



## Description

The CS809x is a general-purpose voltage detector which only consume about 5uA at 3.6V, which can be widely used in all electronic system to either monitor a battery voltage or generate a power-on reset signal. It can work under the voltage ranging from 1V to 6V.

CS809x employs a low voltage reference, low offset comparator, timer and push-pull output stage. Its push-pull output is pushed high after input voltage is greater than the internal setting level for 240ms.

The CS809x is available in SOT-23 package.

## Features

Wide operation range: 1-6V

Voltage detecting level setting range: 2.3-5V

SOT-23 package

Detection delay time: 240ms

Reset pin output kept low when input voltage < 1V

4kV ESD

## Applications

Battery voltage monitor

Power-on reset

Set-top-box

Voltage level trigger

Press button debouncing

Portable devices

## Package Marking and Ordering Information

Part No	Voltage Detecting Level	Package	Tape & Reel
CS809Z	2.32V	SOT-23	3K/Reel
CS809R	2.63V		
CS809S	2.93V		
CS809T	3.08V		
CS809J	4.00V		
CS809M	4.38V		
CS809L	4.63V		



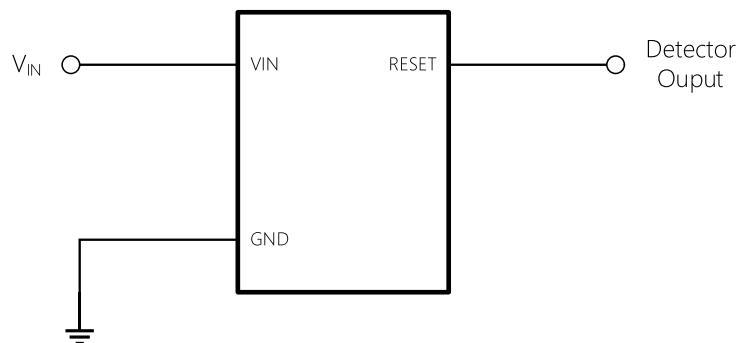
### Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{IN}$		-0.3 to 8	V
$V_{RESET}$		-0.3 to $V_{IN} + 0.3$	V
	Continuous Power Dissipation	0.3	W
$T_J$	Junction Temperature	-40 to 125	$^{\circ}\text{C}$
	Lead Temperature	260	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-55 To 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	280	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Ambient (Note 2)	90	$^{\circ}\text{C}/\text{W}$

#### Notes:

- (1) Exceeding these ratings may damage the device.
- (2) The maximum allowable power dissipation is a function of the maximum junction temperature  $T_J(\text{MAX})$ , the junction-to-ambient thermal resistance  $\theta_{JA}$ , and the ambient temperature  $T_A$ . The maximum allowable continuous power dissipation at any ambient temperature is calculated by  $P_D(\text{MAX})=(T_J(\text{MAX})-T_A)/\theta_{JA}$ . Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
- (3) Measured on JESD51-7, 4-layer PCB.

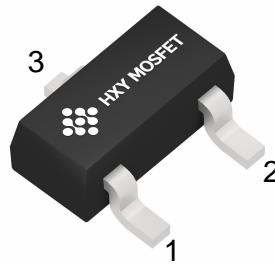
### Typical Application



Detector output remains low if  $V_{IN}$  is below detecting level, and jumps to high if  $V_{IN}$  is above detecting level for 240ms



## Pin Assignment



SOT-23

The package of CS809x is SOT23, with pin assignment shown in following table:

Pin No	Name	Description
1	GND	Ground
2	VIN	The power input node as well as the voltage node to be detected
3	RESET	The push pull output node, pulled low when $V_{IN}$ is lower than detect level and pushed high when $V_{IN}$ is higher than detect level for 240ms



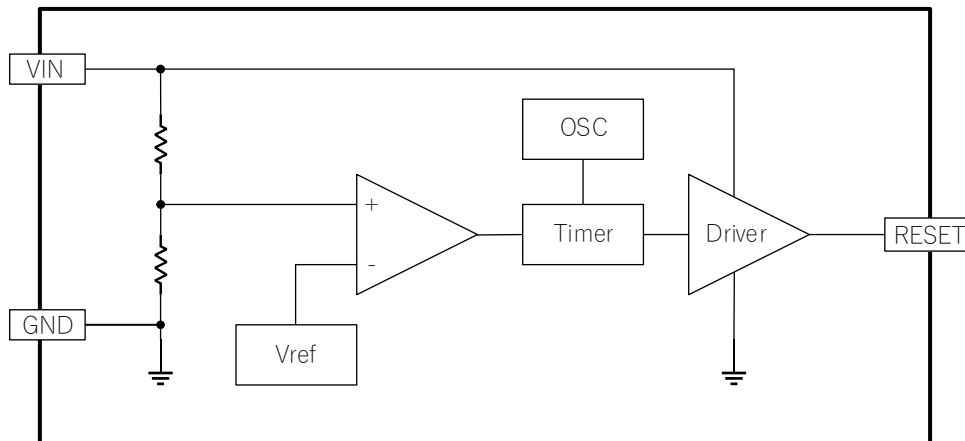
### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Min	Typ	Max	Units
Input voltage range, $V_{IN}$		1		6	V
Quiescent current, $I_Q$	$V_{IN} = 3.6\text{V}$ , $T_A=25^{\circ}\text{C}$	3	5	10	$\mu\text{A}$
	$V_{IN} = 3.6\text{V}$ , $T_A=-40^{\circ}\text{C}$	2	3.5	10	$\mu\text{A}$
	$V_{IN} = 3.6\text{V}$ , $T_A=125^{\circ}\text{C}$	4	6.3	15	$\mu\text{A}$
Detecting voltage level, $V_{DET}$	$V_{DET} = 2.32\text{V}$	2.262	2.32	2.378	V
	$V_{DET} = 2.63\text{V}$	2.564	2.63	2.696	V
	$V_{DET} = 2.93\text{V}$	2.857	2.93	3.003	V
	$V_{DET} = 3.08\text{V}$	3.003	3.08	3.157	V
	$V_{DET} = 4.00\text{V}$	3.92	4.00	4.08	V
	$V_{DET} = 4.38\text{V}$	4.292	4.38	4.468	V
	$V_{DET} = 4.63\text{V}$	4.537	4.63	4.723	V
Delay time	$T_A = -40^{\circ}\text{C}$ to $85^{\circ}\text{C}$	150	240	560	ms
Reset falling delay	$V_{IN}$ falling below $V_{DET}$		2	50	$\mu\text{s}$
Reset output low voltage, $V_{OL}$	$I_{SINK} = 1.2\text{mA}$ , $V_{IN}=2\text{V}$	0	0.03	0.3	V
Reset output high voltage, $V_{OH}$	$I_{SOURCE} = 1.2\text{mA}$ , $V_{IN}=3\text{V}$	$V_{IN}-0.3$	$V_{IN}-0.05$	$V_{IN}$	V

### Function Descriptions

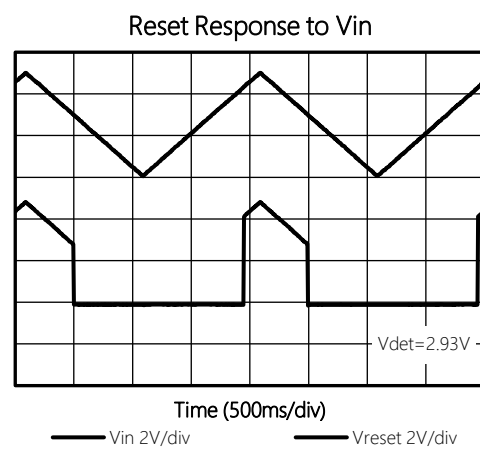
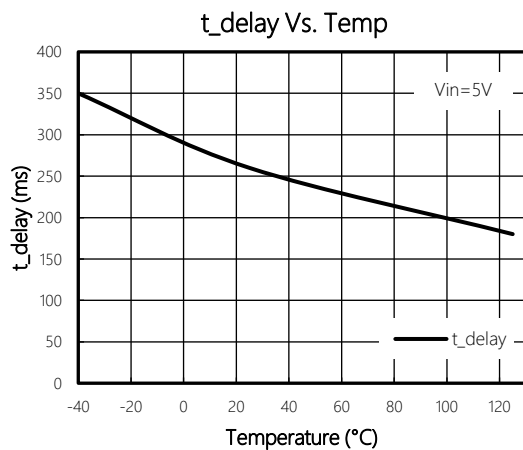
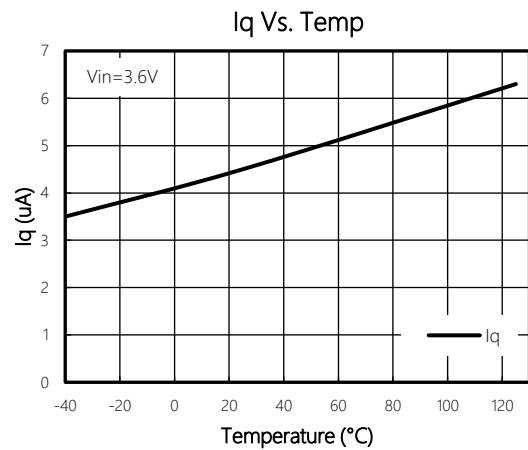
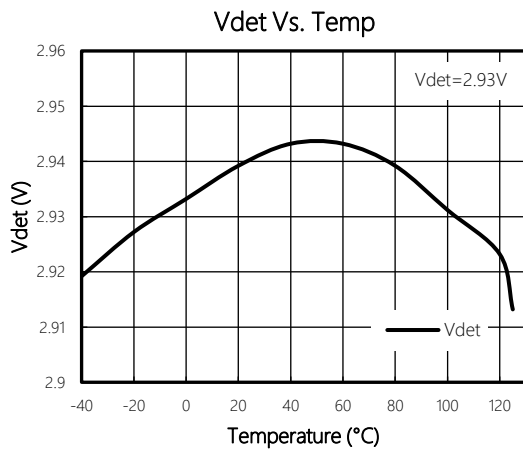
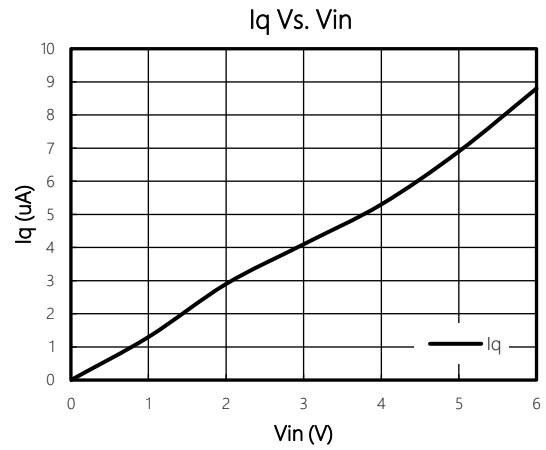
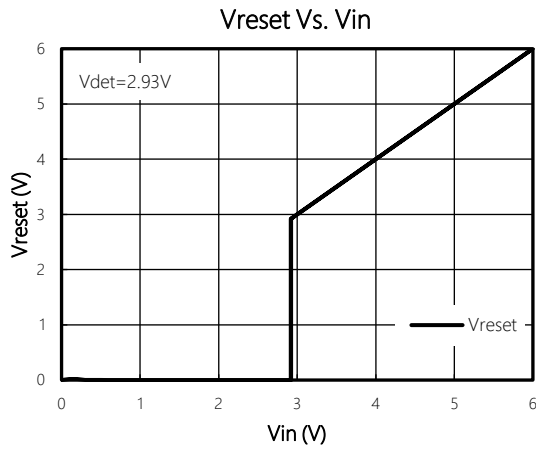
The CS809x is a general-purpose voltage detector. It can work from 1V to 6V while consuming about 5 $\mu\text{A}$  at 3.6V. CS809x keeps monitoring its  $V_{IN}$  voltage, and RESET will jump high if  $V_{IN}$  voltage is higher than detecting level  $V_{DET}$  for 240ms. Given all these features, CS809x is suitable for the applications like battery voltage monitoring, power-on reset, voltage comparison and even press button debouncing.

### Function Diagram



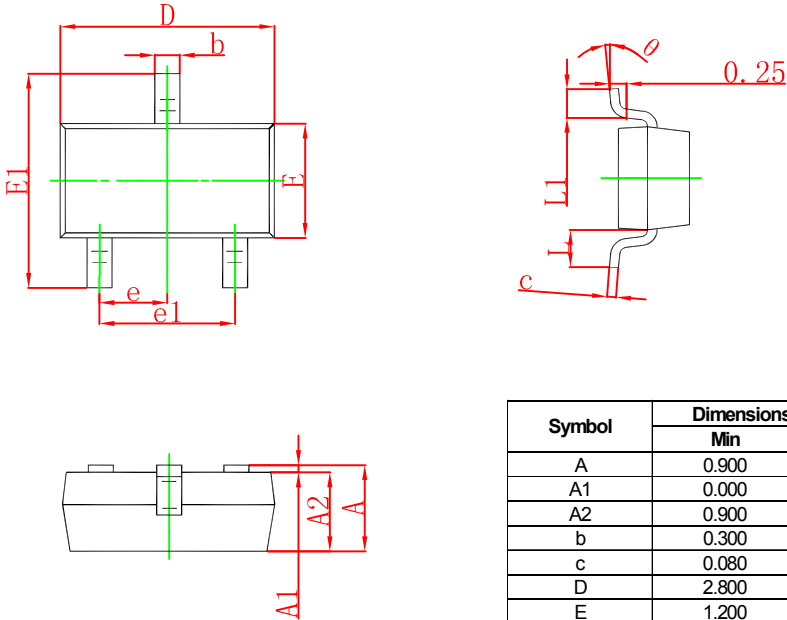


## Typical Characteristics



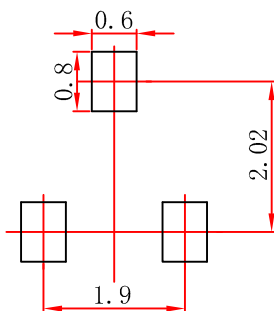


### SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In 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°

### SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.



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