

## 2.93V Micropower Supply Voltage Supervisor (SVS)

### Features

- Precision voltage sensor
- 2.93V threshold voltage
- Stable over temperature
- Valid output logic while  $V_{CC} = 0V$ .
- Power-on reset pulse width of 140ms (min.) to 460ms (max.)
- Low quiescent current (40 $\mu$ A typ.)
- No external components required
- 3-pin SOT23 package
- "809" compatible pinout
- Lead-free versions available

### Applications

- Critical  $\mu$ P and  $\mu$ C power monitoring
- PCI applications
- Memory integrity during "brownouts"

### Product Description

The CM3403 is a micropower low voltage supply supervisor designed to provide the necessary power-on reset control for microprocessors and memory applications. An internal pull-down resistor on the RESET output ensures the output remains valid under all supply conditions.

During either a cold-start power-up or a complete power-down sequence, the RESET output will remain at 0V while the  $V_{CC}$  input voltage is between the threshold level and ground.

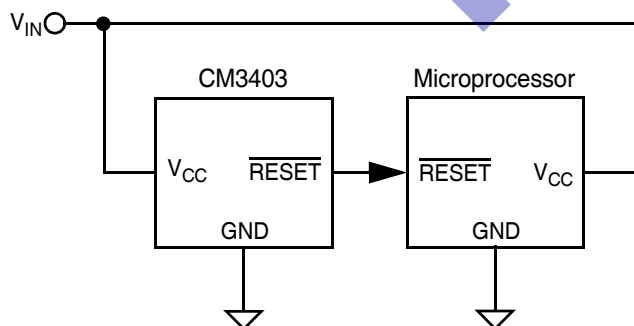
When the  $V_{CC}$  input exceeds the preset threshold voltage, an internal timer is triggered and the RESET output remains active for a minimum of 140ms, at which point the output is taken inactive.

In the event of a "brown-out" condition and the  $V_{CC}$  voltage collapses below the threshold the RESET output is immediately asserted.

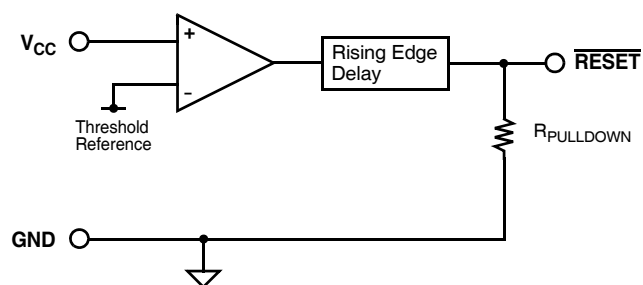
Both the trigger threshold and the precision delay pulse are internally controlled eliminating the requirement for external components.

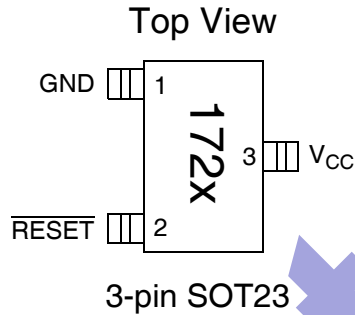
The CM3403 is housed in a 3-pin SOT23 package and is available with optional lead-free finishing.

### Typical Application Circuit



### Simplified Electrical Schematic



**PACKAGE / PINOUT DIAGRAM**


Note: This drawing is not to scale.

**PIN DESCRIPTIONS**

| PIN(S) | NAME                      | DESCRIPTION   |
|--------|---------------------------|---|
| 1      | GND                       | Negative reference for all signals.   |
| 2      | $\overline{\text{RESET}}$ | Active low reset output. When the sense threshold has been exceeded, the $\overline{\text{RESET}}$ signal will remain active for an additional 140ms (min.) after which it becomes inactive. During a "brownout" condition, $\overline{\text{RESET}}$ will immediately become active. Internal circuitry ensures $\overline{\text{RESET}}$ will remain active even when the supply voltage is as low as 0V. |
| 3      | V <sub>CC</sub>           | Supply input signal which is monitored by the sense comparator. This input is compared to the 2.93V reference to determine the state of the output.   |

**Ordering Information**
**PART NUMBERING INFORMATION**

| Pins | Threshold Voltage | Package | Standard Finish                   |              | Lead-free Finish                  |              |
|------|-------------------|---------|-----------------------------------|--------------|-----------------------------------|--------------|
|      |                   |         | Ordering Part Number <sup>1</sup> | Part Marking | Ordering Part Number <sup>1</sup> | Part Marking |
| 3    | 2.93V             | SOT23-3 | CM3403-29ST                       | 172Y         | CM3403-29SO                       | 172R         |

Note 1: Parts are shipped in Tape & Reel form unless otherwise specified.

## Specifications

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                           | RATING                          | UNITS |
|-------------------------------------|---------------------------------|-------|
| Pin Voltages                        | [GND - 0.5] to +6.5             | V     |
| $V_{CC}$                            | [GND - 0.5] to $[V_{CC} + 0.5]$ | V     |
| $\overline{RESET}$                  |                                 |       |
| Storage Temperature Range           | -40 to +150                     | °C    |
| Ambient Operating Temperature Range | -40 to +125                     | °C    |

### STANDARD OPERATING CONDITIONS

| PARAMETER                           | VALUE    | UNITS |
|-------------------------------------|----------|-------|
| $V_{CC}$                            | 0 to 6.0 | V     |
| Ambient Operating Temperature Range | 0 to +70 | °C    |

### ELECTRICAL OPERATING CHARACTERISTICS (SEE NOTE 1)

| SYMBOL         | PARAMETER   | CONDITIONS  | MIN  | TYP        | MAX      | UNITS                    |
|----------------|---|---|------|------------|----------|--------------------------|
| $V_{TH}$       | Sense Threshold                                     | CM3403-29, $T_A=25^\circ\text{C}$                           | 2.89 | 2.93       | 2.96     | V                        |
|                |   | CM3403-29, $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ | 2.85 | 2.93       | 3.00     | V                        |
| $I_{CC}$       | Supply Current                                      | No load, $V_{CC}=5\text{V}$                                 |      | 40         | 80       | $\mu\text{A}$            |
| $T_{DELAY}$    | Reset Release Delay                                 |   | 140  |            | 460      | mS                       |
| $t_{PHL}$      | Propagation Delay when asserting $\overline{RESET}$ | $V_{CC} < (V_{TH} - 50\text{mV})$ , Note 2                  |      | 0.2        | 5        | $\mu\text{S}$            |
| $R_{PULLDOWN}$ | $\overline{RESET}$ Pull-Down Resistance             | $V_{CC} < 1.5\text{V}$<br>$V_{CC} > 1.5\text{V}$            |      | 200<br>0.5 | 500<br>3 | k $\Omega$<br>k $\Omega$ |
| $R_{PULLUP}$   | $\overline{RESET}$ Pull-Up Resistance               | $V_{CC} > V_{TH}$ and $t > T_{DELAY}$                       |      | 0.5        | 3        | k $\Omega$               |

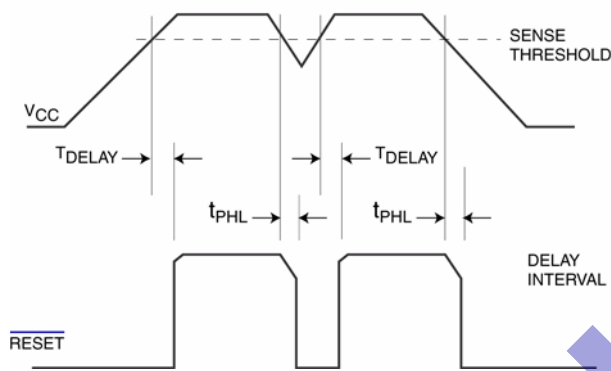
Note 1: Electrical Operating Characteristics are specified over the Standard Operating Conditions unless specified otherwise.

Note 2: This parameter is guaranteed by design and characterization.

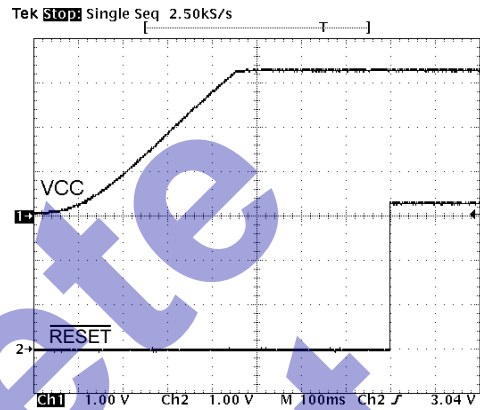
**Performance Information**

CM3403 Typical Characteristics (nominal conditions unless specified otherwise)

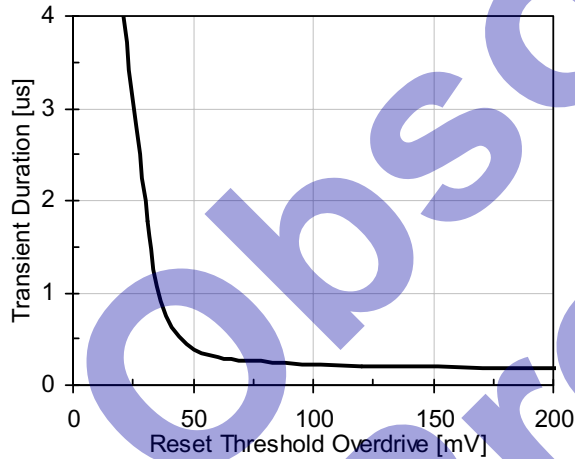
**Transient Operation Description**



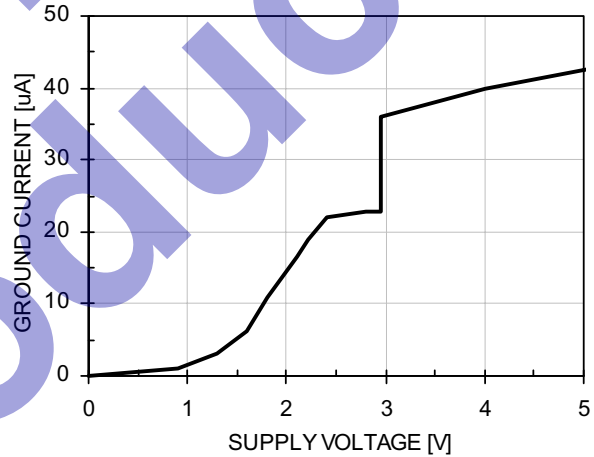
**Power-up Reset Response**



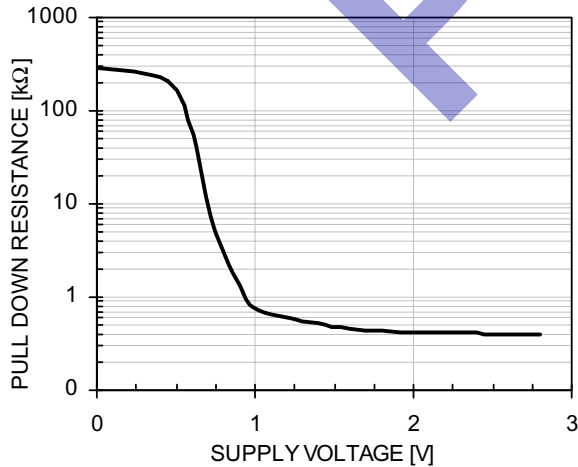
**Reset Response with Overdrive**



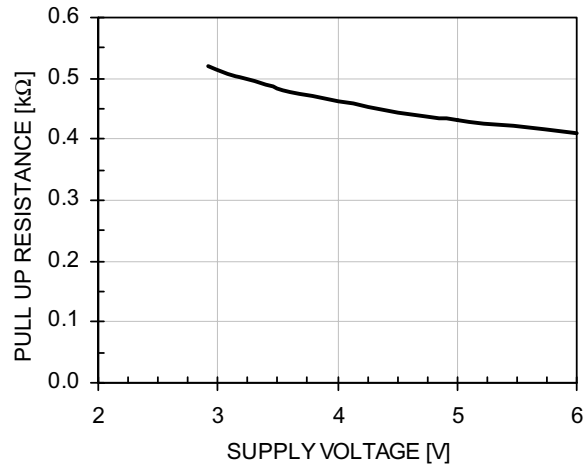
**Ground Current vs. Voltage**



**Below Trigger RESET\* Pull-down**



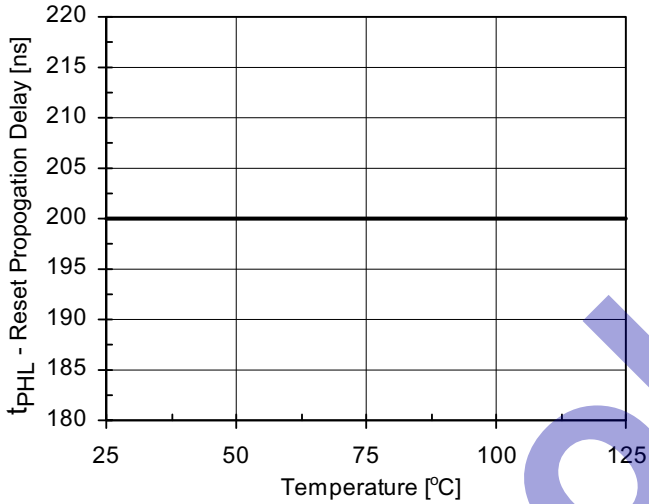
**Above Trigger RESET\* Pull-up**



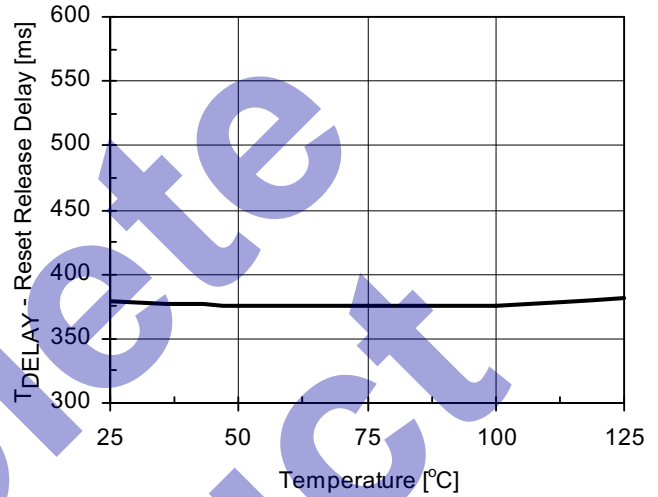
### Performance Information (cont'd)

CM3403 Typical Thermal Characteristics (nominal conditions unless specified otherwise)

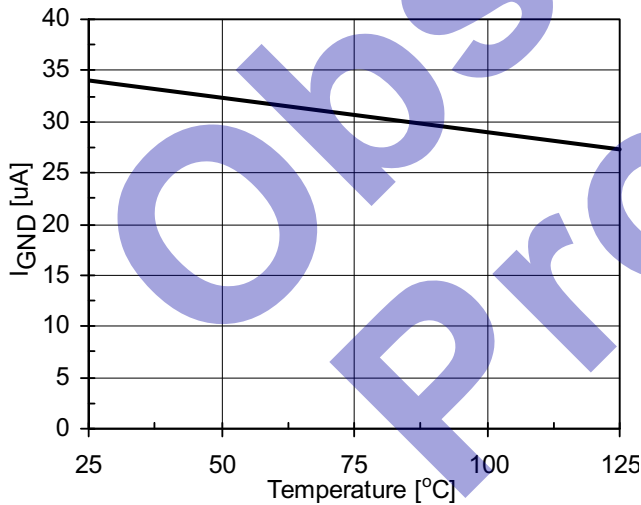
**RESET Propagation Delay vs. Temperature**



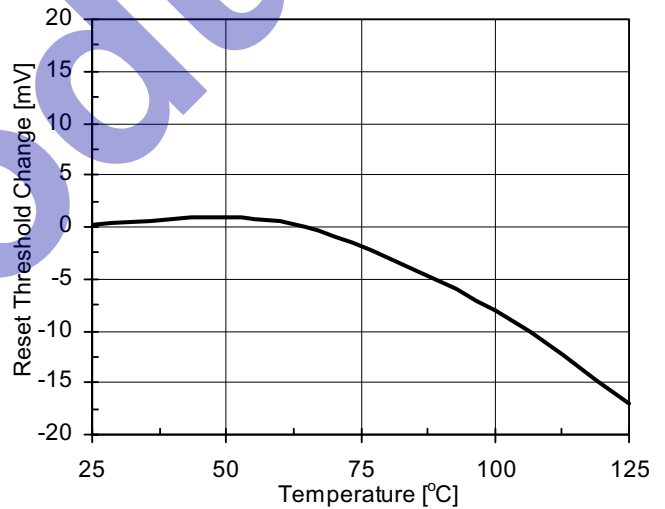
**RESET Release Delay vs. Temperature**



**Ground Current vs. Temperature**



**Threshold variation vs. Temperature**



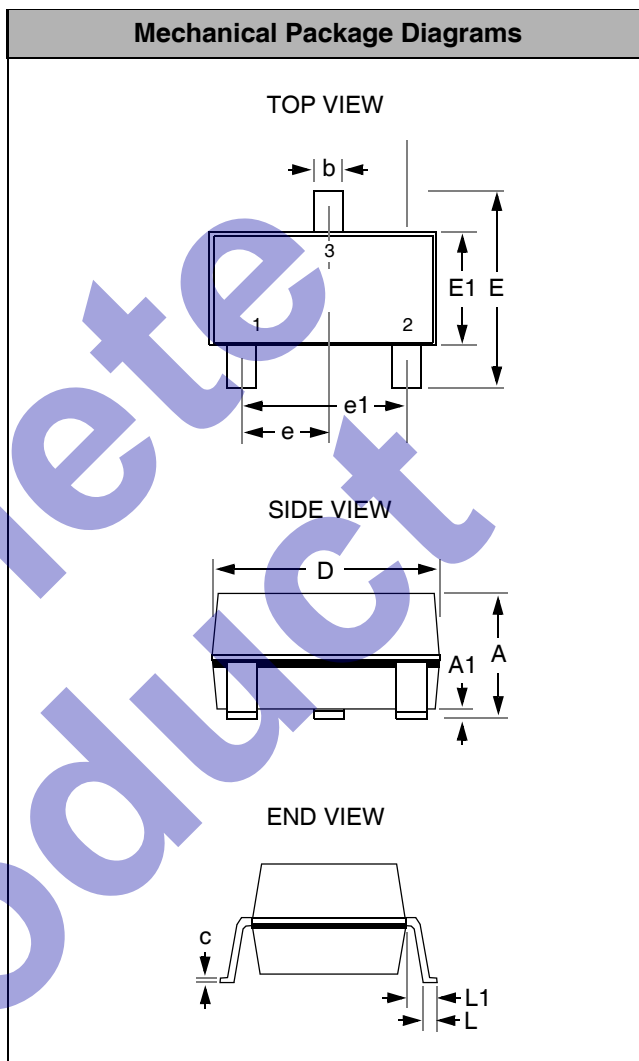
## Mechanical Details

### SOT23-3 Mechanical Specifications

The CM3403 is supplied in a 3-lead SOT23 package. Dimensions are presented below.

For complete information on the SOT23-3, see the California Micro Devices SOT23 Package Information document.

| PACKAGE DIMENSIONS                 |                  |      |            |        |
|------------------------------------|------------------|------|------------|--------|
| Package                            | SOT23-3          |      |            |        |
| JEDEC No.                          | TO-236 (Var. AB) |      |            |        |
| Pins/Leads                         | 3                |      |            |        |
| Dimensions                         | Millimeters      |      | Inches     |        |
|                                    | Min              | Max  | Min        | Max    |
| A                                  | 0.89             | 1.12 | 0.0350     | 0.0441 |
| A1                                 | 0.01             | 0.10 | 0.0004     | 0.0039 |
| b                                  | 0.30             | 0.50 | 0.0118     | 0.0197 |
| c                                  | 0.08             | 0.20 | 0.0031     | 0.0079 |
| D                                  | 2.80             | 3.04 | 0.1102     | 0.1197 |
| E                                  | 2.10             | 2.64 | 0.0827     | 0.1039 |
| E1                                 | 1.20             | 1.40 | 0.0472     | 0.0551 |
| e                                  | 0.95 BSC         |      | 0.0374 BSC |        |
| e1                                 | 1.90 BSC         |      | 0.0748 BSC |        |
| L                                  | 0.40             | 0.60 | 0.0157     | 0.0236 |
| L1                                 | 0.54 REF         |      | 0.0213 REF |        |
| # per tape and reel                | 3000 pieces      |      |            |        |
| Controlling dimension: millimeters |                  |      |            |        |



Package Dimensions for SOT23-3.