



# NTC Thermistors, Low Thermal Gradient Lug Sensors



## ADDITIONAL RESOURCES



3D Models



Design Tools



Models

- 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.

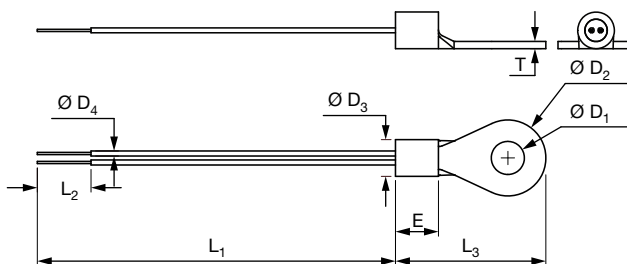
## MOUNTING

- 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                |                        |
|------------------------------------------|-------------------------|--------------------|----------------------------|---------------|--------------------------|-------------------------------------------------|------------------------|
| $R_{25}$<br>(Ω)                          | $R_{25}$ -TOL.<br>(± %) | $B_{25/85}$<br>(K) | $B_{25/85}$ -TOL.<br>(± %) | $L_1$<br>(mm) | UL RECOGNIZED<br>(Y / N) | RoHS COMPLIANT<br>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 <sub>1</sub>              | L <sub>2</sub> | L <sub>3</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Ø D <sub>3</sub>  | Ø D <sub>4</sub> | E         | T   |
|-----------------------------|----------------|----------------|------------------|------------------|-------------------|------------------|-----------|-----|
| Refer to the ordering table | 6 ± 1          | 16.8 ± 0.3     | 3.7 + 0.2 / - 0  | 8.5 ± 0.2        | 4.1 + 0.4 / - 0.1 | 0.56 ± 0.1       | 4.8 ± 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.<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                    | 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.<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         | 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.<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         | 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.<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         | 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.<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           | 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                       |



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9