

**Ultra-Small High-Precision Voltage Detector****CJ808 Series****■ INTRODUCTION**

The Series is a series of high-precision voltage detectors with a built-in delay time generator of fixed time developed using CMOS process.

The detection voltage is fixed internally, with an accuracy of  $\pm 2.0\%$ .

**■ APPLICATIONS**

- Memory battery back-up circuits
- Power-on reset circuits
- Power failure detection
- Power monitor for portable equipment such as notebook computers, digital cameras, PDA, and cellular phones.
- Constant voltage power monitors for cameras, video equipment and communication devices.
- Power monitor for microcomputers and reset for CPUs.

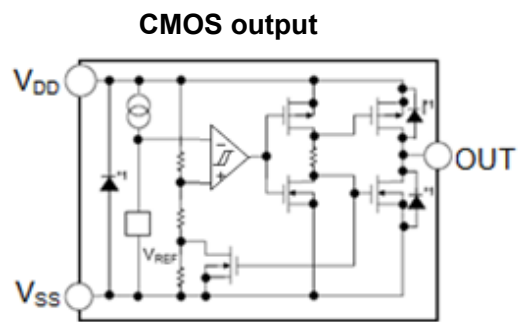
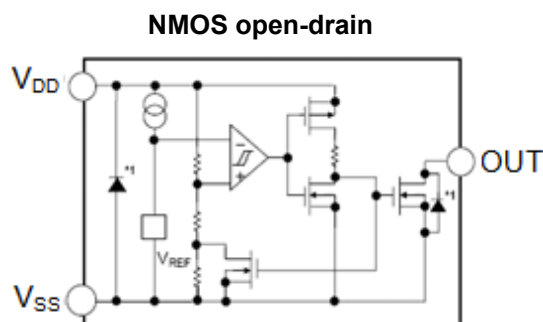
**■ FEATURES**

- Ultra-low current consumption:  
0.9 $\mu$ A@3.5V(Typ.)
- High-precision detection voltage:  $\pm 2.0\%$
- Hysteresis characteristics:  $-V_{DET} \times 5\%$ (Typ.)
- Operating voltage range: 0.95V to 7.0V
- Detection voltage: 1.5V to 6.0V (10mV step)
- ESD(HMB):  $\pm 8KV$
- Output forms:  
NMOS open-drain output (Active Low)  
CMOS output (Active Low)

**■ ORDER INFORMATION****CJ808①②③④⑤**

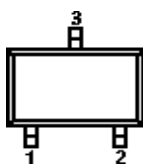
| DESIGNATOR | SYMBOL  | DESCRIPTION  |
|------------|---------|--|
| ①          | C       | CMOS   |
|            | N       | NMOS open drain  |
| ②③④        | Integer | Detection Voltage (1.50V~6.00V),<br>“④”elide when it is “0”<br>e.g. 3.0V=②:3, ③:0<br>2.93V=②:2, ③:9, ④:3 |
| ⑤          | M       | Package: SOT-23-3L   |
|            | MR      | Package: SOT-23-5L   |
|            | P       | Package: SOT-89-3L   |
|            | N       | Package: SOT-23  |

## ■ BLOCK DIAGRAMS



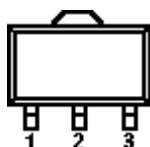
## ■ PIN CONFIGURATION

**SOT-23**  
**SOT-23-3L**



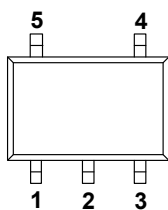
| PIN NO. | N/M       | FUNCTION                     |
|---------|-----------|------------------------------|
| 1       | $V_{OUT}$ | Voltage detection output pin |
| 2       | $V_{SS}$  | Ground                       |
| 3       | $V_{DD}$  | Voltage input pin            |

**SOT-89-3L**



| PIN NO. | P         | FUNCTION                     |
|---------|-----------|------------------------------|
| 1       | $V_{OUT}$ | Voltage detection output pin |
| 2       | $V_{DD}$  | Voltage input pin            |
| 3       | $V_{SS}$  | Ground                       |

**SOT-23-5L**



| PIN NO. | MR        | FUNCTION                     |
|---------|-----------|------------------------------|
| 1       | $V_{OUT}$ | Voltage detection output pin |
| 2       | $V_{DD}$  | Voltage input pin            |
| 3       | $V_{SS}$  | Ground                       |
| 4       | NC        | No connection                |
| 5       | NC        | No connection                |

## Electrical Characteristics

### ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C, unless otherwise specified)

| PARAMETER                     | SYMBOL              | RATINGS                                   | UNITS |
|-------------------------------|---------------------|---|-------|
| 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              | 250                                       | mW    |
|                               | SOT-23-3L           | 400                                       | mW    |
|                               | SOT-89-3L           | 500                                       | mW    |
|                               | SOT-23-5L           | 500                                       | mW    |
| Operating ambient temperature | T <sub>opr</sub>    | -40 ~ +85                                 | °C    |
| Storage temperature           | T <sub>stg</sub>    | -40 ~ +125                                | °C    |
| Soldering Temperature & Time  | T <sub>solder</sub> | 260°C, 10s                                |       |

### ■ ELECTRICAL CHARACTERISTICS

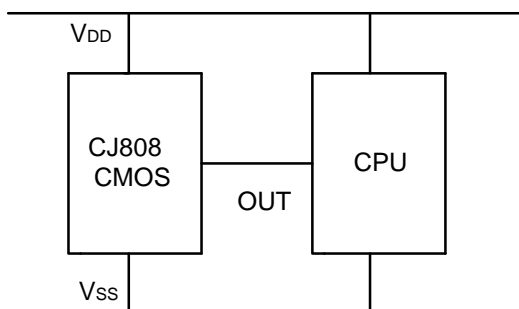
(Ta=25°C, unless otherwise specified)

| PARAMETER               | SYMBOL            | CONDITIONS  | MIN                           | TYP                           | MAX                           | UNITS  |    |
|-------------------------|-------------------|---|-------------------------------|-------------------------------|-------------------------------|--------|----|
| Detection voltage*1     | -V <sub>DET</sub> | —   | -V <sub>DET(S)</sub><br>×0.98 | -V <sub>DET(S)</sub>          | -V <sub>DET(S)</sub><br>×1.02 | V      |    |
| Hysteresis width        | V <sub>HYS</sub>  | —   | 0.02×<br>-V <sub>DET(S)</sub> | 0.05×<br>-V <sub>DET(S)</sub> | 0.08×<br>-V <sub>DET(S)</sub> | V      |    |
| Current consumption     | I <sub>SS</sub>   | V <sub>DD</sub> = -V <sub>DET</sub> +0.5V   | CJ808 C/N 20~26               | —                             | 1.0                           | 2.0    | uA |
|                         |                   |   | CJ808 C/N 26~39               | —                             | 1.2                           | 2.5    | uA |
|                         |                   |   | CJ808 C/N 39~60               | —                             | 1.5                           | 3.0    | uA |
| Operating voltage       | V <sub>DD</sub>   | —   | 0.95                          | —                             | 7                             | V      |    |
| Output current          | I <sub>OUT</sub>  | NMOS:<br>V <sub>OUT</sub> = 0.5 V<br>V <sub>DD</sub> = -V <sub>DET</sub> -0.5 V                 | CJ808 C/N 20~26               | 3.0                           | 13.0                          | —      | mA |
|                         |                   |   | CJ808 C/N 26~39               | 3.0                           | 15.0                          | —      | mA |
|                         |                   |   | CJ808 C/N 39~60               | 3.0                           | 18.0                          | —      | mA |
|                         |                   | PMOS:<br>V <sub>DD</sub> -V <sub>OUT</sub> = 0.5 V<br>V <sub>DD</sub> = -V <sub>DET</sub> +0.5V | CJ808 C/N 20~26               | 1.5                           | 4.0                           | —      | mA |
|                         |                   |   | CJ808 C/N 26~39               | 1.5                           | 6.0                           | —      | mA |
|                         |                   |   | CJ808 C/N 39~60               | 1.5                           | 8.0                           | —      | mA |
| Leakage current         | I <sub>LEAK</sub> | Only for NMOS open-drain output products, V <sub>DD</sub> = 8.0 V, V <sub>OUT</sub> = 8.0 V     | —                             | —                             | 1.0                           | uA     |    |
| temperature coefficient |                   | Ta=-40°C ~+85°C   | —                             | ±120                          | ±360                          | ppm/°C |    |
| Delay time              | T <sub>PLH</sub>  |   |                               | 200                           |                               | us     |    |

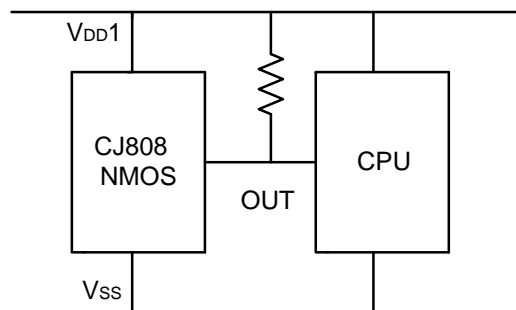
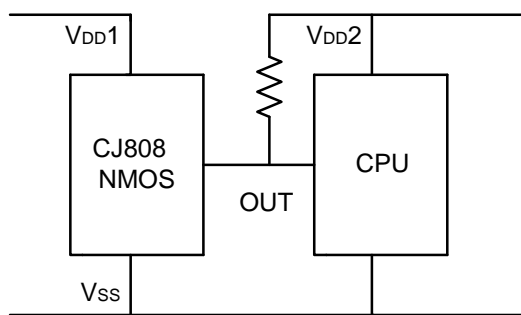
\*1. -V<sub>DET</sub>: Actual detection voltage value, -V<sub>DET(S)</sub>: Specified detection voltage value

## ■ TYPICAL APPLICATION CIRCUITS

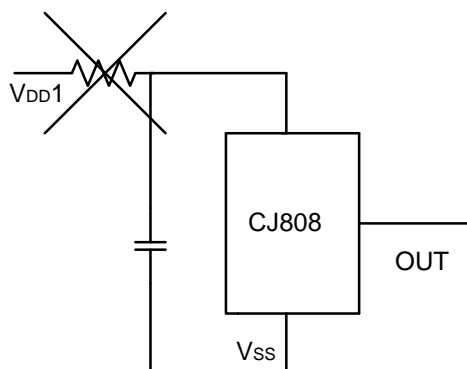
### 1. CMOS output



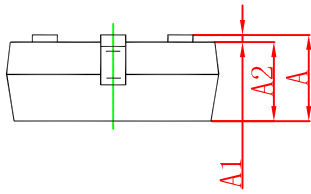
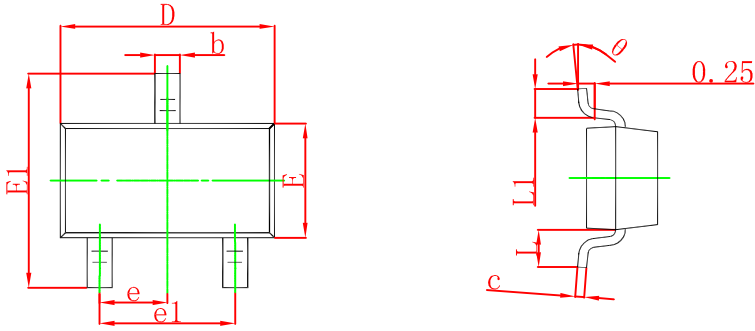
### 2. NMOS open-drain



### 3. Forbidden Circuits

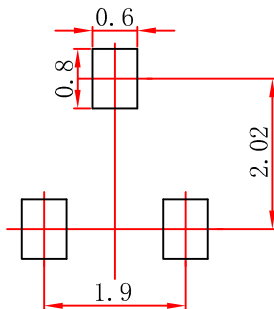


## SOT-23 Package Outline Dimensions



| 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 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

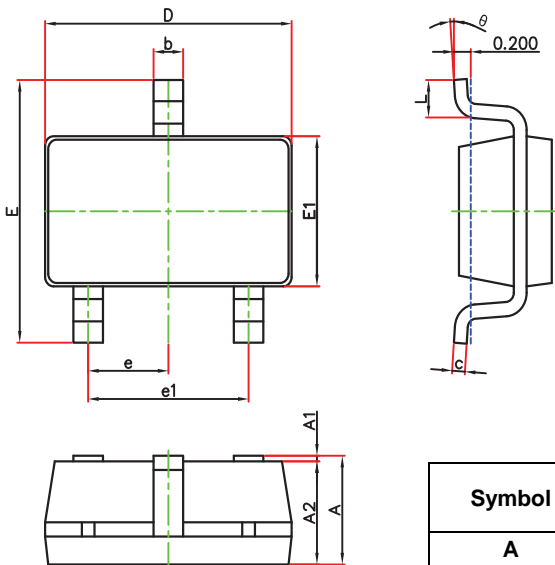
## SOT-23 Suggested Pad Layout



Note:

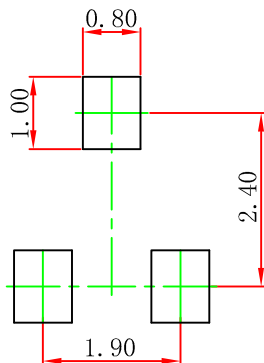
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

## SOT-23-3L Package Outline Dimensions



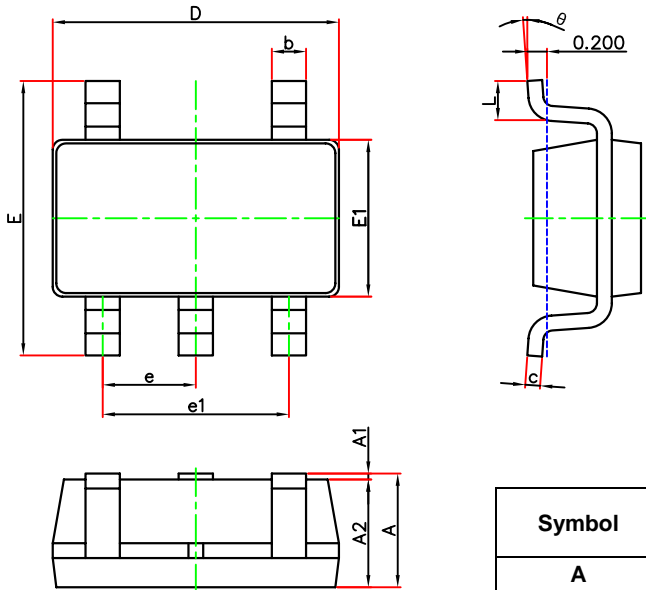
| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 2.650                     | 2.950 | 0.104                | 0.116 |
| E1     | 1.500                     | 1.700 | 0.059                | 0.067 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23-3L Suggested Pad Layout



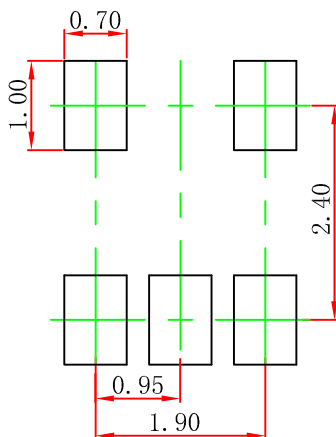
- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.

## SOT-23-5L Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 2.650                     | 2.950 | 0.104                | 0.116 |
| E1     | 1.500                     | 1.700 | 0.059                | 0.067 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |

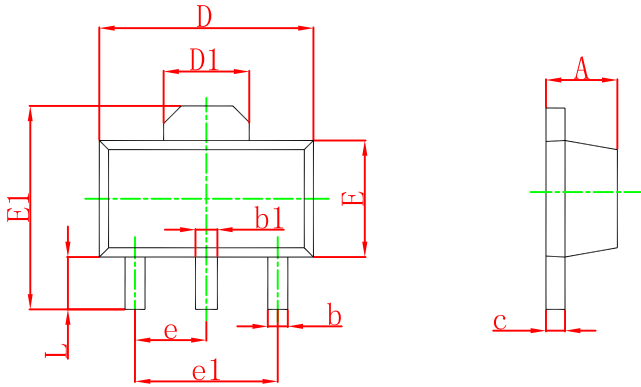
## SOT-23-5L Suggested Pad Layout



Note:

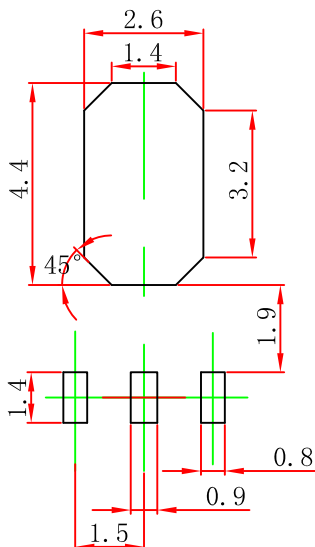
1. Controlling dimension; in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

## SOT-89-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.197 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF                 |       | 0.061 REF            |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP                 |       | 0.060 TYP            |       |
| e1     | 3.000 TYP                 |       | 0.118 TYP            |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

## SOT-89-3L 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.

# DISCLAIMER

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