

Micro-Power Voltage Detectors

General Description

The RT9818 is a micro-power voltage detector supervising the power supply voltage level for microprocessors (μ P) or digital systems. It provides internally fixed threshold levels with 0.1V per step ranging from 1.2V to 5V, which covers most digital applications. It features low supply current of 3 μ A. The RT9818 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. Once V_{DD} recovered upcrossing the threshold level, the reset signal will be released after a certain delay time. RT9818 is provided in SC-82, SC-70-3, SOT-23-3, SOT-23-5 and SOT-89 packages.

Ordering Information

RT9818	□	□	□	□
	Package Type			
	U3 : SC-70-3			
	V : SOT-23-3			
	VL : SOT-23-3 (L-Type)			
	B : SOT-23-5			
	X : SOT-89			
	Y : SC-82			
	YR : SC-82 (R-Type)			
	Lead Plating System			
	P : Pb Free			
	G : Green (Halogen Free and Pb Free)			
	Threshold Voltage			
	12 : 1.2V			
	13 : 1.3V			
	...			
	49 : 4.9V			
	50 : 5.0V			
	Reset Active Timeout Period			
	A = 0ms ($\overline{\text{RESET}}$)			
	B = 55ms ($\overline{\text{RESET}}$)			
	C = 220ms ($\overline{\text{RESET}}$)			
	D = 450ms ($\overline{\text{RESET}}$)			
	E = 0ms (RESET)			
	F = 55ms (RESET)			
	G = 220ms (RESET)			
	H = 450ms (RESET)			

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

- Internally Fixed Threshold 1.2V to 5V in 0.1V Step
- High Accuracy $\pm 1.5\%$
- Low Supply Current 3 μ A
- No External Components Required
- Quick Reset within 20 μ s
- Built-in Recovery Delay Include 0ms, 55ms, 220ms, 450ms Options
- Low Functional Supply Voltage 0.9V
- N-Channel Open-Drain Output
- Small SC-82, SC-70-3, SOT-23-3, SOT-23-5, SOT-89 Packages
- RoHS Compliant and 100% Lead (Pb)-Free

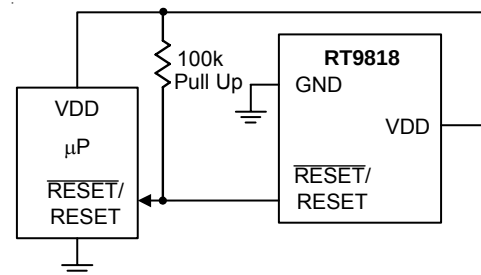
Applications

- Computers
- Controllers
- Intelligent Instruments
- Critical μ P and μ C Power Monitoring
- Portable/Battery-Powered Equipment

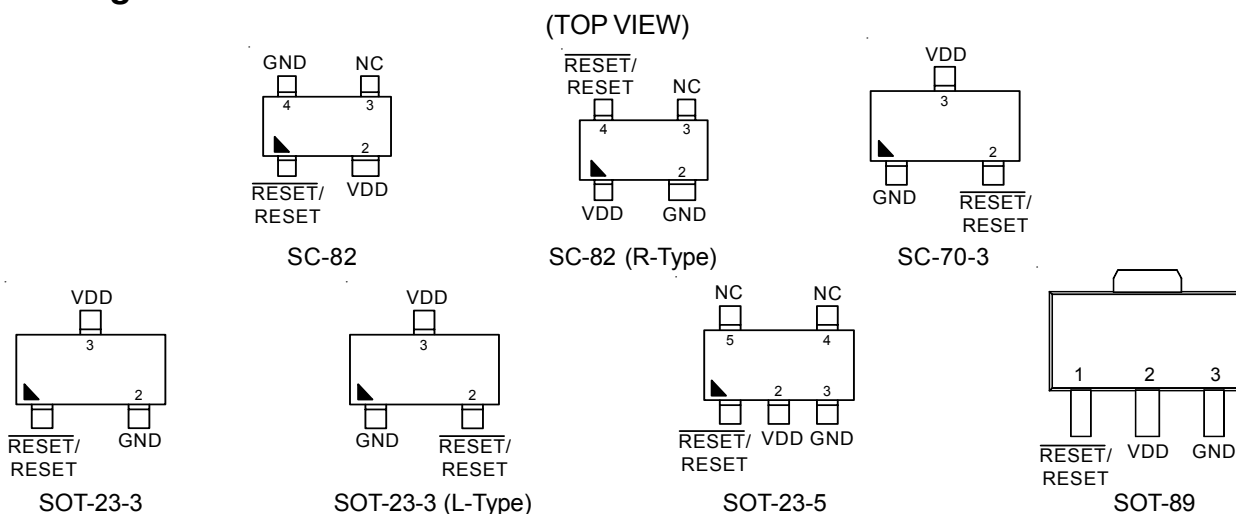
Marking Information

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

Typical Application Circuit



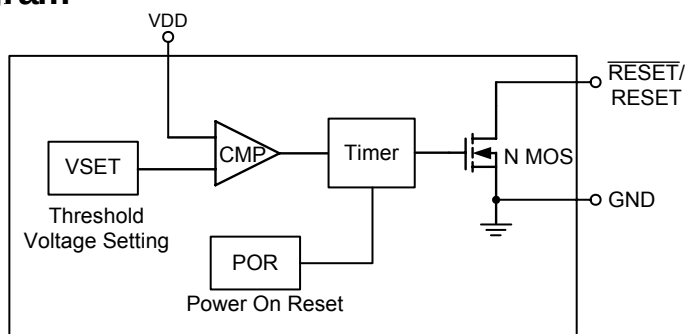
Pin Configurations



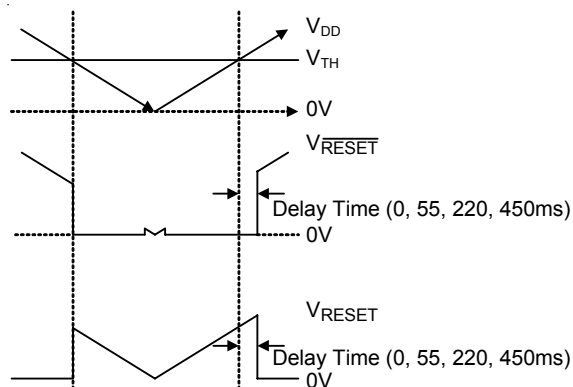
Functional Pin Description

Pin Name	Pin Function
GND	Ground
RESET	Active Low Open-Drain Reset Output
RESET	Active High Open-Drain Reset Output
VDD	Power Pin

Function Block Diagram



Timing Diagram



Absolute Maximum Ratings (Note 1)

- Terminal Voltage (with Respect to GND)
 - V_{DD} ----- -0.3V to 6V
- All Other Inputs ----- -0.3V to ($V_{DD} + 0.3V$)
- Input Current, I_{VDD} ----- 20mA
- Power Dissipation, P_D @ $T_A = 25^\circ C$
 - SC-70 / SC-82 ----- 0.25W
 - SOT-23-3 ----- 0.4W
 - SOT-23-5 ----- 0.4W
 - SOT-89 ----- 0.55W
- Package Thermal Resistance (Note 2)
 - SC-70 / SC-82, θ_{JA} ----- $400^\circ C/W$
 - SOT-23-3, θ_{JA} ----- $250^\circ C/W$
 - SOT-23-5, θ_{JA} ----- $250^\circ C/W$
 - SOT-89, θ_{JA} ----- $180^\circ C/W$
- Lead Temperature (Soldering, 10sec.) ----- $260^\circ C$
- Storage Temperature Range ----- $-65^\circ C$ to $150^\circ C$
- ESD Susceptibility (Note 3)
 - HBM (Human Body Model) ----- 2kV

Recommended Operating Conditions (Note 4)

- Junction Temperature Range ----- $-40^\circ C$ to $125^\circ C$
- Ambient Temperature Range ----- $-40^\circ C$ to $85^\circ C$

Electrical Characteristics

($V_{DD} = 3V$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Operating V_{DD} (V_{OUT}) Range	V_{DD}		0.9	–	6	V
Supply Current	I_{DD}	$V_{TH} = 3V$, $V_{DD} = 4.5V$, $T_A = 27^\circ C$	--	3	8	μA
Reset Threshold	V_{TH}	$T_A = 27^\circ C$	--	1.2 to 5	--	V
Threshold Voltage Accuracy	ΔV_{TH}	$T_A = 27^\circ C$	-1.5	–	1.5	%
V_{DD} Drop to Reset Delay	t_{RD}	Drop = $V_{TH} - 125mV$	--	20	--	μs
Reset Active Time Out Period	RT9818A/E	t_{RP} $V_{DD} \geq 1.02 \times V_{TH}$	--	0	--	ms
	RT9818B/F		35	55	75	
	RT9818C/G		143	220	297	
	RT9818D/H		292	450	608	
RESET Output Voltage Low (Note 5)	V_{OL}	$3 = V_{DD} < V_{TH}$ $I_{SINK} > 3.5mA$	--	–	0.4	V
Hysteresis Width	V_{HYS}		--	$0.01V_{TH}$	$0.016V_{TH}$	V

- Note 1.** Stresses beyond those listed “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions may affect device reliability.
- Note 2.** θ_{JA} is measured at $T_A = 25^\circ\text{C}$ on a low effective thermal conductivity single-layer test board per JEDEC 51-3.
- Note 3.** Devices are ESD sensitive. Handling precaution is recommended.
- Note 4.** The device is not guaranteed to function outside its operating conditions.
- Note 5.** The voltage V_{OL} can be calculated by $V_{OL} = V_{DD} - I_r * R$. Where R is the pull-up resistor and I_r is the current flowing through the pull-up resistor. For typical application ($R=100\text{k}\Omega$), V_{OL} is less than 0.2V.