

## NTC Thermistors, Mini Lug Sensors



| QUICK REFERENCE DATA   |                |                 |
|--|----------------|-----------------|
| PARAMETER  | VALUE          | UNIT            |
| Resistance value at 25 °C                                      | 10K to 47K     | Ω               |
| Tolerance on $R_{25}$ -value                                   | ± 2 to ± 3     | %               |
| $B_{25/85}$ -value   | 3740 to 3984   | K               |
| Tolerance on $B_{25/85}$ -value                                | ± 0.5 to ± 1.5 | %               |
| Operating temperature range:<br>At zero dissipation            | -40 to +125    | °C              |
| Response time  | 3.5            | s               |
| Thermal time constant $\tau$                                   | ≈ 5            | s               |
| Dissipation factor $\delta$                                    | 10             | mW/K            |
| Min. dielectric withstanding voltage between terminals and lug | 1000           | V <sub>AC</sub> |
| Climatic category (LCT / UCT / days)                           | 40 / 125 / 56  | -               |
| Weight   |                |                 |
| without connector  | ~ 0.5          | g               |
| with connector   | ~ 0.6          | g               |

**Note**

- Other  $R_{25}$  values and tolerances available upon request

**FEATURES**

- Fast time response for surface applications compared to industry standard NTC lug sensors
- Reduced thermal gradient, due to the use of small dimensions and nickel conductor, allowing for an accurate surface temperature measurement
- The sensor is not suitable for being permanently in contact with water or liquids
- Small size connector and small lug ring tongue terminal, allowing for temperature sensing at locations where only limited space is available
- Mounting: assembly screw mounting
- Connector ZHR-2 (optional)
- AEC-Q200 qualified available (grade 1)
- UL recognized, file E148885 (UL category XGPU2)
- 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 surface temperature sensing and control in:

- Computer equipment
- MOSFETS, IC's, Power Electronics, heatsink temperature control, LED emitter heat-sink control
- Consumer appliances
- Industrial equipment
- Automotive equipment

**DESCRIPTION**

Miniature insulated chip thermistor with a negative temperature coefficient mounted inside a mini lug barrel. The device has no marking.

**MOUNTING**

- The sensor can be mounted by means of a screw. For stud size, metric 2 mm M2/American stud #1-2
- The end wire can be soldered, welded or crimped to a connector
- Optional connector for Wire-to-Wire or Wire-to-Board connections

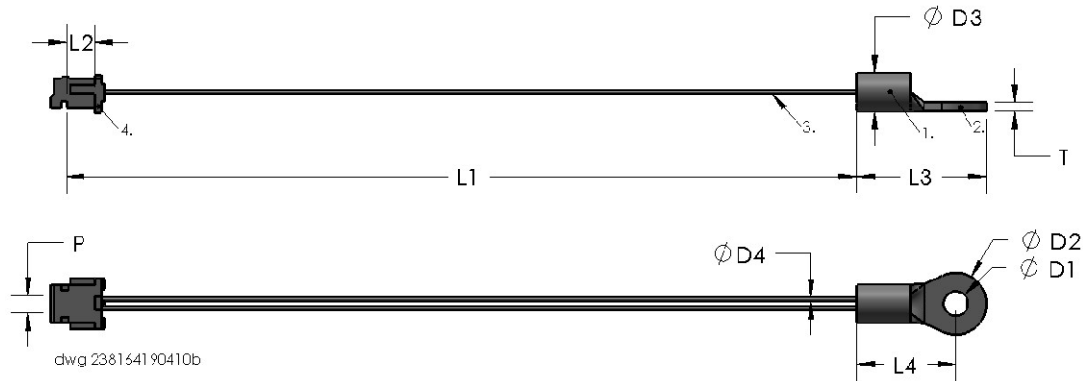
| ELECTRICAL DATA AND ORDERING INFORMATION |                      |                 |                         |  |                       |                                  |
|--|----------------------|-----------------|-------------------------|--|-----------------------|----------------------------------|
| $R_{25}$ (Ω)                             | $R_{25}$ -TOL. (± %) | $B_{25/85}$ (K) | $B_{25/85}$ -TOL. (± %) | DESCRIPTION                                      | UL RECOGNIZED (Y / N) | SAP MATERIAL AND ORDERING NUMBER |
| 10 000                                   | 2                    | 3984            | 0.5                     | NTC Mini Lug 10K 2 % 3984 K 0.5 %                | Y                     | NTCALUG03A103G                   |
| 10 000                                   | 2                    | 3984            | 0.5                     | NTC Mini Lug 10K 2 % 3984 K 0.5 % with connector | Y                     | NTCALUG03A103GC                  |
| 10 000                                   | 3                    | 3984            | 0.5                     | NTC Mini Lug 10K 3 % 3984 K 0.5 %                | Y                     | NTCALUG03A103H                   |
| 10 000                                   | 3                    | 3984            | 0.5                     | NTC Mini Lug 10K 3 % 3984 K 0.5 % with connector | Y                     | NTCALUG03A103HC                  |
| 12 000                                   | 3                    | 3740            | 1.5                     | NTC Mini Lug 12K 3 %                             | N                     | NTCALUG03A123H                   |
| 12 000                                   | 3                    | 3740            | 1.5                     | NTC Mini Lug 12K 3 % with connector              | N                     | NTCALUG03A123HC                  |
| 47 000                                   | 3                    | 3740            | 1.5                     | NTC Mini Lug 47K 3 %                             | N                     | NTCALUG03A473H                   |
| 47 000                                   | 3                    | 3740            | 1.5                     | NTC Mini Lug 47 kΩ 3 % with connector            | N                     | NTCALUG03A473HC                  |

**Note**

- Ordering information can be found on: [www.vishay.com/doc?33036](http://www.vishay.com/doc?33036)



## DIMENSIONS in millimeters



| L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | L <sub>4</sub> | L <sub>1</sub> + L <sub>3</sub><br>(item without connector) | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Ø D <sub>3</sub> | Ø D <sub>4</sub> | T         | Pitch P   |
|----------------|----------------|----------------|----------------|---|------------------|------------------|------------------|------------------|-----------|-----------|
| 70 ± 5         | 4 ± 1          | 11.5 ± 0.3     | 8.8 ± 0.3      | 81.5 ± 5  | 2.2 ± 0.3        | 5.5 ± 0.3        | 3.4 ± 0.3        | 0.35 ± 0.1       | 0.8 ± 0.1 | 1.5 ± 0.3 |

### Notes

- (1) Vishay Thermistor chip NTC, with epoxy coating and middle buffer layer
- (2) Metal ring lug, tin plated
- (3) Insulated leads: AWG#32, monostranded, diam 0.20 mm, silver plated Nickel, ETFE insulated, diameter 0.35 mm
- (4) End wire stripped or 2-poles connector crimped (optional)

## MOUNTING

- With screw size metric M2, or American stud 1-2
- For the type without connector, the electrical connection can be made by soldering, crimping or welding.
- For the type with connector, the connector can mate with following counter-connectors <sup>(5)</sup>:
  - A. One of the PCB connector - Through Hole:
    - JST B 2B-ZR (top entry)
    - JST S 2B-ZR (side entry)
    - JST B 2B-ZR-3.4 (top entry, for 1.6 mm board)
    - JST S 2B-ZR-3.4 (side entry, for 1.6 mm board)
  - B. One of the PCB Board connector - SMT Surface Mount:
    - JST S 2B-ZR-SM2-TF (SM2 side entry)
    - JST B 2B-ZR-SM3-TF (SM3 top entry)
    - JST S 2B-ZR-SM3A-TF (SM3 side entry)
    - JST B 2B-ZR-SM4-TF (SM4 top entry)
    - JST S 2B-ZR-SM4A-TF (SM4 side entry)
  - C. The Wire-to-wire connector:
    - JST ZMR-02 housing (x 1) + JST SMM-003T-P0.5 terminals (x 2)

### Note

<sup>(5)</sup> Additional details and dimensions can be found in JST ZH and JST ZM datasheets.

## PACKAGING

Available in plastic bags of 250 pieces. SPQ = 2000 pieces

## DESIGN-IN SUPPORT

- Other resistance curves and tolerances are available on request
- Consult Vishay for other lead length, other connector crimping or other features
- Other applicable screw size are available, for example M3 (American Stud #3-4)
- 3D solid models: [www.vishay.com/doc?29106](http://www.vishay.com/doc?29106)
- NTC curve computation: [www.vishay.com/thermistors/ntc-curve-list/](http://www.vishay.com/thermistors/ntc-curve-list/)
- For M3 (American Stud #3/4) size, series NTCALUG39 is available for limited R<sub>25</sub> values.



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