



# MIC8114

## Microprocessor Reset Circuit

### Description

The MIC8114 is an inexpensive microprocessor reset circuit that monitor power supplies in microprocessor based systems.

The function of this device is to assert a reset if either the power supply drops below a designated reset threshold level or  $\overline{MR}$  is forced low.

The MIC8114 has an active low  $\overline{RESET}$  output. The reset output is guaranteed to remain asserted for a minimum of 790ms after VCC has risen above the designated reset threshold level. The MIC8114 comes in a 4-pin SOT-143 package.

### Typical Applications

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

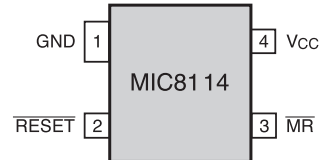
### Ordering Information

<u>Part</u>	<u>Package</u>	<u>Temp. Range</u>
MIC8114TU	4-Lead SOT-143	-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

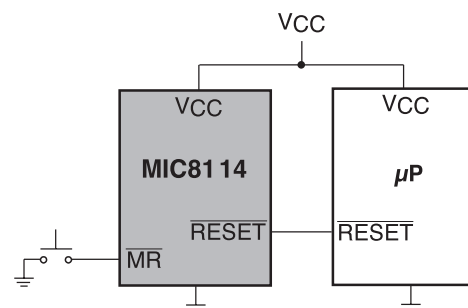
Top View



### Features

- $\overline{RESET}$  Remains Valid with VCC as Low as 1.4V
- Precision Voltage Monitor for 3.3V Power Supplies
- Available in 4-Pin SOT-143 Package
- <math>15\mu\text{A}</math> Supply Current
- 790ms Minimum Reset Pulse Width
- Manual Reset Input
- ***Specifically tailored to the reset requirements of the AMD Elan SC400/410***

### Typical Operating Circuit



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## Absolute Maximum Ratings

Terminal Voltage  
 $V_{CC}$  ..... -0.3V to 6.0V  
 $\overline{MR}$  ..... -0.3V to ( $V_{CC} + 0.3V$ )  
 Input Current,  $V_{CC}$ ,  $\overline{MR}$  ..... 20mA  
 Output Current,  $\overline{RESET}$  ..... 20mA  
 Rate of Rise,  $V_{CC}$  ..... 100V/ $\mu$ s

Operating Temperature Range  
 MIC8114TU ..... -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

$V_{CC} = 3.3V$  for MIC8114T,  $T_A =$  Operating Temperature Range, unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Operating Voltage Range, $V_{CC}$	$T_A = 0^\circ\text{C to } 70^\circ\text{C}$ $T_A = -40^\circ\text{C to } 85^\circ\text{C}$	1.4 1.6		5.5 5.5	V
Supply Current, $I_{CC}$			9	15	$\mu$ A
Reset Voltage Threshold, $V_{TH}$		3.00	3.08	3.15	V
Reset Timeout Period		790	1200	1800	ms
$\overline{RESET}$ Output Voltage, $V_{OH}$	$I_{Source} = 500\mu\text{A}$	$0.8 \times V_{CC}$			V
$\overline{RESET}$ Output Voltage, $V_{OL}$	$V_{CC} = V_{TH}$ Min., $I_{Sink} = 1.2\text{mA}$ $V_{CC} > 1.4V$ , $I_{Sink} = 50\mu\text{A}$ , $T_A = 0^\circ\text{C to } 70^\circ\text{C}$ $V_{CC} > 1.6V$ , $I_{Sink} = 50\mu\text{A}$ , $T_A = -40^\circ\text{C to } 85^\circ\text{C}$			0.3 0.3 0.3	V V V
$\overline{MR}$ Minimum Pulse Width		10			$\mu$ s
$\overline{MR}$ to Reset Delay			0.5		$\mu$ s
$\overline{MR}$ Input Threshold, $V_{IH}$		$0.7 \times V_{CC}$			V
$\overline{MR}$ Input Threshold, $V_{IL}$				$0.25 \times V_{CC}$	V
$\overline{MR}$ Pull-Up Resistance		10	20	30	k $\Omega$
$\overline{MR}$ Glitch Immunity			100		ns

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## Pin Functions

Pin Name	Pin No.	Description
<b>GND</b>	1	IC Ground Pin.
<b><math>\overline{\text{RESET}}</math></b>	2	$\overline{\text{RESET}}$ goes low if either $V_{CC}$ falls below the supply reset threshold or if $\overline{\text{MR}}$ is asserted. $\overline{\text{RESET}}$ remains asserted for one reset timeout period (790ms min.) after both $V_{CC}$ exceeds the supply reset threshold and $\overline{\text{MR}}$ is deasserted.
<b><math>\overline{\text{MR}}</math></b>	3	Manual reset input. A logic low on $\overline{\text{MR}}$ forces a reset. The reset will remain asserted as long as $\overline{\text{MR}}$ is held low and for one reset timeout period (790ms min.) after $\overline{\text{MR}}$ goes high. This input can be shorted to ground via a switch or driven from CMOS or TTI logic. Pulled high internally through a 20k $\Omega$ resistor. Float if unused.
<b><math>V_{CC}</math></b>	4	Power supply input.

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## Block Diagram

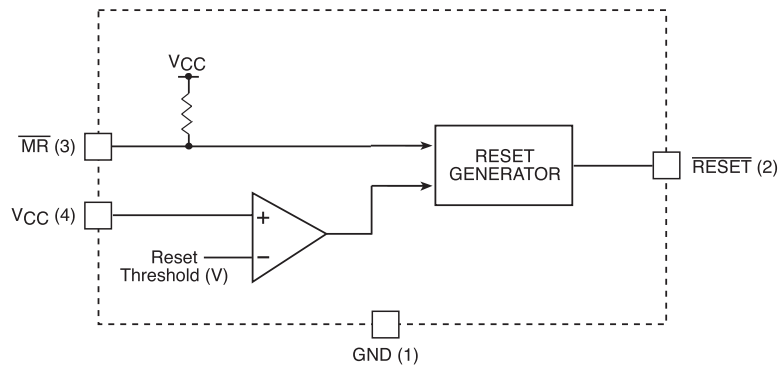


Figure 1. MIC8114 Block Diagram

## Circuit Description

### Microprocessor Reset

The  $\overline{\text{RESET}}$  pin is asserted whenever  $V_{CC}$  falls below the reset threshold voltage or if  $\overline{\text{MR}}$  (manual reset) is forced low. The reset pin remains asserted for a period of at least 790ms after  $V_{CC}$  has risen above the reset threshold voltage or  $\overline{\text{MR}}$  has returned high. 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.

### VCC Transients

The MIC8114 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 25 $\mu$ s or less will not cause an unwanted reset.

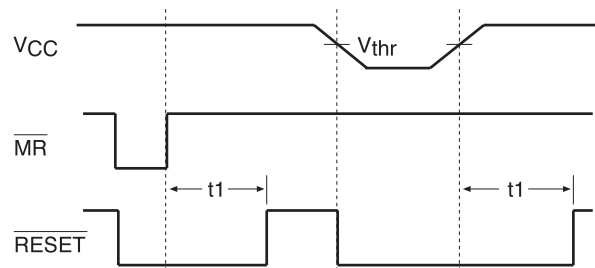


Figure 2. Reset Timing Diagram

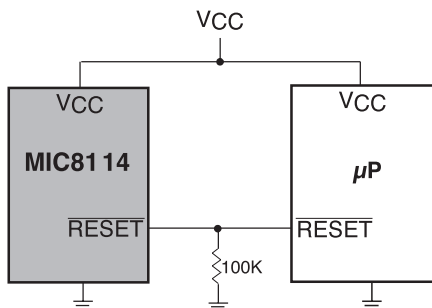


Figure 3.  $\overline{\text{RESET}}$  Valid to  $V_{CC} = 0V$ .

### $\overline{\text{RESET}}$ 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.

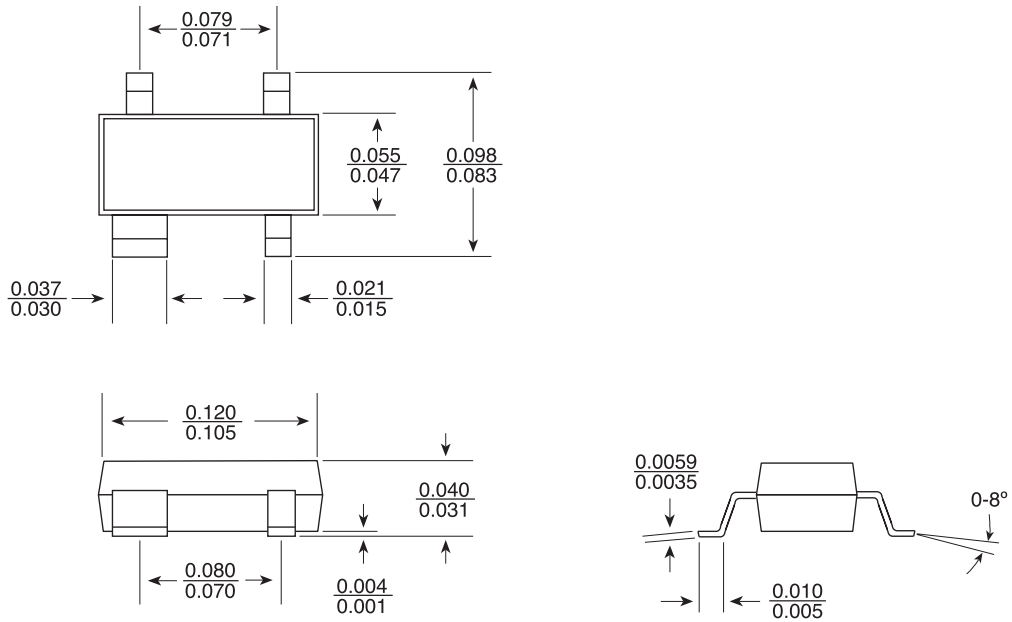
# **MIC8114 Microprocessor Reset Circuit**

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## Packaging Information

### U Package, 4-Pin SOT-143 Small-Outline Transistor Package



Dimensions are in inches.

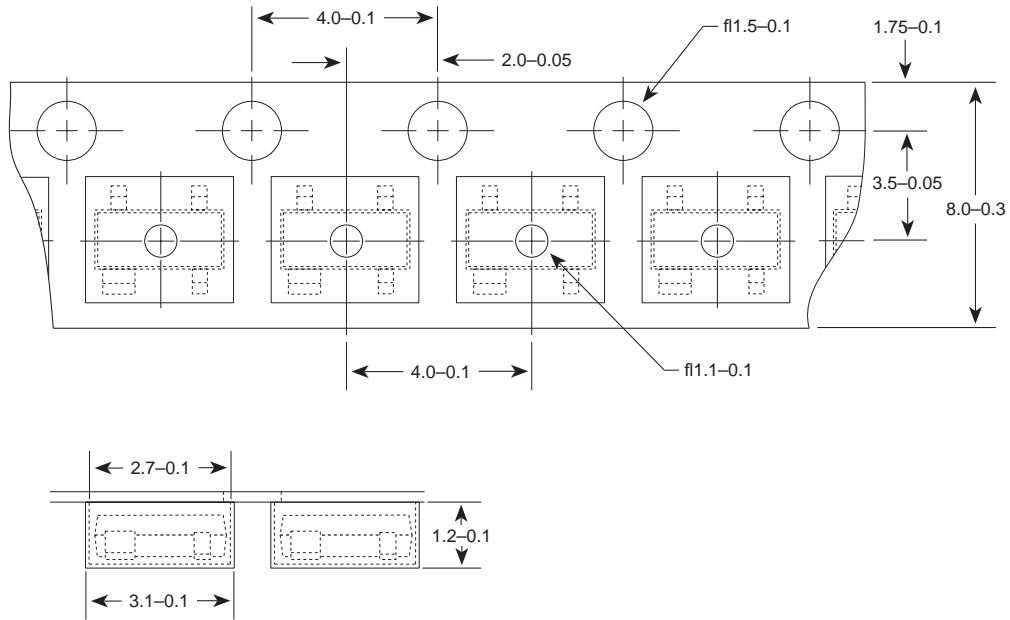
### Device Marking Information

Lot Code  
NVXX<sup>1</sup> = MIC8114

# MIC8114 Microprocessor Reset Circuit

## Packaging Information

### Tape and Reel Information



Dimensions are in millimeters.