

# 样品承认书

## SPECIFICATION FOR APPROVAL

(ROHS COMPLIANCE)

客户名称: CUSTOMER	猎芯科技	料号: LLG NO	MF52A2104F3950 (P209-15A)
品名: PART NAME	热敏电阻	规格: PATR NO	MF52 A2 104F 1% $\beta$ =3950 L=25
版次: REV	AMYCOM-001	日期: DATE	2018-10-17
检验: INSPECT BY	黎德文	制作: PRODUCE BY	钟梅

	MANUFACTURER (制造商) SIGNATURE (签章)	SIGNATURE (签章)
APPROVED BY (核准):	王碧云	

COMMENTS (意见):





南京时恒电子科技有限公司

# MF52 珠状测温型 NTC 热敏电阻器

型号: MF52A 104F3950(A2)

本规格书提供了南京时恒电子科技有限公司生产的 MF52A 系列 NTC 热敏电阻的结构尺寸、产品性能、试验条件、使用要求的描述, 敬请贵司确认。  
对本规格书产生疑问时, 请速与我们联系 (025-52121868), 若无疑义请确认回传, 若无回传, 我司将视为默认。  
贵公司改变使用用途, 作用方法时, 请与我们联系。

客户名称:		
客户 确认	确认:	时间:
	审核:	时间:

## 1. 电气性能

项目	项目	符号	测试条件	单位	性能要求
1.1	25°C 的零功率电阻值	$R_{25°C}$	$T_a=25\pm 0.05^\circ\text{C}$ 测试功率 $\leq 0.1\text{mW}$	$\text{K}\Omega$	$100\text{K}\Omega \pm 1\%$
1.2	B 值	$B_{25/50}$	$B=[(T_a \times T_b)/(T_b - T_a)] \times \ln(R_a/R_b)$ $T_b=50^\circ\text{C} \pm 0.01^\circ\text{C}$	K	$3950 \pm 1\%$
1.3	耗散系数	$\delta$	静止空气中	$\text{mW}/^\circ\text{C}$	$\geq 2$
1.4	时间常数	$\tau$	静止空气中	sec	$\leq 7$
1.5	绝缘电阻	/	100V/DC 1min	$\text{M}\Omega$	$\geq 100$
1.6	工作温度范围	/	/	$^\circ\text{C}$	$-55^\circ\text{C} \sim 125^\circ\text{C}$
1.7	最大额定功率	$P_{\text{max}}$	/	mW	50
1.8	阻温特性	/	/	/	见附表 1
1.9	阻值误差	/	/	/	见附表 2

## 2. 可靠性

项目	测试条件及方法	技术要求
2.1 引出端强度	固定电阻端, 拉力: $5\pm 1\text{N}$ , 时间: $10\pm 1$ 秒	无可见性损伤 $R_{25} \Delta R/R \leq \pm 2\%$
2.2 可焊性	温度 $245\pm 5^\circ\text{C}$ 时间 2-3 秒	着锡面积 $\geq 95\%$
2.3 耐焊接热	锡锅温度: $260\pm 5^\circ\text{C}$ , 浸入深度距电阻体 6mm, 时间 $5\pm 1$ 秒	$R_{25} \Delta R/R \leq \pm 2\%$
2.4 稳态湿热	温度: $40^\circ\text{C} \pm 2^\circ\text{C}$ , 湿度: $93\pm 2\%$ , 时间: 500 小时	$R_{25} \Delta R/R \leq \pm 2\%$
2.5 温度快速变化	$-55^\circ\text{C} 30\text{min} \rightarrow 25^\circ\text{C} 5\text{min} \rightarrow 125^\circ\text{C} 30\text{min} \rightarrow 25^\circ\text{C} 5\text{min}$ , 反复 5 次	$R_{25} \Delta R/R \leq \pm 2\%$
2.6 高温储存	温度: $125^\circ\text{C} \pm 5^\circ\text{C}$ 时间: 1000 小时	$R_{25} \Delta R/R \leq \pm 2\%$
2.7 低温储存	温度: $-55^\circ\text{C}$ 时间: 1000 小时	$R_{25} \Delta R/R \leq \pm 2\%$

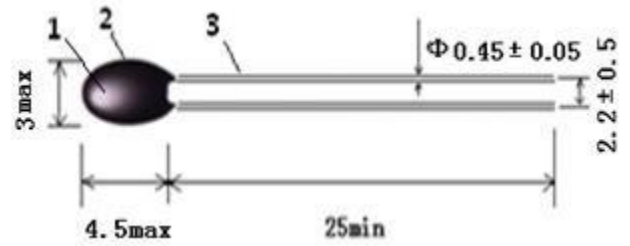
## 3. 使用注意事项

- 本产品的用途: 温度测量与控制;
- 避免流过热敏电阻芯片的电流引起元件自身发热而产生测量误差;
- 烙铁焊接时, 焊接处距涂装层距离至少 2mm, 焊接温度应低于  $300^\circ\text{C}$ , 焊接时间  $< 3\text{ses}$ ;
- 储存温度:  $-10^\circ\text{C} \sim 40^\circ\text{C}$ ; 储存湿度:  $\leq 75\% \text{RH}$ ;
- 避免存放在具有腐蚀性气体及光照的环境下;
- 包装打开后需重新密封保存。

## 4. 认证

- 质量管理体系认证 ISO9001:2008  
ISO/TS16949: 2009
- 环境管理体系认证 ISO14001:2015
- 环保检测报告 ROHS
- 产品 CQC 认证
- 江苏省高新技术产品认证
- UL 1434 认证 (File # E240991)

## 5. 外形尺寸: (单位: mm)



序号	名称	材料规格	数量	备注
1	元件	NTC 热敏电阻	1	
2	改性树脂	封装类树脂	1	黑色
3	导线	镀锡铜包钢线	2	银色

## 6. 产品型号说明

MF52 A 104 F 3950 A2

① ② ③ ④ ⑤ ⑥

- MF52: 珠状精密性 NTC 热敏电阻
- A: 引线为镀锡铜包钢线
- 104:  $25^\circ\text{C}$  的零功率电阻值  $100\text{K}\Omega$
- F: 阻值精度代码 F- $\pm 1\%$  G- $\pm 2\%$  H- $\pm 3\%$  J- $\pm 5\%$
- 3950:  $B_{25/50}$  值 3950K
- A2: 大头

附表 1

## 南京时恒阻温特性表

R25=100K $\Omega$  精度:±1% B25/50=3950K B25/85=4035K 精度:±1%(P209-15A)

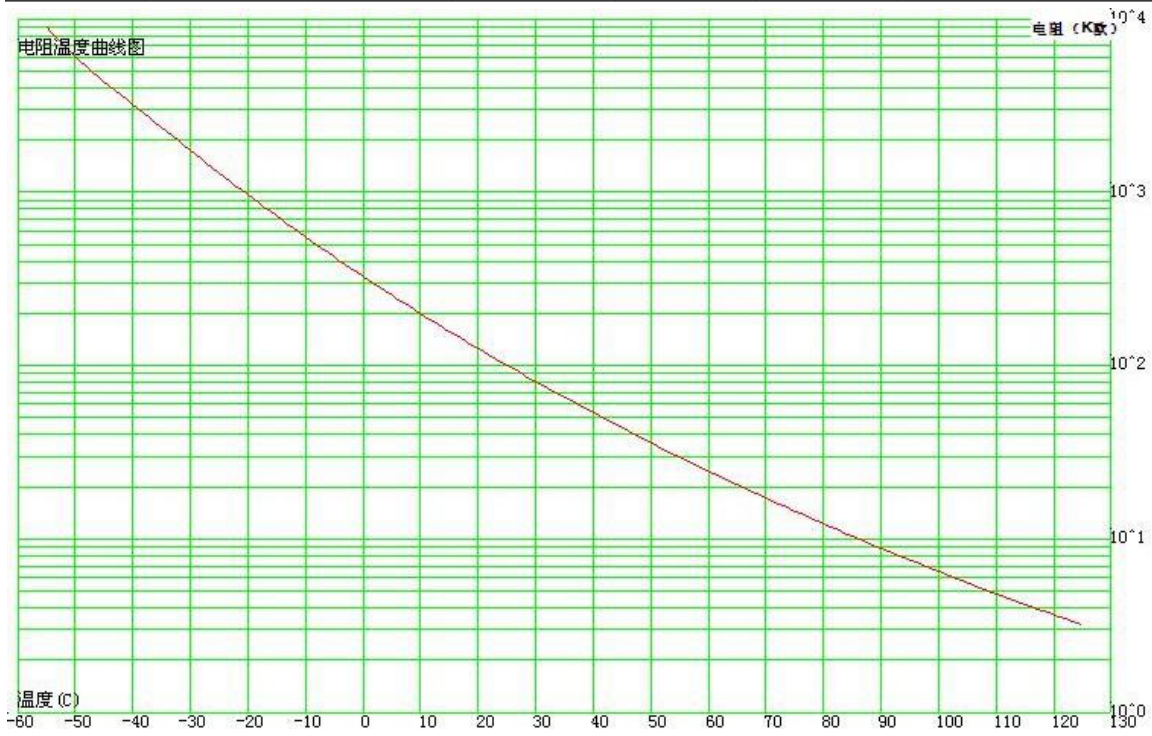
温度(°C)	电阻(K $\Omega$ )			电阻精度(%)		温度精度(°C)	
	最小值	中心值	最大值	$\Delta R$	$-\Delta R$	$\Delta T$	$-\Delta T$
-55	8507.640	8989.000	9496.630	5.647	-5.354	0.734	-0.696
-54	7808.060	8242.680	8700.630	5.555	-5.272	0.731	-0.693
-53	7198.510	7592.960	8008.240	5.469	-5.195	0.727	-0.691
-52	6661.830	7021.380	7399.600	5.386	-5.120	0.723	-0.687
-51	6184.840	6513.750	6859.480	5.307	-5.049	0.719	-0.684
-50	5757.270	6059.060	6376.030	5.231	-4.980	0.715	-0.681
-49	5371.090	5648.680	5940.010	5.157	-4.914	0.711	-0.677
-48	5019.960	5275.800	5544.120	5.085	-4.849	0.706	-0.674
-47	4698.840	4935.020	5182.540	5.015	-4.785	0.702	-0.670
-46	4403.680	4621.990	4850.640	4.946	-4.723	0.698	-0.666
-45	4131.210	4333.220	4544.640	4.879	-4.661	0.693	-0.662
-44	3878.770	4065.840	4261.510	4.812	-4.601	0.688	-0.658
-43	3644.170	3817.520	3998.710	4.746	-4.540	0.684	-0.654
-42	3425.600	3586.310	3754.190	4.680	-4.481	0.679	-0.650
-41	3221.550	3370.600	3526.190	4.616	-4.421	0.674	-0.646
-40	3030.730	3169.000	3313.230	4.551	-4.362	0.669	-0.641
-39	2852.050	2980.330	3114.080	4.487	-4.304	0.664	-0.637
-38	2684.570	2803.600	2927.620	4.423	-4.245	0.659	-0.632
-37	2527.450	2637.910	2752.920	4.359	-4.187	0.654	-0.628
-36	2379.960	2482.470	2589.130	4.296	-4.129	0.649	-0.623
-35	2241.460	2336.580	2435.500	4.233	-4.071	0.643	-0.619
-34	2111.350	2199.620	2291.360	4.170	-4.013	0.638	-0.614
-33	1989.100	2071.020	2156.090	4.107	-3.955	0.633	-0.609
-32	1874.220	1950.230	2029.120	4.045	-3.897	0.627	-0.604
-31	1766.260	1836.790	1909.950	3.982	-3.839	0.622	-0.600
-30	1664.790	1730.230	1798.070	3.920	-3.782	0.616	-0.595
-29	1569.420	1630.150	1693.050	3.858	-3.725	0.611	-0.590
-28	1479.790	1536.140	1594.470	3.797	-3.667	0.605	-0.585
-27	1395.560	1447.840	1501.920	3.735	-3.610	0.600	-0.580
-26	1316.390	1364.900	1415.050	3.674	-3.554	0.594	-0.574
-25	1241.980	1287.000	1333.500	3.613	-3.497	0.588	-0.569
-24	1172.060	1213.820	1256.950	3.553	-3.440	0.582	-0.564
-23	1106.340	1145.090	1185.090	3.492	-3.384	0.576	-0.559
-22	1044.570	1080.530	1117.620	3.432	-3.328	0.571	-0.553
-21	986.513	1019.890	1054.290	3.372	-3.272	0.565	-0.548
-20	931.936	962.912	994.819	3.313	-3.216	0.559	-0.542
-19	880.628	909.379	938.974	3.254	-3.161	0.552	-0.537
-18	832.387	859.074	886.528	3.195	-3.106	0.546	-0.531
-17	787.025	811.797	837.266	3.137	-3.051	0.540	-0.525
-16	744.361	767.359	790.988	3.079	-2.996	0.534	-0.520

-15	704.229	725.581	747.505	3.021	-2.942	0.528	-0.514
-14	666.472	686.296	706.640	2.964	-2.888	0.521	-0.508
-13	630.940	649.348	668.227	2.907	-2.834	0.515	-0.502
-12	597.496	614.590	632.110	2.850	-2.781	0.508	-0.496
-11	566.008	581.883	598.144	2.794	-2.728	0.502	-0.490
-10	536.356	551.100	566.192	2.738	-2.675	0.495	-0.484
-9	508.424	522.117	536.126	2.683	-2.622	0.489	-0.478
-8	482.105	494.824	507.828	2.628	-2.570	0.482	-0.471
-7	457.299	469.113	481.185	2.573	-2.518	0.475	-0.465
-6	433.912	444.886	456.092	2.518	-2.466	0.468	-0.459
-5	411.856	422.050	432.453	2.464	-2.415	0.461	-0.452
-4	391.048	400.518	410.175	2.411	-2.364	0.454	-0.446
-3	371.413	380.209	389.174	2.357	-2.313	0.447	-0.439
-2	352.878	361.048	369.370	2.305	-2.262	0.440	-0.432
-1	335.375	342.963	350.688	2.252	-2.212	0.433	-0.426
0	319.490	326.560	333.752	2.202	-2.164	0.426	-0.418
1	303.218	309.764	316.419	2.148	-2.113	0.419	-0.412
2	288.451	294.529	300.705	2.096	-2.063	0.412	-0.405
3	274.488	280.131	285.862	2.045	-2.014	0.404	-0.398
4	261.281	266.520	271.837	1.994	-1.965	0.397	-0.391
5	248.785	253.647	258.580	1.944	-1.917	0.389	-0.384
6	236.957	241.470	246.044	1.894	-1.868	0.382	-0.377
7	225.759	229.946	234.187	1.844	-1.820	0.374	-0.369
8	215.152	219.036	222.968	1.795	-1.773	0.367	-0.362
9	205.104	208.706	212.349	1.745	-1.725	0.359	-0.355
10	195.581	198.920	202.295	1.697	-1.678	0.351	-0.347
11	186.552	189.647	192.773	1.648	-1.631	0.343	-0.340
12	177.990	180.857	183.751	1.600	-1.584	0.335	-0.332
13	169.868	172.523	175.201	1.552	-1.538	0.327	-0.324
14	162.161	164.618	167.095	1.504	-1.492	0.319	-0.317
15	154.846	157.118	159.408	1.457	-1.446	0.311	-0.309
16	147.900	150.000	152.116	1.410	-1.400	0.303	-0.301
17	141.302	143.243	145.197	1.363	-1.355	0.295	-0.293
18	135.034	136.827	138.629	1.317	-1.309	0.287	-0.285
19	129.078	130.731	132.393	1.271	-1.264	0.278	-0.277
20	123.415	124.940	126.470	1.225	-1.220	0.270	-0.269
21	118.031	119.435	120.844	1.179	-1.175	0.262	-0.261
22	112.910	114.202	115.497	1.134	-1.131	0.253	-0.253
23	108.037	109.225	110.414	1.089	-1.087	0.245	-0.244
24	103.400	104.491	105.582	1.044	-1.043	0.236	-0.236
25	99.000	100.000	101.000	1.000	-1.000	0.228	-0.228
26	94.700	95.699	96.698	1.044	-1.043	0.238	-0.238
27	90.622	91.617	92.614	1.088	-1.086	0.250	-0.249
28	86.740	87.731	88.724	1.132	-1.129	0.262	-0.261
29	83.044	84.028	85.017	1.175	-1.172	0.273	-0.273

30	79.524	80.501	81.483	1.219	-1.214	0.285	-0.284
31	76.171	77.140	78.114	1.262	-1.256	0.297	-0.296
32	72.976	73.936	74.901	1.305	-1.298	0.309	-0.308
33	69.931	70.881	71.837	1.348	-1.340	0.321	-0.319
34	67.029	67.968	68.913	1.390	-1.381	0.333	-0.331
35	64.261	65.188	66.123	1.433	-1.422	0.346	-0.343
36	61.621	62.537	63.459	1.475	-1.463	0.358	-0.355
37	59.103	60.006	60.916	1.517	-1.504	0.370	-0.367
38	56.700	57.590	58.488	1.558	-1.544	0.383	-0.379
39	54.407	55.283	56.168	1.600	-1.585	0.395	-0.391
40	52.218	53.080	53.952	1.641	-1.625	0.408	-0.404
41	50.127	50.976	51.834	1.682	-1.664	0.421	-0.416
42	48.131	48.965	49.809	1.723	-1.704	0.433	-0.428
43	46.223	47.044	47.874	1.764	-1.743	0.446	-0.441
44	44.401	45.207	46.023	1.805	-1.782	0.459	-0.453
45	42.659	43.451	44.252	1.845	-1.821	0.472	-0.466
46	40.994	41.771	42.559	1.885	-1.860	0.485	-0.479
47	39.402	40.165	40.938	1.925	-1.898	0.498	-0.491
48	37.880	38.628	39.387	1.965	-1.937	0.511	-0.504
49	36.423	37.157	37.902	2.004	-1.975	0.525	-0.517
50	35.030	35.750	36.480	2.044	-2.013	0.538	-0.530
51	33.696	34.402	35.119	2.083	-2.050	0.551	-0.543
52	32.420	33.112	33.814	2.122	-2.088	0.565	-0.556
53	31.198	31.876	32.565	2.161	-2.125	0.579	-0.569
54	30.028	30.692	31.367	2.200	-2.162	0.592	-0.582
55	28.908	29.558	30.219	2.238	-2.199	0.606	-0.595
56	27.834	28.471	29.119	2.276	-2.235	0.620	-0.609
57	26.806	27.429	28.064	2.314	-2.272	0.634	-0.622
58	25.820	26.430	27.052	2.352	-2.308	0.648	-0.635
59	24.875	25.472	26.081	2.390	-2.344	0.662	-0.649
60	23.969	24.554	25.150	2.428	-2.380	0.676	-0.662
61	23.100	23.672	24.256	2.465	-2.416	0.690	-0.676
62	22.267	22.827	23.398	2.503	-2.451	0.704	-0.690
63	21.468	22.016	22.575	2.540	-2.486	0.719	-0.704
64	20.701	21.237	21.784	2.577	-2.522	0.733	-0.717
65	19.965	20.489	21.025	2.613	-2.557	0.748	-0.731
66	19.259	19.771	20.295	2.650	-2.591	0.762	-0.745
67	18.581	19.082	19.595	2.686	-2.626	0.777	-0.759
68	17.930	18.420	18.921	2.723	-2.660	0.792	-0.773
69	17.304	17.784	18.274	2.759	-2.694	0.806	-0.787
70	16.704	17.172	17.652	2.795	-2.728	0.821	-0.802
71	16.127	16.585	17.054	2.831	-2.762	0.836	-0.816
72	15.572	16.020	16.479	2.866	-2.796	0.851	-0.830
73	15.039	15.477	15.926	2.902	-2.829	0.866	-0.845
74	14.527	14.955	15.394	2.937	-2.863	0.882	-0.859

75	14.034	14.453	14.882	2.972	-2.896	0.897	-0.874
76	13.560	13.970	14.390	3.007	-2.929	0.912	-0.888
77	13.105	13.505	13.916	3.042	-2.962	0.928	-0.903
78	12.667	13.058	13.460	3.077	-2.995	0.943	-0.918
79	12.245	12.628	13.020	3.111	-3.027	0.959	-0.933
80	11.840	12.213	12.598	3.146	-3.059	0.974	-0.948
81	11.449	11.815	12.190	3.180	-3.092	0.990	-0.962
82	11.073	11.431	11.798	3.214	-3.124	1.006	-0.978
83	10.712	11.061	11.420	3.248	-3.155	1.022	-0.993
84	10.363	10.705	11.056	3.282	-3.187	1.038	-1.008
85	10.028	10.362	10.705	3.315	-3.219	1.054	-1.023
86	9.705	10.031	10.367	3.349	-3.250	1.070	-1.038
87	9.394	9.712	10.041	3.382	-3.281	1.086	-1.054
88	9.094	9.405	9.727	3.415	-3.312	1.102	-1.069
89	8.805	9.110	9.424	3.448	-3.343	1.119	-1.084
90	8.527	8.824	9.132	3.481	-3.374	1.135	-1.100
91	8.258	8.549	8.850	3.514	-3.404	1.152	-1.116
92	8.000	8.284	8.578	3.547	-3.435	1.168	-1.131
93	7.750	8.028	8.316	3.579	-3.465	1.185	-1.147
94	7.510	7.782	8.063	3.612	-3.495	1.202	-1.163
95	7.278	7.544	7.819	3.644	-3.525	1.218	-1.179
96	7.054	7.314	7.583	3.676	-3.555	1.235	-1.195
97	6.838	7.093	7.356	3.708	-3.585	1.252	-1.211
98	6.630	6.879	7.136	3.739	-3.614	1.269	-1.227
99	6.429	6.673	6.924	3.771	-3.644	1.286	-1.243
100	6.236	6.474	6.720	3.802	-3.673	1.304	-1.259
101	6.049	6.281	6.522	3.834	-3.702	1.321	-1.275
102	5.868	6.096	6.331	3.865	-3.731	1.338	-1.292
103	5.694	5.916	6.147	3.896	-3.759	1.356	-1.308
104	5.526	5.743	5.969	3.927	-3.788	1.373	-1.325
105	5.363	5.576	5.797	3.957	-3.816	1.391	-1.341
106	5.207	5.415	5.631	3.988	-3.845	1.408	-1.358
107	5.055	5.259	5.470	4.018	-3.873	1.426	-1.374
108	4.909	5.108	5.315	4.049	-3.901	1.444	-1.391
109	4.768	4.963	5.165	4.079	-3.928	1.462	-1.408
110	4.632	4.822	5.021	4.109	-3.956	1.480	-1.425
111	4.500	4.687	4.881	4.138	-3.983	1.498	-1.442
112	4.373	4.555	4.745	4.168	-4.011	1.516	-1.459
113	4.250	4.428	4.614	4.197	-4.038	1.534	-1.476
114	4.131	4.306	4.488	4.227	-4.065	1.553	-1.493
115	4.016	4.187	4.366	4.256	-4.091	1.571	-1.511
116	3.905	4.073	4.247	4.285	-4.118	1.590	-1.528
117	3.798	3.962	4.133	4.313	-4.144	1.608	-1.545
118	3.694	3.855	4.022	4.342	-4.171	1.627	-1.563
119	3.594	3.751	3.915	4.370	-4.197	1.646	-1.580

120	3.497	3.651	3.812	4.398	-4.223	1.664	-1.598
121	3.404	3.555	3.712	4.427	-4.248	1.683	-1.616
122	3.313	3.461	3.615	4.454	-4.274	1.702	-1.633
123	3.226	3.371	3.522	4.482	-4.299	1.721	-1.651
124	3.141	3.283	3.431	4.510	-4.324	1.740	-1.669
125	3.059	3.199	3.344	4.537	-4.349	1.760	-1.687



附表 2

南京时恒阻值误差曲线图



