

# MIC8115

#### **Microprocessor Reset Circuit**

### **General Description**

The MIC8115 is an inexpensive microprocessor supervisory circuit that monitors power supplies in microprocessor based systems.

The function of this device is to assert a reset if the power supply drops below a designated reset threshold level or /MR is forced low.

The MIC8115 has an active low /RESET output. The reset output is guaranteed to remain asserted for a minimum of 1100ms after V<sub>CC</sub> has risen above the designated reset threshold level. The MIC8115 comes in a 4-pin SOT-143 package.

### Features

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- Precision voltage monitor for 3.3V power supplies
- Specifically tailored to the AMD Elan SC500 Series
- /RESET remains valid with  $V_{CC}$  as low as 1V
- 5µA typical supply current
- 1100ms minimum reset pulse width
- Manual reset input
- Available in 4-Pin SOT-143 Package

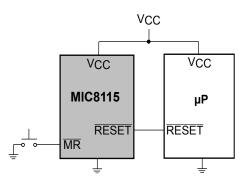
### **Applications**

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

### Ordering Information

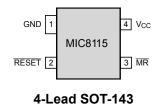
Part Number	Marking	Operating Temp. Range Package		Pb-Free
MIC8115TU	NT	–40°C to +85°C	4-lead SOT-143	No
MIC8115TUY	<u>NT</u>	–40°C to +85°C	4-lead SOT-143	Yes

**Typical Application** 



MIC8115 Typical Application

## **Pin Configuration**



## Pin Description

Pin Number	Pin Name	Pin Function		
1	GND	IC Ground Pin		
2	/RESET	/RESET goes low if either $V_{CC}$ falls below the supply reset threshold voltage or if /MR is asserted. /RESET remains asserted for one reset timeout period 1100ms min. After both $V_{CC}$ exceeds the supply reset threshold voltage and /MR is deasserted.		
3	/MR	Manual Reset Input. A logic low on /MR forces a reset. The reset will remain asserted as long as /MR is held low and for one reset timeout period (1100ms min.) after /MR goes high. This input can be shorted to ground via a switch or driven from CMOS or TTL logic. Pulled high internally through a $20k\Omega$ resistor. Float if unused.		
4	V <sub>CC</sub>	Power supply Input.		

# Absolute Maximum Ratings<sup>(Note 1)</sup>

Terminal Voltage

(V <sub>CC</sub> )	–0.3V to 6.0V
(/MŘ)	–0.3V (V <sub>CC</sub> + 0.3V)
Input Current (V <sub>CC</sub> , /MR)	20mA
Output Current (/RESET)	20mA
Rate of Rise (V <sub>CC</sub> )	100V/µS
Lead Temperature (soldering, 10 sec.)	300°C
Storage Temperature (T <sub>S</sub> )	–65°C to +150°C
ESD Rating	3kV

# Operating Ratings<sup>(Note 2)</sup>

Operating Temperature Range	
MIC8115TU	40°C to +85°C
Power Dissipation ( $T_{\Delta} = +70^{\circ}C$ )	320mW

## **Electrical Characteristics**

For typical values,  $V_{CC}$  = 3.3V;  $T_A$  = 25°C, **bold** values indicate -40°C ≤  $T_A$  ≤ +85°C; unless noted

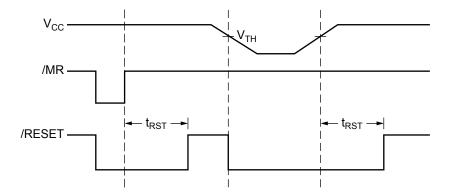
Symbol	Parameter	Condition	Min	Тур	Max	Units
V <sub>CC</sub>	Operating Voltage Range	$T_A = -40^{\circ}C \text{ to } 85^{\circ}C$	1		5.5	V
I <sub>CC</sub>	Supply Current			5	15	μA
V <sub>TH</sub>	Reset Voltage Threshold		3.00	3.08	3.15	V
t <sub>RST</sub>	Reset Timeout Period		1100	1700	2500	ms
V <sub>OH</sub>	/RESET Output Voltage	I <sub>SOURCE</sub> = 500μA	0.8×V <sub>CC</sub>			V
V <sub>OL</sub>	/RESET Output Voltage	V <sub>CC</sub> = V <sub>TH</sub> min, I <sub>SINK</sub> = 1.2mA			0.3	V
		$V_{CC}$ = 1V, $I_{SINK}$ = 50µA, $T_{A}$ = -40°C to +85°C			0.3	V
	/MR Minimum Pulse Width		10			μs
	/MR to Reset Delay			0.5		μs
	/MR Input Threshold, V <sub>IH</sub>		0.7×V <sub>CC</sub>			V
	/MR Input Threshold, V <sub>IL</sub>				0.25×V <sub>CC</sub>	
	/MR Pull-Up Resistance		10	20	30	kΩ
	/MR Glitch Immunity			100		ns

 $\label{eq:Note 1.} \begin{tabular}{ll} \textbf{Note 1.} \\ \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \begin{tabular}{ll} \textbf{S} \end{tabular} \begin{tabular}{ll} \end{tabular} \begin{tabular}{ll} \end{tabular} \begin{tabular}{ll} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular}$ 

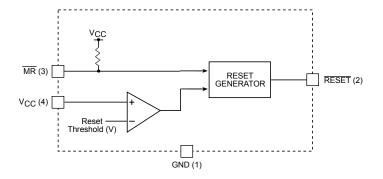
Note 2. The device is not guaranteed to function outside its operating rating.

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

## **Timing Diagram**



## **Functional Diagram**



### **Applications Information**

#### Microprocessor Reset

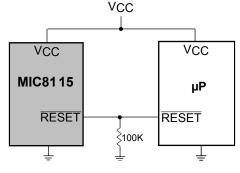
The /RESET pin is asserted whenever V<sub>CC</sub> falls below the reset threshold voltage. The reset pin remains asserted for a period of 1100ms after V<sub>CC</sub> has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after a power failure. /RESET will remain valid with V<sub>CC</sub> as low as 1V.

#### V<sub>CC</sub> Transients

The MIC8115 is relatively immune to the 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 a reset.

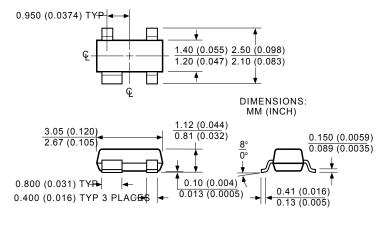
#### /RESET Valid at Low Voltage

A resistor can be added from the /RESET pin-to-the ground to ensure the /RESET output remains low with V<sub>CC</sub> down to 0V. A 100k $\Omega$  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.



/RESET Valid to V<sub>CC</sub> = 0V

### **Package Information**



4-Lead SOT-143 (UT)

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