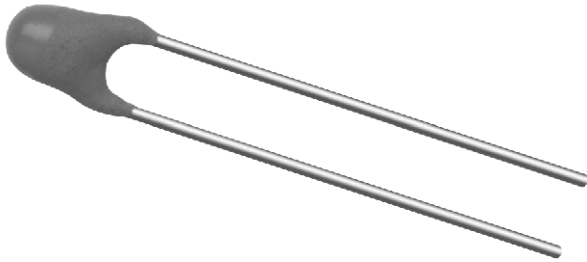


## NTC Thermistors, Radial Leaded Special Accuracy



### FEATURES

- Excellent accuracy between 25 °C and 85 °C
- High stability over a long life
- Old part number was 2322 640 10...
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- Temperature measurement, sensing and control

### DESCRIPTION

These thermistors have a negative temperature coefficient. The device consists of a chip with two tin-plated copper leads. It is grey lacquered and not insulated. These thermistors are very accurate ( $\pm 0.5$  °C) over a trajectory from 25 °C to 85 °C.

### PACKAGING

The thermistors are packed in cardboard boxes, each box contains 500 units.

### MARKING

Grey lacquered body.

### MOUNTING

By soldering in any position.

QUICK REFERENCE DATA	
PARAMETER	VALUE
Resistance at 25 °C <sup>(1)</sup>	4.7 k $\Omega$ to 100 k $\Omega$
Temperature measurement accuracy (between 25 °C and 85 °C)	$\pm 0.5$ °C
Climatic category	40/125/56
Maximum dissipation	250 mW
Dissipation factor $\delta$ (for information only)	7 mW/K
Response time (for information only) <sup>(2)</sup>	1.2 s
Thermal time constant $\tau$ (for information only)	11 s
Operating temperature range: at zero dissipation (continuously) at maximum dissipation	- 40 °C to + 125 °C 0 °C to + 55 °C
Weight	$\approx 0.22$ g

#### Notes

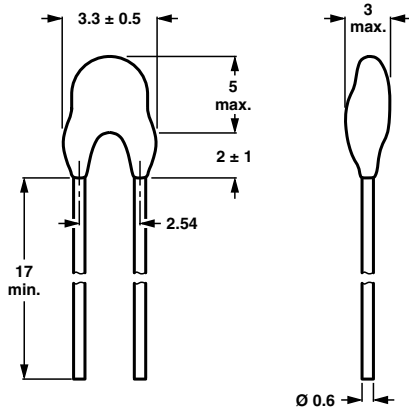
<sup>(1)</sup> For values of nominal resistance value and tolerance at intermediate temperatures; see resistance values tables.

<sup>(2)</sup> 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.

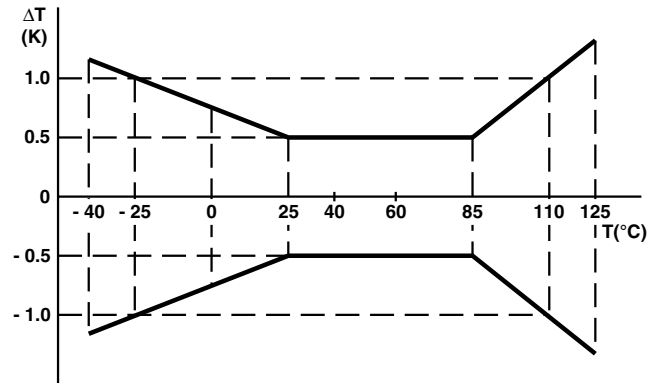
### ELECTRICAL DATA AND ORDERING INFORMATION

$R_{25}$ ( $\Omega$ )	$\Delta R_{25}/R_{25}$ (%)	$R_{85}$ ( $\Omega$ )	$\Delta R_{85}/R_{85}$ (%)	$B_{25/85}$ (K)	$\Delta B/B$ (%)	CATALOG NUMBER 2381 640 .....	SAP MATERIAL NO. NTCLE101E3.....
4700	2.19	503.1	1.58	3977	0.75	10472	472SB0
10 000	2.19	1070	1.58	3977	0.75	10103	103SB0
47 000	2.23	4721	1.64	4090	1.5	10473	473SB0
100 000	2.29	9496	1.72	4190	1.5	10104	104SB0

### DIMENSIONS in millimeters



### TOLERANCE CURVE



### RESISTANCE VALUES AT INTERMEDIATE VALUES with $R_{25}$ at 4.7 k $\Omega$ and 10 k $\Omega$

$T_{oper}$ (°C)	$R_T/R_{25}$	TCR (%/K)	$R_T$ (k $\Omega$ )	
			2381 640 10472 NTCLE101E3472SB0	2381 640 10103 NTCLE101E3103SB0
-40	33.21	6.57	156.1	332.1000
-35	23.99	6.36	112.8	240.0
-30	17.52	6.15	82.35	175.2
-25	12.93	5.95	60.77	129.3
-20	9.636	5.76	45.30	96.36
-15	7.250	5.58	34.08	72.50
-10	5.505	5.40	25.87	55.05
-5	4.216	5.24	19.81	42.16
0	3.255	5.08	15.30	32.56
5	2.534	4.92	11.91	25.34
10	1.987	4.78	9.340	19.87
15	1.570	4.64	7.378	15.70
20	1.249	4.50	5.869	12.49
25	1.000	4.37	4.700	10.00
30	0.8059	4.25	3.788	8.059
35	0.6535	4.13	3.072	6.535
40	0.5330	4.02	2.505	5.330
45	0.4372	3.91	2.055	4.372
50	0.3605	3.80	1.694	3.606
55	0.2989	3.70	1.405	2.989
60	0.2490	3.60	1.170	2.490
65	0.2084	3.51	0.9797	2.084
70	0.1753	3.42	0.8239	1.753
75	0.1481	3.33	0.6960	1.481
80	0.1256	3.25	0.5905	1.256
85	0.1070	3.16	0.5031	1.070
90	0.09154	3.09	0.4303	0.9154
95	0.07860	3.01	0.3694	0.7860
100	0.06773	2.94	0.3183	0.6773
105	0.05858	2.87	0.2753	0.5858
110	0.05083	2.80	0.2389	0.5083
115	0.04426	2.73	0.2080	0.4426
120	0.03866	2.67	0.1817	0.3866
125	0.03387	2.61	0.1592	0.3387
130	0.02977	2.55	0.1399	0.2977
135	0.02624	2.49	0.1233	0.2624
140	0.02319	2.43	0.1090	0.2319
145	0.02055	2.38	0.0966	0.2055
150	0.01826	2.33	0.0858	0.1826

**RESISTANCE VALUES AT INTERMEDIATE VALUES** with  $R_{25}$  at 47 k $\Omega$ 

$T_{oper}$ (°C)	$R_T/R_{25}$	TCR (%/K)	$R_T$ (k $\Omega$ )
			2381 640 10473 NTCLE101E3473SB0
-40	33.81	6.55	1589
-35	24.50	6.34	1151
-30	17.93	6.15	842.8
-25	13.25	5.96	622.6
-20	9.875	5.78	464.1
-15	7.425	5.61	349.0
-10	5.630	5.45	264.6
-5	4.304	5.29	202.3
0	3.315	5.14	155.8
5	2.573	4.99	120.9
10	2.011	4.85	94.53
15	1.583	4.72	74.40
20	1.254	4.59	58.95
25	1.000	4.46	47.00
30	0.8024	4.34	37.71
35	0.6474	4.23	30.43
40	0.5255	4.12	24.70
45	0.4288	4.01	20.15
50	0.3518	3.91	16.53
55	0.2901	3.81	13.63
60	0.2403	3.71	11.30
65	0.2001	3.62	9.404
70	0.1674	3.53	7.865
75	0.1406	3.44	6.607
80	0.1186	3.36	5.573
85	0.1004	3.28	4.721
90	0.08542	3.20	4.015
95	0.07292	3.13	3.427
100	0.06248	3.06	2.936
105	0.05372	2.98	2.525
110	0.04635	2.92	2.179
115	0.04013	2.85	1.886
120	0.03485	2.79	1.638
125	0.03037	2.73	1.427
130	0.02654	2.67	1.247
135	0.02326	2.61	1.093
140	0.02044	2.55	0.9608
145	0.01802	2.50	0.8468
150	0.01592	2.44	0.7483



**RESISTANCE VALUES AT INTERMEDIATE VALUES** with  $R_{25}$  at 100 k $\Omega$

$T_{oper}$ (°C)	$R_T/R_{25}$	TCR (%/K)	$R_T$ (k $\Omega$ )
			2381 640 10104 NTCLE101E3104SB0
- 40	36.66	6.70	3666
- 35	26.38	6.49	2638
- 30	19.17	6.29	1917
- 25	14.06	6.10	1406
- 20	10.41	5.92	1041
- 15	7.779	5.74	777.9
- 10	5.861	5.57	586.1
- 5	4.453	5.41	445.3
0	3.409	5.26	340.9
5	2.631	5.11	263.1
10	2.044	4.97	204.4
15	1.600	4.83	160.0
20	1.261	4.70	126.1
25	1.000	4.57	100.0
30	0.7981	4.45	79.81
35	0.6408	4.35	64.08
40	0.5175	4.22	51.74
45	0.4202	4.11	42.02
50	0.3431	4.00	34.31
55	0.2816	3.90	28.16
60	0.2322	3.80	23.22
65	0.1925	3.71	19.25
70	0.1602	3.62	16.03
75	0.1340	3.53	13.40
80	0.1126	3.45	11.26
85	0.09496	3.36	9.496
90	0.08042	3.28	8.042
95	0.06837	3.21	6.837
100	0.05835	3.13	5.835
105	0.04998	3.06	4.998
110	0.04296	2.99	4.296
115	0.03705	2.92	3.705
120	0.03206	2.86	3.206
125	0.02783	2.80	2.783



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