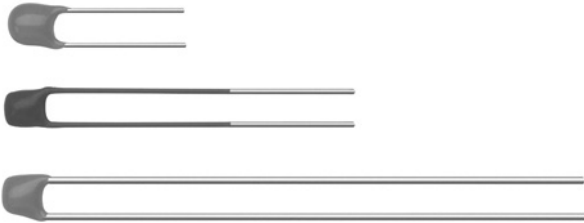


NTC Thermistors, Accuracy Line



| QUICK REFERENCE DATA | |
|--|----------------------------|
| PARAMETER | VALUE |
| Resistance value at 25 °C | 2 to 470 kΩ |
| Tolerance on R_{25} - value | ± 5 %; ± 3 %; ± 2 %; ± 1 % |
| Tolerance on $B_{25/85}$ - value | ± 2.5 to 0.5 % |
| Maximum dissipation | 100 mW |
| Dissipation factor δ | 2.2 mW/K |
| Response time ⁽¹⁾ | ≈ 1.7 s |
| Thermal time constant τ | 13 s |
| Operating temperature range at: zero dissipation (continuously) | - 40 to + 125 °C |
| zero dissipation (for short periods) ⁽²⁾ | ≤ 150 °C |
| maximum dissipation (100 mW) | 0 to + 55 °C |
| Climatic category | 40/125/56 |
| Mass | ≈ 0.11 g |

Notes:

⁽¹⁾ Response time in silicone oil MS200/50. This is the time needed for the sensor to reach 63.2 % of the total temperature difference when subjected to a temperature change from 25 °C in air to 85 °C in oil.

⁽²⁾ Valid for all types with the exception of 2381 640 5.474.

FEATURES

- Accurate over a wide temperature range (tolerance on B-value between 2.5 % and 0.5 %)
- Good stability over a long life
- Excellent price/performance ratio
- Flexible leads
- Low heat conductivity through 0.4 mm diameter Ni-leads
- Old part number was 2322 640 5....
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

APPLICATIONS

- Temperature sensing and control

These thermistors have a negative temperature coefficient. The device consists of a chip with two tinned nickel leads and is color coded.

PACKAGING

The thermistors are packed in cardboard boxes; the smallest packing quantity is 500 units.

DESIGN-IN SUPPORT

For complete Curve Computation, visit:

<http://www.vishay.com/thermistors/curve-computation-list/>

MARKING

The thermistors are marked with colored bands; see Dimensions and “Electrical data and ordering information”

MOUNTING

By soldering in any position.

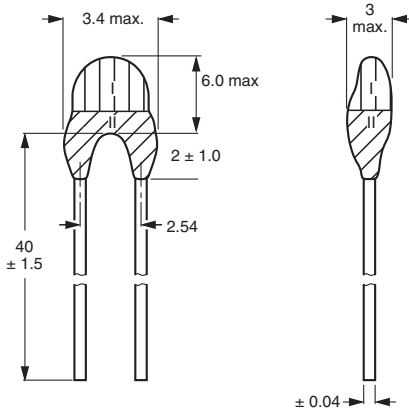
| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | |
|--|---------------------|---|--|-------------------------|--------|
| R_{25} (KΩ) | $B_{25/85}$ - VALUE | 12NC ORDERING CODE 2381 640 5.... ⁽¹⁾ | SAP MATERIAL NO. NTCLE203E3..... ⁽²⁾ | CODING (see dimensions) | |
| | | | | I | II |
| 2 | 3528 K ± 0.5 % | *202 | 202*B0 | orange | orange |
| 2.7 | 3977 K ± 0.75 % | *272 | 272*B0 | red | red |
| 4.7 | 3977 K ± 0.75 % | *472 | 472*B0 | green | green |
| 5 | 3977 K ± 0.75 % | *502 | 502*B0 | black | white |
| 10 | 3977 K ± 0.75 % | *103 | 103*B0 | blue | blue |
| 12 | 3740 K ± 2 % | *123 | 123*B0 | yellow | yellow |
| 22 | 3740 K ± 2 % | *223 | 223*B0 | white | white |
| 47 | 4090 K ± 1.5 % | *473 | 473*B0 | black | black |
| 68 | 4190 K ± 1.5 % | *683 | 683*B0 | grey | grey |
| 100 | 4190 K ± 1.5 % | *104 | 104*B0 | brown | brown |
| 470 | 4570 K ± 1.5 % | *474 | 474*B0 | violet | violet |

Notes:

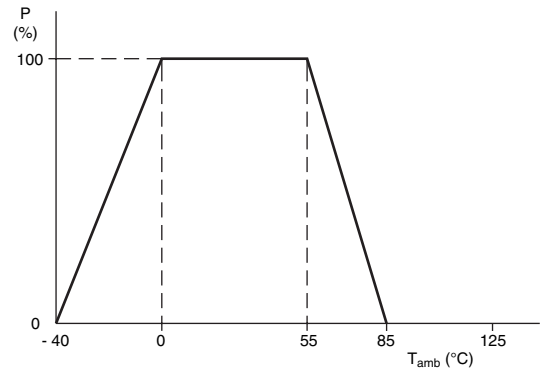
⁽¹⁾ Replace * in 12NC by 3 for ± 5 %, 6 for ± 3 %, 4 for ± 2 %, 5 for ± 1 %

⁽²⁾ Replace * in SAP by J for ± 5 %, H for ± 3 %, G for ± 2 %, F for ± 1 %

DIMENSIONS in millimeters

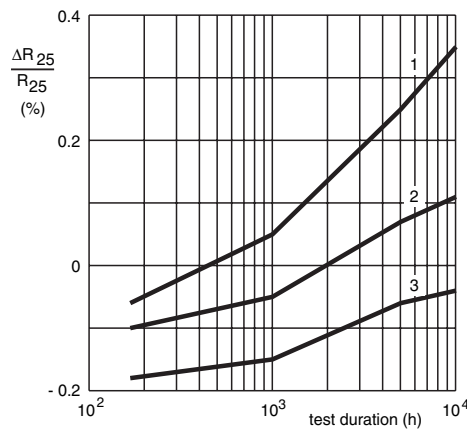


DERATING AND LONG TERM STABILITY



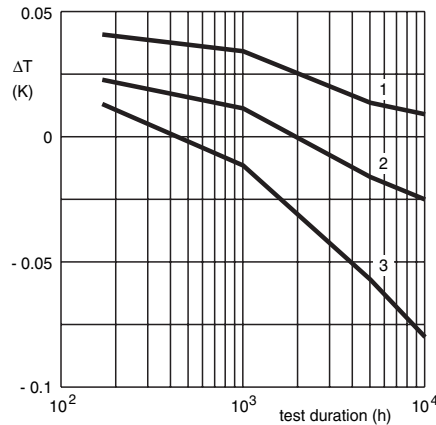
Power

LONG TERM STABILITY OF R_{25} AS A FUNCTION OF TEST DURATION AT MAXIMUM TEMPERATURE (150 °C)



Curves valid for
2.2 to 10 kΩ
Curve 1: maximum deviation
Curve 2: average deviation
Curve 3: minimum deviation

LONG TERM STABILITY OF T AS A FUNCTION OF TEST DURATION AT MAXIMUM TEMPERATURE (150 °C)



Curves valid for
2.2 to 10 kΩ
Curve 1: minimum deviation
Curve 2: average deviation
Curve 3: maximum deviation



For complete Curve Computation, visit: <http://www.vishay.com/thermistors/curve-computation-list/>

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 2 kΩ | | | | |
|--|--------------|---|--------------|---|
| T_{OPER} (°C) | R_T/R_{25} | ΔR DUE TO B-TOLERANCE (%) | TCR (%/K) | R_{25} |
| | | | | 2381 640; see note 1 at end of tables |
| | | | | 5.202 |
| - 40 | 23.3402 | 1.65 | - 6.06 | 46 684 |
| - 35 | 17.3347 | 1.49 | - 5.84 | 34 672 |
| - 30 | 13.0166 | 1.34 | - 5.62 | 26 035 |
| - 25 | 9.8764 | 1.19 | - 5.42 | 19 754 |
| - 20 | 7.5682 | 1.05 | - 5.23 | 15 138 |
| - 15 | 5.8541 | 0.92 | - 5.05 | 11 709 |
| - 10 | 4.5688 | 0.79 | - 4.87 | 9138 |
| - 5 | 3.5961 | 0.66 | - 4.71 | 7193 |
| 0 | 2.8533 | 0.54 | - 4.55 | 5707 |
| 5 | 2.2815 | 0.43 | - 4.40 | 4563 |
| 10 | 1.8376 | 0.31 | - 4.26 | 3675 |
| 15 | 1.4904 | 0.21 | - 4.12 | 2981 |
| 20 | 1.2169 | 0.10 | - 3.99 | 2434 |
| 25 | 1.0000 | 0.00 | - 3.87 | 2000 |
| 30 | 0.8266 | 0.10 | - 3.75 | 1653 |
| 35 | 0.6873 | 0.19 | - 3.63 | 1375 |
| 40 | 0.5746 | 0.28 | - 3.53 | 1149 |
| 45 | 0.4827 | 0.37 | - 3.42 | 965.0 |
| 50 | 0.4073 | 0.46 | - 3.32 | 814.7 |
| 55 | 0.3452 | 0.54 | - 3.23 | 690.5 |
| 60 | 0.2937 | 0.62 | - 3.14 | 587.5 |
| 65 | 0.2508 | 0.70 | - 3.05 | 501.7 |
| 70 | 0.2149 | 0.78 | - 2.97 | 429.8 |
| 75 | 0.1847 | 0.85 | - 2.89 | 369.5 |
| 80 | 0.1593 | 0.92 | - 2.81 | 318.6 |
| 85 | 0.1377 | 0.99 | - 2.73 | 275.5 |
| 90 | 0.1194 | 1.06 | - 2.66 | 238.9 |
| 95 | 0.1038 | 1.13 | - 2.59 | 207.6 |
| 100 | 0.09045 | 1.19 | - 2.53 | 180.9 |
| 105 | 0.07900 | 1.25 | - 2.46 | 158.0 |
| 110 | 0.06915 | 1.31 | - 2.40 | 138.3 |
| 115 | 0.06066 | 1.37 | - 2.34 | 121.3 |
| 120 | 0.05332 | 1.43 | - 2.29 | 106.6 |
| 125 | 0.04696 | 1.49 | - 2.23 | 93.9 |
| 130 | 0.04143 | 1.54 | - 2.18 | 82.9 |
| 135 | 0.03662 | 1.60 | - 2.13 | 73.3 |
| 140 | 0.03243 | 1.65 | - 2.08 | 64.9 |
| 145 | 0.02877 | 1.70 | - 2.03 | 57.5 |
| 150 | 0.02556 | 1.75 | - 2.33 | 51.1 |



For complete Curve Computation, visit: <http://www.vishay.com/thermistors/curve-computation-list/>

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 2.7 kΩ, 4.7 kΩ, 5 kΩ & 10 kΩ | | | | | | | |
|--|--------------|---|--------------|---|--------|--------|--------|
| T_{OPER} (°C) | R_T/R_{25} | ΔR DUE TO B-TOLERANCE (%) | TCR (%/K) | R_{25} | | | |
| | | | | 2381 640; see note 1 at end of tables | | | |
| | | | | 5.272 | 5.472 | 5.502 | 5.103 |
| - 40 | 33.21 | 2.66 | 6.57 | 89.67 | 156.1 | 166.1 | 332.1 |
| - 35 | 23.99 | 2.41 | 6.36 | 64.77 | 112.8 | 120.0 | 240.0 |
| - 30 | 17.52 | 2.17 | 6.15 | 47.31 | 82.35 | 87.60 | 175.2 |
| - 25 | 12.93 | 1.94 | 5.95 | 34.91 | 60.77 | 64.65 | 129.3 |
| - 20 | 9.636 | 1.71 | 5.76 | 26.02 | 45.30 | 48.18 | 96.36 |
| - 15 | 7.250 | 1.50 | 5.58 | 19.58 | 34.08 | 36.25 | 72.50 |
| - 10 | 5.505 | 1.29 | 5.40 | 14.86 | 25.87 | 27.52 | 55.05 |
| - 5 | 4.216 | 1.08 | 5.24 | 11.38 | 19.81 | 21.08 | 42.16 |
| 0 | 3.255 | 0.89 | 5.08 | 8.790 | 15.30 | 16.28 | 32.56 |
| 5 | 2.534 | 0.70 | 4.92 | 6.842 | 11.91 | 12.67 | 25.34 |
| 10 | 1.987 | 0.52 | 4.78 | 5.366 | 9.340 | 9.936 | 19.87 |
| 15 | 1.570 | 0.34 | 4.64 | 4.239 | 7.378 | 7.849 | 15.70 |
| 20 | 1.249 | 0.17 | 4.50 | 3.372 | 5.869 | 6.244 | 12.49 |
| 25 | 1.000 | 0.00 | 4.37 | 2.700 | 4.700 | 5.000 | 10.00 |
| 30 | 0.8059 | 0.16 | 4.25 | 2.176 | 3.788 | 4.030 | 8.059 |
| 35 | 0.6535 | 0.32 | 4.13 | 1.764 | 3.072 | 3.267 | 6.535 |
| 40 | 0.5330 | 0.47 | 4.02 | 1.439 | 2.505 | 2.665 | 5.330 |
| 45 | 0.4372 | 0.62 | 3.91 | 1.180 | 2.055 | 2.186 | 4.372 |
| 50 | 0.3605 | 0.77 | 3.80 | 0.973 | 1.694 | 1.803 | 3.606 |
| 55 | 0.2989 | 0.91 | 3.70 | 0.807 | 1.405 | 1.494 | 2.989 |
| 60 | 0.2490 | 1.05 | 3.60 | 0.672 | 1.170 | 1.245 | 2.490 |
| 65 | 0.2084 | 1.18 | 3.51 | 0.562 | 0.9797 | 1.042 | 2.084 |
| 70 | 0.1753 | 1.31 | 3.42 | 0.473 | 0.8239 | 0.8765 | 1.753 |
| 75 | 0.1481 | 1.44 | 3.33 | 0.399 | 0.6960 | 0.7405 | 1.481 |
| 80 | 0.1256 | 1.57 | 3.25 | 0.339 | 0.5905 | 0.6282 | 1.256 |
| 85 | 0.1070 | 1.69 | 3.16 | 0.289 | 0.5031 | 0.5352 | 1.070 |
| 90 | 0.09154 | 1.81 | 3.09 | 0.247 | 0.4303 | 0.4577 | 0.9154 |
| 95 | 0.07860 | 1.93 | 3.01 | 0.212 | 0.3694 | 0.3930 | 0.7860 |
| 100 | 0.06773 | 2.04 | 2.94 | 0.182 | 0.3183 | 0.3387 | 0.6773 |
| 105 | 0.05858 | 2.15 | 2.87 | 0.158 | 0.2753 | 0.2929 | 0.5858 |
| 110 | 0.05083 | 2.26 | 2.80 | 0.137 | 0.2389 | 0.2542 | 0.5083 |
| 115 | 0.04426 | 2.37 | 2.73 | 0.1195 | 0.2080 | 0.2213 | 0.4426 |
| 120 | 0.03866 | 2.47 | 2.67 | 0.1044 | 0.1817 | 0.1933 | 0.3866 |
| 125 | 0.03387 | 2.57 | 2.61 | 0.0915 | 0.1592 | 0.1694 | 0.3387 |
| 130 | 0.02977 | 2.67 | 2.55 | 0.0804 | 0.1399 | 0.1488 | 0.2977 |
| 135 | 0.02624 | 2.77 | 2.49 | 0.0709 | 0.1233 | 0.1312 | 0.2624 |
| 140 | 0.02319 | 2.86 | 2.43 | 0.0626 | 0.1090 | 0.1160 | 0.2319 |
| 145 | 0.02055 | 2.96 | 2.38 | 0.0555 | 0.0966 | 0.1028 | 0.2055 |
| 150 | 0.01826 | 3.05 | 2.33 | 0.0493 | 0.0858 | 0.0913 | 0.1826 |



For complete Curve Computation, visit: <http://www.vishay.com/thermistors/curve-computation-list/>

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 12 kΩ AND 22 kΩ | | | | | |
|---|--------------|---|--------------|---|--------|
| T_{AMB} (°C) | R_T/R_{25} | ΔR DUE TO B-TOLERANCE (%) | TCR (%/K) | R_{25} | |
| | | | | 2381 640; see note 1 at end of tables | |
| | | | | 5.123 | 5.223 |
| - 40 | 25.78 | 6.81 | 6.09 | 309.4 | 567.2 |
| - 35 | 19.13 | 6.16 | 5.89 | 229.5 | 420.8 |
| - 30 | 14.32 | 5.53 | 5.70 | 171.8 | 315.0 |
| - 25 | 10.82 | 4.93 | 5.52 | 129.8 | 238.0 |
| - 20 | 8.245 | 4.35 | 5.35 | 98.93 | 181.4 |
| - 15 | 6.335 | 3.80 | 5.19 | 76.02 | 139.4 |
| - 10 | 4.907 | 3.26 | 5.03 | 58.88 | 107.9 |
| - 5 | 3.830 | 2.74 | 4.88 | 45.95 | 84.25 |
| 0 | 3.011 | 2.24 | 4.73 | 36.13 | 66.24 |
| 5 | 2.384 | 1.76 | 4.60 | 28.60 | 52.45 |
| 10 | 1.900 | 1.30 | 4.46 | 22.80 | 41.81 |
| 15 | 1.525 | 0.85 | 4.34 | 18.30 | 33.55 |
| 20 | 1.231 | 0.42 | 4.21 | 14.77 | 27.09 |
| 25 | 1.000 | 0.00 | 4.10 | 12.00 | 22.00 |
| 30 | 0.8170 | 0.41 | 3.98 | 9.804 | 17.97 |
| 35 | 0.6712 | 0.80 | 3.88 | 8.054 | 14.77 |
| 40 | 0.5543 | 1.19 | 3.77 | 6.652 | 12.20 |
| 45 | 0.4602 | 1.57 | 3.67 | 5.522 | 10.12 |
| 50 | 0.3839 | 1.94 | 3.57 | 4.607 | 8.447 |
| 55 | 0.3219 | 2.30 | 3.48 | 3.862 | 7.081 |
| 60 | 0.2710 | 2.65 | 3.39 | 3.252 | 5.963 |
| 65 | 0.2293 | 2.99 | 3.30 | 2.751 | 5.044 |
| 70 | 0.1947 | 3.33 | 3.22 | 2.337 | 4.284 |
| 75 | 0.1661 | 3.66 | 3.14 | 1.993 | 3.654 |
| 80 | 0.1422 | 3.98 | 3.06 | 1.707 | 3.129 |
| 85 | 0.1223 | 4.29 | 2.99 | 1.467 | 2.690 |
| 90 | 0.1055 | 4.60 | 2.92 | 1.266 | 2.321 |
| 95 | 0.09135 | 4.90 | 2.85 | 1.096 | 2.010 |
| 100 | 0.07937 | 5.19 | 2.78 | 0.9524 | 1.746 |
| 105 | 0.06919 | 5.48 | 2.71 | 0.8302 | 1.522 |
| 110 | 0.06050 | 5.76 | 2.65 | 0.7260 | 1.331 |
| 115 | 0.05307 | 6.04 | 2.59 | 0.6369 | 1.168 |
| 120 | 0.04670 | 6.31 | 2.53 | 0.5604 | 1.027 |
| 125 | 0.04121 | 6.57 | 2.47 | 0.4945 | 0.9065 |

For complete Curve Computation, visit: <http://www.vishay.com/thermistors/curve-computation-list/>

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 47 kΩ | | | | |
|---|--------------|---|--------------|---|
| T_{AMB} (°C) | R_T/R_{25} | ΔR DUE TO B-TOLERANCE (%) | TCR (%/K) | R_{25} |
| | | | | 2381 640; see note 1 at end of tables |
| | | | | 5.473 |
| - 40 | 33.81 | 5.55 | 6.55 | 1589 |
| - 35 | 24.50 | 5.02 | 6.34 | 1151 |
| - 30 | 17.93 | 4.52 | 6.15 | 842.8 |
| - 25 | 13.25 | 4.03 | 5.96 | 622.6 |
| - 20 | 9.875 | 3.56 | 5.78 | 464.1 |
| - 15 | 7.425 | 3.10 | 5.61 | 349.0 |
| - 10 | 5.630 | 2.67 | 5.45 | 264.6 |
| - 5 | 4.304 | 2.24 | 5.29 | 202.3 |
| 0 | 3.315 | 1.84 | 5.14 | 155.8 |
| 5 | 2.573 | 1.44 | 4.99 | 120.9 |
| 10 | 2.011 | 1.07 | 4.85 | 94.53 |
| 15 | 1.583 | 0.70 | 4.72 | 74.40 |
| 20 | 1.254 | 0.34 | 4.59 | 58.95 |
| 25 | 1.000 | 0.00 | 4.46 | 47.00 |
| 30 | 0.8024 | 0.33 | 4.34 | 37.71 |
| 35 | 0.6474 | 0.66 | 4.23 | 30.43 |
| 40 | 0.5255 | 0.98 | 4.12 | 24.70 |
| 45 | 0.4288 | 1.28 | 4.01 | 20.15 |
| 50 | 0.3518 | 1.59 | 3.91 | 16.53 |
| 55 | 0.2901 | 1.88 | 3.81 | 13.63 |
| 60 | 0.2403 | 2.17 | 3.71 | 11.30 |
| 65 | 0.2001 | 2.45 | 3.62 | 9.404 |
| 70 | 0.1674 | 2.72 | 3.53 | 7.865 |
| 75 | 0.1406 | 2.99 | 3.44 | 6.607 |
| 80 | 0.1186 | 3.25 | 3.36 | 5.573 |
| 85 | 0.1004 | 3.51 | 3.28 | 4.721 |
| 90 | 0.08542 | 3.76 | 3.20 | 4.015 |
| 95 | 0.07292 | 4.00 | 3.13 | 3.427 |
| 100 | 0.06248 | 4.24 | 3.06 | 2.936 |
| 105 | 0.05372 | 4.47 | 2.98 | 2.525 |
| 110 | 0.04635 | 4.70 | 2.92 | 2.179 |
| 115 | 0.04013 | 4.93 | 2.85 | 1.886 |
| 120 | 0.03485 | 5.15 | 2.79 | 1.638 |
| 125 | 0.03037 | 5.36 | 2.73 | 1.427 |
| 130 | 0.02654 | 5.57 | 2.67 | 1.247 |
| 135 | 0.02326 | 5.78 | 2.61 | 1.093 |
| 140 | 0.02044 | 5.98 | 2.55 | 0.9608 |
| 145 | 0.01802 | 6.18 | 2.50 | 0.8468 |
| 150 | 0.01592 | 6.37 | 2.44 | 0.7483 |



For complete Curve Computation, visit: <http://www.vishay.com/thermistors/curve-computation-list/>

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 68 kΩ AND 100 kΩ | | | | | |
|--|--------------|---|--------------|---|-------|
| T_{AMB} (°C) | R_T/R_{25} | ΔR DUE TO B-TOLERANCE (%) | TCR (%/K) | R_{25} | |
| | | | | 2381 640; see note 1 at end of tables | |
| | | | | 6.683 | 6.104 |
| - 40 | 36.66 | 5.69 | 6.70 | 2493 | 3666 |
| - 35 | 26.38 | 5.15 | 6.49 | 1794 | 2638 |
| - 30 | 19.17 | 4.63 | 6.29 | 1303 | 1917 |
| - 25 | 14.06 | 4.13 | 6.10 | 956.2 | 1406 |
| - 20 | 10.41 | 3.65 | 5.92 | 708.0 | 1041 |
| - 15 | 7.779 | 3.18 | 5.74 | 528.9 | 777.9 |
| - 10 | 5.861 | 2.73 | 5.57 | 398.5 | 586.1 |
| - 5 | 4.453 | 2.30 | 5.41 | 302.8 | 445.3 |
| 0 | 3.409 | 1.88 | 5.26 | 231.8 | 340.9 |
| 5 | 2.631 | 1.48 | 5.11 | 178.9 | 263.1 |
| 10 | 2.044 | 1.09 | 4.97 | 139.0 | 204.4 |
| 15 | 1.600 | 0.72 | 4.83 | 108.8 | 160.0 |
| 20 | 1.261 | 0.35 | 4.70 | 85.74 | 126.1 |
| 25 | 1.000 | 0.00 | 4.57 | 68.00 | 100.0 |
| 30 | 0.7981 | 0.34 | 4.45 | 54.27 | 79.81 |
| 35 | 0.6408 | 0.67 | 4.35 | 43.57 | 64.08 |
| 40 | 0.5175 | 1.00 | 4.22 | 35.19 | 51.74 |
| 45 | 0.4202 | 1.32 | 4.11 | 28.57 | 42.02 |
| 50 | 0.3431 | 1.63 | 4.00 | 23.33 | 34.31 |
| 55 | 0.2816 | 1.93 | 3.90 | 19.15 | 28.16 |
| 60 | 0.2322 | 2.22 | 3.80 | 15.79 | 23.22 |
| 65 | 0.1925 | 2.51 | 3.71 | 13.09 | 19.25 |
| 70 | 0.1602 | 2.79 | 3.62 | 10.90 | 16.03 |
| 75 | 0.1340 | 3.06 | 3.53 | 9.114 | 13.40 |
| 80 | 0.1126 | 3.33 | 3.45 | 7.655 | 11.26 |
| 85 | 0.09496 | 3.59 | 3.36 | 6.457 | 9.496 |
| 90 | 0.08042 | 3.85 | 3.28 | 5.469 | 8.042 |
| 95 | 0.06837 | 4.10 | 3.21 | 4.649 | 6.837 |
| 100 | 0.05835 | 4.35 | 3.13 | 3.968 | 5.835 |
| 105 | 0.04998 | 4.59 | 3.06 | 3.399 | 4.998 |
| 110 | 0.04296 | 4.82 | 2.99 | 2.921 | 4.296 |
| 115 | 0.03705 | 5.05 | 2.92 | 2.519 | 3.705 |
| 120 | 0.03206 | 5.28 | 2.86 | 2.180 | 3.206 |
| 125 | 0.02783 | 5.50 | 2.80 | 1.892 | 2.783 |

For complete Curve Computation, visit: <http://www.vishay.com/thermistors/curve-computation-list/>

| RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 470 kΩ | | | | |
|--|--------------|---|--------------|---|
| T_{AMB} (°C) | R_T/R_{25} | ΔR DUE TO B-TOLERANCE (%) | TCR (%/K) | R_{25} |
| | | | | 2381 640; see note 1 at end of tables |
| | | | | 5.474 |
| - 40 | 48.62 | 6.22 | 7.13 | 22 850 |
| - 35 | 34.19 | 5.63 | 6.91 | 16 068 |
| - 30 | 24.28 | 5.06 | 6.71 | 11 413 |
| - 25 | 17.42 | 4.51 | 6.52 | 8 185 |
| - 20 | 12.61 | 3.98 | 6.33 | 5926 |
| - 15 | 9.211 | 3.47 | 6.15 | 4329 |
| - 10 | 6.788 | 2.98 | 5.98 | 3190 |
| - 5 | 5.045 | 2.51 | 5.82 | 2371 |
| 0 | 3.781 | 2.06 | 5.66 | 1776 |
| 5 | 2.855 | 1.62 | 5.50 | 1342 |
| 10 | 2.173 | 1.19 | 5.36 | 1021 |
| 15 | 1.666 | 0.78 | 5.22 | 783.0 |
| 20 | 1.286 | 0.38 | 5.08 | 604.6 |
| 25 | 1.000 | 0.00 | 4.95 | 470.0 |
| 30 | 0.7825 | 0.37 | 4.82 | 367.8 |
| 35 | 0.6163 | 0.74 | 4.70 | 289.6 |
| 40 | 0.4883 | 1.09 | 4.59 | 229.5 |
| 45 | 0.3892 | 1.44 | 4.47 | 182.9 |
| 50 | 0.3120 | 1.77 | 4.36 | 146.7 |
| 55 | 0.2515 | 2.10 | 4.26 | 118.2 |
| 60 | 0.2038 | 2.43 | 4.15 | 95.80 |
| 65 | 0.1660 | 2.74 | 4.06 | 78.03 |
| 70 | 0.1359 | 3.05 | 3.96 | 63.88 |
| 75 | 0.1118 | 3.35 | 3.87 | 52.55 |
| 80 | 0.09240 | 3.64 | 3.78 | 43.43 |
| 85 | 0.07670 | 3.93 | 3.69 | 36.05 |
| 90 | 0.06395 | 4.21 | 3.61 | 30.06 |
| 95 | 0.05354 | 4.48 | 3.53 | 25.16 |
| 100 | 0.04501 | 4.75 | 3.45 | 21.15 |
| 105 | 0.03798 | 5.01 | 3.37 | 17.85 |
| 110 | 0.03218 | 5.27 | 3.30 | 15.12 |
| 115 | 0.02736 | 5.52 | 3.23 | 12.86 |
| 120 | 0.02335 | 5.77 | 3.16 | 10.97 |
| 125 | 0.01999 | 6.01 | 3.09 | 9.396 |

Note:

(1) Replace dot in last 5 digits of catalog number by a number according to the following details and depending on tolerance on required R_{25} - value: 4 for a tolerance of $\pm 2\%$; 6 for a tolerance of $\pm 3\%$; 3 for a tolerance of $\pm 5\%$; 2 for a tolerance of $\pm 10\%$.



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