

## SMD MELF SOD80, Glass Encapsulated NTC Thermistors



### FEATURES

- Small diameter down to 1.7 mm
- Quick response time down to 0.9 s
- Resistant to corrosive atmospheres and harsh environments
- Wide temperature range from - 40 °C to + 150 °C
- Available on tape
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

| QUICK REFERENCE DATA                   |                |          |
|--|----------------|----------|
| PARAMETER                              | VALUE          | UNIT     |
| Resistance value at 25 °C ( $R_{25}$ ) | 10K to 100K    | $\Omega$ |
| Tolerance on $R_{25}$ -value           | $\pm 5$        | %        |
| $B_{25/85}$ -value                     | 3977           | K        |
| Tolerance on $B_{25/85}$ -value        | $\pm 1.3$      | %        |
| Operating temperature range            | - 40 to + 150  | °C       |
| Maximum power dissipation at 55 °C     | 100            | mW       |
| Dissipation factor                     | 2.5            | mW/K     |
| Response time                          | 0.9            | s        |
| Thermal time constant $\tau$           | 6              | s        |
| Climatic category (LCT/UCT/days)       | 40/155/56      |          |
| Weight                                 | $\approx 0.03$ | g        |

### APPLICATIONS

Temperature measurement, sensing and control:

- Domestic appliances
- Automotive systems
- Industrial process control

### DESIGN-IN SUPPORT

For complete Curve Computation, visit:

[www.vishay.com/resistors-non-linear/curve-computation-list/](http://www.vishay.com/resistors-non-linear/curve-computation-list/)

### DESCRIPTION

These thermistors have a negative temperature coefficient and are mounted in a glass envelope with two tinned electrodes. Only available in tape and reel packaging.

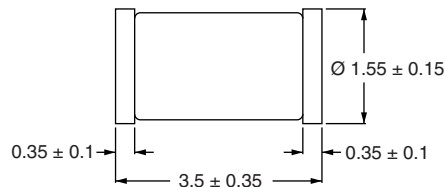
### MOUNTING

By soldering.

| ELECTRICAL DATA AND ORDERING INFORMATION |                    |   |                                |
|--|--------------------|---|--------------------------------|
| $R_{25}$<br>(k $\Omega$ )                | $B_{25/85}$ -VALUE | SAP MATERIAL AND ORDERING NUMBER<br>NTCSMELFE3... | OLD 12NC CODE<br>2381 633 53.. |
| 10                                       | 3977K              | 103JT   | 103                            |
| 20                                       | 3977K              | 203JT   | 203                            |
| 30                                       | 3977K              | 303JT   | 303                            |
| 100                                      | 3977K              | 104JT   | 104                            |

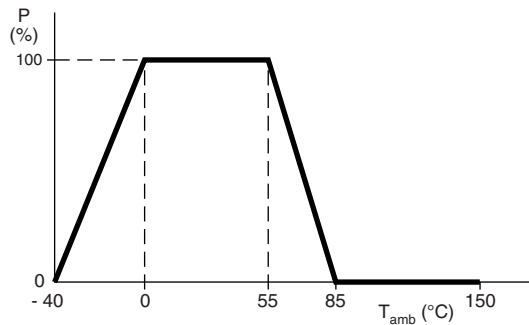
## DIMENSIONS in millimeters

Component outline for NTCSMELFE3 (SOD80)



## DERATING

Power derating curve



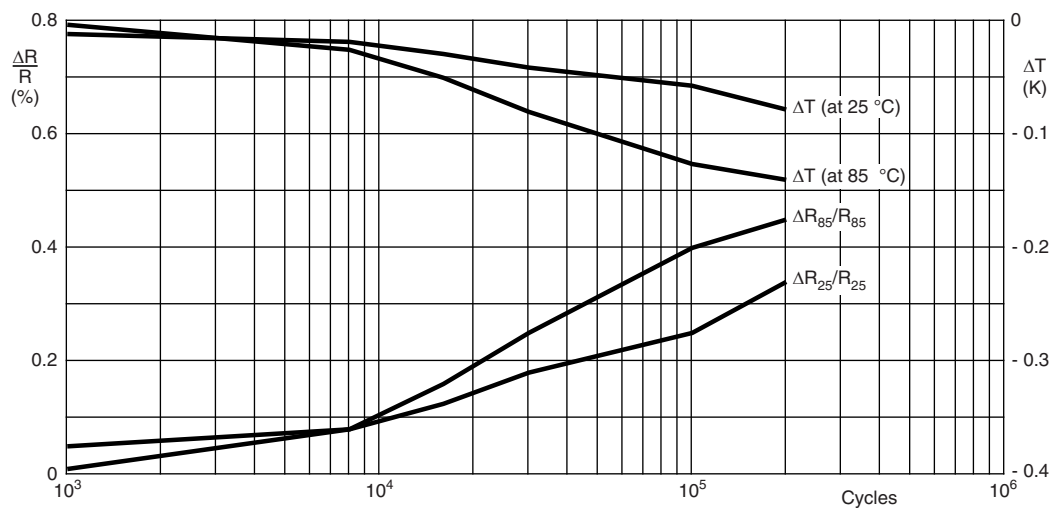
### Note

- Zero power is considered as measuring power max. 1 % of max. power

## STABILITY CHARACTERISTICS

Stability of glass encapsulated NTCs in thermal shock test (200 000 cycles - 40 °C/+ 200 °C).

Tested on non-soldered parts.



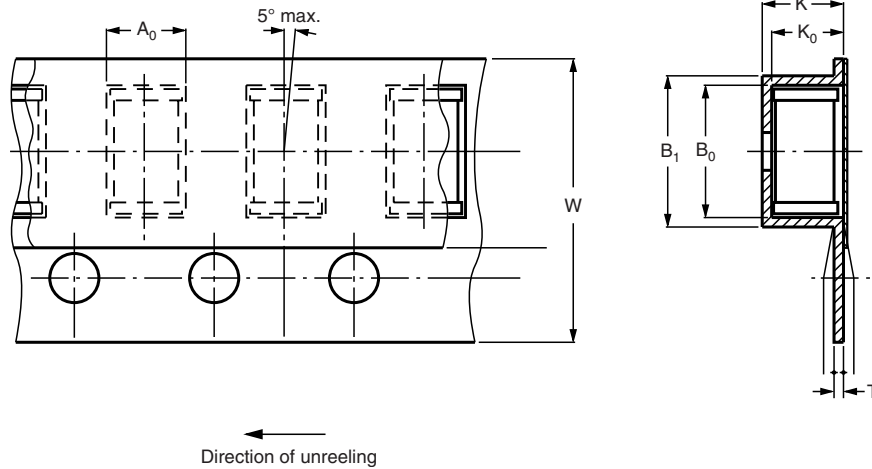


For complete Curve Computation, visit: [www.vishay.com/resistors-non-linear/curve-computation-list/](http://www.vishay.com/resistors-non-linear/curve-computation-list/)

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES FOR NTCSMELFE3 |              |             |             |             |              |                    |                |                  |
|---|--------------|-------------|-------------|-------------|--------------|--------------------|----------------|------------------|
| TEMPERATURE (°C)  | $R_T/R_{25}$ | R for 10 kΩ | R for 20 kΩ | R for 30 kΩ | R for 100 kΩ | $\Delta R/R$ (± %) | $\alpha$ (%/K) | $\Delta T$ (± K) |
| - 40  | 33.21        | 332 094     | 664 187     | 996 281     | 3 320 936    | 10.08              | - 6.62         | 1.52             |
| - 35  | 23.99        | 239 900     | 479 799     | 719 699     | 2 398 996    | 9.59               | - 6.39         | 1.50             |
| - 30  | 17.52        | 175 200     | 350 399     | 525 599     | 1 751 996    | 9.12               | - 6.18         | 1.48             |
| - 25  | 12.93        | 129 287     | 258 574     | 387 861     | 1 292 869    | 8.67               | - 5.98         | 1.45             |
| - 20  | 9.636        | 96 358      | 192 716     | 289 074     | 963 582      | 8.24               | - 5.78         | 1.42             |
| - 15  | 7.250        | 72 500      | 145 001     | 217 501     | 725 004      | 7.82               | - 5.60         | 1.40             |
| - 10  | 5.505        | 55 046      | 110 092     | 165 138     | 550 459      | 7.42               | - 5.42         | 1.37             |
| - 5   | 4.216        | 42 157      | 84 314      | 126 471     | 421 570      | 7.04               | - 5.25         | 1.34             |
| 0   | 3.255        | 32 554      | 65 108      | 97 663      | 325 542      | 6.67               | - 5.09         | 1.31             |
| 5   | 2.534        | 25 339      | 50 677      | 76 016      | 253 386      | 6.31               | - 4.93         | 1.28             |
| 10  | 1.987        | 19 872      | 39 744      | 59 617      | 198 722      | 5.96               | - 4.79         | 1.25             |
| 15  | 1.570        | 15 698      | 31 397      | 47 095      | 156 985      | 5.63               | - 4.64         | 1.21             |
| 20  | 1.249        | 12 488      | 24 975      | 37 463      | 124 877      | 5.31               | - 4.51         | 1.18             |
| 25  | 1.000        | 10 000      | 20 000      | 30 000      | 100 000      | 5.00               | - 4.38         | 1.14             |
| 30  | 0.8059       | 8059        | 16118       | 24 177      | 80 591       | 5.30               | - 4.25         | 1.25             |
| 35  | 0.6535       | 6535        | 13069       | 19 604      | 65 347       | 5.59               | - 4.13         | 1.35             |
| 40  | 0.5330       | 5330        | 10660       | 15 990      | 53 299       | 5.87               | - 4.02         | 1.46             |
| 45  | 0.4372       | 4372        | 8743        | 13 115      | 43 717       | 6.14               | - 3.91         | 1.57             |
| 50  | 0.3605       | 3605        | 7211        | 10 816      | 36 053       | 6.41               | - 3.80         | 1.69             |
| 55  | 0.2989       | 2989        | 5977        | 8966        | 29887        | 6.66               | - 3.70         | 1.80             |
| 60  | 0.2490       | 2490        | 4980        | 7470        | 24900        | 6.91               | - 3.60         | 1.92             |
| 65  | 0.2084       | 2084        | 4169        | 6253        | 20844        | 7.15               | - 3.51         | 2.04             |
| 70  | 0.1753       | 1753        | 3506        | 5259        | 17530        | 7.39               | - 3.42         | 2.16             |
| 75  | 0.1481       | 1481        | 2962        | 4443        | 14809        | 7.61               | - 3.33         | 2.29             |
| 80  | 0.1256       | 1256        | 2513        | 3769        | 12564        | 7.84               | - 3.25         | 2.41             |
| 85  | 0.1070       | 1070        | 2141        | 3211        | 10703        | 8.05               | - 3.17         | 2.54             |
| 90  | 0.09154      | 915.4       | 1831        | 2746        | 9154         | 8.26               | - 3.09         | 2.67             |
| 95  | 0.07860      | 786.0       | 1572        | 2358        | 7860         | 8.46               | - 3.01         | 2.81             |
| 100   | 0.06773      | 677.3       | 1355        | 2032        | 6773         | 8.66               | - 2.94         | 2.95             |
| 105   | 0.05857      | 585.7       | 1171        | 1757        | 5857         | 8.85               | - 2.87         | 3.08             |
| 110   | 0.05083      | 508.3       | 1017        | 1525        | 5083         | 9.04               | - 2.80         | 3.23             |
| 115   | 0.04426      | 442.6       | 885.2       | 1328        | 4426         | 9.22               | - 2.74         | 3.37             |
| 120   | 0.03866      | 386.6       | 773.2       | 1160        | 3866         | 9.40               | - 2.67         | 3.52             |
| 125   | 0.03387      | 338.7       | 677.5       | 1016        | 3387         | 9.57               | - 2.61         | 3.66             |
| 130   | 0.02977      | 297.7       | 595.4       | 893.1       | 2977         | 9.74               | - 2.55         | 3.81             |
| 135   | 0.02624      | 262.4       | 524.8       | 787.2       | 2624         | 9.91               | - 2.50         | 3.97             |
| 140   | 0.02319      | 231.9       | 463.8       | 695.7       | 2319         | 10.07              | - 2.44         | 4.12             |
| 145   | 0.02055      | 205.5       | 411.1       | 616.6       | 2055         | 10.23              | - 2.39         | 4.28             |
| 150   | 0.01826      | 182.6       | 365.3       | 547.9       | 1826         | 10.38              | - 2.34         | 4.44             |

**PACKAGING**
**BLISTER TAPE AND REEL**

Packed in an 8 mm wide blister tape, according to IEC 60286-3



| BLISTER TAPE AND REEL DIMENSIONS |                   |                    |           |      |
|----------------------------------|-------------------|--------------------|-----------|------|
| SYMBOL                           | PARAMETER         | NOMINAL DIMENSIONS | TOLERANCE | UNIT |
| <b>Blister tape</b>              |                   |                    |           |      |
| K                                | Overall thickness | < 2.5              | -         | mm   |
| <b>Pocket</b>                    |                   |                    |           |      |
| A <sub>0</sub>                   | Length            | 2.1                | + 0.3     | mm   |
| B <sub>0</sub>                   | Width             | > 3.8              | -         | mm   |
| K <sub>0</sub>                   | Depth             | 2.1                | + 0.3     | mm   |
| B <sub>1</sub>                   | Outside width     | < 4.5              | -         | mm   |
| <b>Tape</b>                      |                   |                    |           |      |
| T                                | Tape thickness    | < 0.4              | -         | mm   |
| W                                | Tape width        | 8.0                | ± 0.2     | mm   |



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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А