIC1810_U	3-Lead SOT23	-40°C to +85°C

Place the device suffix of desired reset threshold voltage from table above in blank to complete the part number.

Typical Operating Circuit



Absolute Maximum Ratings

Terminal Voltage
  V_{CC} . . . . . -0.3V to 6.0V

Input Current, V_{CC}, ... 20mA
Output Current, $\overline{RESET}$ 20mA
Rate of Rise, V_{CC} 100V/µs

Operating Temperature Range
  MIC1810_U . . . . . -40°C to 85°C
Storage Temperature Range . . . . . .-65°C to 150°C
Lead Temperature (Soldering - 10 sec.) . . . . . 300°C
Power Dissipation (T_A = +70°C) 320mW

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability. Operating ranges define those limits between which the functionality of the device is guaranteed.

Electrical Characteristics

V_{CC} = 5V, T_A = Operating Temperature Range, unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Operating Voltage Range, V_{CC}	T_A = 0°C to 70°C T_A = -40°C to 85°C	1.4 1.6		5.5 5.5	V
Supply Current, I_{CC}			9	20	µA
Reset Voltage Threshold, V_{TH}	MIC1810-5 MIC1810-10 MIC1810-15	4.50 4.25 4.00	4.62 4.37 4.12	4.75 4.50 4.24	V
Reset Timeout Period		100	150	250	ms
$\overline{RESET}$ Output Voltage, V_{OH}	I_{Source} = 800µA	V_{CC} - 1.5V			V
$\overline{RESET}$ Output Voltage, V_{OL}	V_{CC}=V_{TH} Min., I_{Sink}=3.2mA V_{CC}>1.4V, I_{Sink} =50µA			0.4 0.3	V

Pin Functions

Pin Name	Pin No.	
$\overline{\text{RESET}}$	1	$\overline{\text{RESET}}$ 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.
V_{CC}	2	Power supply input, 5V.
GND	3	IC Ground Pin.

Block Diagram

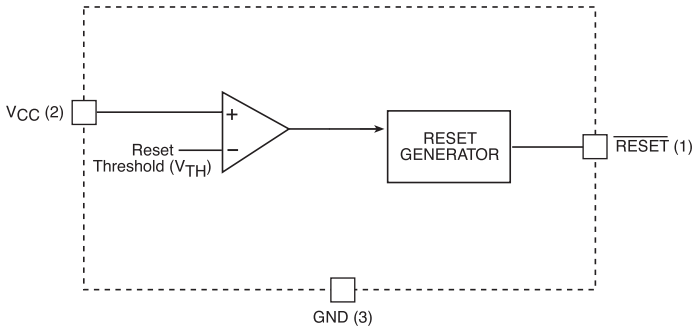


Figure 1. MIC1810 Block Diagram

Circuit Description

Microprocessor Reset

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 150ms 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 1.4V.

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 50µs or less will not cause an unwanted reset.

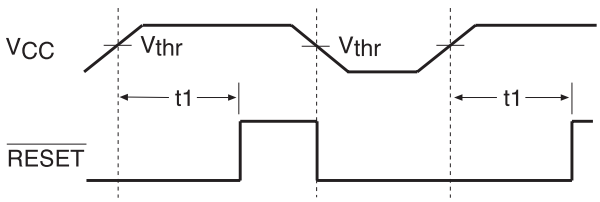


Figure 2. Reset Timing Diagram

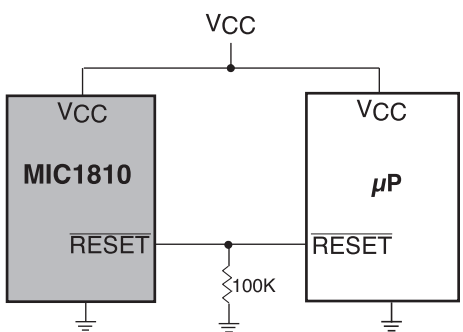


Figure 3. $\overline{\text{RESET}}$ Valid to V_{CC} = OV

$\overline{\text{RESET}}$ Valid to 0V

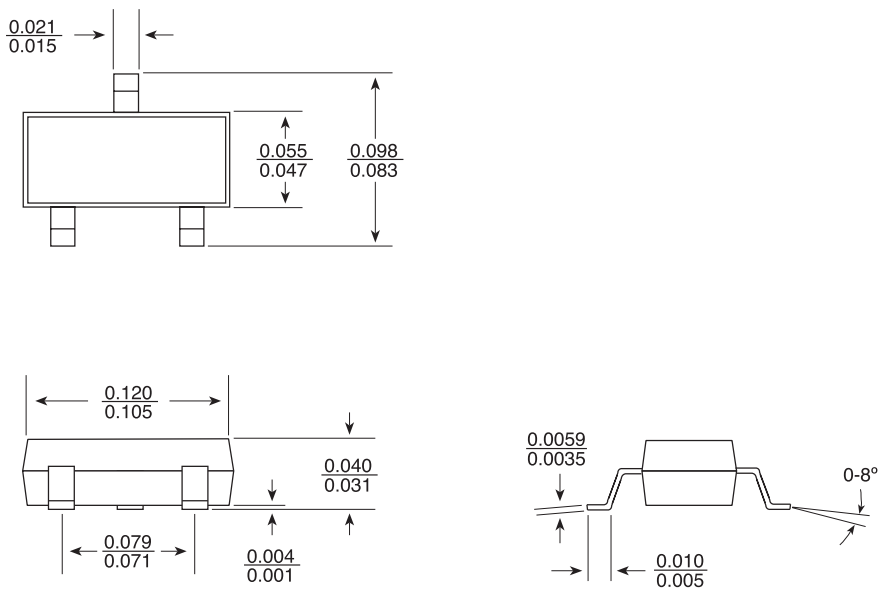
A resistor can be added from the $\overline{\text{RESET}}$ pin to ground to ensure the $\overline{\text{RESET}}$ output remains low with V_{CC} down to 0V. A 100KΩ resistor connected from $\overline{\text{RESET}}$ to ground is recommended. The size of the resistor should be large enough to not load the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

Alternate Source Cross Reference Guide

Industry P/N	MIC Direct Replacement
DS1810R-5	MIC1810-5U
DS1810R-10	MIC1810-10U
DS1810R-15	MIC1810-15U

Packaging Information

U Package, 3-Pin SOT-23 Small-Outline Transistor Package



Dimensions are in inches.

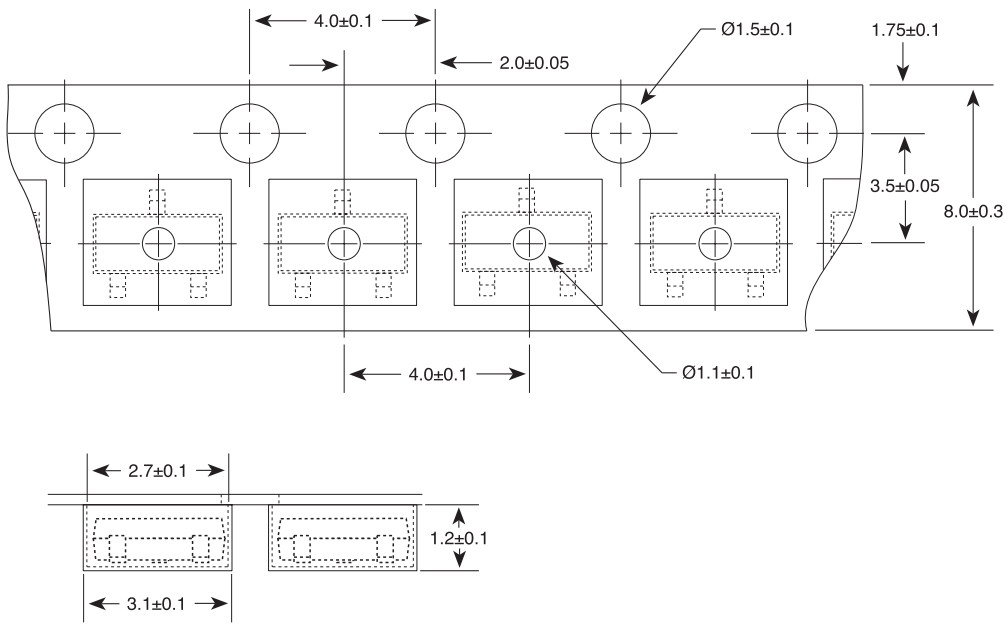
Device Marking Information

Lot Code

XXXX = MIC1810-5U
XXXX = MIC1810-10U
XXXX = MIC1810-15U

Packaging Information

Tape and Reel Information



Dimensions are in millimeters.