

# GSR803

## Reset IC

### Product Description

The GSR803 are microprocessor ( $\mu\text{P}$ ) supervisory circuits used to monitor the power supplies in  $\mu\text{P}$  and digital systems. They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with +3.3V, +3.0V, or 2.5V powered circuits.

These circuits perform a single function: they assert a reset signal whenever the  $V_{\text{CC}}$  supply voltage declines below a preset threshold, keeping it asserted for at least 140ms after  $V_{\text{CC}}$  has risen above the reset threshold. Reset thresholds suitable for operation with a variety of supply voltages are available.

The GSR803 have open drain outputs and have an active low /RESET output. The reset comparator is designed to ignore fast transients on  $V_{\text{CC}}$ , and the outputs are guaranteed to be in the correct logic state for  $V_{\text{CC}}$  down to 1V.

Low supply current makes the GSR803 ideal for use in portable equipment. The ICs are available in SOT-23-3L packages.

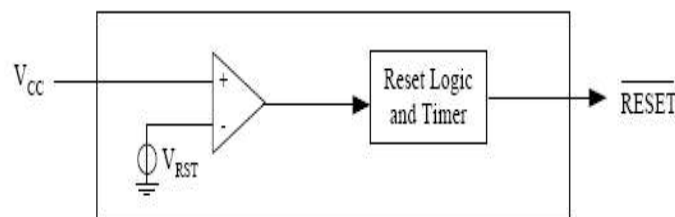
### Features

- Precision supply-voltage monitor
  - 4.63V (GSR803L)
  - 4.38V (GSR803M)
  - 4.00V (GSR803J)
  - 3.08V (GSR803T)
  - 2.93V (GSR803S)
  - 2.63V (GSR803R)
  - 2.32V (GSR803Z)
- 140ms(min) reset pulse width
- Open-Drain /RESET Output Configurations for GSR803
- 12 $\mu\text{A}$  Supply Current
- Guaranteed Reset(/Reset) Valid to  $V_{\text{CC}}=+1.0\text{V}$
- Power Supply Transient Immunity
- No External Components
- RoHS Compliant, 100%Pb & Halogen Free

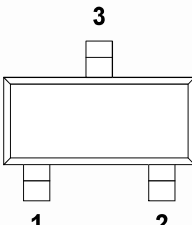
### Applications

- Microprocessor reset circuitry
- Computers
- Wireless
- Embedded Control Systems
- Battery-operated systems

### Block Diagram



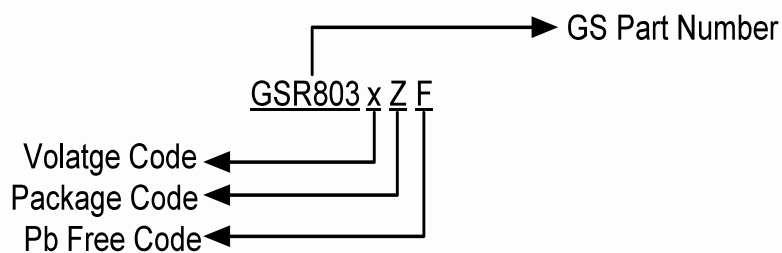
### Packages & Pin Assignments

GSR803xZF (SOT-23-3L)		
	Pin No.	Name
	1	GND
	2	/RESET
	3	$V_{\text{CC}}$

## Pin Description

Name	Type	Description
V <sub>CC</sub>	-	Supply Voltage. Reset is asserted when V <sub>CC</sub> drops below the Reset Threshold Voltage (V <sub>RST</sub> ). Reset remains asserted until V <sub>CC</sub> rises above V <sub>RST</sub> and keep asserted for the duration of the Reset Timeout Period (t <sub>RS</sub> ) once V <sub>CC</sub> rises above V <sub>RST</sub> .
GND	-	Ground Pin.
/RESET	O	Active-Low Reset Output (Open Drain). It goes low when V <sub>CC</sub> is below the reset threshold. It remains low for about 240ms after V <sub>CC</sub> rises above the reset threshold (V <sub>RST</sub> ), it needs external pull up resistor.

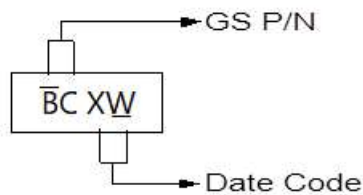
## Ordering Information



Voltage Code : As following Table :

x	L	M	J	T	S	R	Z
Reset Threshold	4.63V	4.38V	4.00V	3.08V	2.93V	2.63V	2.32V

## Marking Information



GS P/N	Package	Marking	Reset Threshold
GSR803LZF	SOT-23-3L	BCXW	4.63V
GSR803MZF	SOT-23-3L	BDXW	4.38V
GSR803JZF	SOT-23-3L	BIXW	4.00V
GSR803TZF	SOT-23-3L	BEXW	3.08V
GSR803SZF	SOT-23-3L	BFXW	2.93V
GSR803RZF	SOT-23-3L	BGXW	2.63V
GSR803ZZF	SOT-23-3L	BHXW	2.32V

Note: Year and Work Week must use the actual time of molding process.

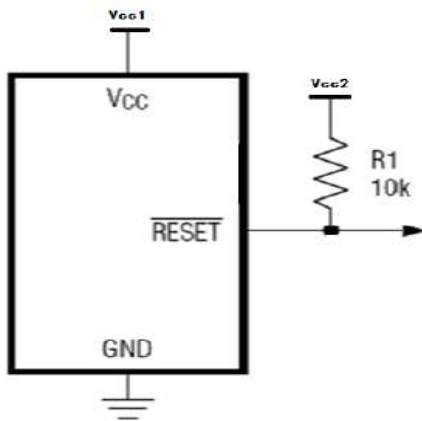
## Functional Description

### Reset Output

A microprocessor ( $\mu\text{P}$ ) reset input starts the  $\mu\text{P}$  in a known state. Whenever the  $\mu\text{P}$  is in an unknown state, it should be held in reset. The supervisory circuits assert reset during power-up and prevent code execution errors during power-down or brownout conditions.

On power-up, once  $V_{\text{CC}}$  reaches about 1.0V,  $\text{/RESET}$  is a guaranteed logic low of 0.4V or less. As  $V_{\text{CC}}$  rises,  $\text{/RESET}$  stays low. When  $V_{\text{CC}}$  rises above the reset threshold, an internal timer releases  $\text{/RESET}$  after about 240ms.  $\text{/RESET}$  pulses low whenever  $V_{\text{CC}}$  drops below the reset threshold, i.e. brownout condition. If brownout occurs in the middle of a previously initiated reset pulse, the pulse continues for at least another 240ms. On power-down, once  $V_{\text{CC}}$  falls below the reset threshold,  $\text{/RESET}$  stays low and is guaranteed to be 0.4V or less until  $V_{\text{CC}}$  drops below 1.0V. Reset timing diagram shows the timing relationship.

### Typical Application Circuit



### Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
$V_{\text{CC}}$	Supply Voltage to Ground Potential	-0.3 to +6.0	V
-	All Other Pins Voltage	-0.3 to $V_{\text{CC}}+0.3$	V
$I_{\text{OUT}}$	Output Current	20	mA
$P_{\text{D}}$	Power Dissipation	320	mW
$T_{\text{A}}$	Operating Ambient Temperature Range	-40 to +85	$^{\circ}\text{C}$
$T_{\text{STG}}$	Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$

Note: Stresses greater than those listed under maximum ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

### Recommended Operation Conditions

Symbol	Parameter	Min	Typ	Max	Unit
$V_{\text{CC}}$	Supply Voltage for GSR803(L/M)	4.5	5.0	5.5	V
	Supply Voltage for GSR803(T/S)	3.0	3.3	5.5	
	Supply Voltage for GSR803(R)	2.8	3.0	5.5	
	Supply Voltage for GSR803(Z)	2.5	-	5.5	
$T_{\text{A}}$	Operating Ambient Temperature Range	-40	-	85	$^{\circ}\text{C}$

## Electrical Characteristics

( $V_{CC}=V_{RN}+5\%$  to 5.5V,  $T_A=-40$  to 85°C, unless otherwise noted.) (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CC}$	Operating Voltage Range	-	1.0	-	5.5	V
$I_{CC}$	Supply Current	$V_{CC}<5.5V$ , GSR803(L/M)	-	10	30	$\mu A$
		$V_{CC}<3.6V$ , GSR803(R/S/T/Z)	-	10	30	$\mu A$
$V_{RST}$	Threshold Voltage (Falling Edge) Note 2	GSR803L~Z $T_A=25^\circ C$	$V_{RN}-1.5\%$	$V_{RN}$	$V_{RN}+1.5\%$	V
		GSR803L~Z $T_A=-40$ to 85°C	$V_{RN}-2.5\%$	$V_{RN}$	$V_{RN}+2.5\%$	V
$V_{OH}$	Output High Voltage	$V_{CC} \geq 4.5V$ , $I_{SOURCE}=800\mu A$	$V_{CC}-1.5$	-	-	V
		$V_{CC} \geq 2.7V$ , $I_{SOURCE}=500\mu A$	$0.8 \times V_{CC}$	-	-	V
		$V_{CC} \geq 1.8V$ , $I_{SOURCE}=150\mu A$	$0.8 \times V_{CC}$	-	-	V
		$V_{CC} \geq 1.0V$ , $I_{SOURCE}=4\mu A$	$0.8 \times V_{CC}$	-	-	V
$V_{OL}$	Output Low Voltage	$V_{CC} \geq 4.5V$ , $I_{SINK}=3.2mA$	-	-	0.4	V
		$V_{CC} \geq 2.7V$ , $I_{SINK}=1.2mA$	-	-	0.3	V
		$V_{CC} \geq 1.0V$ , $I_{SINK}=100\mu A$	-	-	0.3	V

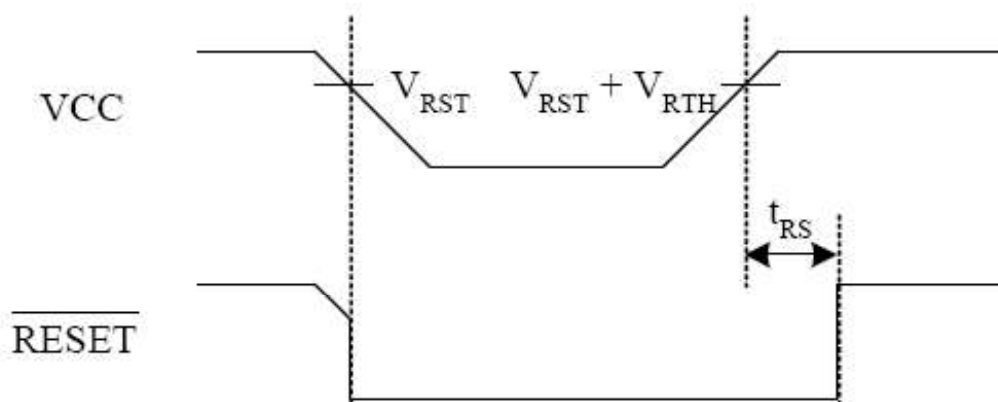
Note: 1. Parameters of room temperature guaranteed by production test and parameters of full-temperature guaranteed by design.

2.  $V_{RST}$  is Reset threshold voltage when  $V_{CC}$  falls from high to low level.  $V_{RN}$  is nominal reset threshold voltage.

## AC Electrical Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$t_{RS}$	Reset Time	GSR803L~Z $T_A=-40$ to 85°C	140	240	400	ms

## Reset Timing Diagram

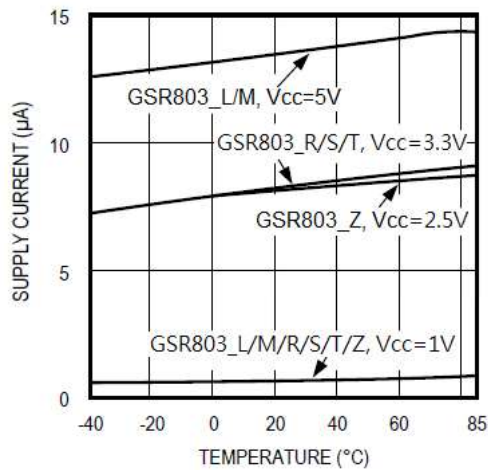


## Typical Operating Characteristics

( $V_{CC}$  = full range,  $T_A$  =  $-40^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$ , unless otherwise noted. Typical values are at  $T_A$  =  $+25^{\circ}\text{C}$ ,  $V_{CC}$  =  $+5\text{V}$  for L/M versions,  $V_{CC}$  =  $+3.3\text{V}$  for T/S versions,  $V_{CC}$  =  $+3\text{V}$  for R version, and  $V_{CC}$  =  $+2.5\text{V}$  for Z version.)

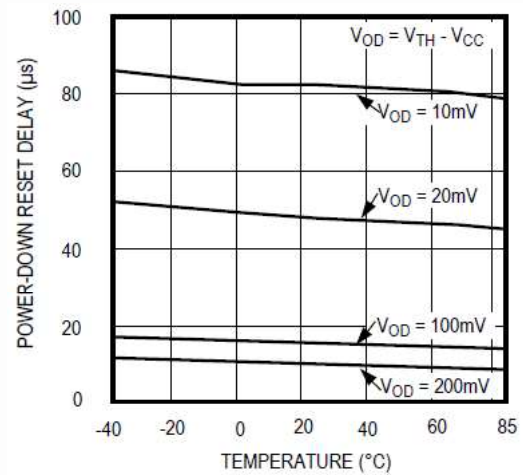
SUPPLY CURRENT vs. TEMPERATURE

(NO LOAD)



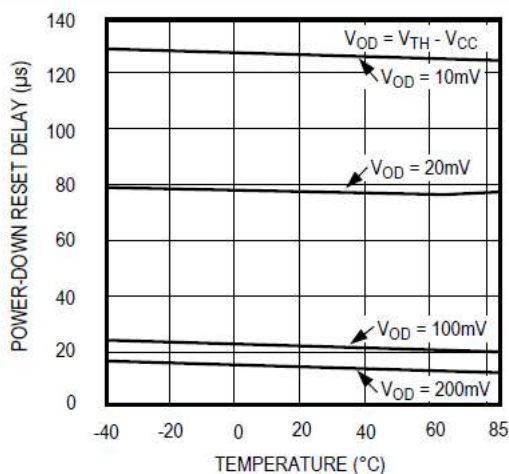
POWER-DOWN RESET DELAY vs. TEMPERATURE

(GSR803\_ \_R/S/T/Z)

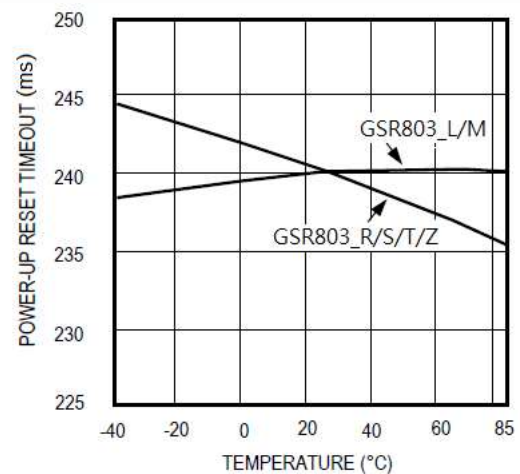


POWER-DOWN RESET DELAY vs. TEMPERATURE

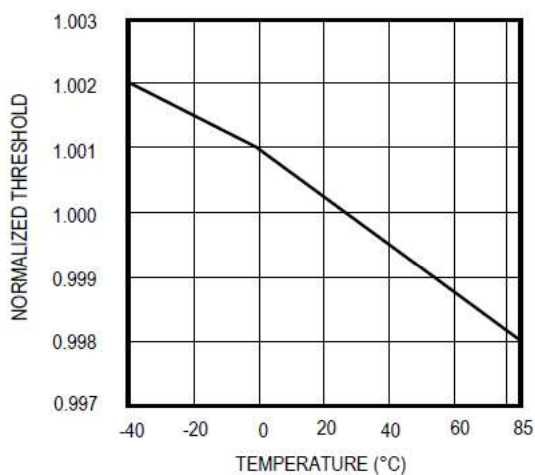
(GSR803\_ \_J/L/M)



POWER-UP RESET TIMEOUT vs. TEMPERATURE







NORMALIZED RESET THRESHOLD vs. TEMPERATURE





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