3-PIN MICROPROCESSOR RESET CIRCUITS AZ809/AZ810

General Description

The AZ809/810 microprocessor supervisory circuits can be used to monitor the power supplies in microprocessor and digital systems. They provide a reset to the microprocessor in power-up, power-down and brown-out conditions. The function of the AZ809/810 is to monitor the V_{CC} supply voltage, and assert a reset signal whenever this voltage declines below the factory-programmed reset threshold. The reset signal remains asserted for 240ms after V_{CC} rises above the threshold. The AZ809 has an active-low RESET output, while the AZ810 has an active-high RESET output. Seven standard reset voltage options are available, suitable for monitoring 3.0V, 3.3V and 5.0V supply voltages. With a typical supply current of only 8μA when V_{CC} is 3.3V, the AZ809/810 are ideal for use in portable equipment.

These ICs are available in SOT-23 package.

Features

- Precise Monitoring of 3.0V, 3.3V and 5.0V Supply Voltages
- Improved Maxim MAX809/MAX810 Replacement
- 140ms Min. Reset Pulse Width
  Active-low Reset Output (AZ809)
  Active-high Reset Output (AZ810)
- No External Components
- Specified Over Full Temperature Range: -40 to 105°C

Applications

- Embedded Controllers
- Battery Operated Systems
- Intelligent Instruments
- Wireless Communication Systems
- PDAs and Handheld Equipment

SOT-23

Figure 1. Package Type of AZ809/810

Pin Configuration

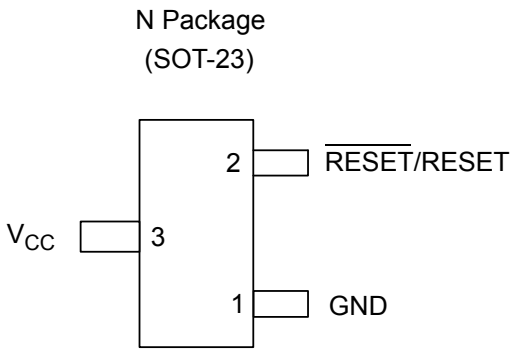


Figure 2. Pin Configuration of AZ809/810 (Top View)

Pin Description

Pin Number		Pin Name	Function
AZ809	AZ810		
1	1	GND	Ground pin
2		$\overline{\text{RESET}}$	$\overline{\text{RESET}}$ is asserted LOW if V_{CC} falls below the reset threshold and remains LOW for the 240ms typical reset timeout period (140ms minimum) after V_{CC} exceeds the threshold
	2	RESET	RESET is asserted HIGH if V_{CC} falls below the reset threshold
3	3	V_{CC}	Power supply input voltage (3.0V, 3.3V, 5.0V)

Functional Block Diagram

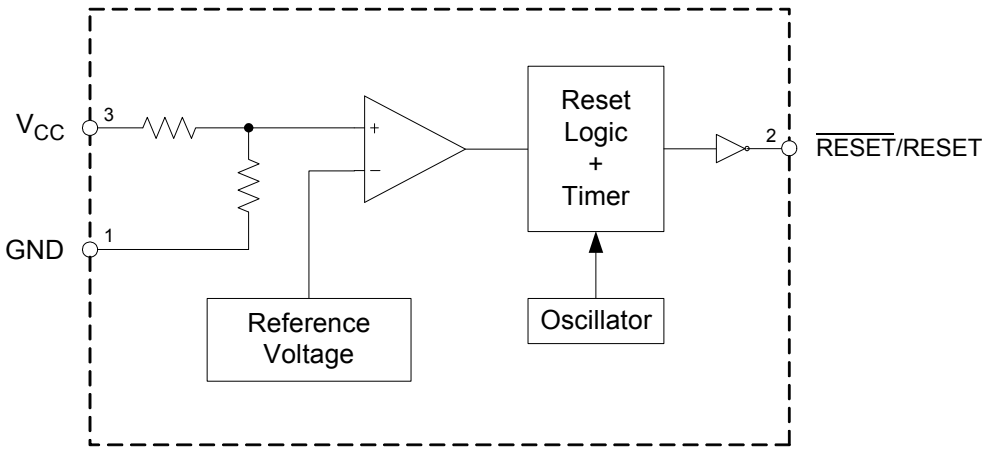
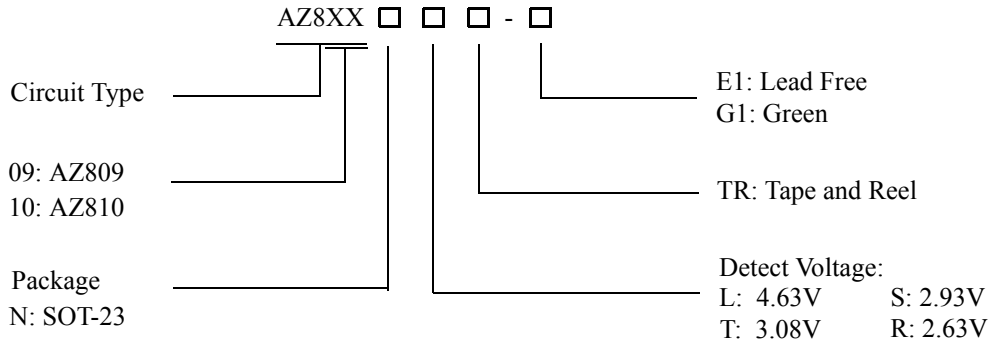


Figure 3. Functional Block Diagram of AZ809/810

Ordering Information



Ordering Information (Continued)

Package	Temperature Range	Part Number		Marking ID		Packing Type
		Lead Free	Green	Lead Free	Green	
SOT-23	-40 to 105°C	AZ809NLTR-E1	AZ809NLTR-G1	EC1	GC1	Tape & Reel
		AZ809NTTR-E1	AZ809NTTR-G1	EC4	GC4	Tape & Reel
		AZ809NSTR-E1	AZ809NSTR-G1	EC5	GC5	Tape & Reel
		AZ809NRTR-E1	AZ809NRTR-G1	EC6	GC6	Tape & Reel
	-40 to 105°C	AZ810NLTR-E1	AZ810NLTR-G1	ED1	GD1	Tape & Reel
		AZ810NTTR-E1	AZ810NTTR-G1	ED4	GD4	Tape & Reel
		AZ810NSTR-E1	AZ810NSTR-G1	ED5	GD5	Tape & Reel
		AZ810NRTR-E1	AZ810NRTR-G1	ED6	GD6	Tape & Reel

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 to 6	V
$\overline{\text{RESET}}$, RESET		-0.3 to V_{CC}+0.3	V
Input Current, V_{CC} Pin		20	mA
Output Current, $\overline{\text{RESET}}$, RESET Pin		20	mA
Rate of Rise, V_{CC}		100	V/μs
Continuous Power Dissipation		320	mW
Junction Temperature	T_J	125	°C
Storage Temperature	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering, 10sec)	T_{LEAD}	300	°C

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Operating Junction Temperature Range	T_J	-40	105	°C

Electrical Characteristics

(T_A=-40°C to 105°C, Typical values at T_A=25°C, V_{CC}=5V for L devices, V_{CC}=3.3V for T/S devices and V_{CC}=3V for R devices, unless otherwise specified.)

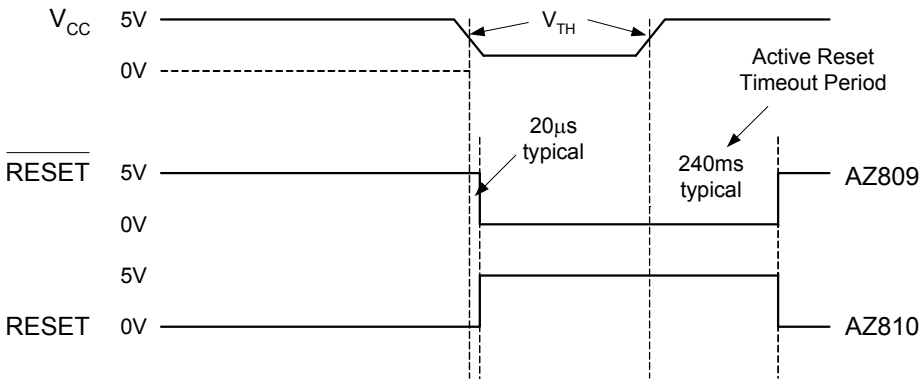
Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Input Voltage (V_{CC}) Range	V_{CC}	T_A=0°C to 70°C		1.1		5.5	V
		T_A=-40°C to 105°C		1.2		5.5	
Supply Current	I_{CC}	T_A=-40°C to 85°C, V_{CC}<5.5V, L			11	20	µA
		T_A=-40°C to 85°C, V_{CC}<3.6V, R/S/T			8	16	
		T_A=85°C to 105°C, V_{CC}<5.5V, L				25	
		T_A=85°C to 105°C, V_{CC}<3.6V, R/S/T				20	
Detect Voltage	V_{TH}	L Devices L: 4.63V	T_A=25°C	4.56	4.63	4.70	V
			T_A=-40°C to 85°C	4.50		4.75	
			T_A=85°C to 105°C	4.40		4.86	
		T Devices T: 3.08V	T_A=25°C	3.04	3.08	3.11	
			T_A=-40°C to 85°C	3.00		3.15	
			T_A=85°C to 105°C	2.92		3.23	
		S Devices S: 2.93V	T_A=25°C	2.89	2.93	2.96	
			T_A=-40°C to 85°C	2.85		3.00	
			T_A=85°C to 105°C	2.78		3.08	
		R Devices R: 2.63V	T_A=25°C	2.59	2.63	2.66	
			T_A=-40°C to 85°C	2.55		2.70	
			T_A=85°C to 105°C	2.50		2.76	
Detect Voltage Temperature Coefficient					±0.003		%/°C
V_{CC} to Reset Delay		V_{CC}=V_{TH} to V_{TH}-100mV			20		µs

Electrical Characteristics (Continued)

(T_A=-40°C to 105°C, Typical values at T_A=25°C, V_{CC}=5V for L devices, V_{CC}=3.3V for T/S devices and V_{CC}=3V for R devices, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reset Active Timeout Period		T_A=-40°C to 85°C	140	240	560	ms
		T_A=85°C to 105°C	100		840	
Low $\overline{\text{RESET}}$ Output Voltage (AZ809)	V_{OL}	V_{CC}=V_{TH} min, I_{SINK}=1.2mA, AZ809R/S/T			0.3	V
		V_{CC}=V_{TH} min, I_{SINK}=3.2mA, AZ809L			0.4	
		V_{CC}>1.1V, I_{SINK}=50μA			0.3	
High $\overline{\text{RESET}}$ Output Voltage (AZ809)		V_{CC}>V_{TH} max, I_{SOURCE}=500μA, AZ809R/S/T	0.8V_{CC}			V
		V_{CC}>V_{TH} max, I_{SOURCE}=800μA, AZ809L	V_{CC}-1.5			
Low RESET Output Voltage (AZ810)	V_{OL}	V_{CC}=V_{TH} max, I_{SINK}=1.2mA, AZ810R/S/T			0.3	V
		V_{CC}=V_{TH} max, I_{SINK}=3.2mA, AZ810L			0.4	
High RESET Output Voltage (AZ810)	V_{OH}	1.8V<V_{CC}<V_{TH} min, I_{SOURCE}=150μA	0.8V_{CC}			V

Operating Diagram



Note: The reset signal is asserted LOW for the AZ809 and HIGH for the AZ810 when the V_{CC} signal falls below the threshold trip voltage and remains asserted for 240ms typical after the V_{CC} has risen above the threshold.

Figure 4. Reset Timing Diagram of AZ809/810

Typical Application

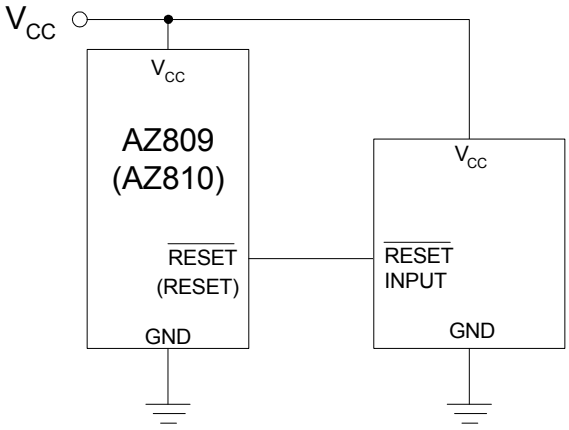
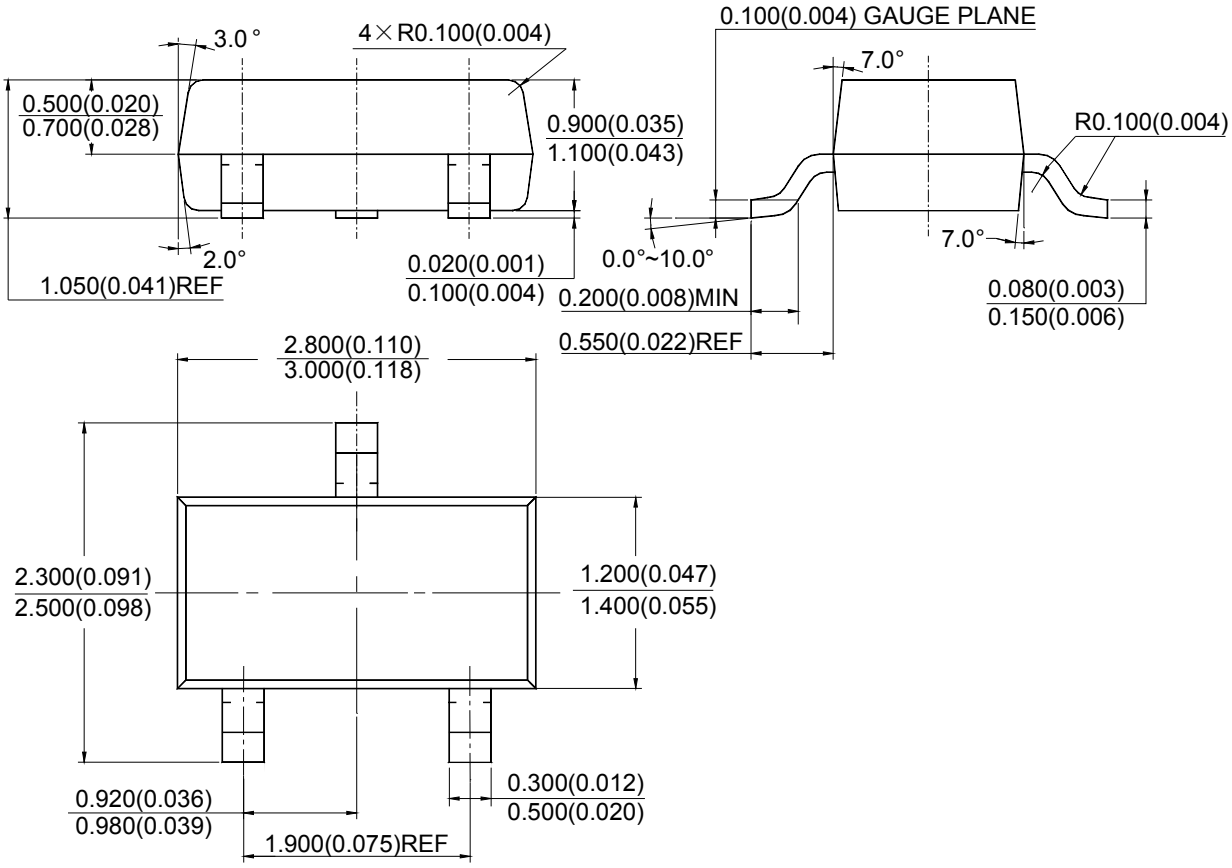


Figure 5. Typical Application of AZ809/810

Mechanical Dimensions

SOT-23 **Unit: mm(inch)**



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