

NTC Thermistor, Epoxy Coated Mini Sensor



FEATURES

- Advanced NTC technology
- Temperature range from -55 °C to +150 °C
- Highly resistant to thermal shocks
- Small body diameter of max. 2.5 mm
- Fast response time
- High sensitivity
- Delivery in bulk or in tape with extra long leads (for automatic mounting)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

| QUICK REFERENCE DATA | | |
|--|----------------|-----------------|
| PARAMETER | VALUE | UNIT |
| Resistance value at 25 °C | 2.1K to 100K | Ω |
| Tolerance on R_{25} -value | ± 1 to ± 5 | % |
| $B_{25/85}$ -value | 3511 to 4190 | K |
| Tolerance on $B_{25/85}$ -value | ± 0.5 to ± 1.5 | % |
| Operating temperature range | -55 to +150 | °C |
| Response time (63.2 %) 25 °C to 85 °C still air (for info) | 5 | s |
| Dissipation factor δ in still air (for info) | 1.8 | mW |
| Maximum power dissipation | 100 | mW |
| Min. dielectric withstanding voltage between terminals and coated body | 500 | V _{AC} |
| Insulation resistance at 100 V _{DC} | > 10M | Ω |
| Weight | approx. 100 | mg |

APPLICATIONS

Temperature sensing, control and compensation.
E.g. inlet air temperature sensing thermistors or ECT in automotive applications, sensor elements in industrial and commercial applications, heating systems and industrial systems.

MOUNTING

The thermistors are suitable for all standard assembly processes like crimping, soldering, welding. The parameters of the assembly process should be chosen in accordance with the lead-wire material (tinned nickel) and validated in application.

The mounting process should be in compliance with the following guidelines and recommendations:

- Peeling forces on the leads should be reduced to a minimum and should never exceed 3 N
- Avoid large temperature gradients between the welding region and the sensor

PACKAGING

- Bulk components are delivered in boxes of 500 components
- Taped components are delivered on a reel of 1500 components (according to IEC 60286-2 but with extra long leads: H0 = 32 mm)

DESIGN IN SUPPORT

R(T) tables spreadsheet available on request at nlr@vishay.com or to download at:

www.vishay.com/resistors-non-linear/curve-computation-list

| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | |
|---|----------------------|--------------------|------------------------|-----------------------|---------------------------|
| VISHAY SAP ORDERING NUMBER ⁽¹⁾ | R_{25} -VALUE (kΩ) | R_{25} -TOL. (%) | $B_{25/85}$ -VALUE (K) | $B_{25/85}$ -TOL. (%) | COLOR DOT (see next page) |
| NTCLE213E3212xMyy | 2.1 | 1, 2, 3, 5 | 3511 | 1 | Orange |
| NTCLE213E3103xLyy | 10 | 1, 2, 3, 5 | 3435 | 1 | Red |
| NTCLE213E3103xHyy | 10 | 1, 2, 3, 5 | 3984 | 0.5 | Blue |
| NTCLE213E3123xMyy | 12 | 1, 2, 3, 5 | 3740 | 1 | Black |
| NTCLE213E3303xHyy | 30 | 1, 2, 3, 5 | 3935 | 0.75 | Green |
| NTCLE213E3104xXyy | 100 | 1, 2, 3, 5 | 4190 | 1.5 | Brown |

Note

- ⁽¹⁾ Replace the x-digit by J for R_{25} -tolerance of 5 %, H for 3 %, G for 2 %, and F for 1 %.
Replace the y-digits by B0 for bulk delivery and by T1 for tape and reel delivery.

DIMENSIONS in millimeters


| PARAMETER | VALUE |
|-----------|-------------|
| B | 2.5 max. |
| T | 2.5 max. |
| P | 1.1 nominal |
| P1 | 2.54 |
| d | 0.4 ± 10 % |
| H1 | 5.5 max. |
| H2 | 10 max. |
| L | 41 ± 1 |

Note

- Non-dimensioned details do not affect the performance of the thermistors.



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.