NRBE

Epoxy sealed radial lead NTC thermistor

Product features

- Faster thermal response
- Epoxy sealed radial NTC thermistor
- Non-linear change in resistance vs temperature

Packaging information

- Bulk: 500 parts per poly bag

Applications

- Industrial process control
- Commercial appliances
- Battery, supercapacitor and energy storage systems
- Uninterruptible power supplies
- Consumer appliances
- Medical devices
- Heating, ventilation and air conditioning, refrigeration (HVACR)
- Food service equipment
- IoT

Environmental compliance and general specifications

Pb HALOGEN HF FREE RoHS

Agency information

- cURus recognition file: E343021

c UL us

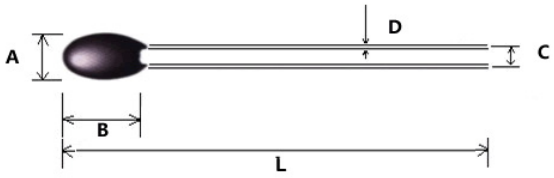
Table 1. Part numbering

NRB E xxy x xxxx Bx x z

Family name	NRB
Packaging type	Epoxy coated
Resistance	x.x * 10^{y} Ω; ex: 3.4 * 10^{5} Ω = 345
Resistance tolerance	F = ±1%, J= ±5%, 2 = ±0.2%
Beta value	ex: 3465, 4215, etc
Beta type	B1=25/50, B2=25/85
Beta tolerance	F = ±1%, J = ±5%
Custom (optional)	Different chip size or lead dimensions

Powering Business Worldwide

Mechanical parameters- mm/inches



	Millimeters		Inches	
Dimension	**Minimum**	**Maximum**	**Minimum**	**Maximum**
A	1.7	2.7	0.0669	0.106
B	4.0	6.0	0.157	0.236
C	1.0	3.0	0.039	0.118
D	0.28	0.38	0.011	0.015
L	30	36	1.181	1.417

Electrical specifications

Part number	Rated temperature	Resistance (kΩ)	Beta value (K)	Beta type	cURus
NRBE233?3935B1*	+25 °C	2.252	3935	B25/50	
NRBE303?3950B1*	+25 °C	3	3950	B25/50	
NRBE503?3300B2*	+25 °C	5	3300	B25/85	
NRBE503?3470B1*	+25 °C	5	3470	B25/50	
NRBE503?3950B1*	+25 °C	5	3950	B25/50	
NRBE104?3380B1*	+25 °C	10	3380	B25/50	x
NRBE104?3435B2*	+25 °C	10	3435	B25/85	x
NRBE104?3500B2*	+25 °C	10	3500	B25/85	x
NRBE104?3950B1*	+25 °C	10	3950	B25/50	x
NRBE104?4100B1*	+25 °C	10	4100	B25/50	x
NRBE154?4150B1*	+25 °C	15	4150	B25/50	x
NRBE234?4200B1*	+25 °C	23	4200	B25/50	
NRBE504?3950B1*	+25 °C	50	3950	B25/50	
NRBE105?3950B1*	+25 °C	100	3950	B25/50	
NRBE105?4150B1*	+25 °C	100	4150	B25/50	
NRBE105?4200B1*	+25 °C	100	4200	B25/50	
NRBE105?4450B1*	+25 °C	100	4450	B25/50	
NRBE353?3435B2*	+50 °C	3.4513	3435	B25/85	
NRBE324?4550B2*	+50 °C	31.765	4550	B25/85	
NRBE203?4250B2*	+86 °C	2.028	4250	B25/85	

?= Enter resistance tolerance codes (F = ±1%,J = ±5%, 2 = ±0.2%)

*= Enter Beta tolerance codes (F = ±1%, J = ±5%)

Dissipation coefficient: ≈0.8 mW/ °C

Thermal time constant: ≤10 s

Withstand voltage: 300 Vac/1 mA/60 s

Insulation resistance: 50 Vdc/50 MΩ/60 s

Operation temperature: -40 °C to +125 °C

Temperature characteristics

Part number	NRBE233?3935B1*	NRBE303?3950B1*	NRBE503?3300B2*	NRBE503?3470B1*	NRBE503?3950B1*
Resistance	2.252K(25 °C)	3K(25 °C)	5K(25 °C)	5K(25 °C)	5K(25 °C)
Beta Value	B25/50=3935	B25/50=3950	B25/85=3300	B25/50=3470	B25/50=3950
Temperature (°C)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)
-40	68.45	91.18	93.37	110.53	154.07
-39	64.4	85.79	88.32	104.22	144.64
-38	60.62	80.75	83.58	98.32	135.85
-37	57.07	76.03	79.13	92.78	127.65
-36	53.75	71.61	74.95	87.6	119.98
-35	50.64	67.47	71.01	82.74	112.83
-34	47.73	63.58	67.31	78.19	106.14
-33	45	59.94	63.83	73.91	99.88
-32	42.43	56.53	60.55	69.9	94.03
-31	40.03	53.32	57.46	66.13	88.56
-30	37.77	50.31	54.55	62.59	83.44
-29	35.6	47.43	51.8	59.27	78.68
-28	33.58	44.73	49.21	56.15	74.22
-27	31.67	42.2	46.76	53.21	70.03
-26	29.89	39.82	44.45	50.44	66.11
-25	28.22	37.59	42.27	47.84	62.42
-24	26.64	35.49	40.22	45.38	58.96
-23	25.17	33.53	38.27	43.07	55.71
-22	23.78	31.68	36.43	40.89	52.65
-21	22.48	29.95	34.7	38.84	49.78
-20	21.25	28.32	33.05	36.9	47.08
-19	20.1	26.77	31.49	35.07	44.56
-18	19.01	25.33	30.01	33.35	42.18
-17	17.99	23.96	28.61	31.72	39.94
-16	17.03	22.68	27.29	30.18	37.83
-15	16.12	21.48	26.03	28.72	35.85
-14	15.27	20.34	24.85	27.34	33.97
-13	14.46	19.27	23.72	26.04	32.2
-12	13.71	18.26	22.65	24.81	30.54
-11	12.99	17.31	21.64	23.64	28.96
-10	12.32	16.41	20.68	22.54	27.47
-9	11.69	15.57	19.76	21.49	26.05
-8	11.09	14.77	18.9	20.51	24.72
-7	10.52	14.02	18.08	19.57	23.45
-6	9.99	13.3	17.3	18.68	22.26
-5	9.48	12.63	16.55	17.84	21.13
-4	9.01	12	15.85	17.04	20.07
-3	8.56	11.4	15.17	16.28	19.06
-2	8.13	10.83	14.54	15.55	18.12
-1	7.73	10.3	13.93	14.87	17.22
0	7.35	9.79	13.35	14.22	16.37
1	6.98	9.3	12.79	13.59	15.55
2	6.64	8.85	12.27	13	14.78
3	6.31	8.41	11.76	12.43	14.06
4	6.01	8	11.29	11.9	13.37
5	5.72	7.62	10.83	11.39	12.72
6	5.44	7.25	10.39	10.9	12.11
7	5.18	6.9	9.98	10.44	11.53
8	4.9351	6.57	9.58	10	10.98
9	4.7019	6.26	9.21	9.58	10.46
10	4.4812	5.97	8.84	9.18	9.96
11	4.2719	5.69	8.5	8.8	9.5
12	4.0737	5.43	8.17	8.44	9.06
13	3.8858	5.18	7.86	8.09	8.64
14	3.7076	4.9391	7.56	7.77	8.24
15	3.5386	4.7139	7.27	7.45	7.86
16	3.3781	4.5001	7	7.15	7.51
17	3.2259	4.2974	6.73	6.87	7.17
18	3.0814	4.1049	6.48	6.59	6.84
19	2.944	3.9218	6.24	6.33	6.54
20	2.8137	3.7483	6.01	6.09	6.25

Temperature characteristics, cont.

21	2.6897	3.5831	5.79	5.85	5.97
22	2.5719	3.4262	5.58	5.62	5.71
23	2.4599	3.277	5.38	5.41	5.46
24	2.3534	3.1351	5.19	5.2	5.23
25	2.252	3	5	5	5
26	2.1555	2.8714	4.8222	4.8104	4.7856
27	2.0627	2.7478	4.6503	4.627	4.5794
28	1.9743	2.6301	4.4857	4.4518	4.3835
29	1.8903	2.5182	4.3279	4.2844	4.1971
30	1.8105	2.4119	4.1766	4.1243	4.0198
31	1.7345	2.3106	4.0316	3.9712	3.8511
32	1.6621	2.2142	3.8925	3.8247	3.6906
33	1.5932	2.1224	3.7591	3.6845	3.5377
34	1.5276	2.035	3.6311	3.5504	3.3921
35	1.4651	1.9517	3.5082	3.4219	3.2534
36	1.4056	1.8725	3.3903	3.2989	3.1212
37	1.3488	1.7968	3.277	3.1811	2.9951
38	1.2946	1.7246	3.1682	3.0682	2.875
39	1.243	1.6559	3.0637	2.9599	2.7604
40	1.1937	1.5902	2.9633	2.8562	2.651
41	1.1467	1.5276	2.8668	2.7567	2.5467
42	1.1018	1.4678	2.774	2.6613	2.447
43	1.059	1.4107	2.6848	2.5699	2.3519
44	1.018	1.3561	2.599	2.482	2.261
45	0.979	1.3042	2.5164	2.3977	2.1742
46	0.9415	1.2542	2.437	2.3168	2.0912
47	0.9059	1.2068	2.3606	2.2391	2.0119
48	0.8717	1.1612	2.287	2.1644	1.9361
49	0.839	1.1177	2.2161	2.0927	1.8635
50	0.8078	1.0761	2.1478	2.0238	1.7942
51	0.7778	1.0361	2.0814	1.9561	1.7271
52	0.7491	0.9979	2.0174	1.891	1.6629
53	0.7216	0.9613	1.9557	1.8282	1.6013
54	0.6953	0.9262	1.8961	1.7679	1.5424
55	0.6701	0.8927	1.8387	1.7098	1.4859
56	0.646	0.8606	1.7833	1.6538	1.4318
57	0.6228	0.8297	1.7299	1.5999	1.3799
58	0.6007	0.8002	1.6783	1.548	1.3301
59	0.5794	0.7718	1.6286	1.498	1.2824
60	0.559	0.7447	1.5805	1.4498	1.2366
61	0.5394	0.7186	1.5341	1.4034	1.1928
62	0.5206	0.6935	1.4893	1.3586	1.1506
63	0.5026	0.6695	1.446	1.3154	1.1101
64	0.4854	0.6466	1.4042	1.2738	1.0713
65	0.4687	0.6244	1.3638	1.2337	1.0341
66	0.4528	0.6032	1.3248	1.195	0.9983
67	0.4375	0.5828	1.2871	1.1576	0.9639
68	0.4227	0.5631	1.2506	1.1216	0.9308
69	0.4086	0.5443	1.2153	1.0868	0.8991
70	0.395	0.5262	1.1812	1.0533	0.8685
71	0.3819	0.5087	1.1483	1.0209	0.8392
72	0.3693	0.492	1.1164	0.9896	0.811
73	0.3573	0.476	1.0855	0.9594	0.7838
74	0.3456	0.4604	1.0556	0.9303	0.7578
75	0.3345	0.4456	1.0267	0.9022	0.7326
76	0.3237	0.4312	0.9987	0.875	0.7085
77	0.3133	0.4174	0.9717	0.8487	0.6852
78	0.3033	0.404	0.9455	0.8233	0.6629
79	0.2937	0.3913	0.9201	0.7988	0.6413
80	0.2845	0.379	0.8955	0.7751	0.6206

Temperature characteristics, cont.

81	0.2756	0.3671	0.8716	0.7521	0.6006
82	0.2669	0.3556	0.8486	0.7301	0.5814
83	0.2587	0.3446	0.8262	0.7087	0.5628
84	0.2507	0.334	0.8045	0.6879	0.5449
85	0.243	0.3237	0.7835	0.6679	0.5277
86	0.2357	0.314	0.7632	0.6483	0.5115
87	0.2285	0.3044	0.7436	0.6294	0.4959
88	0.2216	0.2952	0.7245	0.6111	0.4809
89	0.215	0.2864	0.706	0.5934	0.4664
90	0.2087	0.278	0.6881	0.5764	0.4523
91	0.2025	0.2698	0.6707	0.5598	0.4388
92	0.1965	0.2618	0.6538	0.5437	0.4258
93	0.1907	0.254	0.6374	0.5282	0.4132
94	0.1852	0.2467	0.6216	0.5131	0.4011
95	0.1798	0.2395	0.6061	0.4986	0.3893
96	0.1746	0.2326	0.5912	0.4844	0.378
97	0.1696	0.2259	0.5767	0.4708	0.3671
98	0.1648	0.2195	0.5626	0.4575	0.3566
99	0.1602	0.2134	0.5489	0.4447	0.3463
100	0.1556	0.2073	0.5357	0.4323	0.3365
101	0.1513	0.2016	0.5228	0.4202	0.3268
102	0.147	0.1958	0.5102	0.4087	0.3175
103	0.1429	0.1904	0.4981	0.3974	0.3084
104	0.1389	0.185	0.4862	0.3864	0.2997
105	0.1352	0.1801	0.4747	0.3758	0.2913
106	0.1315	0.1752	0.4636	0.3655	0.2831
107	0.1279	0.1704	0.4526	0.3557	0.2752
108	0.1244	0.1657	0.442	0.3463	0.2676
109	0.121	0.1612	0.4316	0.3371	0.2602
110	0.1177	0.1568	0.4215	0.3282	0.2531
111	0.1145	0.1525	0.4118	0.3196	0.2462
112	0.1115	0.1485	0.4022	0.3112	0.2394
113	0.1085	0.1445	0.393	0.3031	0.2329
114	0.1056	0.1407	0.384	0.2952	0.2267
115	0.1028	0.1369	0.3752	0.2875	0.2206
116	0.1001	0.1333	0.3667	0.28	0.2147
117	0.0975	0.1299	0.3584	0.2728	0.209
118	0.0949	0.1264	0.3503	0.2657	0.2035
119	0.0924	0.1231	0.3424	0.2589	0.1981
120	0.09	0.1199	0.3347	0.2522	0.1929
121	0.0877	0.1168	0.3273	0.2459	0.1879
122	0.0856	0.114	0.32	0.2396	0.183
123	0.0834	0.1111	0.313	0.2336	0.1783
124	0.0813	0.1083	0.3061	0.2276	0.1736
125	0.0792	0.1055	0.2994	0.2219	0.1692

Temperature characteristics

Part number	NRBE104?3380B1* NRBE104?3435B2*	NRBE104?3500B2*	NRBE104?3950B1*	NRBE104?4100B1*	NRBE154?4150B1*
Resistance	10K(25 °C)	10K(25 °C)	10K(25 °C)	10K(25 °C)	15K(25 °C)
Beta Value	B25/50=3380 B25/85=3435	B25/85=3500	B25/50=3950	B25/50=4100	B25/50=4150
Temperature (°C)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)
-40	200.79	216.45	307.57	335.5	612.12
-39	189.87	204.19	288.79	315.56	572.57
-38	179.61	192.7	271.27	296.9	535.77
-37	169.98	181.94	254.91	279.42	501.54
-36	160.92	171.86	239.63	263.04	469.66
-35	152.4	162.4	225.36	247.69	439.98
-34	144.38	153.53	212.02	233.3	412.32
-33	136.84	145.2	199.55	219.8	386.55
-32	129.74	137.38	187.88	207.14	362.51
-31	123.05	130.03	176.96	195.26	340.09
-30	116.74	123.12	166.73	184.11	319.16
-29	110.76	116.61	157.18	173.85	299.47
-28	105.13	110.49	148.23	164.19	281.09
-27	99.81	104.73	139.84	155.1	263.94
-26	94.8	99.31	131.96	146.54	247.92
-25	90.07	94.2	124.58	138.48	232.95
-24	85.61	89.39	117.64	130.89	218.97
-23	81.39	84.86	111.13	123.74	205.89
-22	77.41	80.58	105.02	117	193.66
-21	73.64	76.55	99.27	110.64	182.22
-20	70.09	72.75	93.87	104.65	171.51
-19	66.73	69.17	88.84	98.93	161.56
-18	63.56	65.79	84.11	93.55	152.23
-17	60.56	62.6	79.66	88.47	143.49
-16	57.71	59.58	75.46	83.69	135.28
-15	55.02	56.73	71.5	79.18	127.58
-14	52.46	54.03	67.77	74.93	120.35
-13	50.04	51.47	64.25	70.92	113.57
-12	47.75	49.05	60.92	67.14	107.19
-11	45.57	46.76	57.79	63.58	101.21
-10	43.5	44.59	54.83	60.21	95.58
-9	41.54	42.52	52.11	57.05	90.36
-8	39.68	40.55	49.54	54.06	85.44
-7	37.91	38.69	47.1	51.23	80.81
-6	36.22	36.93	44.78	48.57	76.45
-5	34.63	35.26	42.59	46.05	72.33
-4	33.11	33.67	40.51	43.66	68.45
-3	31.66	32.17	38.53	41.41	64.8
-2	30.29	30.74	36.66	39.28	61.35
-1	28.99	29.38	34.88	37.27	58.09
0	27.74	28.1	33.2	35.36	55.02
1	26.55	26.87	31.51	33.47	51.97
2	25.41	25.71	29.93	31.69	49.12
3	24.33	24.61	28.43	30.01	46.44
4	23.3	23.55	27.02	28.44	43.93
5	22.32	22.56	25.69	26.96	41.57
6	21.39	21.6	24.43	25.57	39.36
7	20.51	20.7	23.24	24.25	37.27
8	19.66	19.84	22.12	23.02	35.32
9	18.86	19.01	21.05	21.85	33.48
10	18.09	18.23	20.05	20.76	31.75
11	17.36	17.49	19.1	19.72	30.12
12	16.66	16.78	18.2	18.74	28.58
13	16	16.1	17.35	17.82	27.14
14	15.36	15.45	16.54	16.95	25.78
15	14.76	14.83	15.78	16.13	24.49
16	14.18	14.25	15.05	15.35	23.28
17	13.62	13.68	14.37	14.62	22.14
18	13.1	13.15	13.72	13.93	21.06
19	12.59	12.63	13.1	13.27	20.04

Temperature characteristics, cont.

20	12.11	12.14	12.51	12.65	19.08
21	11.65	11.68	11.96	12.06	18.17
22	11.21	11.23	11.43	11.5	17.31
23	10.79	10.8	10.93	10.97	16.5
24	10.39	10.39	10.45	10.47	15.73
25	10	10	10	10	15
26	9.63	9.63	9.57	9.55	14.31
27	9.27	9.26	9.16	9.13	13.66
28	8.93	8.92	8.77	8.72	13.05
29	8.61	8.59	8.4	8.34	12.47
30	8.29	8.27	8.04	7.97	11.91
31	7.99	7.97	7.71	7.63	11.39
32	7.71	7.68	7.39	7.3	10.89
33	7.43	7.4	7.08	6.99	10.41
34	7.17	7.13	6.79	6.69	9.96
35	6.92	6.88	6.51	6.41	9.53
36	6.68	6.63	6.25	6.14	9.13
37	6.45	6.4	6	5.88	8.74
38	6.22	6.18	5.76	5.64	8.37
39	6.01	5.96	5.53	5.4	8.02
40	5.81	5.75	5.31	5.18	7.68
41	5.61	5.56	5.1	4.9717	7.37
42	5.42	5.37	4.9028	4.7704	7.06
43	5.24	5.18	4.7127	4.5786	6.77
44	5.07	5.01	4.5311	4.3956	6.5
45	4.898	4.8411	4.3576	4.2209	6.24
46	4.7374	4.6798	4.1917	4.0542	5.99
47	4.583	4.5248	4.0331	3.8953	5.75
48	4.4345	4.3759	3.8815	3.7433	5.52
49	4.2917	4.2327	3.7365	3.5981	5.3
50	4.1544	4.0951	3.5978	3.4595	5.09
51	4.0207	3.961	3.4636	3.3254	4.8934
52	3.8919	3.8319	3.3353	3.1973	4.7025
53	3.7679	3.7076	3.2122	3.0746	4.5202
54	3.6484	3.588	3.0944	2.9573	4.346
55	3.5333	3.4728	2.9814	2.845	4.1792
56	3.4223	3.3618	2.8732	2.7375	4.0199
57	3.3154	3.2549	2.7695	2.6346	3.8674
58	3.2124	3.152	2.6699	2.5361	3.7215
59	3.1131	3.0527	2.5745	2.4417	3.5819
60	3.0173	2.957	2.4829	2.3513	3.4482
61	2.925	2.8649	2.3951	2.2647	3.3203
62	2.8359	2.776	2.3108	2.1816	3.1976
63	2.7499	2.6902	2.2298	2.1021	3.0802
64	2.6669	2.6076	2.1521	2.0258	2.9678
65	2.5869	2.5278	2.0775	1.9526	2.86
66	2.5096	2.4509	2.0059	1.8824	2.7566
67	2.4349	2.3766	1.937	1.8151	2.6575
68	2.3628	2.3049	1.8709	1.7504	2.5625
69	2.2933	2.2357	1.8073	1.6884	2.4713
70	2.2261	2.169	1.7463	1.6289	2.3839
71	2.1611	2.1044	1.6875	1.5717	2.3
72	2.0984	2.0422	1.631	1.5168	2.2194
73	2.0378	1.982	1.5767	1.4641	2.1421
74	1.9792	1.9239	1.5243	1.4134	2.0679
75	1.9225	1.8677	1.474	1.3648	1.9966
76	1.8677	1.8134	1.4256	1.3181	1.9281
77	1.8148	1.761	1.3792	1.273	1.8623
78	1.7636	1.7102	1.3343	1.2299	1.7991
79	1.714	1.6612	1.2911	1.1882	1.7382
80	1.6661	1.6138	1.2495	1.1483	1.6798

Temperature characteristics, cont.

81	1.6197	1.568	1.2095	1.1098	1.6237
82	1.5748	1.5236	1.1709	1.0728	1.5696
83	1.5314	1.4807	1.1337	1.0373	1.5177
84	1.4892	1.4392	1.0979	1.003	1.4677
85	1.4485	1.399	1.0634	0.97	1.4196
86	1.4094	1.361	1.0301	0.9388	1.3728
87	1.3716	1.3243	0.9982	0.9088	1.3278
88	1.335	1.2887	0.9673	0.8798	1.2844
89	1.2995	1.2542	0.9375	0.852	1.2426
90	1.2651	1.2208	0.9088	0.8251	1.2023
91	1.2318	1.1886	0.8811	0.7993	1.1636
92	1.1995	1.1572	0.8544	0.7744	1.1263
93	1.1683	1.1269	0.8286	0.7503	1.0903
94	1.1379	1.0975	0.8037	0.7272	1.0557
95	1.1085	1.0691	0.7796	0.7049	1.0223
96	1.08	1.0415	0.7564	0.6832	0.9901
97	1.0523	1.0147	0.734	0.6625	0.959
98	1.0255	0.9887	0.7123	0.6425	0.9291
99	0.9995	0.9636	0.6914	0.6231	0.9002
100	0.9743	0.9392	0.6712	0.6044	0.8724
101	0.9498	0.9156	0.6517	0.5864	0.8455
102	0.926	0.8926	0.6328	0.569	0.8195
103	0.9029	0.8704	0.6145	0.5521	0.7945
104	0.8805	0.8487	0.5968	0.5359	0.7703
105	0.8588	0.8278	0.5798	0.5202	0.7469
106	0.8377	0.8074	0.5633	0.5051	0.7244
107	0.8173	0.7871	0.5474	0.4903	0.7033
108	0.7974	0.7675	0.5321	0.476	0.6829
109	0.7782	0.7483	0.5172	0.4621	0.6632
110	0.7594	0.7297	0.5029	0.4488	0.6441
111	0.7412	0.7116	0.489	0.4359	0.6257
112	0.7236	0.6941	0.4754	0.4234	0.6079
113	0.7064	0.6771	0.4625	0.4113	0.5907
114	0.6897	0.6605	0.4498	0.3997	0.5741
115	0.6735	0.6444	0.4376	0.3884	0.558
116	0.6577	0.6289	0.4257	0.3774	0.5425
117	0.6424	0.6137	0.4143	0.3669	0.5274
118	0.6274	0.5989	0.4033	0.3566	0.5129
119	0.6129	0.5846	0.3924	0.3468	0.4988
120	0.5988	0.5706	0.382	0.3371	0.4851
121	0.5851	0.557	0.3719	0.3278	0.4719
122	0.5717	0.5438	0.3621	0.3189	0.4592
123	0.5587	0.531	0.3526	0.3102	0.4468
124	0.5461	0.5185	0.3434	0.3017	0.4348
125	0.5338	0.5064	0.3345	0.2935	0.4232

Temperature characteristics

Part number	NRBE234?4200B1*	NRBE504?3950B1*	NRBE105?3950B1*	NRBE105?4150B1*	NRBE105?4200B1*
Resistance	23K(25 °C)	50K(25 °C)	100K(25 °C)	100K(25 °C)	100K(25 °C)
Beta Value	B25/50=4200	B25/50=3950	B25/50=3950	B25/50=4150	B25/50=4200
Temperature (°C)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)
-40	937.76	1619.43	3324.3	3780.99	3776.61
-39	875.81	1519.85	3119.09	3542.47	3533.28
-38	818.32	1426.96	2927.68	3320.21	3307.03
-37	764.95	1340.27	2749.07	3113.03	3096.56
-36	715.36	1259.33	2582.34	2919.82	2900.7
-35	669.28	1183.73	2426.63	2739.57	2718.33
-34	626.43	1113.09	2281.15	2571.35	2548.46
-33	586.57	1047.04	2145.17	2414.29	2390.16
-32	549.48	985.28	2018.03	2267.59	2242.58
-31	514.94	927.49	1899.1	2130.53	2104.93
-30	482.77	873.41	1787.8	2002.41	1976.49
-29	453	822.51	1683.67	1875.43	1854.6
-28	425.22	774.87	1586.15	1757.36	1740.96
-27	399.29	730.24	1494.78	1647.54	1634.97
-26	375.09	688.43	1409.15	1545.33	1536.07
-25	352.47	649.23	1328.85	1450.16	1443.74
-24	331.34	612.48	1253.54	1361.49	1357.5
-23	311.58	578.01	1182.88	1278.84	1276.93
-22	293.11	545.66	1116.55	1201.76	1201.61
-21	275.82	515.29	1054.28	1129.85	1131.17
-20	259.64	486.77	995.79	1062.71	1065.28
-19	243.96	460.36	941.19	1004.03	1003.72
-18	229.32	435.5	889.83	948.8	946.08
-17	215.66	412.09	841.51	896.82	892.07
-16	202.9	390.05	796.04	847.87	841.44
-15	190.98	369.29	753.23	801.77	793.98
-14	179.83	349.72	712.91	758.33	749.45
-13	169.41	331.28	674.93	717.41	707.67
-12	159.66	313.89	639.14	678.84	668.44
-11	150.53	297.49	605.41	642.47	631.61
-10	141.98	282.02	573.6	608.19	597
-9	134.05	267.67	544.15	576.38	564.19
-8	126.6	254.1	516.31	546.31	533.37
-7	119.61	241.26	489.98	517.89	504.42
-6	113.05	229.11	465.07	491.01	477.21
-5	106.89	217.61	441.52	465.59	451.62
-4	101.09	206.73	419.23	441.55	427.56
-3	95.65	196.42	398.13	418.8	404.91
-2	90.52	186.66	378.16	397.28	383.6
-1	85.7	177.41	359.26	376.91	363.52
0	81.17	168.66	341.36	357.63	344.62
1	76.88	159.95	323.53	338.37	326.89
2	72.85	151.75	306.76	320.28	310.17
3	69.05	144.03	290.98	303.27	294.39
4	65.47	136.75	276.12	287.27	279.5
5	62.09	129.9	262.12	272.23	265.43
6	58.91	123.43	248.93	258.07	252.15
7	55.92	117.33	236.5	244.73	239.6
8	53.09	111.57	224.77	232.18	227.73
9	50.42	106.13	213.7	220.34	216.52
10	47.9	100.99	203.26	209.19	205.91
11	45.52	96.14	193.39	198.67	195.88
12	43.27	91.55	184.08	188.75	186.38
13	41.14	87.22	175.27	179.39	177.4
14	39.13	83.11	166.95	170.55	168.89
15	37.23	79.23	159.08	162.2	160.83
16	35.44	75.55	151.63	154.31	153.19
17	33.74	72.07	144.58	146.86	145.96
18	32.13	68.77	137.91	139.81	139.1
19	30.6	65.65	131.59	133.15	132.6
20	29.16	62.69	125.6	126.84	126.43

Temperature characteristics, cont.

21	27.79	59.88	119.93	120.88	120.58
22	26.5	57.21	114.54	115.23	115.03
23	25.27	54.68	109.44	109.87	109.76
24	24.11	52.28	104.6	104.8	104.75
25	23	50	100	100	100
26	21.95	47.83	95.64	95.44	95.48
27	20.94	45.78	91.51	91.12	91.11
28	19.99	43.83	87.59	87.02	86.96
29	19.09	41.97	83.86	83.12	83.03
30	18.23	40.2	80.31	79.43	79.3
31	17.41	38.52	76.93	75.92	75.76
32	16.64	36.92	73.72	72.59	72.4
33	15.91	35.4	70.66	69.42	69.22
34	15.21	33.94	67.74	66.41	66.19
35	14.55	32.56	64.97	63.56	63.31
36	13.92	31.24	62.32	60.84	60.57
37	13.32	29.98	59.8	58.25	57.97
38	12.75	28.78	57.39	55.79	55.5
39	12.21	27.64	55.1	53.45	53.15
40	11.69	26.55	52.91	51.22	50.91
41	11.2	25.5	50.82	49.1	48.78
42	10.74	24.51	48.83	47.07	46.75
43	10.29	23.56	46.93	45.15	44.82
44	9.87	22.65	45.11	43.31	42.98
45	9.47	21.78	43.37	41.56	41.22
46	9.08	20.95	41.71	39.89	39.55
47	8.72	20.16	40.13	38.29	37.96
48	8.37	19.4	38.61	36.77	36.44
49	8.03	18.68	37.16	35.32	34.98
50	7.71	17.98	35.77	33.94	33.6
51	7.41	17.31	34.43	32.58	32.25
52	7.12	16.67	33.14	31.29	30.96
53	6.84	16.05	31.91	30.05	29.72
54	6.57	15.46	30.73	28.87	28.54
55	6.31	14.89	29.6	27.74	27.41
56	6.07	14.35	28.52	26.65	26.33
57	5.84	13.83	27.48	25.62	25.3
58	5.61	13.33	26.49	24.62	24.31
59	5.4	12.85	25.53	23.67	23.36
60	5.2	12.39	24.62	22.77	22.46
61	5	11.95	23.74	21.89	21.59
62	4.815	11.53	22.9	21.06	20.76
63	4.636	11.12	22.09	20.26	19.96
64	4.4645	10.73	21.31	19.5	19.2
65	4.3003	10.36	20.57	18.76	18.47
66	4.1429	10	19.85	18.06	17.77
67	3.9921	9.65	19.17	17.38	17.1
68	3.8475	9.32	18.5	16.74	16.46
69	3.7089	9	17.87	16.12	15.85
70	3.5759	8.69	17.26	15.52	15.26
71	3.4484	8.4	16.68	14.95	14.69
72	3.3261	8.11	16.11	14.4	14.15
73	3.2087	7.84	15.57	13.88	13.63
74	3.096	7.58	15.05	13.37	13.13
75	2.9879	7.33	14.55	12.89	12.65
76	2.884	7.08	14.07	12.43	12.19
77	2.7843	6.85	13.6	11.98	11.75
78	2.6885	6.63	13.15	11.55	11.32
79	2.5964	6.41	12.73	11.14	10.92
80	2.508	6.2	12.31	10.74	10.52
81	2.423	6	11.91	10.36	10.15
82	2.3413	5.81	11.53	10	9.79

Temperature characteristics, cont.

83	2.2627	5.62	11.16	9.65	9.44
84	2.1871	5.44	10.8	9.31	9.11
85	2.1144	5.27	10.46	8.98	8.79
86	2.0443	5.1	10.12	8.68	8.48
87	1.9767	4.9326	9.79	8.38	8.19
88	1.9118	4.7741	9.48	8.09	7.91
89	1.8492	4.6212	9.17	7.82	7.64
90	1.789	4.4738	8.88	7.55	7.38
91	1.731	4.3316	8.6	7.3	7.13
92	1.6752	4.1945	8.33	7.05	6.89
93	1.6214	4.0622	8.06	6.82	6.66
94	1.5696	3.9345	7.81	6.59	6.44
95	1.5196	3.8113	7.57	6.37	6.23
96	1.4718	3.6923	7.33	6.16	6.02
97	1.4258	3.5775	7.1	5.95	5.82
98	1.3814	3.4666	6.88	5.76	5.63
99	1.3386	3.3596	6.67	5.57	5.45
100	1.2973	3.2562	6.46	5.39	5.27
101	1.2574	3.1563	6.27	5.21	5.1
102	1.219	3.0599	6.07	5.04	4.9323
103	1.1819	2.9667	5.89	4.8816	4.7734
104	1.1462	2.8767	5.71	4.7246	4.6202
105	1.1116	2.7897	5.54	4.5733	4.4724
106	1.0783	2.7056	5.37	4.4273	4.33
107	1.0464	2.6265	5.21	4.2894	4.1928
108	1.0155	2.55	5.06	4.1563	4.0604
109	0.9857	2.4761	4.9068	4.0278	3.9327
110	0.957	2.4045	4.7622	3.9038	3.8094
111	0.9292	2.3353	4.6224	3.7841	3.6906
112	0.9023	2.2684	4.4872	3.6686	3.5757
113	0.8764	2.2037	4.3564	3.5571	3.4649
114	0.8513	2.141	4.2298	3.4493	3.358
115	0.827	2.0804	4.1074	3.3452	3.2547
116	0.8036	2.0217	3.989	3.2447	3.155
117	0.7809	1.9649	3.8742	3.1475	3.0587
118	0.7589	1.9099	3.7633	3.0536	2.9656
119	0.7377	1.8566	3.6559	2.963	2.8758
120	0.7172	1.805	3.5519	2.8753	2.789
121	0.6973	1.7551	3.4513	2.7906	2.705
122	0.6781	1.7066	3.3538	2.7086	2.624
123	0.6595	1.6598	3.2593	2.6295	2.5456
124	0.6415	1.6144	3.1679	2.5528	2.4699
125	0.624	1.5704	3.0793	2.4787	2.3966

Temperature characteristics

Part number	**NRBE105?4450B1***	**NRBE353?3435B2***	**NRBE324?4550B2***	**NRBE203?4250B2***
Resistance	**100K(25 °C)**	**3.4513K(50 °C)**	**31.765K(50 °C)**	**2.028K(86 °C)**
Beta Value	**B25/50=4450**	**B25/85=3435**	**B25/85=4550**	**B25/85=4250**
Temperature (°C)	**Resistance (kΩ)**	**Resistance (kΩ)**	**Resistance (kΩ)**	**Resistance (kΩ)**
-40	4673.96	166.81	4754.69	930.3
-39	4360.69	157.74	4436.01	868.85
-38	4070.07	149.22	4140.37	811.82
-37	3800.33	141.21	3865.97	758.86
-36	3549.88	133.69	3611.19	709.67
-35	3317.22	126.61	3374.52	663.96
-34	3101.01	119.95	3154.57	621.45
-33	2899.99	113.68	2950.08	581.91
-32	2713.02	107.78	2759.88	545.11
-31	2539.05	102.22	2582.9	510.85
-30	2377.1	96.98	2418.16	478.93
-29	2225.88	92.02	2264.33	449.4
-28	2085.04	87.34	2121.06	421.84
-27	1953.82	82.92	1987.57	396.12
-26	1831.52	78.76	1863.15	372.1
-25	1717.47	74.83	1747.13	349.67
-24	1611.09	71.12	1638.91	328.7
-23	1511.81	67.62	1537.92	309.1
-22	1419.14	64.31	1443.65	290.78
-21	1332.59	61.18	1355.61	273.63
-20	1251.74	58.23	1273.36	257.58
-19	1175.7	55.44	1196	242.02
-18	1104.66	52.8	1123.74	227.5
-17	1038.27	50.31	1056.2	213.94
-16	976.19	47.95	993.05	201.28
-15	918.14	45.71	934	189.46
-14	863.82	43.58	878.74	178.4
-13	812.98	41.57	827.02	168.06
-12	765.38	39.67	778.6	158.39
-11	720.8	37.86	733.25	149.33
-10	679.03	36.14	690.76	140.85
-9	639.9	34.51	650.95	132.98
-8	603.21	32.96	613.63	125.6
-7	568.8	31.49	578.63	118.66
-6	536.51	30.09	545.78	112.15
-5	506.21	28.77	514.95	106.04
-4	477.75	27.5	486	100.29
-3	451.03	26.31	458.82	94.88
-2	425.92	25.16	433.27	89.8
-1	402.32	24.08	409.27	85.02
0	380.14	23.05	386.7	80.52
1	358.97	22.05	365.17	76.27
2	339.1	21.11	344.95	72.27
3	320.44	20.21	325.97	68.5
4	302.91	19.36	308.14	64.95
5	286.44	18.55	291.38	61.6
6	270.95	17.77	275.63	58.45
7	256.39	17.04	260.82	55.47
8	242.69	16.33	246.88	52.66
9	229.79	15.67	233.76	50.02
10	217.65	15.03	221.41	47.52
11	206.22	14.42	209.78	45.15
12	195.45	13.84	198.83	42.92
13	185.3	13.29	188.5	40.82
14	175.73	12.76	178.77	38.82
15	166.71	12.26	169.59	36.94
16	158.19	11.78	160.93	35.16
17	150.16	11.32	152.75	33.47
18	142.58	10.88	145.04	31.87
19	135.42	10.46	137.76	30.36
20	128.65	10.06	130.87	28.93

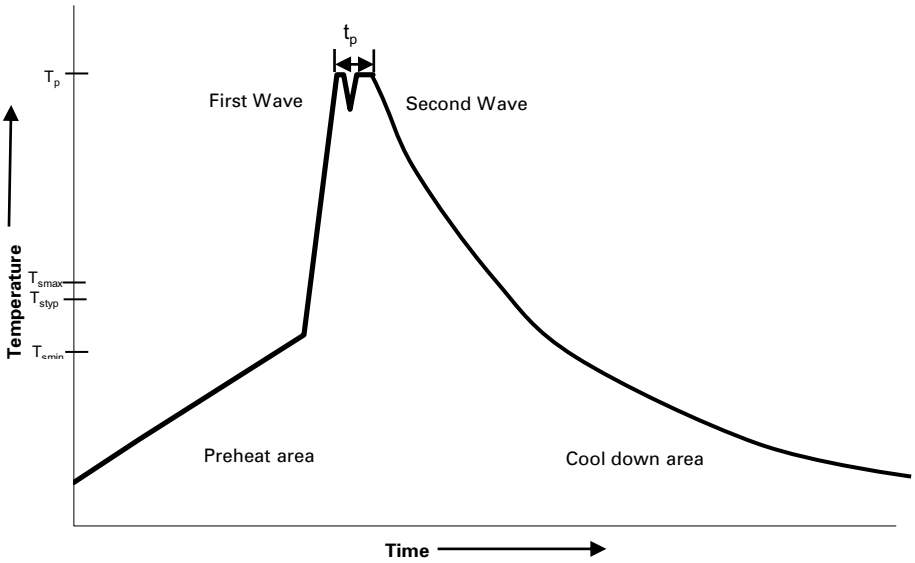
Temperature characteristics, cont.

21	122.26	9.68	124.37	27.57
22	116.22	9.31	118.23	26.29
23	110.51	8.96	112.42	25.07
24	105.11	8.63	106.92	23.91
25	100	8.31	101.73	22.82
26	95.14	8	96.785	21.78
27	90.55	7.7	92.11	20.78
28	86.2	7.42	87.686	19.83
29	82.08	7.15	83.499	18.93
30	78.19	6.89	79.534	18.08
31	74.49	6.64	75.778	17.28
32	71	6.4	72.22	16.51
33	67.68	6.18	68.848	15.78
34	64.54	5.96	65.651	15.09
35	61.56	5.75	62.619	14.43
36	58.73	5.55	59.743	13.81
37	56.05	5.35	57.014	13.21
38	53.5	5.17	54.424	12.65
39	51.08	4.9927	51.965	12.11
40	48.79	4.8227	49.63	11.6
41	46.61	4.6595	47.412	11.12
42	44.54	4.5029	45.304	10.65
43	42.57	4.3524	43.301	10.21
44	40.69	4.2079	41.396	9.792
45	38.91	4.069	39.585	9.391
46	37.22	3.9356	37.862	9.01
47	35.61	3.8073	36.223	8.646
48	34.08	3.684	34.664	8.299
49	32.62	3.5654	33.179	7.968
50	31.23	3.4513	31.765	7.652
51	29.9	3.3402	30.419	7.349
52	28.64	3.2332	29.136	7.059
53	27.44	3.1302	27.914	6.782
54	26.29	3.0309	26.749	6.517
55	25.2	2.9353	25.638	6.264
56	24.16	2.8431	24.579	6.022
57	23.17	2.7543	23.568	5.791
58	22.22	2.6688	22.605	5.57
59	21.32	2.5862	21.685	5.358
60	20.45	2.5067	20.807	5.156
61	19.63	2.4299	19.968	4.962
62	18.84	2.3559	19.168	4.777
63	18.09	2.2845	18.403	4.599
64	17.37	2.2155	17.673	4.429
65	16.69	2.149	16.975	4.266
66	16.03	2.0848	16.308	4.11
67	15.4	2.0228	15.67	3.96
68	14.8	1.963	15.06	3.817
69	14.23	1.9052	14.477	3.679
70	13.68	1.8493	13.919	3.548
71	13.16	1.7954	13.385	3.421
72	12.66	1.7433	12.874	3.3
73	12.17	1.6929	12.385	3.183
74	11.71	1.6442	11.917	3.071
75	11.27	1.5971	11.468	2.964
76	10.85	1.5516	11.039	2.861
77	10.45	1.5076	10.627	2.762
78	10.06	1.4651	10.233	2.667
79	9.69	1.4239	9.855	2.576
80	9.33	1.3841	9.493	2.488
81	8.99	1.3455	9.145	2.404

Temperature characteristics, cont.

82	8.66	1.3083	8.812	2.323
83	8.35	1.2722	8.493	2.245
84	8.05	1.2372	8.186	2.17
85	7.76	1.2034	7.892	2.098
86	7.48	1.1709	7.612	2.028
87	7.22	1.1395	7.343	1.961
88	6.96	1.1091	7.084	1.897
89	6.72	1.0796	6.836	1.835
90	6.49	1.051	6.597	1.775
91	6.26	1.0234	6.368	1.717
92	6.04	0.9965	6.148	1.662
93	5.84	0.9705	5.936	1.609
94	5.64	0.9453	5.733	1.557
95	5.44	0.9209	5.538	1.508
96	5.26	0.8972	5.35	1.46
97	5.08	0.8743	5.169	1.414
98	4.9103	0.852	4.9952	1.37
99	4.746	0.8304	4.828	1.328
100	4.5879	0.8094	4.6671	1.287
101	4.4325	0.789	4.5091	1.247
102	4.283	0.7693	4.3571	1.209
103	4.1392	0.7501	4.2107	1.173
104	4.0007	0.7315	4.0699	1.137
105	3.8673	0.7135	3.9341	1.103
106	3.7389	0.6959	3.8036	1.07
107	3.6153	0.6789	3.6778	1.038
108	3.4963	0.6625	3.5567	1.0074
109	3.3815	0.6464	3.44	0.9779
110	3.271	0.6309	3.3275	0.9494
111	3.1645	0.6158	3.2192	0.9218
112	3.0619	0.6011	3.1148	0.8952
113	2.963	0.5868	3.0141	0.8694
114	2.8676	0.573	2.9171	0.8445
115	2.7756	0.5595	2.8236	0.8204
116	2.687	0.5464	2.7334	0.7972
117	2.6015	0.5336	2.6464	0.7747
118	2.519	0.5212	2.5625	0.7529
119	2.4394	0.5092	2.4816	0.7319
120	2.3627	0.4975	2.4035	0.7115
121	2.2886	0.4861	2.3281	0.6918
122	2.2171	0.475	2.2554	0.6727
123	2.148	0.4642	2.1852	0.6542
124	2.0814	0.4537	2.1174	0.6364
125	2.0172	0.4435	2.052	0.6191

Wave solder profile



Reference EN 61760-1:2006

Profile feature		Standard SnPb solder	Lead (Pb) free solder
Preheat	• Temperature min. (T_{smin})	100 °C	100 °C
	• Temperature typ. (T_{styp})	120 °C	120 °C
	• Temperature max. (T_{smax})	130 °C	130 °C
	• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature		150 °C max.	150 °C max.
Peak temperature (T_P)*		235 °C – 260 °C	250 °C – 260 °C
Time at peak temperature (t_p)		10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate		~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to 25 °C		4 minutes	4 minutes

Manual solder

+280 °C ±20 °C (less than 2 seconds by soldering iron at ≥9 mm distance from the thermistor head), generally manual/hand soldering is not recommended

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

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