



# MIC8114

## Microprocessor Reset Circuit

### General Description

The MIC8114 is an inexpensive microprocessor supervisory circuit that monitors the power supply 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 MIC8114 has an active low /RESET output. The reset output is guaranteed to remain asserted for a minimum of 790ms after  $V_{CC}$  has risen above the designated reset threshold level. The MIC8114 comes in a 4-pin SOT-143 package.

### Features

- Precision voltage monitor for 3.3V power supplies
- **Specifically tailored to the AMD Elan SC400/410**
- /RESET remains valid with  $V_{CC}$  as low as 1V
- 5 $\mu$ A typical supply current
- 790ms minimum reset pulse width
- Manual reset input
- Available in 4-Pin SOT-143 Package

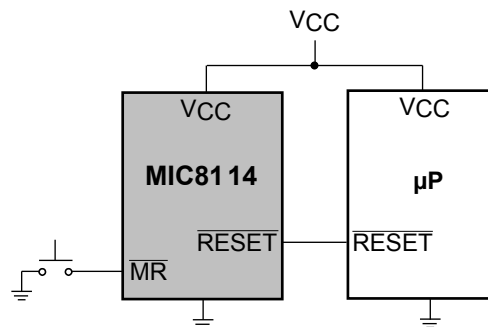
### Applications

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

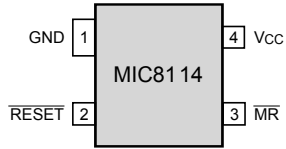
### Ordering Information

Part Number	Marking	Operating Temp. Range	Package	Pb-Free
MIC8114TU	NV	-40°C to +85°C	4-lead SOT-143	No
MIC8114TUY	<u>NV</u>	-40°C to +85°C	4-lead SOT-143	Yes

### Typical Application



## Pin Configuration



**4-Lead SOT-143**

## 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 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 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	$V_{CC}$	Power supply Input.

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

Terminal Voltage  
 $(V_{CC})$ .....-0.3V to +6.0V  
 $(/MR)$ .....-0.3V ( $V_{CC} + 0.3V$ )  
 Input Current ( $V_{CC}$ ,  $/MR$ )..... 20mA  
 Output Current ( $/RESET$ ) ..... 20mA  
 Rate of Rise ( $V_{CC}$ )..... 100V/ $\mu$ S  
 Lead Temperature (soldering, 10 sec.)..... 300°C  
 Storage Temperature ( $T_S$ ) ..... -65°C to +150°C  
 ESD Rating..... 3kV

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

Operating Temperature Range  
 MIC8114TU ..... -40°C to +85°C  
 Power Dissipation ( $T_A = +70^\circ\text{C}$ ) ..... 320mW

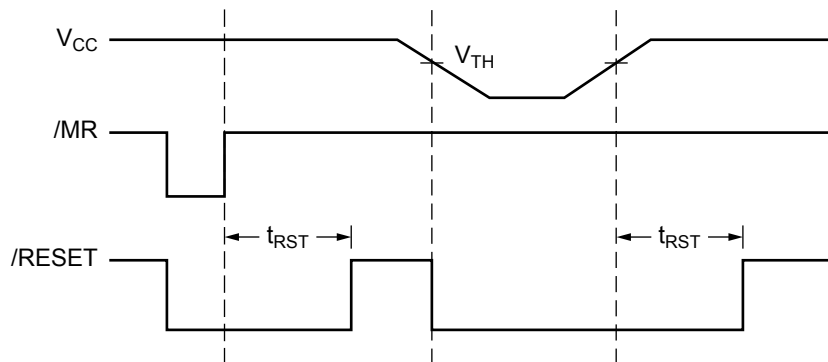
### Electrical Characteristics

For typical values,  $V_{CC} = 3.3V$ ;  $T_A = 25^\circ\text{C}$ , **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 Voltage Range	$T_A = -40^\circ\text{C}$ to $85^\circ\text{C}$	<b>1</b>		<b>5.5</b>	V
$I_{CC}$	Supply Current			5	<b>15</b>	$\mu\text{A}$
$V_{TH}$	Reset Voltage Threshold		<b>3.00</b>	3.08	<b>3.15</b>	V
$t_{RST}$	Reset Timeout Period		<b>790</b>	1200	<b>1800</b>	ms
$V_{OH}$	$/RESET$ Output Voltage	$I_{SOURCE} = 500\mu\text{A}$	<b><math>0.8 \times V_{CC}</math></b>			V
$V_{OL}$	$/RESET$ Output Voltage, $V_{OL}$	$V_{CC} = V_{TH}$ min, $I_{SINK} = 1.2\text{mA}$			<b>0.3</b>	V
		$V_{CC} = 1V$ , $I_{SINK} = 50\mu\text{A}$ , $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$			<b>0.3</b>	V
	$/MR$ Minimum Pulse Width		<b>10</b>			$\mu\text{s}$
	$/MR$ to Reset Delay			0.5		$\mu\text{s}$
	$/MR$ Input Threshold, $V_{IH}$		<b><math>0.7 \times V_{CC}</math></b>			V
	$/MR$ Input Threshold, $V_{IL}$				<b><math>0.25 \times V_{CC}</math></b>	
	$/MR$ Pull-Up Resistance		<b>10</b>	20	<b>30</b>	k $\Omega$
	$/MR$ Glitch Immunity			100		ns

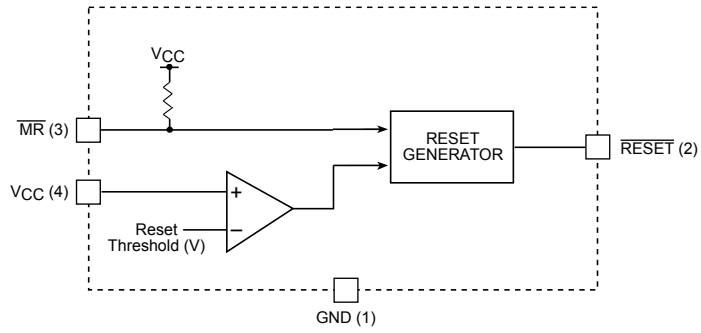
- Note 1.** Exceeding the absolute maximum rating may damage the device.
- Note 2.** The device is not guaranteed to function outside its operating rating.
- Note 3.** Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

### Timing Diagram



Reset Timing Diagram

# Functional Diagram



## Applications Information

### Microprocessor Reset

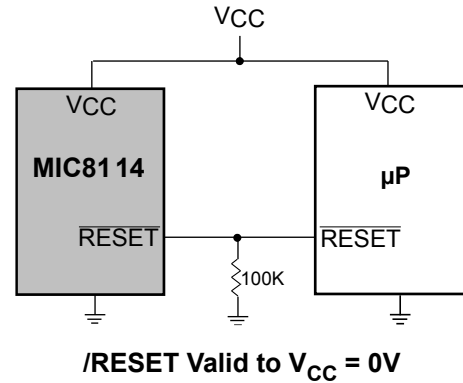
The /RESET pin is asserted whenever  $V_{CC}$  falls below the reset threshold voltage. The reset pin remains asserted for a period of 790ms after  $V_{CC}$  has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after a power failure. /RESET will remain valid with  $V_{CC}$  as low as 1V.

### $V_{CC}$ Transients

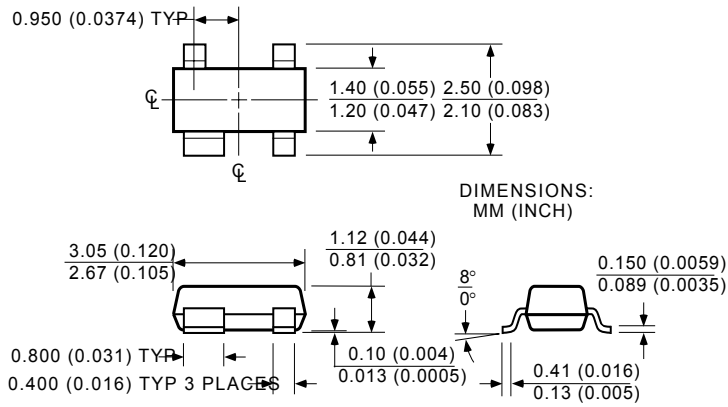
The MIC8114 is relatively immune to the negative-going  $V_{CC}$  glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20 $\mu$ s or less will not cause a reset.

### /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 $\Omega$  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



## Package Information



**4-Lead SOT-143 (UT)**

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