



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 the MIC8115 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_{CC} has risen above the designated reset threshold level. The MIC8115 comes in a 4-pin SOT-143 package.

Datasheets and support documentation are available on Micrel's web site at: www.micrel.com.

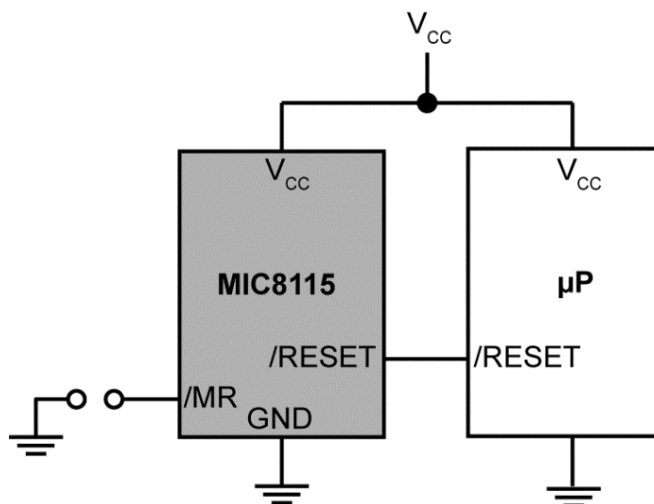
Features

- 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 1.4V
- $<15\mu A$ 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

Typical Application



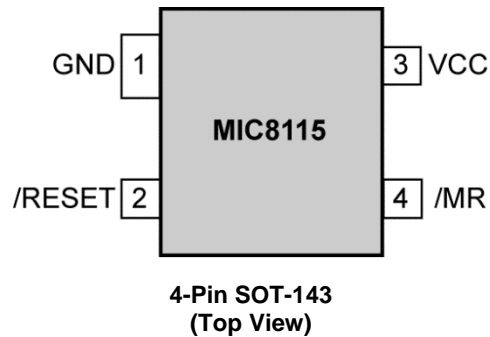
Ordering Information

Part Number ⁽¹⁾	Marking	Junction Temperature Range	Package	Lead Finish
MIC8115-TUY	<u>NT</u>	-40°C to +85°C	4-Pin SOT-143	Pb-Free

Note:

- Underbar (⏟) may not be to scale.

Pin Configuration



Pin Description

Pin Number	Pin Name	Pin Function
1	GND	IC Ground Pin.
2	/RESET	/RESET goes low if either VCC falls below the supply reset threshold voltage or if /MR is asserted. /RESET remains asserted for one reset timeout period 1100ms (minimum) after both VCC 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, minimum) 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 20kΩ resistor. Float if unused.
4	VCC	Power Supply Input.

Absolute Maximum Ratings⁽²⁾

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/μs
Lead Temperature (soldering, 10s).....	300°C
Storage Temperature (T _S).....	-65°C to +150°C
ESD Rating ⁽⁴⁾	3kV

Operating Ratings⁽³⁾

Operating Temperature Range	-40°C to +85°C
Power Dissipation (T _A = +70°C).....	320mW

Electrical Characteristics

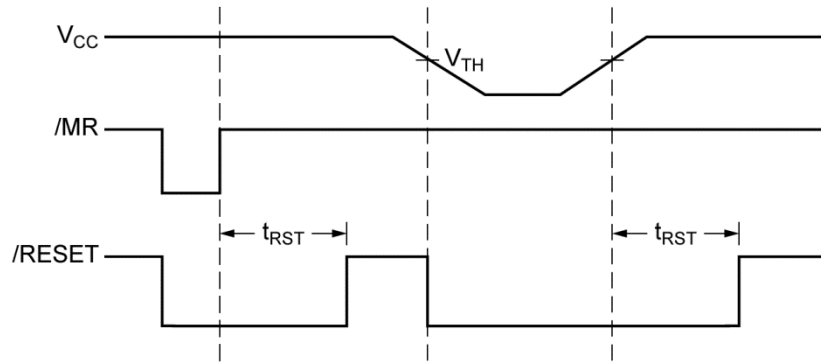
For typical values, V_{CC} = 3.3V; T_A = 25°C, **bold** values indicate -40°C ≤ T_A ≤ +85°C, unless noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
V _{CC}	Operating Voltage Range	T _A = -40°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
I _{RST}	Reset Timeout Period		1100	1700	2500	ms
V _{OH}	/RESET Output Voltage	I _{SOURCE} = 500μA	0.8 × V_{CC}			V
V _{OL}	/Reset Output Voltage	V _{CC} = V _{TH(MIN)} , I _{SINK} = 1.2mA			0.3	V
		V _{CC} = 1V, I _{SINK} = 50μA, T _A = -40°C to +85°C			0.3	
	/MR Minimum Pulse Width		10			μs
	/MR to Reset Delay			0.5		μs
V _{IH}	/MR Input Threshold		0.7 × V_{CC}			V
V _{IL}	/MR Input Threshold				0.25 × V_{CC}	
	/MR Pull-Up Resistance		10	20	30	kΩ
	/MR Glitch Immunity			100		ns

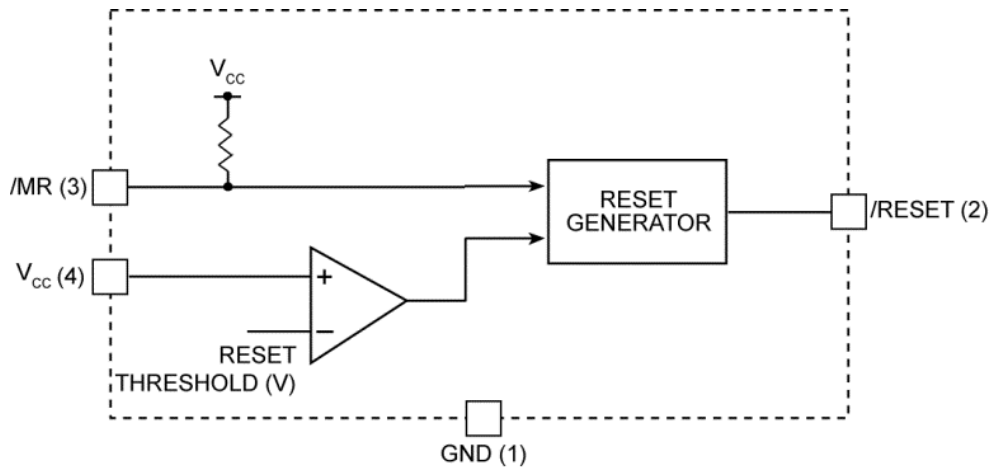
Notes:

- Exceeding the absolute maximum ratings may damage the device.
- The device is not guaranteed to function outside its operating ratings.
- Devices are ESD sensitive. Handling precautions are recommended. Human body model, 1.5kΩ in series with 100pF.

Timing Diagram



Functional Diagram



Application Information

Microprocessor Reset

The $\overline{\text{RESET}}$ pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of 1100ms 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. $\overline{\text{RESET}}$ will remain valid with V_{CC} as low as 1.4V.

V_{CC} 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 duration of 20 μs or less will not cause a reset.

$\overline{\text{RESET}}$ Valid at Low Voltage

A resistor can be added from the $\overline{\text{RESET}}$ pin to the ground to ensure the $\overline{\text{RESET}}$ output remains low with V_{CC} down to 0V. A 100k Ω resistor connected from $\overline{\text{RESET}}$ to ground is recommended. The resistor should be large enough not to load the $\overline{\text{RESET}}$ output and small enough to pull-down any stray leakage currents.

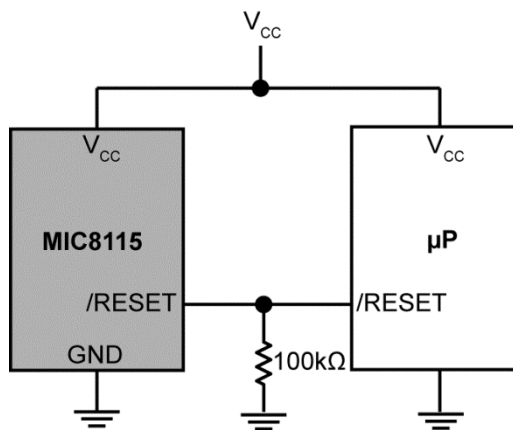
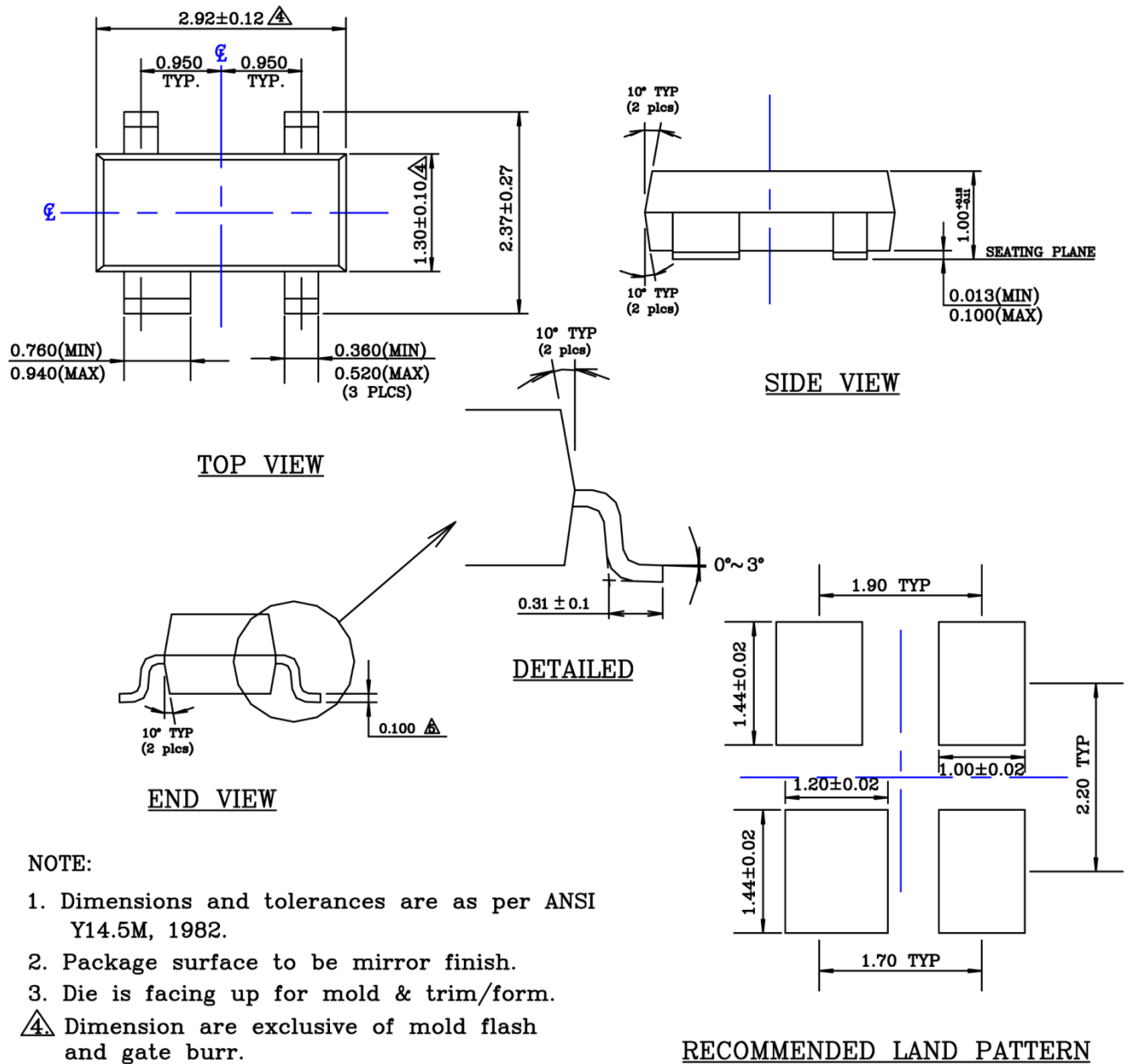


Figure 1. $\overline{\text{RESET}}$ Valid to $V_{\text{CC}} = 0\text{V}$

Package Information and Recommended Landing Pattern⁽⁵⁾



NOTE:

1. Dimensions and tolerances are as per ANSI Y14.5M, 1982.
2. Package surface to be mirror finish.
3. Die is facing up for mold & trim/form.
4. Dimension are exclusive of mold flash and gate burr.
5. Dimension are exclusive of solder plating.

4-Pin SOT-143 (TU)

Note:

5. Package information is correct as of the publication date. For updates and most current information, go to www.micrel.com.

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