



Description

The CN809x 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.

CN809x 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 CN809x 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
CN809Z	2.32V	SOT-23	3K/Reel
CN809R	2.63V		
CN809S	2.93V		
CN809T	3.08V		
CN809J	4.00V		
CN809M	4.38V		
CN809L	4.63V		



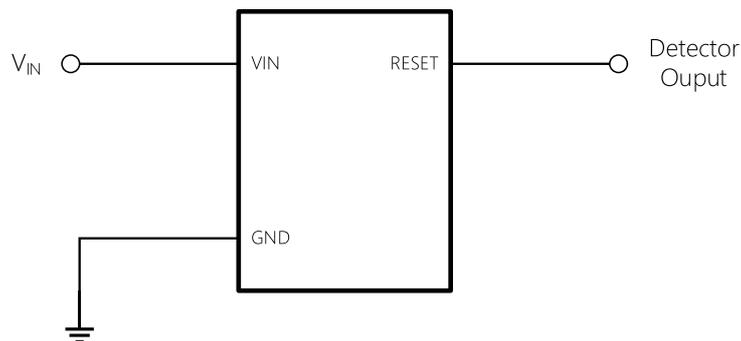
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

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	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Ambient (Note 2)	90	$^{\circ}\text{C/W}$

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 JESD51-7, 4-layer PCB.

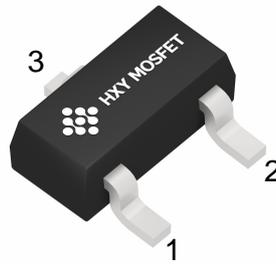
Typical Application



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 CN809x 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



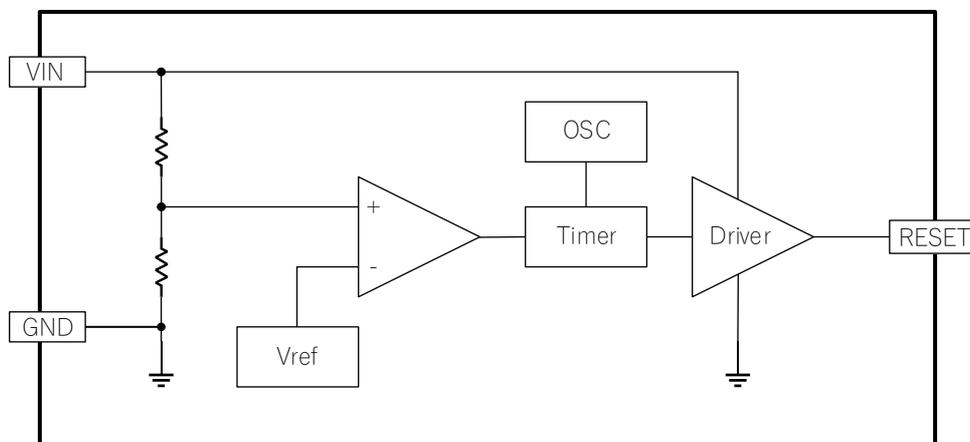
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

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

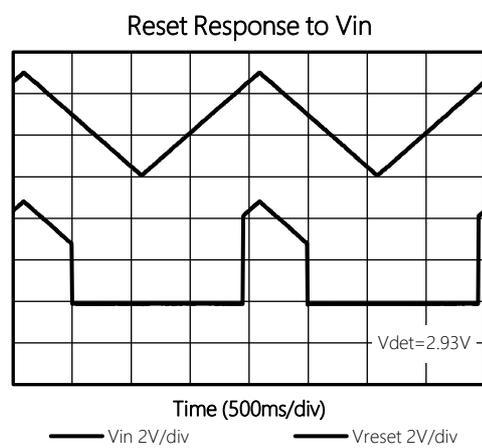
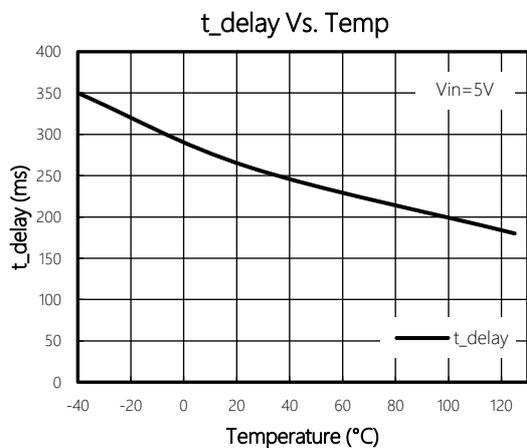
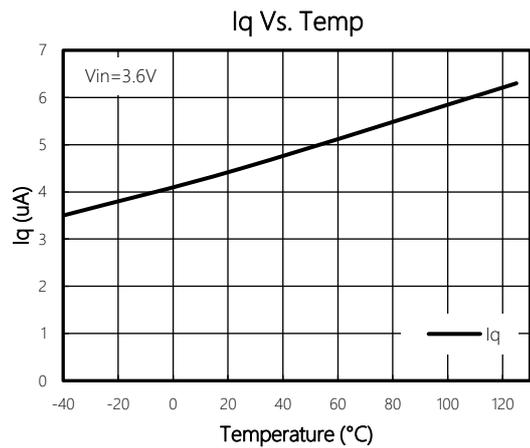
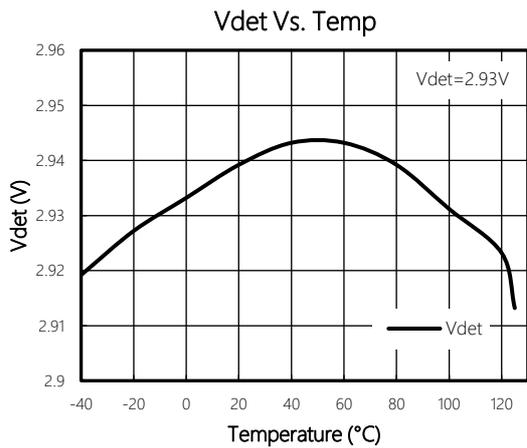
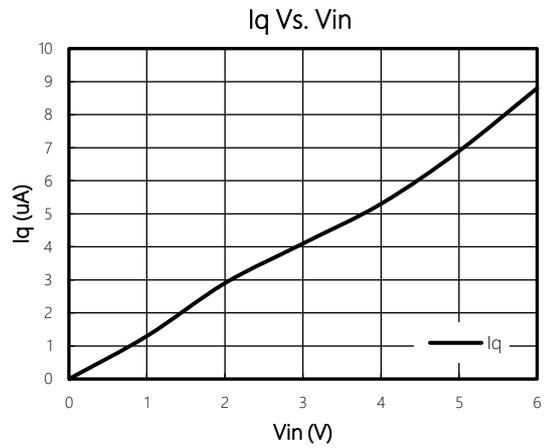
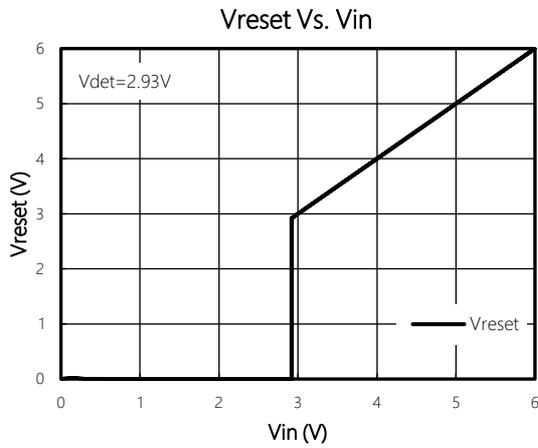
The CN809x is a general-purpose voltage detector. It can work from 1V to 6V while consuming about 5 μA at 3.6V. CN809x keeps monitoring its V_{IN} voltage, and RESET will jump high if V_{IN} voltage is higher than detecting level V_{DET} for 240ms. Given all these features, CN809x is suitable for the applications like battery voltage monitoring, power-on reset, voltage comparison and even press button debouncing.

Function Diagram



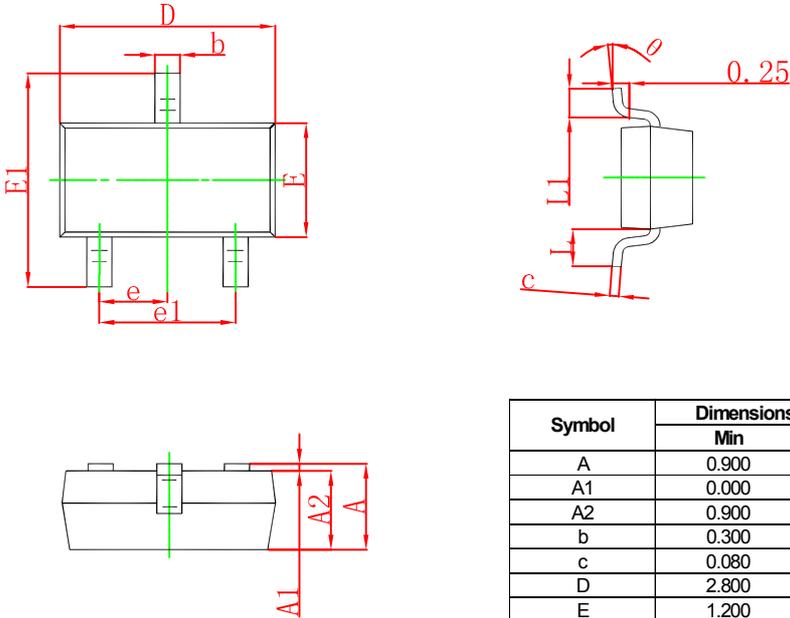


Typical Characteristics



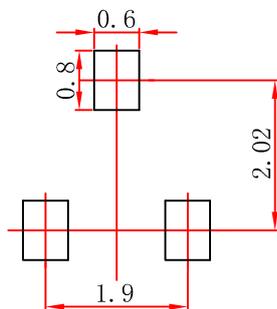


SOT-23 Package Outline Dimensions



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.



Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.