

## NTC Thermistors, Micro Chip Sensor Insulated Leads



### FEATURES

- Flexible insulated leads for special mounting or assembly
- Miniature sized very fast reacting
- Accurate over a wide temperature range
- High stability over a long life
- Exceptional withstanding in thermal shocks
- AEC-Q200 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Fulfils the ELV 2000/53/EC



**RoHS**  
COMPLIANT

QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	2060 to 10 000	Ω
Accuracy of temperature measurement	± 0.5 between 25 and 85 ± 1.0 between - 40 and + 125	°C
B <sub>25/85</sub> - value	3511 to 3984	K
Tolerance on B <sub>25/85</sub>	± 0.5 to ± 1	%
Maximum dissipation	50	mW
Dissipation factor δ (in still air)	≈ 0.8	mW/K
Response time (in stirred air) (in oil)	≈ 3 ≈ 0.7	s
Operating temperature range	- 40 to 125	°C
Climatic category	40/125/56	
Minimum dielectric withstanding voltage between leads and coated body (tested according to IEC 60539 §4.7.2 method 1)	100	V <sub>RMS</sub>
Weight	0.05	g

### APPLICATIONS

- Temperature measurement, sensing and control in automotive and industrial applications

### DESCRIPTION

These negative temperature coefficient thermistors consist of a micro NTC chip with two insulated solid silver plated nickel wires and coated with a ochre-colored epoxy lacquer.

### PACKAGING

The thermistors are packed in cardboard boxes; the smallest packing quantity is 1000 pieces.

### MARKING

The components are not marked.

### DESIGN IN SUPPORT

R(T) tables spreadsheet available on request at [nlr@vishay.com](mailto:nlr@vishay.com).

### MOUNTING

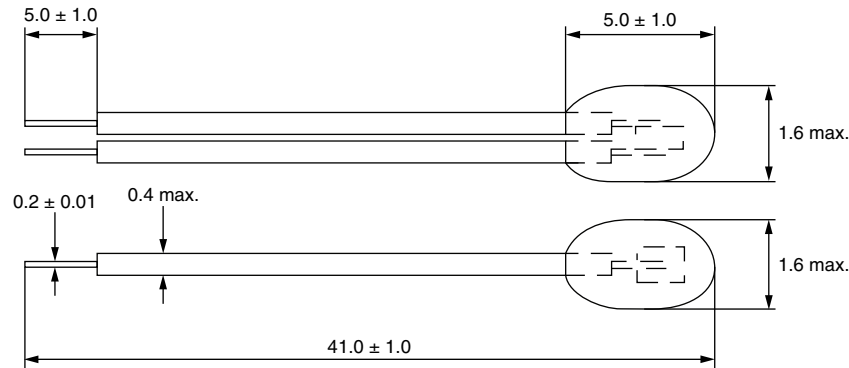
By soldering or welding in any position.  
The parts can be potted in suitable resins.

ELECTRICAL DATA AND ORDERING INFORMATION							
SAP PART AND ORDERING NUMBER	R <sub>25</sub> <sup>(1)</sup> (Ω)	α (25 °C) (%/K)	R <sub>25</sub> Tol. (%)	B <sub>25/85</sub> <sup>(1)</sup> (K)	B <sub>25/85</sub> Tol. (%)	ΔT <sub>max.</sub> <sup>(2)</sup> 25 to 85 (°C)	ΔT <sub>max.</sub> <sup>(2)</sup> - 40 to 125 (°C)
NTCLE305E4202SB	2060	- 3.85	1.93	3511	1.0	± 0.5	± 1
NTCLE305E4502SB	5000	- 4.39	2.2	3984	0.5	± 0.5	± 1
NTCLE305E4103SB	10 000	- 4.39	2.2	3984	0.5	± 0.5	± 1

#### Notes

<sup>(1)</sup> Other R<sub>25</sub> and B-values available on request.

<sup>(2)</sup> ΔT is the temperature measurement accuracy in the defined temperature ranges.

**DIMENSIONS** in millimeters

**RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES**

SAP PART AND ORDERING NUMBER: NTCLE305E4202SB

Temperature (°C)	$R_T/R_{25}$	Resistance (Ω)	$\Delta R/R$ (%)	$\alpha$ (%/K)	$\Delta T$ (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
-40	22.975	47 326	6.03	- 6.03	1.0	45 284	49 369
-35	17.089	35 203	5.81	- 5.81	1.0	33 796	36 610
-30	12.851	26 473	5.60	- 5.60	1.0	25 496	27 449
-25	9.7647	20 115	5.39	- 5.39	1.0	19 431	20 798
-20	7.4928	15 435	5.20	- 5.20	1.0	14 954	15 915
-15	5.8033	11 954	5.02	- 5.02	1.0	11 615	12 294
-10	4.5348	9341.4	4.85	- 4.85	1.0	9100.2	9582.6
-5	3.5736	7361.4	4.68	- 4.68	1.0	7189.8	7532.9
0	2.8388	5847.7	4.53	- 4.53	1.0	5725.6	5969.9
5	2.2724	4680.9	4.38	- 4.38	1.0	4594.1	4767.8
10	1.8323	3774.3	4.24	- 4.24	1.0	3712.8	3835.8
15	1.4877	3064.4	4.10	- 4.10	1.0	3021.1	3107.7
20	1.2159	2504.6	3.97	- 3.97	1.0	2474.5	2534.7
25	1.0000	2060.0	1.92	- 3.85	0.5	2039.4	2080.6
30	0.82743	1704.4	1.86	- 3.73	0.5	1684.1	1724.8
35	0.68863	1418.5	1.81	- 3.62	0.5	1398.9	1438.2
40	0.57617	1186.9	1.75	- 3.51	0.5	1168.2	1205.5
45	0.48445	997.92	1.70	- 3.41	0.5	980.48	1015.4
50	0.40917	842.86	1.65	- 3.31	0.5	826.67	859.04
55	0.34704	714.88	1.61	- 3.21	0.5	699.96	729.80
60	0.29550	608.71	1.56	- 3.12	0.5	595.01	622.40
65	0.25253	520.19	1.52	- 3.04	0.5	507.67	532.71
70	0.21654	446.06	1.48	- 2.95	0.5	434.64	457.47
75	0.18627	383.71	1.44	- 2.87	0.5	373.32	394.10
80	0.16072	331.07	1.40	- 2.79	0.5	321.63	340.51
85	0.13907	286.46	1.36	- 2.72	0.5	277.89	295.04
90	0.12065	248.53	2.65	- 2.65	1.0	240.76	256.31
95	0.10494	216.17	2.58	- 2.58	1.0	209.12	223.22
100	0.091500	188.48	2.52	- 2.52	1.0	182.09	194.87
105	0.079963	164.72	2.45	- 2.45	1.0	158.93	170.51
110	0.070035	144.27	2.39	- 2.39	1.0	139.02	149.52
115	0.061469	126.62	2.33	- 2.33	1.0	121.86	131.38
120	0.054060	111.36	2.28	- 2.28	1.0	107.05	115.67
125	0.047637	98.128	2.22	- 2.22	1.0	94.215	102.04

**Note**

- R(T) table spreadsheet available on request at [nlr@vishay.com](mailto:nlr@vishay.com)

## RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

SAP PART AND ORDERING NUMBER: NTCLE305E4502SB

Temperature (°C)	$R_T/R_{25}$	Resistance ( $\Omega$ )	$\Delta R/R$ (%)	$\alpha$ (%/K)	$\Delta T$ (K)	$R_{min.}$ ( $\Omega$ )	$R_{max.}$ ( $\Omega$ )
-40	33.427	167 137	6.63	- 6.63	1.0	156 057	178 217
-35	24.132	120 661	6.41	- 6.41	1.0	112 932	128 390
-30	17.613	88 066	6.19	- 6.19	1.0	82 613	93 519
-25	12.990	64 950	5.99	- 5.99	1.0	61 061	68 839
-20	9.6761	48 381	5.79	- 5.79	1.0	45 577	51 184
-15	7.2765	36 382	5.61	- 5.61	1.0	34 342	38 423
-10	5.5218	27 609	5.43	- 5.43	1.0	26 110	29 108
-5	4.2268	21 134	5.26	- 5.26	1.0	20 022	22 246
0	3.2624	16 312	5.10	- 5.10	1.0	15 480	17 144
5	2.5381	12 691	4.94	- 4.94	1.0	12 063	13 318
10	1.9897	9948.5	4.80	- 4.80	1.0	9471.4	10 426
15	1.5711	7855.6	4.65	- 4.65	1.0	7490.1	8221.2
20	1.2493	6246.4	4.52	- 4.52	1.0	5964.2	6528.5
25	1.0000	5000.0	2.19	- 4.39	0.5	4890.5	5109.5
30	0.80560	4028.0	2.13	- 4.26	0.5	3942.3	4113.7
35	0.65297	3264.9	2.07	- 4.14	0.5	3197.4	3332.4
40	0.53239	2661.9	2.01	- 4.03	0.5	2608.4	2715.4
45	0.43653	2182.6	1.95	- 3.92	0.5	2140.0	2225.3
50	0.35987	1799.4	1.90	- 3.81	0.5	1765.1	1833.6
55	0.29823	1491.1	1.85	- 3.71	0.5	1463.5	1518.7
60	0.24838	1241.9	1.80	- 3.61	0.5	1219.5	1264.3
65	0.20787	1039.3	1.75	- 3.51	0.5	1021.1	1057.6
70	0.17477	873.83	1.71	- 3.42	0.5	858.89	888.76
75	0.14759	737.96	1.67	- 3.34	0.5	725.67	750.25
80	0.12518	625.90	1.62	- 3.25	0.5	615.74	636.06
85	0.10661	533.06	1.58	- 3.17	0.5	524.62	541.49
90	0.0911586	455.79	3.09	- 3.09	1.0	441.70	469.89
95	0.0782458	391.23	3.02	- 3.02	1.0	379.42	403.03
100	0.067411	337.06	2.94	- 2.94	1.0	327.13	346.98
105	0.0582844	291.42	2.87	- 2.87	1.0	283.05	299.80
110	0.0505676	252.84	2.81	- 2.81	1.0	245.74	259.94
115	0.0440186	220.09	2.74	- 2.74	1.0	214.06	226.13
120	0.0384412	192.21	2.68	- 2.68	1.0	187.06	197.35
125	0.0336748	168.37	2.62	- 2.62	1.0	163.97	172.78

**Note**

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**RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES**

SAP PART AND ORDERING NUMBER: NTCLE305E4103SB

Temperature (°C)	$R_T/R_{25}$	Resistance (Ω)	$\Delta R/R$ (%)	$\alpha$ (%/K)	$\Delta T$ (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
-40	33.427	334 274	6.63	- 6.63	1	312 114	356 434
-35	24.132	241 323	6.41	- 6.41	1	225 865	256 781
-30	17.613	176 133	6.19	- 6.19	1	165 226	187 039
-25	12.990	129 900	5.99	- 5.99	1	122 121	137 679
-20	9.6761	96 761	5.79	- 5.79	1	91 155	102 367
-15	7.2765	72 765	5.61	- 5.61	1	68 684	76 845
-10	5.5218	55 218	5.43	- 5.43	1	52 219	58 217
-5	4.2268	42 268	5.26	- 5.26	1	40 044	44 492
0	3.2624	32 624	5.10	- 5.10	1	30 961	34 288
5	2.5381	25 381	4.94	- 4.94	1	24 127	26 636
10	1.9897	19 897	4.80	- 4.80	1	18 943	20 851
15	1.5711	15 711	4.65	- 4.65	1	14 980	16 442
20	1.2493	12 493	4.52	- 4.52	1	11 928	13 057
25	1.0000	10 000	2.19	- 4.39	0.5	9781.0	10 219
30	0.80560	8056.0	2.13	- 4.26	0.5	7884.6	8227.3
35	0.65297	6529.7	2.07	- 4.14	0.5	6394.8	6664.7
40	0.53239	5323.9	2.01	- 4.03	0.5	5216.9	5430.9
45	0.43653	4365.3	1.95	- 3.92	0.5	4280.0	4450.6
50	0.35987	3598.7	1.90	- 3.81	0.5	3530.3	3667.2
55	0.29823	2982.3	1.85	- 3.71	0.5	2927.1	3037.5
60	0.24838	2483.8	1.80	- 3.61	0.5	2439.1	2528.6
65	0.20787	2078.7	1.75	- 3.51	0.5	2042.2	2115.1
70	0.17477	1747.7	1.71	- 3.42	0.5	1717.8	1777.5
75	0.14759	1475.9	1.67	- 3.34	0.5	1451.3	1500.5
80	0.12518	1251.8	1.62	- 3.25	0.5	1231.5	1272.1
85	0.10661	1066.1	1.58	- 3.17	0.5	1049.2	1083.0
90	0.091159	911.59	3.09	- 3.09	1	883.39	939.78
95	0.078246	782.46	3.02	- 3.02	1	758.85	806.07
100	0.067411	674.11	2.94	- 2.94	1	654.26	693.96
105	0.058285	582.85	2.87	- 2.87	1	566.09	599.60
110	0.050568	505.68	2.81	- 2.81	1	491.48	519.87
115	0.044019	440.19	2.74	- 2.74	1	428.12	452.25
120	0.038441	384.41	2.68	- 2.68	1	374.12	394.71
125	0.033675	336.75	2.62	- 2.62	1	327.93	345.56

**Note**

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