



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 μ A typical supply current
- 790ms minimum reset pulse width
- Manual reset input
- Available in 4-Pin SOT-143 Package

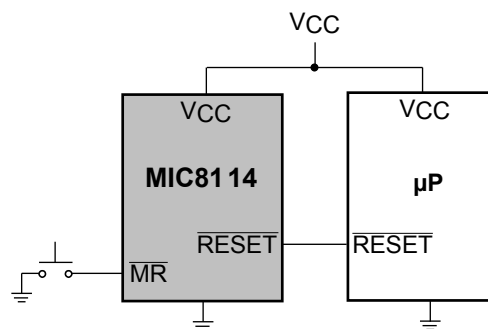
Applications

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

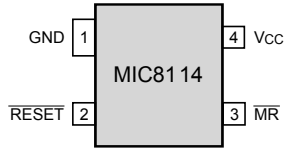
Ordering Information

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 Ω resistor. Float if unused.
4	V_{CC}	Power supply Input.

Absolute Maximum Ratings^(Note 1)

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/ μ S
 Lead Temperature (soldering, 10 sec.)..... 300°C
 Storage Temperature (T_S) -65°C to +150°C
 ESD Rating..... 3kV

Operating Ratings^(Note 2)

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

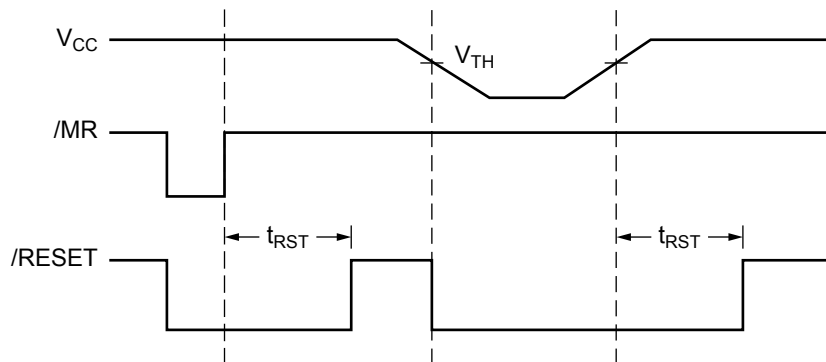
Electrical Characteristics

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

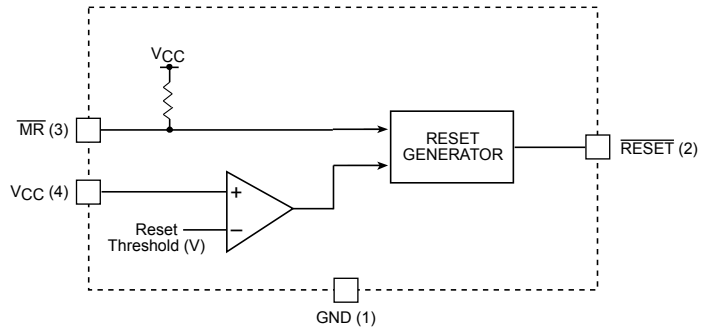
- Note 1.** Exceeding the absolute maximum rating may damage the device.
- Note 2.** The device is not guaranteed to function outside its operating rating.
- Note 3.** Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

Timing Diagram



Reset Timing Diagram

Functional Diagram



Applications Information

Microprocessor Reset

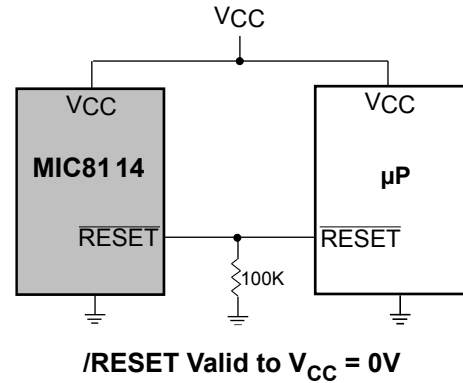
The /RESET pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of 790ms after V_{CC} has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after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

V_{CC} Transients

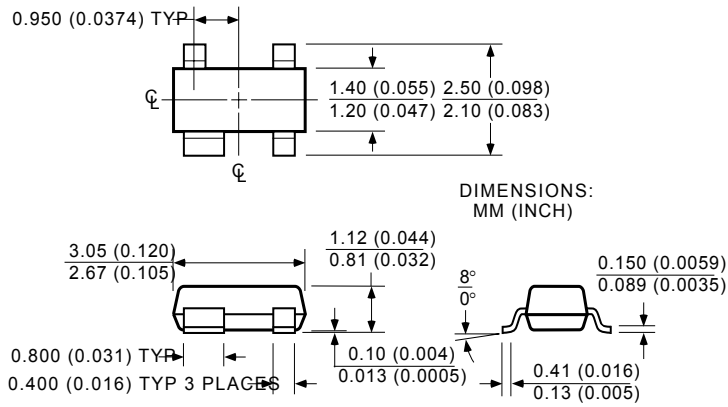
The MIC8114 is relatively immune to the negative-going V_{CC} glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20 μ s or less will not cause a reset.

/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 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



Package Information



4-Lead SOT-143 (UT)

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