

## SMD 0603, Glass Protected NTC Thermistors



### FEATURES

- TCR ranging from -7 %/K at -40 °C to -2 %/K at 150 °C
- Tolerance on  $R_{25}$  down to 1 %, and on  $B_{25/85}$  down to 1 %
- Suitable for wave or reflow soldering
- NiSn terminations
- Fully glass coated and protected
- cUL recognized for safety applications (file E148885)
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### DESIGN SUPPORT TOOLS AVAILABLE



| QUICK REFERENCE DATA                      |                                       |          |
|---|---------------------------------------|----------|
| PARAMETER                                 | VALUE                                 | UNIT     |
| Resistance value at 25 °C                 | 2.0K to 100K                          | $\Omega$ |
| Tolerance on $R_{25}$ -value              | $\pm 1$ ; $\pm 2$ ; $\pm 3$ ; $\pm 5$ | %        |
| $B_{25/85}$ -value                        | 3420 to 4100                          | K        |
| Tolerance on $B_{25/85}$ -value           | $\pm 1$                               | %        |
| Maximum dissipation at 25 °C              | 125                                   | mW       |
| Thermal time constant $\tau$              | $\approx 8$                           | s        |
| Dissipation factor D                      | 3.0                                   | mW/K     |
| Operating temperature range at zero power | -40 to +150                           | °C       |
| Weight                                    | $\approx 0.006$                       | g        |

### APPLICATIONS

- Temperature sensing, protection and compensation in automotive, industrial, telecom and consumer applications. Examples are:
  - Battery chargers
  - Power suppliers
  - Office equipment
  - LCD compensation
  - In-car entertainment

### DESCRIPTION

Size 0603 (M1608) glass protected SMD chip thermistor with negative temperature coefficient (TCR) and tin (Sn) plated terminations. The device has no marking.

### PACKAGING

Available in 8 mm punched paper tape on reel package of 4000 units.

### DESIGN-IN SUPPORT

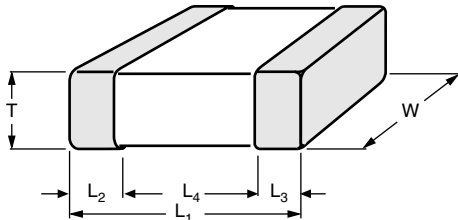
For complete curve computation, please visit: [www.vishay.com/thermistors/ntc-curve-list/](http://www.vishay.com/thermistors/ntc-curve-list/)

| ELECTRICAL DATA AND ORDERING INFORMATION |                              |                    |                                 |                  |                                      |
|--|------------------------------|--------------------|---------------------------------|------------------|--------------------------------------|
| $R_{25}$<br>( $\Omega$ )                 | $R_{25}$ -TOL.<br>( $\pm$ %) | $B_{25/85}$<br>(K) | $B_{25/85}$ -TOL.<br>( $\pm$ %) | UL<br>RECOGNIZED | SAP MATERIAL AND ORDERING NUMBER (1) |
| 2000                                     | 3, 5                         | 3420               | 1                               | Y                | NTCS0603E3202*LT                     |
| 2200                                     | 1, 2, 3, 5                   | 3520               | 1                               | Y                | NTCS0603E3222*MT                     |
| 2700                                     | 1, 2, 3, 5                   | 3600               | 1                               | Y                | NTCS0603E3272*MT                     |
| 4700                                     | 1, 2, 3, 5                   | 3830               | 1                               | Y                | NTCS0603E3472*HT                     |
| 10 000                                   | 1, 2, 3, 5                   | 3435               | 1                               | Y                | NTCS0603E3103*LT                     |
| 10 000                                   | 1, 2, 3, 5                   | 3610               | 1                               | Y                | NTCS0603E3103*MT                     |
| 10 000                                   | 1, 2, 3, 5                   | 3960               | 1                               | Y                | NTCS0603E3103*HT                     |
| 15 000                                   | 1, 2, 3, 5                   | 3600               | 1                               | N                | NTCS0603E3153*MT                     |
| 22 000                                   | 1, 2, 3, 5                   | 3730               | 1                               | Y                | NTCS0603E3223*MT                     |
| 33 000                                   | 1, 2, 3, 5                   | 3860               | 1                               | Y                | NTCS0603E3333*HT                     |
| 47 000                                   | 1, 2, 3, 5                   | 3960               | 1                               | Y                | NTCS0603E3473*HT                     |
| 68 000                                   | 1, 2, 3, 5                   | 3985               | 1                               | Y                | NTCS0603E3683*HT                     |
| 100 000                                  | 1, 2, 3, 5                   | 4100               | 1                               | Y                | NTCS0603E3104*XT                     |

### Note

(1) Replace \* in SAP material number by J for  $\pm 5$  %, H for  $\pm 3$  %, G for  $\pm 2$  %, F for  $\pm 1$  % tolerance on  $R_{25}$

**DIMENSIONS** in millimeters

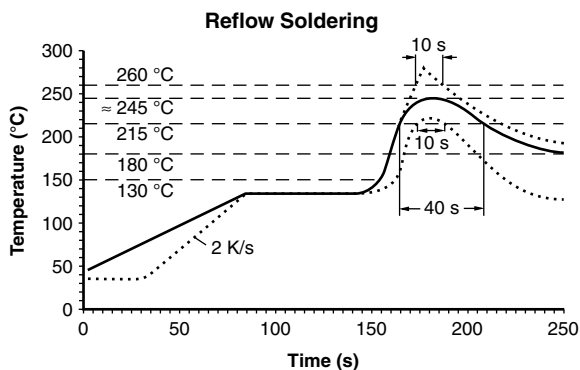


| L <sub>1</sub> | W          | T          | L <sub>2</sub> AND L <sub>3</sub> MIN. | L <sub>4</sub> MIN. |
|----------------|------------|------------|--|---------------------|
| 1.6 ± 0.15     | 0.8 ± 0.15 | 0.8 ± 0.15 | 0.2                                    | 0.4                 |

**SOLDERING CONDITIONS**

This SMD thermistor is only suitable for wave or reflow soldering, in accordance with JEDEC® J-STD-020. The maximum temperature of 260 °C during 40 s should not be exceeded.

Typical examples of a soldering processes that will provide reliable joints without damage, are shown below.



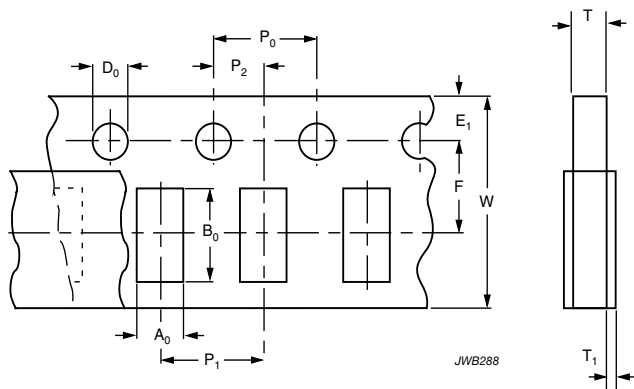
Recommended solder land pattern dimensions (mm)



**PACKAGING TAPE SPECIFICATIONS**

All tape specifications are in accordance with IEC 60286-3. Basic dimensions are given below. Carrier tape material is paper.

**PAPER TAPE**



| DIMENSIONS OF PAPER TAPE in millimeters  |             |
|--|-------------|
| PARAMETER                                | DIMENSION   |
| A <sub>0</sub> <sup>(1)</sup>            | 1.15 ± 0.1  |
| B <sub>0</sub> <sup>(1)</sup>            | 1.9 ± 0.1   |
| W  | 8.0 ± 0.2   |
| E <sub>1</sub>                           | 1.75 ± 0.1  |
| F  | 3.5 ± 0.05  |
| D <sub>0</sub>                           | 1.55 ± 0.05 |
| P <sub>0</sub> <sup>(2)</sup>            | 4.0 ± 0.1   |
| P <sub>1</sub>                           | 4.0 ± 0.1   |
| P <sub>2</sub>                           | 2.0 ± 0.05  |
| T tape thickness max.                    | 1.1         |
| T <sub>1</sub> cover tape thickness max. | 0.1         |

**Notes**

- (1) Measured 0.3 mm above base pocket
- (2) P<sub>0</sub> pitch cumulative error over any 10 pitches ± 0.2 mm



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