WinhiSemi

WR811

Datasheet

Features

- Precision voltage monitor for 3V, 3.3V or 5V power supplies
- Reset remains valid with V_{CC} as low as 1V
- 140ms minimum reset pulse width available
- 3μA typical supply current
- Available in 4-pin SOT-143 package

Applications

- Computer
- Controller
- Intelligent Instruments
- Critical uP and uC Power Monitoring
- Portable/Battery-Powered Equipment

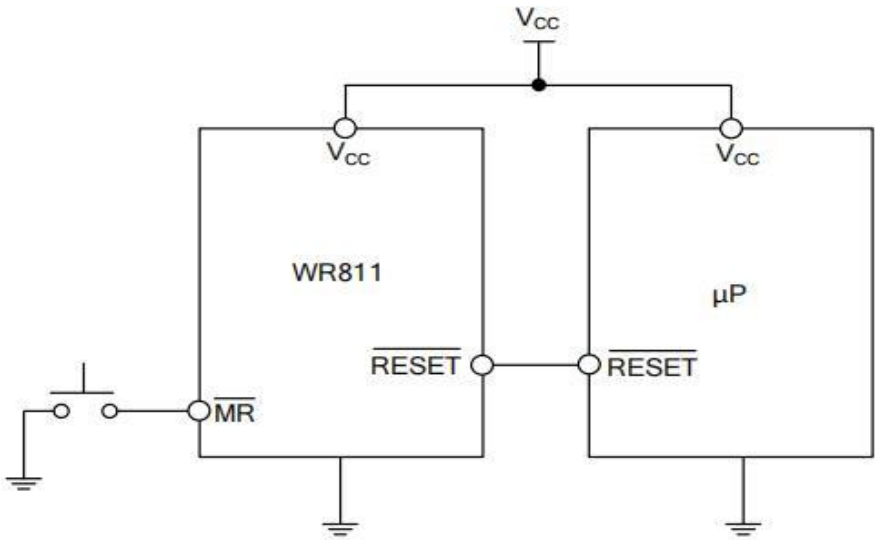
Description

The WR811 is a low-power microprocessor (μP) supervisory circuit used to monitor power supplies in microprocessor and digital systems. Low supply current makes the WR811 ideal for use in portable equipment. The device comes in a 4-pin SOT-143 package.

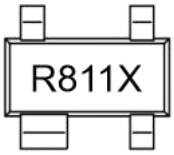
The WR811 provides excellent circuit reliability and low BOM cost by eliminating external components and adjustments when used with 5V-powered or 3V-powered circuits. The WR811 also provides a debounced manual reset input.

The function of this device is to assert a reset if either the power supply drops below a designed reset threshold level or $\overline{MR}$ 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.

Typical Application Circuit

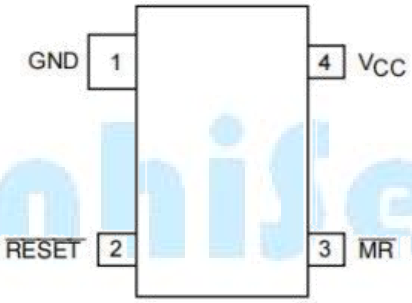


Ordering and Marking Information

Part Number	Marking Code	package
WR811	 R811= Device code X=Special Code	**SOT-143**

Pin Configuration

SOT-143(TOP VIEW)



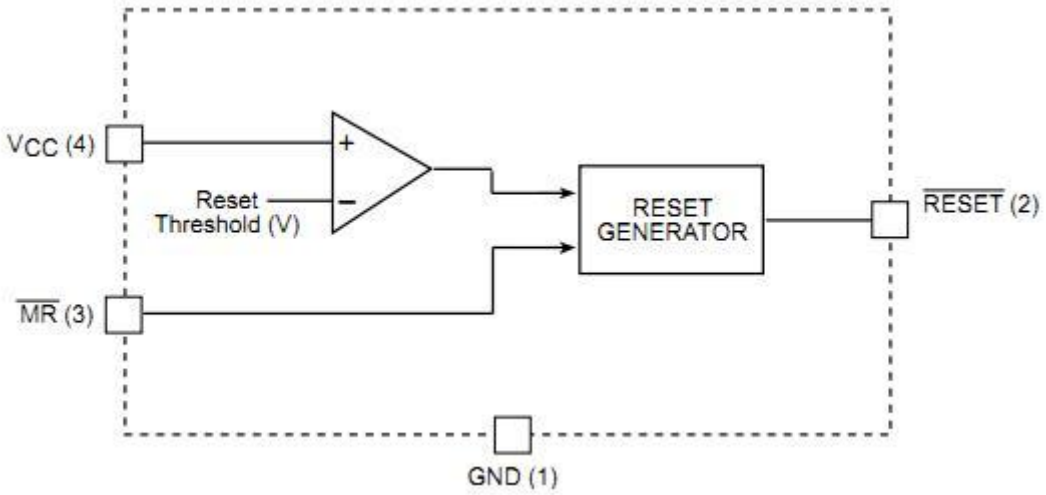
Pin Description

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	$\overline{\text{MR}}$	Manual Reset Input. A logic low on $\overline{\text{MR}}$ forces a reset timeout period after $\overline{\text{MR}}$ goes high. This input can be shorted to ground via a switch or driven from CMOS or TTL logic. Float if unused.
4	V_{CC}	Power Supply Input.

Absolute Maximum Values

Parameter	Symbol	Value	Unit
Terminal Voltage(V_{CC})	V_{CC}	-0.3 to 6.0V	V
Input Current(V_{CC},$\overline{MR}$)	V_{CC}, $\overline{MR}$	20	mA
Output Current($\overline{RESET}$)	$\overline{RESET}$	20	mA
ESD Rating		3	KV
Lead Temperature(soldering,10sec)		300	℃
Junction Temperature		150	℃
Storage Temperature		-65 to 160	℃
Junction Temperature		150	℃
Storage Temperature		-65 to 150	℃
SOT-143 Package Thermal Resistance	$R_{\theta JA}$	250	℃/W
SOT-143 Package Thermal Resistance	$R_{\theta JC}$	115	℃/W

Functional Diagram



Electrical Characteristics

WR811-T(3.08) (TA = +25℃ unless otherwise stated, VCC = 5.0V)

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}		3	8	μA	V_{CC}=3.3V, no load
Reset Voltage Threshold	V_{TH}	3	3.08	3.15	V	
Reset Timeout Period	t_{RST}	140		560	ms	
$\overline{RESET}$ 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, T_A=-40℃ to 85℃
$\overline{MR}$ Minimum Pulse Width		10			μs	
$\overline{MR}$ to Reset Delay			0.5		μs	
$\overline{MR}$ Input Threshold	V_{IH}	0.7×V_{CC}			V	
	V_{IL}			0.25×V_{CC}	V	
$\overline{MR}$ Pull-Up resistance		10	20	30	kΩ	
$\overline{MR}$ Glitch Immunity			100		ns	

WR811-M(4.38) (T_A = +25℃ unless otherwise stated, VCC = 5.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Operation Voltage Range	VCC	1		5.5	V	T_A=-40℃ to 85℃
Supply Current	ICC		3	8	μA	V_{CC}=3.3V, no load
Reset Voltage Threshold	V_{TH}	4.25	4.38	4.50	V	
Reset Timeout Period	t_{RST}	140		560	ms	
$\overline{RESET}$ Output Voltage	V_{OH}	0.8×VCC			V	$I_{SOURECE}$=500μA
	V_{OL}			0.3	V	V_{CC}=VTH min, I_{SINK}=1.2mA
				0.3	V	V_{CC}>1V,I_{SINK}=50μA, T_A=-40℃ to 85℃
$\overline{MR}$ Minimum Pulse Width		10			μs	
$\overline{MR}$ to Reset Delay			0.5		μs	
$\overline{MR}$ Input Threshold	V_{IH}	0.7×VCC			V	
	V_{IL}			0.25×VCC	V	
$\overline{MR}$ Pull-Up resistance		10	20	30	kΩ	
$\overline{MR}$ Glitch Immunity			100		ns	

WR811-L(4.63) (T_A = +25℃ unless otherwise stated, VCC = 5.0V)

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}		3	8	μA	V_{CC}=3.3V, no load
Reset Voltage Threshold	V_{TH}	4.5	4.63	4.8	V	
Reset Timeout Period	t_{RST}	140		560	ms	
$\overline{RESET}$ 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, T_A=-40℃ to 85℃
$\overline{MR}$ Minimum Pulse		10			μs	
$\overline{MR}$ to Reset Delay			0.5		μs	
$\overline{MR}$ Input Threshold	V_{IH}	0.7×V_{CC}			V	
	V_{IL}			0.25×V_{CC}	V	
$\overline{MR}$ Pull-Up resistance		10	20	30	kΩ	
$\overline{MR}$ Glitch Immunity			100		ns	

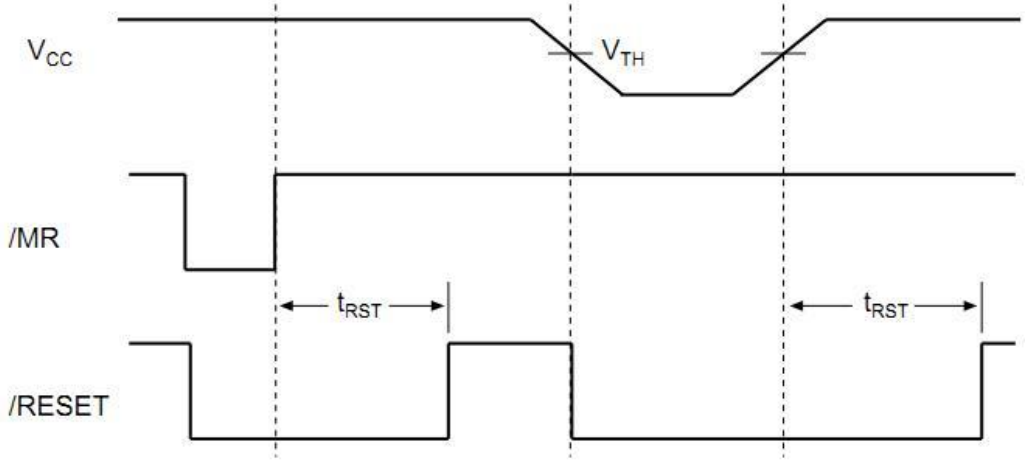
WR811-S(2.93) (TA = +25℃ unless otherwise stated, VCC = 5.0V)

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}		3	8	μA	V_{CC}=3.3V, no load
Reset Voltage Threshold	V_{TH}	2.8	2.93	3.0	V	
Reset Timeout Period	t_{RST}	140		560	ms	
$\overline{RESET}$ 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, T_A=-40℃ to 85℃
$\overline{MR}$ Minimum Pulse		10			μs	
$\overline{MR}$ to Reset Delay			0.5		μs	
$\overline{MR}$ Input Threshold	V_{IH}	0.7×V_{CC}			V	
	V_{IL}			0.25×V_{CC}	V	
$\overline{MR}$ Pull-Up resistance		10	20	30	kΩ	
$\overline{MR}$ Glitch Immunity			100		ns	

WR811-R(2.63) (TA = +25℃ unless otherwise stated, VCC = 5.0V)

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}		3	8	μA	V_{CC}=3.3V, no load
Reset Voltage Threshold	V_{TH}	2.58	2.63	2.68	V	
Reset Timeout Period	t_{RST}	140		560	ms	
$\overline{RESET}$ 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, T_A=-40℃ to 85℃
$\overline{MR}$ Minimum Pulse Width		10			μs	
$\overline{MR}$ to Reset Delay			0.5		μs	
$\overline{MR}$ Input Threshold	V_{IH}	0.7×V_{CC}			V	
	V_{IL}			0.25×V_{CC}	V	
$\overline{MR}$ Pull-Up resistance		10	20	30	kΩ	
$\overline{MR}$ Glitch Immunity			100		ns	

Timing Diagram



Reset Timing Diagram

Application 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.

VCC Transients

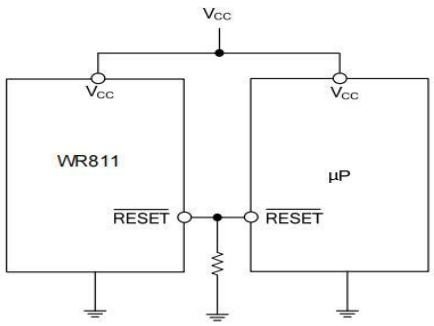
The WR811 is relatively immune to negative-going VCC glitches below the reset threshold. Typically, a negative-going transient 125mV below the reset threshold with a duration of 20μs or less will not cause a reset.

Interfacing to Bidirectional Reset Pins

TheWR811 can interface with μPs with bidirectional reset pins by connecting a 4.7kΩ resistor in series with the WR811 output and the μP reset pin.

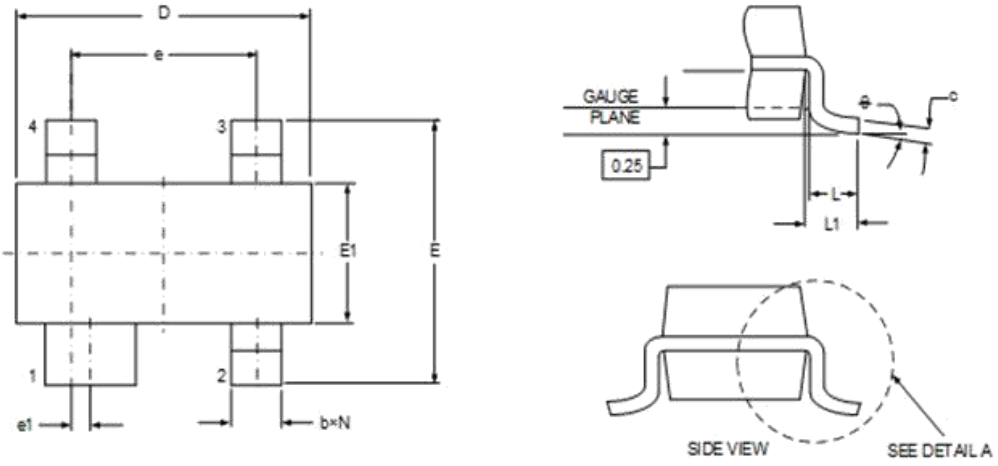
RESET Valid at Low Voltage

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

SOT-143 Package Information



DIMENSIONS				
SYMBOL	MILLIMETER		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
b1	0.750	0.900	0.030	0.035
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
e	1.800	2.000	0.071	0.079
e1	0.200TYP		0.008TYP	
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
L1	0.550REF		0.022REF	
L	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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