



## **NTC thermistors for temperature measurement**

SMD NTC thermistors  
with nickel barrier termination,  
case size 0603

**Series/Type:**      **B573\*\*V**  
**Date:**              March 2006

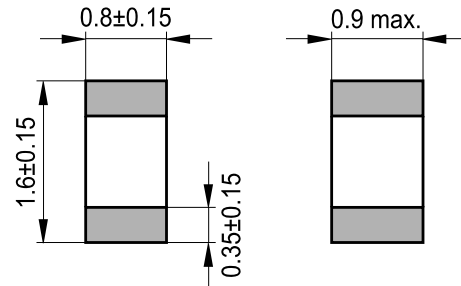
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**SMD**
**Applications**

- Temperature measurement and compensation in
  - mobile phone applications (e.g. battery pack, TCXO, LCD)
  - data systems
  - automotive electronics

**Features**

- Multilayer SMD NTC with inner electrodes
- Excellent long-term ageing stability in high-temperature and high-humidity environment
- Superior resistance stability during soldering (change <1%)

**Dimensional drawing**


■ Termination

TNT0396-Y-E

 Dimensions in mm  
 Approx. weight 6 mg

**Options**

Alternative resistance ratings, resistance tolerance and B value tolerances available on request

**Delivery mode**

Cardboard tape, 180-mm reel (standard);  
 330-mm reel (on request)

**General technical data**

|                               |                    |                    |                |      |
|-------------------------------|--------------------|--------------------|----------------|------|
| Climatic category             | (IEC 60068-1)      |                    | 55/125/56      |      |
| Max. power                    | (at 25 °C, on PCB) | $P_{25}^{1)}$      | 180            | mW   |
| Resistance tolerance          |                    | $\Delta R_R/R_R$   | $\pm 3, \pm 5$ | %    |
| Rated temperature             |                    | $T_R$              | 25             | °C   |
| Dissipation factor            | (on PCB)           | $\delta_{th}^{1)}$ | approx. 3      | mW/K |
| Thermal cooling time constant | (on PCB)           | $\tau_c^{1)}$      | approx. 4      | s    |
| Heat capacity                 |                    | $C_{th}^{1)}$      | approx. 12     | mJ/K |

1) Depends on mounting situation


**Electrical specification and ordering codes**

| R <sub>25</sub><br>Ω | No. of R/T<br>characteristic | B <sub>25/50</sub><br>K | B <sub>25/85</sub><br>K | B <sub>25/100</sub><br>K | Ordering code   |
|----------------------|------------------------------|-------------------------|-------------------------|--------------------------|-----------------|
| 47                   | 8501                         | 3500                    | 3540                    | 3550 ±3%                 | B57311V2470+060 |
| 100                  | 8501                         | 3500                    | 3540                    | 3550 ±3%                 | B57311V2101+060 |
| 150                  | 8501                         | 3500                    | 3540                    | 3550 ±3%                 | B57311V2151+060 |
| 220                  | 8501                         | 3500                    | 3540                    | 3550 ±3%                 | B57311V2221+060 |
| 330                  | 8501                         | 3500                    | 3540                    | 3550 ±3%                 | B57311V2331+060 |
| 680                  | 8502                         | 3940                    | 3980                    | 4000 ±3%                 | B57321V2681+060 |
| 1.0 k                | 8502                         | 3940                    | 3980                    | 4000 ±3%                 | B57321V2102+060 |
| 1.5 k                | 8502                         | 3940                    | 3980                    | 4000 ±3%                 | B57321V2152+060 |
| 2.2 k                | 8502                         | 3940                    | 3980                    | 4000 ±3%                 | B57321V2222+060 |
| 4.7 k                | 8500                         | 3590                    | 3635                    | 3650 ±3%                 | B57301V2472+060 |
| 10 k                 | 8502                         | 3940                    | 3980                    | 4000 ±3%                 | B57321V2103+060 |
| 10 k                 | 8505                         | 3380                    | 3435                    | 3460 ±3%                 | B57351V2103+060 |
| 47 k                 | 8502                         | 3940                    | 3980                    | 4000 ±3%                 | B57321V2473+060 |

+ = Resistance tolerance

H = ±3%

J = ±5%


**Reliability data**

SMD NTC thermistors are tested in accordance with IEC 60068. The parts are mounted on a standardized PCB in accordance with IEC 60539-1.

| Test                               | Standard                     | Test conditions   | $\Delta R_{25}/R_{25}$<br>(typical) | Remarks                    |
|------------------------------------|------------------------------|---|-------------------------------------|----------------------------|
| Storage in dry heat                | IEC 60068-2-2<br>JIS C 0021  | Storage at upper category temperature<br>T: (125 ±2) °C<br>t: 1000 h  | < 2%                                |                            |
| Storage in damp heat, steady state | IEC 60068-2-78<br>JIS C 0022 | Temperature of air: (40 ±2) °C<br>Relative humidity of air: (93 +2/-3)%<br>Duration: 56 days  | < 2%                                |                            |
| Rapid temperature cycling          | IEC 60068-2-14<br>JIS C 0025 | Lower test temperature: -55 °C<br>Upper test temperature: 125 °C<br>Number of cycles: 100   | < 2%                                |                            |
| Endurance                          |                              | $P_{max}$ : 180 mW<br>T: (65 ±2) °C<br>t: 1000 h  | < 2%                                |                            |
| Solderability                      | IEC 60068-2-58<br>JIS C 0054 | Solderability:<br>(215 ±3) °C, (3 ±0.3) s<br>(235 ±5) °C, (2 ±0.2) s<br><br>Resistance to soldering heat:<br>(260 ±5) °C, (10 ±1) s |                                     | 95% of terminations wetted |
| Resistance drift after soldering   |                              | Reflow soldering profile<br>Wave soldering profile  | < 1%<br>< 2% <sup>2)</sup>          |                            |

2) For B57351V2103+060


**R/T characteristics**

| <b>B57311V2470H060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 47 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 2662   | 2232                 | 3092                 | 16.1                                 | 2.5        | 6.5        |
| -50.0                  | 1933   | 1642                 | 2224                 | 15.1                                 | 2.4        | 6.3        |
| -45.0                  | 1420   | 1221                 | 1619                 | 14.0                                 | 2.3        | 6.1        |
| -40.0                  | 1054   | 916.7                | 1191                 | 13.0                                 | 2.2        | 5.9        |
| -35.0                  | 789.9  | 694.8                | 885.1                | 12.0                                 | 2.1        | 5.7        |
| -30.0                  | 597.9  | 531.3                | 664.4                | 11.1                                 | 2.0        | 5.5        |
| -25.0                  | 456.6  | 409.8                | 503.4                | 10.2                                 | 1.9        | 5.3        |
| -20.0                  | 351.8  | 318.7                | 384.9                | 9.4                                  | 1.8        | 5.1        |
| -15.0                  | 273.3  | 249.9                | 296.8                | 8.6                                  | 1.7        | 5.0        |
| -10.0                  | 214.0  | 197.3                | 230.7                | 7.8                                  | 1.6        | 4.8        |
| -5.0                   | 168.9  | 157.0                | 180.8                | 7.0                                  | 1.5        | 4.7        |
| 0.0                    | 134.2  | 125.7                | 142.7                | 6.3                                  | 1.4        | 4.5        |
| 5.0                    | 107.4  | 101.4                | 113.5                | 5.6                                  | 1.3        | 4.4        |
| 10.0                   | 86.56  | 82.28                | 90.84                | 4.9                                  | 1.2        | 4.3        |
| 15.0                   | 70.19  | 67.18                | 73.20                | 4.3                                  | 1.0        | 4.1        |
| 20.0                   | 57.27  | 55.17                | 59.36                | 3.7                                  | 0.9        | 4.0        |
| <b>25.0</b>            | <b>47.00</b>   | <b>45.59</b>         | <b>48.41</b>         | <b>3.0</b>                           | <b>0.8</b> | <b>3.9</b> |
| 30.0                   | 38.79  | 37.38                | 40.20                | 3.6                                  | 1.0        | 3.8        |
| 35.0                   | 32.19  | 30.84                | 33.55                | 4.2                                  | 1.1        | 3.7        |
| 40.0                   | 26.86  | 25.58                | 28.13                | 4.8                                  | 1.3        | 3.6        |
| 45.0                   | 22.52  | 21.32                | 23.71                | 5.3                                  | 1.5        | 3.5        |
| 50.0                   | 18.97  | 17.87                | 20.07                | 5.8                                  | 1.7        | 3.4        |
| 55.0                   | 16.05  | 15.04                | 17.07                | 6.3                                  | 1.9        | 3.3        |
| 60.0                   | 13.65  | 12.72                | 14.58                | 6.8                                  | 2.1        | 3.2        |
| 65.0                   | 11.65  | 10.81                | 12.50                | 7.3                                  | 2.3        | 3.1        |
| 70.0                   | 9.992  | 9.219                | 10.76                | 7.7                                  | 2.5        | 3.0        |
| 75.0                   | 8.601  | 7.897                | 9.304                | 8.2                                  | 2.8        | 3.0        |
| 80.0                   | 7.432  | 6.792                | 8.072                | 8.6                                  | 3.0        | 2.9        |
| 85.0                   | 6.446  | 5.864                | 7.028                | 9.0                                  | 3.2        | 2.8        |
| 90.0                   | 5.611  | 5.081                | 6.141                | 9.4                                  | 3.4        | 2.7        |
| 95.0                   | 4.901  | 4.418                | 5.383                | 9.8                                  | 3.7        | 2.7        |
| 100.0                  | 4.295  | 3.855                | 4.734                | 10.2                                 | 3.9        | 2.6        |
| 105.0                  | 3.776  | 3.375                | 4.176                | 10.6                                 | 4.2        | 2.5        |
| 110.0                  | 3.330  | 2.964                | 3.695                | 11.0                                 | 4.4        | 2.5        |
| 115.0                  | 2.945  | 2.612                | 3.279                | 11.3                                 | 4.7        | 2.4        |
| 120.0                  | 2.613  | 2.308                | 2.918                | 11.7                                 | 4.9        | 2.4        |
| 125.0                  | 2.324  | 2.045                | 2.604                | 12.0                                 | 5.2        | 2.3        |



| <b>B57311V2470J060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 47 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 2662   | 2179                 | 3145                 | 18.1                                 | 2.8        | 6.5        |
| -50.0                  | 1933   | 1604                 | 2263                 | 17.1                                 | 2.7        | 6.3        |
| -45.0                  | 1420   | 1193                 | 1647                 | 16.0                                 | 2.6        | 6.1        |
| -40.0                  | 1054   | 895.6                | 1212                 | 15.0                                 | 2.6        | 5.9        |
| -35.0                  | 789.9  | 679.0                | 900.9                | 14.0                                 | 2.5        | 5.7        |
| -30.0                  | 597.9  | 519.4                | 676.4                | 13.1                                 | 2.4        | 5.5        |
| -25.0                  | 456.6  | 400.7                | 512.6                | 12.2                                 | 2.3        | 5.3        |
| -20.0                  | 351.8  | 311.7                | 391.9                | 11.4                                 | 2.2        | 5.1        |
| -15.0                  | 273.3  | 244.4                | 302.2                | 10.6                                 | 2.1        | 5.0        |
| -10.0                  | 214.0  | 193.0                | 235.0                | 9.8                                  | 2.0        | 4.8        |
| -5.0                   | 168.9  | 153.6                | 184.2                | 9.0                                  | 1.9        | 4.7        |
| 0.0                    | 134.2  | 123.1                | 145.4                | 8.3                                  | 1.8        | 4.5        |
| 5.0                    | 107.4  | 99.24                | 115.6                | 7.6                                  | 1.7        | 4.4        |
| 10.0                   | 86.56  | 80.55                | 92.57                | 6.9                                  | 1.6        | 4.3        |
| 15.0                   | 70.19  | 65.77                | 74.60                | 6.3                                  | 1.5        | 4.1        |
| 20.0                   | 57.27  | 54.03                | 60.51                | 5.7                                  | 1.4        | 4.0        |
| <b>25.0</b>            | <b>47.00</b>   | <b>44.65</b>         | <b>49.35</b>         | <b>5.0</b>                           | <b>1.3</b> | <b>3.9</b> |
| 30.0                   | 38.79  | 36.60                | 40.98                | 5.6                                  | 1.5        | 3.8        |
| 35.0                   | 32.19  | 30.19                | 34.19                | 6.2                                  | 1.7        | 3.7        |
| 40.0                   | 26.86  | 25.04                | 28.67                | 6.8                                  | 1.9        | 3.6        |
| 45.0                   | 22.52  | 20.87                | 24.16                | 7.3                                  | 2.1        | 3.5        |
| 50.0                   | 18.97  | 17.49                | 20.45                | 7.8                                  | 2.3        | 3.4        |
| 55.0                   | 16.05  | 14.72                | 17.39                | 8.3                                  | 2.5        | 3.3        |
| 60.0                   | 13.65  | 12.45                | 14.85                | 8.8                                  | 2.7        | 3.2        |
| 65.0                   | 11.65  | 10.57                | 12.73                | 9.3                                  | 3.0        | 3.1        |
| 70.0                   | 9.992  | 9.019                | 10.96                | 9.7                                  | 3.2        | 3.0        |
| 75.0                   | 8.601  | 7.725                | 9.476                | 10.2                                 | 3.4        | 3.0        |
| 80.0                   | 7.432  | 6.643                | 8.221                | 10.6                                 | 3.7        | 2.9        |
| 85.0                   | 6.446  | 5.735                | 7.157                | 11.0                                 | 3.9        | 2.8        |
| 90.0                   | 5.611  | 4.969                | 6.253                | 11.4                                 | 4.2        | 2.7        |
| 95.0                   | 4.901  | 4.320                | 5.481                | 11.8                                 | 4.4        | 2.7        |
| 100.0                  | 4.295  | 3.769                | 4.820                | 12.2                                 | 4.7        | 2.6        |
| 105.0                  | 3.776  | 3.300                | 4.252                | 12.6                                 | 5.0        | 2.5        |
| 110.0                  | 3.330  | 2.898                | 3.762                | 13.0                                 | 5.2        | 2.5        |
| 115.0                  | 2.945  | 2.553                | 3.338                | 13.3                                 | 5.5        | 2.4        |
| 120.0                  | 2.613  | 2.255                | 2.970                | 13.7                                 | 5.8        | 2.4        |
| 125.0                  | 2.324  | 1.998                | 2.650                | 14.0                                 | 6.1        | 2.3        |



| <b>B57311V2101H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 100 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 5663  | 4749                 | 6578                 | 16.1                                 | 2.5        | 6.5        |
| -50.0                  | 4113  | 3494                 | 4733                 | 15.1                                 | 2.4        | 6.3        |
| -45.0                  | 3021  | 2598                 | 3444                 | 14.0                                 | 2.3        | 6.1        |
| -40.0                  | 2242  | 1950                 | 2534                 | 13.0                                 | 2.2        | 5.9        |
| -35.0                  | 1681  | 1478                 | 1883                 | 12.0                                 | 2.1        | 5.7        |
| -30.0                  | 1272  | 1130                 | 1414                 | 11.1                                 | 2.0        | 5.5        |
| -25.0                  | 971.6   | 872.0                | 1071                 | 10.2                                 | 1.9        | 5.3        |
| -20.0                  | 748.5   | 678.2                | 818.9                | 9.4                                  | 1.8        | 5.1        |
| -15.0                  | 581.5   | 531.6                | 631.4                | 8.6                                  | 1.7        | 5.0        |
| -10.0                  | 455.4   | 419.8                | 490.9                | 7.8                                  | 1.6        | 4.8        |
| -5.0                   | 359.3   | 334.0                | 384.6                | 7.0                                  | 1.5        | 4.7        |
| 0.0                    | 285.6   | 267.5                | 303.6                | 6.3                                  | 1.4        | 4.5        |
| 5.0                    | 228.6   | 215.7                | 241.4                | 5.6                                  | 1.3        | 4.4        |
| 10.0                   | 184.2   | 175.1                | 193.3                | 4.9                                  | 1.2        | 4.3        |
| 15.0                   | 149.3   | 142.9                | 155.7                | 4.3                                  | 1.0        | 4.1        |
| 20.0                   | 121.8   | 117.4                | 126.3                | 3.7                                  | 0.9        | 4.0        |
| <b>25.0</b>            | <b>100.00</b>   | <b>97.00</b>         | <b>103.0</b>         | <b>3.0</b>                           | <b>0.8</b> | <b>3.9</b> |
| 30.0                   | 82.54   | 79.53                | 85.54                | 3.6                                  | 1.0        | 3.8        |
| 35.0                   | 68.49   | 65.61                | 71.38                | 4.2                                  | 1.1        | 3.7        |
| 40.0                   | 57.14   | 54.42                | 59.86                | 4.8                                  | 1.3        | 3.6        |
| 45.0                   | 47.91   | 45.37                | 50.44                | 5.3                                  | 1.5        | 3.5        |
| 50.0                   | 40.36   | 38.01                | 42.70                | 5.8                                  | 1.7        | 3.4        |
| 55.0                   | 34.16   | 32.00                | 36.32                | 6.3                                  | 1.9        | 3.3        |
| 60.0                   | 29.04   | 27.06                | 31.02                | 6.8                                  | 2.1        | 3.2        |
| 65.0                   | 24.80   | 22.99                | 26.60                | 7.3                                  | 2.3        | 3.1        |
| 70.0                   | 21.26   | 19.61                | 22.90                | 7.7                                  | 2.5        | 3.0        |
| 75.0                   | 18.30   | 16.80                | 19.80                | 8.2                                  | 2.8        | 3.0        |
| 80.0                   | 15.81   | 14.45                | 17.17                | 8.6                                  | 3.0        | 2.9        |
| 85.0                   | 13.71   | 12.48                | 14.95                | 9.0                                  | 3.2        | 2.8        |
| 90.0                   | 11.94   | 10.81                | 13.07                | 9.4                                  | 3.4        | 2.7        |
| 95.0                   | 10.43   | 9.401                | 11.45                | 9.8                                  | 3.7        | 2.7        |
| 100.0                  | 9.137   | 8.203                | 10.07                | 10.2                                 | 3.9        | 2.6        |
| 105.0                  | 8.033   | 7.181                | 8.885                | 10.6                                 | 4.2        | 2.5        |
| 110.0                  | 7.085   | 6.307                | 7.862                | 11.0                                 | 4.4        | 2.5        |
| 115.0                  | 6.267   | 5.556                | 6.977                | 11.3                                 | 4.7        | 2.4        |
| 120.0                  | 5.559   | 4.910                | 6.209                | 11.7                                 | 4.9        | 2.4        |
| 125.0                  | 4.945   | 4.351                | 5.540                | 12.0                                 | 5.2        | 2.3        |



| <b>B57311V2101J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 100 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 5663  | 4635                 | 6691                 | 18.1                                 | 2.8        | 6.5        |
| -50.0                  | 4113  | 3412                 | 4815                 | 17.1                                 | 2.7        | 6.3        |
| -45.0                  | 3021  | 2537                 | 3504                 | 16.0                                 | 2.6        | 6.1        |
| -40.0                  | 2242  | 1906                 | 2579                 | 15.0                                 | 2.6        | 5.9        |
| -35.0                  | 1681  | 1445                 | 1917                 | 14.0                                 | 2.5        | 5.7        |
| -30.0                  | 1272  | 1105                 | 1439                 | 13.1                                 | 2.4        | 5.5        |
| -25.0                  | 971.6   | 852.6                | 1091                 | 12.2                                 | 2.3        | 5.3        |
| -20.0                  | 748.5   | 663.2                | 833.9                | 11.4                                 | 2.2        | 5.1        |
| -15.0                  | 581.5   | 520.0                | 643.1                | 10.6                                 | 2.1        | 5.0        |
| -10.0                  | 455.4   | 410.7                | 500.0                | 9.8                                  | 2.0        | 4.8        |
| -5.0                   | 359.3   | 326.8                | 391.8                | 9.0                                  | 1.9        | 4.7        |
| 0.0                    | 285.6   | 261.8                | 309.3                | 8.3                                  | 1.8        | 4.5        |
| 5.0                    | 228.6   | 211.2                | 246.0                | 7.6                                  | 1.7        | 4.4        |
| 10.0                   | 184.2   | 171.4                | 196.9                | 6.9                                  | 1.6        | 4.3        |
| 15.0                   | 149.3   | 139.9                | 158.7                | 6.3                                  | 1.5        | 4.1        |
| 20.0                   | 121.8   | 114.9                | 128.7                | 5.7                                  | 1.4        | 4.0        |
| <b>25.0</b>            | <b>100.00</b>   | <b>95.00</b>         | <b>105.0</b>         | <b>5.0</b>                           | <b>1.3</b> | <b>3.9</b> |
| 30.0                   | 82.54   | 77.88                | 87.19                | 5.6                                  | 1.5        | 3.8        |
| 35.0                   | 68.49   | 64.24                | 72.75                | 6.2                                  | 1.7        | 3.7        |
| 40.0                   | 57.14   | 53.28                | 61.00                | 6.8                                  | 1.9        | 3.6        |
| 45.0                   | 47.91   | 44.41                | 51.40                | 7.3                                  | 2.1        | 3.5        |
| 50.0                   | 40.36   | 37.20                | 43.51                | 7.8                                  | 2.3        | 3.4        |
| 55.0                   | 34.16   | 31.32                | 37.00                | 8.3                                  | 2.5        | 3.3        |
| 60.0                   | 29.04   | 26.48                | 31.60                | 8.8                                  | 2.7        | 3.2        |
| 65.0                   | 24.80   | 22.50                | 27.10                | 9.3                                  | 3.0        | 3.1        |
| 70.0                   | 21.26   | 19.19                | 23.33                | 9.7                                  | 3.2        | 3.0        |
| 75.0                   | 18.30   | 16.44                | 20.16                | 10.2                                 | 3.4        | 3.0        |
| 80.0                   | 15.81   | 14.13                | 17.49                | 10.6                                 | 3.7        | 2.9        |
| 85.0                   | 13.71   | 12.20                | 15.23                | 11.0                                 | 3.9        | 2.8        |
| 90.0                   | 11.94   | 10.57                | 13.30                | 11.4                                 | 4.2        | 2.7        |
| 95.0                   | 10.43   | 9.192                | 11.66                | 11.8                                 | 4.4        | 2.7        |
| 100.0                  | 9.137   | 8.020                | 10.25                | 12.2                                 | 4.7        | 2.6        |
| 105.0                  | 8.033   | 7.021                | 9.046                | 12.6                                 | 5.0        | 2.5        |
| 110.0                  | 7.085   | 6.165                | 8.004                | 13.0                                 | 5.2        | 2.5        |
| 115.0                  | 6.267   | 5.431                | 7.102                | 13.3                                 | 5.5        | 2.4        |
| 120.0                  | 5.559   | 4.799                | 6.320                | 13.7                                 | 5.8        | 2.4        |
| 125.0                  | 4.945   | 4.252                | 5.639                | 14.0                                 | 6.1        | 2.3        |





| <b>B57311V2151H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 150 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 8495  | 7123                 | 9867                 | 16.1                                 | 2.5        | 6.5        |
| -50.0                  | 6170  | 5241                 | 7099                 | 15.1                                 | 2.4        | 6.3        |
| -45.0                  | 4531  | 3896                 | 5166                 | 14.0                                 | 2.3        | 6.1        |
| -40.0                  | 3363  | 2926                 | 3800                 | 13.0                                 | 2.2        | 5.9        |
| -35.0                  | 2521  | 2217                 | 2825                 | 12.0                                 | 2.1        | 5.7        |
| -30.0                  | 1908  | 1696                 | 2120                 | 11.1                                 | 2.0        | 5.5        |
| -25.0                  | 1457  | 1308                 | 1607                 | 10.2                                 | 1.9        | 5.3        |
| -20.0                  | 1123  | 1017                 | 1228                 | 9.4                                  | 1.8        | 5.1        |
| -15.0                  | 872.3   | 797.4                | 947.2                | 8.6                                  | 1.7        | 5.0        |
| -10.0                  | 683.1   | 629.8                | 736.3                | 7.8                                  | 1.6        | 4.8        |
| -5.0                   | 539.0   | 501.0                | 576.9                | 7.0                                  | 1.5        | 4.7        |
| 0.0                    | 428.4   | 401.3                | 455.4                | 6.3                                  | 1.4        | 4.5        |
| 5.0                    | 342.9   | 323.6                | 362.1                | 5.6                                  | 1.3        | 4.4        |
| 10.0                   | 276.2   | 262.6                | 289.9                | 4.9                                  | 1.2        | 4.3        |
| 15.0                   | 224.0   | 214.4                | 233.6                | 4.3                                  | 1.0        | 4.1        |
| 20.0                   | 182.8   | 176.1                | 189.5                | 3.7                                  | 0.9        | 4.0        |
| <b>25.0</b>            | <b>150.0</b>  | <b>145.5</b>         | <b>154.5</b>         | <b>3.0</b>                           | <b>0.8</b> | <b>3.9</b> |
| 30.0                   | 123.8   | 119.3                | 128.3                | 3.6                                  | 1.0        | 3.8        |
| 35.0                   | 102.7   | 98.42                | 107.1                | 4.2                                  | 1.1        | 3.7        |
| 40.0                   | 85.71   | 81.63                | 89.79                | 4.8                                  | 1.3        | 3.6        |
| 45.0                   | 71.86   | 68.05                | 75.66                | 5.3                                  | 1.5        | 3.5        |
| 50.0                   | 60.54   | 57.02                | 64.06                | 5.8                                  | 1.7        | 3.4        |
| 55.0                   | 51.24   | 48.00                | 54.47                | 6.3                                  | 1.9        | 3.3        |
| 60.0                   | 43.56   | 40.60                | 46.52                | 6.8                                  | 2.1        | 3.2        |
| 65.0                   | 37.19   | 34.49                | 39.90                | 7.3                                  | 2.3        | 3.1        |
| 70.0                   | 31.89   | 29.42                | 34.35                | 7.7                                  | 2.5        | 3.0        |
| 75.0                   | 27.45   | 25.20                | 29.69                | 8.2                                  | 2.8        | 3.0        |
| 80.0                   | 23.72   | 21.68                | 25.76                | 8.6                                  | 3.0        | 2.9        |
| 85.0                   | 20.57   | 18.71                | 22.43                | 9.0                                  | 3.2        | 2.8        |
| 90.0                   | 17.91   | 16.22                | 19.60                | 9.4                                  | 3.4        | 2.7        |
| 95.0                   | 15.64   | 14.10                | 17.18                | 9.8                                  | 3.7        | 2.7        |
| 100.0                  | 13.71   | 12.30                | 15.11                | 10.2                                 | 3.9        | 2.6        |
| 105.0                  | 12.05   | 10.77                | 13.33                | 10.6                                 | 4.2        | 2.5        |
| 110.0                  | 10.63   | 9.461                | 11.79                | 11.0                                 | 4.4        | 2.5        |
| 115.0                  | 9.400   | 8.335                | 10.47                | 11.3                                 | 4.7        | 2.4        |
| 120.0                  | 8.339   | 7.365                | 9.313                | 11.7                                 | 4.9        | 2.4        |
| 125.0                  | 7.418   | 6.526                | 8.310                | 12.0                                 | 5.2        | 2.3        |



| <b>B57311V2151J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 150 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 8495  | 6953                 | 10037                | 18.1                                 | 2.8        | 6.5        |
| -50.0                  | 6170  | 5118                 | 7222                 | 17.1                                 | 2.7        | 6.3        |
| -45.0                  | 4531  | 3806                 | 5257                 | 16.0                                 | 2.6        | 6.1        |
| -40.0                  | 3363  | 2858                 | 3868                 | 15.0                                 | 2.6        | 5.9        |
| -35.0                  | 2521  | 2167                 | 2875                 | 14.0                                 | 2.5        | 5.7        |
| -30.0                  | 1908  | 1658                 | 2159                 | 13.1                                 | 2.4        | 5.5        |
| -25.0                  | 1457  | 1279                 | 1636                 | 12.2                                 | 2.3        | 5.3        |
| -20.0                  | 1123  | 994.8                | 1251                 | 11.4                                 | 2.2        | 5.1        |
| -15.0                  | 872.3   | 779.9                | 964.6                | 10.6                                 | 2.1        | 5.0        |
| -10.0                  | 683.1   | 616.1                | 750.0                | 9.8                                  | 2.0        | 4.8        |
| -5.0                   | 539.0   | 490.2                | 587.7                | 9.0                                  | 1.9        | 4.7        |
| 0.0                    | 428.4   | 392.7                | 464.0                | 8.3                                  | 1.8        | 4.5        |
| 5.0                    | 342.9   | 316.7                | 369.0                | 7.6                                  | 1.7        | 4.4        |
| 10.0                   | 276.2   | 257.1                | 295.4                | 6.9                                  | 1.6        | 4.3        |
| 15.0                   | 224.0   | 209.9                | 238.1                | 6.3                                  | 1.5        | 4.1        |
| 20.0                   | 182.8   | 172.4                | 193.1                | 5.7                                  | 1.4        | 4.0        |
| <b>25.0</b>            | <b>150.0</b>  | <b>142.5</b>         | <b>157.5</b>         | <b>5.0</b>                           | <b>1.3</b> | <b>3.9</b> |
| 30.0                   | 123.8   | 116.8                | 130.8                | 5.6                                  | 1.5        | 3.8        |
| 35.0                   | 102.7   | 96.36                | 109.1                | 6.2                                  | 1.7        | 3.7        |
| 40.0                   | 85.71   | 79.91                | 91.50                | 6.8                                  | 1.9        | 3.6        |
| 45.0                   | 71.86   | 66.62                | 77.10                | 7.3                                  | 2.1        | 3.5        |
| 50.0                   | 60.54   | 55.81                | 65.27                | 7.8                                  | 2.3        | 3.4        |
| 55.0                   | 51.24   | 46.98                | 55.50                | 8.3                                  | 2.5        | 3.3        |
| 60.0                   | 43.56   | 39.73                | 47.39                | 8.8                                  | 2.7        | 3.2        |
| 65.0                   | 37.19   | 33.74                | 40.64                | 9.3                                  | 3.0        | 3.1        |
| 70.0                   | 31.89   | 28.78                | 34.99                | 9.7                                  | 3.2        | 3.0        |
| 75.0                   | 27.45   | 24.65                | 30.24                | 10.2                                 | 3.4        | 3.0        |
| 80.0                   | 23.72   | 21.20                | 26.24                | 10.6                                 | 3.7        | 2.9        |
| 85.0                   | 20.57   | 18.30                | 22.84                | 11.0                                 | 3.9        | 2.8        |
| 90.0                   | 17.91   | 15.86                | 19.96                | 11.4                                 | 4.2        | 2.7        |
| 95.0                   | 15.64   | 13.79                | 17.49                | 11.8                                 | 4.4        | 2.7        |
| 100.0                  | 13.71   | 12.03                | 15.38                | 12.2                                 | 4.7        | 2.6        |
| 105.0                  | 12.05   | 10.53                | 13.57                | 12.6                                 | 5.0        | 2.5        |
| 110.0                  | 10.63   | 9.248                | 12.01                | 13.0                                 | 5.2        | 2.5        |
| 115.0                  | 9.400   | 8.147                | 10.65                | 13.3                                 | 5.5        | 2.4        |
| 120.0                  | 8.339   | 7.198                | 9.480                | 13.7                                 | 5.8        | 2.4        |
| 125.0                  | 7.418   | 6.378                | 8.458                | 14.0                                 | 6.1        | 2.3        |



| <b>B57311V2221H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 220 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 12459   | 10447                | 14471                | 16.1                                 | 2.5        | 6.5        |
| -50.0                  | 9049  | 7687                 | 10412                | 15.1                                 | 2.4        | 6.3        |
| -45.0                  | 6646  | 5715                 | 7577                 | 14.0                                 | 2.3        | 6.1        |
| -40.0                  | 4932  | 4291                 | 5574                 | 13.0                                 | 2.2        | 5.9        |
| -35.0                  | 3698  | 3252                 | 4143                 | 12.0                                 | 2.1        | 5.7        |
| -30.0                  | 2799  | 2487                 | 3110                 | 11.1                                 | 2.0        | 5.5        |
| -25.0                  | 2137  | 1918                 | 2356                 | 10.2                                 | 1.9        | 5.3        |
| -20.0                  | 1647  | 1492                 | 1802                 | 9.4                                  | 1.8        | 5.1        |
| -15.0                  | 1279  | 1170                 | 1389                 | 8.6                                  | 1.7        | 5.0        |
| -10.0                  | 1002  | 923.7                | 1080                 | 7.8                                  | 1.6        | 4.8        |
| -5.0                   | 790.5   | 734.8                | 846.2                | 7.0                                  | 1.5        | 4.7        |
| 0.0                    | 628.3   | 588.6                | 668.0                | 6.3                                  | 1.4        | 4.5        |
| 5.0                    | 502.9   | 474.6                | 531.1                | 5.6                                  | 1.3        | 4.4        |
| 10.0                   | 405.2   | 385.1                | 425.2                | 4.9                                  | 1.2        | 4.3        |
| 15.0                   | 328.5   | 314.5                | 342.6                | 4.3                                  | 1.0        | 4.1        |
| 20.0                   | 268.1   | 258.2                | 277.9                | 3.7                                  | 0.9        | 4.0        |
| <b>25.0</b>            | <b>220.0</b>  | <b>213.4</b>         | <b>226.6</b>         | <b>3.0</b>                           | <b>0.8</b> | <b>3.9</b> |
| 30.0                   | 181.6   | 175.0                | 188.2                | 3.6                                  | 1.0        | 3.8        |
| 35.0                   | 150.7   | 144.3                | 157.0                | 4.2                                  | 1.1        | 3.7        |
| 40.0                   | 125.7   | 119.7                | 131.7                | 4.8                                  | 1.3        | 3.6        |
| 45.0                   | 105.4   | 99.81                | 111.0                | 5.3                                  | 1.5        | 3.5        |
| 50.0                   | 88.79   | 83.63                | 93.95                | 5.8                                  | 1.7        | 3.4        |
| 55.0                   | 75.15   | 70.40                | 79.89                | 6.3                                  | 1.9        | 3.3        |
| 60.0                   | 63.89   | 59.54                | 68.23                | 6.8                                  | 2.1        | 3.2        |
| 65.0                   | 54.55   | 50.58                | 58.52                | 7.3                                  | 2.3        | 3.1        |
| 70.0                   | 46.77   | 43.15                | 50.39                | 7.7                                  | 2.5        | 3.0        |
| 75.0                   | 40.26   | 36.97                | 43.55                | 8.2                                  | 2.8        | 3.0        |
| 80.0                   | 34.79   | 31.79                | 37.78                | 8.6                                  | 3.0        | 2.9        |
| 85.0                   | 30.17   | 27.45                | 32.90                | 9.0                                  | 3.2        | 2.8        |
| 90.0                   | 26.26   | 23.78                | 28.74                | 9.4                                  | 3.4        | 2.7        |
| 95.0                   | 22.94   | 20.68                | 25.20                | 9.8                                  | 3.7        | 2.7        |
| 100.0                  | 20.10   | 18.05                | 22.16                | 10.2                                 | 3.9        | 2.6        |
| 105.0                  | 17.67   | 15.80                | 19.55                | 10.6                                 | 4.2        | 2.5        |
| 110.0                  | 15.59   | 13.88                | 17.30                | 11.0                                 | 4.4        | 2.5        |
| 115.0                  | 13.79   | 12.22                | 15.35                | 11.3                                 | 4.7        | 2.4        |
| 120.0                  | 12.23   | 10.80                | 13.66                | 11.7                                 | 4.9        | 2.4        |
| 125.0                  | 10.88   | 9.572                | 12.19                | 12.0                                 | 5.2        | 2.3        |



| <b>B57311V2221J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 220 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 12459   | 10198                | 14721                | 18.1                                 | 2.8        | 6.5        |
| -50.0                  | 9049  | 7506                 | 10593                | 17.1                                 | 2.7        | 6.3        |
| -45.0                  | 6646  | 5582                 | 7710                 | 16.0                                 | 2.6        | 6.1        |
| -40.0                  | 4932  | 4192                 | 5673                 | 15.0                                 | 2.6        | 5.9        |
| -35.0                  | 3698  | 3178                 | 4217                 | 14.0                                 | 2.5        | 5.7        |
| -30.0                  | 2799  | 2431                 | 3166                 | 13.1                                 | 2.4        | 5.5        |
| -25.0                  | 2137  | 1876                 | 2399                 | 12.2                                 | 2.3        | 5.3        |
| -20.0                  | 1647  | 1459                 | 1835                 | 11.4                                 | 2.2        | 5.1        |
| -15.0                  | 1279  | 1144                 | 1415                 | 10.6                                 | 2.1        | 5.0        |
| -10.0                  | 1002  | 903.6                | 1100                 | 9.8                                  | 2.0        | 4.8        |
| -5.0                   | 790.5   | 719.0                | 862.0                | 9.0                                  | 1.9        | 4.7        |
| 0.0                    | 628.3   | 576.0                | 680.5                | 8.3                                  | 1.8        | 4.5        |
| 5.0                    | 502.9   | 464.5                | 541.2                | 7.6                                  | 1.7        | 4.4        |
| 10.0                   | 405.2   | 377.0                | 433.3                | 6.9                                  | 1.6        | 4.3        |
| 15.0                   | 328.5   | 307.9                | 349.2                | 6.3                                  | 1.5        | 4.1        |
| 20.0                   | 268.1   | 252.9                | 283.2                | 5.7                                  | 1.4        | 4.0        |
| <b>25.0</b>            | <b>220.0</b>  | <b>209.0</b>         | <b>231.0</b>         | <b>5.0</b>                           | <b>1.3</b> | <b>3.9</b> |
| 30.0                   | 181.6   | 171.3                | 191.8                | 5.6                                  | 1.5        | 3.8        |
| 35.0                   | 150.7   | 141.3                | 160.0                | 6.2                                  | 1.7        | 3.7        |
| 40.0                   | 125.7   | 117.2                | 134.2                | 6.8                                  | 1.9        | 3.6        |
| 45.0                   | 105.4   | 97.70                | 113.1                | 7.3                                  | 2.1        | 3.5        |
| 50.0                   | 88.79   | 81.85                | 95.73                | 7.8                                  | 2.3        | 3.4        |
| 55.0                   | 75.15   | 68.90                | 81.40                | 8.3                                  | 2.5        | 3.3        |
| 60.0                   | 63.89   | 58.26                | 69.51                | 8.8                                  | 2.7        | 3.2        |
| 65.0                   | 54.55   | 49.49                | 59.61                | 9.3                                  | 3.0        | 3.1        |
| 70.0                   | 46.77   | 42.22                | 51.32                | 9.7                                  | 3.2        | 3.0        |
| 75.0                   | 40.26   | 36.16                | 44.36                | 10.2                                 | 3.4        | 3.0        |
| 80.0                   | 34.79   | 31.10                | 38.48                | 10.6                                 | 3.7        | 2.9        |
| 85.0                   | 30.17   | 26.84                | 33.50                | 11.0                                 | 3.9        | 2.8        |
| 90.0                   | 26.26   | 23.26                | 29.27                | 11.4                                 | 4.2        | 2.7        |
| 95.0                   | 22.94   | 20.22                | 25.66                | 11.8                                 | 4.4        | 2.7        |
| 100.0                  | 20.10   | 17.64                | 22.56                | 12.2                                 | 4.7        | 2.6        |
| 105.0                  | 17.67   | 15.45                | 19.90                | 12.6                                 | 5.0        | 2.5        |
| 110.0                  | 15.59   | 13.56                | 17.61                | 13.0                                 | 5.2        | 2.5        |
| 115.0                  | 13.79   | 11.95                | 15.62                | 13.3                                 | 5.5        | 2.4        |
| 120.0                  | 12.23   | 10.56                | 13.90                | 13.7                                 | 5.8        | 2.4        |
| 125.0                  | 10.88   | 9.354                | 12.41                | 14.0                                 | 6.1        | 2.3        |



| <b>B57311V2331H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 330 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 18689   | 15671                | 21707                | 16.1                                 | 2.5        | 6.5        |
| -50.0                  | 13574   | 11530                | 15618                | 15.1                                 | 2.4        | 6.3        |
| -45.0                  | 9969  | 8572                 | 11365                | 14.0                                 | 2.3        | 6.1        |
| -40.0                  | 7399  | 6436                 | 8361                 | 13.0                                 | 2.2        | 5.9        |
| -35.0                  | 5546  | 4878                 | 6215                 | 12.0                                 | 2.1        | 5.7        |
| -30.0                  | 4198  | 3731                 | 4665                 | 11.1                                 | 2.0        | 5.5        |
| -25.0                  | 3206  | 2878                 | 3535                 | 10.2                                 | 1.9        | 5.3        |
| -20.0                  | 2470  | 2238                 | 2702                 | 9.4                                  | 1.8        | 5.1        |
| -15.0                  | 1919  | 1754                 | 2084                 | 8.6                                  | 1.7        | 5.0        |
| -10.0                  | 1503  | 1385                 | 1620                 | 7.8                                  | 1.6        | 4.8        |
| -5.0                   | 1186  | 1102                 | 1269                 | 7.0                                  | 1.5        | 4.7        |
| 0.0                    | 942.4   | 882.9                | 1002                 | 6.3                                  | 1.4        | 4.5        |
| 5.0                    | 754.3   | 711.9                | 796.7                | 5.6                                  | 1.3        | 4.4        |
| 10.0                   | 607.7   | 577.7                | 637.8                | 4.9                                  | 1.2        | 4.3        |
| 15.0                   | 492.8   | 471.7                | 514.0                | 4.3                                  | 1.0        | 4.1        |
| 20.0                   | 402.1   | 387.4                | 416.8                | 3.7                                  | 0.9        | 4.0        |
| <b>25.0</b>            | <b>330.0</b>  | <b>320.1</b>         | <b>339.9</b>         | <b>3.0</b>                           | <b>0.8</b> | <b>3.9</b> |
| 30.0                   | 272.4   | 262.5                | 282.3                | 3.6                                  | 1.0        | 3.8        |
| 35.0                   | 226.0   | 216.5                | 235.5                | 4.2                                  | 1.1        | 3.7        |
| 40.0                   | 188.6   | 179.6                | 197.5                | 4.8                                  | 1.3        | 3.6        |
| 45.0                   | 158.1   | 149.7                | 166.5                | 5.3                                  | 1.5        | 3.5        |
| 50.0                   | 133.2   | 125.4                | 140.9                | 5.8                                  | 1.7        | 3.4        |
| 55.0                   | 112.7   | 105.6                | 119.8                | 6.3                                  | 1.9        | 3.3        |
| 60.0                   | 95.83   | 89.31                | 102.4                | 6.8                                  | 2.1        | 3.2        |
| 65.0                   | 81.82   | 75.87                | 87.78                | 7.3                                  | 2.3        | 3.1        |
| 70.0                   | 70.15   | 64.73                | 75.58                | 7.7                                  | 2.5        | 3.0        |
| 75.0                   | 60.39   | 55.45                | 65.33                | 8.2                                  | 2.8        | 3.0        |
| 80.0                   | 52.18   | 47.69                | 56.68                | 8.6                                  | 3.0        | 2.9        |
| 85.0                   | 45.26   | 41.17                | 49.35                | 9.0                                  | 3.2        | 2.8        |
| 90.0                   | 39.39   | 35.67                | 43.11                | 9.4                                  | 3.4        | 2.7        |
| 95.0                   | 34.41   | 31.02                | 37.79                | 9.8                                  | 3.7        | 2.7        |
| 100.0                  | 30.15   | 27.07                | 33.24                | 10.2                                 | 3.9        | 2.6        |
| 105.0                  | 26.51   | 23.70                | 29.32                | 10.6                                 | 4.2        | 2.5        |
| 110.0                  | 23.38   | 20.81                | 25.94                | 11.0                                 | 4.4        | 2.5        |
| 115.0                  | 20.68   | 18.34                | 23.02                | 11.3                                 | 4.7        | 2.4        |
| 120.0                  | 18.35   | 16.20                | 20.49                | 11.7                                 | 4.9        | 2.4        |
| 125.0                  | 16.32   | 14.36                | 18.28                | 12.0                                 | 5.2        | 2.3        |



| <b>B57311V2331J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8501  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 330 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 18689   | 15297                | 22081                | 18.1                                 | 2.8        | 6.5        |
| -50.0                  | 13574   | 11259                | 15889                | 17.1                                 | 2.7        | 6.3        |
| -45.0                  | 9969  | 8373                 | 11565                | 16.0                                 | 2.6        | 6.1        |
| -40.0                  | 7399  | 6288                 | 8509                 | 15.0                                 | 2.6        | 5.9        |
| -35.0                  | 5546  | 4767                 | 6326                 | 14.0                                 | 2.5        | 5.7        |
| -30.0                  | 4198  | 3647                 | 4749                 | 13.1                                 | 2.4        | 5.5        |
| -25.0                  | 3206  | 2813                 | 3599                 | 12.2                                 | 2.3        | 5.3        |
| -20.0                  | 2470  | 2189                 | 2752                 | 11.4                                 | 2.2        | 5.1        |
| -15.0                  | 1919  | 1716                 | 2122                 | 10.6                                 | 2.1        | 5.0        |
| -10.0                  | 1503  | 1355                 | 1650                 | 9.8                                  | 2.0        | 4.8        |
| -5.0                   | 1186  | 1078                 | 1293                 | 9.0                                  | 1.9        | 4.7        |
| 0.0                    | 942.4   | 864.0                | 1021                 | 8.3                                  | 1.8        | 4.5        |
| 5.0                    | 754.3   | 696.8                | 811.7                | 7.6                                  | 1.7        | 4.4        |
| 10.0                   | 607.7   | 565.6                | 649.9                | 6.9                                  | 1.6        | 4.3        |
| 15.0                   | 492.8   | 461.8                | 523.8                | 6.3                                  | 1.5        | 4.1        |
| 20.0                   | 402.1   | 379.3                | 424.8                | 5.7                                  | 1.4        | 4.0        |
| <b>25.0</b>            | <b>330.0</b>  | <b>313.5</b>         | <b>346.5</b>         | <b>5.0</b>                           | <b>1.3</b> | <b>3.9</b> |
| 30.0                   | 272.4   | 257.0                | 287.7                | 5.6                                  | 1.5        | 3.8        |
| 35.0                   | 226.0   | 212.0                | 240.1                | 6.2                                  | 1.7        | 3.7        |
| 40.0                   | 188.6   | 175.8                | 201.3                | 6.8                                  | 1.9        | 3.6        |
| 45.0                   | 158.1   | 146.6                | 169.6                | 7.3                                  | 2.1        | 3.5        |
| 50.0                   | 133.2   | 122.8                | 143.6                | 7.8                                  | 2.3        | 3.4        |
| 55.0                   | 112.7   | 103.3                | 122.1                | 8.3                                  | 2.5        | 3.3        |
| 60.0                   | 95.83   | 87.40                | 104.3                | 8.8                                  | 2.7        | 3.2        |
| 65.0                   | 81.82   | 74.24                | 89.41                | 9.3                                  | 3.0        | 3.1        |
| 70.0                   | 70.15   | 63.33                | 76.98                | 9.7                                  | 3.2        | 3.0        |
| 75.0                   | 60.39   | 54.24                | 66.54                | 10.2                                 | 3.4        | 3.0        |
| 80.0                   | 52.18   | 46.64                | 57.72                | 10.6                                 | 3.7        | 2.9        |
| 85.0                   | 45.26   | 40.26                | 50.25                | 11.0                                 | 3.9        | 2.8        |
| 90.0                   | 39.39   | 34.89                | 43.90                | 11.4                                 | 4.2        | 2.7        |
| 95.0                   | 34.41   | 30.33                | 38.48                | 11.8                                 | 4.4        | 2.7        |
| 100.0                  | 30.15   | 26.47                | 33.84                | 12.2                                 | 4.7        | 2.6        |
| 105.0                  | 26.51   | 23.17                | 29.85                | 12.6                                 | 5.0        | 2.5        |
| 110.0                  | 23.38   | 20.35                | 26.41                | 13.0                                 | 5.2        | 2.5        |
| 115.0                  | 20.68   | 17.92                | 23.44                | 13.3                                 | 5.5        | 2.4        |
| 120.0                  | 18.35   | 15.84                | 20.86                | 13.7                                 | 5.8        | 2.4        |
| 125.0                  | 16.32   | 14.03                | 18.61                | 14.0                                 | 6.1        | 2.3        |



| <b>B57321V2681H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 680 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 65387   | 53742                | 77033                | 17.8                                 | 2.4        | 7.4        |
| -50.0                  | 45486   | 37946                | 53027                | 16.6                                 | 2.3        | 7.1        |
| -45.0                  | 32046   | 27112                | 36981                | 15.4                                 | 2.2        | 6.9        |
| -40.0                  | 22852   | 19591                | 26113                | 14.3                                 | 2.1        | 6.6        |
| -35.0                  | 16485   | 14311                | 18659                | 13.2                                 | 2.1        | 6.4        |
| -30.0                  | 12023   | 10562                | 13485                | 12.2                                 | 2.0        | 6.2        |
| -25.0                  | 8862  | 7873                 | 9851                 | 11.2                                 | 1.9        | 6.0        |
| -20.0                  | 6597  | 5924                 | 7271                 | 10.2                                 | 1.8        | 5.8        |
| -15.0                  | 4959  | 4498                 | 5419                 | 9.3                                  | 1.7        | 5.6        |
| -10.0                  | 3761  | 3445                 | 4077                 | 8.4                                  | 1.5        | 5.4        |
| -5.0                   | 2878  | 2661                 | 3095                 | 7.6                                  | 1.4        | 5.3        |
| 0.0                    | 2221  | 2071                 | 2370                 | 6.7                                  | 1.3        | 5.1        |
| 5.0                    | 1727  | 1625                 | 1830                 | 5.9                                  | 1.2        | 4.9        |
| 10.0                   | 1354  | 1284                 | 1424                 | 5.2                                  | 1.1        | 4.8        |
| 15.0                   | 1069  | 1021                 | 1116                 | 4.4                                  | 1.0        | 4.7        |
| 20.0                   | 849.6   | 817.9                | 881.4                | 3.7                                  | 0.8        | 4.5        |
| <b>25.0</b>            | <b>680.0</b>  | <b>659.6</b>         | <b>700.4</b>         | <b>3.0</b>                           | <b>0.7</b> | <b>4.4</b> |
| 30.0                   | 547.8   | 527.4                | 568.1                | 3.7                                  | 0.9        | 4.3        |
| 35.0                   | 444.0   | 424.6                | 463.3                | 4.4                                  | 1.1        | 4.1        |
| 40.0                   | 362.0   | 343.9                | 380.0                | 5.0                                  | 1.2        | 4.0        |
| 45.0                   | 296.8   | 280.2                | 313.3                | 5.6                                  | 1.4        | 3.9        |
| 50.0                   | 244.7   | 229.6                | 259.8                | 6.2                                  | 1.6        | 3.8        |
| 55.0                   | 202.8   | 189.1                | 216.4                | 6.7                                  | 1.8        | 3.7        |
| 60.0                   | 168.9   | 156.6                | 181.2                | 7.3                                  | 2.0        | 3.6        |
| 65.0                   | 141.4   | 130.3                | 152.4                | 7.8                                  | 2.2        | 3.5        |
| 70.0                   | 118.9   | 109.0                | 128.8                | 8.3                                  | 2.4        | 3.4        |
| 75.0                   | 100.4   | 91.53                | 109.3                | 8.8                                  | 2.6        | 3.3        |
| 80.0                   | 85.16   | 77.22                | 93.09                | 9.3                                  | 2.9        | 3.2        |
| 85.0                   | 72.54   | 65.43                | 79.64                | 9.8                                  | 3.1        | 3.2        |
| 90.0                   | 62.03   | 55.67                | 68.40                | 10.3                                 | 3.3        | 3.1        |
| 95.0                   | 53.26   | 47.56                | 58.96                | 10.7                                 | 3.6        | 3.0        |
| 100.0                  | 45.89   | 40.78                | 51.00                | 11.1                                 | 3.8        | 2.9        |
| 105.0                  | 39.69   | 35.10                | 44.28                | 11.6                                 | 4.0        | 2.9        |
| 110.0                  | 34.44   | 30.31                | 38.57                | 12.0                                 | 4.3        | 2.8        |
| 115.0                  | 29.99   | 26.27                | 33.70                | 12.4                                 | 4.5        | 2.7        |
| 120.0                  | 26.19   | 22.85                | 29.54                | 12.8                                 | 4.8        | 2.7        |
| 125.0                  | 22.95   | 19.93                | 25.97                | 13.2                                 | 5.0        | 2.6        |



| <b>B57321V2681J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 680 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 65387   | 52434                | 78341                | 19.8                                 | 2.7        | 7.4        |
| -50.0                  | 45486   | 37036                | 53936                | 18.6                                 | 2.6        | 7.1        |
| -45.0                  | 32046   | 26471                | 37622                | 17.4                                 | 2.5        | 6.9        |
| -40.0                  | 22852   | 19134                | 26570                | 16.3                                 | 2.4        | 6.6        |
| -35.0                  | 16485   | 13981                | 18989                | 15.2                                 | 2.4        | 6.4        |
| -30.0                  | 12023   | 10322                | 13725                | 14.2                                 | 2.3        | 6.2        |
| -25.0                  | 8862  | 7696                 | 10028                | 13.2                                 | 2.2        | 6.0        |
| -20.0                  | 6597  | 5792                 | 7403                 | 12.2                                 | 2.1        | 5.8        |
| -15.0                  | 4959  | 4399                 | 5518                 | 11.3                                 | 2.0        | 5.6        |
| -10.0                  | 3761  | 3370                 | 4153                 | 10.4                                 | 1.9        | 5.4        |
| -5.0                   | 2878  | 2603                 | 3153                 | 9.6                                  | 1.8        | 5.3        |
| 0.0                    | 2221  | 2027                 | 2415                 | 8.7                                  | 1.7        | 5.1        |
| 5.0                    | 1727  | 1590                 | 1864                 | 7.9                                  | 1.6        | 4.9        |
| 10.0                   | 1354  | 1256                 | 1451                 | 7.2                                  | 1.5        | 4.8        |
| 15.0                   | 1069  | 999.8                | 1138                 | 6.4                                  | 1.4        | 4.7        |
| 20.0                   | 849.6   | 800.9                | 898.4                | 5.7                                  | 1.3        | 4.5        |
| <b>25.0</b>            | <b>680.0</b>  | <b>646.0</b>         | <b>714.0</b>         | <b>5.0</b>                           | <b>1.1</b> | <b>4.4</b> |
| 30.0                   | 547.8   | 516.5                | 579.1                | 5.7                                  | 1.3        | 4.3        |
| 35.0                   | 444.0   | 415.7                | 472.2                | 6.4                                  | 1.5        | 4.1        |
| 40.0                   | 362.0   | 336.7                | 387.2                | 7.0                                  | 1.7        | 4.0        |
| 45.0                   | 296.8   | 274.3                | 319.3                | 7.6                                  | 1.9        | 3.9        |
| 50.0                   | 244.7   | 224.7                | 264.6                | 8.2                                  | 2.1        | 3.8        |
| 55.0                   | 202.8   | 185.1                | 220.5                | 8.7                                  | 2.4        | 3.7        |
| 60.0                   | 168.9   | 153.2                | 184.6                | 9.3                                  | 2.6        | 3.6        |
| 65.0                   | 141.4   | 127.5                | 155.2                | 9.8                                  | 2.8        | 3.5        |
| 70.0                   | 118.9   | 106.6                | 131.1                | 10.3                                 | 3.0        | 3.4        |
| 75.0                   | 100.4   | 89.52                | 111.3                | 10.8                                 | 3.2        | 3.3        |
| 80.0                   | 85.16   | 75.52                | 94.80                | 11.3                                 | 3.5        | 3.2        |
| 85.0                   | 72.54   | 63.98                | 81.09                | 11.8                                 | 3.7        | 3.2        |
| 90.0                   | 62.03   | 54.43                | 69.64                | 12.3                                 | 4.0        | 3.1        |
| 95.0                   | 53.26   | 46.49                | 60.02                | 12.7                                 | 4.2        | 3.0        |
| 100.0                  | 45.89   | 39.86                | 51.92                | 13.1                                 | 4.5        | 2.9        |
| 105.0                  | 39.69   | 34.30                | 45.07                | 13.6                                 | 4.7        | 2.9        |
| 110.0                  | 34.44   | 29.63                | 39.25                | 14.0                                 | 5.0        | 2.8        |
| 115.0                  | 29.99   | 25.67                | 34.30                | 14.4                                 | 5.3        | 2.7        |
| 120.0                  | 26.19   | 22.32                | 30.06                | 14.8                                 | 5.5        | 2.7        |
| 125.0                  | 22.95   | 19.47                | 26.43                | 15.2                                 | 5.8        | 2.6        |





| <b>B57321V2102H060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 1000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 96158  | 79032                | 113280               | 17.8                                 | 2.4        | 7.4        |
| -50.0                  | 66892  | 55803                | 77980                | 16.6                                 | 2.3        | 7.1        |
| -45.0                  | 47127  | 39870                | 54384                | 15.4                                 | 2.2        | 6.9        |
| -40.0                  | 33606  | 28810                | 38402                | 14.3                                 | 2.1        | 6.6        |
| -35.0                  | 24243  | 21045                | 27440                | 13.2                                 | 2.1        | 6.4        |
| -30.0                  | 17681  | 15532                | 19830                | 12.2                                 | 2.0        | 6.2        |
| -25.0                  | 13032  | 11578                | 14486                | 11.2                                 | 1.9        | 6.0        |
| -20.0                  | 9702   | 8712                 | 10692                | 10.2                                 | 1.8        | 5.8        |
| -15.0                  | 7292   | 6615                 | 7969                 | 9.3                                  | 1.7        | 5.6        |
| -10.0                  | 5531   | 5067                 | 5996                 | 8.4                                  | 1.5        | 5.4        |
| -5.0                   | 4232   | 3913                 | 4552                 | 7.6                                  | 1.4        | 5.3        |
| 0.0                    | 3266   | 3046                 | 3486                 | 6.7                                  | 1.3        | 5.1        |
| 5.0                    | 2540   | 2389                 | 2691                 | 5.9                                  | 1.2        | 4.9        |
| 10.0                   | 1991   | 1888                 | 2094                 | 5.2                                  | 1.1        | 4.8        |
| 15.0                   | 1572   | 1502                 | 1641                 | 4.4                                  | 1.0        | 4.7        |
| 20.0                   | 1249   | 1203                 | 1296                 | 3.7                                  | 0.8        | 4.5        |
| <b>25.0</b>            | <b>1000.0</b>  | <b>970.0</b>         | <b>1030</b>          | <b>3.0</b>                           | <b>0.7</b> | <b>4.4</b> |
| 30.0                   | 805.5  | 775.6                | 835.4                | 3.7                                  | 0.9        | 4.3        |
| 35.0                   | 652.9  | 624.4                | 681.3                | 4.4                                  | 1.1        | 4.1        |
| 40.0                   | 532.3  | 505.8                | 558.8                | 5.0                                  | 1.2        | 4.0        |
| 45.0                   | 436.4  | 412.1                | 460.8                | 5.6                                  | 1.4        | 3.9        |
| 50.0                   | 359.8  | 337.6                | 382.0                | 6.2                                  | 1.6        | 3.8        |
| 55.0                   | 298.2  | 278.1                | 318.3                | 6.7                                  | 1.8        | 3.7        |
| 60.0                   | 248.4  | 230.3                | 266.4                | 7.3                                  | 2.0        | 3.6        |
| 65.0                   | 207.9  | 191.6                | 224.1                | 7.8                                  | 2.2        | 3.5        |
| 70.0                   | 174.8  | 160.2                | 189.3                | 8.3                                  | 2.4        | 3.4        |
| 75.0                   | 147.6  | 134.6                | 160.7                | 8.8                                  | 2.6        | 3.3        |
| 80.0                   | 125.2  | 113.6                | 136.9                | 9.3                                  | 2.9        | 3.2        |
| 85.0                   | 106.7  | 96.23                | 117.1                | 9.8                                  | 3.1        | 3.2        |
| 90.0                   | 91.23  | 81.87                | 100.6                | 10.3                                 | 3.3        | 3.1        |
| 95.0                   | 78.32  | 69.94                | 86.70                | 10.7                                 | 3.6        | 3.0        |
| 100.0                  | 67.49  | 59.97                | 75.01                | 11.1                                 | 3.8        | 2.9        |
| 105.0                  | 58.36  | 51.61                | 65.11                | 11.6                                 | 4.0        | 2.9        |
| 110.0                  | 50.65  | 44.58                | 56.71                | 12.0                                 | 4.3        | 2.8        |
| 115.0                  | 44.10  | 38.64                | 49.56                | 12.4                                 | 4.5        | 2.7        |
| 120.0                  | 38.52  | 33.60                | 43.44                | 12.8                                 | 4.8        | 2.7        |
| 125.0                  | 33.75  | 29.31                | 38.19                | 13.2                                 | 5.0        | 2.6        |



| <b>B57321V2102J060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 1000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 96158  | 77109                | 115210               | 19.8                                 | 2.7        | 7.4        |
| -50.0                  | 66892  | 54465                | 79318                | 18.6                                 | 2.6        | 7.1        |
| -45.0                  | 47127  | 38927                | 55326                | 17.4                                 | 2.5        | 6.9        |
| -40.0                  | 33606  | 28138                | 39074                | 16.3                                 | 2.4        | 6.6        |
| -35.0                  | 24243  | 20560                | 27925                | 15.2                                 | 2.4        | 6.4        |
| -30.0                  | 17681  | 15179                | 20184                | 14.2                                 | 2.3        | 6.2        |
| -25.0                  | 13032  | 11317                | 14747                | 13.2                                 | 2.2        | 6.0        |
| -20.0                  | 9702   | 8518                 | 10886                | 12.2                                 | 2.1        | 5.8        |
| -15.0                  | 7292   | 6469                 | 8115                 | 11.3                                 | 2.0        | 5.6        |
| -10.0                  | 5531   | 4956                 | 6107                 | 10.4                                 | 1.9        | 5.4        |
| -5.0                   | 4232   | 3828                 | 4637                 | 9.6                                  | 1.8        | 5.3        |
| 0.0                    | 3266   | 2981                 | 3551                 | 8.7                                  | 1.7        | 5.1        |
| 5.0                    | 2540   | 2338                 | 2742                 | 7.9                                  | 1.6        | 4.9        |
| 10.0                   | 1991   | 1848                 | 2134                 | 7.2                                  | 1.5        | 4.8        |
| 15.0                   | 1572   | 1470                 | 1673                 | 6.4                                  | 1.4        | 4.7        |
| 20.0                   | 1249   | 1178                 | 1321                 | 5.7                                  | 1.3        | 4.5        |
| <b>25.0</b>            | <b>1000.0</b>  | <b>950.0</b>         | <b>1050</b>          | <b>5.0</b>                           | <b>1.1</b> | <b>4.4</b> |
| 30.0                   | 805.5  | 759.5                | 851.5                | 5.7                                  | 1.3        | 4.3        |
| 35.0                   | 652.9  | 611.4                | 694.4                | 6.4                                  | 1.5        | 4.1        |
| 40.0                   | 532.3  | 495.1                | 569.4                | 7.0                                  | 1.7        | 4.0        |
| 45.0                   | 436.4  | 403.4                | 469.5                | 7.6                                  | 1.9        | 3.9        |
| 50.0                   | 359.8  | 330.4                | 389.2                | 8.2                                  | 2.1        | 3.8        |
| 55.0                   | 298.2  | 272.2                | 324.2                | 8.7                                  | 2.4        | 3.7        |
| 60.0                   | 248.4  | 225.3                | 271.4                | 9.3                                  | 2.6        | 3.6        |
| 65.0                   | 207.9  | 187.5                | 228.3                | 9.8                                  | 2.8        | 3.5        |
| 70.0                   | 174.8  | 156.7                | 192.8                | 10.3                                 | 3.0        | 3.4        |
| 75.0                   | 147.6  | 131.6                | 163.6                | 10.8                                 | 3.2        | 3.3        |
| 80.0                   | 125.2  | 111.1                | 139.4                | 11.3                                 | 3.5        | 3.2        |
| 85.0                   | 106.7  | 94.09                | 119.3                | 11.8                                 | 3.7        | 3.2        |
| 90.0                   | 91.23  | 80.05                | 102.4                | 12.3                                 | 4.0        | 3.1        |
| 95.0                   | 78.32  | 68.37                | 88.27                | 12.7                                 | 4.2        | 3.0        |
| 100.0                  | 67.49  | 58.62                | 76.36                | 13.1                                 | 4.5        | 2.9        |
| 105.0                  | 58.36  | 50.45                | 66.28                | 13.6                                 | 4.7        | 2.9        |
| 110.0                  | 50.65  | 43.57                | 57.73                | 14.0                                 | 5.0        | 2.8        |
| 115.0                  | 44.10  | 37.76                | 50.44                | 14.4                                 | 5.3        | 2.7        |
| 120.0                  | 38.52  | 32.83                | 44.21                | 14.8                                 | 5.5        | 2.7        |
| 125.0                  | 33.75  | 28.64                | 38.87                | 15.2                                 | 5.8        | 2.6        |



| <b>B57321V2152H060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 1500 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 144240   | 118550               | 169930               | 17.8                                 | 2.4        | 7.4        |
| -50.0                  | 100340   | 83704                | 116970               | 16.6                                 | 2.3        | 7.1        |
| -45.0                  | 70690  | 59805                | 81576                | 15.4                                 | 2.2        | 6.9        |
| -40.0                  | 50409  | 43215                | 57603                | 14.3                                 | 2.1        | 6.6        |
| -35.0                  | 36364  | 31567                | 41160                | 13.2                                 | 2.1        | 6.4        |
| -30.0                  | 26522  | 23299                | 29746                | 12.2                                 | 2.0        | 6.2        |
| -25.0                  | 19548  | 17367                | 21730                | 11.2                                 | 1.9        | 6.0        |
| -20.0                  | 14553  | 13068                | 16038                | 10.2                                 | 1.8        | 5.8        |
| -15.0                  | 10938  | 9923                 | 11954                | 9.3                                  | 1.7        | 5.6        |
| -10.0                  | 8297   | 7600                 | 8994                 | 8.4                                  | 1.5        | 5.4        |
| -5.0                   | 6349   | 5869                 | 6828                 | 7.6                                  | 1.4        | 5.3        |
| 0.0                    | 4899   | 4569                 | 5228                 | 6.7                                  | 1.3        | 5.1        |
| 5.0                    | 3810   | 3584                 | 4036                 | 5.9                                  | 1.2        | 4.9        |
| 10.0                   | 2986   | 2831                 | 3141                 | 5.2                                  | 1.1        | 4.8        |
| 15.0                   | 2357   | 2253                 | 2462                 | 4.4                                  | 1.0        | 4.7        |
| 20.0                   | 1874   | 1804                 | 1944                 | 3.7                                  | 0.8        | 4.5        |
| <b>25.0</b>            | <b>1500</b>  | <b>1455</b>          | <b>1545</b>          | <b>3.0</b>                           | <b>0.7</b> | <b>4.4</b> |
| 30.0                   | 1208   | 1163                 | 1253                 | 3.7                                  | 0.9        | 4.3        |
| 35.0                   | 979.3  | 936.7                | 1022                 | 4.4                                  | 1.1        | 4.1        |
| 40.0                   | 798.4  | 758.7                | 838.2                | 5.0                                  | 1.2        | 4.0        |
| 45.0                   | 654.7  | 618.1                | 691.2                | 5.6                                  | 1.4        | 3.9        |
| 50.0                   | 539.7  | 506.5                | 573.0                | 6.2                                  | 1.6        | 3.8        |
| 55.0                   | 447.3  | 417.2                | 477.4                | 6.7                                  | 1.8        | 3.7        |
| 60.0                   | 372.6  | 345.4                | 399.7                | 7.3                                  | 2.0        | 3.6        |
| 65.0                   | 311.8  | 287.5                | 336.2                | 7.8                                  | 2.2        | 3.5        |
| 70.0                   | 262.2  | 240.4                | 284.0                | 8.3                                  | 2.4        | 3.4        |
| 75.0                   | 221.5  | 201.9                | 241.0                | 8.8                                  | 2.6        | 3.3        |
| 80.0                   | 187.8  | 170.3                | 205.4                | 9.3                                  | 2.9        | 3.2        |
| 85.0                   | 160.0  | 144.3                | 175.7                | 9.8                                  | 3.1        | 3.2        |
| 90.0                   | 136.8  | 122.8                | 150.9                | 10.3                                 | 3.3        | 3.1        |
| 95.0                   | 117.5  | 104.9                | 130.1                | 10.7                                 | 3.6        | 3.0        |
| 100.0                  | 101.2  | 89.96                | 112.5                | 11.1                                 | 3.8        | 2.9        |
| 105.0                  | 87.54  | 77.42                | 97.67                | 11.6                                 | 4.0        | 2.9        |
| 110.0                  | 75.97  | 66.87                | 85.07                | 12.0                                 | 4.3        | 2.8        |
| 115.0                  | 66.15  | 57.96                | 74.34                | 12.4                                 | 4.5        | 2.7        |
| 120.0                  | 57.78  | 50.40                | 65.16                | 12.8                                 | 4.8        | 2.7        |
| 125.0                  | 50.63  | 43.97                | 57.29                | 13.2                                 | 5.0        | 2.6        |



| <b>B57321V2152J060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 1500 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 144240   | 115660               | 172810               | 19.8                                 | 2.7        | 7.4        |
| -50.0                  | 100340   | 81697                | 118980               | 18.6                                 | 2.6        | 7.1        |
| -45.0                  | 70690  | 58391                | 82989                | 17.4                                 | 2.5        | 6.9        |
| -40.0                  | 50409  | 42207                | 58611                | 16.3                                 | 2.4        | 6.6        |
| -35.0                  | 36364  | 30840                | 41888                | 15.2                                 | 2.4        | 6.4        |
| -30.0                  | 26522  | 22768                | 30276                | 14.2                                 | 2.3        | 6.2        |
| -25.0                  | 19548  | 16976                | 22121                | 13.2                                 | 2.2        | 6.0        |
| -20.0                  | 14553  | 12777                | 16329                | 12.2                                 | 2.1        | 5.8        |
| -15.0                  | 10938  | 9704                 | 12173                | 11.3                                 | 2.0        | 5.6        |
| -10.0                  | 8297   | 7434                 | 9160                 | 10.4                                 | 1.9        | 5.4        |
| -5.0                   | 6349   | 5742                 | 6955                 | 9.6                                  | 1.8        | 5.3        |
| 0.0                    | 4899   | 4471                 | 5326                 | 8.7                                  | 1.7        | 5.1        |
| 5.0                    | 3810   | 3507                 | 4113                 | 7.9                                  | 1.6        | 4.9        |
| 10.0                   | 2986   | 2772                 | 3200                 | 7.2                                  | 1.5        | 4.8        |
| 15.0                   | 2357   | 2205                 | 2509                 | 6.4                                  | 1.4        | 4.7        |
| 20.0                   | 1874   | 1767                 | 1982                 | 5.7                                  | 1.3        | 4.5        |
| <b>25.0</b>            | <b>1500</b>  | <b>1425</b>          | <b>1575</b>          | <b>5.0</b>                           | <b>1.1</b> | <b>4.4</b> |
| 30.0                   | 1208   | 1139                 | 1277                 | 5.7                                  | 1.3        | 4.3        |
| 35.0                   | 979.3  | 917.1                | 1042                 | 6.4                                  | 1.5        | 4.1        |
| 40.0                   | 798.4  | 742.7                | 854.2                | 7.0                                  | 1.7        | 4.0        |
| 45.0                   | 654.7  | 605.0                | 704.3                | 7.6                                  | 1.9        | 3.9        |
| 50.0                   | 539.7  | 495.7                | 583.8                | 8.2                                  | 2.1        | 3.8        |
| 55.0                   | 447.3  | 408.2                | 486.3                | 8.7                                  | 2.4        | 3.7        |
| 60.0                   | 372.6  | 338.0                | 407.1                | 9.3                                  | 2.6        | 3.6        |
| 65.0                   | 311.8  | 281.2                | 342.4                | 9.8                                  | 2.8        | 3.5        |
| 70.0                   | 262.2  | 235.1                | 289.3                | 10.3                                 | 3.0        | 3.4        |
| 75.0                   | 221.5  | 197.5                | 245.4                | 10.8                                 | 3.2        | 3.3        |
| 80.0                   | 187.8  | 166.6                | 209.1                | 11.3                                 | 3.5        | 3.2        |
| 85.0                   | 160.0  | 141.1                | 178.9                | 11.8                                 | 3.7        | 3.2        |
| 90.0                   | 136.8  | 120.1                | 153.6                | 12.3                                 | 4.0        | 3.1        |
| 95.0                   | 117.5  | 102.6                | 132.4                | 12.7                                 | 4.2        | 3.0        |
| 100.0                  | 101.2  | 87.93                | 114.5                | 13.1                                 | 4.5        | 2.9        |
| 105.0                  | 87.54  | 75.67                | 99.42                | 13.6                                 | 4.7        | 2.9        |
| 110.0                  | 75.97  | 65.35                | 86.59                | 14.0                                 | 5.0        | 2.8        |
| 115.0                  | 66.15  | 56.63                | 75.66                | 14.4                                 | 5.3        | 2.7        |
| 120.0                  | 57.78  | 49.24                | 66.32                | 14.8                                 | 5.5        | 2.7        |
| 125.0                  | 50.63  | 42.95                | 58.30                | 15.2                                 | 5.8        | 2.6        |



| <b>B57321V2222H060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 2200 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 211550   | 173870               | 249220               | 17.8                                 | 2.4        | 7.4        |
| -50.0                  | 147160   | 122770               | 171560               | 16.6                                 | 2.3        | 7.1        |
| -45.0                  | 103680   | 87714                | 119640               | 15.4                                 | 2.2        | 6.9        |
| -40.0                  | 73933  | 63383                | 84484                | 14.3                                 | 2.1        | 6.6        |
| -35.0                  | 53334  | 46299                | 60368                | 13.2                                 | 2.1        | 6.4        |
| -30.0                  | 38899  | 34171                | 43627                | 12.2                                 | 2.0        | 6.2        |
| -25.0                  | 28671  | 25471                | 31870                | 11.2                                 | 1.9        | 6.0        |
| -20.0                  | 21344  | 19166                | 23523                | 10.2                                 | 1.8        | 5.8        |
| -15.0                  | 16043  | 14553                | 17533                | 9.3                                  | 1.7        | 5.6        |
| -10.0                  | 12169  | 11146                | 13192                | 8.4                                  | 1.5        | 5.4        |
| -5.0                   | 9311   | 8608                 | 10015                | 7.6                                  | 1.4        | 5.3        |
| 0.0                    | 7185   | 6701                 | 7668                 | 6.7                                  | 1.3        | 5.1        |
| 5.0                    | 5588   | 5256                 | 5920                 | 5.9                                  | 1.2        | 4.9        |
| 10.0                   | 4379   | 4153                 | 4606                 | 5.2                                  | 1.1        | 4.8        |
| 15.0                   | 3457   | 3304                 | 3611                 | 4.4                                  | 1.0        | 4.7        |
| 20.0                   | 2749   | 2646                 | 2851                 | 3.7                                  | 0.8        | 4.5        |
| <b>25.0</b>            | <b>2200</b>  | <b>2134</b>          | <b>2266</b>          | <b>3.0</b>                           | <b>0.7</b> | <b>4.4</b> |
| 30.0                   | 1772   | 1706                 | 1838                 | 3.7                                  | 0.9        | 4.3        |
| 35.0                   | 1436   | 1374                 | 1499                 | 4.4                                  | 1.1        | 4.1        |
| 40.0                   | 1171   | 1113                 | 1229                 | 5.0                                  | 1.2        | 4.0        |
| 45.0                   | 960.2  | 906.6                | 1014                 | 5.6                                  | 1.4        | 3.9        |
| 50.0                   | 791.6  | 742.8                | 840.4                | 6.2                                  | 1.6        | 3.8        |
| 55.0                   | 656.0  | 611.9                | 700.2                | 6.7                                  | 1.8        | 3.7        |
| 60.0                   | 546.4  | 506.6                | 586.2                | 7.3                                  | 2.0        | 3.6        |
| 65.0                   | 457.3  | 421.6                | 493.0                | 7.8                                  | 2.2        | 3.5        |
| 70.0                   | 384.5  | 352.5                | 416.6                | 8.3                                  | 2.4        | 3.4        |
| 75.0                   | 324.8  | 296.1                | 353.5                | 8.8                                  | 2.6        | 3.3        |
| 80.0                   | 275.5  | 249.8                | 301.2                | 9.3                                  | 2.9        | 3.2        |
| 85.0                   | 234.7  | 211.7                | 257.7                | 9.8                                  | 3.1        | 3.2        |
| 90.0                   | 200.7  | 180.1                | 221.3                | 10.3                                 | 3.3        | 3.1        |
| 95.0                   | 172.3  | 153.9                | 190.7                | 10.7                                 | 3.6        | 3.0        |
| 100.0                  | 148.5  | 131.9                | 165.0                | 11.1                                 | 3.8        | 2.9        |
| 105.0                  | 128.4  | 113.6                | 143.2                | 11.6                                 | 4.0        | 2.9        |
| 110.0                  | 111.4  | 98.08                | 124.8                | 12.0                                 | 4.3        | 2.8        |
| 115.0                  | 97.02  | 85.00                | 109.0                | 12.4                                 | 4.5        | 2.7        |
| 120.0                  | 84.74  | 73.92                | 95.57                | 12.8                                 | 4.8        | 2.7        |
| 125.0                  | 74.25  | 64.48                | 84.03                | 13.2                                 | 5.0        | 2.6        |



| <b>B57321V2222J060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 2200 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 211550   | 169640               | 253460               | 19.8                                 | 2.7        | 7.4        |
| -50.0                  | 147160   | 119820               | 174500               | 18.6                                 | 2.6        | 7.1        |
| -45.0                  | 103680   | 85640                | 121720               | 17.4                                 | 2.5        | 6.9        |
| -40.0                  | 73933  | 61904                | 85963                | 16.3                                 | 2.4        | 6.6        |
| -35.0                  | 53334  | 45232                | 61435                | 15.2                                 | 2.4        | 6.4        |
| -30.0                  | 38899  | 33393                | 44405                | 14.2                                 | 2.3        | 6.2        |
| -25.0                  | 28671  | 24898                | 32444                | 13.2                                 | 2.2        | 6.0        |
| -20.0                  | 21344  | 18739                | 23949                | 12.2                                 | 2.1        | 5.8        |
| -15.0                  | 16043  | 14232                | 17854                | 11.3                                 | 2.0        | 5.6        |
| -10.0                  | 12169  | 10903                | 13435                | 10.4                                 | 1.9        | 5.4        |
| -5.0                   | 9311   | 8422                 | 10201                | 9.6                                  | 1.8        | 5.3        |
| 0.0                    | 7185   | 6557                 | 7812                 | 8.7                                  | 1.7        | 5.1        |
| 5.0                    | 5588   | 5144                 | 6032                 | 7.9                                  | 1.6        | 4.9        |
| 10.0                   | 4379   | 4065                 | 4694                 | 7.2                                  | 1.5        | 4.8        |
| 15.0                   | 3457   | 3235                 | 3680                 | 6.4                                  | 1.4        | 4.7        |
| 20.0                   | 2749   | 2591                 | 2906                 | 5.7                                  | 1.3        | 4.5        |
| <b>25.0</b>            | <b>2200</b>  | <b>2090</b>          | <b>2310</b>          | <b>5.0</b>                           | <b>1.1</b> | <b>4.4</b> |
| 30.0                   | 1772   | 1671                 | 1873                 | 5.7                                  | 1.3        | 4.3        |
| 35.0                   | 1436   | 1345                 | 1528                 | 6.4                                  | 1.5        | 4.1        |
| 40.0                   | 1171   | 1089                 | 1253                 | 7.0                                  | 1.7        | 4.0        |
| 45.0                   | 960.2  | 887.4                | 1033                 | 7.6                                  | 1.9        | 3.9        |
| 50.0                   | 791.6  | 727.0                | 856.2                | 8.2                                  | 2.1        | 3.8        |
| 55.0                   | 656.0  | 598.8                | 713.3                | 8.7                                  | 2.4        | 3.7        |
| 60.0                   | 546.4  | 495.7                | 597.1                | 9.3                                  | 2.6        | 3.6        |
| 65.0                   | 457.3  | 412.5                | 502.2                | 9.8                                  | 2.8        | 3.5        |
| 70.0                   | 384.5  | 344.8                | 424.3                | 10.3                                 | 3.0        | 3.4        |
| 75.0                   | 324.8  | 289.6                | 360.0                | 10.8                                 | 3.2        | 3.3        |
| 80.0                   | 275.5  | 244.3                | 306.7                | 11.3                                 | 3.5        | 3.2        |
| 85.0                   | 234.7  | 207.0                | 262.4                | 11.8                                 | 3.7        | 3.2        |
| 90.0                   | 200.7  | 176.1                | 225.3                | 12.3                                 | 4.0        | 3.1        |
| 95.0                   | 172.3  | 150.4                | 194.2                | 12.7                                 | 4.2        | 3.0        |
| 100.0                  | 148.5  | 129.0                | 168.0                | 13.1                                 | 4.5        | 2.9        |
| 105.0                  | 128.4  | 111.0                | 145.8                | 13.6                                 | 4.7        | 2.9        |
| 110.0                  | 111.4  | 95.85                | 127.0                | 14.0                                 | 5.0        | 2.8        |
| 115.0                  | 97.02  | 83.06                | 111.0                | 14.4                                 | 5.3        | 2.7        |
| 120.0                  | 84.74  | 72.22                | 97.26                | 14.8                                 | 5.5        | 2.7        |
| 125.0                  | 74.25  | 63.00                | 85.51                | 15.2                                 | 5.8        | 2.6        |



| <b>B57301V2472H060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8500   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3650 K, R <sub>25</sub> = 4700 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 300410   | 250790               | 350030               | 16.5                                 | 2.4        | 6.8        |
| -50.0                  | 215680   | 182480               | 248880               | 15.4                                 | 2.4        | 6.5        |
| -45.0                  | 156720   | 134280               | 179150               | 14.3                                 | 2.3        | 6.3        |
| -40.0                  | 115170   | 99862                | 130470               | 13.3                                 | 2.2        | 6.1        |
| -35.0                  | 85545  | 75020                | 96069                | 12.3                                 | 2.1        | 5.8        |
| -30.0                  | 64190  | 56900                | 71480                | 11.4                                 | 2.0        | 5.6        |
| -25.0                  | 48632  | 43550                | 53714                | 10.5                                 | 1.9        | 5.5        |
| -20.0                  | 37184  | 33622                | 40745                | 9.6                                  | 1.8        | 5.3        |
| -15.0                  | 28679  | 26172                | 31186                | 8.7                                  | 1.7        | 5.1        |
| -10.0                  | 22303  | 20534                | 24073                | 7.9                                  | 1.6        | 4.9        |
| -5.0                   | 17483  | 16232                | 18735                | 7.2                                  | 1.5        | 4.8        |
| 0.0                    | 13808  | 12923                | 14694                | 6.4                                  | 1.4        | 4.6        |
| 5.0                    | 10985  | 10360                | 11610                | 5.7                                  | 1.3        | 4.5        |
| 10.0                   | 8799   | 8360                 | 9239                 | 5.0                                  | 1.1        | 4.4        |
| 15.0                   | 7095   | 6788                 | 7402                 | 4.3                                  | 1.0        | 4.2        |
| 20.0                   | 5757   | 5546                 | 5969                 | 3.7                                  | 0.9        | 4.1        |
| <b>25.0</b>            | <b>4700</b>  | <b>4559</b>          | <b>4841</b>          | <b>3.0</b>                           | <b>0.8</b> | <b>4.0</b> |
| 30.0                   | 3859   | 3718                 | 4000                 | 3.7                                  | 0.9        | 3.9        |
| 35.0                   | 3186   | 3051                 | 3322                 | 4.2                                  | 1.1        | 3.8        |
| 40.0                   | 2645   | 2518                 | 2772                 | 4.8                                  | 1.3        | 3.7        |
| 45.0                   | 2207   | 2089                 | 2325                 | 5.4                                  | 1.5        | 3.6        |
| 50.0                   | 1851   | 1742                 | 1960                 | 5.9                                  | 1.7        | 3.5        |
| 55.0                   | 1559   | 1459                 | 1659                 | 6.4                                  | 1.9        | 3.4        |
| 60.0                   | 1319   | 1228                 | 1411                 | 6.9                                  | 2.1        | 3.3        |
| 65.0                   | 1122   | 1039                 | 1204                 | 7.4                                  | 2.3        | 3.2        |
| 70.0                   | 957.4  | 882.1                | 1033                 | 7.9                                  | 2.5        | 3.1        |
| 75.0                   | 820.6  | 752.3                | 888.9                | 8.3                                  | 2.7        | 3.0        |
| 80.0                   | 706.1  | 644.1                | 768.0                | 8.8                                  | 3.0        | 3.0        |
| 85.0                   | 609.8  | 553.7                | 665.9                | 9.2                                  | 3.2        | 2.9        |
| 90.0                   | 528.6  | 477.7                | 579.5                | 9.6                                  | 3.4        | 2.8        |
| 95.0                   | 459.8  | 413.7                | 506.0                | 10.0                                 | 3.6        | 2.8        |
| 100.0                  | 401.4  | 359.5                | 443.2                | 10.4                                 | 3.9        | 2.7        |
| 105.0                  | 351.5  | 313.4                | 389.5                | 10.8                                 | 4.1        | 2.6        |
| 110.0                  | 308.7  | 274.2                | 343.3                | 11.2                                 | 4.4        | 2.6        |
| 115.0                  | 272.1  | 240.6                | 303.5                | 11.6                                 | 4.6        | 2.5        |
| 120.0                  | 240.4  | 211.8                | 269.1                | 11.9                                 | 4.9        | 2.4        |
| 125.0                  | 213.1  | 186.9                | 239.2                | 12.3                                 | 5.1        | 2.4        |



| <b>B57301V2472J060</b> |  |                      |                      |                                      |            |            |
|------------------------|--|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8500   |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3650 K, R <sub>25</sub> = 4700 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]   | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 300410   | 244780               | 356040               | 18.5                                 | 2.7        | 6.8        |
| -50.0                  | 215680   | 178170               | 253190               | 17.4                                 | 2.7        | 6.5        |
| -45.0                  | 156720   | 131140               | 182290               | 16.3                                 | 2.6        | 6.3        |
| -40.0                  | 115170   | 97559                | 132780               | 15.3                                 | 2.5        | 6.1        |
| -35.0                  | 85545  | 73309                | 97780                | 14.3                                 | 2.4        | 5.8        |
| -30.0                  | 64190  | 55616                | 72764                | 13.4                                 | 2.4        | 5.6        |
| -25.0                  | 48632  | 42577                | 54687                | 12.5                                 | 2.3        | 5.5        |
| -20.0                  | 37184  | 32878                | 41489                | 11.6                                 | 2.2        | 5.3        |
| -15.0                  | 28679  | 25598                | 31759                | 10.7                                 | 2.1        | 5.1        |
| -10.0                  | 22303  | 20088                | 24519                | 9.9                                  | 2.0        | 4.9        |
| -5.0                   | 17483  | 15882                | 19084                | 9.2                                  | 1.9        | 4.8        |
| 0.0                    | 13808  | 12647                | 14970                | 8.4                                  | 1.8        | 4.6        |
| 5.0                    | 10985  | 10140                | 11830                | 7.7                                  | 1.7        | 4.5        |
| 10.0                   | 8799   | 8184                 | 9415                 | 7.0                                  | 1.6        | 4.4        |
| 15.0                   | 7095   | 6646                 | 7544                 | 6.3                                  | 1.5        | 4.2        |
| 20.0                   | 5757   | 5430                 | 6084                 | 5.7                                  | 1.4        | 4.1        |
| <b>25.0</b>            | <b>4700</b>  | <b>4465</b>          | <b>4935</b>          | <b>5.0</b>                           | <b>1.3</b> | <b>4.0</b> |
| 30.0                   | 3859   | 3641                 | 4077                 | 5.7                                  | 1.5        | 3.9        |
| 35.0                   | 3186   | 2988                 | 3385                 | 6.2                                  | 1.7        | 3.8        |
| 40.0                   | 2645   | 2465                 | 2825                 | 6.8                                  | 1.9        | 3.7        |
| 45.0                   | 2207   | 2045                 | 2369                 | 7.4                                  | 2.1        | 3.6        |
| 50.0                   | 1851   | 1705                 | 1997                 | 7.9                                  | 2.3        | 3.5        |
| 55.0                   | 1559   | 1428                 | 1690                 | 8.4                                  | 2.5        | 3.4        |
| 60.0                   | 1319   | 1202                 | 1437                 | 8.9                                  | 2.7        | 3.3        |
| 65.0                   | 1122   | 1016                 | 1227                 | 9.4                                  | 2.9        | 3.2        |
| 70.0                   | 957.4  | 862.9                | 1052                 | 9.9                                  | 3.2        | 3.1        |
| 75.0                   | 820.6  | 735.8                | 905.3                | 10.3                                 | 3.4        | 3.0        |
| 80.0                   | 706.1  | 630.0                | 782.1                | 10.8                                 | 3.6        | 3.0        |
| 85.0                   | 609.8  | 541.5                | 678.1                | 11.2                                 | 3.9        | 2.9        |
| 90.0                   | 528.6  | 467.2                | 590.1                | 11.6                                 | 4.1        | 2.8        |
| 95.0                   | 459.8  | 404.5                | 515.2                | 12.0                                 | 4.4        | 2.8        |
| 100.0                  | 401.4  | 351.5                | 451.3                | 12.4                                 | 4.6        | 2.7        |
| 105.0                  | 351.5  | 306.4                | 396.5                | 12.8                                 | 4.9        | 2.6        |
| 110.0                  | 308.7  | 268.0                | 349.5                | 13.2                                 | 5.2        | 2.6        |
| 115.0                  | 272.1  | 235.1                | 309.0                | 13.6                                 | 5.4        | 2.5        |
| 120.0                  | 240.4  | 206.9                | 273.9                | 13.9                                 | 5.7        | 2.4        |
| 125.0                  | 213.1  | 182.7                | 243.5                | 14.3                                 | 6.0        | 2.4        |





| <b>B57321V2103H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 10000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 961580  | 790320               | 1132800              | 17.8                                 | 2.4        | 7.4        |
| -50.0                  | 668920  | 558030               | 779810               | 16.6                                 | 2.3        | 7.1        |
| -45.0                  | 471270  | 398700               | 543840               | 15.4                                 | 2.2        | 6.9        |
| -40.0                  | 336060  | 288100               | 384020               | 14.3                                 | 2.1        | 6.6        |
| -35.0                  | 242430  | 210450               | 274400               | 13.2                                 | 2.1        | 6.4        |
| -30.0                  | 176810  | 155320               | 198300               | 12.2                                 | 2.0        | 6.2        |
| -25.0                  | 130320  | 115780               | 144860               | 11.2                                 | 1.9        | 6.0        |
| -20.0                  | 97020   | 87120                | 106920               | 10.2                                 | 1.8        | 5.8        |
| -15.0                  | 72923   | 66151                | 79695                | 9.3                                  | 1.7        | 5.6        |
| -10.0                  | 55314   | 50666                | 59962                | 8.4                                  | 1.5        | 5.4        |
| -5.0                   | 42325   | 39128                | 45522                | 7.6                                  | 1.4        | 5.3        |
| 0.0                    | 32657   | 30458                | 34856                | 6.7                                  | 1.3        | 5.1        |
| 5.0                    | 25400   | 23890                | 26910                | 5.9                                  | 1.2        | 4.9        |
| 10.0                   | 19907   | 18875                | 20938                | 5.2                                  | 1.1        | 4.8        |
| 15.0                   | 15716   | 15017                | 16415                | 4.4                                  | 1.0        | 4.7        |
| 20.0                   | 12494   | 12027                | 12961                | 3.7                                  | 0.8        | 4.5        |
| <b>25.0</b>            | <b>10000</b>  | <b>9700</b>          | <b>10300</b>         | <b>3.0</b>                           | <b>0.7</b> | <b>4.4</b> |
| 30.0                   | 8055  | 7756                 | 8354                 | 3.7                                  | 0.9        | 4.3        |
| 35.0                   | 6529  | 6244                 | 6813                 | 4.4                                  | 1.1        | 4.1        |
| 40.0                   | 5323  | 5058                 | 5588                 | 5.0                                  | 1.2        | 4.0        |
| 45.0                   | 4364  | 4121                 | 4608                 | 5.6                                  | 1.4        | 3.9        |
| 50.0                   | 3598  | 3376                 | 3820                 | 6.2                                  | 1.6        | 3.8        |
| 55.0                   | 2982  | 2781                 | 3183                 | 6.7                                  | 1.8        | 3.7        |
| 60.0                   | 2484  | 2303                 | 2664                 | 7.3                                  | 2.0        | 3.6        |
| 65.0                   | 2079  | 1916                 | 2241                 | 7.8                                  | 2.2        | 3.5        |
| 70.0                   | 1748  | 1602                 | 1893                 | 8.3                                  | 2.4        | 3.4        |
| 75.0                   | 1476  | 1346                 | 1607                 | 8.8                                  | 2.6        | 3.3        |
| 80.0                   | 1252  | 1136                 | 1369                 | 9.3                                  | 2.9        | 3.2        |
| 85.0                   | 1067  | 962.3                | 1171                 | 9.8                                  | 3.1        | 3.2        |
| 90.0                   | 912.3   | 818.7                | 1006                 | 10.3                                 | 3.3        | 3.1        |
| 95.0                   | 783.2   | 699.4                | 867.0                | 10.7                                 | 3.6        | 3.0        |
| 100.0                  | 674.9   | 599.7                | 750.1                | 11.1                                 | 3.8        | 2.9        |
| 105.0                  | 583.6   | 516.1                | 651.1                | 11.6                                 | 4.0        | 2.9        |
| 110.0                  | 506.5   | 445.8                | 567.1                | 12.0                                 | 4.3        | 2.8        |
| 115.0                  | 441.0   | 386.4                | 495.6                | 12.4                                 | 4.5        | 2.7        |
| 120.0                  | 385.2   | 336.0                | 434.4                | 12.8                                 | 4.8        | 2.7        |
| 125.0                  | 337.5   | 293.1                | 381.9                | 13.2                                 | 5.0        | 2.6        |



| <b>B57321V2103J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 10000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 961580  | 771090               | 1152100              | 19.8                                 | 2.7        | 7.4        |
| -50.0                  | 668920  | 544650               | 793180               | 18.6                                 | 2.6        | 7.1        |
| -45.0                  | 471270  | 389270               | 553260               | 17.4                                 | 2.5        | 6.9        |
| -40.0                  | 336060  | 281380               | 390740               | 16.3                                 | 2.4        | 6.6        |
| -35.0                  | 242430  | 205600               | 279250               | 15.2                                 | 2.4        | 6.4        |
| -30.0                  | 176810  | 151790               | 201840               | 14.2                                 | 2.3        | 6.2        |
| -25.0                  | 130320  | 113170               | 147470               | 13.2                                 | 2.2        | 6.0        |
| -20.0                  | 97020   | 85179                | 108860               | 12.2                                 | 2.1        | 5.8        |
| -15.0                  | 72923   | 64693                | 81153                | 11.3                                 | 2.0        | 5.6        |
| -10.0                  | 55314   | 49560                | 61068                | 10.4                                 | 1.9        | 5.4        |
| -5.0                   | 42325   | 38282                | 46368                | 9.6                                  | 1.8        | 5.3        |
| 0.0                    | 32657   | 29805                | 35510                | 8.7                                  | 1.7        | 5.1        |
| 5.0                    | 25400   | 23382                | 27418                | 7.9                                  | 1.6        | 4.9        |
| 10.0                   | 19907   | 18477                | 21336                | 7.2                                  | 1.5        | 4.8        |
| 15.0                   | 15716   | 14703                | 16729                | 6.4                                  | 1.4        | 4.7        |
| 20.0                   | 12494   | 11778                | 13211                | 5.7                                  | 1.3        | 4.5        |
| <b>25.0</b>            | <b>10000</b>  | <b>9500</b>          | <b>10500</b>         | <b>5.0</b>                           | <b>1.1</b> | <b>4.4</b> |
| 30.0                   | 8055  | 7595                 | 8515                 | 5.7                                  | 1.3        | 4.3        |
| 35.0                   | 6529  | 6114                 | 6944                 | 6.4                                  | 1.5        | 4.1        |
| 40.0                   | 5323  | 4951                 | 5694                 | 7.0                                  | 1.7        | 4.0        |
| 45.0                   | 4364  | 4034                 | 4695                 | 7.6                                  | 1.9        | 3.9        |
| 50.0                   | 3598  | 3304                 | 3892                 | 8.2                                  | 2.1        | 3.8        |
| 55.0                   | 2982  | 2722                 | 3242                 | 8.7                                  | 2.4        | 3.7        |
| 60.0                   | 2484  | 2253                 | 2714                 | 9.3                                  | 2.6        | 3.6        |
| 65.0                   | 2079  | 1875                 | 2283                 | 9.8                                  | 2.8        | 3.5        |
| 70.0                   | 1748  | 1567                 | 1928                 | 10.3                                 | 3.0        | 3.4        |
| 75.0                   | 1476  | 1316                 | 1636                 | 10.8                                 | 3.2        | 3.3        |
| 80.0                   | 1252  | 1111                 | 1394                 | 11.3                                 | 3.5        | 3.2        |
| 85.0                   | 1067  | 940.9                | 1193                 | 11.8                                 | 3.7        | 3.2        |
| 90.0                   | 912.3   | 800.5                | 1024                 | 12.3                                 | 4.0        | 3.1        |
| 95.0                   | 783.2   | 683.7                | 882.7                | 12.7                                 | 4.2        | 3.0        |
| 100.0                  | 674.9   | 586.2                | 763.6                | 13.1                                 | 4.5        | 2.9        |
| 105.0                  | 583.6   | 504.5                | 662.8                | 13.6                                 | 4.7        | 2.9        |
| 110.0                  | 506.5   | 435.7                | 577.3                | 14.0                                 | 5.0        | 2.8        |
| 115.0                  | 441.0   | 377.6                | 504.4                | 14.4                                 | 5.3        | 2.7        |
| 120.0                  | 385.2   | 328.3                | 442.1                | 14.8                                 | 5.5        | 2.7        |
| 125.0                  | 337.5   | 286.4                | 388.7                | 15.2                                 | 5.8        | 2.6        |



| <b>B57351V2103H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8505  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3460 K, R <sub>25</sub> = 10000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 503650  | 423990               | 583310               | 15.8                                 | 2.5        | 6.3        |
| -50.0                  | 369790  | 315240               | 424330               | 14.8                                 | 2.4        | 6.1        |
| -45.0                  | 274310  | 236640               | 311970               | 13.7                                 | 2.3        | 5.9        |
| -40.0                  | 205500  | 179280               | 231710               | 12.8                                 | 2.2        | 5.7        |
| -35.0                  | 155410  | 137040               | 173780               | 11.8                                 | 2.2        | 5.5        |
| -30.0                  | 118600  | 105640               | 131550               | 10.9                                 | 2.1        | 5.3        |
| -25.0                  | 91293   | 82104                | 100480               | 10.1                                 | 2.0        | 5.1        |
| -20.0                  | 70862   | 64316                | 77409                | 9.2                                  | 1.9        | 5.0        |
| -15.0                  | 55444   | 50762                | 60126                | 8.4                                  | 1.7        | 4.8        |
| -10.0                  | 43713   | 40356                | 47071                | 7.7                                  | 1.6        | 4.7        |
| -5.0                   | 34718   | 32306                | 37129                | 6.9                                  | 1.5        | 4.5        |
| 0.0                    | 27767   | 26036                | 29499                | 6.2                                  | 1.4        | 4.4        |
| 5.0                    | 22359   | 21117                | 23600                | 5.6                                  | 1.3        | 4.3        |
| 10.0                   | 18120   | 17233                | 19007                | 4.9                                  | 1.2        | 4.1        |
| 15.0                   | 14776   | 14147                | 15405                | 4.3                                  | 1.1        | 4.0        |
| 20.0                   | 12121   | 11679                | 12563                | 3.6                                  | 0.9        | 3.9        |
| <b>25.0</b>            | <b>10000</b>  | <b>9700</b>          | <b>10300</b>         | <b>3.0</b>                           | <b>0.8</b> | <b>3.8</b> |
| 30.0                   | 8295  | 7995                 | 8596                 | 3.6                                  | 1.0        | 3.7        |
| 35.0                   | 6918  | 6629                 | 7207                 | 4.2                                  | 1.2        | 3.6        |
| 40.0                   | 5798  | 5525                 | 6072                 | 4.7                                  | 1.4        | 3.5        |
| 45.0                   | 4883  | 4628                 | 5139                 | 5.2                                  | 1.5        | 3.4        |
| 50.0                   | 4132  | 3895                 | 4370                 | 5.7                                  | 1.7        | 3.3        |
| 55.0                   | 3512  | 3293                 | 3731                 | 6.2                                  | 1.9        | 3.2        |
| 60.0                   | 2998  | 2797                 | 3200                 | 6.7                                  | 2.1        | 3.1        |
| 65.0                   | 2570  | 2386                 | 2755                 | 7.2                                  | 2.4        | 3.0        |
| 70.0                   | 2212  | 2044                 | 2381                 | 7.6                                  | 2.6        | 3.0        |
| 75.0                   | 1911  | 1758                 | 2065                 | 8.0                                  | 2.8        | 2.9        |
| 80.0                   | 1658  | 1517                 | 1798                 | 8.5                                  | 3.0        | 2.8        |
| 85.0                   | 1443  | 1315                 | 1571                 | 8.9                                  | 3.2        | 2.7        |
| 90.0                   | 1260  | 1143                 | 1377                 | 9.3                                  | 3.5        | 2.7        |
| 95.0                   | 1104  | 997.4                | 1211                 | 9.7                                  | 3.7        | 2.6        |
| 100.0                  | 970.7   | 873.1                | 1068                 | 10.0                                 | 3.9        | 2.5        |
| 105.0                  | 856.0   | 766.8                | 945.1                | 10.4                                 | 4.2        | 2.5        |
| 110.0                  | 757.1   | 675.5                | 838.7                | 10.8                                 | 4.4        | 2.4        |
| 115.0                  | 671.6   | 596.9                | 746.3                | 11.1                                 | 4.7        | 2.4        |
| 120.0                  | 597.4   | 528.9                | 665.9                | 11.5                                 | 5.0        | 2.3        |
| 125.0                  | 532.8   | 470.0                | 595.7                | 11.8                                 | 5.2        | 2.3        |



| <b>B57351V2103J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8505  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 3460 K, R <sub>25</sub> = 10000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 503650  | 413910               | 593390               | 17.8                                 | 2.8        | 6.3        |
| -50.0                  | 369790  | 307840               | 431730               | 16.8                                 | 2.8        | 6.1        |
| -45.0                  | 274310  | 231150               | 317460               | 15.7                                 | 2.7        | 5.9        |
| -40.0                  | 205500  | 175170               | 235820               | 14.8                                 | 2.6        | 5.7        |
| -35.0                  | 155410  | 133930               | 176890               | 13.8                                 | 2.5        | 5.5        |
| -30.0                  | 118600  | 103270               | 133920               | 12.9                                 | 2.4        | 5.3        |
| -25.0                  | 91293   | 80278                | 102310               | 12.1                                 | 2.3        | 5.1        |
| -20.0                  | 70862   | 62898                | 78826                | 11.2                                 | 2.3        | 5.0        |
| -15.0                  | 55444   | 49653                | 61235                | 10.4                                 | 2.2        | 4.8        |
| -10.0                  | 43713   | 39482                | 47945                | 9.7                                  | 2.1        | 4.7        |
| -5.0                   | 34718   | 31612                | 37823                | 8.9                                  | 2.0        | 4.5        |
| 0.0                    | 27767   | 25480                | 30054                | 8.2                                  | 1.9        | 4.4        |
| 5.0                    | 22359   | 20670                | 24047                | 7.6                                  | 1.8        | 4.3        |
| 10.0                   | 18120   | 16871                | 19369                | 6.9                                  | 1.7        | 4.1        |
| 15.0                   | 14776   | 13851                | 15701                | 6.3                                  | 1.6        | 4.0        |
| 20.0                   | 12121   | 11437                | 12805                | 5.6                                  | 1.4        | 3.9        |
| <b>25.0</b>            | <b>10000</b>  | <b>9500</b>          | <b>10500</b>         | <b>5.0</b>                           | <b>1.3</b> | <b>3.8</b> |
| 30.0                   | 8295  | 7829                 | 8762                 | 5.6                                  | 1.5        | 3.7        |
| 35.0                   | 6918  | 6490                 | 7345                 | 6.2                                  | 1.7        | 3.6        |
| 40.0                   | 5798  | 5409                 | 6188                 | 6.7                                  | 1.9        | 3.5        |
| 45.0                   | 4883  | 4530                 | 5237                 | 7.2                                  | 2.1        | 3.4        |
| 50.0                   | 4132  | 3812                 | 4452                 | 7.7                                  | 2.4        | 3.3        |
| 55.0                   | 3512  | 3223                 | 3802                 | 8.2                                  | 2.6        | 3.2        |
| 60.0                   | 2998  | 2737                 | 3260                 | 8.7                                  | 2.8        | 3.1        |
| 65.0                   | 2570  | 2335                 | 2806                 | 9.2                                  | 3.0        | 3.0        |
| 70.0                   | 2212  | 2000                 | 2425                 | 9.6                                  | 3.2        | 3.0        |
| 75.0                   | 1911  | 1719                 | 2104                 | 10.0                                 | 3.5        | 2.9        |
| 80.0                   | 1658  | 1484                 | 1831                 | 10.5                                 | 3.7        | 2.8        |
| 85.0                   | 1443  | 1286                 | 1600                 | 10.9                                 | 4.0        | 2.7        |
| 90.0                   | 1260  | 1118                 | 1402                 | 11.3                                 | 4.2        | 2.7        |
| 95.0                   | 1104  | 975.3                | 1233                 | 11.7                                 | 4.5        | 2.6        |
| 100.0                  | 970.7   | 853.7                | 1088                 | 12.0                                 | 4.7        | 2.5        |
| 105.0                  | 856.0   | 749.7                | 962.2                | 12.4                                 | 5.0        | 2.5        |
| 110.0                  | 757.1   | 660.4                | 853.8                | 12.8                                 | 5.3        | 2.4        |
| 115.0                  | 671.6   | 583.5                | 759.7                | 13.1                                 | 5.5        | 2.4        |
| 120.0                  | 597.4   | 517.0                | 677.8                | 13.5                                 | 5.8        | 2.3        |
| 125.0                  | 532.8   | 459.3                | 606.4                | 13.8                                 | 6.1        | 2.3        |



| <b>B57321V2473H060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 47000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 3% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 4519400   | 3714500              | 5324300              | 17.8                                 | 2.4        | 7.4        |
| -50.0                  | 3143900   | 2622700              | 3665100              | 16.6                                 | 2.3        | 7.1        |
| -45.0                  | 2215000   | 1873900              | 2556000              | 15.4                                 | 2.2        | 6.9        |
| -40.0                  | 1579500   | 1354100              | 1804900              | 14.3                                 | 2.1        | 6.6        |
| -35.0                  | 1139400   | 989110               | 1289700              | 13.2                                 | 2.1        | 6.4        |
| -30.0                  | 831030  | 730020               | 932030               | 12.2                                 | 2.0        | 6.2        |
| -25.0                  | 612510  | 544150               | 680860               | 11.2                                 | 1.9        | 6.0        |
| -20.0                  | 456000  | 409460               | 502530               | 10.2                                 | 1.8        | 5.8        |
| -15.0                  | 342740  | 310910               | 374570               | 9.3                                  | 1.7        | 5.6        |
| -10.0                  | 259980  | 238130               | 281820               | 8.4                                  | 1.5        | 5.4        |
| -5.0                   | 198930  | 183900               | 213950               | 7.6                                  | 1.4        | 5.3        |
| 0.0                    | 153490  | 143150               | 163830               | 6.7                                  | 1.3        | 5.1        |
| 5.0                    | 119380  | 112280               | 126480               | 5.9                                  | 1.2        | 4.9        |
| 10.0                   | 93561   | 88713                | 98409                | 5.2                                  | 1.1        | 4.8        |
| 15.0                   | 73864   | 70580                | 77149                | 4.4                                  | 1.0        | 4.7        |
| 20.0                   | 58723   | 56529                | 60917                | 3.7                                  | 0.8        | 4.5        |
| <b>25.0</b>            | <b>47000</b>  | <b>45590</b>         | <b>48410</b>         | <b>3.0</b>                           | <b>0.7</b> | <b>4.4</b> |
| 30.0                   | 37860   | 36454                | 39266                | 3.7                                  | 0.9        | 4.3        |
| 35.0                   | 30685   | 29348                | 32022                | 4.4                                  | 1.1        | 4.1        |
| 40.0                   | 25018   | 23772                | 26263                | 5.0                                  | 1.2        | 4.0        |
| 45.0                   | 20513   | 19368                | 21658                | 5.6                                  | 1.4        | 3.9        |
| 50.0                   | 16911   | 15869                | 17954                | 6.2                                  | 1.6        | 3.8        |
| 55.0                   | 14015   | 13072                | 14958                | 6.7                                  | 1.8        | 3.7        |
| 60.0                   | 11673   | 10824                | 12523                | 7.3                                  | 2.0        | 3.6        |
| 65.0                   | 9770  | 9007                 | 10533                | 7.8                                  | 2.2        | 3.5        |
| 70.0                   | 8215  | 7531                 | 8899                 | 8.3                                  | 2.4        | 3.4        |
| 75.0                   | 6939  | 6326                 | 7551                 | 8.8                                  | 2.6        | 3.3        |
| 80.0                   | 5886  | 5337                 | 6434                 | 9.3                                  | 2.9        | 3.2        |
| 85.0                   | 5014  | 4523                 | 5505                 | 9.8                                  | 3.1        | 3.2        |
| 90.0                   | 4288  | 3848                 | 4727                 | 10.3                                 | 3.3        | 3.1        |
| 95.0                   | 3681  | 3287                 | 4075                 | 10.7                                 | 3.6        | 3.0        |
| 100.0                  | 3172  | 2819                 | 3525                 | 11.1                                 | 3.8        | 2.9        |
| 105.0                  | 2743  | 2426                 | 3060                 | 11.6                                 | 4.0        | 2.9        |
| 110.0                  | 2380  | 2095                 | 2666                 | 12.0                                 | 4.3        | 2.8        |
| 115.0                  | 2073  | 1816                 | 2329                 | 12.4                                 | 4.5        | 2.7        |
| 120.0                  | 1810  | 1579                 | 2042                 | 12.8                                 | 4.8        | 2.7        |
| 125.0                  | 1586  | 1378                 | 1795                 | 13.2                                 | 5.0        | 2.6        |



| <b>B57321V2473J060</b> |   |                      |                      |                                      |            |            |
|------------------------|---|----------------------|----------------------|--------------------------------------|------------|------------|
| R/T No.                | 8502  |                      |                      |                                      |            |            |
| T (°C)                 | B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 47000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5% |                      |                      |                                      |            |            |
|                        | R <sub>nom</sub> [Ω]  | R <sub>min</sub> [Ω] | R <sub>max</sub> [Ω] | ΔR <sub>R</sub> /R <sub>R</sub> [±%] | ΔT[±°C]    | α (%/K)    |
| -55.0                  | 4519400   | 3624100              | 5414700              | 19.8                                 | 2.7        | 7.4        |
| -50.0                  | 3143900   | 2559900              | 3728000              | 18.6                                 | 2.6        | 7.1        |
| -45.0                  | 2215000   | 1829600              | 2600300              | 17.4                                 | 2.5        | 6.9        |
| -40.0                  | 1579500   | 1322500              | 1836500              | 16.3                                 | 2.4        | 6.6        |
| -35.0                  | 1139400   | 966320               | 1312500              | 15.2                                 | 2.4        | 6.4        |
| -30.0                  | 831030  | 713400               | 948650               | 14.2                                 | 2.3        | 6.2        |
| -25.0                  | 612510  | 531900               | 693110               | 13.2                                 | 2.2        | 6.0        |
| -20.0                  | 456000  | 400340               | 511650               | 12.2                                 | 2.1        | 5.8        |
| -15.0                  | 342740  | 304060               | 381420               | 11.3                                 | 2.0        | 5.6        |
| -10.0                  | 259980  | 232930               | 287020               | 10.4                                 | 1.9        | 5.4        |
| -5.0                   | 198930  | 179920               | 217930               | 9.6                                  | 1.8        | 5.3        |
| 0.0                    | 153490  | 140080               | 166900               | 8.7                                  | 1.7        | 5.1        |
| 5.0                    | 119380  | 109900               | 128860               | 7.9                                  | 1.6        | 4.9        |
| 10.0                   | 93561   | 86841                | 100280               | 7.2                                  | 1.5        | 4.8        |
| 15.0                   | 73864   | 69102                | 78626                | 6.4                                  | 1.4        | 4.7        |
| 20.0                   | 58723   | 55355                | 62092                | 5.7                                  | 1.3        | 4.5        |
| <b>25.0</b>            | <b>47000</b>  | <b>44650</b>         | <b>49350</b>         | <b>5.0</b>                           | <b>1.1</b> | <b>4.4</b> |
| 30.0                   | 37860   | 35696                | 40023                | 5.7                                  | 1.3        | 4.3        |
| 35.0                   | 30685   | 28735                | 32636                | 6.4                                  | 1.5        | 4.1        |
| 40.0                   | 25018   | 23272                | 26763                | 7.0                                  | 1.7        | 4.0        |
| 45.0                   | 20513   | 18958                | 22068                | 7.6                                  | 1.9        | 3.9        |
| 50.0                   | 16911   | 15531                | 18292                | 8.2                                  | 2.1        | 3.8        |
| 55.0                   | 14015   | 12792                | 15239                | 8.7                                  | 2.4        | 3.7        |
| 60.0                   | 11673   | 10590                | 12757                | 9.3                                  | 2.6        | 3.6        |
| 65.0                   | 9770  | 8812                 | 10729                | 9.8                                  | 2.8        | 3.5        |
| 70.0                   | 8215  | 7367                 | 9064                 | 10.3                                 | 3.0        | 3.4        |
| 75.0                   | 6939  | 6187                 | 7690                 | 10.8                                 | 3.2        | 3.3        |
| 80.0                   | 5886  | 5220                 | 6552                 | 11.3                                 | 3.5        | 3.2        |
| 85.0                   | 5014  | 4422                 | 5605                 | 11.8                                 | 3.7        | 3.2        |
| 90.0                   | 4288  | 3762                 | 4813                 | 12.3                                 | 4.0        | 3.1        |
| 95.0                   | 3681  | 3213                 | 4149                 | 12.7                                 | 4.2        | 3.0        |
| 100.0                  | 3172  | 2755                 | 3589                 | 13.1                                 | 4.5        | 2.9        |
| 105.0                  | 2743  | 2371                 | 3115                 | 13.6                                 | 4.7        | 2.9        |
| 110.0                  | 2380  | 2048                 | 2713                 | 14.0                                 | 5.0        | 2.8        |
| 115.0                  | 2073  | 1775                 | 2371                 | 14.4                                 | 5.3        | 2.7        |
| 120.0                  | 1810  | 1543                 | 2078                 | 14.8                                 | 5.5        | 2.7        |
| 125.0                  | 1586  | 1346                 | 1827                 | 15.2                                 | 5.8        | 2.6        |



## Cautions and warnings

### General

See "Important notes" at the end of this document.

### Storage

- Store thermistors only in original packaging. Do not open the package before storage.
- Storage conditions in original packaging: storage temperature  $-25\text{ °C} \dots +45\text{ °C}$ , relative humidity  $\leq 75\%$  annual mean, maximum 95%, dew precipitation is inadmissible.
- Do not store SMDs where they are exposed to heat or direct sunlight. Otherwise, the packing material may be deformed or SMDs may stick together, causing problems during mounting.
- Avoid contamination of thermistors surface during storage, handling and processing.
- Avoid storage of thermistor in harmful environments like corrosive gases (SO<sub>x</sub>, Cl etc).
- After opening the factory seals, such as polyvinyl-sealed packages, use the SMDs as soon as possible.
- Solder thermistors after shipment from EPCOS within the time specified:  
SMDs: 12 months  
Leaded components: 24 months

### Handling

- NTC thermistors must not be dropped. Chip-offs must not be caused during handling of NTCs.
- Components must not be touched with bare hands. Gloves are recommended.
- Avoid contamination of thermistor surface during handling.

### Soldering

- Use resin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.

### Mounting

- When NTC thermistors are encapsulated with sealing material or overmolded with plastic material, the precautions given in chapter "Mounting instructions", "Sealing, potting and overmolding" must be observed.
- Electrode must not be scratched before/during/after the mounting process.
- Contacts and housings used for assembly with thermistor have to be clean before mounting.
- During operation, the thermistor's surface temperature can be very high (ICL). Ensure that adjacent components are placed at a sufficient distance from the thermistor to allow for proper cooling of the thermistors.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of the thermistor. Be sure that surrounding parts and materials can withstand this temperature.
- Make sure that thermistors (ICLs) are adequately ventilated to avoid overheating.
- Avoid contamination of thermistor surface during processing.



### Operation

- Use thermistors only within the specified operating temperature range.
- Use thermistors only within the specified voltage and current ranges (ICLs).
- Environmental conditions must not harm the thermistors. Use thermistors only in normal atmospheric conditions.
- Contact of NTC thermistors with any liquids and solvents should be prevented. It must be ensured that no water enters the NTC thermistor (e.g. through plug terminals). For measurement purposes (checking the specified resistance vs. temperature), the component must not be immersed in water but in suitable liquids (e.g. Galden).
- Avoid dewing and condensation.
- Be sure to provide an appropriate fail-safe function to prevent secondary product damage caused by malfunction (e.g. use VDR for limitation of overvoltage condition).



## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of passive electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of a passive electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of a passive electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as “hazardous”)**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.epcos.com/material](http://www.epcos.com/material)). Should you have any more detailed questions, please contact our sales offices.
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