

MAXIM

3-Pin Microprocessor Reset

MAX809/MAX810

General Description

The MAX809/MAX810 are microprocessor (μ P) supervisory circuits used to monitor the power supplies in μ P and digital systems. They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with 5V-powered or 3V-powered circuits.

These circuits perform a single function: They assert a reset signal whenever the V_{CC} supply voltage declines below a preset threshold, keeping it asserted for at least 140ms after V_{CC} has risen above the reset threshold. The only difference between the two devices is that the MAX809 has an active-low RESET output (which is guaranteed to be in the correct state for V_{CC} down to 1V), while the MAX810 has an active-high RESET output. The reset comparator is designed to ignore fast transients on V_{CC} . Reset thresholds suitable for operation with a variety of supply voltages are available.

Low supply current makes the MAX809/MAX810 ideal for use in portable equipment. The MAX809/MAX810 come in an 8-pin DIP package as well as a 3-pin SOT-23 package.

Applications

Computers
Controllers
Intelligent Instruments
Critical μ P and μ C Power Monitoring
Portable/Battery-Powered Equipment

Features

- ◆ Precision Monitoring of 3V, 3.3V, and 5V Power-Supply Voltages
- ◆ Fully Specified Over Temperature
- ◆ 140ms Min Power-On Reset Pulse Width
RESET Output (MAX809)
RESET Output (MAX810)
- ◆ 17 μ A Supply Current
- ◆ Guaranteed RESET Valid to $V_{CC} = 1V$ (MAX809)
- ◆ Power Supply Transient Immunity
- ◆ No External Components
- ◆ 8-Pin DIP Package
3-Pin SOT-23 Package

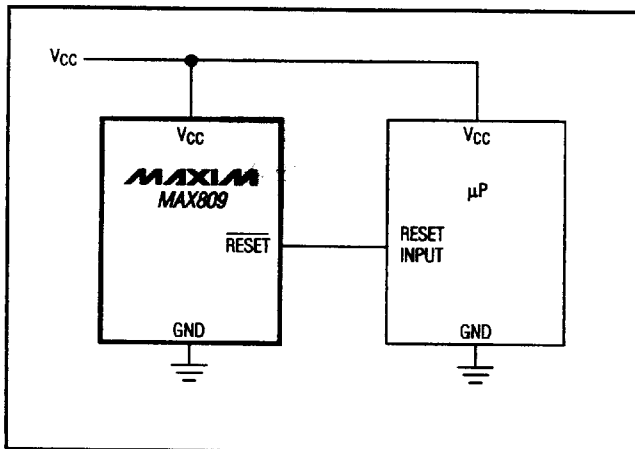
Ordering Information

| PART [†] | TEMP. RANGE | PIN-PACKAGE |
|-------------------|--------------|---------------|
| MAX809_CPA | 0°C to +70°C | 8 Plastic DIP |
| MAX809_CUR | 0°C to +70°C | 3 SOT-23 |
| MAX810_CPA | 0°C to +70°C | 8 Plastic DIP |
| MAX810_CUR | 0°C to +70°C | 3 SOT-23 |

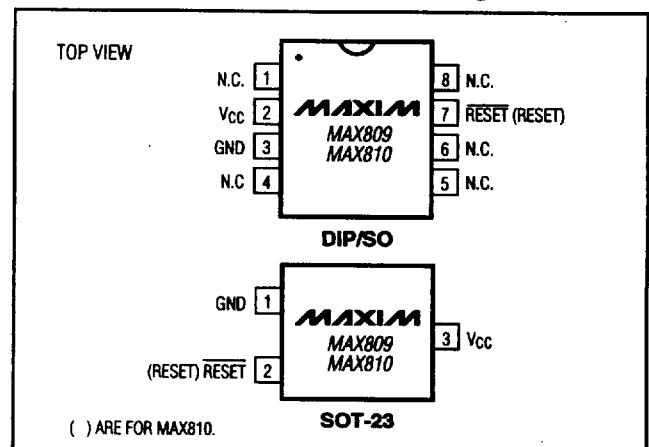
[†] Insert the desired suffix into blank to complete the part number:

| SUFFIX | RESET THRESHOLD (V) |
|--------|---------------------|
| L | 4.63 |
| M | 4.38 |
| T | 3.08 |
| S | 2.93 |
| R | 2.63 |

Typical Operating Circuit



Pin Configurations



MAXIM

Maxim Integrated Products 1

Call toll free 1-800-998-8800 for free samples or literature.

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3-Pin Microprocessor Reset

ABSOLUTE MAXIMUM RATINGS

Terminal Voltage (with respect to GND)

| | |
|--------------------------------------|-----------------------------------|
| V _{CC} | -0.3V to 6.0V |
| RESET, RESET | -0.3V to (V _{CC} + 0.3V) |
| Input Current, V _{CC} | 20mA |
| Output Current, RESET, RESET | 20mA |
| Rate-of Rise, V _{CC} | 100V/μs |

Continuous Power Dissipation (T_A = +70°C)

| | |
|--|-----------------|
| Plastic DIP (derates above +70°C by 9.09mW/°C) | 727mW |
| SOT-23 (derates above +70°C by TBD mW/°C) | 150mW |
| Operating Temperature Range | 0°C to +70°C |
| Storage Temperature Range | -65°C to +160°C |
| Lead Temperature (soldering, 10sec) | +300°C |

Stresses beyond 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 in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

(V_{CC} = full range, T_A = 0°C to +70°C, unless otherwise noted. Typical values are at T_A = +25°C, V_{CC} = 5V for L/M versions, and V_{CC} = 3V for R/S/T versions.)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---|-----------------|--|-------------------------------|------|------|--------|
| V _{CC} Range | | | 1.0 | | 5.5 | V |
| Supply Current | I _{CC} | V _{CC} < 5.5V, MAX8_L/M | | 24 | 60 | μA |
| | | V _{CC} < 3.6V, MAX8_R/S/T | | 17 | 50 | |
| Reset Threshold (Note 1) | V _{TH} | MAX8_L | T _A = +25°C | tbd | 4.63 | V |
| | | | T _A = 0°C to +70°C | 4.50 | 4.75 | |
| | | MAX8_M | T _A = +25°C | tbd | 4.38 | |
| | | | T _A = 0°C to +70°C | 4.25 | 4.50 | |
| | | MAX8_T | T _A = +25°C | tbd | 3.08 | |
| | | | T _A = 0°C to +70°C | 3.00 | 3.15 | |
| | | MAX8_R | T _A = +25°C | tbd | 2.93 | |
| | | | T _A = 0°C to +70°C | 2.85 | 3.00 | |
| | | MAX8_S | T _A = +25°C | tbd | 2.63 | |
| | | | T _A = 0°C to +70°C | 2.55 | 2.70 | |
| Reset Threshold Tempco | | | | | tbd | ppm/°C |
| V _{CC} to Reset Delay (Note 1) | | V _{CC} = V _{TH} to (V _{TH} - 100mV) | | 20 | | μs |
| Reset Active Timeout Period | | | 140 | 240 | 560 | ms |
| RESET Output Voltage Low (MAX809) | V _{OL} | V _{CC} = V _{TH} min, I _{SINK} = 1.2mA, MAX809R/S/T | | | 0.3 | V |
| | | V _{CC} = V _{TH} min, I _{SINK} = 3.2mA, MAX809L/M | | | 0.4 | |
| | | V _{CC} > 1.0V, I _{SINK} = 50μA | | | 0.3 | |
| RESET Output Voltage High (MAX809) | V _{OH} | V _{CC} > V _{TH} max, I _{SOURCE} = 500μA, MAX809R/S/T | 0.8V _{CC} | | | V |
| | | V _{CC} > V _{TH} max, I _{SOURCE} = 800μA, MAX809L/M | V _{CC} -1.5 | | | |
| RESET Output Voltage Low (MAX810) | V _{OL} | V _{CC} = V _{TH} max, I _{SINK} = 1.2mA, MAX810R/S/T | | | 0.3 | V |
| | | V _{CC} = V _{TH} max, I _{SINK} = 3.2mA, MAX810L/M | | | 0.4 | |
| RESET Output Voltage High (MAX810) | V _{OH} | V _{CC} < V _{TH} min, I _{SOURCE} = 150μA, V _{CC} > 1.8V | 0.8V _{CC} | | | V |

Note 1: RESET Output for MAX809, RESET Output for MAX810.