GSR810 Series
Reset IC

Product Description

The GSR810 is microprocessor (µP) supervisory circuit used to monitor the power supplies in µP and digital systems. It provides excellent circuit reliability and low cost by eliminating external components and adjustments when used with +5V, +3.3V, +3.0V, or 2.5V powered circuits.

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

The GSR810 has push-pull output and has an active-high RESET output. The reset comparator is designed to ignore fast transients on V_{CC}, and the output is guaranteed to be in the correct logic state for V_{CC} down to 1.15V within the range of the operating temperature .
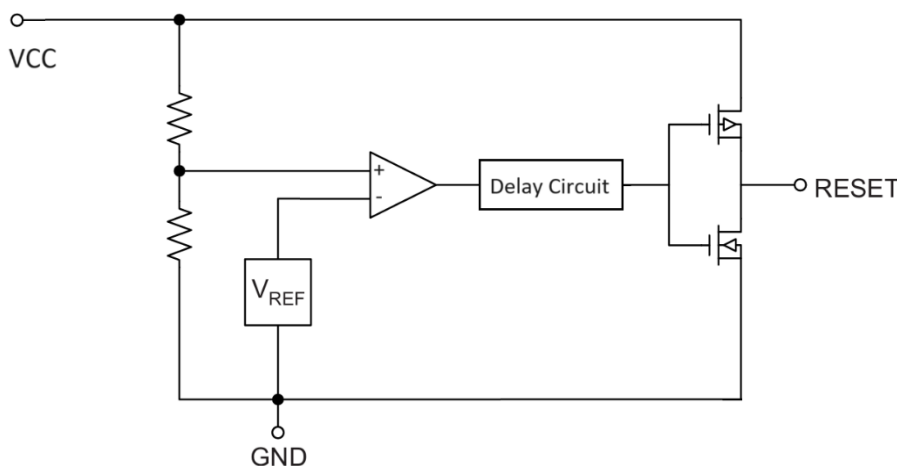
Features

■ Precision monitoring of Supply Voltages
  – Available Threshold Options:
  - 4.63V (GSR810L)
  - 4.38V (GSR810M)
  - 4.00V (GSR810J)
  - 3.08V (GSR810T)
  - 2.93V (GSR810S)
  - 2.63V (GSR810R)
  - 2.32V (GSR810Z)
■ 140ms Minimum Reset Pulse Width
■ Push-Pull Configurations for RESET Output
■ 10µA Supply Current Typically
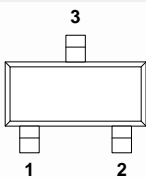■ Power Supply Transient Immunity
■ RoHS Compliant and Halogen Free

Applications

■ Computers
■ Controllers
■ Intelligent Instruments
■ Embedded Control Systems
■ Battery-powered Equipment

Block Diagram

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Packages & Pin Assignments

GSR810□ZF (SOT-23)

Pin No.	Name	Type	Description
1	GND	GROUND	Ground Pin.
2	RESET	OUTPUT	Active-High Reset Output (Push-Pull). RESET Output remains High while Vcc is below the reset threshold, and for at least 140ms after Vcc rises above the reset threshold.
3	Vcc	INPUT	Supply Voltage.

Ordering and Marking Information

GS P/N	Package	Marking	Reset Threshold
*GSR810LZF	SOT-23	AGAA	4.63V
*GSR810MZF	SOT-23	AHAA	4.38V
*GSR810JZF	SOT-23	AIAA	4.00V
GSR810TZF	SOT-23	AJAA	3.08V
GSR810SZF	SOT-23	AKAA	2.93V
GSR810RZF	SOT-23	ALAA	2.63V
*GSR810ZZF	SOT-23	AZZA	2.32V

GSR810□ZF

- **Product Code:**
  GSR810

- **Voltage Code:**
  □ is Reset Threshold
  Voltage such as **S** is 2.93V

- **Package Code:**
  Z for SOT-23

- **Green Level:**
  F for RoHS Compliant and
  Halogen Free

★   Please contact GS sales representative to inquire about production status.

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Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.3 to +6.0	V
RESET	Output Pin	-0.3 to V_{CC}+0.3	V
I_{OUT}	Output Current	20	mA
$T_{J(MAX)}$	Maximum Junction Temperature	125	ºC
T_{STG}	Storage Temperature Range	-65 to +150	ºC
$R_{\theta JA}$	Junction-to-ambient thermal resistance	300	°C/W
P_D	Power Dissipation	320	mW
T_{SOD}	Lead temperature (Soldering, 10 s)	300	ºC
V_{ESD}	Human-body model (HBM)	2000	V
	Charged-device model (CDM)	200	V

Note: Stresses beyond those listed under "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 for extended periods may affect device reliability.

Recommended Operating Conditions

Symbol	Parameter	Value	Unit
T_A	Operating Temperature Range	-40 to +85	ºC

Electrical Characteristics
Over operating free-air temperature range (unless otherwise noted) (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CC}	Operating Voltage Range	T_A=0℃ ~ +70℃	1.0	-	5.5	V
		T_A=-40℃ ~ +85℃	1.15	-	5.5	
I_{CC}	Supply Current (T_A=-40℃ ~ +85℃)	V_{CC}<5.5V, GSR810(L/M/J)	-	10	25	µA
		V_{CC}<3.6V, GSR810(T/S/R/Z)	-	8	25	µA
V_{TH}	GSR810L Reset Threshold Voltage	T_A=25ºC	4.54	4.63	4.72	V
		T_A=-40 to 85ºC	4.50	-	4.75	
	GSR810M Reset Threshold Voltage	T_A=25ºC	4.29	4.38	4.47	V
		T_A=-40 to 85ºC	4.25	-	4.50	
	GSR810J Reset Threshold Voltage	T_A=25ºC	3.92	4.00	4.08	V
		T_A=-40 to 85ºC	3.89	-	4.10	

Electrical Characteristics (Continued)

V_{TH}	GSR810T Reset Threshold Voltage	T_A=25ºC	3.01	3.08	3.15	V
		T_A=-40 to 85ºC	3.00	-	3.17	
	GSR810S Reset Threshold Voltage	T_A=25ºC	2.86	2.93	3.00	V
		T_A=-40 to 85ºC	2.85	-	3.01	
	GSR810R Reset Threshold Voltage	T_A=25ºC	2.56	2.63	2.69	V
		T_A=-40 to 85ºC	2.55	-	2.70	
	GSR810Z Reset Threshold Voltage	T_A=25ºC	2.26	2.32	2.37	V
		T_A=-40 to 85ºC	2.25	-	2.38	
-	Reset Threshold Temp Coefficient			30		ppm/ºC
-	V_{CC} to Reset Delay	V_{CC}= V_{TH} ~ (V_{TH}-100mV)		20		µs
t_{RS}	Reset Active Timeout Period	T_A=-40 to 85ºC	140	240	560	ms
V_{OH}	GSR810(L/M/J/T/S/R/Z) Output High Voltage	1.8V < V_{CC} < V_{TH} (min), I_{SOURCE} = 150µA	0.8 x V_{CC}	-	-	V
V_{OL}	GSR810(L/M/J) Output Low Voltage	V_{CC} = V_{TH} (max), I_{SINK} = 3.2mA	-	-	0.4	V
	GSR810(T/S/R/Z) Output Low Voltage	V_{CC} = V_{TH} (max), I_{SOURCE} = 1.2mA	-	-	0.3	

Note: Production testing done at T_A = 25°C, over temperature limits specified by design only.

Application Information

Typical Application Circuit

The GSR810 is a supervisor circuit for microprocessor and digital systems. With a low supply current of only 10 μA is ideal for use in portable equipment.
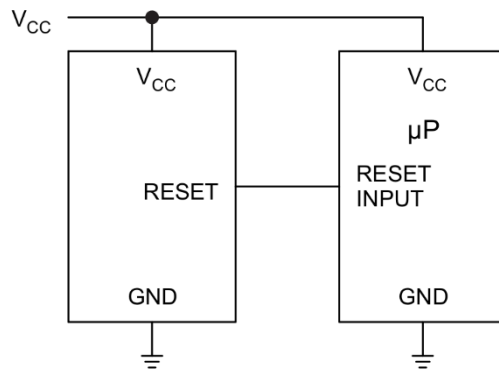

Figure. 1

Negative-Going V_{CC} Transients

GSR810 is relatively immune to short negative-going transients or glitches on V_{CC}. Figure 2 shows the maximum pulse width a negative-going V_{CC} transient can have without causing a reset pulse. In general, as the magnitude of the transient increases, going further below the threshold, the maximum allowable pulse width decreases. Typically, for the 4.63V and 4.38V version of the GSR810, a V_{CC} transient that goes 100 mV below the reset threshold and lasts 20 μs or less will not cause a reset pulse. A 0.1μF bypass capacitor mounted as close as possible to the V_{CC} pin will provide additional transient rejection.
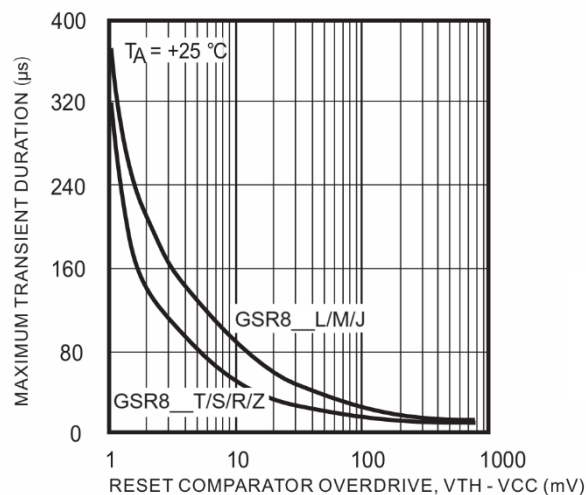
Figure. 2

Ensuring a Valid Reset Output for $V_{CC} < 1.15V$

A 100kΩ pullup resistor to V_{CC} is also recommended for the GSR810 if RESET is required to remain valid for $V_{CC} <$ 1.15V.

Reference of Reset Curve

When V_{CC} supply voltage declines below the reset threshold, the active-high RESET output is High.
When the V_{CC} supply voltage rises above the reset threshold, the active-high RESET output drops Low after 240 ms typically.
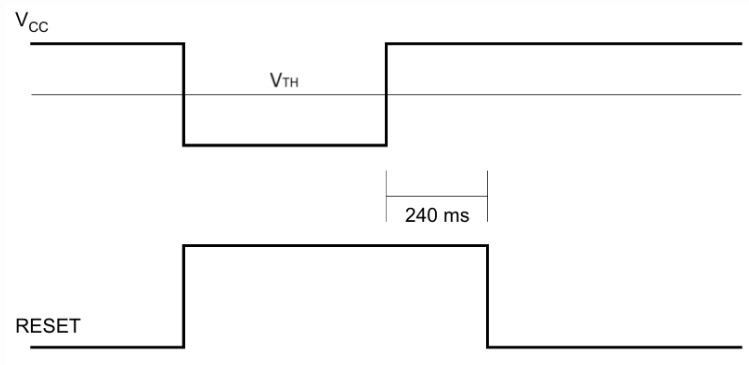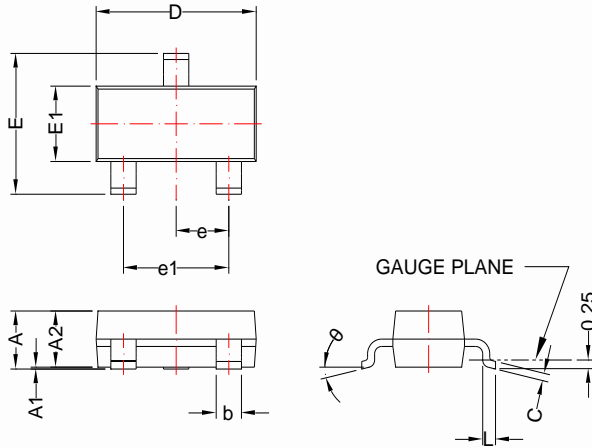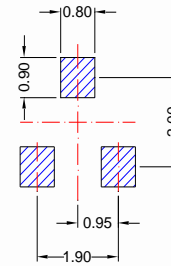
Figure. 3

SOT-23

GAUGE PLANE

SYMBOL	Millimeters		Inches	
	MIN	**MAX**	**MIN**	**MAX**
A	0.75	1.17	0.030	0.046
A1	0.01	0.15	0.000	0.006
A2	0.70	1.02	0.028	0.040
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.3	0.6	0.012	0.024
θ	0°	8°	0°	8°

Dimensions

NOTE:

DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.25mm PER END. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE

GSR810 Series

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