

NTC Thermistor Sensors - Pipe Type with Fast Time Response



DESIGN SUPPORT TOOLS AVAILABLE



QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	100K	Ω
Tolerance on R_{25} -value	± 3	%
$B_{25/85}$ -value	4190	K
Tolerance on $B_{25/85}$ -value	± 1.5	%
Operating temperature range	-40 to +105	°C
Response time in oil (typical) ⁽¹⁾	$t_{0.63} = 3.5$ $t_{0.90} = 9.5$	s
Minimum dielectric withstanding voltage	1500	V_{RMS}
Maximum power dissipation at 55 °C	250	mW
Mass	≈ 1.6	g

Note

- ⁽¹⁾ Response time in silicone oil MS 200/50. This is the time needed for the sensor to reach 63.2 % or 90 % of the total temperature difference when subjected to a temperature change from 25 °C in air to 85 °C in oil

DIMENSIONS in millimeters						
L_1	L_2	L_3	D	d_1	d_2	W
3.5 +0 / -2	300 +20 / -10	15 ± 0.3	3.2 ± 0.3	0.3 ± 0.03	1.0 (for info)	2.0 (for info)

ELECTRICAL DATA AND ORDERING INFORMATION				
R_{25} (Ω)	R_{25} -TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$ -TOL. (± %)	SAP MATERIAL AND ORDERING NUMBER
100 000	3	4190	1.5	NTCLP450E3104H ⁽¹⁾

Note

- ⁽¹⁾ This part was formerly known as NTCAPIPE3104H101

FEATURES

- Fast time response vs. industry standards
- High stability
- High resistance to humidity
- Accurate over wide temperature range
- High encapsulating strength between the PVC wire and the encapsulated lacquer
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

APPLICATIONS

Temperature measurement, sensing and control in remote locations and for various environmental conditions, indoor or outdoor.

Typical applications include, for example:

- Air-conditioning sensors
- Evaporator sensors
- Industrial sensors
- Heating systems sensors

DESCRIPTION

These negative temperature coefficient thermistors consist of a mini-chip soldered to a twin stranded tin plated copper AWG #30, 105 °C resistant, PVC (UL2651) wire and potted in a nickel plated brass pipe. Terminations are tin solder dipped.

MOUNTING

By soldering or clamping the wire ends, in any position. Body can be inserted, glued or taped attached to a surface, pipe or mounting hole. Not intended for fluid immersed applications.

DESIGN-IN SUPPORT

- Other R/T curves available on request
- The lead length can be customized
- Connectors or ferrules can be added to the wire end

For complete curve computation, please visit:

www.vishay.com/thermistors/ntc-curve-list/



RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES							
TEMP. (°C)	R_T/R_{25}	RESISTANCE (ω)	R-TOL. (\pm %)	α (%/K)	T-TOL. (\pm °C)	$R_{min.}$ (ω)	$R_{max.}$ (ω)
-40	36.663	3 666 299	9.05	-6.69	1.35	3 334 382	3 998 217
-35	26.376	2 637 588	8.47	-6.49	1.31	2 414 177	2 860 998
-30	19.166	1 916 576	7.91	-6.29	1.26	1 764 950	2 068 202
-25	14.061	1 406 111	7.37	-6.10	1.21	1 302 413	1 509 810
-20	10.412	1 041 184	6.86	-5.92	1.16	969 762	1 112 605
-15	7.778	77 7846	6.36	-5.75	1.11	728 341	827 350
-10	5.861	586 097	5.89	-5.58	1.06	551 588	620 605
-5	4.453	445 257	5.43	-5.42	1.00	421 083	469 431
0	3.409	340 942	4.99	-5.26	0.95	323 938	357 945
5	2.631	263 054	4.56	-5.11	0.89	251 055	275 052
10	2.044	204 446	4.15	-4.97	0.84	195 961	212 931
15	1.600	160 014	3.75	-4.83	0.78	154 008	166 020
20	1.261	126 087	3.37	-4.70	0.72	121 837	130 336
25	1.000	100 000	3.00	-4.57	0.66	97 000	103 000
30	0.7981	79 808	3.36	-4.45	0.75	77 128	82 488
35	0.6408	64 077	3.70	-4.33	0.86	61 703	66 451
40	0.5175	51 745	4.04	-4.22	0.96	49 655	53 836
45	0.4202	42 021	4.36	-4.11	1.06	40 187	43 855
50	0.3431	34 308	4.68	-4.00	1.17	32 702	35 913
55	0.2816	28 156	4.98	-3.90	1.28	26 752	29 559
60	0.2322	23 222	5.28	-3.80	1.39	21 996	24 449
65	0.1925	19 246	5.57	-3.71	1.50	18 174	20 318
70	0.1603	16 025	5.85	-3.62	1.62	15 088	16 962
75	0.1340	13 402	6.12	-3.53	1.73	12 582	14 222
80	0.1126	11 258	6.38	-3.45	1.85	10 539	11 976
85	0.09496	9496	6.64	-3.36	1.97	8866	10 126
90	0.08042	8042	6.89	-3.28	2.10	7488	8596
95	0.06837	6837	7.13	-3.21	2.22	6350	7325
100	0.05835	5835	7.36	-3.13	2.35	5405	6265
105	0.04998	4998	7.59	-3.06	2.48	4618	5377

TESTS AND REQUIREMENTS

STABILITY TESTS		
TEST	PROCEDURE	$ \Delta R_{25}/R_{25} $
Endurance at UCT	+105 °C; 1000 h	< 5 %
Endurance at LCT	-40 °C; 1000 h	< 5 %
Endurance, max. power dissipation	250 mW; 55 °C; 1000 h	< 5 %
Damp heat, steady state	56 days at 40 °C; 90 % to 95 % RH	< 7 %
Rapid change of temperature	-40 °C to +105 °C; 500 cycles	< 5 %



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.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.