VR809T

Datasheet

Features

- Precision voltage monitor for 1.8V,2.5V,3.3V power supplies
- $\overline{\text{RESET}}$ remains valid with V_{CC} as low as 1V
- 140ms minimum reset pulse width available
- 3μA typical supply current
- Available in 3-pin SOT23-3L package

Description

The VR809T is a low-power microprocessor (μP) supervisory circuit used to monitor power supplies in microprocessor and digital systems. Low supply current makes the VR809T ideal for use in portable equipment. The device comes in a 3-pin SOT23-3L package.

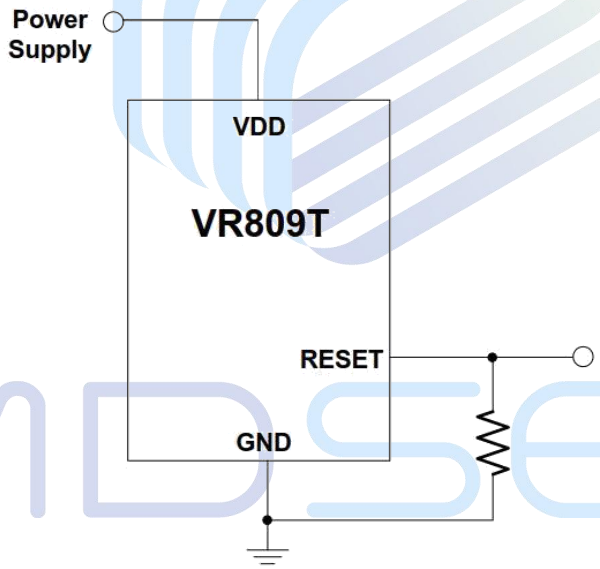
The VR809T provides excellent circuit reliability and low BOM cost by eliminating external components and adjustments when used with 5V-powered or 3V-powered circuits. The VR809T also provides a debounced manual reset input. The VR809T provide an active low reset signal while the VR809T provides an active high signal output.

The function of this device is to assert a reset if either the power supply drops below a designed reset threshold level is forced low. The reset comparator is designed to ignore fast transients on V_{CC}. Reset thresholds are available for operation with a variety of supply voltages.

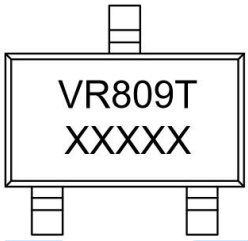
Applications

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

Typical Application Circuit

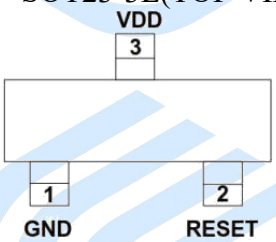


Ordering and Marking Information

Part Number	Marking Code	package
VR809T	 VR809T= Device code X=Special Code	**SOT23-3L**

Pin configuration

SOT23-3L(TOP VIEW)



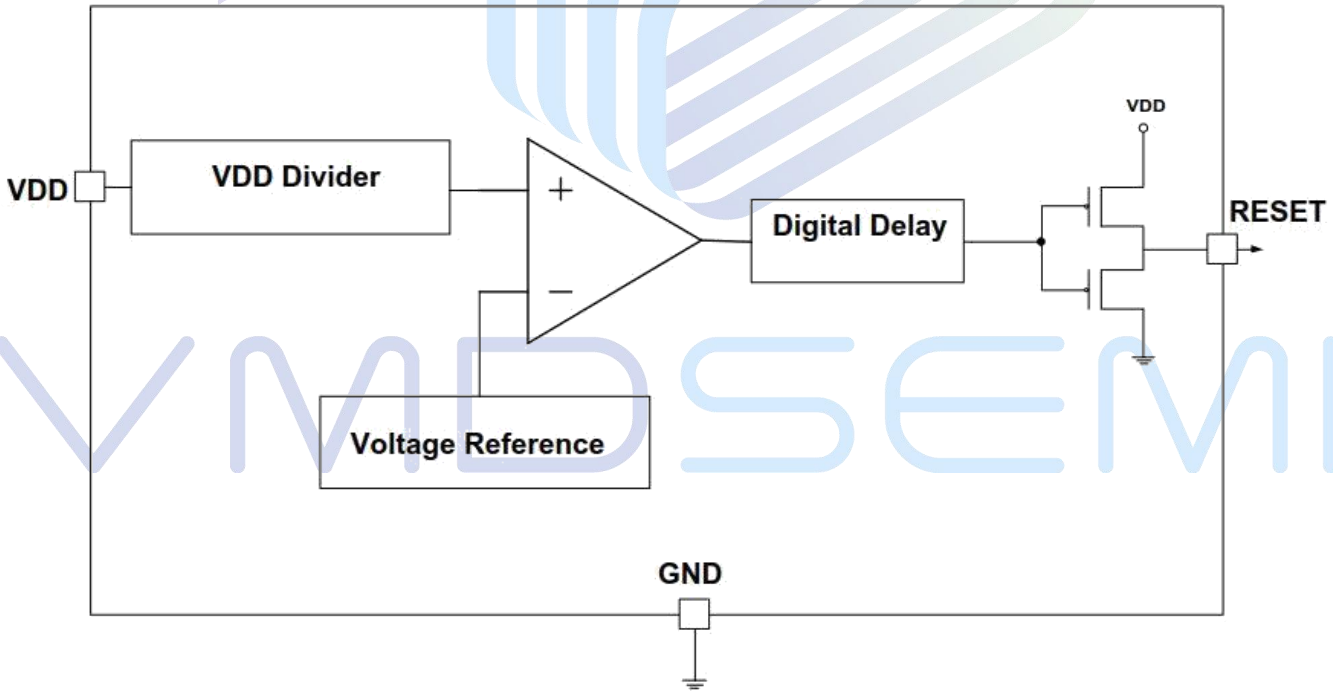
Pin Description

Pin No.	Name	Function
1	GND	IC Ground Pin.
2	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$ goes low if V_{CC} falls below the reset threshold and remains asserted for one reset timeout period after V_{CC} exceeds the reset threshold.
3	V_{CC}	Power Supply Input.

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Terminal Voltage(V_{CC})	V_{CC}	-0.3 to 6.0V	V
Input Current(V_{CC})	V_{CC}	20	mA
Output Current(RESET)		20	mA
ESD Rating		3	KV
Lead Temperature(soldering,10sec)		300	℃
Junction Temperature		150	℃
Storage Temperature		-65 to 150	℃
SOT23-3L Package Thermal Resistance, θJA		250	℃/W
SOT23-3L Package Thermal Resistance, θJC		115	℃/W
HBM		±4000	V
CDM		±1000	V

Functional Diagram

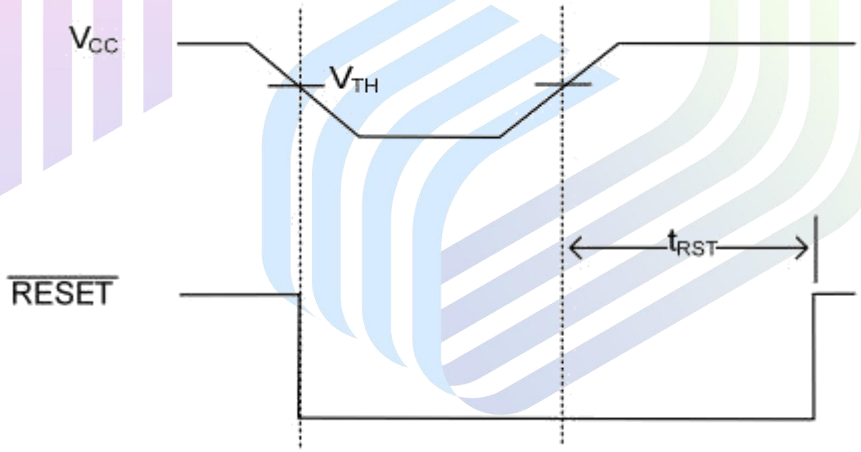


Electrical Characteristics

VR809_X (TA = +25℃ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Operation Voltage Range	V_{CC}	**1**		**5.5**	V	T_A=-40℃ to 85℃
Supply Current	I_{CC}		2.2	**8**	μA	V_{CC}=1.8V, no load
Reset Voltage Threshold	V_{TH}	**1.589**	1.63	**1.671**	V	
Reset Timeout Period	t_{RST}	**140**		**560**	ms	
$\overline{\text{RESET}}$ Output Voltage	V_{OH}	**0.8×V_{CC}**			V	$I_{SOURECE}$=500μA
	V_{OL}			**0.3**	V	V_{CC}=V_{TH} min, I_{SINK}=1.2mA
				0.3	V	V_{CC}>1V,I_{SINK}=50μA,

Timing Diagram



Typical Performance Characteristics

Fig.1 Power down Reset Delay vs Temperature

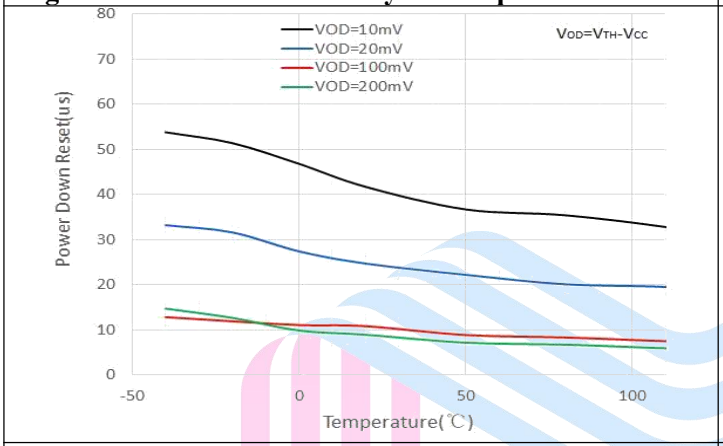


Fig.2 Power Up Reset Delay vs Temperature

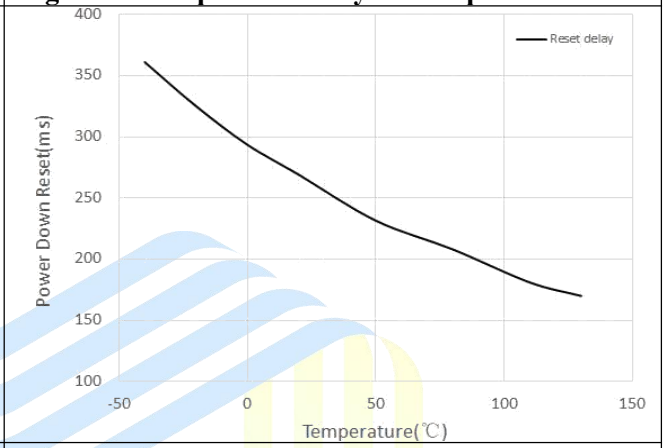


Fig.3 Supply Current vs Temperature

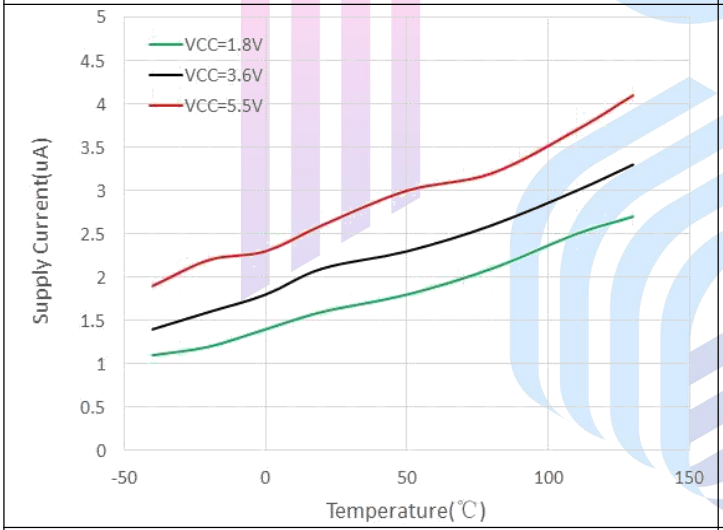


Fig.4 Normalized RESET Voltage Threshold vs. Temperature

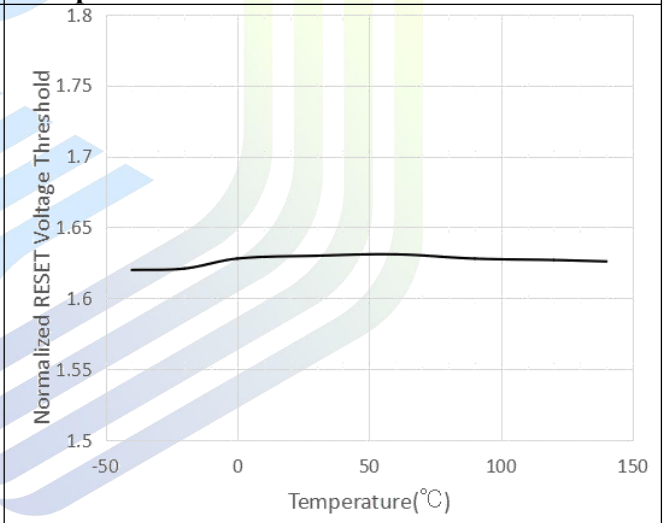
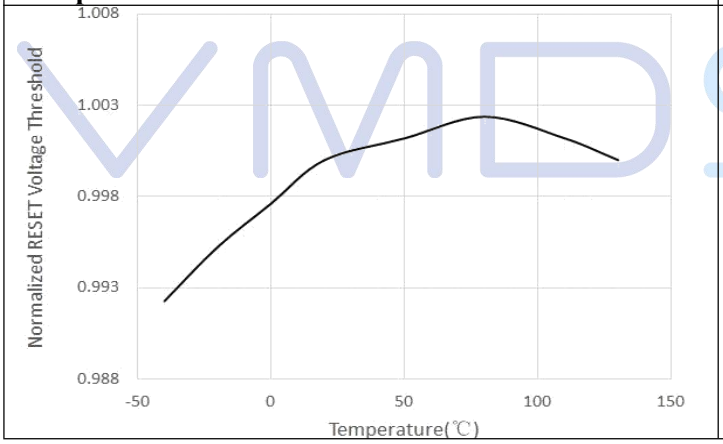


Fig.4 Normalized RESET Voltage Threshold vs. Temperature



Applications Information

Microprocessor Reset

The $\overline{\text{RESET}}$ pin is asserted whenever V_{CC} falls below the reset threshold voltage. The $\overline{\text{RESET}}$ pin remains asserted for a period of 140ms after V_{CC} has risen above the reset threshold voltage. The reset and powers up in a known condition after a power failure. $\overline{\text{RESET}}$ will remain valid with V_{CC} as low as 1V.

V_{CC} Transients

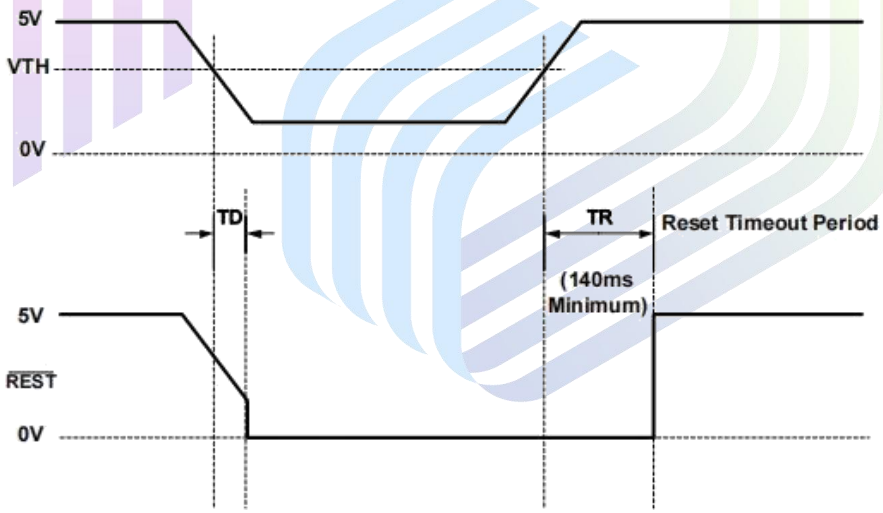
The VR809T is relatively immune to negative-going V_{CC} glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20μs or less will not cause a reset.

Interfacing to Bidirectional Reset Pins

TheVR809T can interface with μPs with bidirectional reset pins by connecting a 4.7kΩ resistor in series with the VR809T output and the μP reset pin.

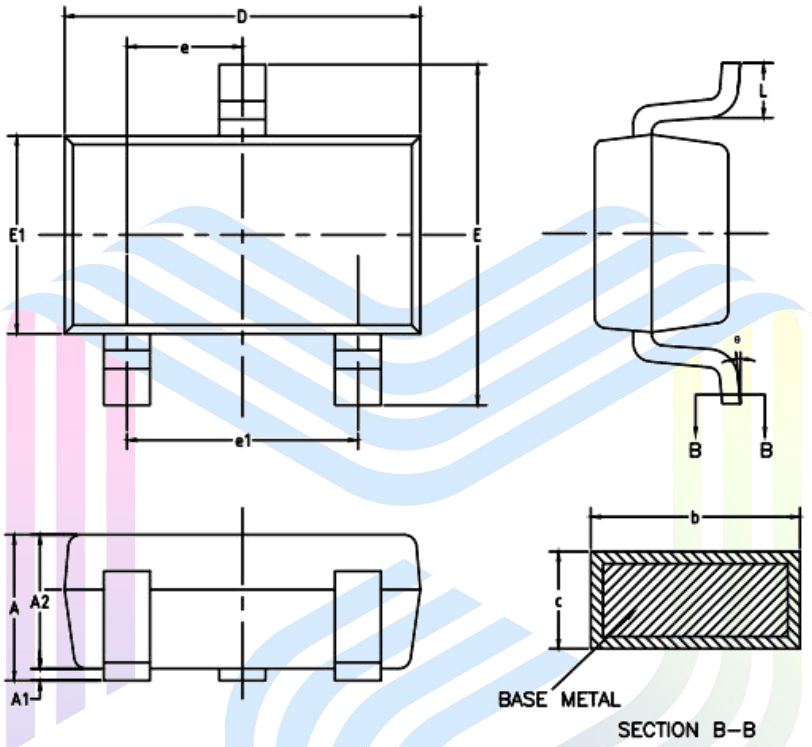
Reset Valid at Low Voltage

A resistor can be added from the $\overline{\text{RESET}}$ pin to ground to ensure the $\overline{\text{RESET}}$ output remains low with VCC down to 0V. A 100kΩ resistor connected from the $\overline{\text{RESET}}$ to ground is recommended. The size of the resistor should be large enough not to load the output excessively and small enough to pull-down any stray leakage currents.



Mechanical Dimensions

SOT23-3L Package Information



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.9	1.45
A1	0	0.15
A2	0.9	1.3
b	0.28	0.5
c	0.1	0.23
D	2.82	3.05
E	2.6	3.0
E1	1.5	1.75
e	0.95BSC	
e1	1.8	2
L	0.3	0.6
θ	0°	8°

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