



MIC1815

Microprocessor Reset Circuit

General Description

The MIC1815 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 10% or 20% drop in 3.3V powered systems.

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

Features

- Precision voltage monitor for 10% or 20% drop in 3.3V power supplies
- /RESET remains valid with V_{CC} as low as 1V
- 5 μ A supply current
- 100ms minimum reset pulse width
- No external components required
- Available in 3-pin SOT-23 package

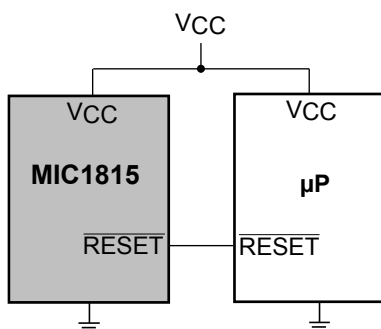
Applications

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

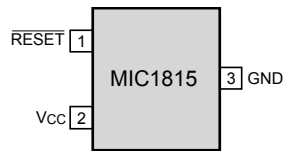
Ordering Information

Part Number	Marking	Threshold Voltage	Operating Temp. Range	Package	Pb-Free
MIC1815-10U	ND	2.88V	-40°C to +85°C	SOT-23	No
MIC1815-20U	NE	2.55V	-40°C to +85°C	SOT-23	No
MIC1815-10UY	<u>ND</u>	2.88V	-40°C to +85°C	SOT-23	Yes
MIC1815-20UY	<u>NE</u>	2.55V	-40°C to +85°C	SOT-23	Yes

Typical Application



Pin Configuration



3-Lead SOT23

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
 MIC1815-10U -40°C to +85°C
 MIC1815-20U -40°C to +85°C
 Power Dissipation ($T_A = +70^\circ\text{C}$) 320mW

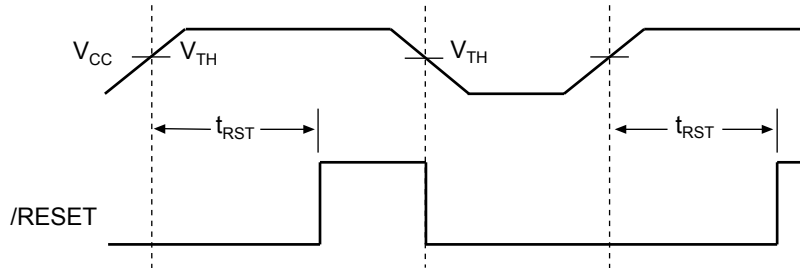
Electrical Characteristics

For typical values, $V_{CC} = 3.3\text{V}$, $T_A = 25^\circ\text{C}$; **bold** values indicate $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$; unless noted

Symbol	Parameter	Condition	Min	Typ	Max	Units
V_{CC}	Operating Temperature 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	MIC1815-10U	2.80	2.88	2.97	V
		MIC1815-20U	2.47	2.55	2.64	V
t_{RST}	Reset Timeout Period		100	150	250	ms
V_{OH}	/RESET Output Voltage	$I_{SOURCE} = 800\mu\text{A}$	1.5			V
V_{OL}	/RESET Output Voltage	$V_{CC} = V_{TH}$ min., $I_{SINK} = 10\text{mA}$			0.4	V
		$V_{CC} > 1\text{V}$, $I_{SINK} = 50\mu\text{A}$			0.3	V

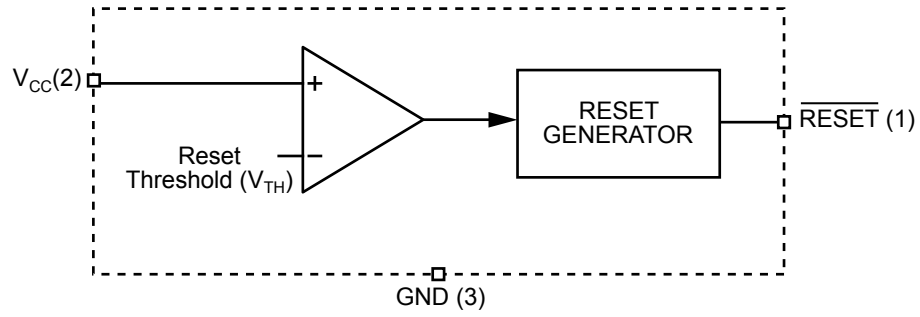
- Note 1.** Exceeding the absolute maximum rating may damage the device.
- Note 2.** The device is not guaranteed to function outside its operating rating.
- Note 3.** Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

Timing Diagram



Reset Timing Diagram

Functional Diagram



Applications Information

Microprocessor Reset

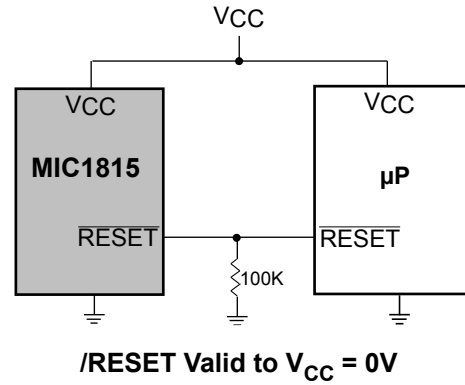
The /RESET pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of t_{RST} after V_{CC} has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after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

V_{CC} Transients

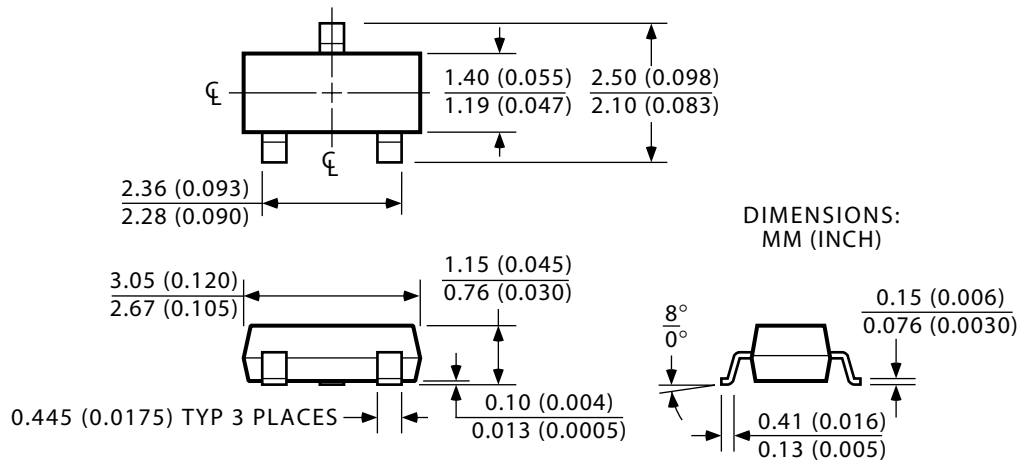
The MIC1815 is relatively immune to negative-going V_{CC} glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20 μ s or less will not cause an unwanted reset.

/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.



Package Information



3-Pin SOT-23 Small Outline Transistor

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