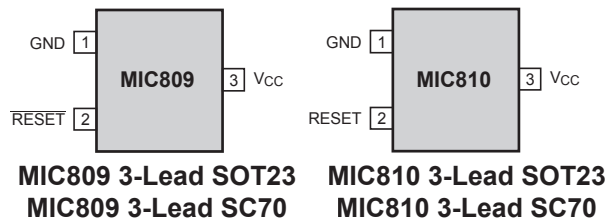


## Ordering Information

| Part Number           |                      | Marking   | Threshold Voltage | Operating Temp. Range | Lead Finish |
|-----------------------|----------------------|-----------|-------------------|-----------------------|-------------|
| 3-lead SOT-23 Package | 3-lead SC-70 Package |           |                   |                       |             |
| MIC809LU              | MIC809LBC3           | IL        | 4.63              | -40°C to +85°C        | Standard    |
| MIC809MU              | MIC809MBC3           | IM        | 4.38              | -40°C to +85°C        | Standard    |
| MIC809JU              | MIC809JBC3           | IJ        | 4.00              | -40°C to +85°C        | Standard    |
| MIC809TU              | MIC809TBC3           | IT        | 3.08              | -40°C to +85°C        | Standard    |
| MIC809SU              | MIC809SBC3           | IS        | 2.93              | -40°C to +85°C        | Standard    |
| MIC809RU              | MIC809RBC3           | IR        | 2.63              | -40°C to +85°C        | Standard    |
| MIC810LU              | MIC810LBC3           | JL        | 4.63              | -40°C to +85°C        | Standard    |
| MIC810MU              | MIC810MBC3           | JM        | 4.38              | -40°C to +85°C        | Standard    |
| MIC810JU              | MIC810JBC3           | JJ        | 4.00              | -40°C to +85°C        | Standard    |
| MIC810TU              | MIC810TBC3           | JT        | 3.08              | -40°C to +85°C        | Standard    |
| MIC810SU              | MIC810SBC3           | JS        | 2.93              | -40°C to +85°C        | Standard    |
| MIC810RU              | MIC810RBC3           | JR        | 2.63              | -40°C to +85°C        | Standard    |
| MIC809LUY             | MIC809LYC3           | <u>IL</u> | 4.63              | -40°C to +85°C        | Pb-Free     |
| MIC809MUY             | MIC809MYC3           | <u>IM</u> | 4.38              | -40°C to +85°C        | Pb-Free     |
| MIC809JUY             | MIC809JYC3           | <u>IJ</u> | 4.00              | -40°C to +85°C        | Pb-Free     |
| MIC809TUY             | MIC809TYC3           | <u>IT</u> | 3.08              | -40°C to +85°C        | Pb-Free     |
| MIC809SUY             | MIC809SYC3           | <u>IS</u> | 2.93              | -40°C to +85°C        | Pb-Free     |
| MIC809RUY             | MIC809RYC3           | <u>IR</u> | 2.63              | -40°C to +85°C        | Pb-Free     |
| MIC810LUY             | MIC810LYC3           | <u>JL</u> | 4.63              | -40°C to +85°C        | Pb-Free     |
| MIC810MUY             | MIC810MYC3           | <u>JM</u> | 4.38              | -40°C to +85°C        | Pb-Free     |
| MIC810JUY             | MIC810JYC3           | <u>JJ</u> | 4.00              | -40°C to +85°C        | Pb-Free     |
| MIC810TUY             | MIC810TYC3           | <u>JT</u> | 3.08              | -40°C to +85°C        | Pb-Free     |
| MIC810SUY             | MIC810SYC3           | <u>JS</u> | 2.93              | -40°C to +85°C        | Pb-Free     |
| MIC810RUY             | MIC810RYC3           | <u>JR</u> | 2.63              | -40°C to +85°C        | Pb-Free     |

Note: Contact factory for SC70 packaged Pb-free options..

## Pin Configuration



## Pin Description

| Pin Number<br>MIC809 | Pin Number<br>MIC810 | Pin Name | Pin Function                                                                                                                                                           |
|----------------------|----------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                    | 1                    | GND      | IC Ground Pin.                                                                                                                                                         |
| 2                    | N/A                  | /RESET   | /RESET goes low if $V_{CC}$ falls below the reset threshold and remains asserted for one reset timeout period (140ms min.) after $V_{CC}$ exceeds the reset threshold. |
| N/A                  | 2                    | RESET    | RESET goes high if $V_{CC}$ falls below the reset threshold and remains asserted for one reset timeout period (140ms min.) after $V_{CC}$ exceeds the reset threshold. |
| 3                    | 3                    | VCC      | Power Supply Input.                                                                                                                                                    |

**Absolute Maximum Ratings<sup>(1)</sup>**

|                                       |                    |
|---------------------------------------|--------------------|
| Terminal Voltage ( $V_{CC}$ )         | –0.3V to 6.0V      |
| Input Current ( $V_{CC}$ )            | 20mA               |
| Output Current (RESET, /RESET)        | 20mA               |
| Lead Temperature (soldering, 10 sec.) | 300°C              |
| Storage Temperature ( $T_S$ )         | –65°C to 150°C     |
| Rate of Rise ( $V_{CC}$ )             | 100V/ $\mu$ s      |
| ESD Rating <sup>(3)</sup>             | 3kV (SC70 Package) |

**Operating Ratings<sup>(2)</sup>**

|                                                 |               |
|-------------------------------------------------|---------------|
| Operating Temperature Range                     |               |
| MIC809                                          | –40°C to 85°C |
| MIC810                                          | –40°C to 85°C |
| Power Dissipation ( $T_A = +70^\circ\text{C}$ ) | 320mW         |

**Electrical Characteristics<sup>(4)</sup>**

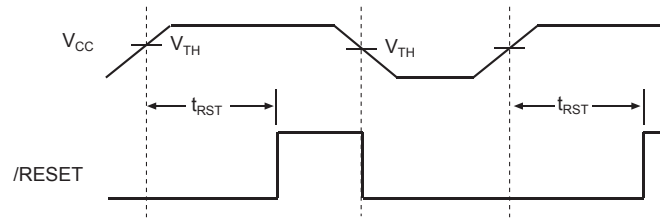
For typical values,  $V_{CC} = 5\text{V}$  for MIC8\_L/M/J,  $V_{CC} = 3.3\text{V}$  for MIC8\_S/T,  $V_{CC} = 3\text{V}$  for MIC8\_R;  $T_A = 25^\circ\text{C}$ , **bold** values indicate  $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ ; unless noted.

| Symbol    | Parameter                       | Condition                                                                                                               | Min                                      | Typ  | Max         | Units         |
|-----------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|-------------|---------------|
| $V_{CC}$  | Operating Voltage Range         | $T_A = 0^\circ\text{C}$ to $70^\circ\text{C}$ SOT-23 package                                                            | <b>1.4</b>                               |      | <b>5.5</b>  | V             |
|           |                                 | $T_A = -40^\circ\text{C}$ to $85^\circ\text{C}$ SOT-23 package                                                          | <b>1.6</b>                               |      | <b>5.5</b>  | V             |
|           |                                 | $T_A = -40^\circ\text{C}$ to $85^\circ\text{C}$ SC70 package                                                            | <b>1</b>                                 |      | <b>5.5</b>  | V             |
| $I_{CC}$  | Supply Current                  | MIC809L/M/J, MIC810L/M/J SOT-23 Package                                                                                 |                                          | 9    | <b>15</b>   | $\mu\text{A}$ |
|           |                                 | For SC-70 Package: MIC809L/M/J, MIC810L/M/J                                                                             |                                          | 5    | <b>15</b>   | $\mu\text{A}$ |
|           |                                 | $V_{CC} < 3.6\text{V}$ , MIC809R/S/T, MIC810R/S/T SOT-23 package                                                        |                                          | 6    | <b>10</b>   | $\mu\text{A}$ |
|           |                                 | For SC-70 Package: $V_{CC} < 3.6\text{V}$ , MIC809R/S/T, MIC810R/S/T                                                    |                                          | 5    | <b>10</b>   | $\mu\text{A}$ |
| $V_{TH}$  | Reset Voltage Threshold         | MIC809L, MIC810L                                                                                                        | <b>4.50</b>                              | 4.63 | <b>4.75</b> | V             |
|           |                                 | MIC809M, MIC810M                                                                                                        | <b>4.25</b>                              | 4.38 | <b>4.50</b> | V             |
|           |                                 | MIC809J, MIC810J                                                                                                        | <b>3.89</b>                              | 4.00 | <b>4.10</b> | V             |
|           |                                 | MIC809T, MIC810T                                                                                                        | <b>3.00</b>                              | 3.08 | <b>3.15</b> | V             |
|           |                                 | MIC809S, MIC810S                                                                                                        | <b>2.85</b>                              | 2.93 | <b>3.00</b> | V             |
|           |                                 | MIC809R, MIC810R                                                                                                        | <b>2.55</b>                              | 2.63 | <b>2.70</b> | V             |
| $t_{RST}$ | Reset Timeout Period            |                                                                                                                         | <b>140</b>                               | 240  | <b>560</b>  | ms            |
| $V_{OH}$  | /RESET Output Voltage<br>MIC809 | $I_{SOURCE} = 800\mu\text{A}$ , MIC809L/M/J                                                                             | <b><math>V_{CC} - 1.5\text{V}</math></b> |      |             | V             |
|           |                                 | $I_{SOURCE} = 500\mu\text{A}$ , MIC809R/S/T                                                                             | <b><math>0.8 \times V_{CC}</math></b>    |      |             | V             |
| $V_{OL}$  | /RESET Output Voltage<br>MIC809 | $V_{CC} = V_{TH} \text{ min.}$ , $I_{SINK} = 3.2\text{mA}$ , MIC809L/M/J                                                |                                          |      | <b>0.4</b>  | V             |
|           |                                 | $V_{CC} = V_{TH} \text{ min.}$ , $I_{SINK} = 1.2\text{mA}$ , MIC809R/S/T                                                |                                          |      | <b>0.3</b>  | V             |
|           |                                 | $V_{CC} > 1.4\text{V}$ , $I_{SINK} = 50\mu\text{A}$ , $T_A = 0^\circ\text{C}$ to $+70^\circ\text{C}$                    |                                          |      | <b>0.3</b>  | V             |
|           |                                 | For SC-70 Package: $V_{CC} = 1\text{V}$ , $I_{SINK} = 50\mu\text{A}$<br>$T_A = -40^\circ\text{C}$ to $85^\circ\text{C}$ |                                          |      | <b>0.3</b>  | V             |
|           |                                 | $V_{CC} > 1.6\text{V}$ , $I_{SINK} = 50\mu\text{A}$ , $T_A = -40^\circ$ to $+85^\circ\text{C}$                          |                                          |      | <b>0.3</b>  | V             |
| $V_{OH}$  | RESET Output Voltage<br>MIC810  | $1.8\text{V} < V_{CC} < V_{TH} \text{ min.}$ , $I_{SOURCE} = 150\mu\text{A}$                                            | <b><math>0.8 \times V_{CC}</math></b>    |      |             | V             |
| $V_{OL}$  | RESET Output Voltage<br>MIC810  | $I_{SINK} = 3.2\text{mA}$ , MIC810L/M/J                                                                                 |                                          |      | <b>0.4</b>  | V             |
|           |                                 | $I_{SINK} = 1.2\text{mA}$ , MIC810R/S/T                                                                                 |                                          |      | <b>0.3</b>  | V             |

**Notes:**

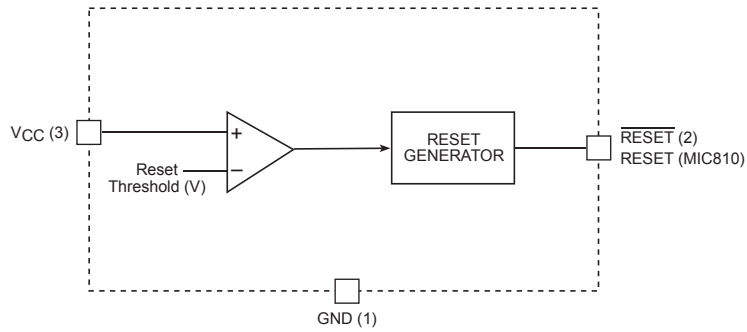
- Exceeding the absolute maximum rating may damage the device.
- The device is not guaranteed to function outside its operating rating.
- Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.
- Specification for packaged product only.

## Timing Diagram



### Reset Timing Diagram

## Functional Diagram



## Applications Information

### Microprocessor Reset

The /RESET (or RESET) pin is asserted whenever  $V_{CC}$  falls below the reset threshold voltage. The /RESET pin remains asserted for a period of 140ms after  $V_{CC}$  has risen above the reset threshold voltage. The reset function ensures the microprocessor is properly reset and powers up in a known condition after a power failure. /RESET will remain valid with  $V_{CC}$  as low as 1.4V (1V for SC-70 package).

### $V_{CC}$ Transients

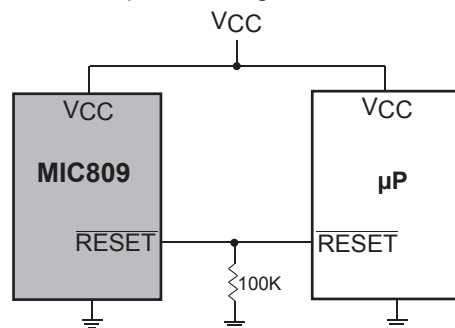
The MIC809/810 are relatively immune to negative-going  $V_{CC}$  glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20 $\mu$ s or less (SC70 package) will not cause a reset.

### Interfacing to Bidirectional Reset Pins

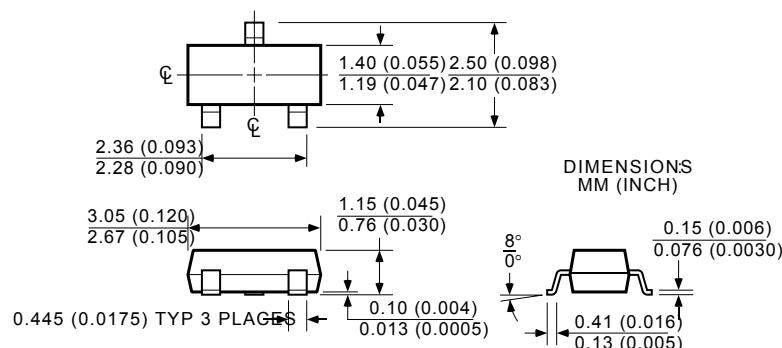
The MIC809/810 can interface with  $\mu$ Ps with bidirectional reset pins by connecting a 4.7k $\Omega$  resistor in series with the MIC809/810 output and the  $\mu$ P reset pin.

### /RESET Valid at Low Voltage

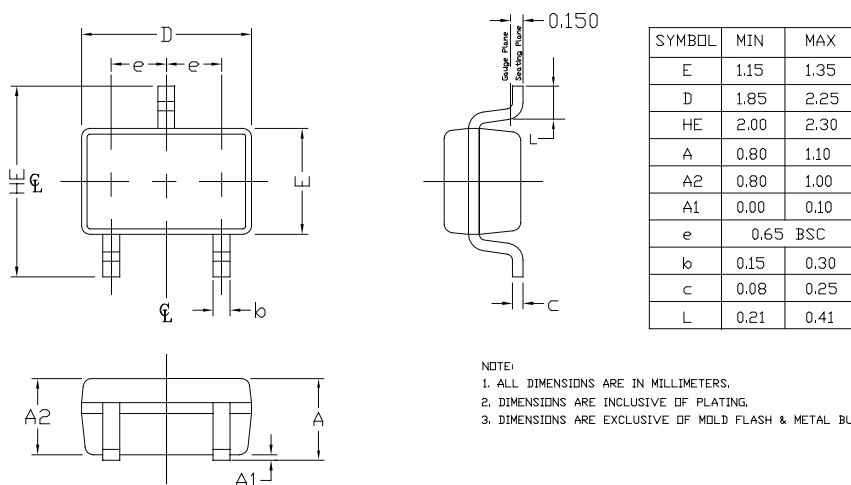
A resistor can be added from the /RESET pin to ground to ensure the /RESET output remains low with  $V_{CC}$  down to 0V. A 100k $\Omega$  resistor connected from the /RESET to ground is recommended. The resistor should be small enough to pull-down any stray leakage currents and large enough not to load the reset output. See Figure below.



## Package Information



### 3-lead SOT-23 (M3)



### 3-Lead SC-70 (C3)

**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**

TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

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