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**ULTRA-SMALL BUILT-IN DELAY  
HIGH-PRECISION VOLTAGE DETECTOR**

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**CE8801 Series**

■ **Introduction**

The CE8801 Series is a series of high-precision voltage detectors developed using CMOS process. The detection voltage is fixed internally, with an accuracy of  $\pm 2.0\%$ . Internal oscillator and counter timer can delay the release signal without external parts, delay time is 200 ms ( $V_{DS}=V_{SS}$ ). Two output forms, Nch open-drain and CMOS output, are available.

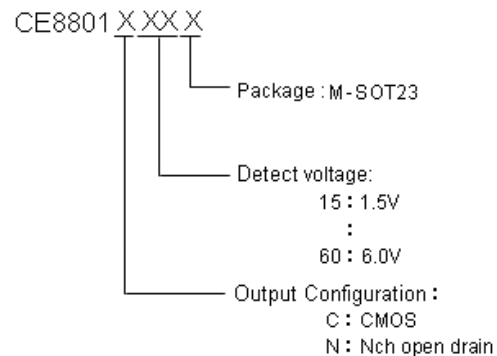
■ **Application**

- Power monitor for portable equipment such as notebook computers, digital still cameras, PDA, and cellular phones.
- Constant voltage power monitors for cameras, video equipment and communication devices.
- Power monitor for microcomputers and reset for CPUs.

■ **Features**

- Ultra-low current consumption:  $1.0\mu A@3.5V$ (Typ.)
- High-precision detection voltage:  $\pm 2.0\%$
- Hysteresis characteristics:  $-V_{DET} \times 5\%$ (Typ.)
- Operating voltage range: 0.95 V to 8.0 V
- Detection voltage: 1.5V to 6.0 V (0.1 V step)
- CE switching function of delay time (DS pin)
- Delay times: 200ms ( $V_{DS}=V_{SS}$ ) (Typ.)  
200us ( $V_{DS}=V_{DD}$ ) (Typ.)
- Output forms:
  - NMOS open-drain output (Active Low)
  - CMOS output (Active Low)

■ **Ordering Information**



## Pin Configurations

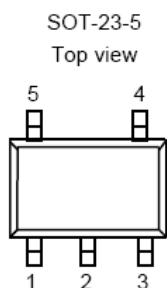


Table 1 CE8801 Series (SOT-23-5)

PIN NO.	PIN name	Functions
1	DS	DS switch for delay time: “L”: 200ms delay; “H”: 200us delay.
2	V <sub>SS</sub>	GND pin
3	NC	No connection
4	V <sub>OUT</sub>	Voltage detection output pin
5	V <sub>DD</sub>	Voltage input pin

## Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Item	Symbol	Absolute maximum ratings	Unit	
Power supply voltage	V <sub>DD</sub>	V <sub>SS</sub> -0.3 ~ V <sub>SS</sub> +8	V	
Output voltage	V <sub>OUT</sub>	V <sub>SS</sub> -0.3 ~ V <sub>SS</sub> +8	V	
Power dissipation	SOT-23-3	PD	250	mW
	SOT-23-5		250	mW
Operating ambient temperature	Topr	-40 ~ +85	°C	
Storage temperature	Tstg	-40 ~ +125	°C	

## Electrical Characteristics

(Ta=25°C unless otherwise specified)

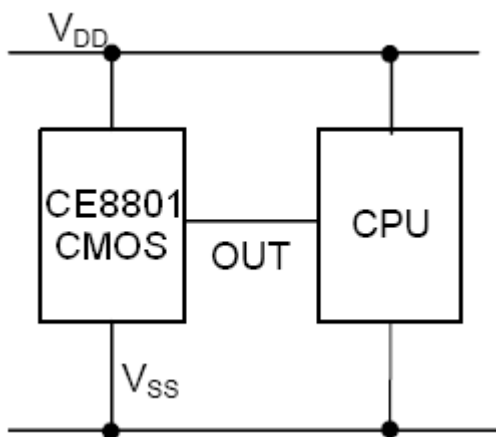
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Detection voltage*1	-V <sub>DET</sub>	—	-V <sub>DET(S)</sub> ×0.98	-V <sub>DET(S)</sub>	-V <sub>DET(S)</sub> ×1.02	V	
Hysteresis width	V <sub>HYS</sub>	—	0.02× -V <sub>DET(S)</sub>	0.05× -V <sub>DET(S)</sub>	0.08× -V <sub>DET(S)</sub>	V	
Current consumption	I <sub>SS</sub>	V <sub>DD</sub> = -V <sub>DET</sub> + 0.5V	CE8801X20~26	—	1.0	2.0	uA
			CE8801X26~39	—	1.2	2.5	uA
			CE8801X39~60	—	1.5	3.0	uA
Operating voltage	V <sub>DD</sub>	—	0.95	—	8	V	
Output current	I <sub>OUT</sub>	NMOS: V <sub>OUT</sub> = 0.5 V V <sub>DD</sub> = -V <sub>DET</sub> - 0.5 V	CE8801X20~26	3.0	13.0	—	mA
			CE8801X26~39	3.0	15.0	—	mA
			CE8801X39~60	3.0	18.0	—	mA
		PMOS: V <sub>DD</sub> - V <sub>OUT</sub> = 0.5 V V <sub>DD</sub> = -V <sub>DET</sub> + 0.5 V	CE8801X20~26	1.5	4.0	—	mA
			CE8801X26~39	1.5	6.0	—	mA
			CE8801X39~60	1.5	8.0	—	mA

Leakage current	$I_{LEAK}$	Only for NMOS open-drain output products, $V_{DD} = 8.0\text{ V}$ , $V_{OUT} = 8.0\text{ V}$		—	0.1	$\mu\text{A}$
temperature coefficient		$T_a = -40^\circ\text{C} \sim +85^\circ\text{C}$		$\pm 120$		ppm/ $^\circ\text{C}$
Delay time 1	$t_{D1}$	$V_{DD} = -V_{DET} + 1\text{ V}$ , DS PIN Low		200		ms
Delay time 2	$t_{D2}$	$V_{DD} = -V_{DET} + 1\text{ V}$ , DS PIN High		220		$\mu\text{s}$
Input voltage	$V_{SH}$	DS PIN, $V_{DD} = 6.0\text{ V}$	1.0	—	—	V
	$V_{SH}$	DS PIN, $V_{DD} = 6.0\text{ V}$	—	—	0.3	V

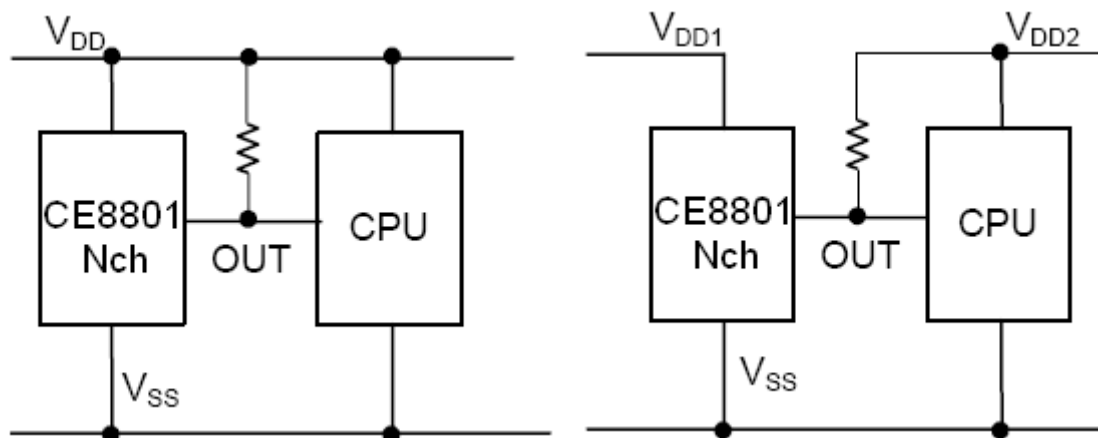
\*1. -VDET: Actual detection voltage value, -VDET(S): Specified detection voltage value

## ■ Application Circuit

### 1、CMOS output:

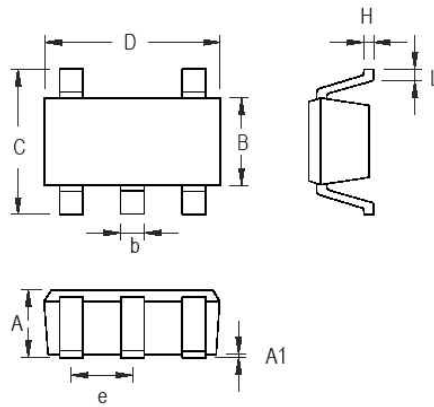


### 2、Nch open-drain



■ Package information

● SOT-23-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.035	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.356	0.559	0.014	0.022
C	2.591	2.997	0.102	0.118
D	2.692	3.099	0.106	0.122
e	0.838	1.041	0.033	0.041
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024