ETC8115
Microprocessor Reset Circuit

Description

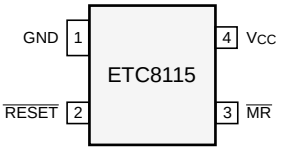
The ETC8115 is an inexpensive microprocessor reset circuit that monitor power supplies in microprocessor based systems.

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 ETC8115 has an active low $\overline{RESET}$ output. The reset output is guaranteed to remain asserted for a minimum of 1100ms after VCC has risen above the designated reset threshold level. The ETC8115 comes in a 4-pin SOT-143 package.

Pin Configuration

Top View



Typical Applications

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

Features

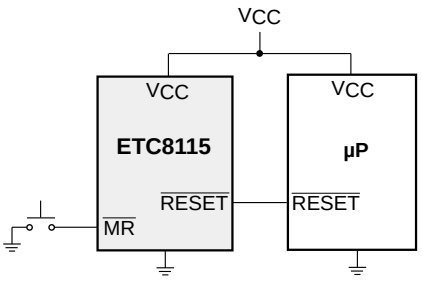
- $\overline{RESET}$ Remains Valid with VCC as Low as 1.4V
- Precision Voltage Monitor for 3.3V Power Supplies
- Available in 4-Pin SOT-143 Package
- <15µA Supply Current
- 1100ms Minimum Reset Pulse Width
- Manual Reset Input
- **Specifically tailored to the reset requirements of the AMD Elan SC500 Series**

Ordering Information

Part	Package	Temp. Range
ETC8115TU	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.

Typical Operating Circuit



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/µs

Operating Temperature Range
- ETC8115TU . . . . . -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°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 ETC8115T, T_A = Operating Temperature Range, unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Operating Voltage Range, V_{CC}	T_A = 0°C to 70°C T_A = -40°C to 85°C	1.4 1.6		5.5 5.5	V
Supply Current, I_{CC}			9	15	µA
Reset Voltage Threshold, V_{TH}		3.00	3.08	3.15	V
Reset Timeout Period		1100	1700	2500	ms
$\overline{RESET}$ Output Voltage, V_{OH}	I_{Source} = 500µA	0.8 X V_{CC}			V
$\overline{RESET}$ Output Voltage, V_{OL}	V_{CC}=V_{TH} Min., I_{Sink} =1.2mA V_{CC}>1.4V, I_{Sink} =50µA, T_A = 0°C to 70°C V_{CC}>1.6V, I_{Sink} =50µA, T_A = -40°C to 85°C			0.3 0.3 0.3	V V V
$\overline{MR}$ Minimum Pulse Width		10			µs
$\overline{MR}$ to Reset Delay			0.5		µs
$\overline{MR}$ Input Threshold, V_{IH}		0.7 X V_{CC}			V
$\overline{MR}$ Input Threshold, V_{IL}				0.25 X V_{CC}	V
$\overline{MR}$ Pull-Up Resistance		10	20	30	kΩ
$\overline{MR}$ Glitch Immunity			100		ns

Pin Functions

Pin Name	Pin No.	Description
GND	1	IC Ground Pin.
$\overline{\text{RESET}}$	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 1100ms min.) after both V_{CC} exceeds the supply reset threshold and $\overline{\text{MR}}$ is deasserted.
$\overline{\text{MR}}$	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 (1100ms) min.) after $\overline{\text{MR}}$ 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.
V_{CC}	4	Power supply input.

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Block Diagram

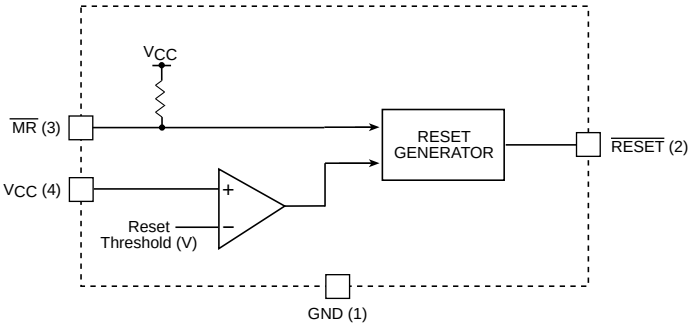

Figure 1. ETC8115 Block Diagram

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 1100ms 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.

V_{CC} Transients

The ETC8115 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 25µs or less will not cause an unwanted reset.

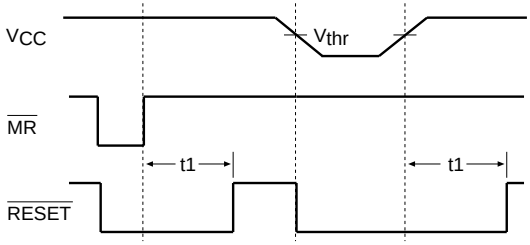

Figure 2. Reset Timing Diagram

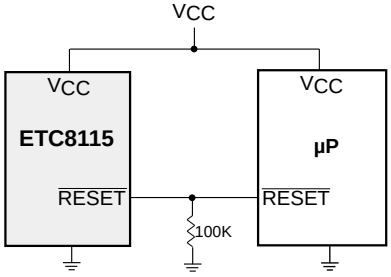

Figure 3. RESET Valid to V_{CC} = 0V.

$\overline{\text{RESET}}$ 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 100KΩ 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.

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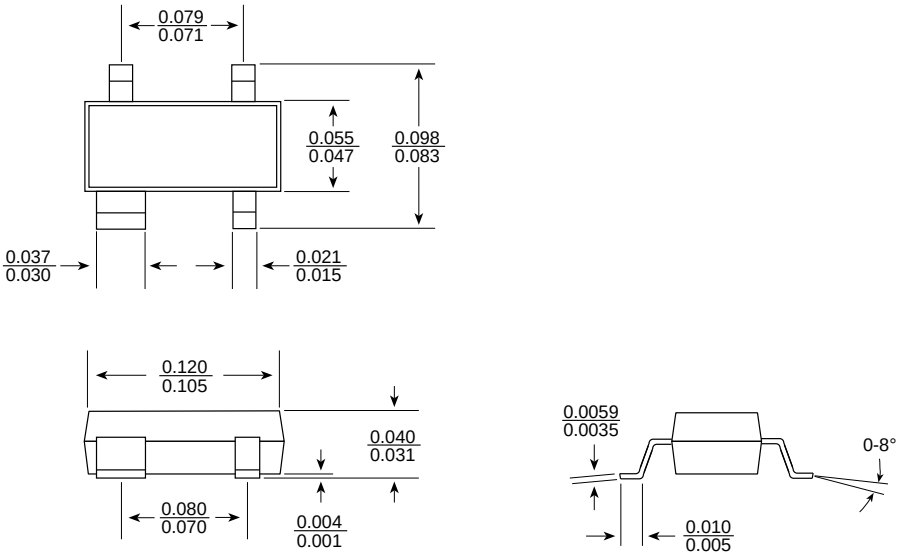
Packaging Information

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



Dimensions are in inches.

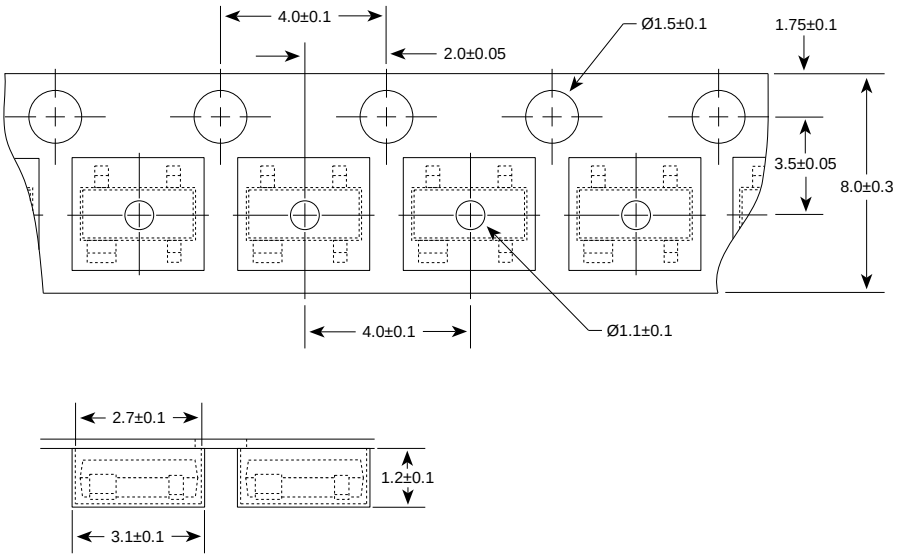
Device Marking Information

Lot Code

NTXX = ETC8115TU

Packaging Information

Tape and Reel Information



Dimensions are in millimeters.