



# MIC1815

## Microprocessor Reset Circuit

### Description

The MIC1815 is an inexpensive microprocessor supervisory circuit 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 10% or 20% drop in 3.3V powered systems.

The MIC1815 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 MIC1815 comes in a 3-pin SOT-23 package.

### Typical Applications

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

Reset Threshold Voltage (V)	Device Suffix
2.88	-10
2.55	-20

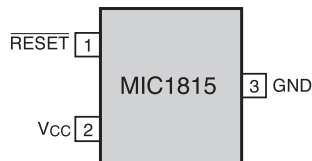
### Ordering Information

Part	Package	Temp. Range
MIC1815_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.

### Pin Configuration

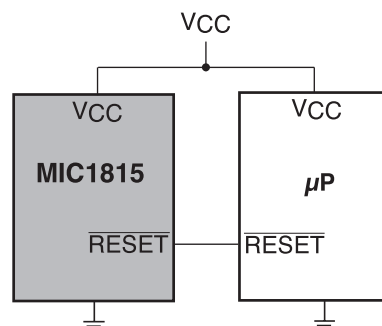
Top View



### Features

- $\overline{\text{RESET}}$  Remains Valid with VCC as Low as 1.4V
- Precision Voltage Monitor for 10% or 20% drop in 3.3V Power Supplies
- Available in 3-Pin SOT23 Package
- 9 $\mu$ A Supply Current
- 100ms Minimum Reset Pulse Width
- No External Components Required

### Typical Operating Circuit



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## Absolute Maximum Ratings

Terminal Voltage

VCC ..... -0.3V to 6.0V

Input Current, VCC, ..... 20mA

Output Current, RESET ..... 20mA

Rate of Rise, VCC ..... 100V/ $\mu$ s

Operating Temperature Range

MIC1815\_U ..... -40°C to 85°C

Storage Temperature Range ..... -65°C to 150°C

Lead Temperature (Soldering - 10 sec.) ..... 300°C

Power Dissipation ( $T_A = +70^\circ\text{C}$ ) ..... 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

VCC = 3.3V,  $T_A$  = Operating Temperature Range, unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Operating Voltage Range, VCC	$T_A = 0^\circ\text{C to } 70^\circ\text{C}$ $T_A = -40^\circ\text{C to } 85^\circ\text{C}$	1.4 1.6		5.5 5.5	V
Supply Current, ICC			9	20	$\mu\text{A}$
Reset Voltage Threshold, VTH	MIC1815-10 MIC1815-20	2.80 2.47	2.88 2.55	2.97 2.64	V
Reset Timeout Period		100	150	250	ms
RESET Output Voltage, VOH	ISource = 800 $\mu$ A	VCC - 1.5V			V
RESET Output Voltage, VOL	VCC=VTH Min., ISink=1.2mA VCC>1.4V, ISink =50 $\mu$ A			0.4 0.3	V

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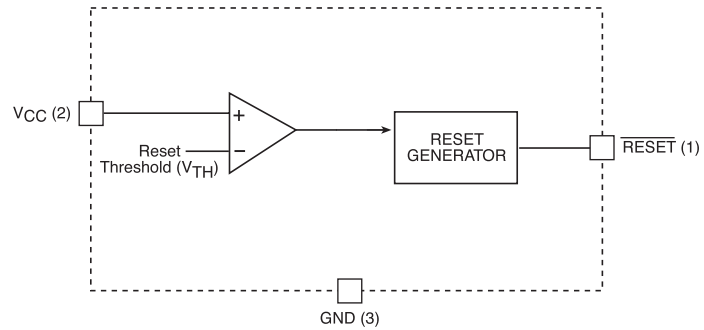
## Pin Functions

Pin Name	Pin No.	
<b><math>\overline{\text{RESET}}</math></b>	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.
<b><math>V_{CC}</math></b>	2	Power supply input, 3.3V.
<b>GND</b>	3	IC Ground Pin.

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## Block Diagram



**Figure 1. MIC1815 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<sub>CC</sub> Transients

The MIC1815 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 50 $\mu$ s or less will not cause an unwanted reset.

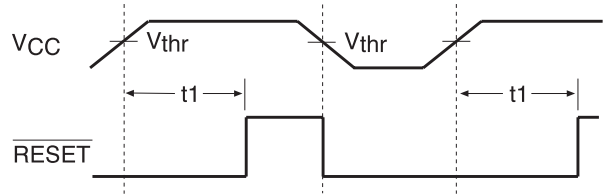


Figure 2. Reset Timing Diagram

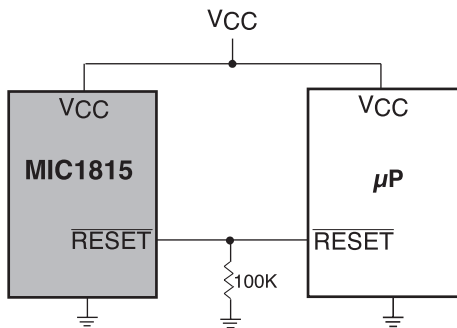


Figure 3.  $\overline{\text{RESET}}$  Valid to  $V_{CC} = 0V$

### $\overline{\text{RESET}}$ 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 100K $\Omega$  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.

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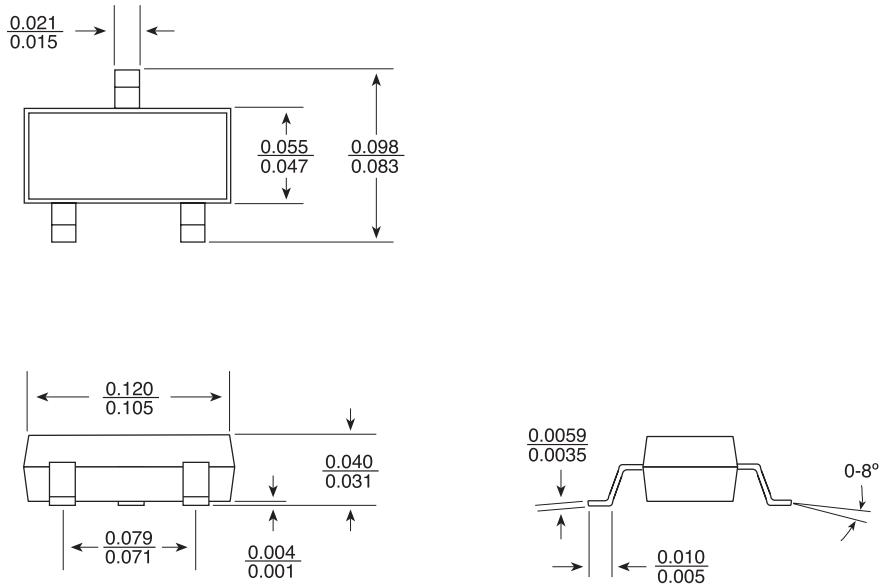
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## Alternate Source Cross Reference Guide

<u>Industry P/N</u>	<u>MIC Direct Replacement</u>
DS1815-10	MIC1815-10U
DS1815-20	MIC1815-20U

## Packaging Information

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



Dimensions are in inches.

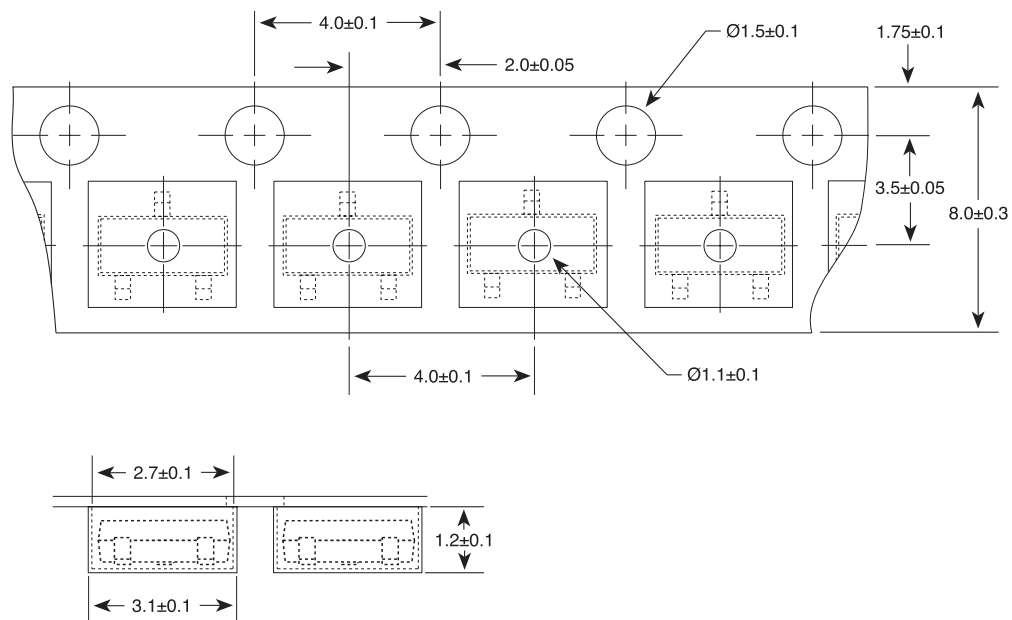
### Device Marking Information

Lot Code  
NDXX = MIC1815-10U  
NEXX = MIC1815-20U

# MIC1815 Microprocessor Reset Circuit

## Packaging Information

### Tape and Reel Information



Dimensions are in millimeters.