

Microprocessor Reset Circuit

General Description

The MIC8115 is an inexpensive microprocessor supervisory circuit that monitors power supplies 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 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.

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 1V
- 5µA typical supply current
- 1100ms minimum reset pulse width
- Manual reset input
- Available in 4-Pin SOT-143 Package

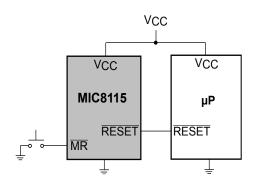
Applications

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

Ordering Information

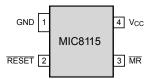
Part Number	Marking	Operating Temp. Range	Operating Temp. Range Package		nge Package Pb-Fr	
MIC8115TU	NT	–40°C to +85°C	4-lead SOT-143	No		
MIC8115TUY	<u>NT</u>	–40°C to +85°C	4-lead SOT-143	Yes		

Typical Application



MIC8115 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 1100ms min. 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 (1100ms min.) 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	V _{CC}	Power supply Input.		

Absolute Maximum Ratings(Note 1)

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

Operating Ratings(Note 2)

Operating Temperature Range	
MIC8115TU	40°C to +85°C
Power Dissipation ($T_A = +70^{\circ}C$)	320mW

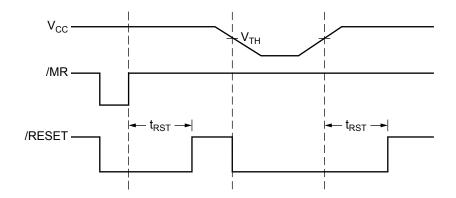
Electrical Characteristics

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

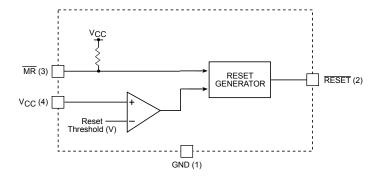
Symbol	Parameter	Condition	Min	Тур	Max	Units
V_{CC}	Operating Voltage Range	$T_A = -40$ °C to 85°C	1		5.5	V
I_{CC}	Supply Current			5	15	μA
$\overline{V_{TH}}$	Reset Voltage Threshold		3.00	3.08	3.15	V
t _{RST}	Reset Timeout Period		1100	1700	2500	ms
V_{OH}	/RESET Output Voltage	I _{SOURCE} = 500μA	0.8×V _{CC}			V
V_{OL}	/RESET Output Voltage	V _{CC} = V _{TH} min, I _{SINK} = 1.2mA			0.3	V
		$V_{CC} = 1V$, $I_{SINK} = 50\mu A$, $T_A = -40^{\circ} C$ to $+85^{\circ} C$			0.3	V
	/MR Minimum Pulse Width		10			μs
	/MR to Reset Delay			0.5		μs
	/MR Input Threshold, V _{IH}		0.7×V _{CC}			V
	/MR Input Threshold, V _{IL}				0.25×V _{CC}	
	/MR Pull-Up Resistance		10	20	30	kΩ
	/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



Functional Diagram



Applications Information

Microprocessor Reset

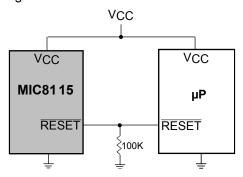
The /RESET pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of 1100ms after V_{CC} has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up into a known condition after a power failure. /RESET will remain valid with V_{CC} as low as 1V.

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 a duration of 20µs or less will not cause a reset.

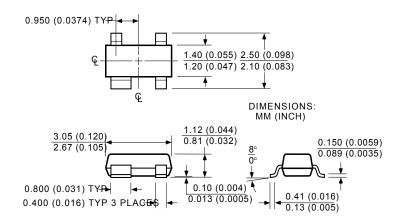
/RESET Valid at Low Voltage

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 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.



/RESET Valid to $V_{CC} = 0V$

Package Information



4-Lead SOT-143 (UT)

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