NTC Thermistor Sensors - Pipe Type with Fast Time Response



DESIGN SUPPORT TOOLS AVAILABLE

3D Models Design Tools

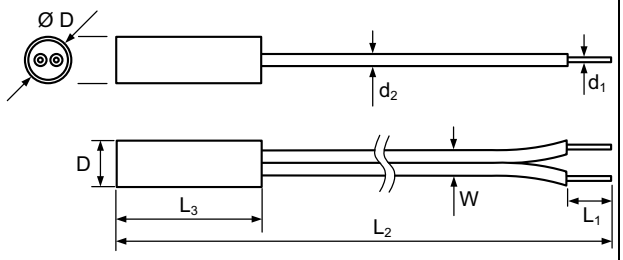
QUICK REFERENCE DATA

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)

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/

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

For technical questions, contact: nlr@vishay.com

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RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES							
TEMP. (°C)	R_T/R_{25}	RESISTANCE (ω)	*R*-TOL. (± %)	α (%/K)	T-TOL. (± °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	$\lvert\Delta R_{25}/R_{25}\rvert$
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 %

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