



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	Tpe & 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		



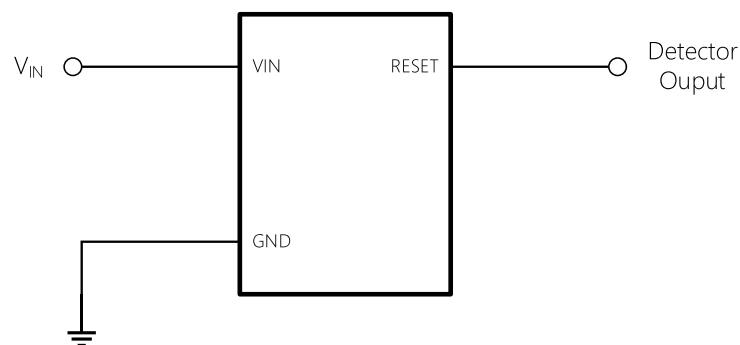
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

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 θ_{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 JE5D51-7, 4-layer PCB.

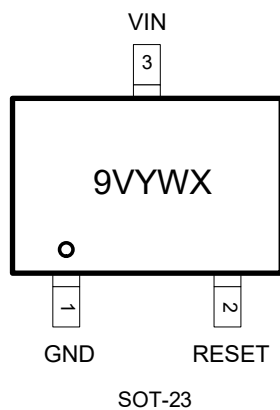
Typical Application



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



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



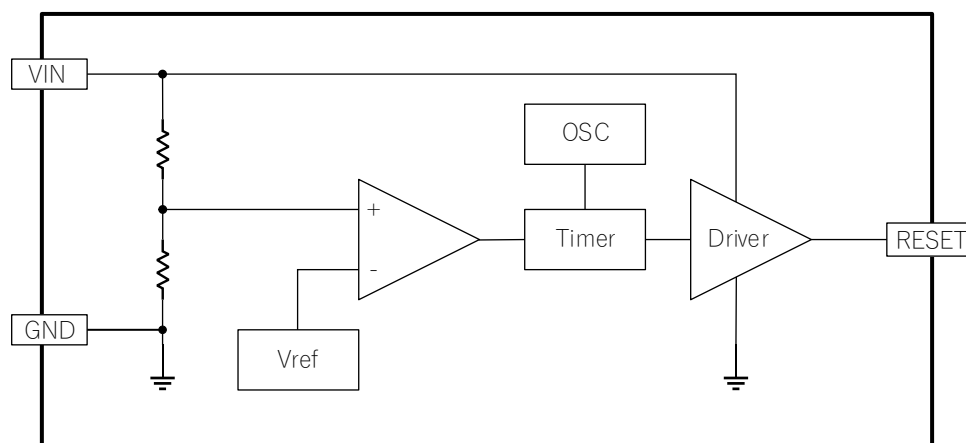
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

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	μA
	$V_{IN} = 3.6\text{V}$, $T_A=-40^{\circ}\text{C}$	2	3.5	10	μA
	$V_{IN} = 3.6\text{V}$, $T_A=125^{\circ}\text{C}$	4	6.3	15	μA
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°C	150	240	560	ms
Reset falling delay	V_{IN} falling below V_{DET}		2	50	μs
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

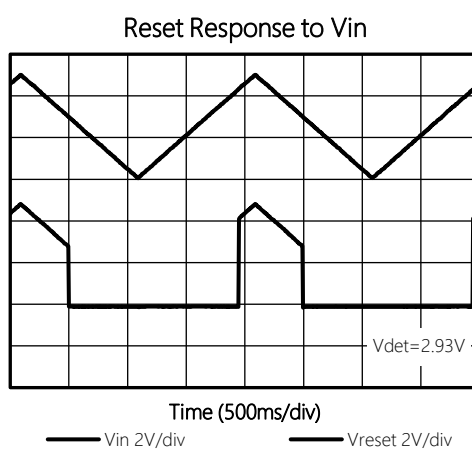
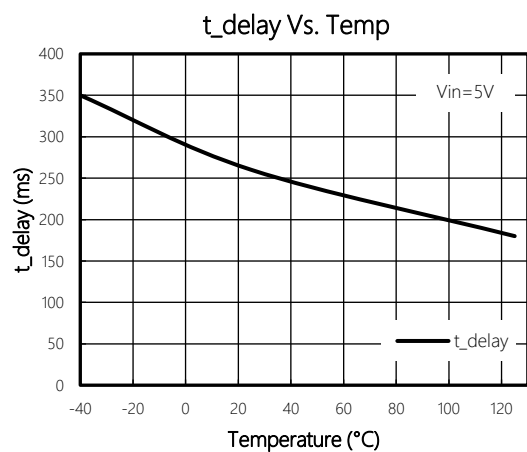
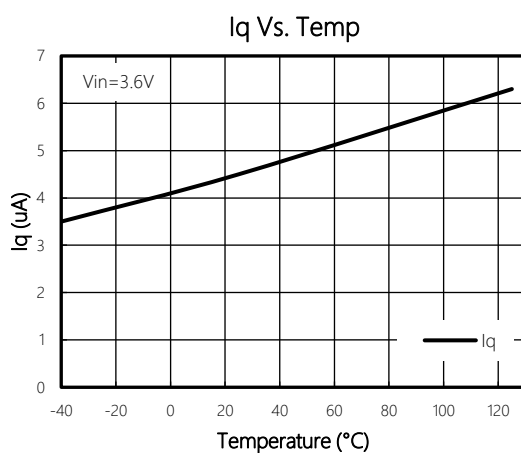
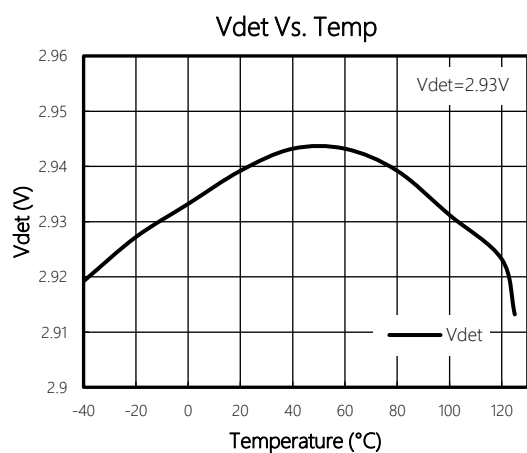
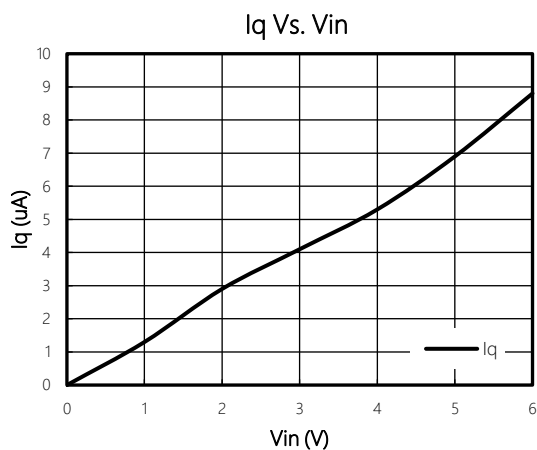
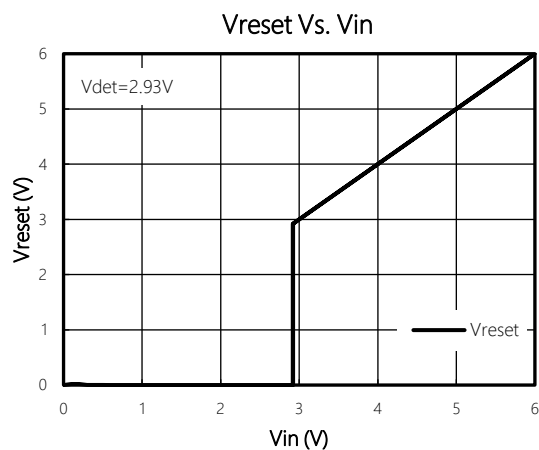
The CS809x is a general-purpose voltage detector. It can work from 1V to 6V while consuming about 5 μA at 3.6V. CS809x keeps monitoring its V_{IN} voltage, and RESET will jump high if V_{IN} voltage is higher than detecting level V_{DET} for 240ms. Given all these features, CS809x is suitable for the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

Function Diagram



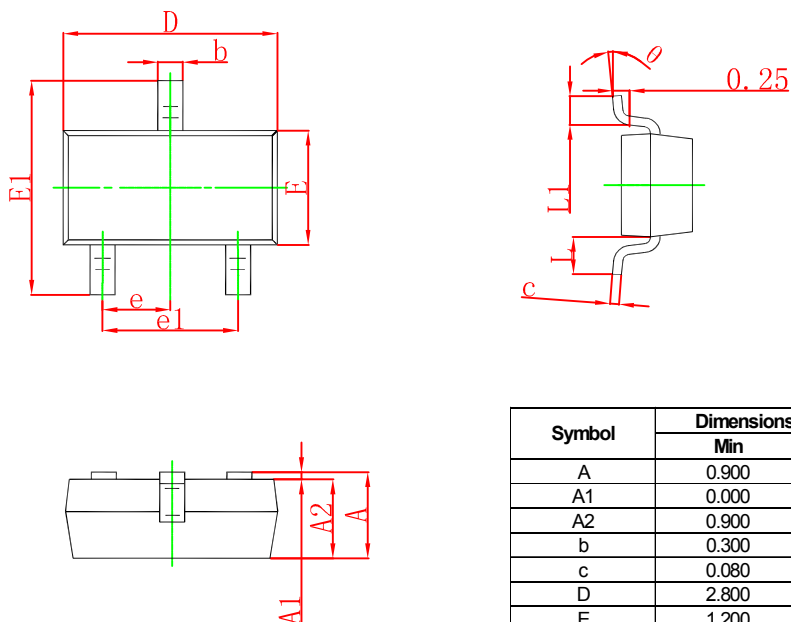


Typical Characteristics



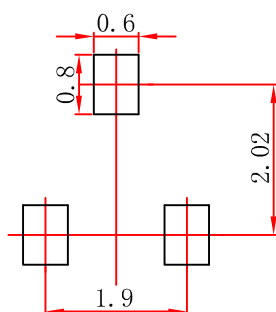


SOT-23 Package Outline Dimensions



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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