

# NTC Thermistors, 2-Point Mini Chip Sensor, Flexible Leads



## QUICK REFERENCE DATA

| PARAMETER                                                               | VALUE         | UNIT |
|-------------------------------------------------------------------------|---------------|------|
| Resistance value at 25 °C                                               | 3K to 10K     | Ω    |
| Tolerance on $R_{25}$ -value                                            | ± 2.18        | %    |
| $B_{25/85}$ -value                                                      | 3977          | K    |
| Tolerance on $B_{25/85}$ -value                                         | ± 0.75        | %    |
| Operating temperature range at zero dissipation                         | - 40 to + 125 | °C   |
| Accuracy for T measured between 0 °C and 50 °C                          | ± 0.5         | °C   |
| Maximum power dissipation at 55 °C                                      | 100           | mW   |
| Minimum dielectric withstanding voltage (RMS) between leads and coating | 500           | V    |
| Climatic category (LCT/UCT/days)                                        | 40/125/56     |      |
| Weight                                                                  | ≈ 0.2         | g    |

## FEATURES

- Accuracy of 0.5 °C between 0 °C and 50 °C
- Small diameter
- High stability over a long life
- Long and flexible leads for special mounting or assembly requirements
- AEC-Q200 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

## APPLICATIONS

- Temperature measurement, sensing and control in automotive, industrial and consumer electronic equipment

## DESCRIPTION

These negative temperature coefficient thermistors consist of a mini-chip soldered between two EFTE insulated (LE300) or non-insulated (LE201) nickel leads and coated with a solid ochre epoxy lacquer.

## PACKAGING

The thermistors are packed in cardboard boxes; the smallest packing quantity is 1000 units.

## MARKING

The body is colored with ochre lacquer and not marked.

## MOUNTING

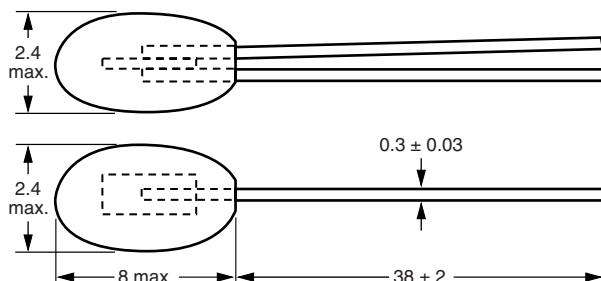
By soldering in any position.

## ELECTRICAL DATA AND ORDERING INFORMATION

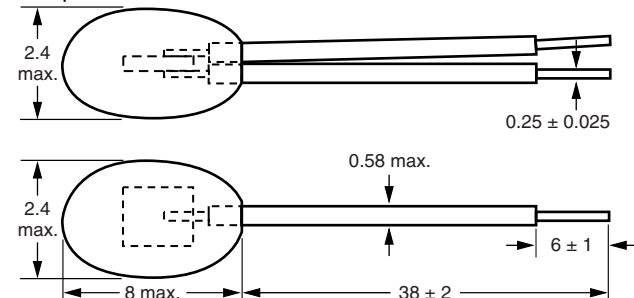
| $R_{25}$ -VALUE<br>(kΩ) | $B_{25/85}$ -VALUE<br>(K) | SAP MATERIAL AND<br>ORDERING NUMBER<br>NTCLE201E3... | OLD 12NC CODE<br>2381 645.... |
|-------------------------|---------------------------|------------------------------------------------------|-------------------------------|
| 3                       | 3977                      | 302SB                                                | 10302                         |
| 5                       | 3977                      | 502SB                                                | 10502                         |
| 10                      | 3977                      | 103SB                                                | 10103                         |
| $R_{25}$ -VALUE<br>(kΩ) | $B_{25/85}$ -VALUE<br>(K) | SAP MATERIAL AND<br>ORDERING NUMBER<br>NTCLE300E3... | OLD 12NC CODE<br>2381 645.... |
| 3                       | 3977                      | 302SB                                                | 20302                         |
| 5                       | 3977                      | 502SB                                                | 20502                         |
| 10                      | 3977                      | 103SB                                                | 20103                         |

## DIMENSIONS in millimeters

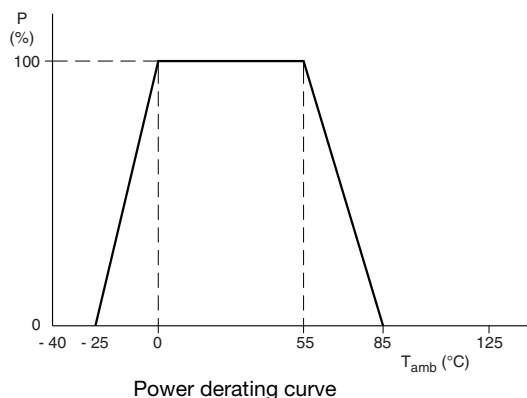
Component outline for NTCLE201E3...



Component outline for NTCLE300E3...



## DERATING



### Note

- Zero power is considered as measuring power max. 1 % of max. power

## RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

| T <sub>OPER</sub><br>(°C) | R <sub>T</sub> /R <sub>25</sub> | ΔT<br>(K) | TCR<br>(%/K) | R <sub>25</sub> -VALUE (kΩ)        |        |        |
|---------------------------|---------------------------------|-----------|--------------|------------------------------------|--------|--------|
|                           |                                 |           |              | NTCLE201E3...SB OR NTCLE300E3...SB |        |        |
|                           |                                 |           |              | 302                                | 502    | 103    |
| - 40                      | 33.21                           | 0.68      | 6.57         | 99.63                              | 166.1  | 332.1  |
| - 35                      | 23.99                           | 0.66      | 6.36         | 71.97                              | 120.0  | 239.9  |
| - 30                      | 17.52                           | 0.64      | 6.15         | 52.56                              | 87.60  | 175.2  |
| - 25                      | 12.93                           | 0.62      | 5.95         | 38.79                              | 64.65  | 129.3  |
| - 20                      | 9.636                           | 0.59      | 5.76         | 28.91                              | 48.18  | 96.36  |
| - 15                      | 7.250                           | 0.57      | 5.58         | 21.75                              | 36.25  | 72.50  |
| - 10                      | 5.505                           | 0.55      | 5.40         | 16.51                              | 27.52  | 55.05  |
| - 5                       | 4.216                           | 0.52      | 5.24         | 12.65                              | 21.08  | 42.16  |
| 0                         | 3.255                           | 0.50      | 5.08         | 9.766                              | 16.28  | 32.56  |
| 5                         | 2.534                           | 0.50      | 4.92         | 7.602                              | 12.67  | 25.34  |
| 10                        | 1.987                           | 0.50      | 4.78         | 5.962                              | 9.936  | 19.87  |
| 15                        | 1.570                           | 0.50      | 4.64         | 4.710                              | 7.849  | 15.70  |
| 20                        | 1.249                           | 0.50      | 4.50         | 3.746                              | 6.244  | 12.49  |
| 25                        | 1.000                           | 0.50      | 4.37         | 3.000                              | 5.000  | 10.00  |
| 30                        | 0.8059                          | 0.50      | 4.25         | 2.418                              | 4.030  | 8.059  |
| 35                        | 0.6535                          | 0.50      | 4.13         | 1.960                              | 3.267  | 6.535  |
| 40                        | 0.5330                          | 0.50      | 4.02         | 1.599                              | 2.665  | 5.330  |
| 45                        | 0.4372                          | 0.50      | 3.91         | 1.312                              | 2.186  | 4.372  |
| 50                        | 0.3605                          | 0.50      | 3.80         | 1.082                              | 1.803  | 3.606  |
| 55                        | 0.2989                          | 0.55      | 3.70         | 0.8966                             | 1.494  | 2.989  |
| 60                        | 0.2490                          | 0.61      | 3.60         | 0.7470                             | 1.245  | 2.490  |
| 65                        | 0.2084                          | 0.66      | 3.51         | 0.6253                             | 1.042  | 2.084  |
| 70                        | 0.1753                          | 0.72      | 3.42         | 0.5259                             | 0.8765 | 1.753  |
| 75                        | 0.1481                          | 0.77      | 3.33         | 0.4443                             | 0.7405 | 1.481  |
| 80                        | 0.1256                          | 0.83      | 3.25         | 0.3769                             | 0.6282 | 1.256  |
| 85                        | 0.1070                          | 0.89      | 3.16         | 0.3211                             | 0.5352 | 1.070  |
| 90                        | 0.09154                         | 0.95      | 3.09         | 0.2746                             | 0.4577 | 0.9154 |
| 95                        | 0.07860                         | 1.02      | 3.01         | 0.2358                             | 0.3930 | 0.7860 |
| 100                       | 0.06773                         | 1.08      | 2.94         | 0.2032                             | 0.3387 | 0.6773 |
| 105                       | 0.05858                         | 1.14      | 2.87         | 0.1757                             | 0.2929 | 0.5858 |
| 110                       | 0.05083                         | 1.21      | 2.80         | 0.1525                             | 0.2542 | 0.5083 |
| 115                       | 0.04426                         | 1.27      | 2.73         | 0.1328                             | 0.2213 | 0.4426 |
| 120                       | 0.03866                         | 1.34      | 2.67         | 0.1160                             | 0.1933 | 0.3866 |
| 125                       | 0.03387                         | 1.41      | 2.61         | 0.1016                             | 0.1694 | 0.3387 |



## 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.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**