

NTC Thermistors, Insulated Leads for 185 °C Applications



LINKS TO ADDITIONAL RESOURCES



3D Models



Design Tools



Related Documents

QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	2.1K to 30K	Ω
Tolerance on R_{25} -value	1, 2, 3, 5	%
$B_{25/85}$ -value	3435 to 3984	K
Tolerance on $B_{25/85}$ -value	± 0.5 to ± 1	%
Operating temperature range	-55 to +185	°C
Response time (63.2 %) in stirred air 25 °C to 85 °C (for information only)	6	s
Dissipation factor δ in still air (for information only)	1.0	mW/K
Maximum power dissipation at 55 °C	100	mW
Minimum dielectric withstanding voltage (RMS) between terminals and coated body	1000	V _{AC}
Minimum insulation resistance between terminals and coated body at 500 V _{DC}	100M	Ω
Weight	30	mg

DESIGN-IN SUPPORT

Not intended for fluid immersed applications or continuous contact with water or conducting liquids. See also Environmental Conditions. Can be potted in suitable resins.

For complete curve computation, please visit:
www.vishay.com/thermistors/ntc-curve-list/

Consult Vishay for specific applications, mounting, alternative RT curves, or wire length.

FEATURES

- Advanced NTC ceramic technology
- Wide temperature range from -55 °C to +185 °C
- Cost efficient thermistor design
- Small body diameter of maximum 2.4 mm
- Fast response time and high sensitivity
- Improved noxious gas and acid resistance
- Insulated Ag-plated NiFe alloy leads
- Mounting: radial
- AEC-Q200 qualified (rev. D)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

APPLICATIONS

NTCLE350 can be processed by potting or molding into sensors for electric traction motors, for example in the sensing and protection of high current connectors.

NTCLE350 is suitable for EGR applications (exhaust gas recirculation) for steady state temperatures going up to 185 °C.

This series is also intended for oil temperatures sensors (OTS), in for example transmission systems and liquid cooled starter/generator systems.

The AEC-Q200 qualification (between -55 °C and 185 °C) enables this series to be used for classical motor thermal sensing applications (engine coolant, fuel sensor, TMAP for manifold air pressure) as well as in HVAC applications.

DESCRIPTION

These negative temperature coefficient thermistors consist of a mini-chip soldered between two AWG #32 PEEK insulated silver plated NiFe alloy leads and coated with black colored epoxy lacquer. High adhesive strength between PEEK wire and encapsulating lacquer.

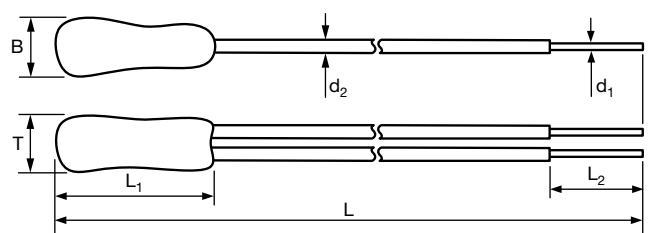
MOUNTING

Important mounting and handling instructions: see www.vishay.com/doc?29222

ELECTRICAL DATA AND ORDERING INFORMATION				
R_{25} (Ω)	R_{25} -TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$ -TOL. (± %)	SAP MATERIAL AND ORDERING NUMBER ⁽¹⁾
				RoHS COMPLIANT
2100	1, 2, 3, 5	3511	1	NTCLE350E4212xMB0
5000	1, 2, 3, 5	3435	1	NTCLE350E4502xLB0
10 000	1, 2, 3, 5	3984	0.5	NTCLE350E4103xHB0
10 000	1, 2, 3, 5	3435	1	NTCLE350E4103xLB0
30 000	1, 2, 3, 5	3935	1	NTCLE350E4303xHB0

Note

⁽¹⁾ Replace the x-digit by J for R_{25} -tolerance of 5 %, H for 3 %, G for 2 %, and F for 1 %

DIMENSIONS in millimeters						
						
T	B	L	L ₁	L ₂	Ø d ₂ MAX.	Ø d ₁
2.4 max.	2.4 max.	40 ± 1	6 ± 1	5 ± 1	0.4	0.2 ± 0.02

MOUNTING

The thermistors are suitable for all standard assembly processes like crimping, brazing, and welding (laser, ultrasonic, or resistance). The parameters of the assembly process should be chosen in accordance with the lead-wire material (silver plated Ni-Fe alloy) and validated in application.

Different conductor, insulation material, and dimensions are available on request.

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
- After complete assembly it is recommended to fix the leads in the welding region with a strain relief

If using a ceramic adhesive / potting or filling material avoid phosphate-based binders. Always follow the supplier's curing specifications fully including bringing the part up to operating temperature for a short time to ensure good moisture resistance and electrical performance of the total sensor.

ENVIRONMENTAL CONDITIONS

The thermistor should not be placed in a reducing atmosphere or be subjected to corrosive substances (e.g. phosphates) which could affect the functionality or the lifetime of the thermistor. Always maintain a sufficient partial oxygen pressure to avoid abnormal electrical drift and / or a reduced "life time".

The thermistor design can withstand conditions with low concentrations of H₂S, NO₂, Cl₂, and SO₂ according to DIN EN 60068-2-60, test Ke, method 4. Additionally it can withstand FOS90 testing according to ASTM B 809-95 (1000 hours / 90 °C / 76 % to 95 % RH / sulfur flowers) and 12 hours immersion (at 50 °C) in low concentrations of HCl, H₂SO₄, and acetic acid without functional or visual damage.

The thermistor was qualified according to AEC-Q200 rev. D with top temperature of 185 °C to assure best performance in today's most challenging environments.



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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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.