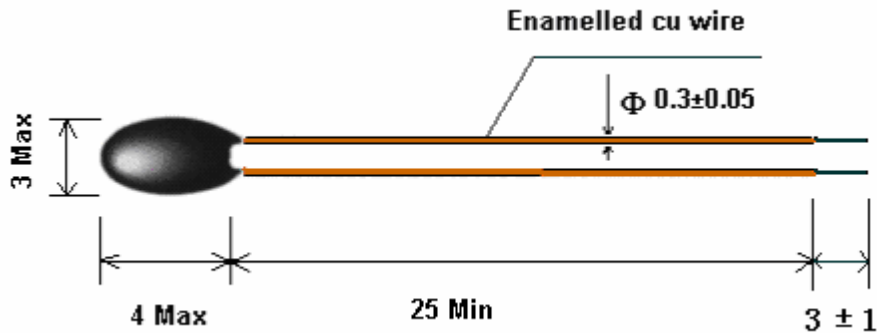# Specifications for NTC Thermistor

Part No.	MF52B2 103F4150
Operating criteria	Q/320115SHD03-2008

1、Dimensions(mm)

2、Materials

Coating		Lead wire	
Material	Color	Material	Color
Epoxy Resin	Black	Enamelled Cu wire	Yellow

3、Ordering information

MF52	B2	103	F	4150
Pearl-Shape Temp Measurement NTC Thermistor	Enamelled cu wire	Resistance	Tolerance	B-value（25/50）
		10×10^3=10KΩ	±1%	4150K

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	4150±1%
4.3	Thermal dissipation Coefficient	δ	In still air	mW/℃	≥2
4.4	Thermal time constant	τ	In still air	sec	≤7

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 235±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 6mm, temperature should be less than 350℃, 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.

8. Certificate

8.1 Quality Control System Certification　　　　　ISO9001：2000（01110Q20002R3M）

8.2 Environment Management System Certification　ISO14001：2004（01110E20031R1M）

8.3 Environment Test Report　　　　　　　　　　RoHS　（RLSHD000645310001C）

8.4 　CQC Certification　　　　　　　　　　　　（CQC07001019009)

R&T Table

R25=10KΩ TOLERANCE:±1% B25/50=4150K TOLERANCE:±1% （P186-15）							
TEMP(℃)	RESISTANCE(KΩ)			RESISST-TOL(%)		TEMP-TOL(℃)	
	MIN	CENTER	MAX	△R	-△R	△T	-△T
-55	1042.750	1104.010	1168.760	5.864	-5.549	0.729	-0.690
-54	970.502	1026.770	1086.200	5.787	-5.480	0.725	-0.687
-53	903.562	955.265	1009.820	5.711	-5.412	0.721	-0.683
-52	841.526	889.040	939.144	5.635	-5.344	0.717	-0.680
-51	784.018	827.693	873.714	5.560	-5.276	0.712	-0.676
-50	730.692	770.849	813.130	5.485	-5.209	0.708	-0.673
-49	681.231	718.161	757.016	5.410	-5.142	0.704	-0.669
-48	635.341	669.311	705.026	5.336	-5.075	0.699	-0.665
-47	592.751	624.006	656.844	5.262	-5.008	0.695	-0.661
-46	553.211	581.976	612.175	5.189	-4.942	0.690	-0.657
-45	516.493	542.972	570.751	5.116	-4.876	0.686	-0.653
-44	482.385	506.765	532.324	5.043	-4.810	0.681	-0.649
-43	450.690	473.143	496.666	4.971	-4.745	0.676	-0.645
-42	421.229	441.913	463.566	4.899	-4.680	0.671	-0.641
-41	393.836	412.894	432.831	4.828	-4.615	0.666	-0.637
-40	368.357	385.921	404.282	4.757	-4.551	0.662	-0.633
-39	344.651	360.842	377.756	4.687	-4.487	0.657	-0.628
-38	322.587	337.516	353.101	4.617	-4.423	0.651	-0.624
-37	302.044	315.813	330.176	4.547	-4.359	0.646	-0.620

−36	282.913	295.614	308.854	4.478	−4.296	0.641	−0.615
−35	265.088	276.807	289.015	4.410	−4.233	0.636	−0.610
−34	248.477	259.292	270.551	4.342	−4.170	0.631	−0.606
−33	232.991	242.974	253.359	4.274	−4.108	0.625	−0.601
−32	218.548	227.765	237.347	4.206	−4.046	0.620	−0.596
−31	205.075	213.586	222.429	4.139	−3.984	0.615	−0.592
−30	192.502	200.363	208.525	4.073	−3.923	0.609	−0.587
−29	180.764	188.027	195.561	4.007	−3.862	0.603	−0.582
−28	169.803	176.513	183.471	3.941	−3.801	0.598	−0.577
−27	159.563	165.765	172.190	3.876	−3.741	0.592	−0.571
−26	149.995	155.727	161.662	3.811	−3.681	0.586	−0.566
−25	141.050	146.350	151.833	3.746	−3.621	0.581	−0.561
−24	132.685	137.586	142.653	3.682	−3.561	0.575	−0.556
−23	124.861	129.393	134.076	3.619	−3.502	0.569	−0.550
−22	117.539	121.731	126.060	3.556	−3.443	0.563	−0.545
−21	110.686	114.564	118.566	3.493	−3.384	0.557	−0.540
−20	104.268	107.856	111.557	3.430	−3.326	0.551	−0.534
−19	98.257	101.577	104.999	3.368	−3.268	0.545	−0.528
−18	92.624	95.697	98.862	3.307	−3.210	0.538	−0.523
−17	87.345	90.189	93.116	3.245	−3.153	0.532	−0.517
−16	82.394	85.027	87.735	3.185	−3.096	0.526	−0.511
−15	77.751	80.188	82.694	3.124	−3.039	0.519	−0.505
−14	73.394	75.651	77.969	3.064	−2.983	0.513	−0.499
−13	69.305	71.394	73.540	3.004	−2.926	0.506	−0.493
−12	65.465	67.401	69.386	2.945	−2.871	0.500	−0.487
−11	61.860	63.652	65.489	2.886	−2.815	0.493	−0.481
−10	58.472	60.131	61.832	2.828	−2.760	0.487	−0.475
−9	55.288	56.825	58.399	2.770	−2.705	0.480	−0.469
−8	52.294	53.718	55.175	2.712	−2.650	0.473	−0.462
−7	49.479	50.798	52.147	2.654	−2.596	0.466	−0.456
−6	46.831	48.052	49.301	2.597	−2.541	0.459	−0.449
−5	44.339	45.470	46.626	2.541	−2.488	0.452	−0.443
−4	41.993	43.041	44.110	2.484	−2.434	0.445	−0.436
−3	39.784	40.754	41.744	2.429	−2.381	0.438	−0.429
−2	37.703	38.601	39.518	2.373	−2.328	0.431	−0.423
−1	35.742	36.574	37.422	2.318	−2.275	0.424	−0.416
0	33.894	34.665	35.449	2.263	−2.223	0.417	−0.409
1	32.151	32.865	33.591	2.208	−2.170	0.409	−0.402
2	30.508	31.168	31.840	2.154	−2.119	0.402	−0.395
3	28.957	29.569	30.190	2.100	−2.067	0.394	−0.388
4	27.494	28.060	28.634	2.047	−2.016	0.387	−0.381
5	26.113	26.636	27.167	1.994	−1.965	0.379	−0.374
6	24.808	25.293	25.784	1.941	−1.914	0.372	−0.367
7	23.576	24.024	24.478	1.889	−1.863	0.364	−0.359
8	22.412	22.826	23.245	1.837	−1.813	0.356	−0.352

9	21.311	21.694	22.081	1.785	−1.763	0.349	−0.344
10	20.334	20.690	21.049	1.737	−1.717	0.340	−0.336
11	19.287	19.613	19.944	1.682	−1.664	0.333	−0.329
12	18.356	18.658	18.962	1.631	−1.615	0.325	−0.322
13	17.475	17.753	18.034	1.581	−1.566	0.317	−0.314
14	16.641	16.898	17.157	1.531	−1.518	0.309	−0.306
15	15.852	16.088	16.327	1.481	−1.469	0.301	−0.298
16	15.104	15.322	15.541	1.431	−1.421	0.292	−0.290
17	14.396	14.596	14.798	1.382	−1.373	0.284	−0.282
18	13.724	13.909	14.094	1.333	−1.326	0.276	−0.274
19	13.088	13.257	13.428	1.285	−1.278	0.267	−0.266
20	12.484	12.640	12.796	1.236	−1.231	0.259	−0.258
21	11.912	12.055	12.198	1.188	−1.184	0.251	−0.250
22	11.369	11.500	11.631	1.141	−1.138	0.242	−0.241
23	10.853	10.973	11.093	1.093	−1.091	0.233	−0.233
24	10.364	10.474	10.583	1.046	−1.045	0.225	−0.225
25	9.900	10.000	10.100	1.000	−1.000	0.216	−0.216
26	9.450	9.549	9.649	1.046	−1.045	0.228	−0.227
27	9.022	9.122	9.222	1.092	−1.090	0.239	−0.239
28	8.617	8.716	8.815	1.138	−1.135	0.251	−0.250
29	8.232	8.330	8.429	1.184	−1.180	0.262	−0.262
30	7.866	7.964	8.062	1.230	−1.225	0.274	−0.273
31	7.518	7.615	7.712	1.275	−1.269	0.286	−0.285
32	7.188	7.284	7.380	1.320	−1.313	0.298	−0.296
33	6.874	6.968	7.064	1.365	−1.356	0.310	−0.308
34	6.575	6.669	6.763	1.409	−1.400	0.322	−0.320
35	6.291	6.383	6.476	1.454	−1.443	0.334	−0.332
36	6.021	6.112	6.203	1.498	−1.486	0.347	−0.344
37	5.763	5.853	5.943	1.542	−1.528	0.359	−0.356
38	5.518	5.607	5.695	1.586	−1.571	0.371	−0.368
39	5.285	5.372	5.459	1.629	−1.613	0.384	−0.380
40	5.063	5.148	5.234	1.672	−1.655	0.396	−0.392
41	4.851	4.935	5.020	1.715	−1.696	0.409	−0.405
42	4.650	4.732	4.815	1.758	−1.737	0.422	−0.417
43	4.457	4.538	4.620	1.800	−1.778	0.435	−0.429
44	4.274	4.353	4.434	1.843	−1.819	0.448	−0.442
45	4.099	4.177	4.256	1.885	−1.860	0.461	−0.454
46	3.933	4.009	4.086	1.927	−1.900	0.474	−0.467
47	3.774	3.848	3.924	1.968	−1.940	0.487	−0.480
48	3.622	3.695	3.769	2.010	−1.980	0.500	−0.492
49	3.477	3.549	3.621	2.051	−2.020	0.513	−0.505
50	3.339	3.410	3.481	2.092	−2.059	0.527	−0.518
51	3.206	3.275	3.345	2.133	−2.098	0.540	−0.531
52	3.080	3.148	3.216	2.174	−2.137	0.553	−0.544
53	2.960	3.026	3.093	2.214	−2.176	0.567	−0.557

54	2.844	2.909	2.974	2.254	−2.214	0.581	−0.570
55	2.734	2.797	2.861	2.294	−2.253	0.594	−0.584
56	2.629	2.691	2.753	2.334	−2.291	0.608	−0.597
57	2.528	2.588	2.650	2.374	−2.328	0.622	−0.610
58	2.432	2.491	2.551	2.413	−2.366	0.636	−0.624
59	2.340	2.397	2.456	2.452	−2.403	0.650	−0.637
60	2.251	2.308	2.365	2.491	−2.440	0.664	−0.651
61	2.167	2.222	2.278	2.530	−2.477	0.678	−0.664
62	2.086	2.140	2.195	2.569	−2.514	0.693	−0.678
63	2.009	2.061	2.115	2.607	−2.550	0.707	−0.692
64	1.935	1.986	2.039	2.645	−2.587	0.721	−0.705
65	1.864	1.914	1.965	2.683	−2.623	0.736	−0.719
66	1.796	1.845	1.895	2.721	−2.659	0.751	−0.733
67	1.730	1.778	1.827	2.759	−2.694	0.765	−0.747
68	1.668	1.715	1.763	2.796	−2.730	0.780	−0.761
69	1.608	1.654	1.700	2.833	−2.765	0.795	−0.776
70	1.550	1.595	1.641	2.870	−2.800	0.810	−0.790
71	1.495	1.539	1.584	2.907	−2.835	0.825	−0.804
72	1.442	1.485	1.529	2.944	−2.869	0.840	−0.818
73	1.391	1.433	1.476	2.981	−2.904	0.855	−0.833
74	1.343	1.383	1.425	3.017	−2.938	0.870	−0.847
75	1.296	1.336	1.376	3.053	−2.972	0.885	−0.862
76	1.251	1.290	1.330	3.089	−3.006	0.901	−0.876
77	1.208	1.246	1.285	3.125	−3.040	0.916	−0.891
78	1.166	1.203	1.241	3.160	−3.073	0.932	−0.906
79	1.127	1.163	1.200	3.196	−3.107	0.947	−0.921
80	1.088	1.124	1.160	3.231	−3.140	0.963	−0.936
81	1.052	1.086	1.122	3.266	−3.173	0.979	−0.950
82	1.016	1.050	1.085	3.301	−3.205	0.994	−0.965
83	0.982	1.015	1.049	3.336	−3.238	1.010	−0.981
84	0.950	0.982	1.015	3.371	−3.270	1.026	−0.996
85	0.918	0.950	0.982	3.405	−3.303	1.042	−1.011
86	0.888	0.919	0.950	3.439	−3.335	1.058	−1.026
87	0.859	0.889	0.920	3.474	−3.367	1.075	−1.042
88	0.831	0.860	0.890	3.507	−3.398	1.091	−1.057
89	0.804	0.832	0.862	3.541	−3.430	1.107	−1.072
90	0.778	0.806	0.835	3.575	−3.461	1.124	−1.088
91	0.753	0.780	0.808	3.608	−3.492	1.140	−1.104
92	0.729	0.755	0.783	3.642	−3.523	1.157	−1.119
93	0.706	0.732	0.759	3.675	−3.554	1.173	−1.135
94	0.683	0.709	0.735	3.708	−3.585	1.190	−1.151
95	0.662	0.687	0.712	3.741	−3.615	1.207	−1.167
96	0.641	0.665	0.691	3.773	−3.646	1.224	−1.183
97	0.621	0.645	0.669	3.806	−3.676	1.241	−1.199
98	0.602	0.625	0.649	3.838	−3.706	1.258	−1.215

99	0.583	0.606	0.629	3.870	−3.736	1.275	−1.231
100	0.565	0.588	0.610	3.902	−3.765	1.292	−1.247
101	0.548	0.570	0.592	3.934	−3.795	1.310	−1.263
102	0.531	0.553	0.574	3.966	−3.824	1.327	−1.280
103	0.515	0.536	0.557	3.998	−3.854	1.344	−1.296
104	0.500	0.520	0.541	4.029	−3.883	1.362	−1.312
105	0.485	0.505	0.525	4.060	−3.912	1.380	−1.329
106	0.470	0.490	0.510	4.092	−3.940	1.397	−1.346
107	0.456	0.475	0.495	4.123	−3.969	1.415	−1.362
108	0.443	0.461	0.481	4.154	−3.997	1.433	−1.379
109	0.430	0.448	0.467	4.184	−4.026	1.451	−1.396
110	0.417	0.435	0.453	4.215	−4.054	1.469	−1.413
111	0.405	0.422	0.440	4.245	−4.082	1.487	−1.430
112	0.393	0.410	0.428	4.276	−4.110	1.505	−1.447
113	0.382	0.399	0.416	4.306	−4.138	1.523	−1.464
114	0.371	0.387	0.404	4.336	−4.165	1.542	−1.481
115	0.361	0.376	0.393	4.366	−4.193	1.560	−1.498
116	0.350	0.366	0.382	4.396	−4.220	1.578	−1.515
117	0.340	0.355	0.371	4.425	−4.247	1.597	−1.533
118	0.331	0.346	0.361	4.455	−4.274	1.615	−1.550
119	0.321	0.336	0.351	4.484	−4.301	1.634	−1.567
120	0.313	0.327	0.341	4.513	−4.328	1.653	−1.585
121	0.304	0.318	0.332	4.542	−4.355	1.672	−1.603
122	0.295	0.309	0.323	4.571	−4.381	1.691	−1.620
123	0.287	0.301	0.314	4.600	−4.407	1.710	−1.638
124	0.279	0.292	0.306	4.629	−4.434	1.729	−1.656
125	0.272	0.285	0.298	4.657	−4.460	1.748	−1.674

R-T CHART

RESISTANCE

10^4

10^3

10^2

10^1

10^0

10^-1

TEMPERATURE(C)

-60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130

RESISTANCE TOLERANCE %

10

5.8
5   5.1
        4.4
            3.7
                3.1
                    2.5
                        1.9
                            1.4
                                1
                                    1.4
                                        1.9
                                            2.3
                                                2.7
                                                    3
                                                        3.4
                                                            3.7
                                                                4
                                                                    4.3

| -55 | -45 | -35 | -25 | -15 | -5 | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | 95 | 105 | 115 | 125 | THE |

-1
-1.5
-2
-2.5
-3.1
-3.7
-4.3
-5   -4.9
-5.6

-1
-1.5
-1.9
-2.3
-2.7
-3.1
-3.4
-3.7
-4
-4.3

TEMPERATURE TOLERANCE

2

1

.72
    .68
        .63
            .58
                .51
                    .45
                        .37
                            .3
                                .21
                                    .34
                                        .47
                                            .6
                                                .75
                                                    .9
                                                        1
                                                            1.2
                                                                1.3
                                                                    1.5

| -55 | -45 | -35 | -25 | -15 | -5 | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | 95 | 105 | 115 | 125 | THE |

-.22
-.3
-.35
-.38
-.45
-.47
-.51
-.57
-.6
-.61
-.66
-.69
-.74
-.88
-1
-1.1
-1.2
-1.4
-1.6