

### Features

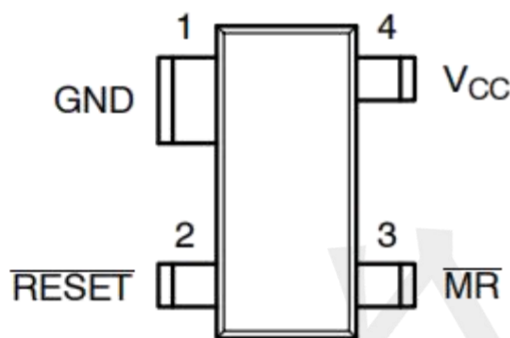
- High Accurate  $\pm 5\%$
- Precision VCC Monitoring of +2.5V, +3V, +3.3V and +5V Supplies
- Power Supply Transient Immunity
- Guaranteed Reset Valid to VCC=+1V
- Fully Specified Over Temperature
- 6 $\mu$ A Supply Current
- Output Configuration: push-pull output

### Applications

- Battery-operated systems and controllers
- Embedded Control Systems
- Critical  $\mu$ P and  $\mu$ C power monitoring
- Portable / Battery powered equipment
- Automotive

### Pin Definition

### SOT-143



### Ordering Information

TPCAT811MTBI-GT3

RESET VOLTAGE: L=4.63V  
M=4.38V  
T=3.08V  
S=2.93V  
R=2.63V  
Z=2.32V

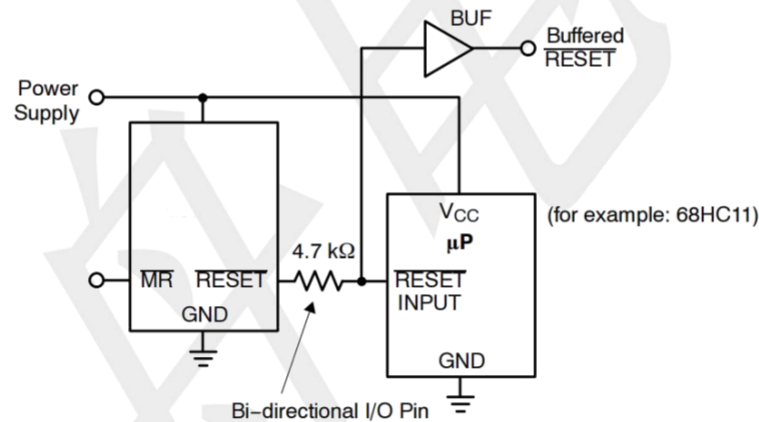
### PIN CONFIGURATION

| PIN | NAME  | FUNCTION                                                                                                                                                                                                                                             |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | GND   | Ground                                                                                                                                                                                                                                               |
| 2   | RESET | Active LOW reset. RESET is asserted if VCC falls below the reset threshold and remains low for at least 140 ms after VCC rises above the reset threshold.                                                                                            |
| 3   | MR    | Manual Reset Input. A logic LOW on MR asserts RESET. RESET remains active as long as MR is LOW and for 140 ms after MR returns HIGH. The active low input has an internal 20 k $\Omega$ pull-up resistor. The input should be left open if not used. |
| 4   | VCC   | Power supply voltage that is monitored.                                                                                                                                                                                                              |

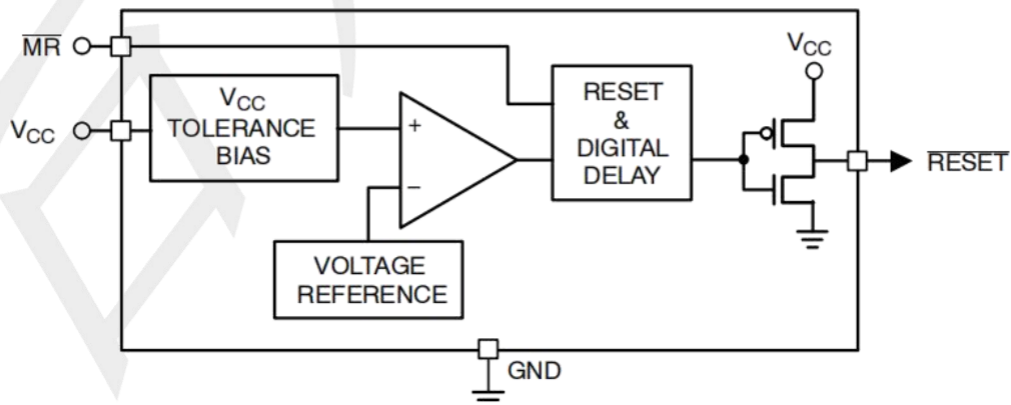
### Absolute Maximum Ratings

| Symbol           | Parameter                                                | Value        | UNIT       |
|------------------|----------------------------------------------------------|--------------|------------|
| VCC              | Any pin with respect to ground                           | -0.3 to +6.0 | V          |
| ICC              | Input Current, VCC                                       | 20           | mA         |
| IO               | Output Current, RESET                                    | 20           | mA         |
|                  | Rate of Rise, VCC                                        | 100          | V/ $\mu$ s |
| PD               | Continuous Power Dissipation<br>Derate 4mW/°C above 70°C | 320          | mW         |
| TA               | Operating Temperature Range                              | -40 to +85   | °C         |
| TSTG             | Storage Temperature Range                                | -65 to +105  | °C         |
| R <sub>θJC</sub> | Thermal Resistance from Junction to Case                 | 110          | °C/W       |
| R <sub>θJA</sub> | Thermal Resistance from Junction to Ambient              | 250          | °C/W       |

### TYPICAL APPLICATION CIRCUIT



### FUNCTIONAL BLOCK DIAGRAM



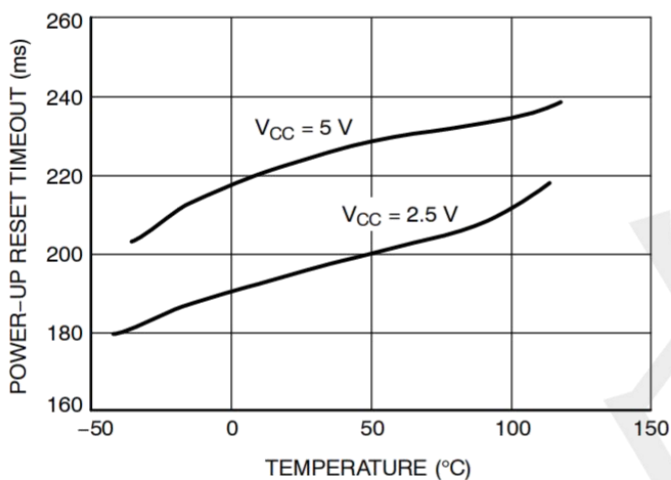
### Electrical Characteristics

(VCC=5V for L/M/J versions, VCC=3.3V for T/S versions, VCC=3V for R version, and VCC=2.5V for Z version, TA=-40°C to +85°C, unless otherwise noted. Typical values are at TA=+25°C.)

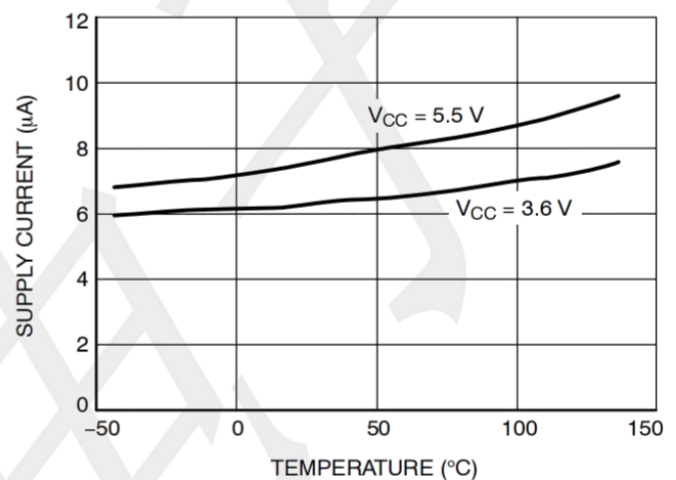
| Symbol | Parameter                                    | Conditions                            |                   | MIN                | Typ  | MAX                 | UNIT   |
|--------|----------------------------------------------|---------------------------------------|-------------------|--------------------|------|---------------------|--------|
| VCC    | Supply Voltage Range                         | TA=0°C to +70°C                       |                   | 1.0                | --   | 5.5                 | V      |
|        |                                              | TA=-40°C to +85°C                     |                   | 1.2                | --   | 5.5                 |        |
| ICC    | Supply Current                               |                                       |                   | --                 | 6.0  | --                  | uA     |
| VTH    | Reset Threshold                              | L Version                             | TA=+25°C          | 4.56               | 4.63 | 4.70                | V      |
|        |                                              |                                       | TA=-40°C to +85°C | 4.50               | --   | 4.75                |        |
|        |                                              | M Version                             | TA=+25°C          | 4.31               | 4.38 | 4.45                |        |
|        |                                              |                                       | TA=-40°C to +85°C | 4.25               | --   | 4.50                |        |
|        |                                              | J Version                             | TA=+25°C          | 3.93               | 4.00 | 4.06                |        |
|        |                                              |                                       | TA=-40°C to +85°C | 3.89               | --   | 4.10                |        |
|        |                                              | T Version                             | TA=+25°C          | 3.04               | 3.08 | 3.11                |        |
|        |                                              |                                       | TA=-40°C to +85°C | 3.00               | --   | 3.15                |        |
|        |                                              | S Version                             | TA=+25°C          | 2.89               | 2.93 | 3.96                |        |
|        |                                              |                                       | TA=-40°C to +85°C | 2.85               | --   | 3.00                |        |
|        |                                              | R Version                             | TA=+25°C          | 2.59               | 2.63 | 2.66                |        |
|        |                                              |                                       | TA=-40°C to +85°C | 2.55               | --   | 2.70                |        |
|        |                                              | Z Version                             | TA=+25°C          | 2.28               | 2.32 | 2.35                |        |
|        |                                              |                                       | TA=-40°C to +85°C | 2.25               | --   | 2.38                |        |
|        | Reset Threshold Tempco                       |                                       |                   | --                 | 150  | --                  | ppm/°C |
|        | VCC to Reset Delay                           | VCC=VTH to (VTH-100mV)                |                   | --                 | 20   | --                  | μS     |
| TRP    | Reset Active Timeout Period                  | TA=-40°C to +85°C                     |                   | 140                | 240  | 450                 | mS     |
| VOL    | RESET Output Voltage Low (Push-pull, active) | VCC=VTH min, ISINK=1.2mA, T_/S_/R_/Z_ |                   | --                 | --   | 0.3                 | V      |
|        |                                              | VCC=VTH min, ISINK=3.2mA, T_/S_/R_/Z_ |                   | --                 | --   | 0.4                 |        |
|        |                                              | VCC>1.0V, ISINK=50μA                  |                   | --                 | --   | 0.3                 |        |
| tMR    | MR Minimum Pulse Width                       |                                       |                   | --                 | 10   | 1                   | μS     |
| VIH    | MR Input Threshold                           | VCC > VTH (MAX), L/M/J                |                   | 2.3                | --   | --                  | V      |
| VIL    |                                              |                                       |                   | --                 | --   | 0.8                 |        |
| VIH    |                                              | VCC > VTH (MAX), T/S/R/Z              |                   | 0.7V <sub>cc</sub> | --   | --                  |        |
| VIL    |                                              |                                       |                   | --                 | --   | 0.25V <sub>cc</sub> |        |
|        | MR Pull-up Resistance                        |                                       |                   | 10                 | 20   | 75                  | KΩ     |

### Typical Operating Characteristics

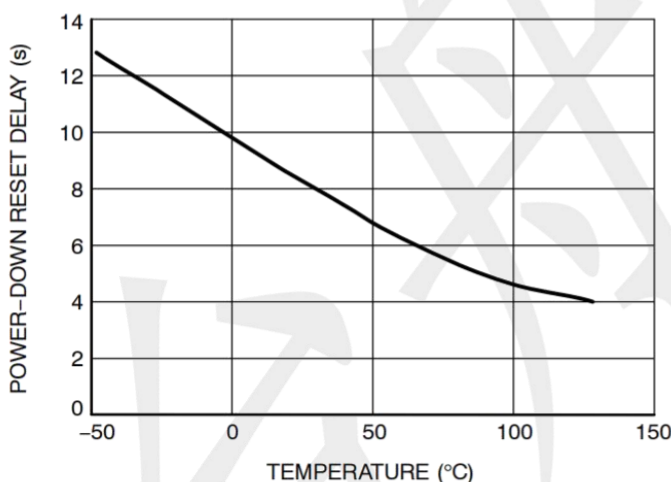
(VCC = Full range, TA = -40°C to +85°C unless otherwise noted. Typical values at TA = +25°C and VCC = 5 V for the L/M/J versions, VCC = 3.3 V for the T/S versions, VCC = 3 V for the R version and VCC = 2.5 V for the Z version.)



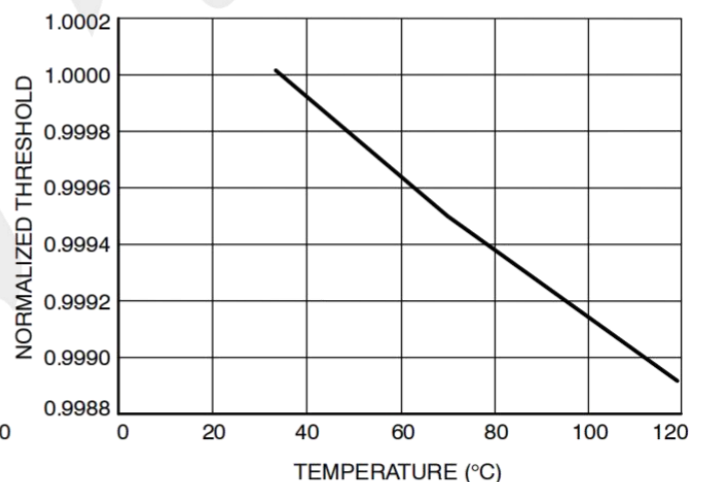
Power-Up Reset Timeout vs. Temperature



Supply Current vs. Temperature  
(No Load, R/S/T/Z)

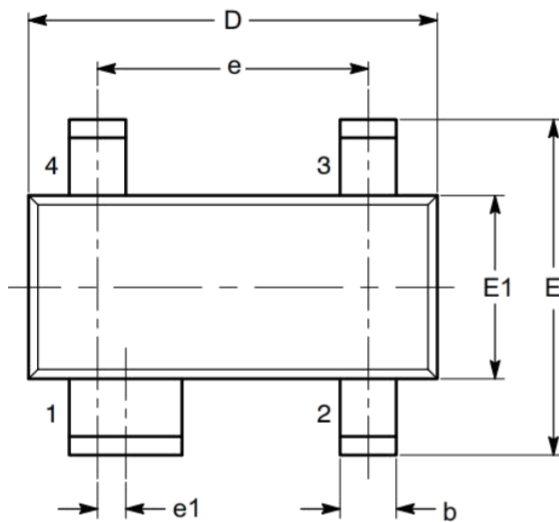


Power-Down Reset Delay vs. Temperature  
S/T/Z



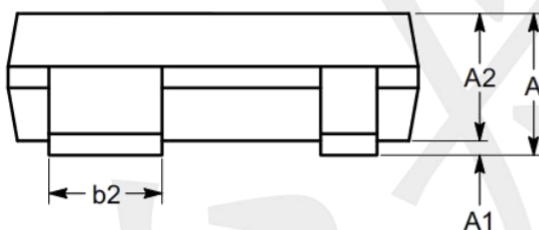
Normalized Reset Threshold vs. Temperature

### Package information SOT-143, 4 Lead

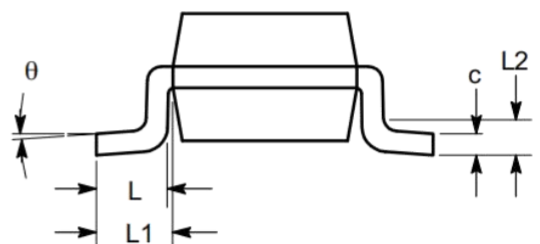


TOP VIEW

| SYMBOL   | MIN      | NOM  | MAX  |
|----------|----------|------|------|
| A        | 0.80     |      | 1.22 |
| A1       | 0.05     |      | 0.15 |
| A2       | 0.75     | 0.90 | 1.07 |
| b        | 0.30     |      | 0.50 |
| b2       | 0.76     |      | 0.89 |
| c        | 0.08     |      | 0.20 |
| D        | 2.80     | 2.90 | 3.04 |
| E        | 2.10     |      | 2.64 |
| E1       | 1.20     | 1.30 | 1.40 |
| e        | 1.92 BSC |      |      |
| e1       | 0.20 BSC |      |      |
| L        | 0.40     | 0.50 | 0.60 |
| L1       | 0.54 REF |      |      |
| L2       |          | 0.25 |      |
| $\theta$ | 0°       |      | 8°   |



SIDE VIEW



END VIEW

#### Notes:

- (1) All dimensions are in millimeters. Angles in degrees.
- (2) Complies with JEDEC TO-253.