

User Programmable Micro-Power Voltage Detectors

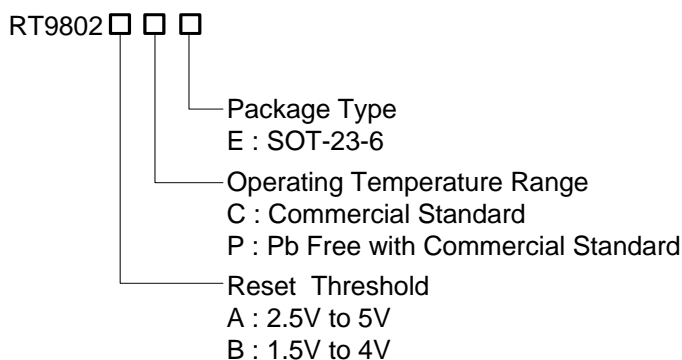
General Description

The RT9802 is a micro-power voltage detector supervising the power supply voltage level for microprocessors (μ P) 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 3 μ A. 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 Pb-free 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.
- 100%matte tin (Sn) plating.

Features

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

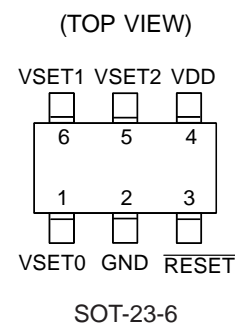
Applications

- Computers
- Controllers
- Intelligent Instruments
- Critical mP and mC Power Monitoring
- Portable/Battery-Powered Equipment

Marking Information

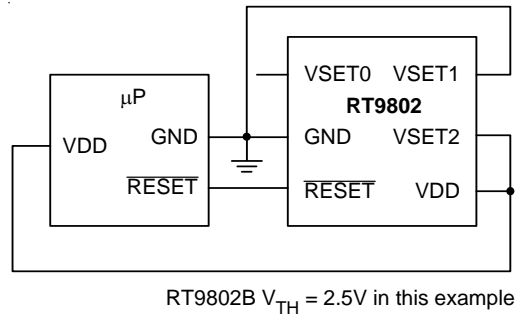
For marking information, contact our sales representative directly or through a RichTek distributor located in your area, otherwise visit our website for detail.

Pin Configurations



Note : There is no pin1 indicator on top mark for SOT-23-6 type, and pin 1 will be lower left pin when reading top mark from left to right.

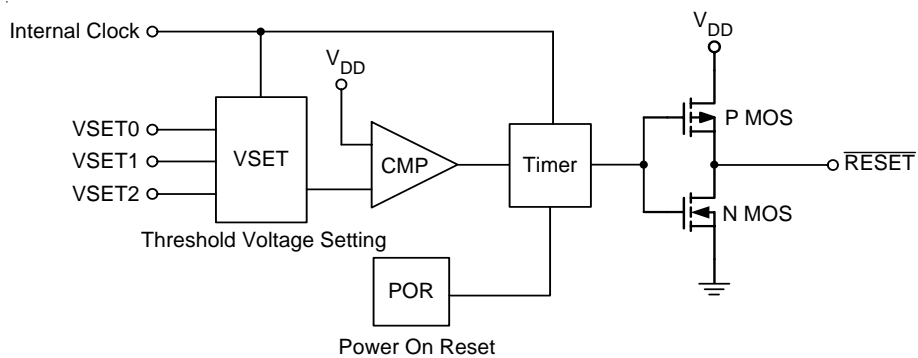
Typical Application Circuit



Functional Pin Description

| Pin Name | Pin Function |
|---------------------------|------------------------------------|
| VSET0 | Threshold Voltage Selection Pin 1 |
| GND | Ground Pin |
| $\overline{\text{RESET}}$ | 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)

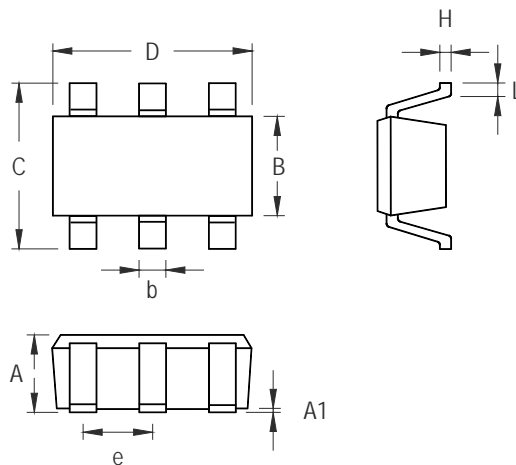
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|-----------------------------------|-----------------|---|-----|--------------|-----|---------|
| Operating VDD (V_{OUT}) Range | V_{DD} | | 0.9 | -- | 6 | V |
| Supply Current | I_{DD} | $V_{DD} = 1.5V \sim 3.5V, I_{OUT} = 0$ | -- | | 3 | μA |
| | | $V_{DD} = 3.5V \sim 5V, I_{OUT} = 0$ | | | 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 | μs |
| 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} | $T_A = 27^\circ C$ | -- | $0.85V_{DD}$ | -- | |
| 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

RICHTEK TECHNOLOGY CORP.

Headquarter
 5F, No. 20, Taiyuen Street, Chupei City
 Hsinchu, Taiwan, R.O.C.
 Tel: (8863)5526789 Fax: (8863)5526611

RICHTEK TECHNOLOGY CORP.

Taipei Office (Marketing)
 8F-1, No. 137, Lane 235, Paochiao Road, Hsintien City
 Taipei County, Taiwan, R.O.C.
 Tel: (8862)89191466 Fax: (8862)89191465
 Email: marketing@richtek.com