



## NTC Thermistors, Low Thermal Gradient Lug Sensors



### LINKS TO ADDITIONAL RESOURCES



| QUICK REFERENCE DATA                                                        |                                   |                 |
|-----------------------------------------------------------------------------|-----------------------------------|-----------------|
| PARAMETER                                                                   | VALUE                             | UNIT            |
| Resistance value at 25 °C                                                   | 4.7K to 100K                      | $\Omega$        |
| Tolerance on $R_{25}$ -value                                                | $\pm 1$ ; $\pm 2$ ; $\pm 3$       | %               |
| $B_{25/85}$ value                                                           | 3435 to 4190                      | K               |
| Tolerance on $B_{25/85}$ -value                                             | $\pm 0.5$ ; $\pm 1.0$ ; $\pm 1.5$ | %               |
| Operating temperature range (without connector)                             | -55 to +125                       | °C              |
| Storage temperature range                                                   | -55 to +150                       | °C              |
| Response time (for info) <sup>(1)</sup>                                     | 3                                 | s               |
| Thermal time constant $\tau_c$ <sup>(2)</sup>                               | 2.5                               | s               |
| Dissipation factor $\delta$ <sup>(2)</sup>                                  | 5                                 | mW/K            |
| Max. power dissipation at 55 °C <sup>(3)</sup>                              | 175                               | mW              |
| Thermal gradient <sup>(4)</sup>                                             | 0.05                              | K/K             |
| Min. dielectric withstanding voltage between terminals and lug              | 1500                              | V <sub>AC</sub> |
| Min. insulation resistance between terminals and lug at 500 V <sub>DC</sub> | 100                               | M $\Omega$      |
| Weight                                                                      | ~ 1                               | g               |

#### Notes

- (1) The response time is the time the sensor responds to a 63.2 % step change in temperature, usually set to  $\Delta T = 60$  °C (25 to 85) unless mentioned differently. This step is generally conducted by quickly transferring the NTC from one liquid to another (generally water or oil)
- (2) Measured with screw mounted on an aluminum heatsink of 100 cm<sup>2</sup>, thickness 1.5 mm, in still air at  $T_{amb} = +25$  °C
- (3) In still air on an aluminum plate
- (4) 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

### AGENCY APPROVALS

- cUL certificate XGPU8.E148885
- ULus certificate XGPU2.E148885

#### Note

- Agency approval documents, please see: [www.vishay.com/ppg?29094&documents](http://www.vishay.com/ppg?29094&documents)

### DESIGN-IN SUPPORT

- Other resistance curves and tolerances are available on request
- Consult Vishay for other lead length, other connector crimping, or other features  
<https://info.vishay.com/vishay-ntc-modification-request>
- 3D solid models: [www.vishay.com/doc?29145](http://www.vishay.com/doc?29145)
- NTC curve computation:  
[www.vishay.com/thermistors/ntc-rt-calculator/](http://www.vishay.com/thermistors/ntc-rt-calculator/)

### 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 ( $\varnothing$  0.25 mm), mono-stranded silver-plated nickel.

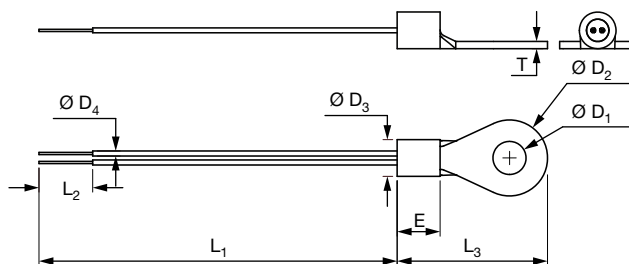
### PACKAGING

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

### CAUTIONS AND WARNINGS ON MOUNTING AND HANDLING

Please read the special instructions: see [www.vishay.com/doc?29221](http://www.vishay.com/doc?29221).

- 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

**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 |

**ELECTRICAL DATA AND ORDERING INFORMATION**

| R <sub>25</sub><br>(Ω) | R <sub>25</sub> -TOL.<br>(± %) | B <sub>25/85</sub><br>(K) | B <sub>25/85</sub> -TOL.<br>(± %) | L <sub>1</sub><br>(mm) | UL RECOG.<br> US | SAP MATERIAL AND ORDERING NUMBER                |                        |
|------------------------|--------------------------------|---------------------------|-----------------------------------|------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------|
|                        |                                |                           |                                   |                        |                                                                                                   | RoHS-COMPLIANT<br>WITH EXEMPTION <sup>(1)</sup> | RoHS-COMPLIANT         |
| 4700                   | 2                              | 3984                      | 0.5                               | 45 ± 3                 |                                                                                                   | NTCALUG02A472G                                  | NTCALUG02A472GA        |
| 4700                   | 1                              | 3984                      | 0.5                               | 45 ± 3                 |                                                                                                   | NTCALUG02A472F                                  | NTCALUG02A472FA        |
| 5000                   | 2                              | 3984                      | 0.5                               | 45 ± 3                 | ✓                                                                                                 | <b>NTCALUG02A502G</b>                           | <b>NTCALUG02A502GA</b> |
| 10 000                 | 2                              | 3984                      | 0.5                               | 45 ± 3                 | ✓                                                                                                 | <b>NTCALUG02A103G <sup>(2)</sup></b>            | <b>NTCALUG02A103GA</b> |
| 10 000                 | 1                              | 3984                      | 0.5                               | 45 ± 3                 | ✓                                                                                                 | NTCALUG02A103F                                  | NTCALUG02A103FA        |
| 10 000                 | 1                              | 3984                      | 0.5                               | 80 +5 / -3             | ✓                                                                                                 | NTCALUG02A103F800                               | NTCALUG02A103F800A     |
| 10 000                 | 1                              | 3984                      | 0.5                               | 160 +5 / -3            | ✓                                                                                                 | NTCALUG02A103F161                               | NTCALUG02A103F161A     |
| 10 000                 | 1                              | 3435                      | 1.0                               | 45 ± 3                 | ✓                                                                                                 | NTCALUG02A103FL                                 | NTCALUG02A103FLA       |
| 10 000                 | 1                              | 3435                      | 1.0                               | 80 +5 / -3             | ✓                                                                                                 | NTCALUG02A103F800L                              | NTCALUG02A103F804A     |
| 10 000                 | 1                              | 3435                      | 1.0                               | 160 +5 / -3            | ✓                                                                                                 | NTCALUG02A103F161L                              | NTCALUG02A103F165A     |
| 100 000                | 3                              | 4190                      | 1.5                               | 45 ± 3                 |                                                                                                   | NTCALUG02A104H                                  | NTCALUG02A104HA        |

**Notes**

 Preferred versions for new designs

<sup>(1)</sup> 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

<sup>(2)</sup> Is also known under material number NTCALUGE4C90294



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