

## Description

The EC95809 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 typical delay of 150msec after  $V_{CC}$  rises above the reset threshold. The EC95809 has an active-low RESET output. The output of the EC95809 is guaranteed valid down to  $V_{CC}=1V$  in most applications. Please see application section for more details.

The EC95809 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.

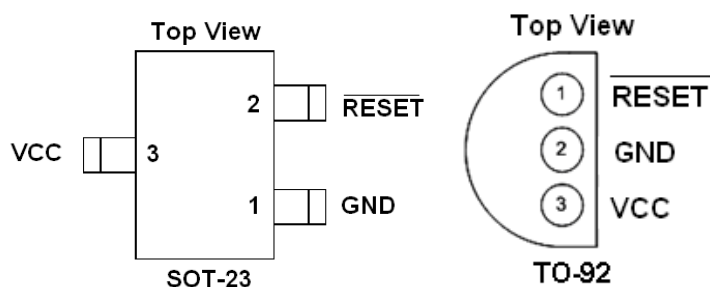
## Features

- Precision  $V_{CC}$  Monitor for 2.8V, 3.0V, 3.3V, and 5.0V Supplies
- 150msec typical delay for RESET Output
- RESET Output Guaranteed to  $V_{CC}=1.0V$
- Low 20 $\mu$ A Supply Current
- $V_{CC}$  Transient Immunity
- No External Components
- Small SOT-23 Package and TO-92 Package
- Wide Operating Temperature: -40°C to 85°C
- 100% Lead (Pb)-Free

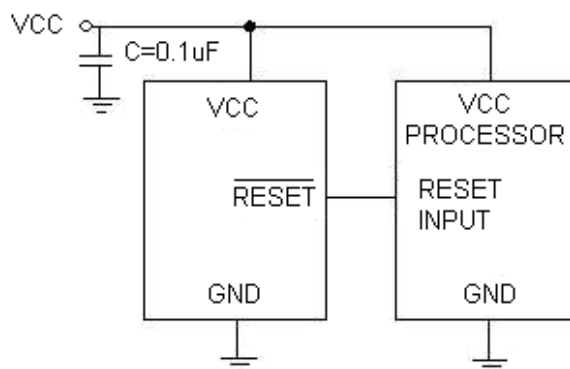
## Application

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

## Pin Configuration



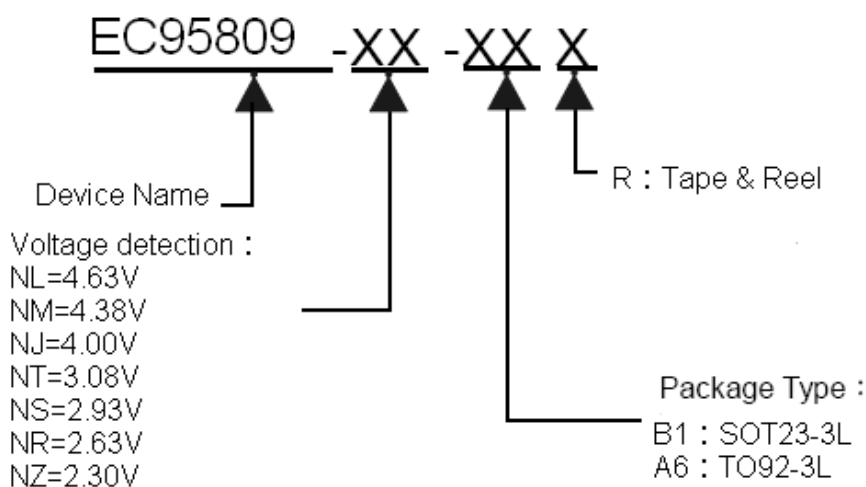
## Application Diagram



## PIN DESCRIPTION:

Symbol	Description
GND	Ground
RESET	RESET output remains low while Vcc is below the reset voltage threshold and for 150msec(typ) after Vcc rises above reset threshold
Vcc	Supply Voltage (typ.)

## Ordering Information



## Marking Information(SOT23-3L)

Device	Voltage Detection	Marking Information	Package Type	Remarks
EC95809NLB1R	4.63V	<u>S</u> 809La	SOT23-3L	1. Starting with S,a bar on top of S is for production year 2013,and underlined S is for 2014.The next character is marked .on top for 2015 and underlined for 2016.The naming pattern continues with consecutive characters for last year. 2. the 5 <sup>th</sup> character denotes a suffix for Vcc threshold. 3. The last character is the week code (A-Z:1-26 ; a-z:27-25). *A dot on top right corner is for lead-free. Non-dot on top right corner is for Green.
EC95809NMB1R	4.38V	<u>S</u> 809Ma		
EC95809NJB1R	4.00V	<u>S</u> 809Ja		
EC95809NTB1R	3.08V	<u>S</u> 809Ta		
EC95809NSB1R	2.93V	<u>S</u> 809Sa		
EC95809NRB1R	2.63V	<u>S</u> 809Ra		

## Marking Information(TO92-3L)

Device	Voltage Detection	Marking Information	Package Type	Remarks
EC95809NZA6R	2.30V	809Zf	TO92-3L	<p>1. Starting with underlined 0, a bar is for production year 2012. The next bar is mark on top of 9 is for year 2013. The next bar is mark on bottom of 9 is for year 2014. The next bar is mark on top of Z is year for 2015. The naming pattern continues with consecutive characters for later years.</p> <p>2. f is the week of production. The big character of A~Z is for the week of 1~26, and small a~z is for the week of 27~52.</p>

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

Parameter	Symbol	Value	Units
Input Voltage	$V_{CC}$	5.5	V
Output Voltage	RESET	-0.3 to ( $V_{CC} + 0.3$ )	V
Input Current		20	mA
Output Current	$I_{OUT}$	20	mA
Power Dissipation	$P_D$	Internally Limited <sup>(3)</sup>	
Output Short Circuit Duration		Infinite	
Thermal Resistance, Junction-to-Ambient	$\Theta_{JA}$	230	°C/W
Operating Temperature Range	$T_A$	-40 ~ 85	°C
Lead Temperature (Soldering, 10 sec.)		260	°C
Junction Temperature	$T_J$	0 to +125	°C
Storage Temperature	$T_S$	-60 to +150	°C

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

Parameter	Symbol	Value	Units
Supply Input Voltage	$V_{CC}$	+2.0V to +5.5	V
Junction Temperature	$T_J$	0 to +125	°C

## Electrical Characteristics

V<sub>CC</sub>=5V for L/M/J ;3.3V for T/S ;3.0V for R ,T<sub>A</sub> = 25°C, unless otherwise specified.

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V <sub>CC</sub>	Input Voltage		2.0		5.5	V
I <sub>CC</sub>	Supply Current		--		13	μA
V <sub>TH</sub>	Reset Threshold	EC95809NL-4.63V	4.514	4.63	4.746	V
		EC95809NM-4.38V	4.271	4.380	4.490	
		EC95809NJ-4.00V	3.900	4.000	4.100	
		EC95809NT-3.08V	3.003	3.080	3.157	
		EC95809NS-2.93V	2.857	2.930	3.003	
		EC95809NR-2.63V	2.564	2.630	2.696	
		EC95809NZ-2.30V	2.194	2.250	2.306	
	Reset Threshold Temperature Coefficient <sup>(4)</sup>		--	30	--	ppm/°C
	V <sub>CC</sub> to Reset Delay V <sub>CC</sub> = V <sub>TH</sub> to (V <sub>TH</sub> – 100mV)		--	20	--	μsec
	Reset Active Timeout Period		--	150	500	msec
V <sub>OL</sub>	RESET Output Voltage Low	I <sub>SINK</sub> = 3.2mA	--	--	0.4	V
V <sub>OH</sub>	RESET Output Voltage High	I <sub>SOURCE</sub> = 800μA	0.8V <sub>CC</sub>	--	--	V

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

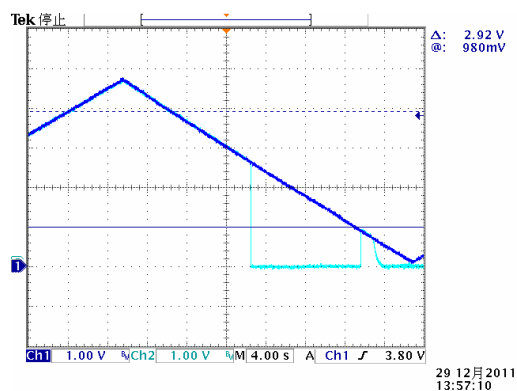
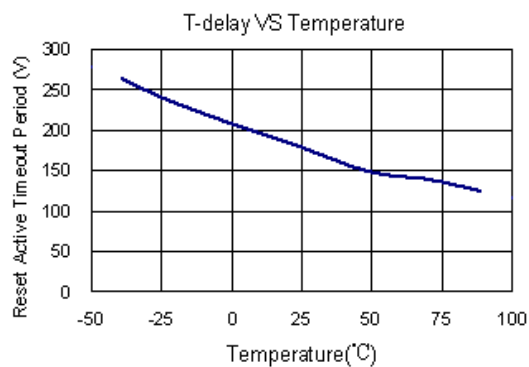
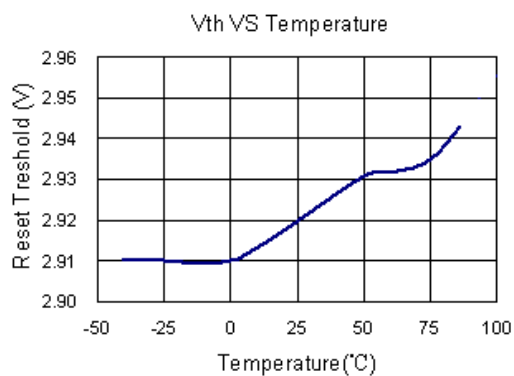
**Note 2:** The device is not guaranteed to function outside its operating rating.

**Note 3:** The maximum allowable power dissipation at any T<sub>A</sub> (ambient temperature) is calculated using: P<sub>D(MAX)</sub> =

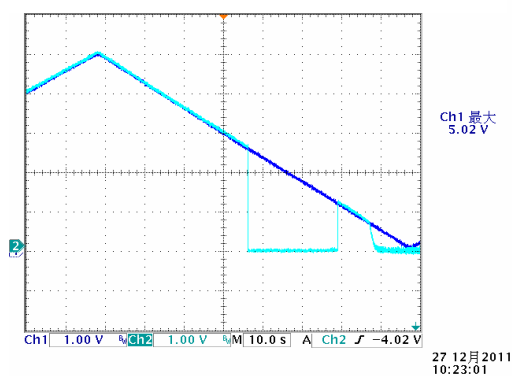
(T<sub>J(MAX)</sub> – T<sub>A</sub>)/Θ<sub>JA</sub>. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown. See “Thermal Consideration” section for details

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

## Typical Performance Characteristics

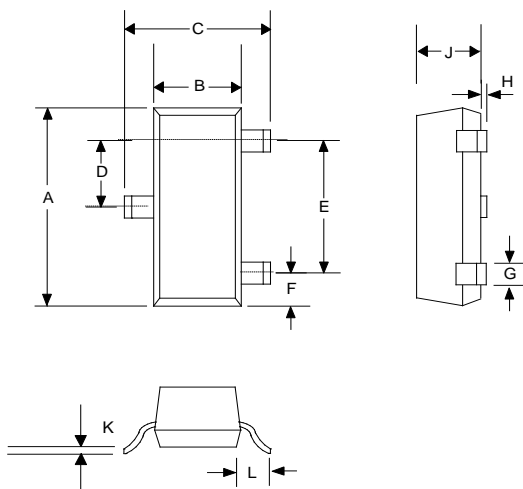


Vout is maintained to <1V if waveform period is less than 56 sec.



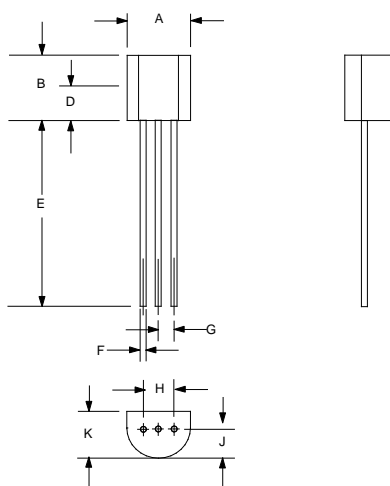
Vout is maintained to 1.2V if waveform period is longer than 160 sec.

## 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