

User Programmable Micro-Power Voltage Detectors

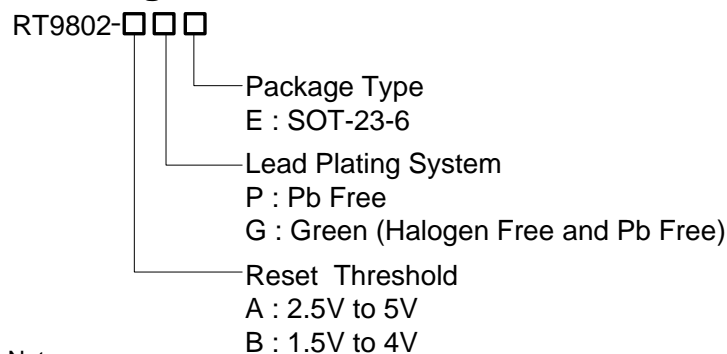
General Description

The RT9802 is a micro-power voltage detector supervising the power supply voltage level for microprocessors (uP) or digital systems. It provides user programmable threshold levels with 0.1V step ranging from 1.5V to 5V, which covers most digital applications. It features low supply current of 3uA. Selection of V_{TH} is easily achieved through 3 pins connected to GND, V_{DD} or floating for different threshold voltage settings. Two versions of threshold voltages, 1.5V to 4V and 2.5V to 5V, which are programmed in factory are offered by customer demands.

The RT9802 performs supervisory function by sending out a reset signal whenever the V_{DD} voltage falls below a preset threshold level. This reset signal will last the whole period before V_{DD} recovering. Reset signal will release after V_{DD} is recovered and lasts for the whole period of Reset Active Time-out period.

RT9802 is CMOS, active-low output and provided in SOT-23-6 package.

Ordering Information



Note :

Richtek products are :

- ▶ RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- ▶ Suitable for use in SnPb or Pb-free soldering processes.

Features

- User Programmable Threshold 1.5V to 5V in 0.1V Step with $\pm 3\%$ Accuracy
- Low Supply Current 3uA
- Quick Reset within 20us
- Built-in Recovery Delay 200ms
- Low Functional Supply Voltage 0.9V
- Small SOT-23-6 Package
- RoHS Compliant and 100% Lead (Pb)-Free

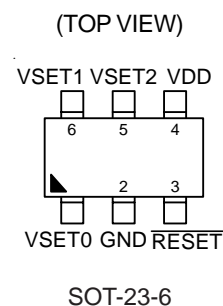
Applications

- Computers
- Controllers
- Intelligent Instruments
- Critical μP and μC Power Monitoring
- Portable/Battery-Powered Equipment

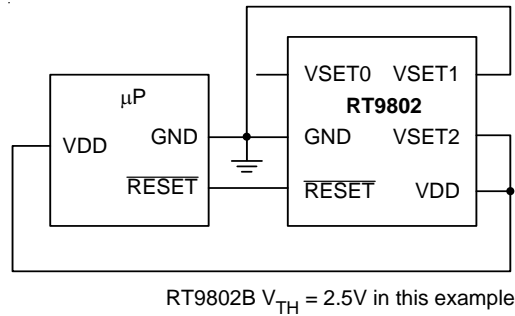
Marking Information

For marking information, contact our sales representative directly or through a Richtek distributor located in your area.

Pin Configurations



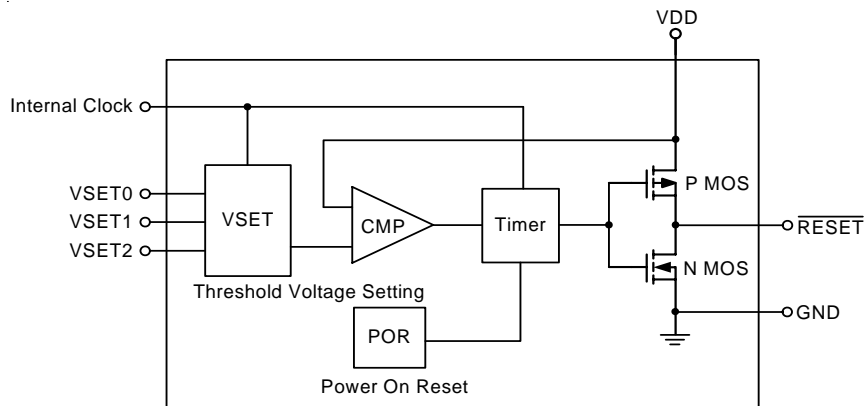
Typical Application Circuit



Functional Pin Description

| Pin Name | Pin Function |
|-------------------|------------------------------------|
| VSET0 | Threshold Voltage Selection Pin 1 |
| GND | Ground Pin |
| \overline{RESE} | Reset Pulse Output, Negative Pulse |
| VDD | Power Pin |
| VSET1 | Threshold Voltage Selection Pin 2 |
| VSET2 | Threshold Voltage Selection Pin 3 |

Function Block Diagram



Absolute Maximum Ratings

- Terminal Voltage (with Respect to GND)
 - V_{DD} ----- -0.3V to 6.0V
 - All Other Inputs ----- -0.3V to $V_{DD}+0.3V$
- Input Current, V_{DD} ----- 20mA
- Continuous Power Dissipation, P_D @ $T_A = 25^\circ C$
 - SOT-23-6 ----- 0.25W
- Operating Junction Temperature Range ----- -40°C to 125°C
- Storage Temperature Range ----- -65°C to 125°C
- Package Thermal Resistance
 - SOT-23-6, θ_{JA} ----- 250°C /W
- Lead Temperature (Soldering, 10 sec.) ----- 260°C

Electrical Characteristics

($V_{DD} = 3.0$, unless specified)

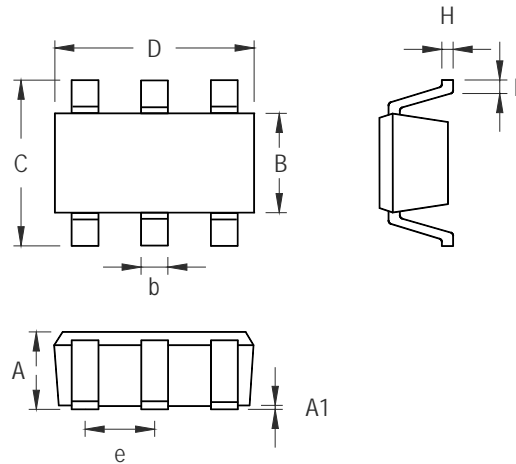
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|-----------------------------------|-----------------|---|-----|--------------|-----|-------|
| Operating VDD (V_{OUT}) Range | V_{DD} | | 0.9 | -- | 6 | V |
| Supply Current | I_{DD} | $V_{DD} = 1.5V$ to $3.5V$, $I_{OUT} = 0$ | -- | | 3 | uA |
| | | $V_{DD} = 3.5V$ to $5V$, $I_{OUT} = 0$ | | | 3.3 | |
| Reset Threshold | V_{TH} | $T_A = 27^\circ C$ | -- | Note1 | -- | V |
| Threshold Voltage Accuracy | ΔV_{TH} | $T_A = 27^\circ C$ | -- | | 3 | % |
| VCC Drop to Reset Delay | t_{RD} | Drop = -125mV | -- | -- | 20 | us |
| Reset Active Time Out Period | t_{RP} | $V_{DD} \geq 1.02 \times V_{TH}$, Programmable | -- | 200 | -- | ms |
| VSET Pin Input Threshold | V_{IL} | $T_A = 27^\circ C$ | -- | $0.2V_{DD}$ | -- | V |
| | V_{IH} | $T_A = 27^\circ C$ | -- | $0.85V_{DD}$ | -- | |
| \overline{RESET} Output Voltage | V_{OL} | $V_{DD} < V_{TH}$, $I_{SINK} = 3.5mA$ | -- | 0.4 | -- | V |

Note 1: Pin Conditions for Programmable Threshold Voltage Setting

| RT9802A | RT9802B | VSET0 input | VSET1 input | VSET2 input |
|---------|---------|-----------------|-----------------|-----------------|
| 5 | 4 | V _{DD} | V _{DD} | V _{DD} |
| 4.9 | 3.9 | V _{DD} | V _{DD} | floating |
| 4.8 | 3.8 | V _{DD} | V _{DD} | GND |
| 4.7 | 3.7 | V _{DD} | floating | V _{DD} |
| 4.6 | 3.6 | V _{DD} | floating | floating |
| 4.5 | 3.5 | V _{DD} | floating | GND |
| 4.4 | 3.4 | V _{DD} | GND | V _{DD} |
| 4.3 | 3.3 | V _{DD} | GND | floating |
| 4.2 | 3.2 | V _{DD} | GND | GND |
| 4.1 | 3.1 | floating | V _{DD} | V _{DD} |
| 4 | 3 | floating | V _{DD} | floating |
| 3.9 | 2.9 | floating | V _{DD} | GND |
| 3.8 | 2.8 | floating | floating | V _{DD} |
| 3.7 | 2.7 | floating | floating | floating |
| 3.6 | 2.6 | floating | floating | GND |
| 3.5 | 2.5 | floating | GND | V _{DD} |
| 3.4 | 2.4 | floating | GND | floating |
| 3.3 | 2.3 | floating | GND | GND |
| 3.2 | 2.2 | GND | V _{DD} | V _{DD} |
| 3.1 | 2.1 | GND | V _{DD} | floating |
| 3 | 2 | GND | V _{DD} | GND |
| 2.9 | 1.9 | GND | floating | V _{DD} |
| 2.8 | 1.8 | GND | floating | floating |
| 2.7 | 1.7 | GND | floating | GND |
| 2.6 | 1.6 | GND | GND | V _{DD} |
| 2.5 | 1.5 | GND | GND | floating |

V_{DD}: bond to V_{DD}; 0: bond to GND; f: no bonding

Outline Dimension



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.889 | 1.295 | 0.031 | 0.051 |
| A1 | 0.000 | 0.152 | 0.000 | 0.006 |
| B | 1.397 | 1.803 | 0.055 | 0.071 |
| b | 0.250 | 0.560 | 0.010 | 0.022 |
| C | 2.591 | 2.997 | 0.102 | 0.118 |
| D | 2.692 | 3.099 | 0.106 | 0.122 |
| e | 0.838 | 1.041 | 0.033 | 0.041 |
| H | 0.080 | 0.254 | 0.003 | 0.010 |
| L | 0.300 | 0.610 | 0.012 | 0.024 |

SOT-23-6 Surface Mount Package

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