

## 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

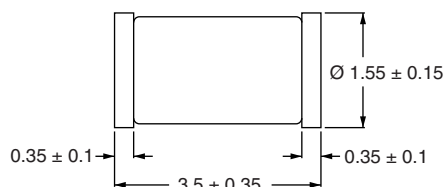
By soldering.

### ELECTRICAL DATA AND ORDERING INFORMATION

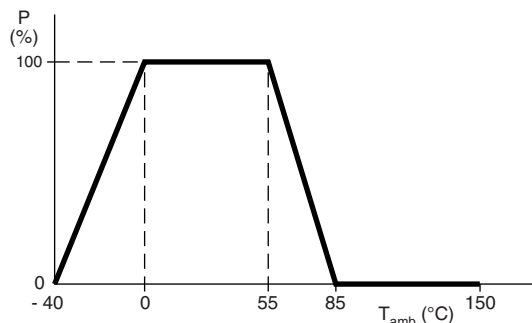
| $R_{25}$<br>(k $\Omega$ ) | $B_{25/85}$ -VALUE | SAP MATERIAL AND<br>ORDERING NUMBER<br>NTCSMELFE3... | OLD 12NC CODE<br>2381 633 53.. |
|---------------------------|--------------------|------------------------------------------------------|--------------------------------|
| 10                        | 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

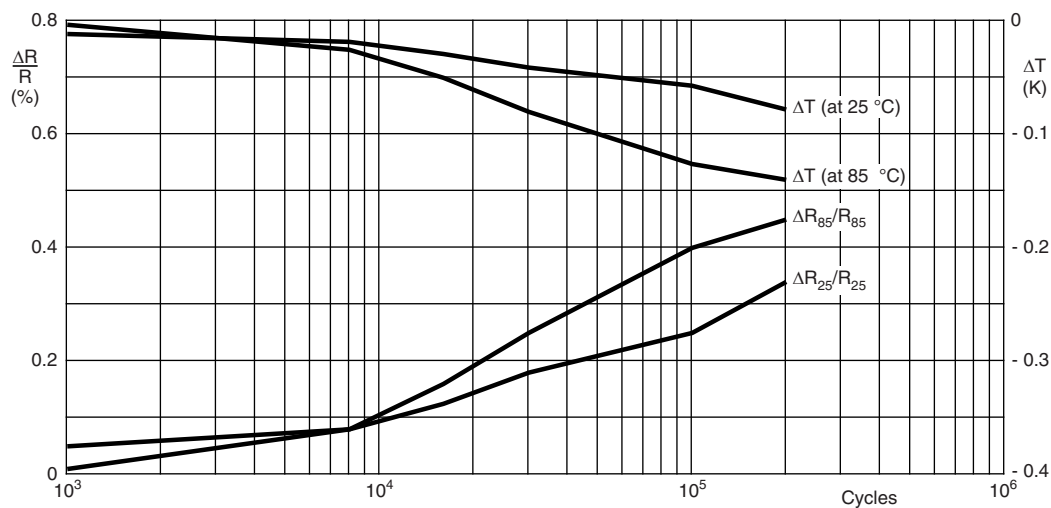

**Note**

- 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 -  $40^{\circ}\text{C}/+200^{\circ}\text{C}$ ).

Tested on non-soldered parts.





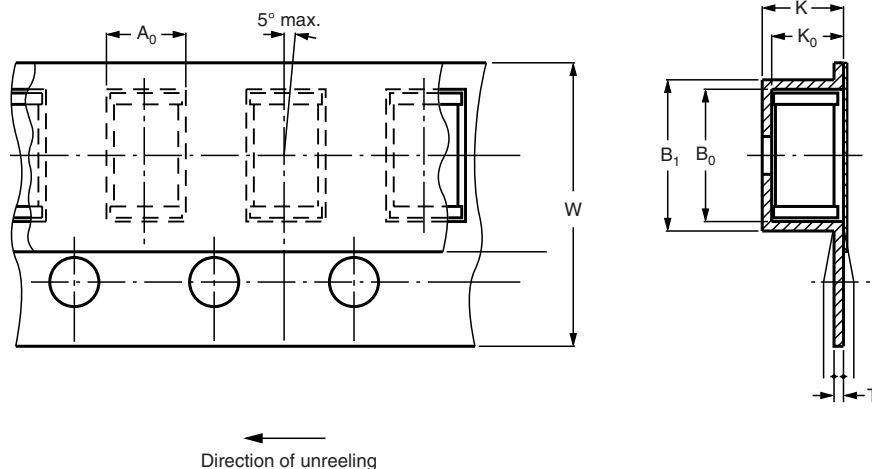
For complete Curve Computation, visit: [www.vishay.com/resistors-non-linear/curve-computation-list/](http://www.vishay.com/resistors-non-linear/curve-computation-list/)

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES FOR NTCSMELFE3 |              |                       |                       |                       |                        |                       |                   |                     |
|---------------------------------------------------------------|--------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-------------------|---------------------|
| TEMPERATURE<br>(°C)                                           | $R_T/R_{25}$ | $R$ for 10 k $\Omega$ | $R$ for 20 k $\Omega$ | $R$ for 30 k $\Omega$ | $R$ for 100 k $\Omega$ | $\Delta R/R$<br>(± %) | $\alpha$<br>(%/K) | $\Delta T$<br>(± 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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