

## SMD 0805, Glass Protected NTC Thermistors



### FEATURES

- TCR ranging from - 6 %/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)

### 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 0805 chip thermistors with a negative temperature coefficient. 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, visit:

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

| QUICK REFERENCE DATA                      |                    |      |
|---|--------------------|------|
| PARAMETER                                 | VALUE              | UNIT |
| Resistance value at 25 °C                 | 2.2K to 680K       | Ω    |
| Tolerance on $R_{25}$ -value              | ± 1; ± 2; ± 3; ± 5 | %    |
| $B_{25/85}$ -value                        | 3430 to 4125       | K    |
| Tolerance on $B_{25/85}$ -value           | ± 1; ± 3           | %    |
| Maximum dissipation at 25 °C              | 210                | mW   |
| Thermal time constant $\tau$              | ≈ 10               | s    |
| Dissipation factor D                      | 3.5                | mW/K |
| Operating temperature range at zero power | - 40 to + 150      | °C   |
| Weight                                    | ≈ 0.008            | g    |

| ELECTRICAL DATA AND ORDERING INFORMATION |                        |                              |  |  |
|--|------------------------|------------------------------|--|--|
| $R_{25}$ -VALUE (kΩ)                     | $B_{25/85}$ -VALUE (K) | TOLERANCE ON $B_{25/85}$ (%) | SAP MATERIAL AND ORDERING NUMBER NTCS0805E3... (1) | 12NC OLD MATERIAL NUMBER 2381 615 5... (2) |
| 2.2                                      | 3600                   | ± 1                          | 222*MT   | *222                                       |
| 4.7                                      | 3500                   | ± 1                          | 472*MT   | *472                                       |
| 10                                       | 3430                   | ± 3                          | 103*LT   | -  |
| 10                                       | 3570                   | ± 3                          | 103*MT   | *103                                       |
| 10                                       | 3940                   | ± 1                          | 103*HT   | -  |
| 15                                       | 3700                   | ± 1                          | 153*MT   | *153                                       |
| 22                                       | 3800                   | ± 1                          | 223*HT   | *223                                       |
| 33                                       | 3920                   | ± 1                          | 333*HT   | *333                                       |
| 47                                       | 3960                   | ± 1                          | 473*HT   | *473                                       |
| 68                                       | 4100                   | ± 1                          | 683*XT   | *683                                       |
| 100                                      | 3590                   | ± 1                          | 104*MT   | -  |
| 100                                      | 4100                   | ± 1                          | 104*XT   | *104                                       |
| 330                                      | 3930                   | ± 1                          | 334*HT   | *334                                       |
| 470                                      | 4025                   | ± 1                          | 474*XT   | *474                                       |
| 680                                      | 4125                   | ± 1                          | 684*XT   | *684                                       |

#### Notes

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

(2) Replace \* in 12NC by 3 for 5 %, 6 for 3 %, 4 for 2 %, 5 for 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. |
|----------------|-------------|------------|--|---------------------|
| 2.0 ± 0.2      | 1.25 ± 0.15 | 0.8 ± 0.15 | 0.2                                    | 0.55                |

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

| <b>RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R<sub>25</sub> AT 2.2 kΩ AND 4.7 kΩ</b> |                                 |           |                                 |           |  |
|--|---------------------------------|-----------|---------------------------------|-----------|--|
| T <sub>OPER</sub> (°C)   | PART NUMBER<br>NTCS0805E3222*MT |           | PART NUMBER<br>NTCS0805E3472*MT |           | ΔR/R DUE TO B <sub>tol.</sub><br>(± %) |
|  | R <sub>T</sub> (Ω)              | TCR (%/K) | R <sub>T</sub> (Ω)              | TCR (%/K) |  |
| -40  | 57 658                          | - 6.26    | 101 275                         | - 5.75    | 7.58                                   |
| -35  | 42 410                          | - 6.03    | 76 325                          | - 5.57    | 6.83                                   |
| -30  | 31 537                          | - 5.82    | 58 034                          | - 5.39    | 6.13                                   |
| -25  | 23 698                          | - 5.61    | 44 505                          | - 5.22    | 5.45                                   |
| -20  | 17 986                          | - 5.42    | 34 413                          | - 5.06    | 4.80                                   |
| -15  | 13 782                          | - 5.23    | 26 821                          | - 4.91    | 4.18                                   |
| -10  | 10 657                          | - 5.06    | 21 065                          | - 4.76    | 3.58                                   |
| -5   | 8312.0                          | - 4.89    | 16 667                          | - 4.61    | 3.01                                   |
| 0  | 6537.1                          | - 4.72    | 13 280                          | - 4.47    | 2.46                                   |
| 5  | 5182.1                          | - 4.57    | 10 654                          | - 4.34    | 1.93                                   |
| 10   | 4139.2                          | - 4.42    | 8603.2                          | - 4.21    | 1.42                                   |
| 15   | 3330.1                          | - 4.28    | 6991.1                          | - 4.09    | 0.93                                   |
| 20   | 2697.8                          | - 4.14    | 5715.6                          | - 3.97    | 0.46                                   |
| 25   | 2200.0                          | - 4.02    | 4700.0                          | - 3.86    | 0.00                                   |
| 30   | 1805.5                          | - 3.89    | 3886.6                          | - 3.75    | 0.22                                   |
| 35   | 1490.7                          | - 3.77    | 3231.2                          | - 3.64    | 0.43                                   |
| 40   | 1237.9                          | - 3.66    | 2700.3                          | - 3.54    | 0.64                                   |
| 45   | 1033.7                          | - 3.55    | 2267.9                          | - 3.44    | 0.84                                   |
| 50   | 867.85                          | - 3.45    | 1913.9                          | - 3.35    | 1.03                                   |
| 55   | 732.31                          | - 3.35    | 1622.6                          | - 3.26    | 1.22                                   |
| 60   | 620.96                          | - 3.25    | 1381.7                          | - 3.17    | 1.40                                   |
| 65   | 529.02                          | - 3.16    | 1181.7                          | - 3.09    | 1.58                                   |
| 70   | 452.73                          | - 3.07    | 1014.7                          | - 3.01    | 1.75                                   |
| 75   | 389.13                          | - 2.99    | 874.85                          | - 2.93    | 1.92                                   |
| 80   | 335.85                          | - 2.90    | 757.13                          | - 2.85    | 2.08                                   |
| 85   | 291.02                          | - 2.83    | 657.67                          | - 2.78    | 2.23                                   |
| 90   | 253.15                          | - 2.75    | 573.31                          | - 2.71    | 2.54                                   |
| 95   | 221.03                          | - 2.68    | 501.48                          | - 2.64    | 2.85                                   |
| 100  | 193.66                          | - 2.61    | 440.10                          | - 2.58    | 3.14                                   |
| 105  | 170.27                          | - 2.54    | 387.47                          | - 2.52    | 3.43                                   |
| 110  | 150.20                          | - 2.48    | 342.18                          | - 2.46    | 3.71                                   |
| 115  | 132.91                          | - 2.41    | 303.09                          | - 2.40    | 3.98                                   |
| 120  | 117.98                          | - 2.35    | 269.24                          | - 2.34    | 4.24                                   |
| 125  | 105.03                          | - 2.20    | 239.83                          | - 2.29    | 4.50                                   |
| 130  | 93.766                          | - 2.24    | 214.20                          | - 2.23    | 4.76                                   |
| 135  | 83.943                          | - 2.19    | 191.82                          | - 2.18    | 5.00                                   |
| 140  | 75.349                          | - 2.13    | 172.20                          | - 2.13    | 5.25                                   |
| 145  | 67.807                          | - 2.08    | 154.96                          | - 2.09    | 5.48                                   |
| 150  | 61.172                          | - 2.04    | 139.78                          | - 2.04    | 5.71                                   |



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 WITH R <sub>25</sub> AT 10 kΩ |                                 |              |                                 |              |                                 |              |  |
|--|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|--|
| T <sub>OPER</sub><br>(°C)  | PART NUMBER<br>NTCS0805E3103*LT |              | PART NUMBER<br>NTCS0805E3103*MT |              | PART NUMBER<br>NTCS0805E3103*HT |              | ΔR/R DUE TO B <sub>tol.</sub><br>(± %) |
|  | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) |  |
| - 40   | 182 928                         | - 5.47       | 232 634                         | - 5.92       | 335 922                         | - 6.60       | 11.22                                  |
| - 35   | 139 839                         | - 5.28       | 173 538                         | - 5.71       | 242 721                         | - 6.40       | 10.14                                  |
| - 30   | 107 902                         | - 5.10       | 130 769                         | - 5.51       | 177 179                         | - 6.19       | 9.10                                   |
| - 25   | 83 986                          | - 4.93       | 99 489                          | - 5.33       | 130 625                         | - 6.00       | 8.11                                   |
| - 20   | 65 904                          | - 4.77       | 76 385                          | - 5.15       | 97 234                          | - 5.81       | 7.15                                   |
| - 15   | 52 111                          | - 4.62       | 59 157                          | - 4.98       | 73 056                          | - 5.63       | 6.24                                   |
| - 10   | 41 501                          | - 4.48       | 46 194                          | - 4.82       | 55 387                          | - 5.45       | 5.35                                   |
| - 5  | 33 276                          | - 4.35       | 36 356                          | - 4.67       | 42 358                          | - 5.28       | 4.50                                   |
| 0  | 26 851                          | - 4.23       | 28 829                          | - 4.52       | 32 666                          | - 5.11       | 3.68                                   |
| 5  | 21 799                          | - 4.11       | 23 025                          | - 4.38       | 25 396                          | - 4.96       | 2.89                                   |
| 10   | 17 798                          | - 4.00       | 18 515                          | - 4.25       | 19 898                          | - 4.80       | 2.13                                   |
| 15   | 14 612                          | - 3.89       | 14 986                          | - 4.12       | 15 708                          | - 4.66       | 1.40                                   |
| 20   | 12 058                          | - 3.79       | 12 205                          | - 4.00       | 12 490                          | - 4.51       | 0.69                                   |
| 25   | 10 000                          | - 3.69       | 10 000                          | - 3.88       | 10 000                          | - 4.38       | 0.00                                   |
| 30   | 8332.5                          | - 3.60       | 8240.3                          | - 3.77       | 8060.1                          | - 4.25       | 0.66                                   |
| 35   | 6974.6                          | - 3.51       | 6827.5                          | - 3.66       | 6538.4                          | - 4.12       | 1.31                                   |
| 40   | 5863.2                          | - 3.43       | 5686.6                          | - 3.56       | 5336.7                          | - 4.00       | 1.93                                   |
| 45   | 4949.5                          | - 3.35       | 4760.3                          | - 3.46       | 4381.9                          | - 3.88       | 2.53                                   |
| 50   | 4194.8                          | - 3.27       | 4004.2                          | - 3.37       | 3618.5                          | - 3.77       | 3.11                                   |
| 55   | 3568.8                          | - 3.19       | 3383.8                          | - 3.28       | 3004.5                          | - 3.67       | 3.68                                   |
| 60   | 3047.5                          | - 3.12       | 2872.3                          | - 3.19       | 2507.9                          | - 3.56       | 4.23                                   |
| 65   | 2611.5                          | - 3.05       | 2448.5                          | - 3.11       | 2104.1                          | - 3.46       | 4.76                                   |
| 70   | 2245.5                          | - 2.99       | 2095.9                          | - 3.03       | 1774.0                          | - 3.37       | 5.28                                   |
| 75   | 1937.2                          | - 2.92       | 1801.2                          | - 2.95       | 1502.7                          | - 3.27       | 5.78                                   |
| 80   | 1676.6                          | - 2.86       | 1553.8                          | - 2.88       | 1278.7                          | - 3.18       | 6.27                                   |
| 85   | 1455.4                          | - 2.80       | 1345.3                          | - 2.81       | 1092.8                          | - 3.10       | 6.74                                   |
| 90   | 1267.2                          | - 2.74       | 1168.9                          | - 2.74       | 937.89                          | - 3.02       | 7.20                                   |
| 95   | 1106.5                          | - 2.68       | 1019.2                          | - 2.67       | 808.21                          | - 2.94       | 7.65                                   |
| 100  | 968.83                          | - 2.63       | 891.48                          | - 2.61       | 699.18                          | - 2.86       | 8.09                                   |
| 105  | 850.57                          | - 2.53       | 782.28                          | - 2.54       | 607.15                          | - 2.79       | 8.51                                   |
| 110  | 748.69                          | - 2.53       | 688.56                          | - 2.48       | 529.14                          | - 2.71       | 8.93                                   |
| 115  | 660.67                          | - 2.48       | 607.85                          | - 2.43       | 462.78                          | - 2.65       | 9.33                                   |
| 120  | 584.42                          | - 2.43       | 538.14                          | - 2.37       | 406.10                          | - 2.58       | 9.73                                   |
| 125  | 518.20                          | - 2.38       | 477.73                          | - 2.32       | 357.54                          | - 2.52       | 10.11                                  |
| 130  | 460.53                          | - 2.34       | 425.24                          | - 2.26       | 315.77                          | - 2.45       | 10.48                                  |
| 135  | 410.19                          | - 2.29       | 379.49                          | - 2.21       | 279.73                          | - 2.39       | 10.85                                  |
| 140  | 366.15                          | - 2.25       | 339.51                          | - 2.17       | 248.53                          | - 2.34       | 11.20                                  |
| 145  | 327.52                          | - 2.21       | 304.47                          | - 2.12       | 221.44                          | - 2.28       | 11.55                                  |
| 150  | 293.56                          | - 2.17       | 273.69                          | - 2.07       | 197.84                          | - 2.23       | 11.89                                  |



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| <b>RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R<sub>25</sub> AT 15 kΩ, 22 kΩ AND 47 kΩ</b> |                                 |              |                                 |              |                                 |              |  |
|---|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|--|
| T <sub>OPER</sub><br>(°C)   | PART NUMBER<br>NTCS0805E3153*MT |              | PART NUMBER<br>NTCS0805E3223*HT |              | PART NUMBER<br>NTCS0805E3333*MT |              | ΔR/R DUE TO B <sub>tol.</sub><br>(± %) |
|   | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) |  |
| - 40  | 391 251                         | - 6.14       | 641 004                         | - 6.40       | 1 104 739                       | - 6.79       | 7.58                                   |
| - 35  | 289 245                         | - 5.94       | 468 038                         | - 6.18       | 793 249                         | - 6.53       | 6.83                                   |
| - 30  | 215 960                         | - 5.75       | 345 469                         | - 5.97       | 576 683                         | - 6.28       | 6.13                                   |
| - 25  | 162 779                         | - 5.56       | 257 644                         | - 5.77       | 424 161                         | - 6.05       | 5.45                                   |
| - 20  | 123 815                         | - 5.38       | 194 045                         | - 5.57       | 315 430                         | - 5.84       | 4.80                                   |
| - 15  | 95 001                          | - 5.21       | 147 521                         | - 5.39       | 237 022                         | - 5.63       | 4.18                                   |
| - 10  | 73 505                          | - 5.05       | 113 159                         | - 5.22       | 179 865                         | - 5.44       | 3.58                                   |
| - 5   | 57 329                          | - 4.89       | 87 544                          | - 5.05       | 137 767                         | - 5.26       | 3.01                                   |
| 0   | 45 058                          | - 4.74       | 68 281                          | - 4.89       | 106 459                         | - 5.08       | 2.46                                   |
| 5   | 35 674                          | - 4.60       | 53 672                          | - 4.74       | 82 958                          | - 4.92       | 1.93                                   |
| 10  | 28 445                          | - 4.46       | 42 503                          | - 4.59       | 65 162                          | - 4.76       | 1.42                                   |
| 15  | 22 834                          | - 4.33       | 33 898                          | - 4.46       | 51 572                          | - 4.61       | 0.93                                   |
| 20  | 18 450                          | - 4.20       | 27 220                          | - 4.32       | 41 112                          | - 4.47       | 0.46                                   |
| 25  | 15 000                          | - 4.08       | 22 000                          | - 4.20       | 33 000                          | - 4.34       | 0.00                                   |
| 30  | 12 268                          | - 3.96       | 17 892                          | - 4.07       | 26 663                          | - 4.21       | 0.22                                   |
| 35  | 10 092                          | - 3.85       | 14 638                          | - 3.96       | 21 678                          | - 4.08       | 0.43                                   |
| 40  | 8347.4                          | - 3.74       | 12 045                          | - 3.84       | 17 730                          | - 3.97       | 0.64                                   |
| 45  | 6941.1                          | - 3.64       | 9965.0                          | - 3.74       | 14 585                          | - 3.86       | 0.84                                   |
| 50  | 5801.1                          | - 3.54       | 8288.3                          | - 3.63       | 12 063                          | - 3.75       | 1.03                                   |
| 55  | 4872.1                          | - 3.44       | 6928.4                          | - 3.54       | 10 030                          | - 3.65       | 1.22                                   |
| 60  | 4111.1                          | - 3.35       | 5819.8                          | - 3.44       | 8381.6                          | - 3.55       | 1.40                                   |
| 65  | 3484.7                          | - 3.26       | 4911.4                          | - 3.35       | 7037.8                          | - 3.45       | 1.58                                   |
| 70  | 2966.6                          | - 3.18       | 4163.4                          | - 3.26       | 5936.8                          | - 3.36       | 1.75                                   |
| 75  | 2536.2                          | - 3.09       | 3544.6                          | - 3.18       | 5030.3                          | - 3.27       | 1.92                                   |
| 80  | 2176.9                          | - 3.02       | 3030.2                          | - 3.10       | 4280.4                          | - 3.19       | 2.08                                   |
| 85  | 1875.8                          | - 2.94       | 2600.9                          | - 3.02       | 3657.2                          | - 3.11       | 2.23                                   |
| 90  | 1622.5                          | - 2.87       | 2241.0                          | - 2.94       | 3137.1                          | - 3.03       | 2.54                                   |
| 95  | 1408.4                          | - 2.79       | 1938.0                          | - 2.87       | 2701.2                          | - 2.96       | 2.85                                   |
| 100   | 1226.8                          | - 2.73       | 1682.0                          | - 2.80       | 2334.4                          | - 2.89       | 3.14                                   |
| 105   | 1072.3                          | - 2.66       | 1464.9                          | - 2.73       | 2024.4                          | - 2.82       | 3.43                                   |
| 110   | 940.20                          | - 2.60       | 1280.0                          | - 2.67       | 1761.6                          | - 2.75       | 3.71                                   |
| 115   | 827.00                          | - 2.54       | 1122.0                          | - 2.60       | 1538.0                          | - 2.69       | 3.98                                   |
| 120   | 729.62                          | - 2.48       | 986.60                          | - 2.54       | 1346.9                          | - 2.63       | 4.24                                   |
| 125   | 645.60                          | - 2.42       | 870.11                          | - 2.48       | 1183.23                         | - 2.57       | 4.50                                   |
| 130   | 572.86                          | - 2.36       | 769.60                          | - 2.43       | 1042.4                          | - 2.51       | 4.76                                   |
| 135   | 509.71                          | - 2.31       | 682.59                          | - 2.37       | 921.02                          | - 2.45       | 5.00                                   |
| 140   | 454.71                          | - 2.26       | 607.05                          | - 2.32       | 815.99                          | - 2.40       | 5.25                                   |
| 145   | 406.69                          | - 2.21       | 541.28                          | - 2.27       | 724.85                          | - 2.35       | 5.48                                   |
| 150   | 364.64                          | - 2.16       | 483.86                          | - 2.22       | 645.54                          | - 2.30       | 5.71                                   |

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| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH $R_{25}$ AT 47 k $\Omega$ , 68 k $\Omega$ AND 100 k $\Omega$ |                                 |              |                                 |              |                                 |              |                                 |              |   |
|--|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|---|
| $T_{OPER}$<br>(°C)   | PART NUMBER<br>NTCS0805E3473*HT |              | PART NUMBER<br>NTCS0805E3683*XT |              | PART NUMBER<br>NTCS0805E3104*MT |              | PART NUMBER<br>NTCS0805E3104*XT |              | $\Delta R/R$ DUE<br>TO $B_{tol}$ .<br>(± %) |
|  | $R_T$<br>( $\Omega$ )           | TCR<br>(%/K) | $R_T$<br>( $\Omega$ )           | TCR<br>(%/K) | $R_T$<br>( $\Omega$ )           | TCR<br>(%/K) | $R_T$<br>( $\Omega$ )           | TCR<br>(%/K) |   |
| -40  | 1 536 095                       | - 6.60       | 2 596 437                       | - 6.92       | 2 245 445                       | - 5.82       | 3 833 689                       | - 6.96       | 7.58  |
| -35  | 1 110 020                       | - 6.37       | 1 848 208                       | - 6.68       | 1 686 623                       | - 5.63       | 2 724 206                       | - 6.71       | 6.83  |
| -30  | 811 212                         | - 6.15       | 1 331 164                       | - 6.45       | 1 278 403                       | - 5.45       | 1 959 612                       | - 6.47       | 6.13  |
| -25  | 599 204                         | - 5.94       | 969 559                         | - 6.23       | 977 431                         | - 5.28       | 1 426 014                       | - 6.25       | 5.45  |
| -20  | 447 111                         | - 5.74       | 713 753                         | - 6.02       | 753 552                         | - 5.12       | 1 049 150                       | - 6.03       | 4.80  |
| -15  | 336 851                         | - 5.56       | 530 805                         | - 5.82       | 585 597                         | - 4.97       | 779 950                         | - 5.83       | 4.18  |
| -10  | 256 116                         | - 5.38       | 398 593                         | - 5.64       | 458 561                         | - 4.82       | 585 575                         | - 5.64       | 3.58  |
| -5   | 196 435                         | - 5.21       | 302 091                         | - 5.45       | 361 719                         | - 4.67       | 443 786                         | - 5.45       | 3.01  |
| 0  | 151 917                         | - 5.05       | 230 981                         | - 5.28       | 287 337                         | - 4.54       | 339 343                         | - 5.28       | 2.46  |
| 5  | 118 422                         | - 4.89       | 178 104                         | - 5.12       | 229 790                         | - 4.40       | 261 695                         | - 5.11       | 1.93  |
| 10   | 93 012                          | - 4.74       | 138 441                         | - 4.96       | 184 958                         | - 4.28       | 203 455                         | - 4.96       | 1.42  |
| 15   | 73 583                          | - 4.60       | 108 442                         | - 4.81       | 149 796                         | - 4.16       | 159 402                         | - 4.81       | 0.93  |
| 20   | 58 615                          | - 4.47       | 85 571                          | - 4.67       | 122 043                         | - 4.04       | 125 811                         | - 4.66       | 0.46  |
| 25   | 47 000                          | - 4.34       | 68 000                          | - 4.53       | 100 000                         | - 3.93       | 100 000                         | - 4.52       | 0.00  |
| 30   | 37 925                          | - 4.22       | 54 403                          | - 4.40       | 82 389                          | - 3.82       | 80 021                          | - 4.39       | 0.22  |
| 35   | 30 788                          | - 4.10       | 43 806                          | - 4.27       | 68 238                          | - 3.72       | 64 447                          | - 4.27       | 0.43  |
| 40   | 25 139                          | - 3.99       | 35 493                          | - 4.15       | 56 805                          | - 3.62       | 52 224                          | - 4.15       | 0.64  |
| 45   | 20 641                          | - 3.88       | 28 928                          | - 4.03       | 47 518                          | - 3.52       | 42 570                          | - 4.03       | 0.84  |
| 50   | 17 038                          | - 3.78       | 23 712                          | - 3.92       | 39 936                          | - 3.43       | 34 897                          | - 3.92       | 1.03  |
| 55   | 14 136                          | - 3.68       | 19 543                          | - 3.81       | 33 716                          | - 3.34       | 28 763                          | - 3.81       | 1.22  |
| 60   | 11 786                          | - 3.58       | 16 192                          | - 3.71       | 28 589                          | - 3.26       | 23 830                          | - 3.71       | 1.40  |
| 65   | 9872.9                          | - 3.49       | 13 483                          | - 3.61       | 24 342                          | - 3.17       | 19 842                          | - 3.61       | 1.58  |
| 70   | 8308.1                          | - 3.40       | 11 282                          | - 3.52       | 20 811                          | - 3.10       | 16 601                          | - 3.52       | 1.75  |
| 75   | 7021.9                          | - 3.31       | 9484.2                          | - 3.43       | 17 861                          | - 3.02       | 13 954                          | - 3.43       | 1.92  |
| 80   | 5959.7                          | - 3.23       | 8008.8                          | - 3.34       | 15 386                          | - 2.95       | 11 781                          | - 3.34       | 2.08  |
| 85   | 5078.7                          | - 3.15       | 6792.1                          | - 3.25       | 13 303                          | - 2.87       | 9988.4                          | - 3.26       | 2.23  |
| 90   | 4344.9                          | - 3.08       | 5784.2                          | - 3.17       | 11 542                          | - 2.81       | 8503.6                          | - 3.18       | 2.54  |
| 95   | 3731.0                          | - 3.00       | 4945.7                          | - 3.09       | 10 048                          | - 2.74       | 7268.2                          | - 3.10       | 2.85  |
| 100  | 3215.5                          | - 2.93       | 4245.0                          | - 3.02       | 8775.2                          | - 2.68       | 6236.0                          | - 3.03       | 3.14  |
| 105  | 2781.0                          | - 2.86       | 3657.2                          | - 2.94       | 7688.1                          | - 2.61       | 5370.1                          | - 2.95       | 3.43  |
| 110  | 2413.2                          | - 2.80       | 3162.1                          | - 2.87       | 6756.2                          | - 2.55       | 4640.8                          | - 2.88       | 3.71  |
| 115  | 2101.0                          | - 2.73       | 2743.5                          | - 2.81       | 5954.7                          | - 2.50       | 4024.3                          | - 2.82       | 3.98  |
| 120  | 1834.9                          | - 2.67       | 2388.2                          | - 2.74       | 5263.2                          | - 2.44       | 3501.2                          | - 2.75       | 4.24  |
| 125  | 1607.3                          | - 2.61       | 2085.7                          | - 2.68       | 4664.8                          | - 2.39       | 3055.8                          | - 2.69       | 4.50  |
| 130  | 1412.2                          | - 2.55       | 1827.2                          | - 2.62       | 4145.4                          | - 2.33       | 2675.3                          | - 2.63       | 4.76  |
| 135  | 1244.2                          | - 2.50       | 1605.5                          | - 2.56       | 3693.3                          | - 2.28       | 2349.2                          | - 2.57       | 5.00  |
| 140  | 1099.3                          | - 2.44       | 1414.9                          | - 2.50       | 3298.7                          | - 2.24       | 2068.7                          | - 2.51       | 5.25  |
| 145  | 973.81                          | - 2.39       | 1250.4                          | - 2.44       | 2953.4                          | - 2.19       | 1826.8                          | - 2.46       | 5.48  |
| 150  | 864.87                          | - 2.34       | 1108.0                          | - 2.39       | 2650.5                          | - 2.14       | 1617.5                          | - 2.41       | 5.71  |



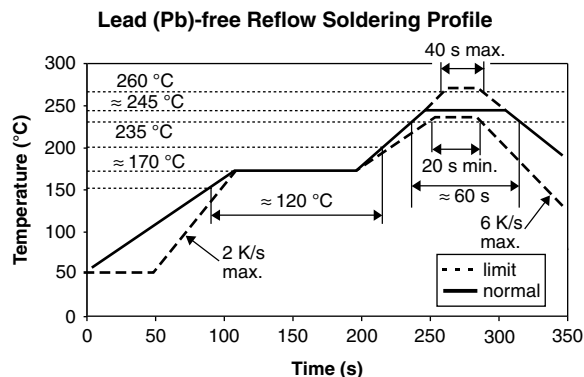
For complete Curve Computation, visit: [www.vishay.com/resistors-non-linear/curve-computation-list/](http://www.vishay.com/resistors-non-linear/curve-computation-list/)

| <b>RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R<sub>25</sub> AT 330 kΩ, 470 kΩ AND 680 kΩ</b> |                                 |              |                                 |              |                                 |              |  |
|--|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|--|
| T <sub>OPER</sub><br>(°C)  | PART NUMBER<br>NTCS0805E3334*HT |              | PART NUMBER<br>NTCS0805E3474*XT |              | PART NUMBER<br>NTCS0805E3684*XT |              | ΔR/R DUE TO B <sub>tol.</sub><br>(± %) |
|  | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) | R <sub>T</sub><br>(Ω)           | TCR<br>(%/K) |  |
| - 40   | 10 488                          | - 6.53       | 16 325                          | - 6.70       | 23 477                          | - 6.58       | 7.58                                   |
| - 35   | 7608.4                          | - 6.31       | 11 742                          | - 6.48       | 16 980                          | - 6.38       | 6.83                                   |
| - 30   | 5579.1                          | - 6.10       | 8539.8                          | - 6.26       | 12 404                          | - 6.18       | 6.13                                   |
| - 25   | 4133.1                          | - 5.90       | 6276.8                          | - 6.05       | 9147.1                          | - 6.00       | 5.45                                   |
| - 20   | 3092.0                          | - 5.71       | 4660.3                          | - 5.86       | 6807.4                          | - 5.82       | 4.80                                   |
| - 15   | 2334.8                          | - 5.53       | 3493.6                          | - 5.67       | 5110.7                          | - 5.65       | 4.18                                   |
| - 10   | 1778.8                          | - 5.35       | 2643.2                          | - 5.49       | 3869.3                          | - 5.48       | 3.58                                   |
| - 5  | 1366.9                          | - 5.19       | 2017.4                          | - 5.32       | 2953.2                          | - 5.33       | 3.01                                   |
| 0  | 1058.9                          | - 5.03       | 1552.8                          | - 5.15       | 2271.5                          | - 5.17       | 2.46                                   |
| 5  | 826.75                          | - 4.87       | 1204.7                          | - 5.00       | 1760.2                          | - 5.03       | 1.93                                   |
| 10   | 650.33                          | - 4.73       | 941.99                          | - 4.85       | 1373.89                         | - 4.89       | 1.42                                   |
| 15   | 515.22                          | - 4.59       | 741.96                          | - 4.70       | 1079.7                          | - 4.75       | 0.93                                   |
| 20   | 410.99                          | - 4.45       | 588.54                          | - 4.56       | 854.12                          | - 4.62       | 0.46                                   |
| 25   | 330.00                          | - 4.33       | 470.00                          | - 4.43       | 680.00                          | - 4.50       | 0.00                                   |
| 30   | 266.64                          | - 4.20       | 377.77                          | - 4.31       | 544.69                          | - 4.38       | 0.22                                   |
| 35   | 216.75                          | - 4.08       | 305.53                          | - 4.18       | 438.89                          | - 4.26       | 0.43                                   |
| 40   | 177.22                          | - 3.97       | 248.58                          | - 4.07       | 355.64                          | - 4.15       | 0.64                                   |
| 45   | 145.70                          | - 3.86       | 203.40                          | - 3.96       | 289.76                          | - 4.04       | 0.84                                   |
| 50   | 120.43                          | - 3.76       | 167.35                          | - 3.85       | 237.33                          | - 3.94       | 1.03                                   |
| 55   | 100.06                          | - 3.66       | 138.42                          | - 3.75       | 195.38                          | - 3.84       | 1.22                                   |
| 60   | 83.541                          | - 3.56       | 115.06                          | - 3.65       | 161.62                          | - 3.75       | 1.40                                   |
| 65   | 70.081                          | - 3.47       | 96.120                          | - 3.55       | 134.33                          | - 3.65       | 1.58                                   |
| 70   | 59.059                          | - 3.38       | 80.672                          | - 3.46       | 112.16                          | - 3.56       | 1.75                                   |
| 75   | 49.989                          | - 3.29       | 68.012                          | - 3.37       | 94.052                          | - 3.48       | 1.92                                   |
| 80   | 42.491                          | - 3.21       | 57.588                          | - 3.29       | 79.204                          | - 3.39       | 2.08                                   |
| 85   | 36.265                          | - 3.13       | 48.966                          | - 3.20       | 66.973                          | - 3.31       | 2.23                                   |
| 90   | 31.074                          | - 3.05       | 41.803                          | - 3.12       | 56.855                          | - 3.24       | 2.54                                   |
| 95   | 26.726                          | - 2.98       | 35.826                          | - 3.05       | 48.449                          | - 3.16       | 2.85                                   |
| 100  | 23.070                          | - 2.91       | 30.819                          | - 2.97       | 41.439                          | - 3.09       | 3.14                                   |
| 105  | 19.985                          | - 2.84       | 26.608                          | - 2.90       | 35.569                          | - 3.02       | 3.43                                   |
| 110  | 17.371                          | - 2.77       | 23.053                          | - 2.83       | 30.636                          | - 2.95       | 3.71                                   |
| 115  | 15.149                          | - 2.71       | 20.039                          | - 2.77       | 26.474                          | - 2.89       | 3.98                                   |
| 120  | 13.253                          | - 2.64       | 17.477                          | - 2.70       | 22.952                          | - 2.82       | 4.24                                   |
| 125  | 11.630                          | - 2.58       | 15.290                          | - 2.64       | 19.961                          | - 2.76       | 4.50                                   |
| 130  | 10.236                          | - 2.52       | 13.417                          | - 2.58       | 17.412                          | - 2.70       | 4.76                                   |
| 135  | 9.0345                          | - 2.47       | 11.808                          | - 2.53       | 15.233                          | - 2.65       | 5.00                                   |
| 140  | 7.9963                          | - 2.41       | 10.422                          | - 2.47       | 13.364                          | - 2.59       | 5.25                                   |
| 145  | 7.0964                          | - 2.36       | 9.2239                          | - 2.42       | 11.757                          | - 2.54       | 5.48                                   |
| 150  | 6.3142                          | - 2.31       | 8.1851                          | - 2.36       | 10.371                          | - 2.48       | 5.71                                   |

### 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.



Dimensions of the solder lands



### TESTS AND REQUIREMENTS

| SOLDERABILITY AND RESISTANCE TO SOLDERING HEAT |                |                              |                |                             |
|--|----------------|------------------------------|----------------|-----------------------------|
| IEC 60068-2-58                                 | TEST METHOD    | TEST                         | PROCEDURE      | REQUIREMENTS                |
| 6  | T <sub>C</sub> | Solderability                | 2 s at 235 °C  | Min. 95 % of surface wetted |
|  |                | Resistance to soldering heat | 10 s at 260 °C | $\Delta R/R < 5 \%$         |

### 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 | TOLERANCE |
|-------------------------------|-----------|-----------|
| A <sub>0</sub> <sup>(1)</sup> | 1.7       | ± 0.2     |
| B <sub>0</sub> <sup>(1)</sup> | 2.35      | ± 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              | 1.1       | Max.      |
| T <sub>1</sub> cover tape     | < 0.1     | -         |

#### Notes

- (1) Measured 0.3 mm above base pocket
- (2) P<sub>0</sub> pitch cumulative error over any 10 pitches ± 1.0 mm



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