

## NTC Thermistors, Molded Range



### FEATURES

- Excellent for surface temperature measurement
- Designed for harsh environments
- Based on the "2322 640 0...." naked thermistor chips.

### APPLICATIONS

- Temperature control.

These thermistors have a negative temperature coefficient. The device consists of a molded chip with two tin-plated solid nickel leads. The body color is white and the device is non-flammable.

QUICK REFERENCE DATA	
PARAMETER	VALUE
Resistance value at 25 °C ( $R_{25}$ )	2.2 to 470 k $\Omega$
Tolerance on $R_{25}$ -value	$\pm 2\%$ , $\pm 3\%$ , $\pm 5\%$ , $\pm 10\%$
$B_{25/85}$ -values	3740 to 4570 K
Maximum dissipation	250 mW
Response time	$\approx 2.7$ s
Operating temperature range:	
at zero dissipation	-40 to +125 °C
at maximum dissipation	0 to 55 °C
Minimum dielectric withstanding voltage (RMS) between leads and lead insulation	350 V
Minimum insulation resistance between leads and lead insulation at 100 V (DC)	100 M $\Omega$
Climatic category	40/125/56
Mass	$\approx 0.3$ g

### PACKAGING

The smallest packing quantity is 500 units.

### MARKING

White coloured body.

### MOUNTING

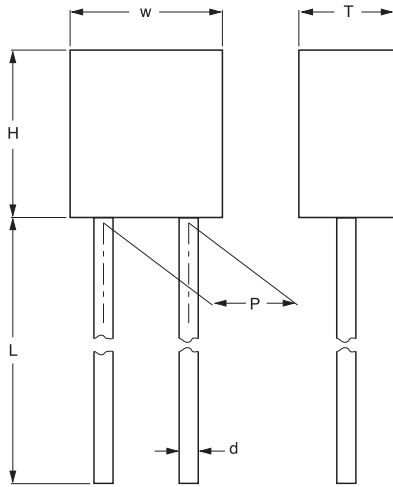
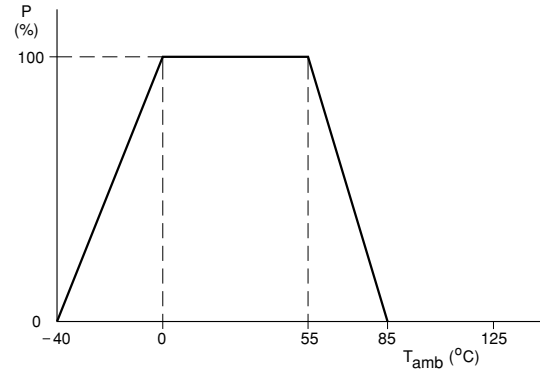
By soldering in any position or mechanical fixing.

### ELECTRICAL DATA AND ORDERING INFORMATION

$R_{25}$ (k $\Omega$ )	TC (%/K)	MASS (g)	W (mm)	H (mm)	L (mm)	P (mm)	T (mm)	d (mm)	$B_{25/85}$		CATALOG NUMBER 2322 641 ..... <sup>(2)</sup>
									K	TOL. (%)	
2.2	-4.37	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	3977	$\pm 0.75$	6.222
2.7	-4.37	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	3977	$\pm 0.75$	6.272
12	-4.10	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	3740	$\pm 2.0$	6.123
15	-4.10	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	3740	$\pm 2.0$	6.153
33	-4.46	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	4090	$\pm 1.5$	6.333
100	-4.57	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	4190	$\pm 1.5$	6.104
470	-4.95	$\approx 0.3$	4 $\pm 0.2$	4.4 $\pm 0.2$	21 $\pm 1$	2.54 $\pm 0.3$	2.5 $\pm 0.2$	0.6 $\pm 0.06$	4570	$\pm 1.5$	6.474

#### Note

1.  $R_{25}$ -values, TC, mass, dimensions and catalog numbers.
  - a) Other  $R_{25}$ -values are available on request.
2. Replace dot in the code numbers by one of the following, depending on required  $R_{25}$ -value:
  - 4 for a tolerance of  $\pm 2\%$
  - 6 for a tolerance of  $\pm 3\%$
  - 3 for a tolerance of  $\pm 5\%$
  - 2 for a tolerance of  $\pm 10\%$

**DIMENSIONS** in millimeters

**DERATING**


Power derating curve.

For dimensions see Electrical Data and Ordering Information Table

**RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES**

T <sub>oper</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)	
				2322 641 ..... <sup>(1)</sup>	
				6.222	6.272
-40	33.21	2.66	-6.57	73062	89667
-35	23.99	2.41	-6.36	52779	64774
-30	17.52	2.17	-6.15	38545	47305
-25	12.93	1.94	-5.95	28444	34908
-20	9.636	1.71	-5.76	21199	26017
-15	7.250	1.50	-5.58	15950	19575
-10	5.505	1.29	-5.40	12110	14863
-5	4.216	1.08	-5.24	9275	11383
0	3.255	0.89	-5.08	7162	8790
5	2.534	0.70	-4.92	5575	6842
10	1.987	0.52	-4.78	4372	5366
15	1.570	0.34	-4.64	3454	4239
20	1.249	0.17	-4.50	2747	3372
25	1.000	0.00	-4.37	2200	2700
30	0.8059	0.16	-4.25	1773	2176
35	0.6535	0.32	-4.13	1438	1764
40	0.5330	0.47	-4.02	1173	1439
45	0.4372	0.62	-3.91	961.8	1180
50	0.3605	0.77	-3.80	793.2	973.4
55	0.2989	0.91	-3.70	657.5	807.0
60	0.2490	1.05	-3.60	547.8	672.3
65	0.2084	1.18	-3.51	458.6	562.8
70	0.1753	1.31	-3.42	385.7	473.3
75	0.1481	1.44	-3.33	325.8	399.9
80	0.1256	1.57	-3.25	276.4	339.2
85	0.1070	1.69	-3.16	235.5	289.0
90	0.09154	1.81	-3.09	201.4	247.2
95	0.07860	1.93	-3.01	172.9	212.2
100	0.06773	2.04	-2.94	149.0	182.9
105	0.05858	2.15	-2.87	128.9	158.2
110	0.05083	2.26	-2.80	111.8	137.2
115	0.04426	2.37	-2.73	97.37	119.5
120	0.03866	2.47	-2.67	85.05	104.4
125	0.03387	2.57	-2.61	74.52	91.46


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T <sub>oper</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)	
				2322 641 ..... <sup>(1)</sup>	
				6.123	6.153
-40	25.78	6.81	-6.09	309403	386754
-35	19.13	6.16	-5.89	229509	286887
-30	14.32	5.53	-5.70	171844	214805
-25	10.82	4.93	-5.52	129828	162285
-20	8.245	4.35	-5.35	98935	123669
-15	6.335	3.80	-5.19	76020	95025
-10	4.907	3.26	-5.03	58880	73600
-5	3.830	2.74	-4.88	45954	57443
0	3.011	2.24	-4.73	36130	45163
5	2.384	1.76	-4.60	28607	35759
10	1.900	1.30	-4.46	22805	28506
15	1.525	0.85	-4.34	18298	22872
20	1.231	0.42	-4.21	14774	18467
25	1.000	0.00	-4.10	12000	15000
30	0.8171	0.41	-3.98	9804	12255
35	0.6712	0.80	-3.88	8054	10068
40	0.5543	1.19	-3.77	6652	8315
45	0.4602	1.57	-3.67	5522	6903
50	0.3839	1.94	-3.57	4607	5759
55	0.3219	2.30	-3.48	3862	4828
60	0.2710	2.65	-3.39	3252	4066
65	0.2293	2.99	-3.30	2751	3439
70	0.1947	3.33	-3.22	2337	2921
75	0.1661	3.66	-3.14	1993	2492
80	0.1422	3.98	-3.06	1707	2134
85	0.1223	4.29	-2.99	1467	1834
90	0.1055	4.60	-2.92	1266	1583
95	0.09135	4.90	-2.85	1096	1370
100	0.07937	5.19	-2.78	952.2	1190
105	0.06919	5.48	-2.71	830.2	1038
110	0.06050	5.76	-2.65	726.0	907.5
115	0.05307	6.04	-2.59	636.9	796.1
120	0.04670	6.31	-2.53	560.4	700.5
125	0.04121	6.57	-2.47	494.5	618.1

**RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES**

T <sub>oper</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)	
				2322 641 ..... <sup>(1)</sup>	
				6.104	
-40	36.66	5.69	-6.70	3666321	
-35	26.38	5.15	-6.49	2637604	
-30	19.17	4.63	-6.29	1916588	
-25	14.06	4.13	-6.10	1406120	
-20	10.41	3.65	-5.92	1041190	
-15	7.779	3.18	-5.74	777851	
-10	5.861	2.73	-5.57	586100	
-5	4.453	2.30	-5.41	445260	
0	3.409	1.88	-5.26	340944	
5	2.631	1.48	-5.11	263055	
10	2.044	1.09	-4.97	204447	
15	1.600	0.72	-4.83	160015	
20	1.261	0.35	-4.70	126087	
25	1.000	0.00	-4.57	100000	
30	0.7981	0.34	-4.45	79808	



T <sub>oper</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2322 641 ..... <sup>(1)</sup>
				6.104
35	0.6408	0.67	-4.35	64077
40	0.5175	1.00	-4.22	51746
45	0.4202	1.32	-4.11	42021
50	0.3431	1.63	-4.00	34308
55	0.2816	1.93	-3.90	28156
60	0.2322	2.22	-3.80	23223
65	0.1925	2.51	-3.71	19246
70	0.1602	2.79	-3.62	16025
75	0.1340	3.06	-3.53	13402
80	0.1126	3.33	-3.45	11258
85	0.09496	3.59	-3.36	9496
90	0.08042	3.85	-3.28	8042
95	0.06837	4.10	-3.21	6837
100	0.05835	4.35	-3.13	5835
105	0.04998	4.59	-3.06	4998
110	0.04296	4.82	-2.99	4296
115	0.03705	5.05	-2.92	3705
120	0.03206	5.28	-2.86	3206
125	0.02783	5.50	-2.80	2783

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T <sub>oper</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2322 641 ..... <sup>(1)</sup>
				6.474
-40	48.62	6.22	-7.13	22849885
-35	34.19	5.63	-6.91	16068156
-30	24.28	5.06	-6.71	11412861
-25	17.42	4.51	-6.52	8185271
-20	12.61	3.98	-6.33	5925780
-15	9.211	3.47	-6.15	4329092
-10	6.788	2.98	-5.98	3190465
-5	5.045	2.51	-5.82	2371302
0	3.781	2.06	-5.66	1776920
5	2.855	1.62	-5.50	1342065
10	2.173	1.19	-5.36	1021372
15	1.666	0.78	-5.22	783037
20	1.286	0.38	-5.08	604583
25	1.000	0.00	-4.95	470000
30	0.7825	0.37	-4.82	367792
35	0.6163	0.74	-4.70	289646
40	0.4883	1.09	-4.59	229509
45	0.3892	1.44	-4.47	182938
50	0.3120	1.77	-4.36	146652
55	0.2515	2.10	-4.26	118215
60	0.2038	2.43	-4.15	95801
65	0.1660	2.74	-4.06	78037
70	0.1359	3.05	-3.96	63884
75	0.1118	3.35	-3.87	52549
80	0.09240	3.64	-3.78	43427
85	0.07670	3.93	-3.69	30055
90	0.06395	4.21	-3.61	25163
95	0.05354	4.48	-3.53	21153
100	0.04501	4.75	-3.45	17852
105	0.03798	5.01	-3.37	15123
110	0.03218	5.27	-3.30	12859
115	0.02736	5.52	-3.23	10973
120	0.02335	5.77	-3.16	9396
125	0.01999	6.01	-3.09	9325


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T <sub>oper</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2322 641 ..... <sup>(1)</sup>
				6.333
-40	33.81	5.55	-6.55	1116
-35	24.50	5.02	-6.34	808.6
-30	17.93	4.52	-6.15	591.7
-25	13.25	4.03	-5.96	437.1
-20	9.875	3.56	-5.78	325.9
-15	7.425	3.10	-5.61	245.0
-10	5.630	2.67	-5.45	185.8
-5	4.304	2.24	-5.29	142.0
0	3.315	1.84	-5.14	109.4
5	2.573	1.44	-4.99	84.91
10	2.011	1.07	-4.85	66.37
15	1.583	0.70	-4.72	52.24
20	1.254	0.34	-4.59	41.39
25	1.0000	0.00	-4.46	33.00
30	0.8024	.033	-4.34	26.47
35	0.6474	0.66	-4.23	21.37
40	0.5255	0.98	-4.12	17.34
45	0.4288	1.28	-4.01	14.15
50	0.3518	1.59	-3.91	11.61
55	0.2901	1.88	-3.81	9.572
60	0.2403	2.17	-3.71	7.931
65	0.2001	2.45	-3.62	6.603
70	0.1674	2.72	-3.53	5.522
75	0.1406	2.99	-3.44	4.639
80	0.1186	3.25	-3.36	3.913
85	0.1004	3.51	-3.28	3.315
90	0.08542	3.76	-3.20	2.819
95	0.07292	4.00	-3.13	2.406
100	0.06248	4.24	-3.06	2.062
105	0.05372	4.47	-2.98	1.773
110	0.04635	4.70	-2.92	1.530
115	0.04013	4.93	-2.85	1.324
120	0.03485	5.15	-2.79	1.150
125	0.03037	5.36	-2.73	1.002

**Note**

1. Replace dot in the code numbers by one of the following, depending on required R<sub>25</sub>-value:

- 4 for a tolerance of ±2%
- 6 for a tolerance of ±3%
- 3 for a tolerance of ±5%
- 2 for a tolerance of ±10%