Low Power Voltage Detector IC

CN61C

General Description

The CN61C series is a highly precise and low power consumption voltage detector IC. It provides excellent circuit reliability and low cost by eliminating external components.

The CN61C series performs a single function, it outputs a low level at RES pin whenever the VCC supply voltage declines below a preset threshold, keeping it asserted until VCC has risen above the detection threshold plus a hysteresis.

The CN61C series provides CMOS output or open drain output. The reset comparator is designed to ignore fast transients on VCC, and the outputs are guaranteed to be in the correct logic state for VCC down to 1.15V over the temperature range.

The device is available in 3 pin SOT23 package.

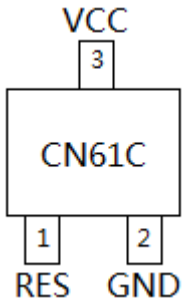
Features

- Precise Detection Threshold：±2%
- Low Power Consumption：4uA（VCC=3.7V）
- Operating Voltage Range：1.15V to 5.5V
- Guaranteed Output Valid to VCC = +1.15V
- CMOS Output and Open Drain Output
- Power Supply Transient Immunity
- Operating Temperature Range：
  －40°C to +85°C
- Available in SOT23-3

Applications

- Microprocessor Reset
- Memory Battery Back-up
- Power On Reset
- Power Failure Detection
- Battery Voltage Monitoring

Pin Assignment



Typical Application Circuit

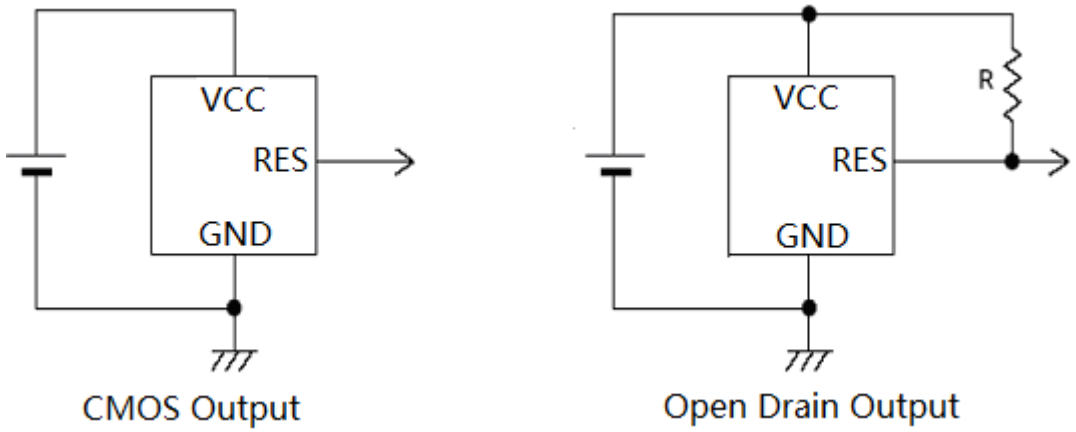


Figure 1 Typical Application Circuit

Device Function Reference Table

Part No.	Detection Voltage	Output Type	Top Mark
CN61CN25	2.5V	OD	N25X
CN61CN33	3.3V	OD	N33X

Note 1：OD means Open Drain Output； CMOS means CMOS Output

Note 2：X in top mark is the lot number based on internal standard

Ordering Information

Part No.

CN61C X XX

- XX: Voltage Detection Threshold
  - 25: 2.5V
  - 33: 3.3V
- X: Output Type
  - C: CMOS Output
  - N: Open Drain Output

Block Diagram

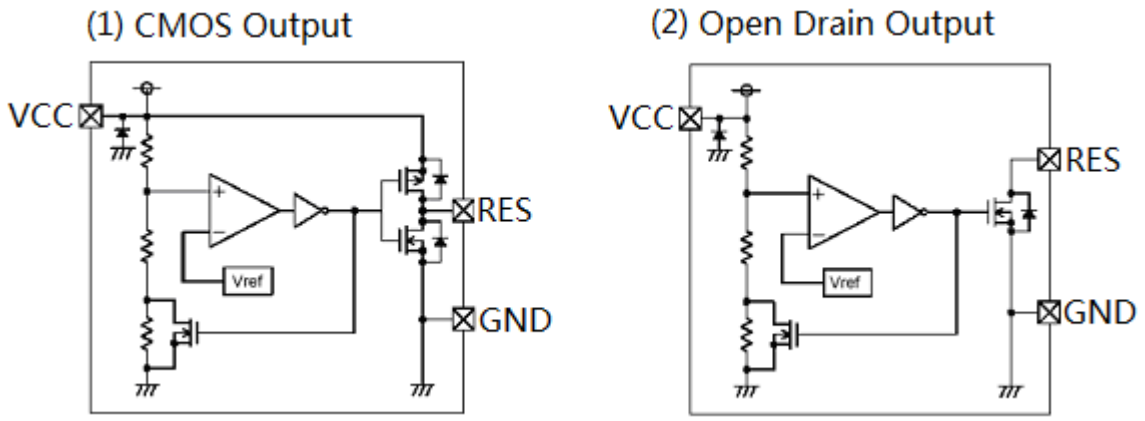


Figure 2 Block Diagram

Pin Description

Pin No.	Symbol	Description
1	RES	**Voltage Detection Output.** This output remains low if VCC drops below V_{DET}, and high after VCC rises above $V_{DET} + V_{HYST}$.
2	GND	**Power Supply Negative Terminal (GND).**
3	VCC	**Power Supply Positive Terminal.** This pin is both the power supply to internal circuit and the voltage to be detected.

ABSOLUTE MAXIMUM RATINGS

Terminal Voltage (With respect to GND)
VCC.....-0.3V to +6.0V
RES ……..-0.3V to +6.0V
VCC and RES Current
VCC 20mA
RES ..……..20mA

Thermal Resistance……..220°C/W
Operating Temperature…..-40 to +85°C
Storage Temperature..…….....-65 to +150°C
Lead Temperature(10s)…….....+260°C
ESD Rating(HBM)…….……4KV

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics (V_{CC}=3.7V, T_A= －40℃ to 85℃, Typical values are at T_A=25℃, unless otherwise noted.)

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum input voltage	VCC_{MAX}		5.5			V
Minimum input voltage	VCC_{MIN}				1.15	V
Operating Current	I_{VCC}	VCC=3.0V	1.5	3	5	uA
		VCC=3.7V	2	4	6	
Detection Threshold	V_{DET}	CN61CN25，VCC falling	2.45	2.5	2.55	V
		CN61CN33，VCC falling	3.235	3.3	3.365	
Hysteresis of V_{DET}	V_{HYST}	VCC rising	VDF ×0.03	VDF ×0.05	VDF ×0.07	V
Delay From VCC to RES	t1	VCC from V_{DET}＋0.1V to V_{DET}－0.1V		20		us
	t2	VCC from V_{DET}－0.1V to V_{DET}＋0.1V		30		us
RES Output Voltage	V_{OL}	VCC=2V，I_{SINK}=1.5mA			0.3	V
		VCC=3V，I_{SINK}=3.2mA			0.3	

Detailed Description

The CN61C series can be used to monitor battery's voltage. The device consists of a comparator, a low current high precision voltage reference, voltage divider and output driver. It outputs a low level at RES pin whenever the VCC supply voltage declines below a preset threshold, and outputs high after VCC has risen above the reset threshold plus the hysteresis.

The CN61C series provides CMOS output or open drain output. The on-chip comparator is designed to ignore fast transients on VCC, and the output are guaranteed to be in the correct logic state for VCC down to 1.15V over the temperature range.

The operation of the device can be best understood by referring to figure 3.

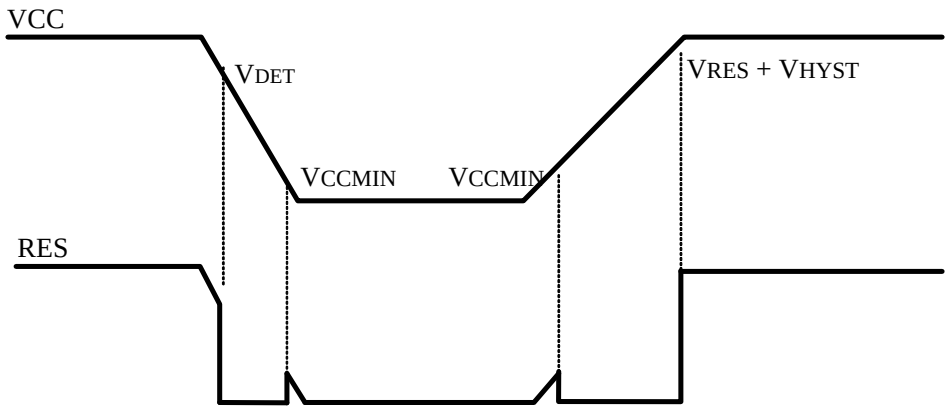


Figure 3 Timing Waveform

Application Information

Negative-Going VCC Transients

In addition to outputting a low level at RES pin during low power supply, power-down, and brownout conditions, the CN61C series is relatively immune to short-duration negative-going VCC transients (glitches). As the magnitude of the transient increases (goes farther below the reset threshold), the maximum allowable pulse width decreases. Typically, a VCC transient that goes 100mV below the reset threshold and lasts 10μs or less will not cause a reset pulse. A 0.1μF bypass capacitor mounted as close as possible to the VCC pin provides additional transient immunity.

Power-on Reset Circuit

The CN61C series with open drain output can be used to generate the power-on reset signal for a microprocessor, microcontroller or memory, etc. A capacitor should be used between RES pin and GND to generate a delay with pull-up resistor as shown in Figure 4.

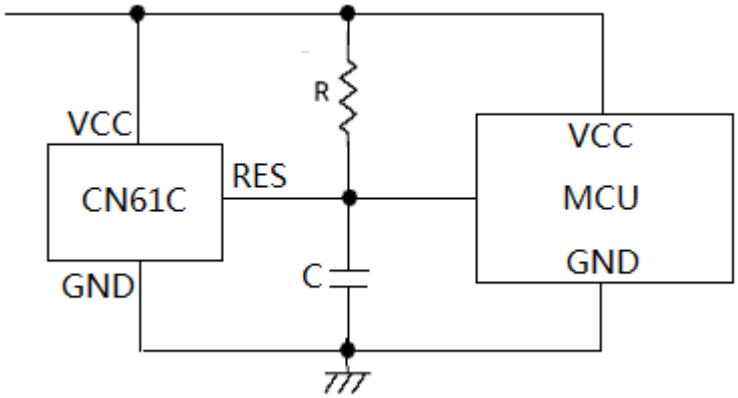
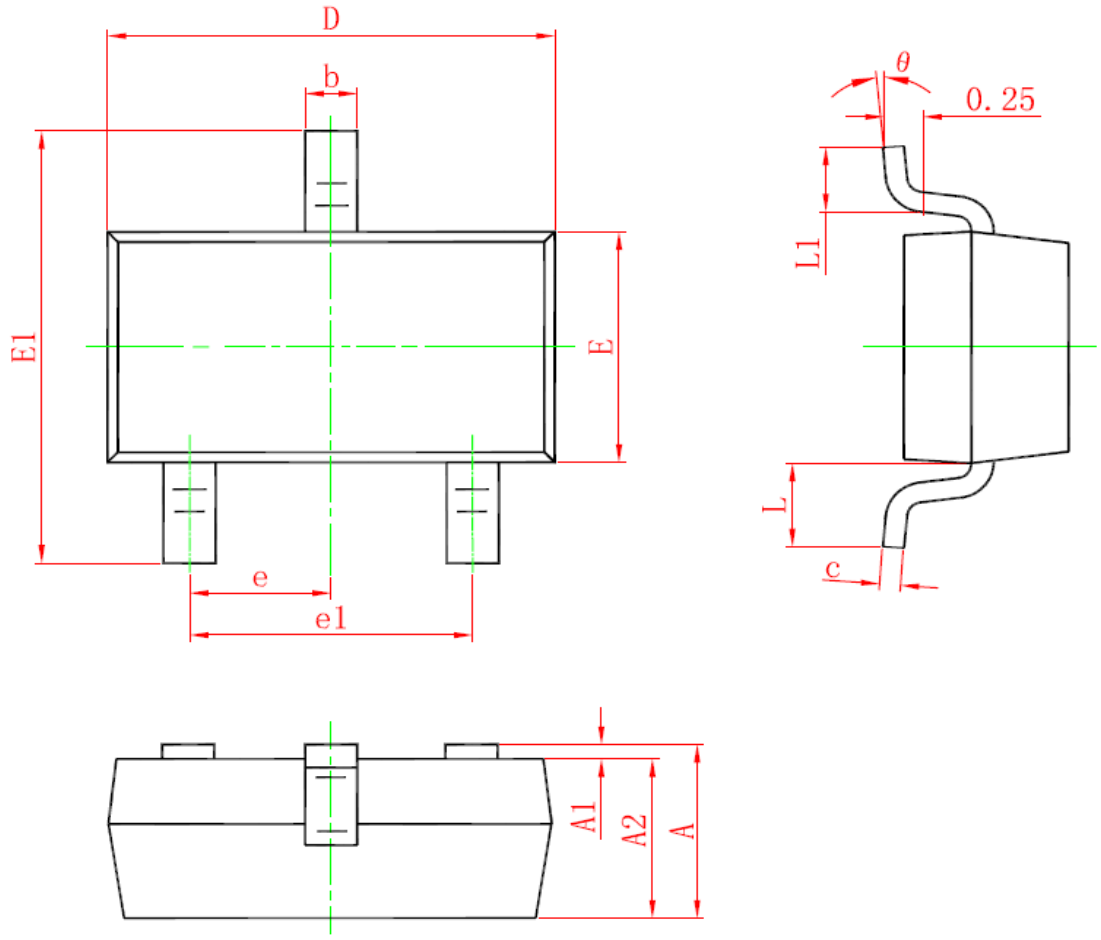


Figure 4 Power-on Reset Circuit

Package Information



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°