NTC Thermistors, Epoxy PVC Long Leads Sensors



FEATURES

- Accurate over wide temperature range
- High stability
- Excellent price / performance ratio
- High adhesive strength between PVC wire and the encapsulating lacquer
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

e3

RoHS COMPLIANT

LINKS TO ADDITIONAL RESOURCES

Related Documents

QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C (R_{25})	2.2K to 100K	Ω
Tolerance on R_{25}-value (2)	± 3	%
$B_{25/85}$-value	3977 to 4190	K
Tolerance on $B_{25/85}$-value	± 0.75 to ± 1.5	%
Operating temperature range at zero dissipation	-40 to +85	°C
Maximum power dissipation at 55 °C	250	mW
Min. dielectric withstanding voltage between terminals and sensor body	1500	V_{AC}
Dissipation factor	6.0	mW/K
Response time (1)	≈ 7	s
Weight	≈ 4	g

Notes

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

(2) Tighter tolerances on R_{25} are available upon request

APPLICATIONS

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

DESCRIPTION

These sensors exist of a small NTC chip reflow soldered between two AWG #24 UL-2468 style wires. They are lacquered and insulated with black epoxy.

MARKING

UL mark on wire, no mark on body.

PACKAGING

The thermistors are packed in cardboard boxes; each box containing 500 pieces.

DESIGN-IN SUPPORT

Other wire length and wire type (UL-2651 style PVC 105 °C), other wire gauge, are available on request.

The products can be provided with a connector on request.

A UL-2651 105 °C multistranded version is available as **NTCLE430**.

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

MOUNTING

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

By soldering or clamping the wire ends, in any position. Body can be inserted or taped attached. Not intended for fluid immersed applications.

ELECTRICAL DATA AND ORDERING INFORMATION					
R_{25} (Ω)	R_{25}-TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$-TOL. (± %)	SAP MATERIAL AND ORDERING NUMBER	
				RoHS COMPLIANT WITH EXEMPTION (1)	RoHS COMPLIANT
2200	3	3977	0.75	NTCLE400E3222H	NTCLE400E3222HA
4700	3	3977	0.75	NTCLE400E3472H	NTCLE400E3472HA
5000	3	3977	0.75	NTCLE400E3502H	NTCLE400E3502HA
10 000	3	3977	0.75	NTCLE400E3103H	NTCLE400E3103HA
47 000	3	4090	1.5	NTCLE400E3473H	NTCLE400E3473HA
100 000	3	4190	1.5	NTCLE400E3104H	NTCLE400E3104HA

Notes

Preferred versions for new designs

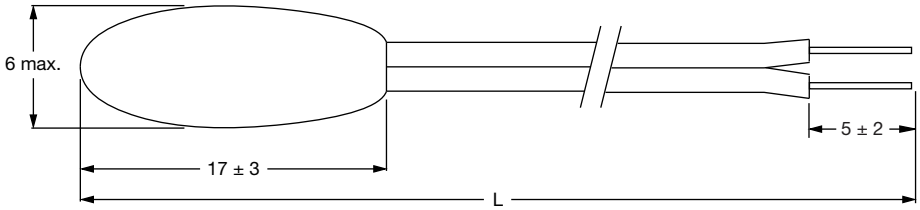
(1) RoHS exemption 7(c)-I: electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezo-electronic devices, or in a glass or ceramic matrix compound

For technical questions, contact: nlr@vishay.com

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DIMENSIONS in millimeters

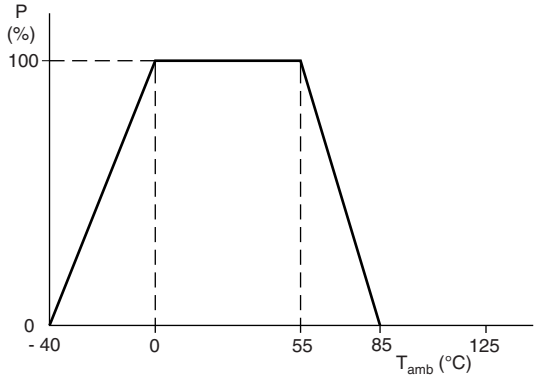
Epoxy-coated type NTCLE400E....



L = 400 mm + 15 / - 0
Other wire lengths or connector attached available on request.

DERATING

Power derating curve.



Note

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

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RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 2.2 kΩ, 4.7 kΩ, 5.0 kΩ , AND 10 kΩ							
T_{OPER} (°C)	PART NR. NTCLE400E3222H(A)	PART NR. NTCLE400E3472H(A)	PART NR. NTCLE400E3502H(A)	PART NR. NTCLE400E3103H(A)	*R*-TOL. (± %)	α (%/K)	T-TOL. (± °C)
	R_T (Ω)	R_T (Ω)	R_T (Ω)	R_T (Ω)			
-40	73 061	156 084	166 047	332 094	5.87	-6.62	0.89
-35	52 778	112 753	119 950	239 900	5.60	-6.39	0.88
-30	38 544	82 344	87 600	175 200	5.33	-6.18	0.86
-25	28 443	60 765	64 643	129 287	5.08	-5.98	0.85
-20	21 199	45 288	48 179	96 358	4.83	-5.78	0.84
-15	15 950	34 075	36 250	72 500	4.60	-5.60	0.82
-10	12 110	25 872	27 523	55 046	4.37	-5.42	0.81
-5	9275	19 814	21 078	42 157	4.15	-5.25	0.79
0	7162	15 300	16 277	32 554	3.94	-5.09	0.77
5	5574	11 909	12 669	25 339	3.74	-4.93	0.76
10	4372	9340	9936	19 872	3.55	-4.79	0.74
15	3454	7378	7849	15 698	3.36	-4.64	0.72
20	2747	5869	6244	12 488	3.18	-4.51	0.70
25	2200	4700	5000	10 000	3.00	-4.38	0.69
30	1773	3788	4030	8059	3.17	-4.25	0.75
35	1438	3071	3267	6535	3.33	-4.13	0.81
40	1173	2505	2665	5330	3.49	-4.02	0.87
45	961.8	2055	2186	4372	3.65	-3.91	0.93
50	793.2	1694	1803	3605	3.80	-3.80	1.00
55	657.5	1405	1494	2989	3.94	-3.70	1.07
60	547.8	1170	1245	2490	4.08	-3.60	1.13
65	458.6	979.7	1042	2084	4.22	-3.51	1.20
70	385.7	823.9	876.5	1753	4.35	-3.42	1.27
75	325.8	696.0	740.5	1481	4.48	-3.33	1.35
80	276.4	590.5	628.2	1256	4.60	-3.25	1.42
85	235.5	503.0	585.2	1070	4.73	-3.17	1.49

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RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 47 kΩ				
T_{OPER} (°C)	PART NR. NTCLE400E3473H(A) R_T (Ω)	*R*-TOL. (± %)	α (%/K)	T-TOL. (± °C)
-40	1 589 068	8.91	-6.54	1.36
-35	1 151 627	8.34	-6.34	1.32
-30	842 790	7.79	-6.15	1.27
-25	622 597	7.27	-5.96	1.22
-20	464 110	6.77	-5.79	1.17
-15	348 989	6.28	-5.62	1.12
-10	264 628	5.82	-5.45	1.07
-5	202 280	5.37	-5.30	1.01
0	155 823	4.94	-5.14	0.96
5	120 932	4.52	-5.00	0.91
10	94 528	4.12	-4.86	0.85
15	74 399	3.74	-4.72	0.79
20	58 945	3.36	-4.59	0.73
25	47 000	3.00	-4.47	0.67
30	37 706	3.35	-4.35	0.77
35	30 429	3.69	-4.23	0.87
40	24 696	4.02	-4.12	0.97
45	20 154	4.33	-4.01	1.08
50	16 534	4.64	-3.91	1.19
55	13 633	4.94	-3.81	1.30
60	11 296	5.23	-3.71	1.41
65	9404	5.51	-3.62	1.52
70	7865	5.78	-3.53	1.64
75	6607	6.04	-3.44	1.75
80	5573	6.30	-3.36	1.87
85	4721	6.55	-3.28	2.00

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RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 100 kΩ				
T_{OPER} (°C)	PART NR. NTCLE400E3104H(A) R_T (Ω)	*R*-TOL. (± %)	α (%/K)	T-TOL. (± °C)
-40	3 666 299	9.05	-6.69	1.35
-35	2 637 588	8.47	-6.49	1.31
-30	1 916 576	7.91	-6.29	1.26
-25	1 406 111	7.37	-6.10	1.21
-20	1 041 184	6.86	-5.92	1.16
-15	777 846	6.36	-5.75	1.11
-10	586 097	5.89	-5.58	1.06
-5	445 257	5.43	-5.42	1.00
0	340 942	4.99	-5.26	0.95
5	263 054	4.56	-5.11	0.89
10	204 446	4.15	-4.97	0.84
15	160 014	3.75	-4.83	0.78
20	126 087	3.37	-4.70	0.72
25	100 000	3.00	-4.57	0.66
30	79 808	3.36	-4.45	0.75
35	64 077	3.70	-4.33	0.86
40	51 745	4.04	-4.22	0.96
45	42 021	4.36	-4.11	1.06
50	34 308	4.68	-4.00	1.17
55	28 156	4.98	-3.90	1.28
60	23 222	5.28	-3.80	1.39
65	19 246	5.57	-3.71	1.50
70	16 025	5.85	-3.62	1.62
75	13 402	6.12	-3.53	1.73
80	11 258	6.38	-3.45	1.85
85	9496	6.64	-3.36	1.97

TESTS AND REQUIREMENTS

STABILITY TESTS			
IEC	TEST	PROCEDURE	DRIFT REQUIREMENT
60068-2-2	Endurance dry heat	85 °C; 1000 h	$\Delta R/R < 5$ %
60068-2-1	Endurance cold	-40 °C; 1000 h	$\Delta R/R < 5$ %
60539	Endurance max. dissipation	250 mW; 55 °C; 1000 h	$\Delta R/R < 5$ %
60068-2-3	Damp heat, steady state	56 days at 40 °C; 90 % to 95 % RH	$\Delta R/R < 7$ %
60068-20-14	Rapid change of temperature	-40 °C to +85 °C; 50 cycles	$\Delta R/R < 5$ %

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