GSR809

Reset IC

Product Description

The GSR809 are microprocessor (μP) supervisory circuits used to monitor the power supplies in μP 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, 1.8V powered circuits.

These circuits perform a single function: they assert a reset signal whenever the V_{CC} supply voltage declines below a preset threshold, keeping it asserted for at least 200ms after V_{CC} has risen above the reset threshold. Reset thresholds suitable for operation with a variety of supply voltages are available.

The GSR809 have push-pull outputs and have an active-low /RESET output. The reset comparator is designed to ignore fast transients on V_{CC}, and the outputs are guaranteed to be in the correct logic state for V_{CC} down to 1V.

Low supply current makes the GSR809 ideal for use in portable equipment. The ICs are available in SOT-23-3L packages.

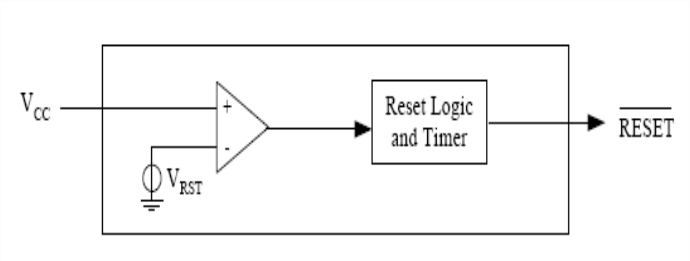
Features

- Precision supply-voltage monitor
  - 4.63V (GSR809L)
  - 4.38V (GSR809M)
  - 4.00V (GSR809J)
  - 3.08V (GSR809T)
  - 2.93V (GSR809S)
  - 2.63V (GSR809R)
  - 2.32V (GSR809Z)
  - 1.63V (GSR809X)
- 200ms(min) reset pulse width
- Push-Pull /RESET Output Configurations for GSR809
- 9μA Supply Current
- Guaranteed Reset(/Reset) Valid to V_{CC}=+1.0V
- Power Supply Transient Immunity
- No External Components
- RoHS Compliant, 100%Pb & Halogen Free

Applications

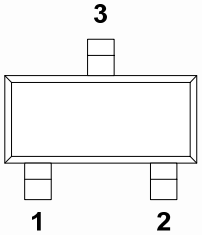
- Microprocessor reset circuitry
- Computers
- Wireless
- Embedded Control Systems
- Battery-operated systems

Block Diagram



Packages & Pin Assignments

GSR809xZF (SOT-23-3L)

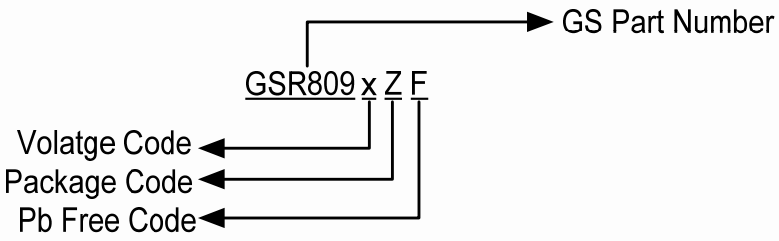


Pin No.	Name
1	GND
2	/RESET
3	V_{CC}

Pin Description

Name	Type	Description
V_{CC}	-	Supply Voltage. Reset is asserted when V_{CC} drops below the Reset Threshold Voltage (V_{RST}). Reset remains asserted until V_{CC} rises above V_{RST} and keep asserted for the duration of the Reset Timeout Period (t_{RS}) once V_{CC} rises above V_{RST}.
GND	-	Ground Pin.
/RESET	O	Active-Low Reset Output (Push-Pull). It goes low when V_{CC} is below the reset threshold. It remains low for about 240ms after V_{CC} rises above the reset threshold (V_{RST}).

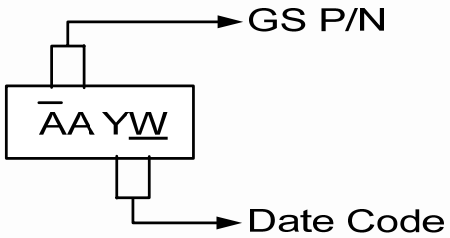
Ordering Information



Voltage Code : As following Table :

x	L	M	J	T	S	R	Z	X
Reset Threshold	4.63V	4.38V	4.00V	3.08V	2.93V	2.63V	2.32V	1.63V

Marking Information



GS P/N	Package	Marking	Reset Threshold
GSR809LZF	SOT-23-3L	AAYW	4.63V
GSR809MZF	SOT-23-3L	ABYW	4.38V
GSR809JZF	SOT-23-3L	AGYW	4.00V
GSR809TZF	SOT-23-3L	ACYW	3.08V
GSR809SZF	SOT-23-3L	ADYW	2.93V
GSR809RZF	SOT-23-3L	AEYW	2.63V
GSR809ZZF	SOT-23-3L	AFYW	2.32V
GSR809XZF	SOT-23-3L	DXYW	1.63V

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

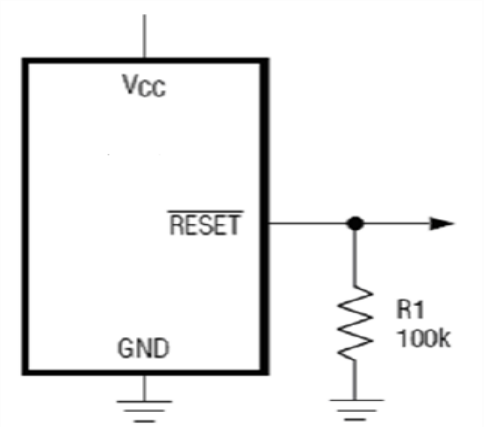
Functional Description

Reset Output

A microprocessor (μP) reset input starts the μP in a known state. Whenever the μP 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_{CC} reaches about 1.0V, /RESET is a guaranteed logic low of 0.4V or less. As V_{CC} rises, /RESET stays low. When V_{CC} rises above the reset threshold, an internal timer releases /RESET after about 240ms. /RESET pulses low whenever V_{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_{CC} falls below the reset threshold, /RESET stays low and is guaranteed to be 0.4V or less until V_{CC} drops below 1.0V. Reset timing diagram shows the timing relationship.

Typical Application Circuit



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage to Ground Potential	-0.3 to +6.0	V
-	All Other Pins Voltage	-0.3 to V_{CC}+0.3	V
I_{OUT}	Output Current	20	mA
P_D	Power Dissipation	320	mW
T_A	Operating Ambient Temperature Range	-40 to +85	ºC
T_{STG}	Storage Temperature Range	-55 to +150	ºC

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	Max	Unit
V_{CC}	Supply Voltage for GSR809(L/M/J)	4.5	5.5	V
	Supply Voltage for GSR809(T/S)	3.2	5.5	
	Supply Voltage for GSR809(R)	2.8	5.5	
	Supply Voltage for GSR809(Z)	2.5	5.5	
	Supply Voltage for GSR809(X)	1.8	-	
T_A	Operating Ambient Temperature Range	-40	85	ºC

Electrical Characteristics

(V_{CC}=V_{RN}+5% to 5.5V, T_A=-40 to 85ºC, 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, GSR809(L/M/J)	-	10	30	μA
		V_{CC}<3.6V, GSR809(R/S/T/Z/X)	-	10	30	μA
Vrst	Threshold Voltage (Falling Edge) Note 2	GSR809L~Z T_A=25ºC	V_{RN}-1.5%	V_{RN}	V_{RN}+1.5%	V
		GSR809L~X T_A=-40 to 85ºC	V_{RN}-2.5%	V_{RN}	V_{RN}+2.5%	
V_{OH}	Output High Voltage	V_{CC}≧4.5V, I_{SOURCE}=800μA	V_{CC}-1.5	-	-	V
		V_{CC}≧2.7V, I_{SOURCE}=500μA	0.8xV_{CC}	-	-	
		V_{CC}≧1.8V, I_{SOURCE}=150μA	0.8xV_{CC}	-	-	
		V_{CC}≧1.0V, I_{SOURCE}=4μA	0.8xV_{CC}	-	-	
V_{OL}	Output Low Voltage	V_{CC}≧4.5V, I_{SINK}=3.2mA	-	-	0.4	V
		V_{CC}≧2.7V, I_{SINK}=1.2mA	-	-	0.3	
		V_{CC}≧1.0V, I_{SINK}=100μA	-	-	0.3	

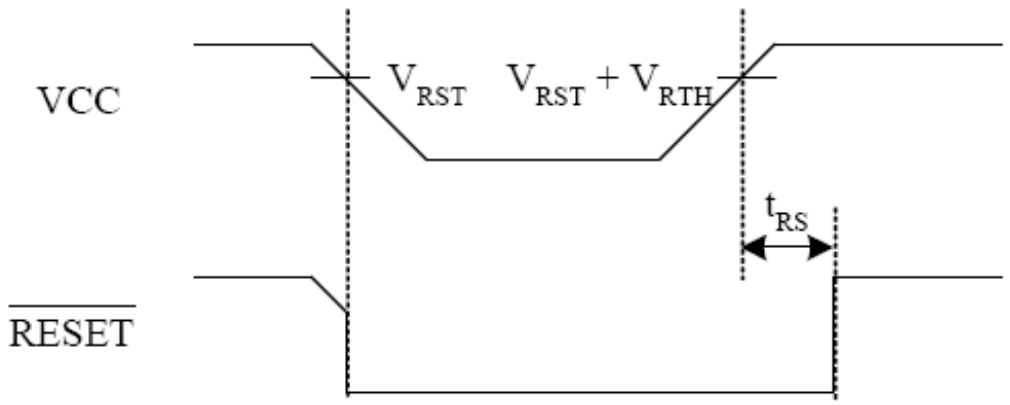
Note: 1. Parameters of room temperature guaranteed by production test and parameters of full-temperature guaranteed by design.

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

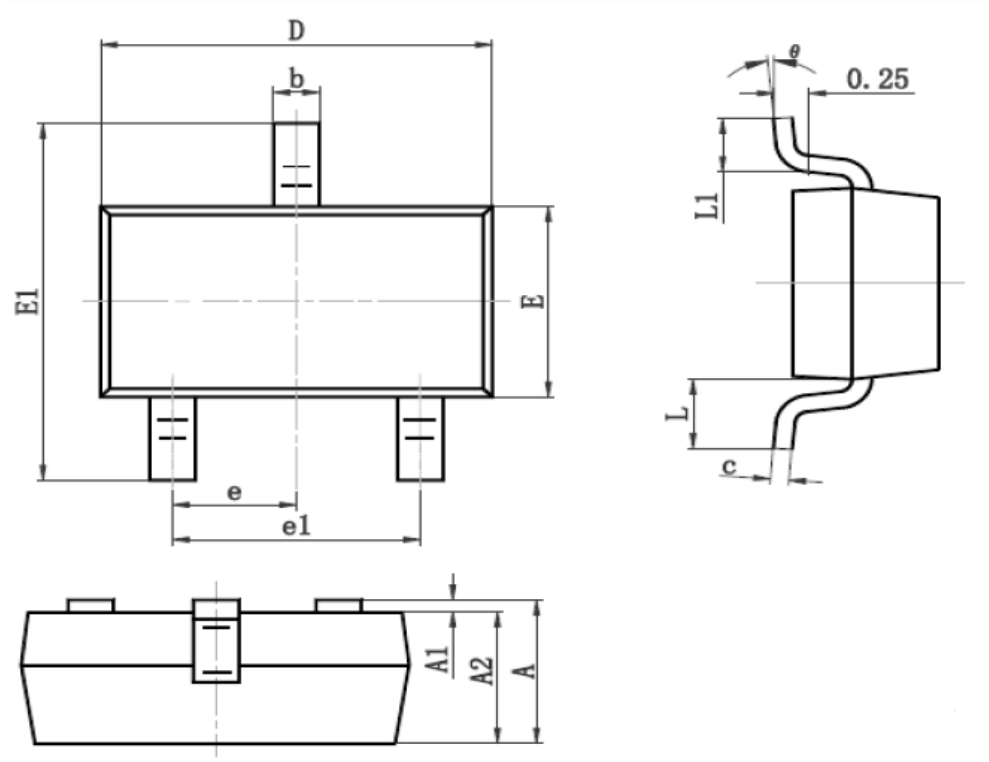
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{rs}	Reset Time	GSR809L~X T_A=-40 to 85ºC	200	240	400	ms

Reset Timing Diagram



Package Dimension

SOT-23-3L PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		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
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 (TYP)		0.037 (TYP)	
e1	1.800	2.000	0.071	0.079
L	0.550 (REF)		0.022 (REF)	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

Wu-Xi Branch	
	No.21 Changjiang Rd., WND, Wuxi, Jiangsu, China (INFO. &. TECH. Science Park Building A 210 Room)
	86-510-85217051
	86-510-85211238
	sales_cn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587