

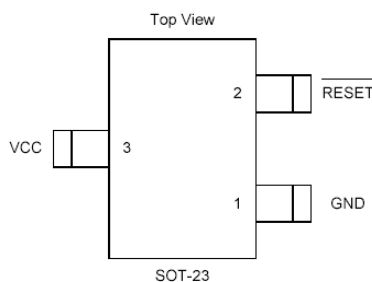
### Description

The SE809 is a cost-effective system supervisor Integrated Circuit (IC) designed to monitor  $V_{CC}$  in digital and mixed signal systems and provide a warning signal when the system power supply is out of working range, and a reset signal to the host processor when necessary. No external components are required.

The reset output is driven active within 20 $\mu$ sec of  $V_{CC}$  falling through the reset voltage threshold. Reset is maintained active for a minimum of 150msec after  $V_{CC}$  rises above the reset threshold. The SE809 has an active-low  $\overline{\text{RESET}}$  output. The output of the SE809 is guaranteed valid down to  $V_{CC}=1V$ .

The SE809 is optimized to reject fast transient glitches on the  $V_{CC}$  line. Low supply current of 18 $\mu$ A ( $V_{CC}=3.3V$ ) makes these devices suitable for battery powered applications. The output voltages range from 1.7V to 4.5V in 100mV increments. Standard voltage versions are 2.63, 2.93, 3.08, 4.0, 4.38, and 4.63V.

### Pin Configuration



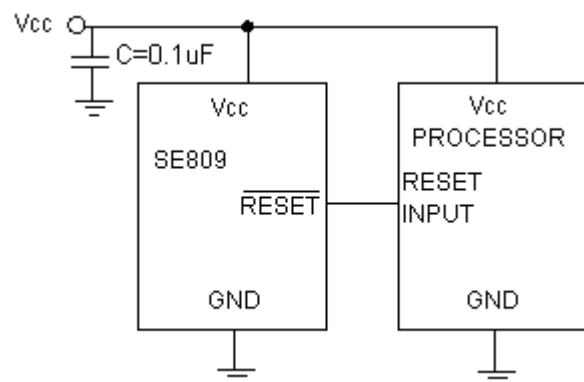
### Features

- Precision  $V_{CC}$  Monitor for 2.8V, 3.0V, 3.3V, and 5.0V Supplies
- 150msec Guaranteed Minimum  $\overline{\text{RESET}}$  Output Duration
- $\overline{\text{RESET}}$  Output Guaranteed to  $V_{CC}=1.0V$
- Low 7 $\mu$ A Supply Current
- $V_{CC}$  Transient Immunity
- No External Components
- Small SOT-23 Package and TO-92 Package
- Wide Operating Temperature: 0°C to 85°C

### Application

- Computers
- Embedded systems
- Battery powered equipment
- Critical  $\mu$ P power supply monitoring

### Application Diagram



### Ordering/Marking Information

Ordering Information	Marking Information	
SE809-LF-XXV	S809 $\bar{x}$ a <sup>*</sup>	<p>Starting with 8, a bar on top of 8 is for production year 2003, and underlined 8 is for year 2004. The next character is marked on top for 2005, and underlined for 2006. The naming pattern continues with consecutive characters for later years. The "x" denotes a suffix for V<sub>CC</sub> threshold. The last character is the week code. (A-Z: 1-26, a-z: 27-52)</p> <p>A dot on top right corner is for lead-free process. No dot on top right corner is for Halogen Free process</p>
SE809-HF-XXV	S809 $\bar{x}$ a	
Suffix	Reset V <sub>CC</sub> threshold(V)	
L	4.63	
M	4.38	
J	4.00	
T	3.08	
S	2.93	
R	2.63	
Z	2.30	

### Absolute Maximum Ratings<sup>(1)</sup>

Parameter	Symbol	Value	Units
Input Voltage	V <sub>CC</sub>	5.5	V
Output Voltage	RESET	-0.3 to (V <sub>CC</sub> + 0.3)	V
Input Current		20	mA
Output Current	I <sub>OUT</sub>	20	mA
Power Dissipation	P <sub>D</sub>	Internally Limited <sup>(3)</sup>	
Output Short Circuit Duration		Infinite	
Thermal Resistance, Junction-to-Ambient	Θ <sub>JA</sub>	230	°C/W
Operating Temperature Range	T <sub>A</sub>	0 ~ 85	°C
Lead Temperature (Soldering, 10 sec.)		260	°C
Junction Temperature	T <sub>J</sub>	0 to +125	°C
Storage Temperature	T <sub>S</sub>	-60 to +150	°C

### Operating Rating<sup>(2)</sup>

Parameter	Symbol	Value	Units
Supply Input Voltage	V <sub>CC</sub>	+2.0V to +5.5	V
Junction Temperature	T <sub>J</sub>	0 to +125	°C

### Electrical Characteristics

$V_{CC}=5V$  for L/M/J ; $3.3V$  for T/S ; $3.0V$  for R ,  $T_A = 25^{\circ}C$ , unless otherwise specified.

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_{CC}$	Input Voltage		2.0		5.5	V
$I_{CC}$	Supply Current		--	7	-	$\mu A$
$V_{TH}$	Reset Threshold	SE809L-4.63V	4.514	4.63	4.746	V
		SE809M-4.38V	4.271	4.38	4.49	
		SE809J-4.00V	3.90	4.00	4.1	
		SE809T-3.08V	3.003	3.08	3.157	
		SE809S-2.93V	2.857	2.93	3.003	
		SE809R-2.63V	2.564	2.63	2.696	
		SE809Z-2.30V	2.194	2.25	2.306	
	Reset Threshold Temperature Coefficient <sup>(4)</sup>		--	30	--	ppm/ $^{\circ}C$
	$V_{CC}$ to Reset Delay $V_{CC} = V_{TH}$ to $(V_{TH} - 100mV)$		--	20	--	$\mu sec$
	Reset Active Timeout Period		--	150		msec
$V_{OL}$	RESET Output Voltage Low	$I_{SINK} = 3.2mA$	--	--	0.4	V
$V_{OH}$	RESET Output Voltage High	$I_{SOURCE} = 800\mu A$	$0.8V_{CC}$	--	--	V

### PIN DESCRIPTION:

Pin No.	Symbol	Description
1	GND	Ground
2	RESET	RESET output remains low while $V_{CC}$ is below the reset voltage threshold and for 150msec(typ) after $V_{CC}$ rises above reset threshold
3	$V_{CC}$	Supply Voltage (typ.)

**Note 1:** Exceeding the absolute maximum rating may damage the device.

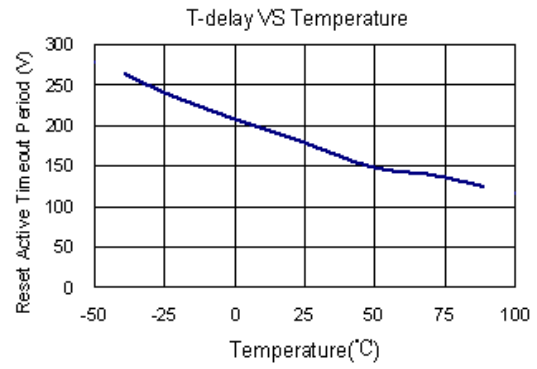
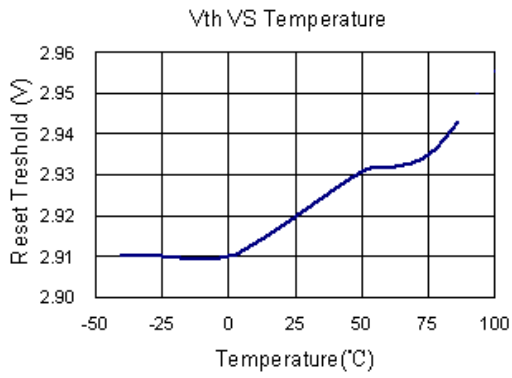
**Note 2:** The device is not guaranteed to function outside its operating rating.

**Note 3:** The maximum allowable power dissipation at any  $T_A$  (ambient temperature) is calculated using:  $P_{D(MAX)} = (T_{J(MAX)} - T_A)/\theta_{JA}$ . Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown. See "Thermal Consideration" section for details

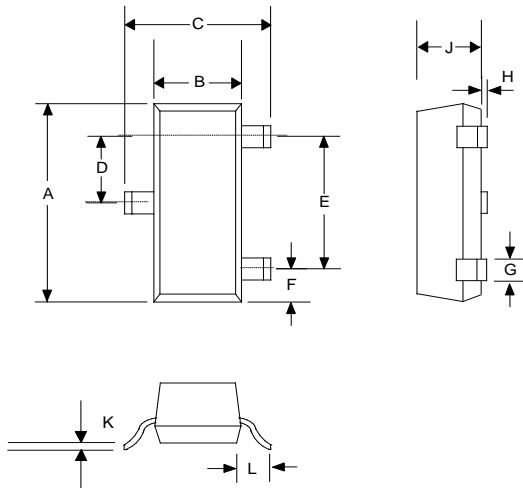
**Note 4:** RESET threshold temperature coefficient is the worst case voltage change divided by the total temperature range.



Typical Performance Characteristics

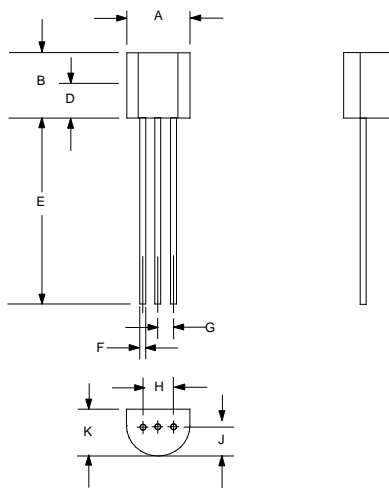


### OUTLINE DRAWING SOT-23



DIMENSIONS				
DIM <sup>N</sup>	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.110	0.120	2.80	3.04
B	0.047	0.055	1.20	1.40
C	0.083	0.104	2.10	2.64
D	0.035	0.040	0.89	1.03
E	0.070	0.080	1.78	2.05
F	0.018	0.024	0.45	0.60
G	0.015	0.020	0.37	0.51
H	0.0005	0.004	0.013	0.10
J	0.034	0.040	0.887	1.02
K	0.003	0.007	0.085	0.18
L	-	0.027	-	0.69

### OUTLINE DRAWING TO-92



DIMENSIONS				
DIM <sup>N</sup>	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.445	5.207
B	0.170	0.210	4.318	5.334
E	0.500	0.610	12.70	15.50
F	0.016	0.021	0.407	0.533
G	0.045	0.055	1.143	1.397
H	0.095	0.105	2.413	2.667
J	0.080	0.105	2.032	2.667
K	0.125	0.165	3.175	4.191

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