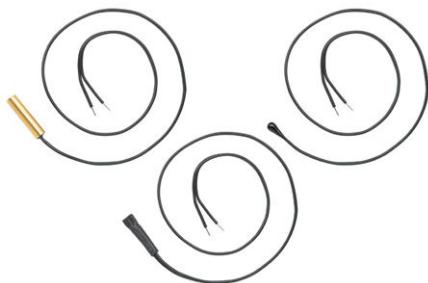


NTC Thermistors, Special Long Lead Sensors



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 (continuously)	- 40 to + 85	°C
At maximum dissipation	0 to + 55	
Maximum power dissipation at 55 °C	250	mW
Dissipation factor: NTCLE400... NTCLS100... NTCLP100...	6.0 8.0 6.0	mW/K
Response time ⁽¹⁾ : NTCLE400... NTCLS100... NTCLP100...	≈ 7 ≈ 15 ≈ 10	s
Climatic category (LCT/UCT/days)	40/085/56	
Weight NTCLE400... NTCLS100... NTCLP100...	≈ 4 ≈ 6 ≈ 6	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.

FEATURES

- Accurate over wide temperature range
- High stability
- Excellent price/performance ratio
- High adhesive strength between PVC wire and the encapsulating laquer
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC


RoHS
COMPLIANT

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 AWG24 UL-2468 wires. They are lacquered and insulated with black epoxy (NTCLE400 type), sleeved (NTCLS100 type) or potted into a brass pipe (NTCLP100 type).

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 PVC 105 °C) are available on request. The products can be provided with a connector on request.

For complete curve computation, visit:
www.vishay.com/resistors-non-linear/curve-computation-list/

MOUNTING

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} (kΩ)	$B_{25/85}$ -VALUE	SAP MATERIAL AND ORDERING NUMBER ⁽³⁾⁽⁴⁾			OLD 12NC CODE 2381 641		
		EPOXY TYPE	SLEEVED TYPE	PIPE TYPE	EPOXY-COATED TYPE	SLEEVED TYPE	BRASS-PIPE TYPE
2.2	3977K ± 0.75 %	NTCLE400E3222H	NTCLS100E3222H	NTCLP100E3222H	26222	36222	46222
4.7	3977K ± 0.75 %	NTCLE400E3472H	NTCLS100E3472H	NTCLP100E3472H	26472	36472	46472
5	3977K ± 0.75 %	NTCLE400E3502H	NTCLS100E3502H	NTCLP100E3502H	26502	36502	46502
10	3977K ± 0.75 %	NTCLE400E3103H	NTCLS100E3103H	NTCLP100E3103H	26103	36103	46103
47	4090K ± 1.5 %	NTCLE400E3473H	NTCLS100E3473H	NTCLP100E3473H	26473	36473	46473
100	4190K ± 1.5 %	NTCLE400E3104H	NTCLS100E3104H	NTCLP100E3104H	26104	36104	46104

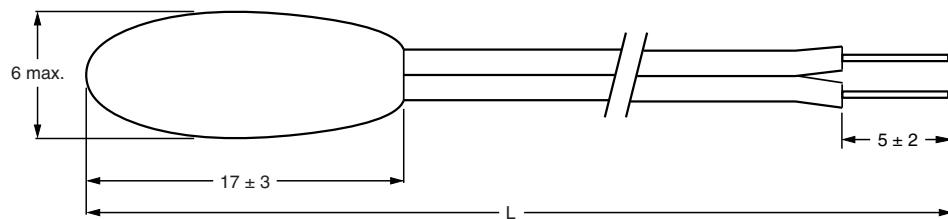
Notes

(3) Other values and tolerances based on the NTCC100E4 series are available on request. (www.vishay.com/doc?229058)

(4) The specified catalog numbers refer to products with L = 400 mm, without connector and adopt UL-2468.AWG24 wire.

DIMENSIONS in millimeters

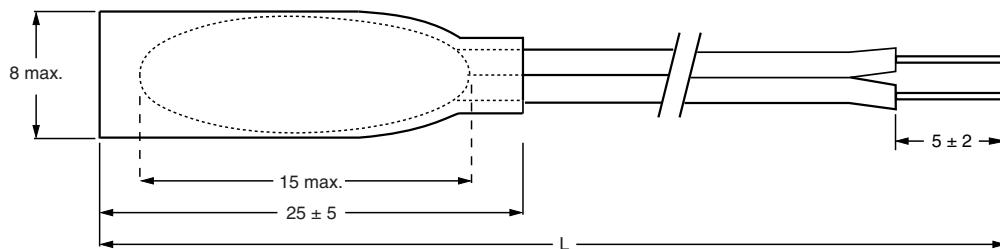
Epoxy-coated type NTCLE400E....



$L = 400 \text{ mm} + 15/-0$

Other wire lengths or connector attached available on request.

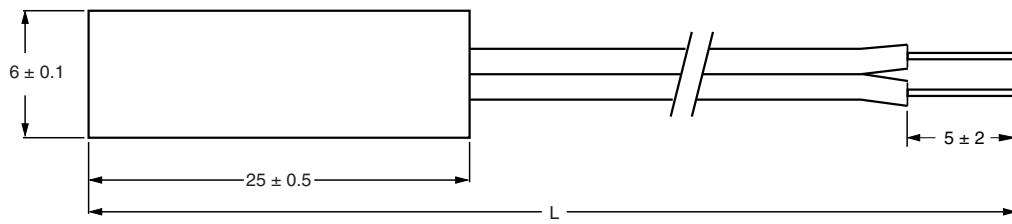
Sleeved type NTCLS100E....



$L = 400 \text{ mm} + 15/-0$

Other wire lengths or connector attached available on request.

Brass-pipe type NTCLP100E....

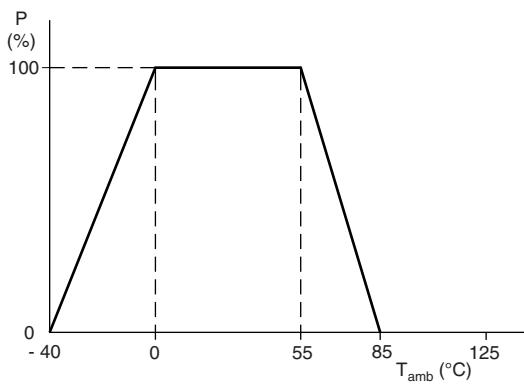


$L = 400 \text{ mm} + 15/-0$

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.

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 2.2 k Ω , 4.7 k Ω , 5.0 k Ω , AND 10 k Ω

T_{OPER} (°C)	PART NR. NTCL**00E3222H	PART NR. NTCL**00E3472H	PART NR. NTCL**00E3502H	PART NR. NTCL**00E3103H	$\Delta R/R$ (%)	TCR (%/K)	$\Delta T_{max.}$ (± K)
	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

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 47 k Ω

T _{OPER} (°C)	PART NR. NTCL**00E3473H	$\Delta R/R$ (%)	TCR (%/K)	$\Delta T_{max.}$ (± K)
	R_T (Ω)			
- 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



NTCLE400, NTCLS100, NTCLP100

NTC Thermistors, Special Long
Lead Sensors

Vishay BCcomponents

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 100 k Ω

T_{OPER} (°C)	PART NR. NTCL**00E3104H	$\Delta R/R$ (%)	TCR (%/K)	$\Delta T_{max.}$ (± K)
	R_T (Ω)			
- 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	- 40 °C to + 85 °C; 50 cycles	Rapid change of temperature	$\Delta R/R < 5$ %

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