

General Description

The ILC803, ILC809 and ILC810 are low cost microprocessor supervisory circuits that assert a reset if the power supply drops below a designated threshold. Several different reset thresholds are available to accommodate systems operating at 3V, 3.3V or 5V.

The ILC803 has an open drain output stage with active low RESET output

The ILC809 has an active low RESET output, while the ILC810 offers an active high RESET output. The reset output is guaranteed to remain asserted for a minimum of 140ms after V_{CC} has risen above the designated reset threshold. The ILC803, ILC809 and ILC810 are available in either a 3-Pin SOT-23 package or a 3-Pin SC-70 packages.

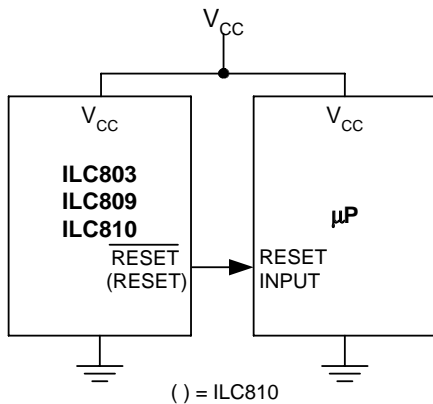
Package Features

- Precision Voltage Monitor for 3V, 3.3V or 5V Power Supplies
- 6 μ A Supply Current
- 140ms Minimum Reset Pulse Width
- RESET Remains Valid with V_{CC} as Low as 1.4V
- Active Low Manual Reset Input
- No External Components
- 3-Pin SOT-23 Package
- 3-Pin SC-70 package option

Applications

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

Typical Circuit

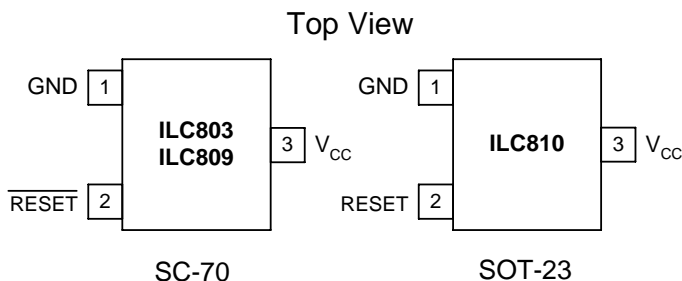


Ordering Information

| Part | Package | Temp. Range |
|----------|---------------|----------------|
| ILC803_U | 3-Lead SOT-23 | -40°C to +85°C |
| ILC809_U | 3-Lead SOT-23 | -40°C to +85°C |
| ILC810_U | 3-Lead SOT-23 | -40°C to +85°C |
| ILC803_W | 3-Lead SC-70 | -40°C to +85°C |
| ILC809_W | 3-Lead SC-70 | -40°C to +85°C |
| ILC810_W | 3-Lead SC-70 | -40°C to +85°C |

Place the device suffix of the desired reset threshold voltage from the table [below] in the blank to complete the part number.

Pin Package Configurations



| Reset Threshold Voltage (V) | Device Suffix |
|-----------------------------|---------------|
| 4.63 | L |
| 4.38 | M |
| 4.00 | J |
| 3.08 | T |
| 2.93 | S |
| 2.63 | R |

Absolute Maximum Ratings

| Parameter | Symbol | Ratings | Units |
|--|----------------------------------|-------------|--------------|
| Terminal Voltage | V_{CC} | -0.3 to 6.0 | V |
| Input Current | V_{CC} | 20 | mA |
| Output Current | RESET, $\overline{\text{RESET}}$ | 20 | mA |
| Rate of Rise | V_{CC} | 100 | V/ μ s |
| Operating Temperature Range | T_A | -40 to +85 | $^{\circ}$ C |
| Storage Temperature Range | | -65 to +150 | $^{\circ}$ C |
| Lead Temperature (Soldering, 10 sec.) | | 300 | $^{\circ}$ C |
| Power Dissipation ($T_A = +70^{\circ}$ C) | | 320 | mW |

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

| $V_{CC} = 5V$ for ILC8__L/M/J, $V_{CC} = 3.3V$ for ILC8__S/T, $V_{CC} = 3V$ for ILC8__R, $T_A =$ Operating Temperature Range, unless otherwise noted. | | | | | |
|---|--|--|--|--|---------|
| Parameter | Conditions | Min | Typ | Max | Units |
| Operating Voltage Range, V_{CC} | $T_A = 0^{\circ}\text{C to }70^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to }85^{\circ}\text{C}$ | 1.4 1.6 | | 5.5 5.5 | V |
| Supply Current, I_{CC} | ILC803L/M/J, ILC809L/M/J, ILC810L/M/J $V_{CC} < 3.6V$, ILC803R/S/T, ILC809R/S/T, ILC810R/S/T | | 9 6 | 15 10 | μ A |
| Reset Voltage Threshold, V_{TH} | ILC803L, ILC809L, ILC810L ILC803M, ILC809M, ILC810M ILC803J, ILC809J, ILC810J ILC803T, ILC809T, ILC810T ILC803S, ILC809S, ILC810S ILC803R, ILC809R, ILC810R | 4.50 4.25 3.89 3.00 2.85 2.55 | 4.63 4.38 4.00 3.08 2.93 2.63 | 4.75 4.50 4.10 3.15 3.00 2.70 | V |
| Reset Timeout Period, t_R | | 140 | 240 | 560 | ms |
| $\overline{\text{RESET}}$ Output Voltage Low (Active low ILC803 & 809) V_{OL} | $V_{CC} = V_{TH}$ $I_{SINK} = 1.2\text{mA}$ $V_{CC} = V_{TH}$ $I_{SINK} = 3.2\text{mA}$ | | | 0.3 0.4 | V |
| $\overline{\text{RESET}}$ Open Drain Output Leakage Current | $V_{CC} > V_{TH}$ $\overline{\text{RESET}}$ Deasserted | | | 7 | μ A |
| $\overline{\text{RESET}}$ Output Voltage V_{OH} | $I_{SOURCE} = 800\ \mu\text{A}$, ILC809L/M/J $I_{SOURCE} = 500\ \mu\text{A}$, ILC809R/S/T | $V_{CC} - 1.5$ $0.8 \times V_{CC}$ | | | V |
| $\overline{\text{RESET}}$ Output Voltage, V_{OL} | $V_{CC} = V_{TH}$ Min., $I_{SINK} = 3.2\ \text{mA}$, ILC809L/M/J $V_{CC} = V_{TH}$ Min., $I_{SINK} = 1.2\ \text{mA}$, ILC809R/S/T $V_{CC} > 1.4\ \text{V}$, $I_{SINK} = 50\ \mu\text{A}$, $T_A = 0^{\circ}\text{C to }70^{\circ}\text{C}$ $V_{CC} > 1.6\ \text{V}$, $I_{SINK} = 50\ \mu\text{A}$, $T_A = -40^{\circ}\text{C to }85^{\circ}\text{C}$ | | | 0.4 0.3 0.3 0.3 | V |
| RESET Output Voltage, V_{OH} | $1.8V < V_{CC} < V_{TH}$ Min., $I_{SOURCE} = 150\ \mu\text{A}$ | $0.8 \times V_{CC}$ | | | V |
| RESET Output Voltage, V_{OL} | $I_{SINK} = 3.2\text{mA}$, ILC810L/M/J $I_{SINK} = 1.2\text{mA}$, ILC810R/S/T | | | 0.4 0.3 | V |

Pin Functions

| Pin Name | Pin Number | | | Description |
|----------|------------|--------|--------|--|
| | ILC803 | ILC809 | ILC810 | |
| GND | 1 | 1 | 1 | Ground Pin. |
| RESET | 2 | 2 | N/A | 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. |
| RESET | N/A | N/A | 2 | 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. |
| V_{CC} | 4 | 3 | 3 | Power supply input, 3 V, 3.3 V or 5 V. |

Circuit Description

Microprocessor Reset

The $\overline{\text{RESET}}$ pin is asserted whenever V_{CC} falls below the reset threshold voltage. The reset pin remains asserted for a period of 240ms 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. $\overline{\text{RESET}}$ will remain valid with V_{CC} as low as 1.4V.

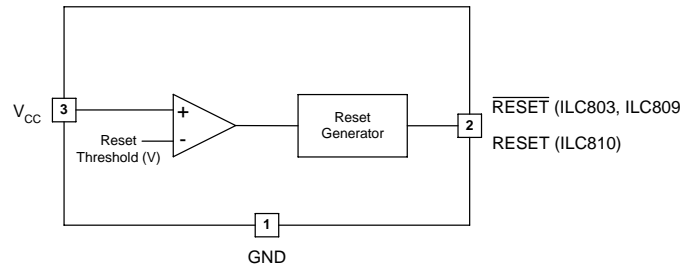


Figure 3: Block Diagram

Alternate Source Cross Reference Guide

| Industry P/N | ILC Direct Replacement |
|--------------|------------------------|
| MAX803XYUR-T | ILC803YU |
| MAX809JEUR-T | ILC809JU |
| MAX809LEUR-T | ILC809LU |
| MAX809MEUR-T | ILC809MU |
| MAX809REUR-T | ILC809RU |
| MAX809SEUR-T | ILC809SU |
| MAX809TEUR-T | ILC809TU |
| MAX810JEUR-T | ILC810JU |
| MAX810LEUR-T | ILC810LU |
| MAX810MEUR-T | ILC810MU |
| MAX810REUR-T | ILC810RU |
| MAX810SEUR-T | ILC810SU |
| MAX810TEUR-T | ILC810TU |

Device Markings Information

| | SC-70 Case | SOT-23 Case |
|---------|------------|-------------|
| ILC803J | QJY | QJYY |
| ILC803L | QLY | QLYY |
| ILC803M | QMY | QMYY |
| ILC803R | QRY | QRYY |
| ILC803S | QSY | QSYY |
| ILC803T | QTY | QTY |
| ILC809J | VJY | VJYY |
| ILC809L | VLY | VLYY |
| ILC809M | VMY | VMYY |
| ILC809R | VR | VRYY |
| ILC809S | VS | VSYY |
| ILC809T | VT | VTYY |
| ILC810J | ZJY | ZJYY |
| ILC810L | ZCY | ZCYY |
| ILC810M | ZMY | ZMY |
| ILC810R | ZRY | ZRY |
| ILC810S | ZSY | ZSY |
| ILC810T | ZTY | ZTY |
| | Y-LOT CODE | YY-LOT CODE |

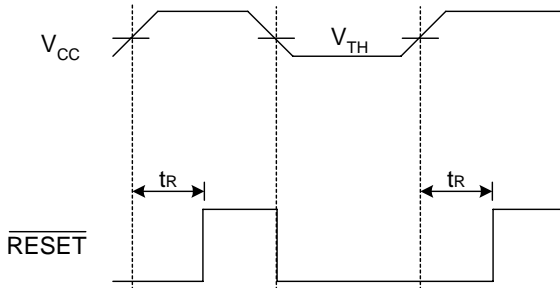


Figure 1: Timing Diagram

V_{CC} Transients

The ILC803, ILC809 and ILC810 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 50 μ s (25 μ s for ILC8__R/S/T) or less will not cause an unwanted reset.

Interfacing to Bi-directional Reset Pins

The ILC803/ILC809/ILC810 can interface with μ P's with bi-directional reset pins by connecting a 4.7k Ω resistor in series with the ILC803/ILC809/ILC810 output and the μ P reset pin. ILC803 connects directly with a single pull-up resistor (figure 2).

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 100k Ω 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.

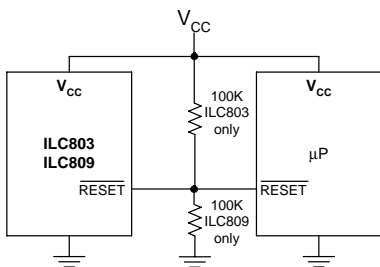
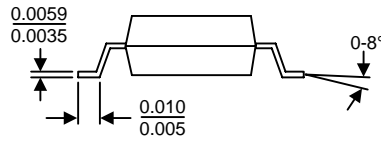
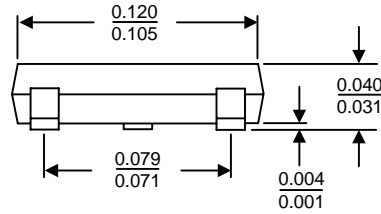
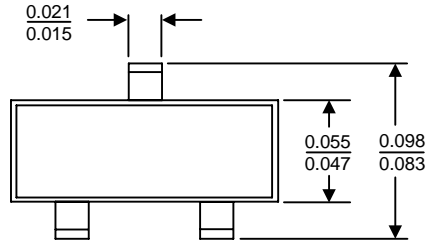


Figure 2: Reset valid to V_{CC}

Packaging Information

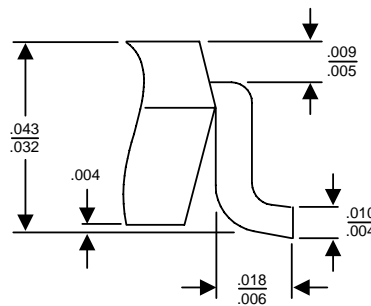
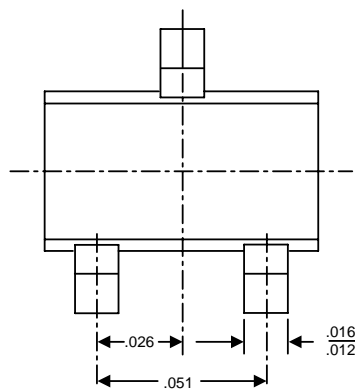
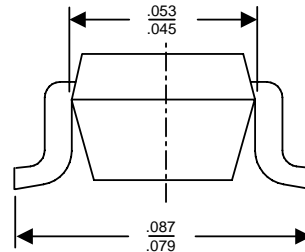
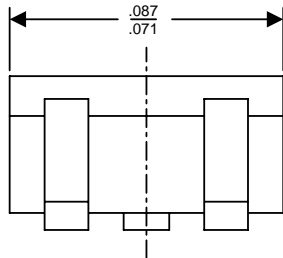
U Package, 3-Pin SOT-23

Dimensions are in inches



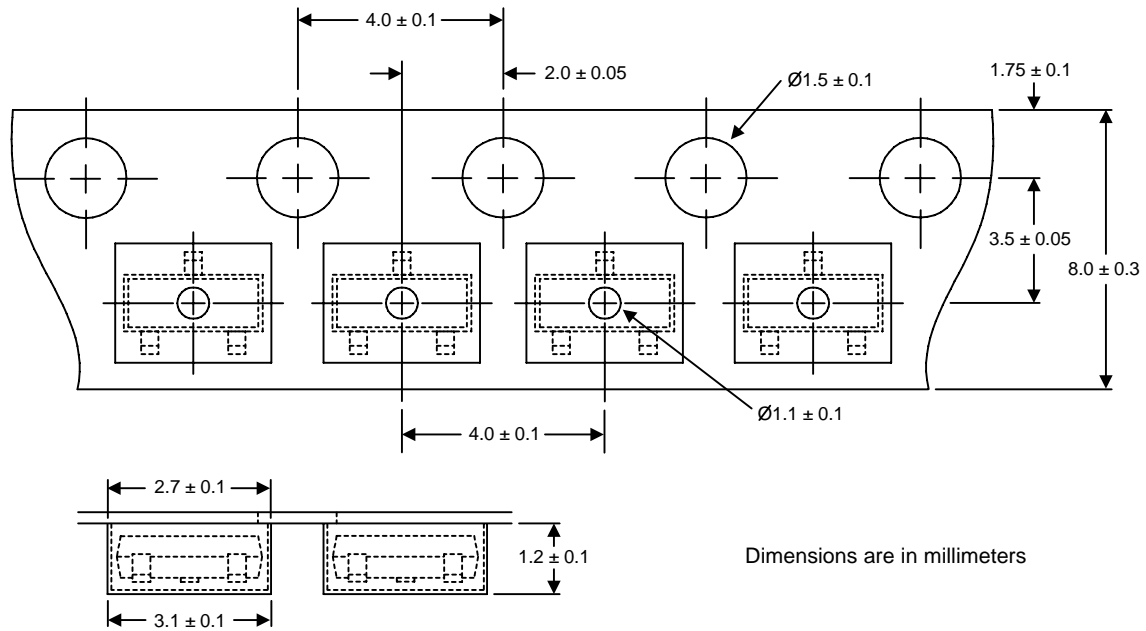
W Package, 3-Pin SC-70

Dimensions are in inches



Tape and Reel Information

Diagram applies to SOT-23 and SC-70



Dimensions are in millimeters

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