



# TS834

## MICROPOWER VOLTAGE SUPERVISOR RESET ACTIVE LOW OR HIGH INTEGRATED TIMER

- ULTRA LOW POWER CONSUMPTION :  
12µA max. @  $V_{CC} = 5V$
- BOTH ACTIVE HIGH AND ACTIVE LOW  
OUTPUTS
- RESET TIMER WITH DISABLE FUNCTION
- PRECISION RESET THRESHOLD (guaranteed over Temperature)
- 4.33V typ. THRESHOLD VOLTAGE
- GUARANTEED RESET OPERATION DOWN  
TO 1.5V
- OPEN DRAIN OUTPUT WITH
- $V_{OL} = 450mV$  typ. @  $I_{OL} = 8mA$  &  $V_{CC} = 4V$
- FAST RESPONSE TIME : 20µs FOR A 10mV  
OVERDRIVE
- 100mV INTERNAL HYSTERESIS

### DESCRIPTION

The TS834 is a voltage supervisor providing two different outputs (one active low and one active high) with an integrated timer that can be disabled.

It incorporates a high stability bandgap voltage reference and a comparator with open drain output.

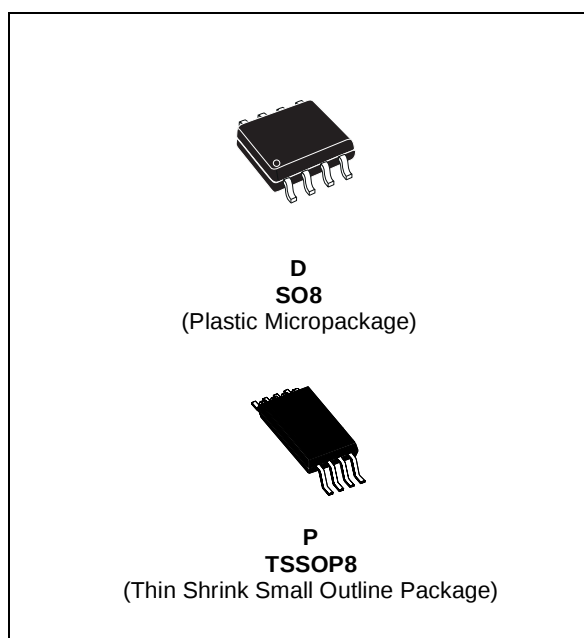
The threshold voltage is set at 4.33V by internal thermally matched resistors.

The comparator exhibits a 20µs response (with 10mV overdrive).

An internal hysteresis of 100mV increases the comparator noise margin and prevents false reset operation.

### APPLICATION

- Computers
- Microcontrollers
- Microprocessor systems
- Intelligent instruments
- Power failure detection

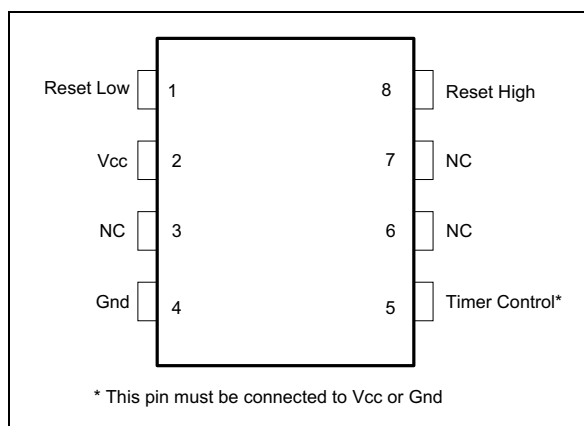


### ORDER CODE

| Part Number | Temperature Range | Package |   |
|-------------|-------------------|---------|---|
|             |                   | D       | P |
| TS834-5I    | -40, +85°C        | •       | • |

D = Small Outline Package (SO) - also available in Tape & Reel (DT)  
P = Thin Shrink Small Outline Package (TSSOP) - only available in Tape & Reel (PT)

### PIN CONNECTIONS (top view)



## ABSOLUTE MAXIMUM RATINGS

| Symbol     | Parameter                                        | Value                  | Unit |
|------------|--------------------------------------------------|------------------------|------|
| $V_{CC}$   | Supply Voltage <sup>1)</sup>                     | 7                      | V    |
| $V_{out}$  | Output Voltage - See note 1                      | -0.3 to $V_{CC} + 0.3$ | V    |
| $I_{out}$  | Output Current                                   | 20                     | mA   |
| $P_d$      | Power Dissipation <sup>2)</sup><br>SO8<br>TSSOP8 | 700<br>625             | mW   |
| $T_{oper}$ | Operating Free Air Temperature Range             | -40 to +85             | °C   |
| $T_{stg}$  | Storage Temperature                              | -65 to +150            | °C   |

1. All voltages values, except differential voltage are with respect to network ground terminal.

2.  $T_j = 150^\circ\text{C}$ ,  $T_{amb} = 25^\circ\text{C}$  with  $R_{thja} = 175^\circ\text{C/W}$  for SO8 package  
 $R_{thja} = 200^\circ\text{C/W}$  for TSSOP8 package

## OPERATING CONDITIONS

| Symbol     | Parameter                            | Value      | Unit |
|------------|--------------------------------------|------------|------|
| $V_{CC}$   | Supply Voltage                       | 1.5 to 5.5 | V    |
| $T_{oper}$ | Operating Free Air Temperature Range | -40 to +85 | °C   |

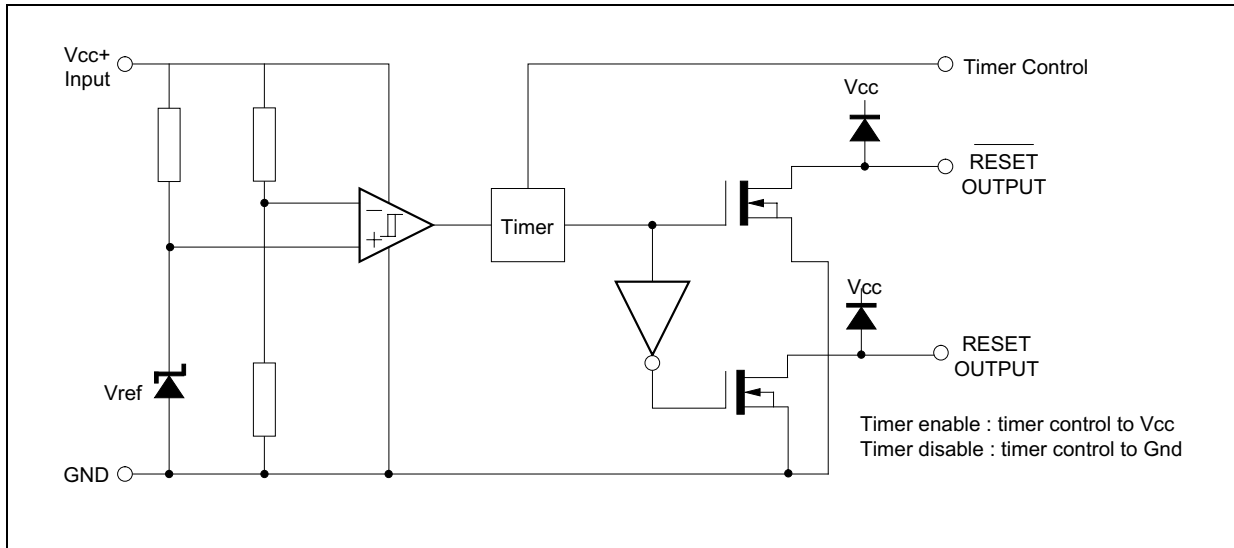
## TS834-5

ELECTRICAL CHARACTERISTICS  $T_{amb} = 25^\circ\text{C}$  (unless otherwise specified)

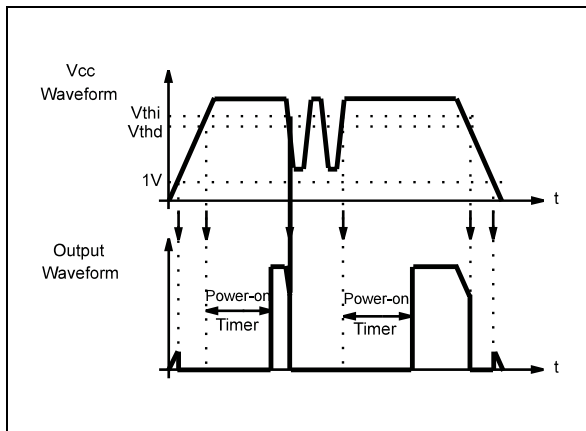
| Symbol    | Parameter                                                                                                                               | Min. | Typ. | Max.        | Unit          |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|------|------|-------------|---------------|
| $V_{thi}$ | Threshold Voltage - $V_{CC}$ Increasing<br>$T_{amb} = 25^\circ\text{C}$<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$      | 4.10 | 4.33 | 4.46        | V             |
| $V_{thd}$ | Threshold Voltage - $V_{CC}$ Decreasing<br>$T_{amb} = 25^\circ\text{C}$<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$      | 4.10 | 4.23 | 4.46        | V             |
| $V_{hys}$ | Hysteresis Voltage                                                                                                                      | 50   | 100  | 200         | mV            |
| $I_{CC}$  | Current Consumption $V_{CC} = 5V$                                                                                                       |      |      | 12          | $\mu\text{A}$ |
| $V_{OL1}$ | Low Level Output Voltage (OUTPUT 1)<br>$V_{CC} = 4V$ , $I_{OL} = 8\text{mA}$<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$ |      | 450  | 800<br>1000 | mV            |
| $V_{OL2}$ | Low Level Output Voltage (OUTPUT 2)<br>$V_{CC} = 5V$ , $I_{OL} = 8\text{mA}$<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$ |      | 450  | 800<br>1000 | mV            |
| $I_{OH1}$ | Low Level Output Voltage (OUTPUT 1)<br>$V_{CC} = 5V$<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$                         |      | 2    | 40<br>1000  | nA            |
| $I_{OH2}$ | Low Level Output Voltage (OUTPUT 2)<br>$V_{CC} = 4V$<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$                         |      | 2    | 40<br>1000  | nA            |
| $t_{phl}$ | Response Time High to Low<br>$R_L = 10\text{k}\Omega$ , $C_L = 15\text{pF}$ , $V_{CC} = V_{thd} - 10\text{mV}$                          |      | 20   |             | $\mu\text{s}$ |
| $t_{rst}$ | Reset Pulse width (Timer enabled)<br>$-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$                                            | 125  | 300  | 500         | ms            |

## TIMING DIAGRAMS

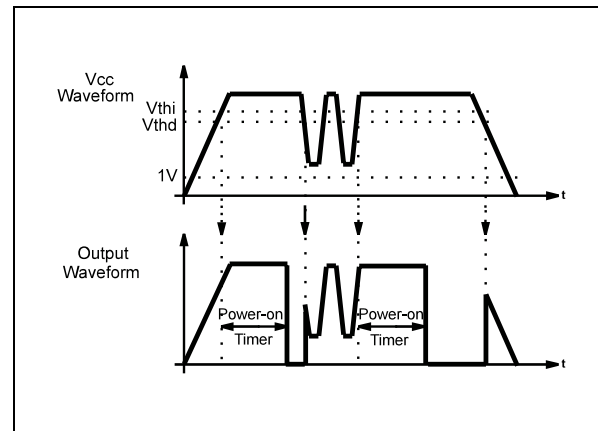
All the timing diagrams are given with outputs loaded by 10 k $\Omega$  resistors to  $V_{CC}$



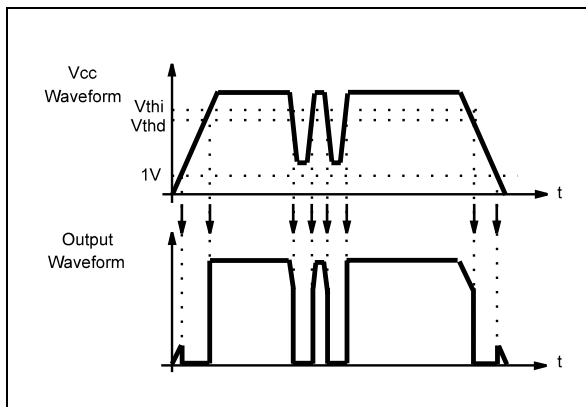
**Active Low Reset, Timer Enabled**



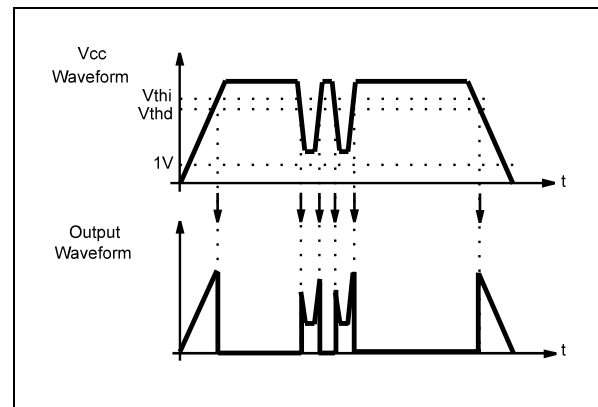
**Active High Reset, Timer Enabled**



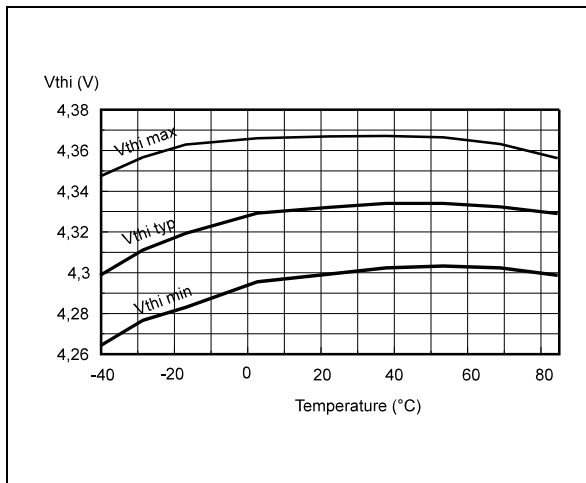
**Active Low Reset, Timer Disabled**



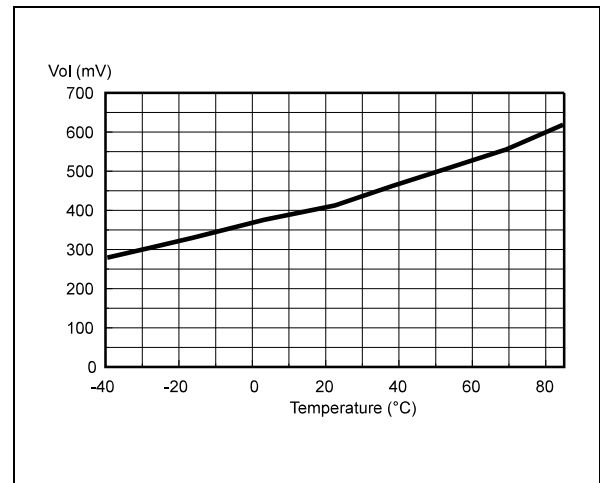
**Active High Reset, Timer Disabled**



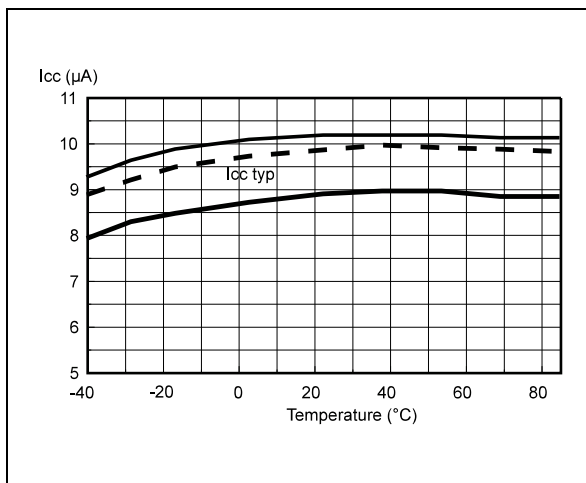
Voltage Threshold (Vthi) vs Temperature



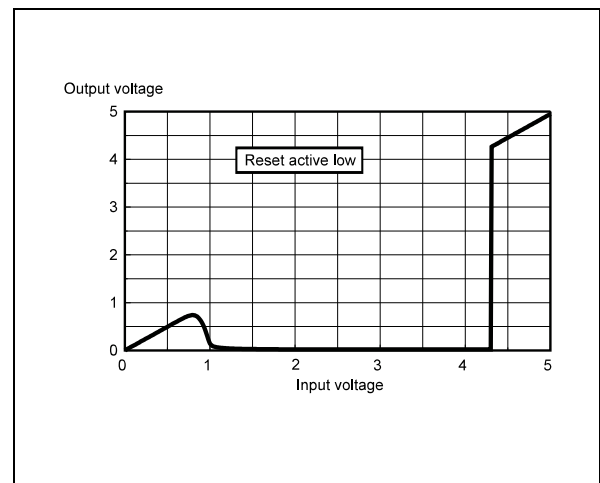
Vol vs Temperature



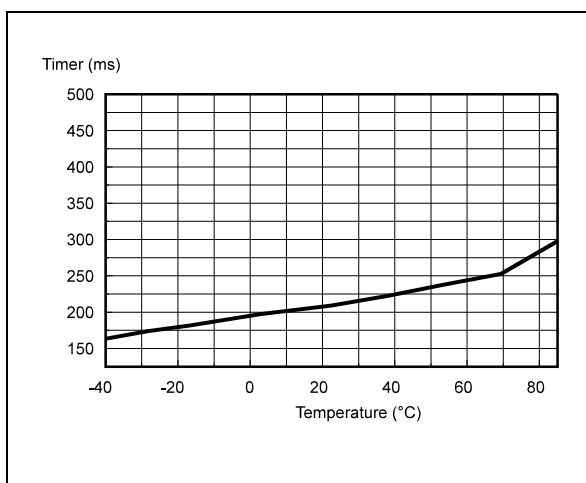
Current Consumption vs Temperature



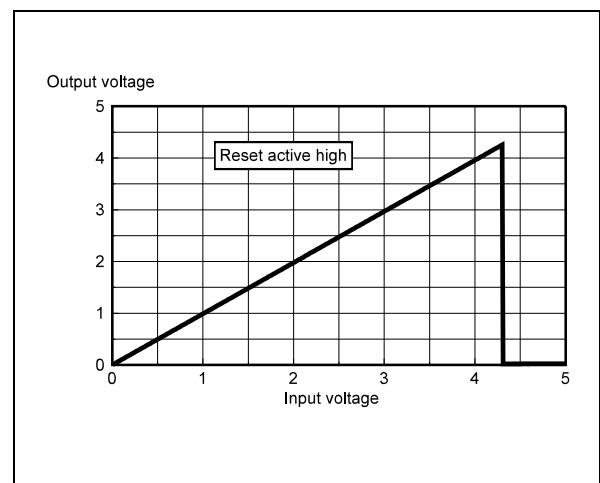
Output Voltage vs Input



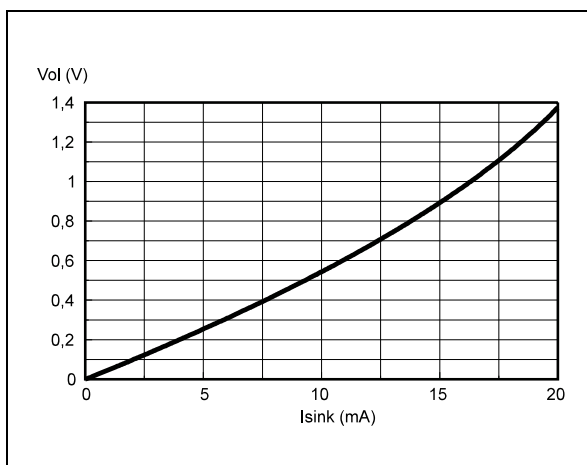
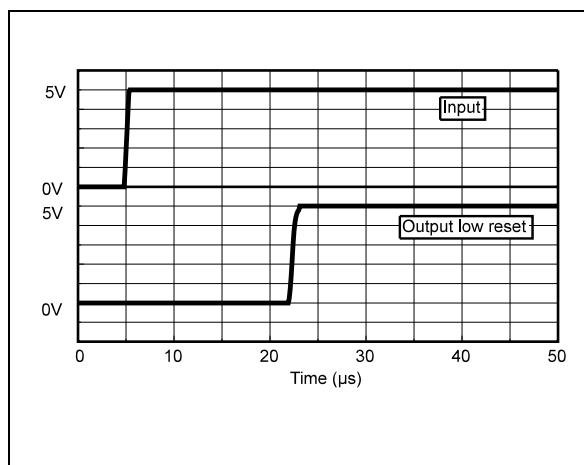
Timer Period (trst) vs Temperature



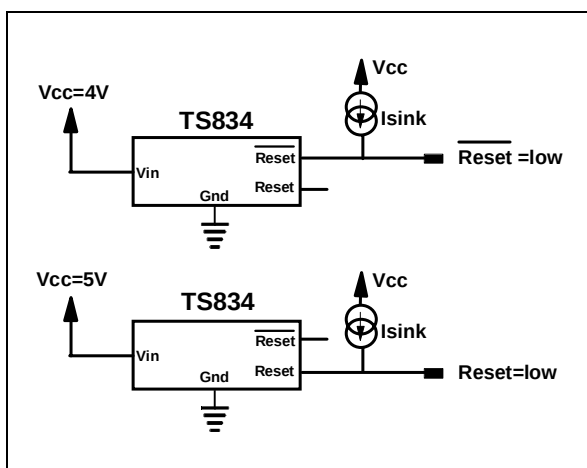
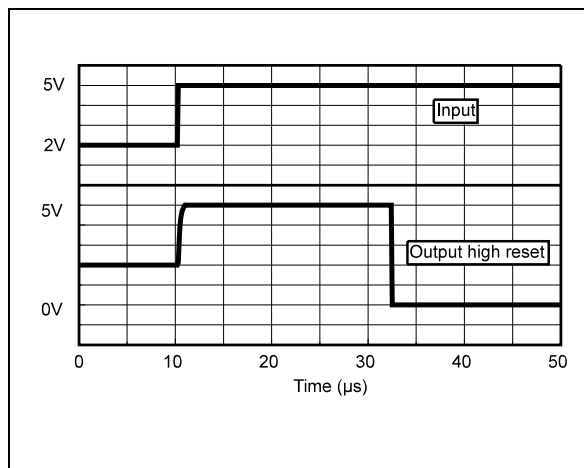
Output Voltage vs Input



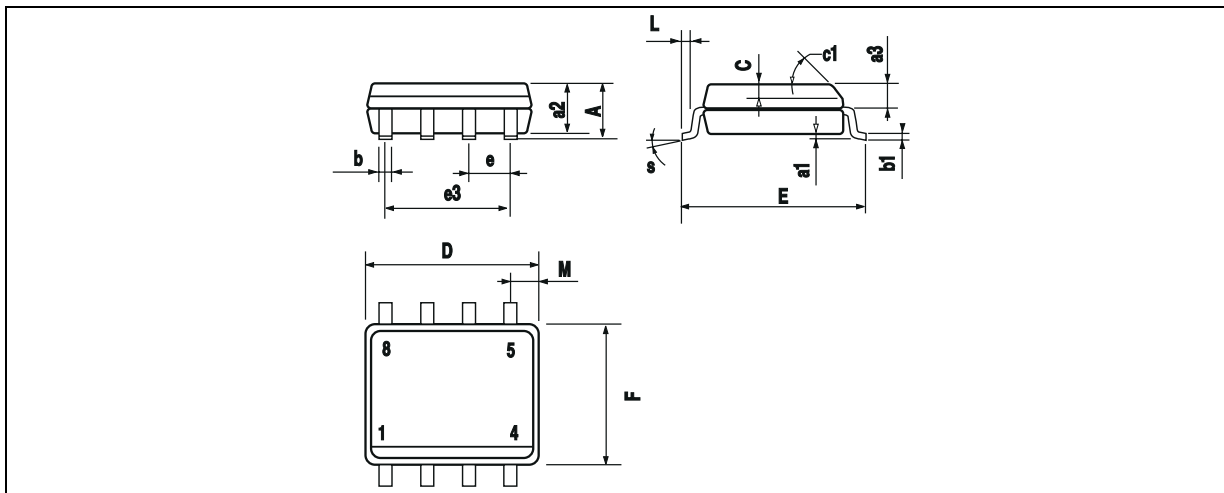
Vol vs Isink

Reset High After  $V_{CC}$  Transition (timer disabled)

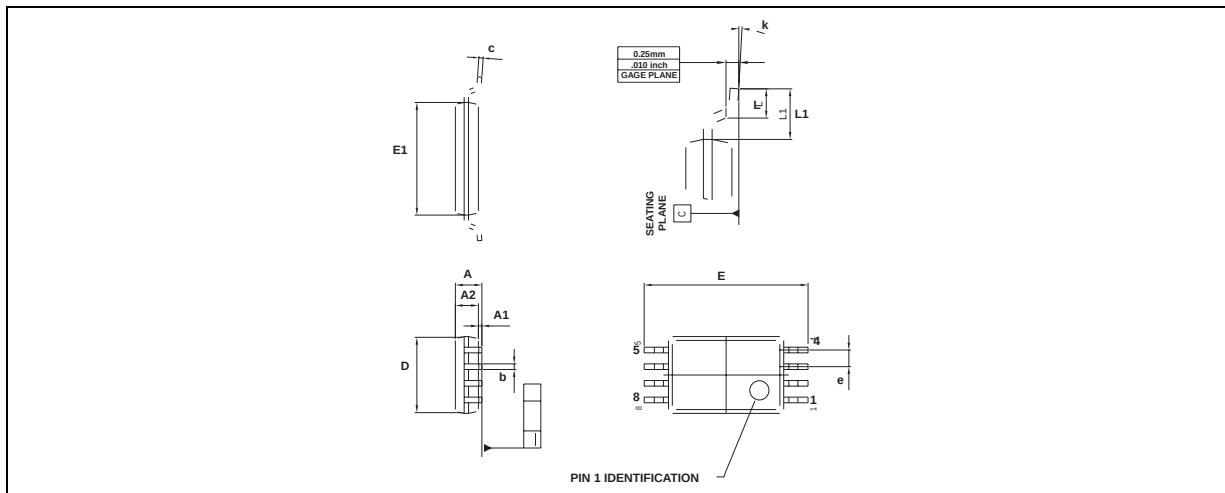
Schematic to Measure Vol vs Isink

Reset Low After  $V_{CC}$  Transition (timer disabled)

**PACKAGE MECHANICAL DATA**  
**8 PINS - PLASTIC MICROPACKAGE (SO)**



| Dim. | Millimeters |      |      | Inches |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    |             |      | 1.75 |        |       | 0.069 |
| a1   | 0.1         |      | 0.25 | 0.004  |       | 0.010 |
| a2   |             |      | 1.65 |        |       | 0.065 |
| a3   | 0.65        |      | 0.85 | 0.026  |       | 0.033 |
| b    | 0.35        |      | 0.48 | 0.014  |       | 0.019 |
| b1   | 0.19        |      | 0.25 | 0.007  |       | 0.010 |
| C    | 0.25        |      | 0.5  | 0.010  |       | 0.020 |
| c1   | 45° (typ.)  |      |      |        |       |       |
| D    | 4.8         |      | 5.0  | 0.189  |       | 0.197 |
| E    | 5.8         |      | 6.2  | 0.228  |       | 0.244 |
| e    |             | 1.27 |      |        | 0.050 |       |
| e3   |             | 3.81 |      |        | 0.150 |       |
| F    | 3.8         |      | 4.0  | 0.150  |       | 0.157 |
| L    | 0.4         |      | 1.27 | 0.016  |       | 0.050 |
| M    |             |      | 0.6  |        |       | 0.024 |
| S    | 8° (max.)   |      |      |        |       |       |

**PACKAGE MECHANICAL DATA****8 PINS - THIN SHRINK SMALL OUTLINE PACKAGE**

| Dim. | Millimeters |       |      | Inches |        |       |
|------|-------------|-------|------|--------|--------|-------|
|      | Min.        | Typ.  | Max. | Min.   | Typ.   | Max.  |
| A    |             |       | 1.20 |        |        | 0.05  |
| A1   | 0.05        |       | 0.15 | 0.01   |        | 0.006 |
| A2   | 0.80        | 1.00  | 1.05 | 0.031  | 0.039  | 0.041 |
| b    | 0.19        |       | 0.30 | 0.007  |        | 0.15  |
| c    | 0.09        |       | 0.20 | 0.003  |        | 0.012 |
| D    | 2.90        | 3.00  | 3.10 | 0.114  | 0.118  | 0.122 |
| E    |             | 6.40  |      |        | 0.252  |       |
| E1   | 4.30        | 4.40  | 4.50 | 0.169  | 0.173  | 0.177 |
| e    |             | 0.65  |      |        | 0.025  |       |
| k    | 0°          |       | 8°   | 0°     |        | 8°    |
| l    | 0.50        | 0.60  | 0.75 | 0.09   | 0.0236 | 0.030 |
| L    | 0.45        | 0.600 | 0.75 | 0.018  | 0.024  | 0.030 |
| L1   |             | 1.000 |      |        | 0.039  |       |

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