



Description

The SGM809 is a general-purpose voltage detector which only consume about 5uA at 3.6V, which can be widely used in all electronic system to either monitor a battery voltage or generate a power-on reset signal. It can work under the voltage ranging from 1V to 6V.

SGM809 employs a low voltage reference, low offset comparator, timer and push-pull output stage. Its push-pull output is pushed high after input voltage is greater than the internal setting level for 240ms.

The SGM809 is available in SOT-23 package.

Features

Wide operation range: 1-6V

Voltage detecting level setting range: 2.3-5V

SOT-23 package

Detection delay time: 240ms

Reset pin output kept low when input voltage < 1V

4kV ESD

Applications

Battery voltage monitor

Power-on reset

Set-top-box

Voltage level trigger

Press button debouncing

Portable devices

Package Marking and Ordering Information

| Part No | Voltage Detecting Level | Package | Tape & Reel |
|-----------------|-------------------------|---------|-------------|
| SGM809-ZXN3L/TR | 2.32V | SOT-23 | 3K/Reel |
| SGM809-RXN3L/TR | 2.63V | | |
| SGM809-SXN3L/TR | 2.93V | | |
| SGM809-TXN3L/TR | 3.08V | | |
| SGM809-JXN3L/TR | 4.00V | | |
| SGM809-MXN3L/TR | 4.38V | | |
| SGM809-LXN3L/TR | 4.63V | | |



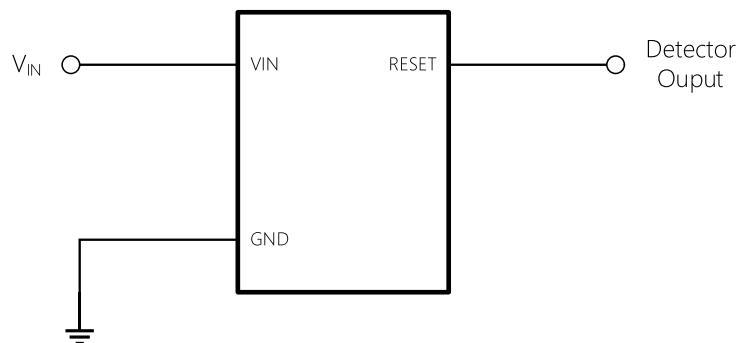
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|-----------------|--|------------------------|----------------------|
| V_{IN} | | -0.3 to 8 | V |
| V_{RESET} | | -0.3 to $V_{IN} + 0.3$ | V |
| | Continuous Power Dissipation | 0.3 | W |
| T_J | Junction Temperature | -40 to 125 | $^{\circ}\text{C}$ |
| | Lead Temperature | 260 | $^{\circ}\text{C}$ |
| T_{STG} | Storage Temperature | -55 To 150 | $^{\circ}\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 280 | $^{\circ}\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 90 | $^{\circ}\text{C/W}$ |

Notes:

- (1) Exceeding these ratings may damage the device.
- (2) The maximum allowable power dissipation is a function of the maximum junction temperature $T_J(\text{MAX})$, the junction-to-ambient thermal resistance θ_{JA} , and the ambient temperature T_A . The maximum allowable continuous power dissipation at any ambient temperature is calculated by $P_D(\text{MAX})=(T_J(\text{MAX})-T_A)/\theta_{JA}$. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
- (3) Measured on JESD51-7, 4-layer PCB.

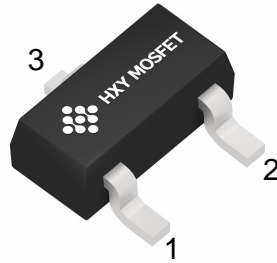
Typical Application



Detector output remains low if V_{IN} is below detecting level, and jumps to high if V_{IN} is above detecting level for 240ms



Pin Assignment



SOT-23

The package of SGM809 is SOT23, with pin assignment shown in following table:

| Pin No | Name | Description |
|--------|-------|--|
| 1 | GND | Ground |
| 2 | VIN | The power input node as well as the voltage node to be detected |
| 3 | RESET | The push pull output node, pulled low when V_{IN} is lower than detect level and pushed high when V_{IN} is higher than detect level for 240ms |



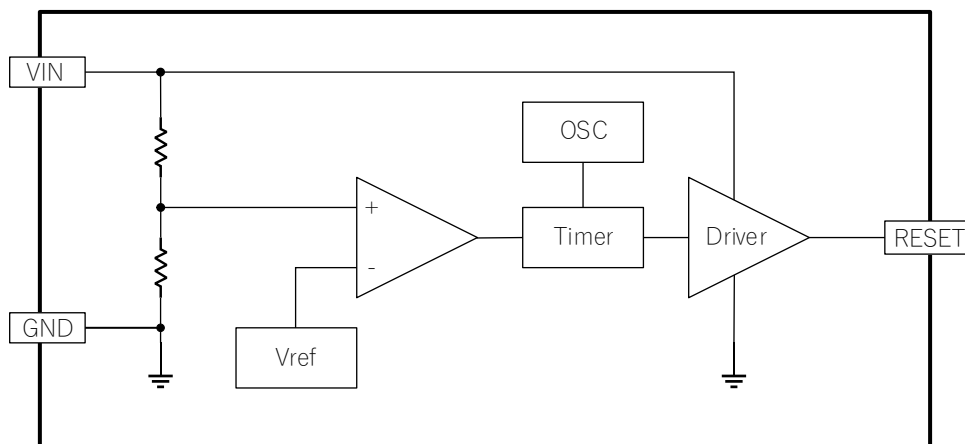
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Conditions | Min | Typ | Max | Units |
|-------------------------------------|---|--------------|---------------|----------|---------------|
| Input voltage range, V_{IN} | | 1 | | 6 | V |
| Quiescent current, I_Q | $V_{IN} = 3.6\text{V}$, $T_A=25^{\circ}$ | 3 | 5 | 10 | μA |
| | $V_{IN} = 3.6\text{V}$, $T_A=-40^{\circ}$ | 2 | 3.5 | 10 | μA |
| | $V_{IN} = 3.6\text{V}$, $T_A=125^{\circ}$ | 4 | 6.3 | 15 | μA |
| Detecting voltage level, V_{DET} | $V_{DET} = 2.32\text{V}$ | 2.262 | 2.32 | 2.378 | V |
| | $V_{DET} = 2.63\text{V}$ | 2.564 | 2.63 | 2.696 | V |
| | $V_{DET} = 2.93\text{V}$ | 2.857 | 2.93 | 3.003 | V |
| | $V_{DET} = 3.08\text{V}$ | 3.003 | 3.08 | 3.157 | V |
| | $V_{DET} = 4.00\text{V}$ | 3.92 | 4.00 | 4.08 | V |
| | $V_{DET} = 4.38\text{V}$ | 4.292 | 4.38 | 4.468 | V |
| | $V_{DET} = 4.63\text{V}$ | 4.537 | 4.63 | 4.723 | V |
| Delay time | $T_A = -40^{\circ}\text{C}$ to 85°C | 150 | 240 | 560 | ms |
| Reset falling delay | V_{IN} falling below V_{DET} | | 2 | 50 | μs |
| Reset output low voltage, V_{OL} | $I_{SINK} = 1.2\text{mA}$, $V_{IN}=2\text{V}$ | 0 | 0.03 | 0.3 | V |
| Reset output high voltage, V_{OH} | $I_{SOURCE} = 1.2\text{mA}$, $V_{IN}=3\text{V}$ | $V_{IN}-0.3$ | $V_{IN}-0.05$ | V_{IN} | V |

Function Descriptions

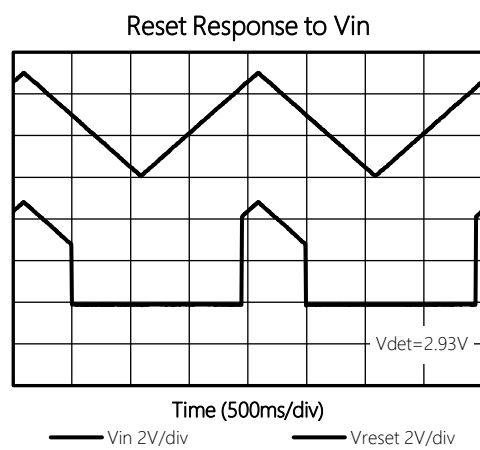
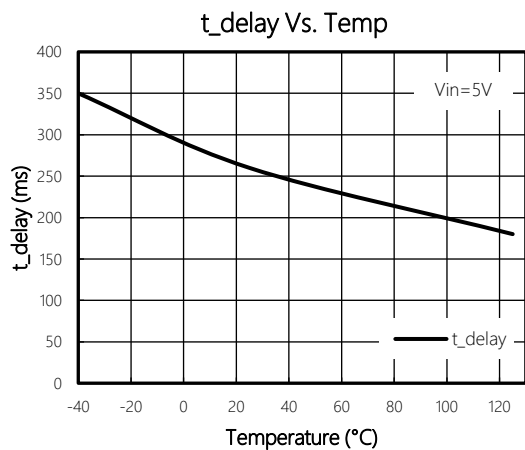
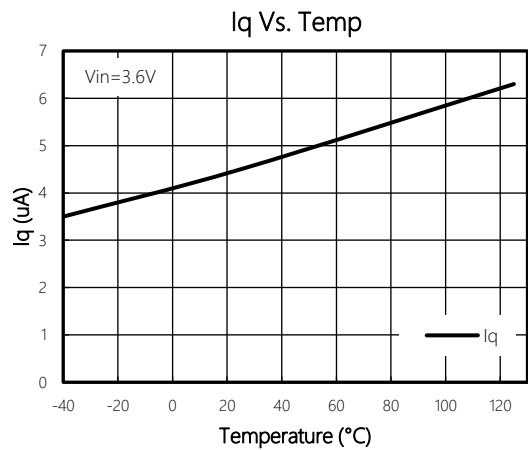
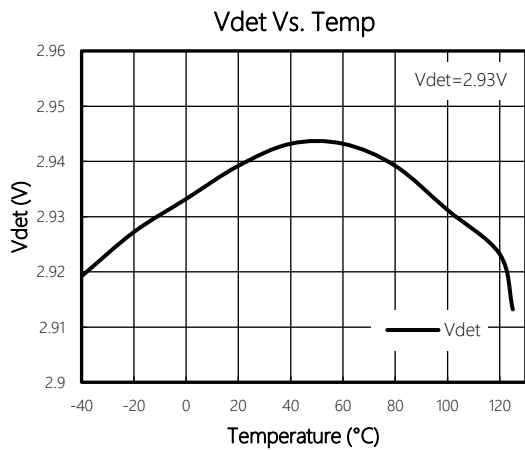
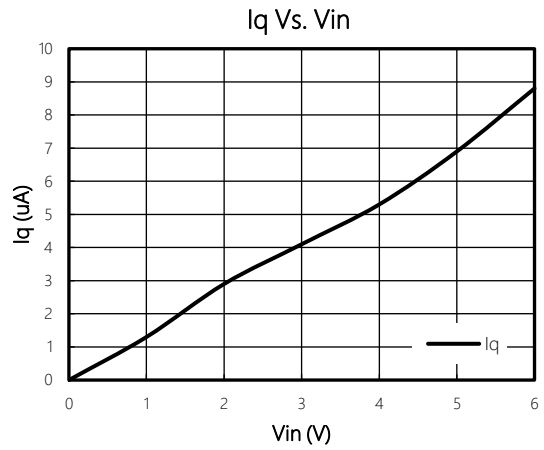
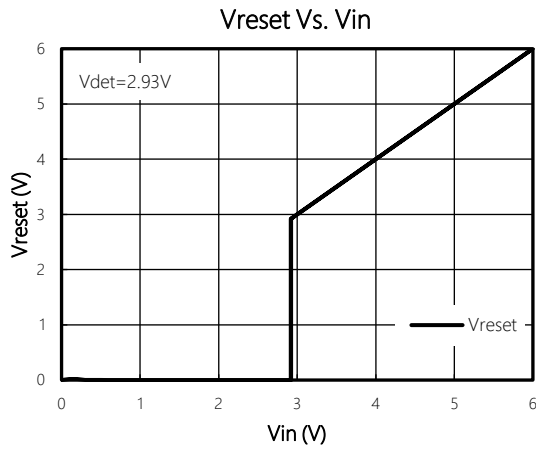
The SGM809 is a general-purpose voltage detector. It can work from 1V to 6V while consuming about 5 μA at 3.6V. SGM809 keeps monitoring its V_{IN} voltage, and RESET will jump high if V_{IN} voltage is higher than detecting level V_{DET} for 240ms. Given all these features, SGM809 is suitable for the applications like battery voltage monitoring, power-on reset, voltage SGM809 employs a low voltage reference, low offset comparator, timer and push-pull output stage. Its push-pull output is comparison and even press button debouncing.

Function Diagram



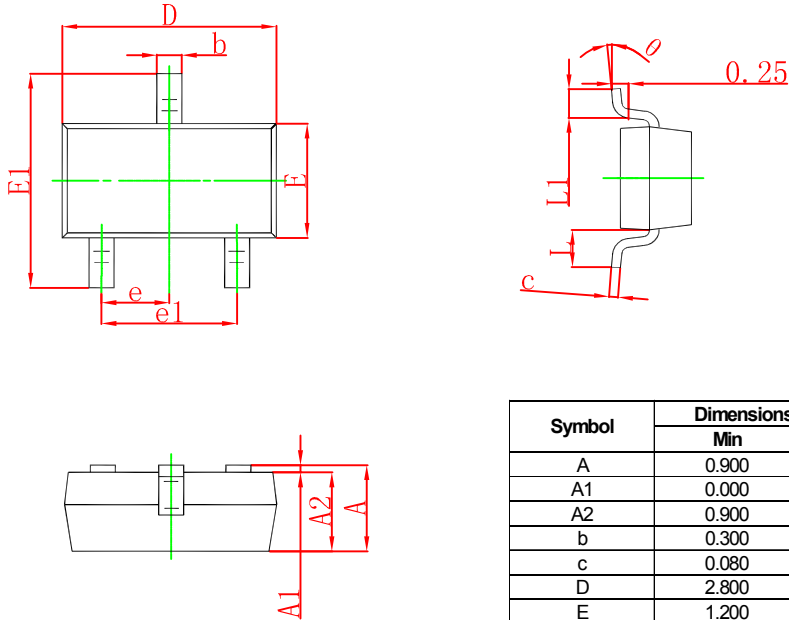


Typical Characteristics



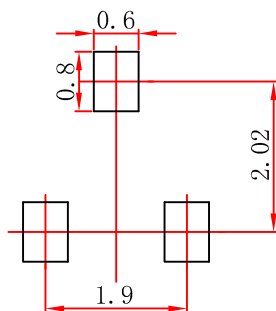


SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.



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