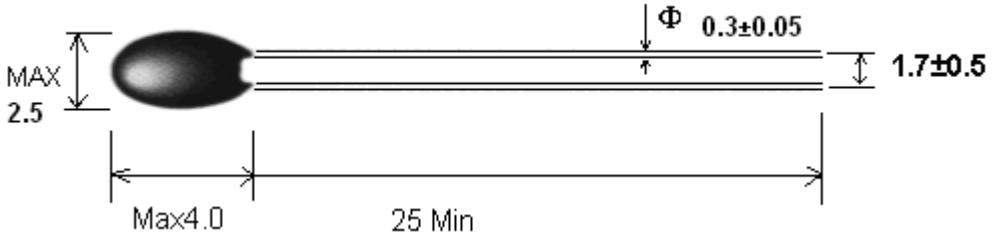
Specifications for NTC Thermistor

Part No.	MF52A1 103F3950
Operating criteria	Q/320115SHD03-2011

1、Dimensions(mm)



2、Materials

Coating		Lead wire
Material	Color	Material
Modified Resin	Black	CP wire

3、Ordering information

MF52	A1	103	F	3950
Pearl-Shape Temp Measurement NTC Thermistor	CP wire	Resistance	Tolerance	B-value（25/50）
		10×10^3=10KΩ	±1%	3950K

4、Electrical characteristics

	Item	Symbol	Test conditions	Unit	Specification
4.1	Zero Power Resistance at 25℃	R_{25}	Ta=25±0.05℃ Test Power≤0.1mW Test in fluid liquid	KΩ	10±1%
4.2	B-value	$B_{25/50}$	$B=[(T_a\times T_b)/(T_b-T_a)]\times\ln(R_a/R_b)$ T_b=50℃±0.1℃	K	3950±1%
4.3	Thermal dissipation Coefficient	δ	In still air	mW/℃	≥2
4.4	Thermal time	τ	In still air	sec	≤7

	constant				
4.5	Insulation resistance	/	100V/DC 1min	MΩ	≥100
4.6	Operating temperature	/	/	℃	-55 ~ +125
4.7	R&T-table	/	/	/	See attached table
4.8	Resistance tolerance	/	/	/	See attached curve

5、Reliability

	Item	Test conditions and methods	Technical requirements
5.1	Solderability	The lead wire shall be dipped into solder bath of 245±5℃ for 2~3sec with 6mm space from the body.	Solder dipped on lead wire should be uniform and smooth; the coverage area should be more than 95%.
5.2	Withstand Soldering heat	The lead wire shall be dipped into solder bath of 265±5℃ for 5±1sec with 6mm space from the body.	No obvious damage, R25 ΔR/R≤±2%
5.3	Terminal strength	Pull strength：5N，time：10sec	No obvious damage, R25 ΔR/R≤±2%
5.4	Temperature cycle	-55℃30min→25℃5min→125℃30min →25℃5min， 5cycles ,recover 4hrs	No obvious damage, R25 ΔR/R≤±2%
5.5	High temperature	Temperature：125℃，time：16hrs	No obvious damage, R25 ΔR/R≤±2%
5.6	Low temperature	Temperature：-55℃，Time：2hrs	No obvious damage, R25 ΔR/R≤±2%
5.7	Low atmospheric pressure	Atmospheric pressure：40±0.1Kpa，time :4hrs	No obvious damage, R25 ΔR/R≤±2%
5.8	Steady humidity and heat	Temp：40℃，humidity：93%， Time ： 500±12hrs	No obvious damage, R25 ΔR/R≤±2%， Withstanding voltage ≥700V/AC 1min Insulating resistance ≥100MΩ
5.9	Damp heat	Temp：25~40℃，humidity：90%， Time：24hrs	No obvious damage, R25 ΔR/R≤±2%， Withstanding voltage ≥700V/AC 1min Insulating resistance ≥100MΩ
5.10	Zero power endurance at upper category temperature	Temp : 125℃±2℃, Time :1000±24hrs	No obvious damage, R25 ΔR/R≤±2%
5.11	Vibrate	Frequency ：10~500HZ，swing ：0.75m or 98m/S^2， time :2hurs	No obvious damage, R25 ΔR/R≤±2%
5.12	Bump	Acceleration：250m/S^2，pulse duration ：6mS，Bump times：4000times	No obvious damage, R25 ΔR/R≤±2%

6、Soldering conditions

When soldering, space between iron tip and thermistor body must be more than 10mm, temperature should be less than 350℃, and soldering time should be as short as possible.

7、Storage conditions

7.1 Storage temp：-10℃ ～ 40℃；
7.2 Storage humidity ：≤75% RH；
7.3 Avoid air corrosion or sunlight
7.4 Remake sealed storage after package opening.

R&T Table

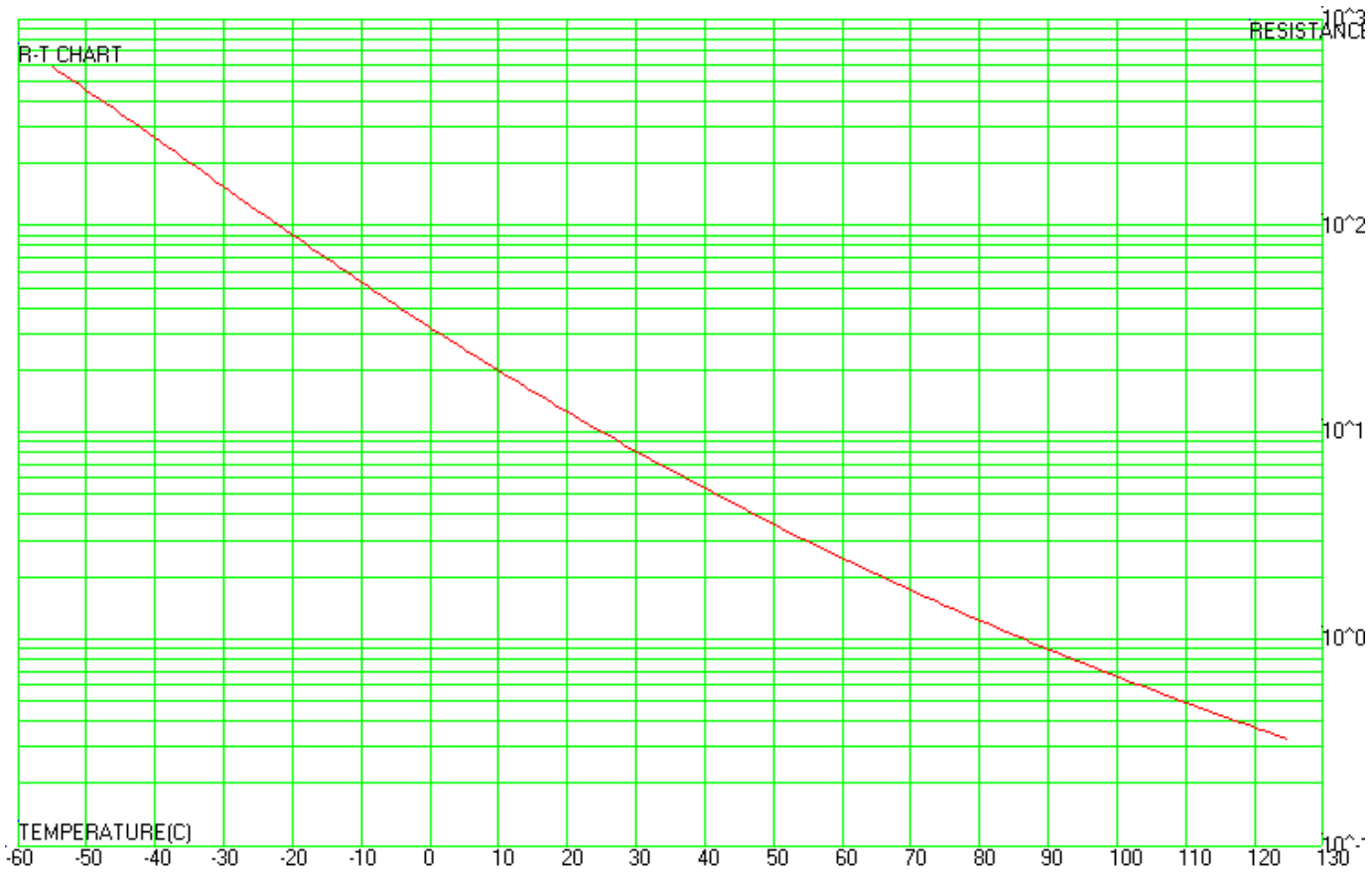
R25=10Ω TOLERANCE:±1% B25/50=3950K TOLERANCE:±1% (P163-6)							
TEMP(℃)	RESISTANCE(KΩ)			RESISST-TOL(%)		TEMP-TOL(℃)	
	MIN	CENTER	MAX	△R	-△R	△T	-△T
-55	554.685	583.542	613.839	5.191	-4.945	0.747	-0.711
-54	527.487	554.647	583.148	5.138	-4.896	0.743	-0.708
-53	501.420	526.968	553.762	5.084	-4.848	0.738	-0.704
-52	476.462	500.480	525.656	5.030	-4.799	0.734	-0.700
-51	452.590	475.159	498.802	4.975	-4.749	0.729	-0.696
-50	429.779	450.974	473.167	4.921	-4.699	0.725	-0.692
-49	408.000	427.897	448.718	4.866	-4.649	0.720	-0.688
-48	387.224	405.892	425.419	4.810	-4.599	0.716	-0.684
-47	367.418	384.927	403.231	4.755	-4.548	0.711	-0.680

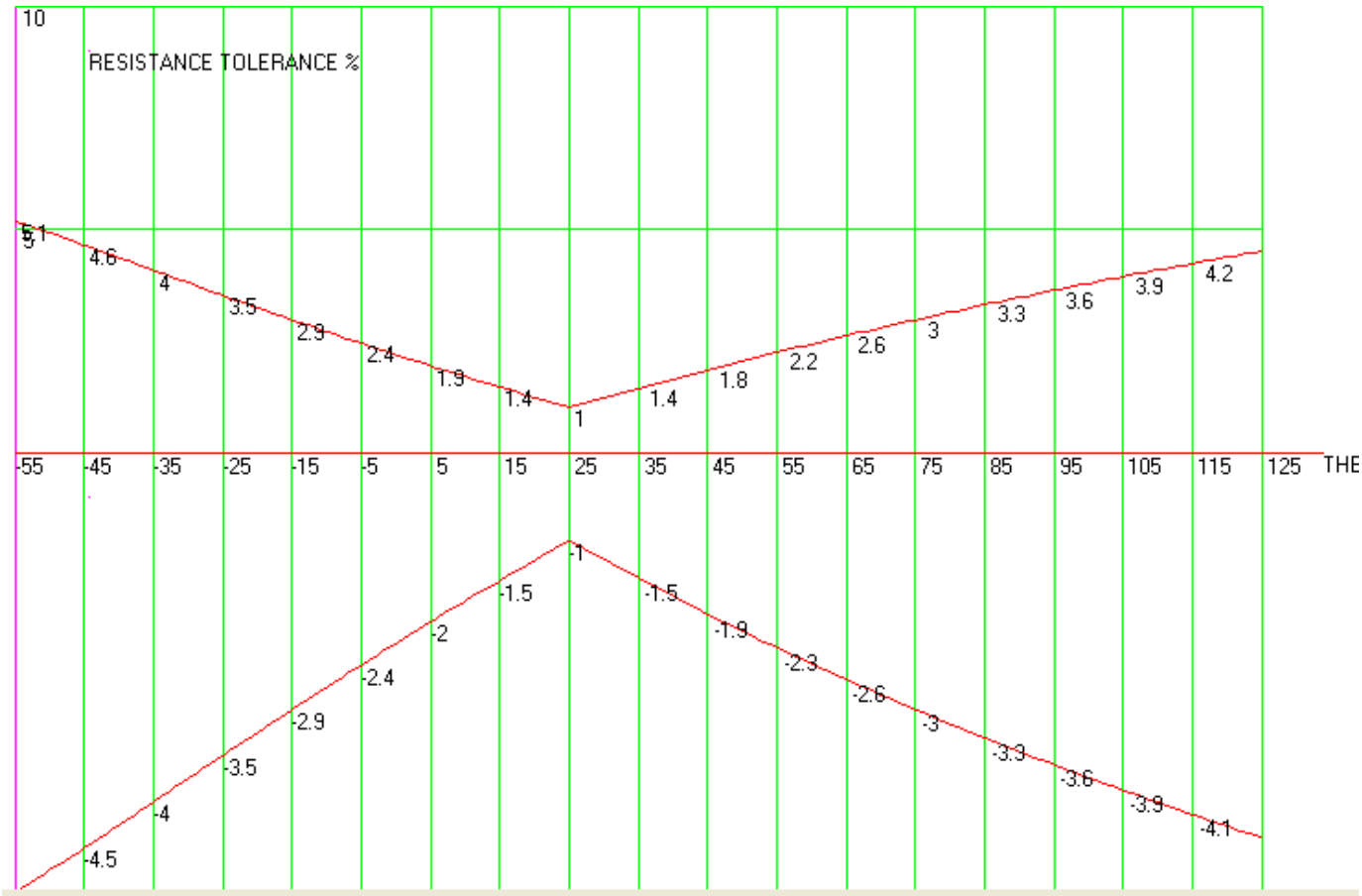
-46	348.551	364.967	382.118	4.699	-4.497	0.706	-0.676
-45	330.589	345.975	362.039	4.643	-4.446	0.701	-0.672
-44	313.501	327.915	342.957	4.587	-4.395	0.697	-0.667
-43	297.251	310.751	324.831	4.531	-4.344	0.692	-0.663
-42	281.808	294.448	307.623	4.474	-4.292	0.687	-0.659
-41	267.138	278.969	291.294	4.418	-4.240	0.682	-0.654
-40	253.208	264.279	275.806	4.361	-4.189	0.677	-0.650
-39	239.986	250.344	261.122	4.305	-4.137	0.671	-0.645
-38	227.442	237.130	247.205	4.248	-4.085	0.666	-0.641
-37	215.545	224.603	234.019	4.192	-4.033	0.661	-0.636
-36	204.264	212.733	221.531	4.135	-3.981	0.656	-0.631
-35	193.571	201.487	209.706	4.079	-3.928	0.650	-0.626
-34	183.437	190.836	198.512	4.022	-3.876	0.645	-0.622
-33	173.837	180.750	187.919	3.966	-3.824	0.640	-0.617
-32	164.743	171.201	177.895	3.909	-3.772	0.634	-0.612
-31	156.131	162.163	168.412	3.853	-3.720	0.629	-0.607
-30	147.976	153.610	159.443	3.797	-3.667	0.623	-0.602
-29	140.255	145.516	150.960	3.741	-3.615	0.617	-0.597
-28	132.946	137.858	142.938	3.684	-3.563	0.612	-0.591
-27	126.027	130.614	135.354	3.628	-3.511	0.606	-0.586
-26	119.480	123.761	128.184	3.573	-3.459	0.600	-0.581
-25	113.283	117.280	121.405	3.517	-3.407	0.594	-0.575
-24	107.419	111.149	114.997	3.461	-3.355	0.588	-0.570
-23	101.870	105.351	108.939	3.406	-3.303	0.582	-0.565
-22	96.619	99.867	103.214	3.351	-3.252	0.576	-0.559
-21	91.650	94.681	97.801	3.296	-3.200	0.570	-0.553
-20	86.949	89.776	92.686	3.241	-3.149	0.564	-0.548
-19	82.500	85.137	87.850	3.186	-3.097	0.558	-0.542
-18	78.290	80.750	83.279	3.131	-3.046	0.551	-0.536
-17	74.306	76.600	78.958	3.077	-2.995	0.545	-0.530
-16	70.536	72.676	74.873	3.023	-2.944	0.539	-0.524
-15	66.968	68.963	71.011	2.969	-2.893	0.532	-0.518
-14	63.591	65.451	67.360	2.915	-2.842	0.526	-0.512
-13	60.394	62.129	63.907	2.861	-2.791	0.519	-0.506
-12	57.369	58.986	60.643	2.808	-2.741	0.512	-0.500
-11	54.504	56.012	57.555	2.755	-2.691	0.506	-0.494
-10	51.793	53.198	54.635	2.702	-2.640	0.499	-0.488
-9	49.225	50.534	51.873	2.649	-2.590	0.492	-0.481
-8	46.793	48.013	49.260	2.597	-2.541	0.485	-0.475
-7	44.490	45.627	46.788	2.544	-2.491	0.478	-0.468
-6	42.309	43.368	44.449	2.492	-2.441	0.471	-0.462
-5	40.243	41.229	42.235	2.440	-2.392	0.464	-0.455
-4	38.285	39.204	40.140	2.389	-2.343	0.457	-0.449
-3	36.430	37.285	38.157	2.337	-2.294	0.450	-0.442

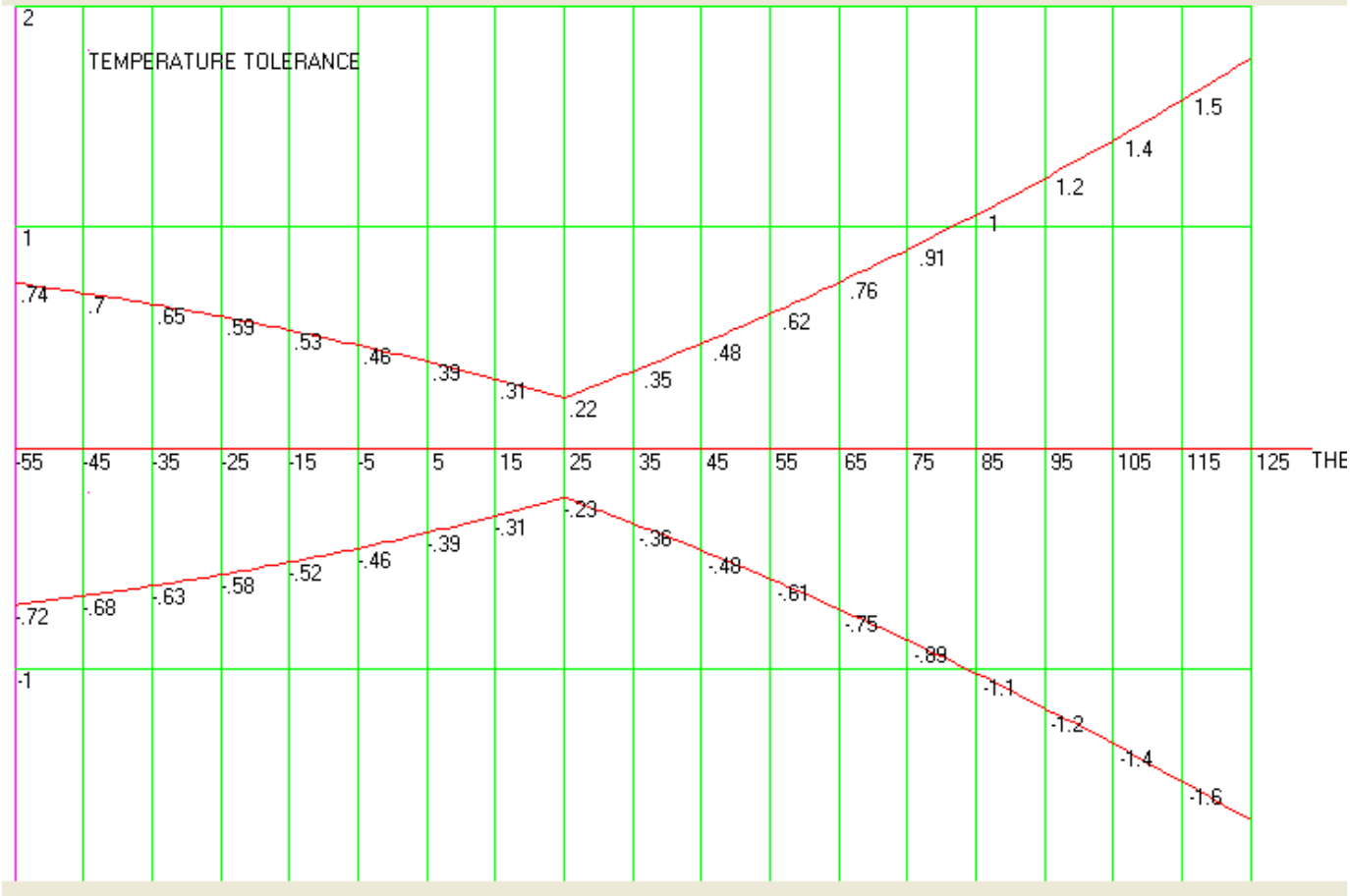
-2	34.672	35.468	36.279	2.286	-2.245	0.443	-0.435
-1	33.005	33.747	34.501	2.235	-2.196	0.436	-0.428
0	31.426	32.116	32.817	2.185	-2.148	0.428	-0.421
1	29.928	30.570	31.222	2.134	-2.100	0.421	-0.414
2	28.507	29.105	29.711	2.084	-2.052	0.414	-0.407
3	27.160	27.716	28.280	2.034	-2.004	0.406	-0.400
4	25.882	26.399	26.923	1.985	-1.956	0.399	-0.393
5	24.670	25.150	25.637	1.935	-1.908	0.391	-0.386
6	23.519	23.965	24.418	1.886	-1.861	0.383	-0.378
7	22.427	22.842	23.262	1.837	-1.814	0.376	-0.371
8	21.391	21.776	22.165	1.789	-1.767	0.368	-0.364
9	20.407	20.764	21.125	1.740	-1.720	0.360	-0.356
10	19.452	19.783	20.117	1.691	-1.673	0.353	-0.349
11	18.584	18.892	19.203	1.644	-1.627	0.344	-0.341
12	17.741	18.026	18.314	1.596	-1.581	0.336	-0.333
13	16.940	17.204	17.471	1.549	-1.535	0.328	-0.325
14	16.178	16.423	16.670	1.502	-1.489	0.320	-0.318
15	15.455	15.681	15.909	1.455	-1.444	0.312	-0.310
16	14.766	14.976	15.187	1.408	-1.399	0.304	-0.302
17	14.112	14.306	14.501	1.362	-1.353	0.296	-0.294
18	13.490	13.669	13.849	1.316	-1.308	0.287	-0.286
19	12.898	13.063	13.229	1.270	-1.264	0.279	-0.278
20	12.335	12.487	12.640	1.224	-1.219	0.271	-0.269
21	11.799	11.939	12.080	1.179	-1.175	0.262	-0.261
22	11.288	11.418	11.547	1.134	-1.131	0.253	-0.253
23	10.803	10.921	11.040	1.089	-1.087	0.245	-0.244
24	10.340	10.449	10.558	1.044	-1.043	0.236	-0.236
25	9.900	10.000	10.100	1.000	-1.000	0.228	-0.228
26	9.472	9.571	9.671	1.044	-1.043	0.239	-0.239
27	9.064	9.164	9.263	1.088	-1.086	0.251	-0.250
28	8.676	8.775	8.875	1.131	-1.129	0.262	-0.262
29	8.307	8.405	8.504	1.175	-1.171	0.274	-0.273
30	7.955	8.052	8.151	1.218	-1.214	0.286	-0.285
31	7.619	7.716	7.814	1.262	-1.256	0.298	-0.296
32	7.300	7.396	7.492	1.305	-1.298	0.309	-0.308
33	6.995	7.090	7.186	1.347	-1.339	0.322	-0.320
34	6.705	6.798	6.893	1.390	-1.381	0.334	-0.331
35	6.428	6.520	6.614	1.432	-1.422	0.346	-0.343
36	6.163	6.255	6.347	1.474	-1.463	0.358	-0.355
37	5.911	6.002	6.093	1.516	-1.504	0.370	-0.367
38	5.671	5.760	5.850	1.558	-1.544	0.383	-0.379
39	5.441	5.529	5.617	1.600	-1.584	0.395	-0.392
40	5.222	5.309	5.396	1.641	-1.624	0.408	-0.404
41	5.013	5.098	5.184	1.682	-1.664	0.421	-0.416

42	4.813	4.897	4.981	1.723	-1.704	0.433	-0.428
43	4.622	4.704	4.787	1.764	-1.743	0.446	-0.441
44	4.440	4.521	4.602	1.804	-1.782	0.459	-0.453
45	4.266	4.345	4.425	1.845	-1.821	0.472	-0.466
46	4.099	4.177	4.256	1.885	-1.860	0.485	-0.479
47	3.940	4.016	4.094	1.925	-1.898	0.498	-0.491
48	3.788	3.863	3.939	1.965	-1.937	0.511	-0.504
49	3.642	3.716	3.790	2.004	-1.975	0.525	-0.517
50	3.515	3.588	3.661	2.040	-2.009	0.539	-0.531
51	3.370	3.440	3.512	2.083	-2.050	0.551	-0.543
52	3.242	3.311	3.381	2.122	-2.088	0.565	-0.556
53	3.120	3.188	3.257	2.161	-2.125	0.579	-0.569
54	3.003	3.069	3.137	2.199	-2.162	0.592	-0.582
55	2.891	2.956	3.022	2.238	-2.199	0.606	-0.595
56	2.784	2.848	2.912	2.276	-2.235	0.620	-0.609
57	2.681	2.744	2.807	2.314	-2.271	0.634	-0.622
58	2.583	2.644	2.706	2.352	-2.308	0.648	-0.636
59	2.489	2.548	2.609	2.390	-2.344	0.662	-0.649
60	2.398	2.457	2.516	2.427	-2.379	0.676	-0.663
61	2.312	2.369	2.427	2.464	-2.415	0.690	-0.676
62	2.228	2.284	2.342	2.502	-2.450	0.704	-0.690
63	2.149	2.204	2.260	2.539	-2.485	0.719	-0.704
64	2.072	2.126	2.181	2.575	-2.520	0.733	-0.718
65	1.999	2.051	2.105	2.612	-2.555	0.748	-0.732
66	1.929	1.980	2.032	2.648	-2.590	0.762	-0.746
67	1.861	1.911	1.963	2.685	-2.624	0.777	-0.760
68	1.796	1.845	1.895	2.721	-2.658	0.792	-0.774
69	1.734	1.782	1.831	2.756	-2.692	0.807	-0.788
70	1.674	1.721	1.769	2.792	-2.726	0.822	-0.802
71	1.617	1.663	1.710	2.828	-2.760	0.837	-0.816
72	1.561	1.606	1.652	2.863	-2.793	0.852	-0.831
73	1.508	1.552	1.597	2.898	-2.826	0.867	-0.845
74	1.457	1.500	1.544	2.933	-2.859	0.882	-0.860
75	1.408	1.450	1.493	2.968	-2.892	0.897	-0.874
76	1.361	1.402	1.444	3.003	-2.925	0.913	-0.889
77	1.316	1.356	1.397	3.037	-2.958	0.928	-0.904
78	1.272	1.312	1.352	3.072	-2.990	0.944	-0.919
79	1.230	1.269	1.308	3.106	-3.022	0.959	-0.933
80	1.190	1.228	1.266	3.140	-3.054	0.975	-0.948
81	1.151	1.188	1.226	3.174	-3.086	0.991	-0.963
82	1.114	1.150	1.187	3.207	-3.117	1.007	-0.978
83	1.078	1.113	1.149	3.241	-3.149	1.023	-0.994
84	1.043	1.078	1.113	3.274	-3.180	1.039	-1.009
85	1.010	1.044	1.078	3.308	-3.211	1.055	-1.024

86	0.978	1.011	1.044	3.341	-3.242	1.071	-1.039
87	0.947	0.979	1.012	3.374	-3.273	1.087	-1.055
88	0.917	0.948	0.981	3.406	-3.304	1.103	-1.070
89	0.888	0.919	0.951	3.439	-3.334	1.120	-1.086
90	0.861	0.891	0.922	3.471	-3.364	1.136	-1.101
91	0.834	0.863	0.894	3.504	-3.395	1.153	-1.117
92	0.808	0.837	0.867	3.536	-3.425	1.169	-1.133
93	0.783	0.811	0.840	3.568	-3.454	1.186	-1.149
94	0.759	0.787	0.815	3.599	-3.484	1.203	-1.164
95	0.736	0.763	0.791	3.631	-3.513	1.220	-1.180
96	0.714	0.740	0.767	3.663	-3.543	1.237	-1.196
97	0.693	0.718	0.745	3.694	-3.572	1.254	-1.212
98	0.672	0.697	0.723	3.725	-3.601	1.271	-1.229
99	0.652	0.676	0.702	3.756	-3.630	1.288	-1.245
100	0.632	0.657	0.681	3.787	-3.659	1.305	-1.261
101	0.614	0.637	0.662	3.818	-3.687	1.323	-1.277
102	0.596	0.619	0.643	3.849	-3.716	1.340	-1.294
103	0.578	0.601	0.624	3.879	-3.744	1.358	-1.310
104	0.562	0.584	0.606	3.909	-3.772	1.375	-1.327
105	0.545	0.567	0.589	3.940	-3.800	1.393	-1.343
106	0.530	0.551	0.573	3.970	-3.828	1.410	-1.360
107	0.514	0.535	0.556	4.000	-3.855	1.428	-1.377
108	0.500	0.520	0.541	4.029	-3.883	1.446	-1.394
109	0.485	0.505	0.526	4.059	-3.910	1.464	-1.410
110	0.472	0.491	0.511	4.089	-3.938	1.482	-1.427
111	0.459	0.477	0.497	4.118	-3.965	1.500	-1.444
112	0.446	0.464	0.483	4.147	-3.992	1.518	-1.461
113	0.433	0.451	0.470	4.176	-4.018	1.537	-1.479
114	0.421	0.439	0.458	4.205	-4.045	1.555	-1.496
115	0.410	0.427	0.445	4.234	-4.072	1.573	-1.513
116	0.398	0.415	0.433	4.263	-4.098	1.592	-1.530
117	0.387	0.404	0.422	4.291	-4.124	1.610	-1.548
118	0.377	0.393	0.410	4.320	-4.150	1.629	-1.565
119	0.367	0.383	0.399	4.348	-4.176	1.648	-1.583
120	0.357	0.373	0.389	4.376	-4.202	1.667	-1.600
121	0.347	0.363	0.379	4.404	-4.228	1.686	-1.618
122	0.338	0.353	0.369	4.432	-4.254	1.705	-1.636
123	0.329	0.344	0.359	4.460	-4.279	1.724	-1.654
124	0.320	0.335	0.350	4.488	-4.305	1.743	-1.672
125	0.312	0.326	0.341	4.515	-4.330	1.762	-1.689


R-T CHART
RESISTANCE
10^3
10^2
10^1
10^0
TEMPERATURE(C)
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130


10
RESISTANCE TOLERANCE %
5.1
4.6
4
3.5
2.9
2.4
1.9
1.4
1
1.4
1.8
2.2
2.6
3
3.3
3.6
3.9
4.2
-55 -45 -35 -25 -15 -5 5 15 25 35 45 55 65 75 85 95 105 115 125 THE
-4.5
-4
-3.5
-2.9
-2.4
-2
-1.5
-1
-1.5
-1.9
-2.3
-2.6
-3
-3.3
-3.6
-3.9
-4.1


2
TEMPERATURE TOLERANCE
1
.74
.7
.65
.59
.53
.46
.39
.31
.22
.35
.48
.62
.76
.91
1
1.2
1.4
1.5
-55 -45 -35 -25 -15 -5 5 15 25 35 45 55 65 75 85 95 105 115 125 THE
.72
.68
.63
.58
.52
.46
.39
.31
.23
.36
.48
.61
.75
.89
-1
-1.1
-1.2
-1.4
-1.6