

# NTC Thermistors, Low Thermal Gradient Lug Sensors



## ADDITIONAL RESOURCES



- NTC curve computation:  
[www.vishay.com/thermistors/ntc-curve-list/](http://www.vishay.com/thermistors/ntc-curve-list/)

| QUICK REFERENCE DATA   |                     |                 |
|--|---------------------|-----------------|
| PARAMETER  | VALUE               | UNIT            |
| Resistance value at 25 °C <sup>(1)</sup>                       | 4.7K to 100K        | Ω               |
| Tolerance on $R_{25}$ -value <sup>(1)</sup>                    | ± 1; ± 2; ± 3       | %               |
| $B_{25/85}$ value <sup>(1)</sup>                               | 3435 to 4190        | K               |
| Tolerance on $B_{25/85}$ -value                                | ± 0.5; ± 1.0; ± 1.5 | %               |
| Operating temperature range at zero power                      | -55 to +125         | °C              |
| Thermal time constant $\tau$                                   | ≈ 5                 | s               |
| Dissipation factor   | 10                  | mW/K            |
| Thermal gradient <sup>(2)</sup>                                | < 0.05              | K/K             |
| Min. dielectric withstanding voltage between terminals and lug | 1500                | V <sub>AC</sub> |
| Climatic category (LCT / UCT / days)                           | 55 / 125 / 56       |                 |
| Weight   | ≈ 1.0               | g               |

### Notes

- (1) Other  $R_{25}$ -values,  $B_{25/85}$ -values, and tolerances are available upon request
- (2) The thermal gradient is the difference per °C between the true temperature of the surface to be sensed and the temperature measured by the sensor

## FEATURES

- Low thermal gradient due to the use of nickel conductor and low profile closed ring tongue
- AEC-Q200 qualified (grade 1)
- cULus recognized, file E148885 (UL category XGPU2/XGPU8)
- Mounting: assembly screw mounting
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS COMPLIANT**

## APPLICATIONS

Thermistors used for accurate surface temperature sensing and control in:

- Computer equipment
- Power electronics, heat-sink temperature control
- Consumer appliances
- Industrial equipment
- Automotive equipment

## DESCRIPTION

Vishay thermistor chip NTC with epoxy coating and middle buffer layer mounted in a tin plated copper ring lug with PEEK insulated leads AWG#30 (Ø 0.25 mm), mono-stranded silver-plated nickel.

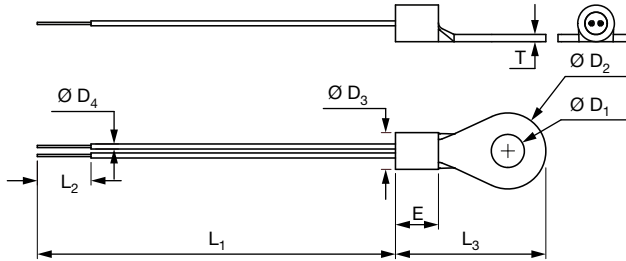
## MOUNTING

- The device is suitable for screwing e.g. on a metal surface through means of an M3 or M3.5 screw
- The connections are suitable for soldering on a PCB or for connector insertion
- The sensor is not suitable for being in permanent contact with water or liquids
- Other applicable screw hole sizes are available, for example M4 or American Stud #8
- AWG#28 or AWG#26 wires available on request
- Consult Vishay for other cable length, cable section, screw sizes, insulation, connector crimping or other features

| ELECTRICAL DATA AND ORDERING INFORMATION |                      |                 |                         |             |                       | SAP MATERIAL AND ORDERING NUMBER             |                        |
|--|----------------------|-----------------|-------------------------|-------------|-----------------------|--|------------------------|
| $R_{25}$ (Ω)                             | $R_{25}$ -TOL. (± %) | $B_{25/85}$ (K) | $B_{25/85}$ -TOL. (± %) | $L_1$ (mm)  | UL RECOGNIZED (Y / N) | RoHS COMPLIANT WITH EXEMPTION <sup>(1)</sup> | RoHS COMPLIANT         |
| 4700                                     | 2                    | 3984            | 0.5                     | 45 ± 3      | N                     | NTCALUG02A472G                               | NTCALUG02A472GA        |
| 4700                                     | 1                    | 3984            | 0.5                     | 45 ± 3      | N                     | NTCALUG02A472F                               | NTCALUG02A472FA        |
| 5000                                     | 2                    | 3984            | 0.5                     | 45 ± 3      | Y                     | <b>NTCALUG02A502G</b>                        | <b>NTCALUG02A502GA</b> |
| 10 000                                   | 2                    | 3984            | 0.5                     | 45 ± 3      | Y                     | <b>NTCALUG02A103G <sup>(2)</sup></b>         | <b>NTCALUG02A103GA</b> |
| 10 000                                   | 1                    | 3984            | 0.5                     | 45 ± 3      | Y                     | NTCALUG02A103F                               | NTCALUG02A103FA        |
| 10 000                                   | 1                    | 3984            | 0.5                     | 80 +5 / -3  | Y                     | NTCALUG02A103F800                            | NTCALUG02A103F800A     |
| 10 000                                   | 1                    | 3984            | 0.5                     | 160 +5 / -3 | Y                     | NTCALUG02A103F161                            | NTCALUG02A103F161A     |
| 10 000                                   | 1                    | 3435            | 1.0                     | 45 ± 3      | Y                     | NTCALUG02A103FL                              | NTCALUG02A103FLA       |
| 10 000                                   | 1                    | 3435            | 1.0                     | 80 +5 / -3  | Y                     | NTCALUG02A103F800L                           | NTCALUG02A103F804A     |
| 10 000                                   | 1                    | 3435            | 1.0                     | 160 +5 / -3 | Y                     | NTCALUG02A103F161L                           | NTCALUG02A103F165A     |
| 100 000                                  | 3                    | 4190            | 1.5                     | 45 ± 3      | N                     | NTCALUG02A104H                               | NTCALUG02A104HA        |

### Notes

- (1) RoHS exemption 7(c)-I: electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezo-electronic devices, or in a glass or ceramic matrix compound
- (2) Is also known under material number NTCALUGE4C90294

**DIMENSIONS** in millimeters


| $L_1$                       | $L_2$     | $L_3$          | $\varnothing D_1$ | $\varnothing D_2$ | $\varnothing D_3$   | $\varnothing D_4$ | E             | T   |
|-----------------------------|-----------|----------------|-------------------|-------------------|---------------------|-------------------|---------------|-----|
| Refer to the ordering table | $6 \pm 1$ | $16.8 \pm 0.3$ | $3.7 + 0.2 / - 0$ | $8.5 \pm 0.2$     | $4.1 + 0.4 / - 0.1$ | $0.56 \pm 0.1$    | $4.8 \pm 0.2$ | 0.8 |



NTCALUG02A472G\*

NTC LUG02A 4.7K 2 % 3984 K 0.5 %

**RESISTANCE TEMPERATURE CHARACTERISTICS**

| TEMP.<br>(°C) | $R(T)/R_{25}$ | RESISTANCE<br>( $\Omega$ ) | $\Delta R/R$<br>(%) | $\alpha$<br>(%/K) | $\Delta T$<br>(K) | $R_{min.}$<br>( $\Omega$ ) | $R_{max.}$<br>( $\Omega$ ) |
|---------------|---------------|----------------------------|---------------------|-------------------|-------------------|----------------------------|----------------------------|
| -40           | 33.43         | 157 109                    | 3.90                | -6.63             | 0.59              | 150 982                    | 163 236                    |
| -35           | 24.13         | 113 422                    | 3.72                | -6.41             | 0.58              | 109 206                    | 117 638                    |
| -30           | 17.61         | 82 782                     | 3.54                | -6.19             | 0.57              | 79 851                     | 85714                      |
| -25           | 12.99         | 61 053                     | 3.37                | -5.99             | 0.56              | 58 994                     | 63 112                     |
| -20           | 9.68          | 45 478                     | 3.21                | -5.79             | 0.55              | 44 017                     | 46 938                     |
| -15           | 7.276         | 34 199                     | 3.06                | -5.61             | 0.54              | 33 154                     | 35 244                     |
| -10           | 5.522         | 25 953                     | 2.91                | -5.43             | 0.54              | 25 198                     | 26 707                     |
| -5            | 4.227         | 19 866                     | 2.76                | -5.26             | 0.53              | 19 317                     | 20 415                     |
| 0             | 3.262         | 15 333                     | 2.62                | -5.10             | 0.51              | 14 931                     | 15 736                     |
| 5             | 2.538         | 11 929                     | 2.49                | -4.94             | 0.50              | 11 632                     | 12 226                     |
| 10            | 1.990         | 9352                       | 2.36                | -4.80             | 0.49              | 9131                       | 9572                       |
| 15            | 1.571         | 7384                       | 2.24                | -4.65             | 0.48              | 7219                       | 7549                       |
| 20            | 1.249         | 5872                       | 2.12                | -4.52             | 0.47              | 5747                       | 5996                       |
| 25            | 1.000         | 4700                       | 2.00                | -4.39             | 0.46              | 4606                       | 4794                       |
| 30            | 0.8056        | 3786                       | 2.11                | -4.26             | 0.50              | 3706                       | 3866                       |
| 35            | 0.6530        | 3069                       | 2.22                | -4.14             | 0.54              | 3001                       | 3137                       |
| 40            | 0.5324        | 2502                       | 2.33                | -4.03             | 0.58              | 2444                       | 2560                       |
| 45            | 0.4365        | 2052                       | 2.43                | -3.92             | 0.62              | 2002                       | 2102                       |
| 50            | 0.3599        | 1691                       | 2.53                | -3.81             | 0.66              | 1649                       | 1734                       |
| 55            | 0.2982        | 1402                       | 2.62                | -3.71             | 0.71              | 1365                       | 1438                       |
| 60            | 0.2484        | 1167                       | 2.72                | -3.61             | 0.75              | 1136                       | 1199                       |
| 65            | 0.2079        | 977.0                      | 2.81                | -3.51             | 0.80              | 949.6                      | 1004                       |
| 70            | 0.1748        | 821.4                      | 2.89                | -3.42             | 0.85              | 797.6                      | 845.2                      |
| 75            | 0.1476        | 693.7                      | 2.98                | -3.34             | 0.89              | 673.0                      | 714.3                      |
| 80            | 0.1252        | 588.3                      | 3.06                | -3.25             | 0.94              | 570.3                      | 606.4                      |
| 85            | 0.1066        | 501.1                      | 3.14                | -3.17             | 0.99              | 485.3                      | 516.8                      |
| 90            | 0.09116       | 428.4                      | 3.22                | -3.09             | 1.04              | 414.7                      | 442.2                      |
| 95            | 0.07825       | 367.8                      | 3.30                | -3.02             | 1.09              | 355.6                      | 379.9                      |
| 100           | 0.06741       | 316.8                      | 3.37                | -2.94             | 1.14              | 306.2                      | 327.5                      |
| 105           | 0.05828       | 273.9                      | 3.44                | -2.87             | 1.20              | 264.5                      | 283.4                      |
| 110           | 0.05057       | 237.7                      | 3.51                | -2.81             | 1.25              | 229.3                      | 246.0                      |
| 115           | 0.04402       | 206.9                      | 3.58                | -2.74             | 1.31              | 199.5                      | 214.3                      |
| 120           | 0.03844       | 180.7                      | 3.65                | -2.68             | 1.36              | 174.1                      | 187.3                      |
| 125           | 0.03367       | 158.3                      | 3.71                | -2.62             | 1.42              | 152.4                      | 164.1                      |



|                 |                                  |
|-----------------|----------------------------------|
| NTCALUG02A472F* | NTC LUG02A 4.7K 1 % 3984 K 0.5 % |
|-----------------|----------------------------------|

| RESISTANCE TEMPERATURE CHARACTERISTICS |                  |                |                  |                |                |                |                |
|--|------------------|----------------|------------------|----------------|----------------|----------------|----------------|
| TEMP. (°C)                             | $R_{(T)}/R_{25}$ | RESISTANCE (Ω) | $\Delta R/R$ (%) | $\alpha$ (%/K) | $\Delta T$ (K) | $R_{min.}$ (Ω) | $R_{max.}$ (Ω) |
| -40                                    | 33.43            | 157 109        | 2.88             | -6.63          | 0.43           | 152 582        | 161 636        |
| -35                                    | 24.13            | 113 422        | 2.70             | -6.41          | 0.42           | 110 359        | 116 484        |
| -30                                    | 17.61            | 82 782         | 2.53             | -6.19          | 0.41           | 80 691         | 84 874         |
| -25                                    | 12.99            | 61 053         | 2.36             | -5.99          | 0.39           | 59 612         | 62 494         |
| -20                                    | 9.68             | 45 478         | 2.20             | -5.79          | 0.38           | 44 477         | 46 478         |
| -15                                    | 7.276            | 34 199         | 2.05             | -5.61          | 0.36           | 33 500         | 34 899         |
| -10                                    | 5.522            | 25 953         | 1.90             | -5.43          | 0.35           | 25 460         | 26 445         |
| -5                                     | 4.227            | 19 866         | 1.75             | -5.26          | 0.33           | 19 517         | 20 215         |
| 0                                      | 3.262            | 15 333         | 1.62             | -5.10          | 0.32           | 15 085         | 15 581         |
| 5                                      | 2.538            | 11 929         | 1.49             | -4.94          | 0.30           | 11 752         | 12 106         |
| 10                                     | 1.990            | 9352           | 1.36             | -4.80          | 0.28           | 9225           | 9478           |
| 15                                     | 1.571            | 7384           | 1.23             | -4.65          | 0.27           | 7293           | 7475           |
| 20                                     | 1.249            | 5872           | 1.12             | -4.52          | 0.25           | 5806           | 5937           |
| 25                                     | 1.000            | 4700           | 1.00             | -4.39          | 0.23           | 4653           | 4747           |
| 30                                     | 0.8056           | 3786           | 1.11             | -4.26          | 0.26           | 3744           | 3828           |
| 35                                     | 0.6530           | 3069           | 1.22             | -4.14          | 0.29           | 3032           | 3106           |
| 40                                     | 0.5324           | 2502           | 1.32             | -4.03          | 0.33           | 2469           | 2535           |
| 45                                     | 0.4365           | 2052           | 1.42             | -3.92          | 0.36           | 2022           | 2081           |
| 50                                     | 0.3599           | 1691           | 1.52             | -3.81          | 0.40           | 1666           | 1717           |
| 55                                     | 0.2982           | 1402           | 1.62             | -3.71          | 0.44           | 1379           | 1424           |
| 60                                     | 0.2484           | 1167           | 1.71             | -3.61          | 0.47           | 1147           | 1187           |
| 65                                     | 0.2079           | 977.0          | 1.80             | -3.51          | 0.51           | 959.4          | 994.5          |
| 70                                     | 0.1748           | 821.4          | 1.88             | -3.42          | 0.55           | 805.9          | 836.9          |
| 75                                     | 0.1476           | 693.7          | 1.97             | -3.34          | 0.59           | 680.0          | 707.3          |
| 80                                     | 0.1252           | 588.3          | 2.05             | -3.25          | 0.63           | 576.3          | 600.4          |
| 85                                     | 0.1066           | 501.1          | 2.13             | -3.17          | 0.67           | 490.4          | 511.7          |
| 90                                     | 0.09116          | 428.4          | 2.21             | -3.09          | 0.71           | 419.0          | 437.9          |
| 95                                     | 0.07825          | 367.8          | 2.28             | -3.02          | 0.76           | 359.4          | 376.2          |
| 100                                    | 0.06741          | 316.8          | 2.36             | -2.94          | 0.80           | 309.4          | 324.3          |
| 105                                    | 0.05828          | 273.9          | 2.43             | -2.87          | 0.84           | 267.3          | 280.6          |
| 110                                    | 0.05057          | 237.7          | 2.50             | -2.81          | 0.89           | 231.7          | 243.6          |
| 115                                    | 0.04402          | 206.9          | 2.56             | -2.74          | 0.94           | 201.6          | 212.2          |
| 120                                    | 0.03844          | 180.7          | 2.63             | -2.68          | 0.98           | 175.9          | 185.4          |
| 125                                    | 0.03367          | 158.3          | 2.69             | -2.62          | 1.03           | 154.0          | 162.5          |



|                 |                                |
|-----------------|--------------------------------|
| NTCALUG02A502G* | NTC LUG02A 5K 2 % 3984 K 0.5 % |
|-----------------|--------------------------------|

| RESISTANCE TEMPERATURE CHARACTERISTICS |               |                |                  |                |                |                |                |
|--|---------------|----------------|------------------|----------------|----------------|----------------|----------------|
| TEMP. (°C)                             | $R(T)/R_{25}$ | RESISTANCE (Ω) | $\Delta R/R$ (%) | $\alpha$ (%/K) | $\Delta T$ (K) | $R_{min.}$ (Ω) | $R_{max.}$ (Ω) |
| -40                                    | 33.43         | 167 137        | 3.90             | -6.63          | 0.59           | 160 619        | 173 655        |
| -35                                    | 24.13         | 120 661        | 3.72             | -6.41          | 0.58           | 116 177        | 125 146        |
| -30                                    | 17.61         | 88 066         | 3.54             | -6.19          | 0.57           | 84 947         | 91 185         |
| -25                                    | 12.99         | 64 950         | 3.37             | -5.99          | 0.56           | 62 759         | 67 141         |
| -20                                    | 9.68          | 48 381         | 3.21             | -5.79          | 0.55           | 46 827         | 49 934         |
| -15                                    | 7.276         | 36 382         | 3.06             | -5.61          | 0.54           | 35 270         | 37 494         |
| -10                                    | 5.522         | 27 609         | 2.91             | -5.43          | 0.54           | 26 807         | 28 411         |
| -5                                     | 4.227         | 21 134         | 2.76             | -5.26          | 0.53           | 20 550         | 21 718         |
| 0                                      | 3.262         | 16 312         | 2.62             | -5.10          | 0.51           | 15 884         | 16 740         |
| 5                                      | 2.538         | 12 691         | 2.49             | -4.94          | 0.50           | 12 375         | 13 007         |
| 10                                     | 1.990         | 9948           | 2.36             | -4.80          | 0.49           | 9714           | 10 183         |
| 15                                     | 1.571         | 7856           | 2.24             | -4.65          | 0.48           | 7680           | 8031           |
| 20                                     | 1.249         | 6246           | 2.12             | -4.52          | 0.47           | 6114           | 6379           |
| 25                                     | 1.000         | 5000           | 2.00             | -4.39          | 0.46           | 4900           | 5100           |
| 30                                     | 0.8056        | 4028           | 2.11             | -4.26          | 0.50           | 3943           | 4113           |
| 35                                     | 0.6530        | 3265           | 2.22             | -4.14          | 0.54           | 3192           | 3337           |
| 40                                     | 0.5324        | 2662           | 2.33             | -4.03          | 0.58           | 2600           | 2724           |
| 45                                     | 0.4365        | 2183           | 2.43             | -3.92          | 0.62           | 2130           | 2236           |
| 50                                     | 0.3599        | 1799           | 2.53             | -3.81          | 0.66           | 1754           | 1845           |
| 55                                     | 0.2982        | 1491           | 2.62             | -3.71          | 0.71           | 1452           | 1530           |
| 60                                     | 0.2484        | 1242           | 2.72             | -3.61          | 0.75           | 1208           | 1276           |
| 65                                     | 0.2079        | 1039           | 2.81             | -3.51          | 0.80           | 1010           | 1068           |
| 70                                     | 0.1748        | 873.8          | 2.89             | -3.42          | 0.85           | 848.5          | 899.1          |
| 75                                     | 0.1476        | 738.0          | 2.98             | -3.34          | 0.89           | 716.0          | 759.9          |
| 80                                     | 0.1252        | 625.9          | 3.06             | -3.25          | 0.94           | 606.7          | 645.1          |
| 85                                     | 0.1066        | 533.1          | 3.14             | -3.17          | 0.99           | 516.3          | 549.8          |
| 90                                     | 0.09116       | 455.8          | 3.22             | -3.09          | 1.04           | 441.1          | 470.5          |
| 95                                     | 0.07825       | 391.2          | 3.30             | -3.02          | 1.09           | 378.3          | 404.1          |
| 100                                    | 0.06741       | 337.1          | 3.37             | -2.94          | 1.14           | 325.7          | 348.4          |
| 105                                    | 0.05828       | 291.4          | 3.44             | -2.87          | 1.20           | 281.4          | 301.5          |
| 110                                    | 0.05057       | 252.8          | 3.51             | -2.81          | 1.25           | 244.0          | 261.7          |
| 115                                    | 0.04402       | 220.1          | 3.58             | -2.74          | 1.31           | 212.2          | 228.0          |
| 120                                    | 0.03844       | 192.2          | 3.65             | -2.68          | 1.36           | 185.2          | 199.2          |
| 125                                    | 0.03367       | 168.4          | 3.71             | -2.62          | 1.42           | 162.1          | 174.6          |



|                 |                                 |
|-----------------|---------------------------------|
| NTCALUG02A103G* | NTC LUG02A 10K 2 % 3984 K 0.5 % |
|-----------------|---------------------------------|

| RESISTANCE TEMPERATURE CHARACTERISTICS |               |                |                  |                |                |                |                |
|--|---------------|----------------|------------------|----------------|----------------|----------------|----------------|
| TEMP. (°C)                             | $R(T)/R_{25}$ | RESISTANCE (Ω) | $\Delta R/R$ (%) | $\alpha$ (%/K) | $\Delta T$ (K) | $R_{min.}$ (Ω) | $R_{max.}$ (Ω) |
| -40                                    | 33.43         | 334 274        | 3.90             | -6.63          | 0.59           | 321 238        | 347 311        |
| -35                                    | 24.13         | 241 323        | 3.72             | -6.41          | 0.58           | 232 353        | 250 293        |
| -30                                    | 17.61         | 176 133        | 3.54             | -6.19          | 0.57           | 169 895        | 182 370        |
| -25                                    | 12.99         | 129 900        | 3.37             | -5.99          | 0.56           | 125 518        | 134 282        |
| -20                                    | 9.68          | 96 761         | 3.21             | -5.79          | 0.55           | 93 654         | 99 869         |
| -15                                    | 7.276         | 72 765         | 3.06             | -5.61          | 0.54           | 70 541         | 74 988         |
| -10                                    | 5.522         | 55 218         | 2.91             | -5.43          | 0.54           | 53 613         | 56 823         |
| -5                                     | 4.227         | 42 268         | 2.76             | -5.26          | 0.53           | 41 100         | 43 435         |
| 0                                      | 3.262         | 32 624         | 2.62             | -5.10          | 0.51           | 31 768         | 33 480         |
| 5                                      | 2.538         | 25 381         | 2.49             | -4.94          | 0.50           | 24 749         | 26 013         |
| 10                                     | 1.990         | 19 897         | 2.36             | -4.80          | 0.49           | 19 427         | 20 367         |
| 15                                     | 1.571         | 15 711         | 2.24             | -4.65          | 0.48           | 15 360         | 16 063         |
| 20                                     | 1.249         | 12 493         | 2.12             | -4.52          | 0.47           | 12 228         | 12 757         |
| 25                                     | 1.000         | 10 000         | 2.00             | -4.39          | 0.46           | 9800           | 10 200         |
| 30                                     | 0.8056        | 8056           | 2.11             | -4.26          | 0.50           | 7886           | 8226           |
| 35                                     | 0.6530        | 6530           | 2.22             | -4.14          | 0.54           | 6385           | 6675           |
| 40                                     | 0.5324        | 5324           | 2.33             | -4.03          | 0.58           | 5200           | 5448           |
| 45                                     | 0.4365        | 4365           | 2.43             | -3.92          | 0.62           | 4259           | 4471           |
| 50                                     | 0.3599        | 3599           | 2.53             | -3.81          | 0.66           | 3508           | 3690           |
| 55                                     | 0.2982        | 2982           | 2.62             | -3.71          | 0.71           | 2904           | 3060           |
| 60                                     | 0.2484        | 2484           | 2.72             | -3.61          | 0.75           | 2416           | 2551           |
| 65                                     | 0.2079        | 2079           | 2.81             | -3.51          | 0.80           | 2020           | 2137           |
| 70                                     | 0.1748        | 1748           | 2.89             | -3.42          | 0.85           | 1697           | 1798           |
| 75                                     | 0.1476        | 1476           | 2.98             | -3.34          | 0.89           | 1432           | 1520           |
| 80                                     | 0.1252        | 1252           | 3.06             | -3.25          | 0.94           | 1213           | 1290           |
| 85                                     | 0.1066        | 1066           | 3.14             | -3.17          | 0.99           | 1033           | 1100           |
| 90                                     | 0.09116       | 911.6          | 3.22             | -3.09          | 1.04           | 882.2          | 940.9          |
| 95                                     | 0.07825       | 782.5          | 3.30             | -3.02          | 1.09           | 756.7          | 808.2          |
| 100                                    | 0.06741       | 674.1          | 3.37             | -2.94          | 1.14           | 651.4          | 696.8          |
| 105                                    | 0.05828       | 582.8          | 3.44             | -2.87          | 1.20           | 562.8          | 602.9          |
| 110                                    | 0.05057       | 505.7          | 3.51             | -2.81          | 1.25           | 487.9          | 523.4          |
| 115                                    | 0.04402       | 440.2          | 3.58             | -2.74          | 1.31           | 424.4          | 455.9          |
| 120                                    | 0.03844       | 384.4          | 3.65             | -2.68          | 1.36           | 370.4          | 398.4          |
| 125                                    | 0.03367       | 336.7          | 3.71             | -2.62          | 1.42           | 324.2          | 349.2          |



|                 |                                 |
|-----------------|---------------------------------|
| NTCALUG02A103F* | NTC LUG02A 10K 1 % 3984 K 0.5 % |
|-----------------|---------------------------------|

| RESISTANCE TEMPERATURE CHARACTERISTICS |               |                |                  |                |                |                |                |
|--|---------------|----------------|------------------|----------------|----------------|----------------|----------------|
| TEMP. (°C)                             | $R(T)/R_{25}$ | RESISTANCE (Ω) | $\Delta R/R$ (%) | $\alpha$ (%/K) | $\Delta T$ (K) | $R_{min.}$ (Ω) | $R_{max.}$ (Ω) |
| -40                                    | 33.43         | 334 274        | 2.88             | -6.63          | 0.43           | 324 643        | 343 906        |
| -35                                    | 24.13         | 241 323        | 2.70             | -6.41          | 0.42           | 234 807        | 247 839        |
| -30                                    | 17.61         | 176 133        | 2.53             | -6.19          | 0.41           | 171 683        | 180 582        |
| -25                                    | 12.99         | 129 900        | 2.36             | -5.99          | 0.39           | 126 835        | 132 965        |
| -20                                    | 9.68          | 96 761         | 2.20             | -5.79          | 0.38           | 94 633         | 98 889         |
| -15                                    | 7.276         | 72 765         | 2.05             | -5.61          | 0.36           | 71 276         | 74 253         |
| -10                                    | 5.522         | 55 218         | 1.90             | -5.43          | 0.35           | 54 170         | 56 266         |
| -5                                     | 4.227         | 42 268         | 1.75             | -5.26          | 0.33           | 41 526         | 43 010         |
| 0                                      | 3.262         | 32 624         | 1.62             | -5.10          | 0.32           | 32 096         | 33 152         |
| 5                                      | 2.538         | 25 381         | 1.49             | -4.94          | 0.30           | 25 004         | 25 758         |
| 10                                     | 1.990         | 19 897         | 1.36             | -4.80          | 0.28           | 19 627         | 20 167         |
| 15                                     | 1.571         | 15 711         | 1.23             | -4.65          | 0.27           | 15 517         | 15 905         |
| 20                                     | 1.249         | 12 493         | 1.12             | -4.52          | 0.25           | 12 353         | 12 632         |
| 25                                     | 1.000         | 10 000         | 1.00             | -4.39          | 0.23           | 9900           | 10 100         |
| 30                                     | 0.8056        | 8056           | 1.11             | -4.26          | 0.26           | 7966           | 8145           |
| 35                                     | 0.6530        | 6530           | 1.22             | -4.14          | 0.29           | 6450           | 6609           |
| 40                                     | 0.5324        | 5324           | 1.32             | -4.03          | 0.33           | 5253           | 5394           |
| 45                                     | 0.4365        | 4365           | 1.42             | -3.92          | 0.36           | 4303           | 4427           |
| 50                                     | 0.3599        | 3599           | 1.52             | -3.81          | 0.40           | 3544           | 3653           |
| 55                                     | 0.2982        | 2982           | 1.62             | -3.71          | 0.44           | 2934           | 3030           |
| 60                                     | 0.2484        | 2484           | 1.71             | -3.61          | 0.47           | 2441           | 2526           |
| 65                                     | 0.2079        | 2079           | 1.80             | -3.51          | 0.51           | 2041           | 2116           |
| 70                                     | 0.1748        | 1748           | 1.88             | -3.42          | 0.55           | 1715           | 1781           |
| 75                                     | 0.1476        | 1476           | 1.97             | -3.34          | 0.59           | 1447           | 1505           |
| 80                                     | 0.1252        | 1252           | 2.05             | -3.25          | 0.63           | 1226           | 1277           |
| 85                                     | 0.1066        | 1066           | 2.13             | -3.17          | 0.67           | 1043           | 1089           |
| 90                                     | 0.09116       | 911.6          | 2.21             | -3.09          | 0.71           | 891.5          | 931.7          |
| 95                                     | 0.07825       | 782.5          | 2.28             | -3.02          | 0.76           | 764.6          | 800.3          |
| 100                                    | 0.06741       | 674.1          | 2.36             | -2.94          | 0.80           | 658.2          | 690.0          |
| 105                                    | 0.05828       | 582.8          | 2.43             | -2.87          | 0.84           | 568.7          | 597.0          |
| 110                                    | 0.05057       | 505.7          | 2.50             | -2.81          | 0.89           | 493.0          | 518.3          |
| 115                                    | 0.04402       | 440.2          | 2.56             | -2.74          | 0.94           | 428.9          | 451.5          |
| 120                                    | 0.03844       | 384.4          | 2.63             | -2.68          | 0.98           | 374.3          | 394.5          |
| 125                                    | 0.03367       | 336.7          | 2.69             | -2.62          | 1.03           | 327.7          | 345.8          |



|                  |                               |
|------------------|-------------------------------|
| NTCALUG02A103FL* | NTC LUG02A 10K 1 % 3435 K 1 % |
|------------------|-------------------------------|

| RESISTANCE TEMPERATURE CHARACTERISTICS |                  |                |                  |                |                |                |                |
|--|------------------|----------------|------------------|----------------|----------------|----------------|----------------|
| TEMP. (°C)                             | $R_{(T)}/R_{25}$ | RESISTANCE (Ω) | $\Delta R/R$ (%) | $\alpha$ (%/K) | $\Delta T$ (K) | $R_{min.}$ (Ω) | $R_{max.}$ (Ω) |
| -40                                    | 19.10            | 190 953        | 4.24             | -5.46          | 0.78           | 182 848        | 199 057        |
| -35                                    | 14.60            | 145 953        | 3.93             | -5.30          | 0.74           | 140 213        | 151 693        |
| -30                                    | 11.24            | 112 440        | 3.63             | -5.14          | 0.71           | 108 354        | 116 526        |
| -25                                    | 8.729            | 87 285         | 3.35             | -4.99          | 0.67           | 84 364         | 90 206         |
| -20                                    | 6.826            | 68 260         | 3.07             | -4.85          | 0.63           | 66 164         | 70 355         |
| -15                                    | 5.376            | 53 762         | 2.80             | -4.71          | 0.60           | 52 254         | 55 270         |
| -10                                    | 4.264            | 42 636         | 2.55             | -4.57          | 0.56           | 41 549         | 43 723         |
| -5                                     | 3.404            | 34 038         | 2.30             | -4.44          | 0.52           | 33 254         | 34 822         |
| 0                                      | 2.735            | 27 348         | 2.07             | -4.31          | 0.48           | 26 783         | 27 913         |
| 5                                      | 2.211            | 22 108         | 1.84             | -4.19          | 0.44           | 21 702         | 22 515         |
| 10                                     | 1.798            | 17 979         | 1.62             | -4.08          | 0.40           | 17 689         | 18 270         |
| 15                                     | 1.471            | 14 706         | 1.40             | -3.96          | 0.35           | 14 499         | 14 912         |
| 20                                     | 1.209            | 12 094         | 1.20             | -3.86          | 0.31           | 11 949         | 12 239         |
| 25                                     | 1.000            | 10 000         | 1.00             | -3.75          | 0.27           | 9900           | 10 100         |
| 30                                     | 0.8311           | 8311           | 1.19             | -3.65          | 0.33           | 8212           | 8410           |
| 35                                     | 0.6941           | 6941           | 1.38             | -3.55          | 0.39           | 6845           | 7037           |
| 40                                     | 0.5825           | 5825           | 1.56             | -3.46          | 0.45           | 5734           | 5916           |
| 45                                     | 0.4911           | 4911           | 1.73             | -3.37          | 0.51           | 4826           | 4996           |
| 50                                     | 0.4158           | 4158           | 1.90             | -3.28          | 0.58           | 4079           | 4237           |
| 55                                     | 0.3536           | 3536           | 2.06             | -3.20          | 0.65           | 3463           | 3609           |
| 60                                     | 0.3020           | 3020           | 2.22             | -3.12          | 0.71           | 2953           | 3087           |
| 65                                     | 0.2589           | 2589           | 2.38             | -3.04          | 0.78           | 2527           | 2650           |
| 70                                     | 0.2228           | 2228           | 2.53             | -2.96          | 0.85           | 2172           | 2284           |
| 75                                     | 0.1925           | 1925           | 2.67             | -2.89          | 0.92           | 1873           | 1976           |
| 80                                     | 0.1668           | 1668           | 2.81             | -2.82          | 1.00           | 1621           | 1715           |
| 85                                     | 0.1451           | 1451           | 2.95             | -2.75          | 1.07           | 1409           | 1494           |
| 90                                     | 0.1267           | 1267           | 3.08             | -2.69          | 1.15           | 1228           | 1306           |
| 95                                     | 0.1109           | 1109           | 3.21             | -2.62          | 1.22           | 1074           | 1145           |
| 100                                    | 0.09743          | 974.3          | 3.34             | -2.56          | 1.30           | 941.7          | 1007           |
| 105                                    | 0.08583          | 858.3          | 3.46             | -2.50          | 1.38           | 828.6          | 888.0          |
| 110                                    | 0.07584          | 758.4          | 3.58             | -2.45          | 1.46           | 731.2          | 785.6          |
| 115                                    | 0.06720          | 672.0          | 3.70             | -2.39          | 1.55           | 647.1          | 696.8          |
| 120                                    | 0.05971          | 597.1          | 3.81             | -2.34          | 1.63           | 574.3          | 619.8          |
| 125                                    | 0.05319          | 531.9          | 3.92             | -2.29          | 1.72           | 511.0          | 552.7          |





NTCALUG02A104H\*

NTC LUG02A 100K 3 % 4190 K 1.50 %

**RESISTANCE TEMPERATURE CHARACTERISTICS**

| TEMP.<br>(°C) | $R_{(T)}/R_{25}$ | RESISTANCE<br>( $\Omega$ ) | $\Delta R/R$<br>(%) | $\alpha$<br>(%/K) | $\Delta T$<br>(K) | $R_{min.}$<br>( $\Omega$ ) | $R_{max.}$<br>( $\Omega$ ) |
|---------------|------------------|----------------------------|---------------------|-------------------|-------------------|----------------------------|----------------------------|
| -40           | 36.66            | 3 666 299                  | 9.05                | -6.69             | 1.35              | 3 334 354                  | 3 998 244                  |
| -35           | 26.38            | 2 637 588                  | 8.47                | -6.49             | 1.31              | 2 414 139                  | 2 861 036                  |
| -30           | 19.17            | 1 916 576                  | 7.91                | -6.29             | 1.26              | 1 764 917                  | 2 068 236                  |
| -25           | 14.06            | 1 406 111                  | 7.38                | -6.10             | 1.21              | 1 302 387                  | 1 509 836                  |
| -20           | 10.41            | 1 041 184                  | 6.86                | -5.92             | 1.16              | 969 745                    | 1 112 622                  |
| -15           | 7.778            | 777 846                    | 6.37                | -5.75             | 1.11              | 728 330                    | 827 362                    |
| -10           | 5.861            | 586 097                    | 5.89                | -5.58             | 1.06              | 551 581                    | 620 613                    |
| -5            | 4.453            | 445 257                    | 5.43                | -5.42             | 1.00              | 421 079                    | 469 435                    |
| 0             | 3.409            | 340 942                    | 4.99                | -5.26             | 0.95              | 323 936                    | 357 948                    |
| 5             | 2.631            | 263 054                    | 4.56                | -5.11             | 0.89              | 251 054                    | 275 054                    |
| 10            | 2.044            | 204 446                    | 4.15                | -4.97             | 0.84              | 195 960                    | 212 931                    |
| 15            | 1.600            | 160 014                    | 3.75                | -4.83             | 0.78              | 154 008                    | 166 020                    |
| 20            | 1.261            | 126 087                    | 3.37                | -4.70             | 0.72              | 121 837                    | 130 336                    |
| 25            | 1.000            | 100 000                    | 3.00                | -4.57             | 0.66              | 97 000                     | 103 000                    |
| 30            | 0.7981           | 79 808                     | 3.36                | -4.45             | 0.75              | 77 128                     | 82 488                     |
| 35            | 0.6408           | 64 077                     | 3.70                | -4.33             | 0.86              | 61 703                     | 66 451                     |
| 40            | 0.5175           | 51 745                     | 4.04                | -4.22             | 0.96              | 49 655                     | 53 836                     |
| 45            | 0.4202           | 42 021                     | 4.36                | -4.11             | 1.06              | 40 187                     | 43 855                     |
| 50            | 0.3431           | 34 308                     | 4.68                | -4.00             | 1.17              | 32 702                     | 35 913                     |
| 55            | 0.2816           | 28 156                     | 4.98                | -3.90             | 1.28              | 26 752                     | 29 559                     |
| 60            | 0.2322           | 23 222                     | 5.28                | -3.80             | 1.39              | 21 996                     | 24 449                     |
| 65            | 0.1925           | 19 246                     | 5.57                | -3.71             | 1.50              | 18 174                     | 20 318                     |
| 70            | 0.1602           | 16 025                     | 5.85                | -3.62             | 1.62              | 15 088                     | 16 961                     |
| 75            | 0.1340           | 13 402                     | 6.12                | -3.53             | 1.73              | 12 582                     | 14 222                     |
| 80            | 0.1126           | 11 258                     | 6.38                | -3.45             | 1.85              | 10 539                     | 11 976                     |
| 85            | 0.09496          | 9496                       | 6.64                | -3.36             | 1.97              | 8866                       | 10 126                     |
| 90            | 0.08042          | 8042                       | 6.89                | -3.28             | 2.10              | 7488                       | 8596                       |
| 95            | 0.06837          | 6837                       | 7.13                | -3.21             | 2.22              | 6350                       | 7325                       |
| 100           | 0.05835          | 5835                       | 7.36                | -3.13             | 2.35              | 5405                       | 6265                       |
| 105           | 0.04998          | 4998                       | 7.59                | -3.06             | 2.48              | 4618                       | 5377                       |
| 110           | 0.04296          | 4296                       | 7.82                | -2.99             | 2.61              | 3960                       | 4632                       |
| 115           | 0.03705          | 3705                       | 8.03                | -2.93             | 2.75              | 3407                       | 4003                       |
| 120           | 0.03206          | 3206                       | 8.25                | -2.86             | 2.88              | 2942                       | 3470                       |
| 125           | 0.02783          | 2783                       | 8.45                | -2.80             | 3.02              | 2548                       | 3018                       |



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#### Как с нами связаться

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