



MICROPOWER VOLTAGE SUPERVISOR RESET ACTIVE LOW OR HIGH INTEGRATED TIMER

- ULTRA LOW POWER CONSUMPTION :
12 μ A max. @ $V_{CC} = 5V$
- BOTH ACTIVE HIGH AND ACTIVE LOW
OUTPUTS
- RESET TIMER WITH DISABLE FUNCTION
- PRECISION RESET THRESHOLD (guaran-
teed 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 : 20 μ s 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.

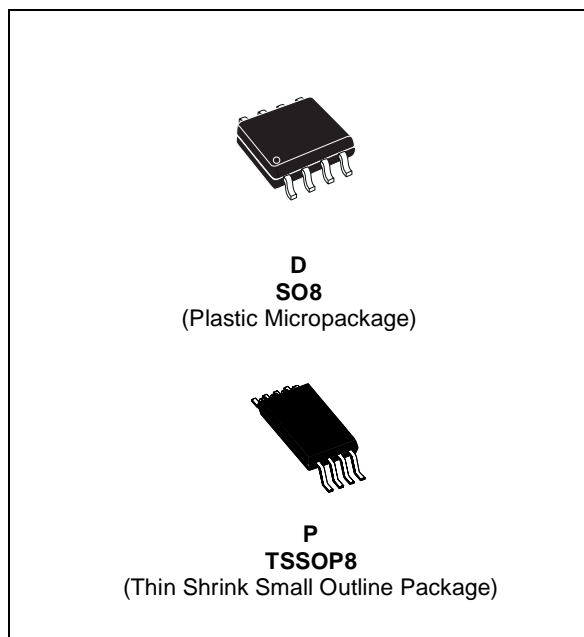
The threshold voltage is set at 4.33V by internal thermally matched resistors.

The comparator exhibits a 20 μ s 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

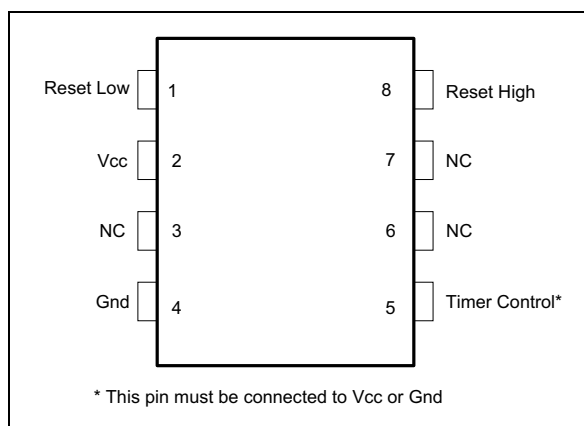


ORDER CODE

| 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 ¹⁾ | 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 ²⁾ | SO8 700 TSSOP8 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 |

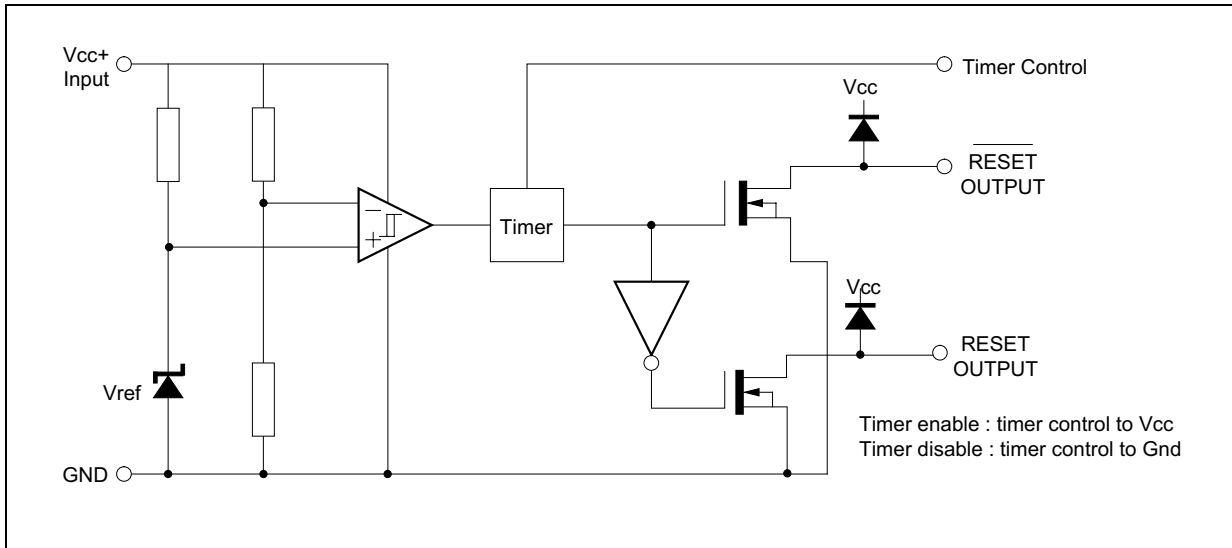
TS834-5

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

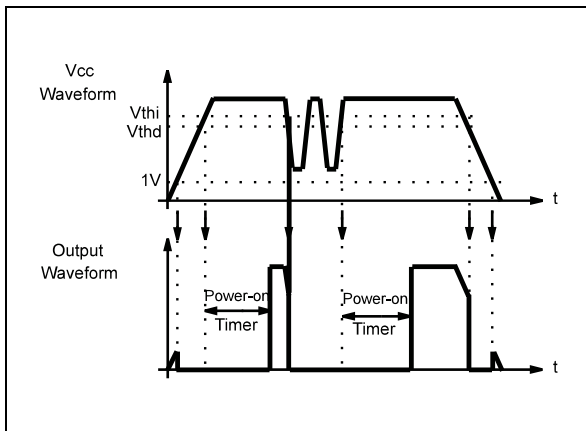
| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|-----------|--|------|------|-------------|---------------|
| V_{thi} | Threshold Voltage - V_{CC} Increasing $T_{amb} = 25^\circ\text{C}$ $-40^\circ\text{C} \leq T_{amb} \leq +85^\circ\text{C}$ | 4.10 | 4.33 | 4.46 | V |
| V_{thd} | Threshold Voltage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

TIMING DIAGRAMS

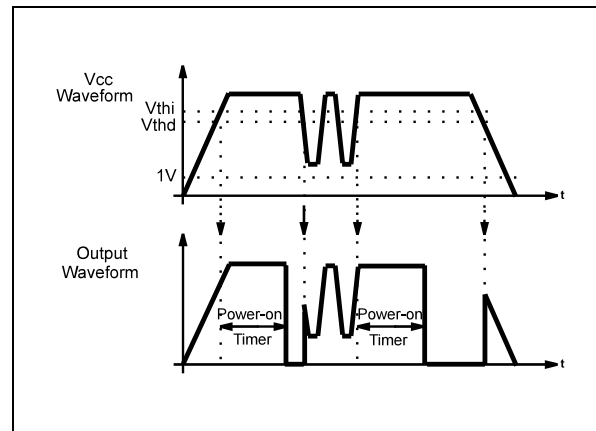
All the timing diagrams are given with outputs loaded by 10 kΩ resistors to V_{CC}



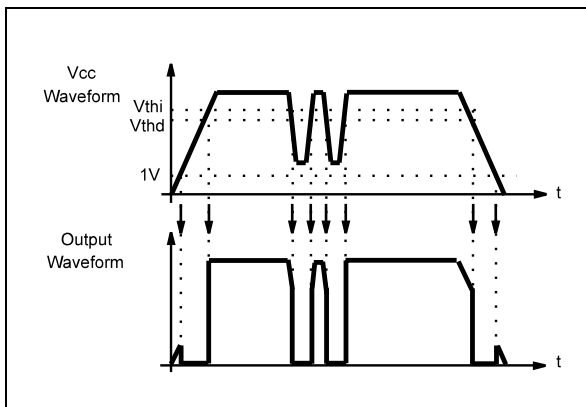
Active Low Reset, Timer Enabled



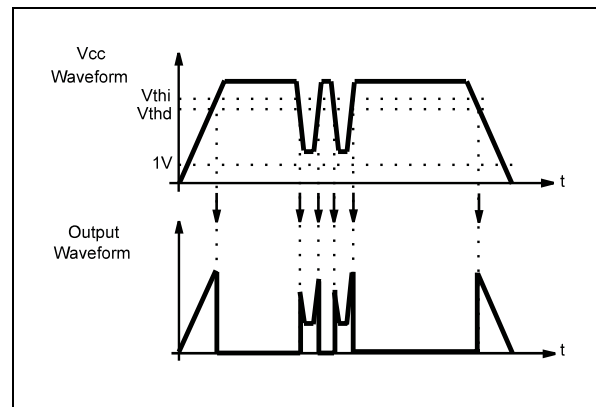
Active High Reset, Timer Enabled



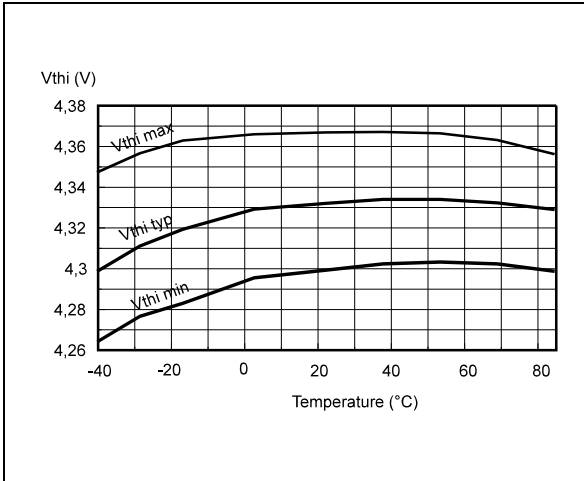
Active Low Reset, Timer Disabled



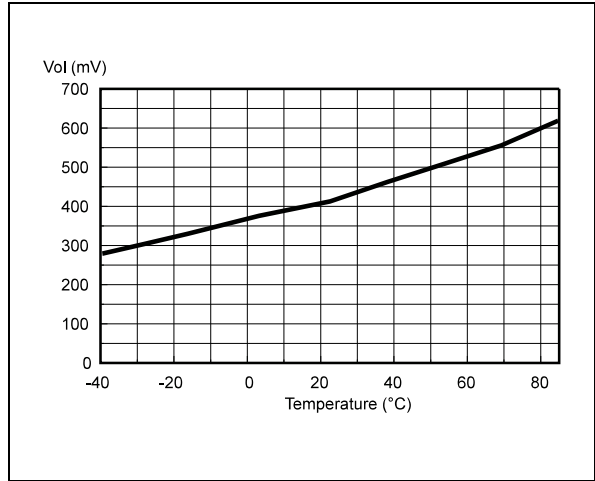
Active High Reset, Timer Disabled



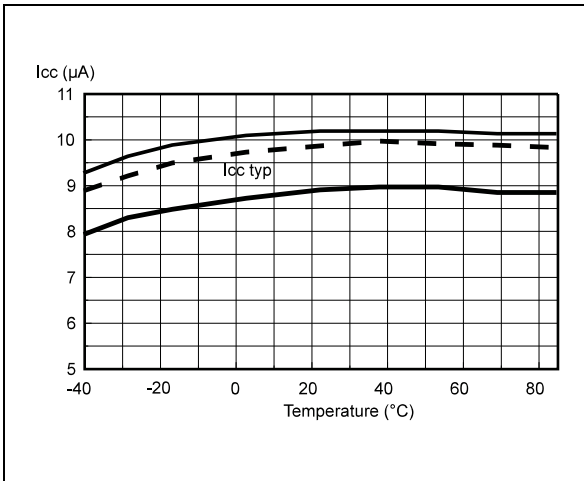
Voltage Threshold (Vthi) vs Temperature



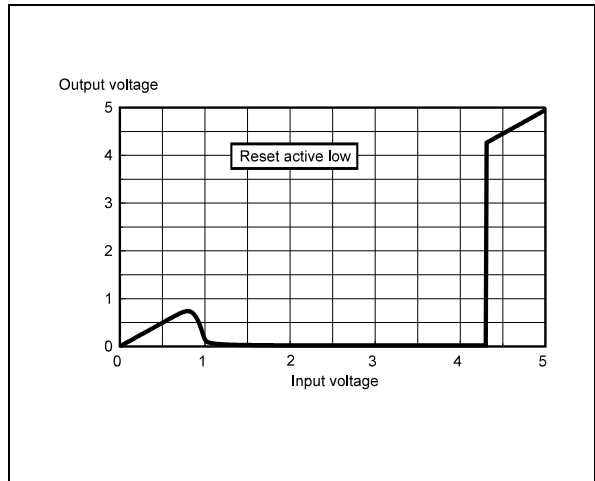
Vol vs Temperature



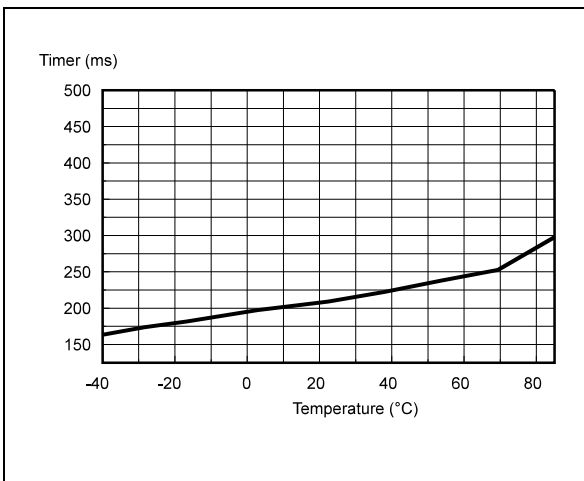
Current Consumption vs Temperature



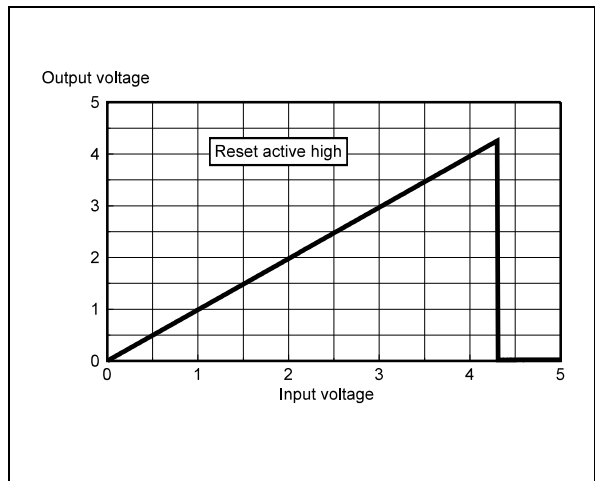
Output Voltage vs Input



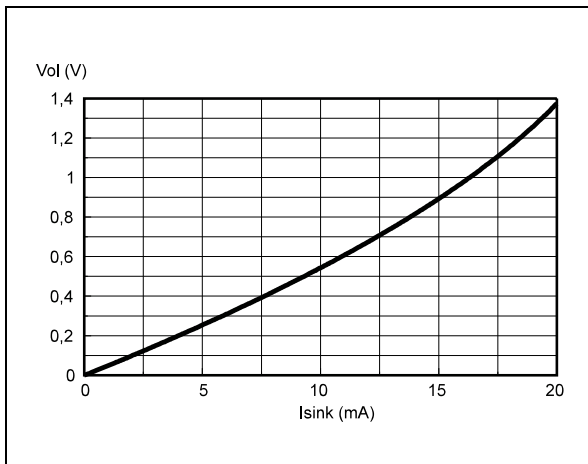
Timer Period (trst) vs Temperature



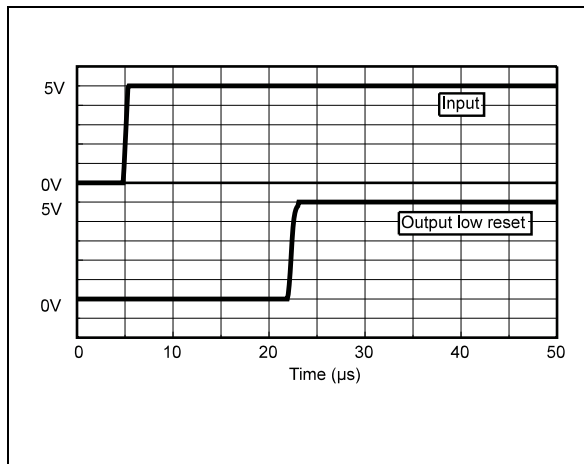
Output Voltage vs Input



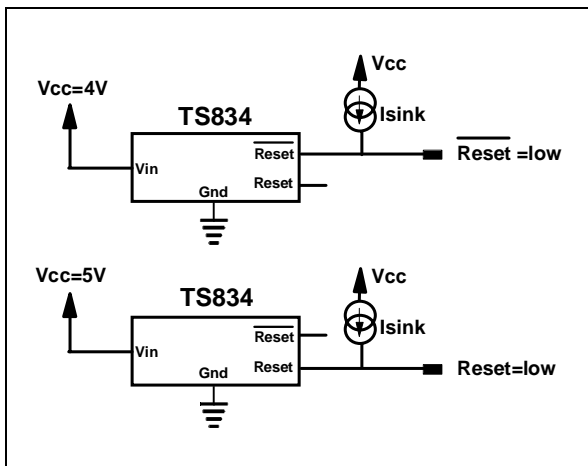
Vol vs Isink



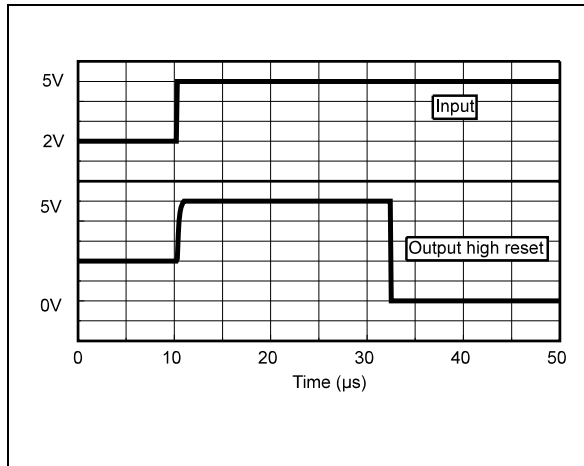
Reset High After V_{CC} Transition (timer disabled)



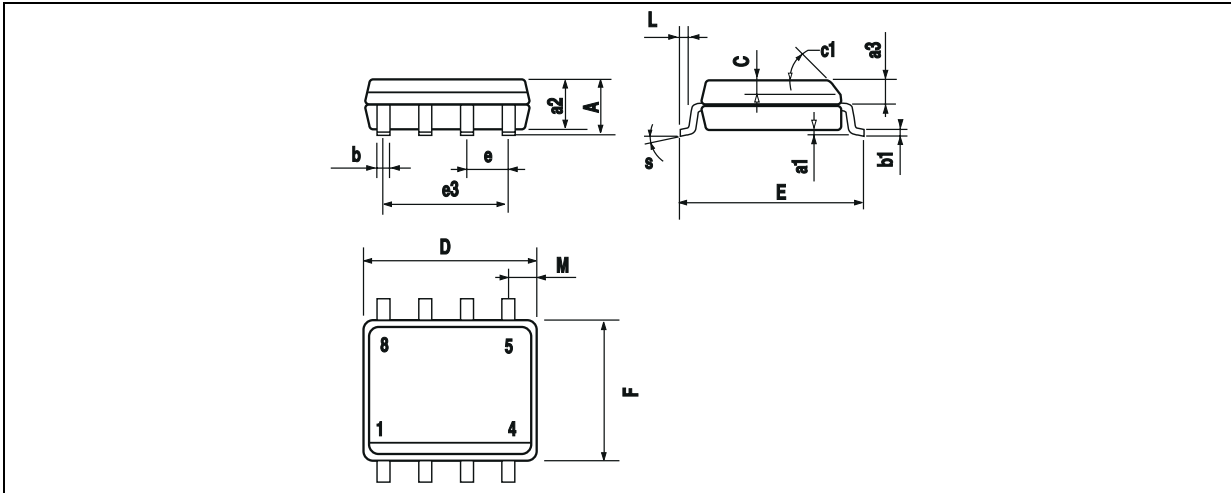
Schematic to Measure Vol vs Isink



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

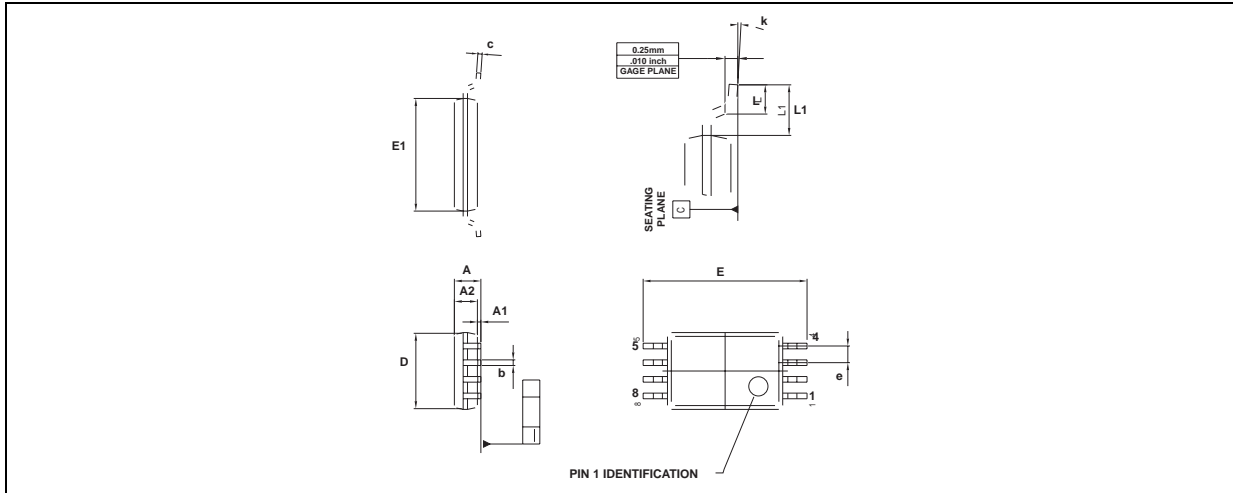


PACKAGE MECHANICAL DATA
8 PINS - PLASTIC MICROPACKAGE (SO)



| 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 | |

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

© The ST logo is a registered trademark of STMicroelectronics

© 2001 STMicroelectronics - Printed in Italy - All Rights Reserved
STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco
 Singapore - Spain - Sweden - Switzerland - United Kingdom

© <http://www.st.com>