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.

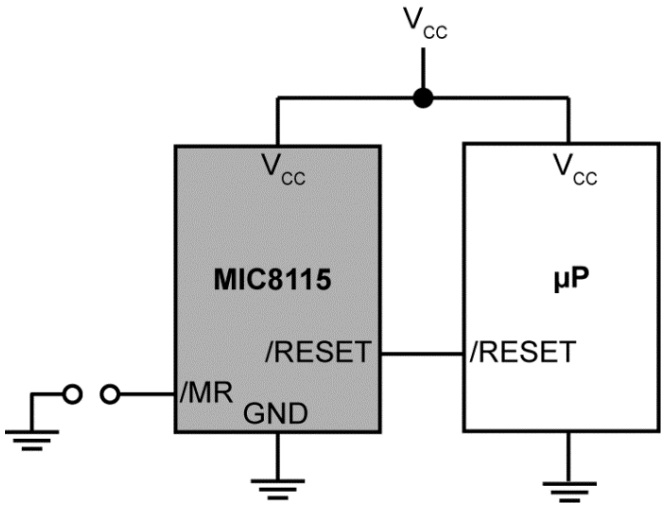
Features

- 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
- <15µA 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



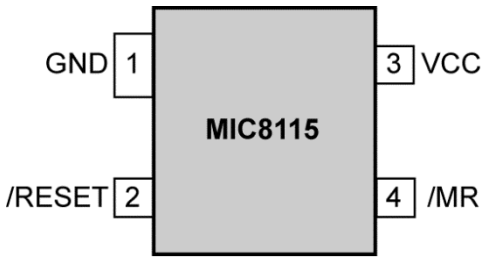
Ordering Information

Part Number[1]	Marking	Junction Temperature Range	Package	Lead Finish
MIC8115-TUY	NT	–40°C to +85°C	4-Pin SOT-143	Pb-Free

Note:

1. Underbar (__) may not be to scale.

Pin Configuration



4-Pin SOT-143
(Top View)

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 (VCC, /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

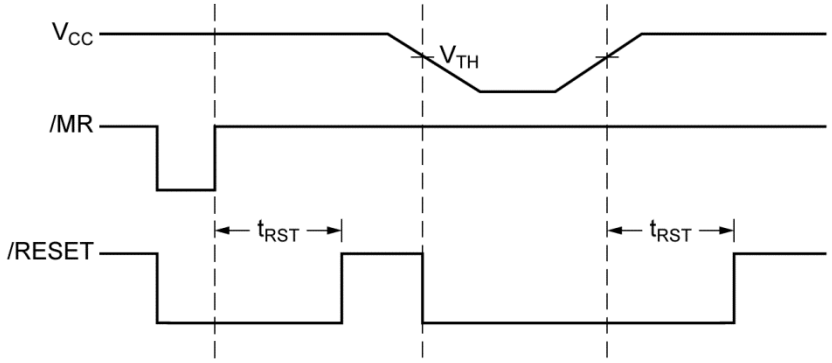
For typical values, V_{CC} = 3.3V; T_A = 25°C, **bold** values indicate –40°C ≤ T_A ≤ +85°C, unless noted.

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
VIH	/MR Input Threshold		**0.7 × V_{CC}**			V
VIL	/MR Input Threshold				**0.25 × V_{CC}**	
	/MR Pull-Up Resistance		**10**	20	**30**	kΩ
	/MR Glitch Immunity			100		ns

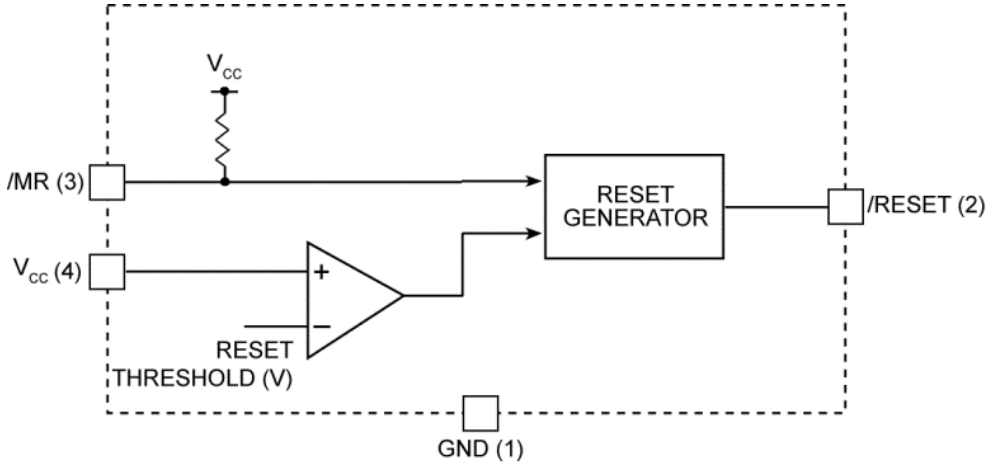
Notes:

2. Exceeding the absolute maximum ratings may damage the device.
3. The device is not guaranteed to function outside its operating ratings.
4. 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 /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. /RESET will remain valid with V_{CC} as low as 1.4V.

V_{CC} Transients

The MIC1815 is relatively immune to the negative-going V_{CC} glitches below the reset threshold. Typically, a negative- going transient 125mV belt the reset threshold with 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_{CC} down to 0V. A 100kΩ 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.

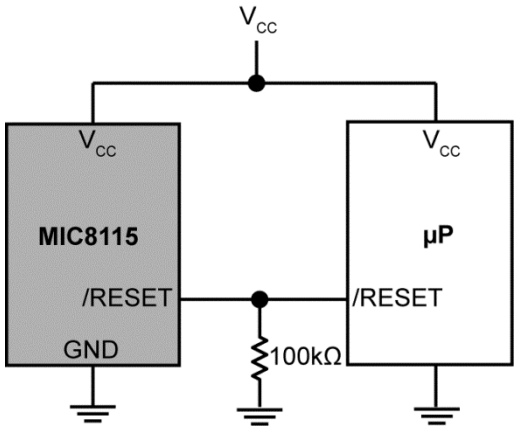
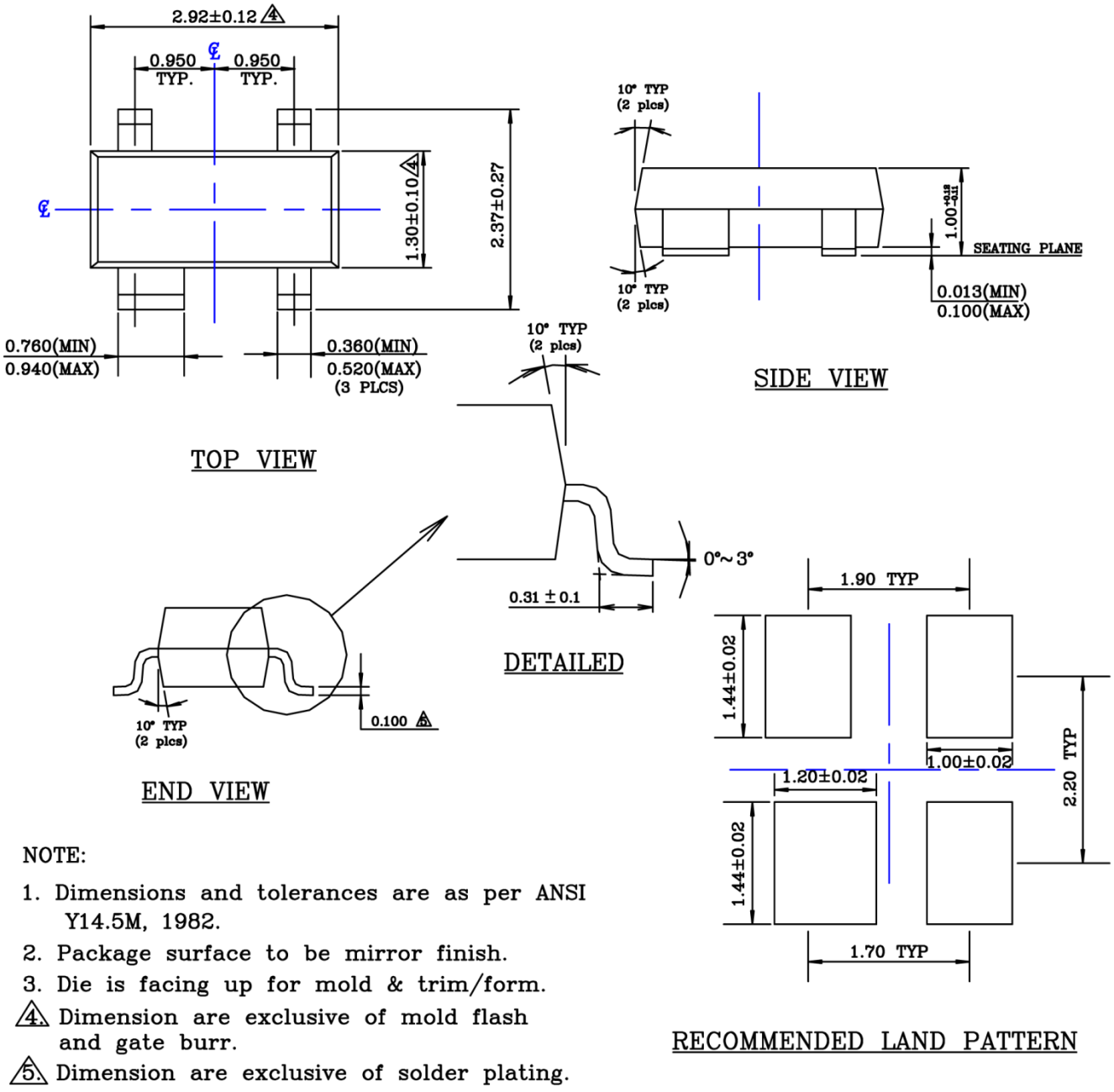


Figure 1. /RESET Valid to V_{CC} = 0V

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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