

热敏电阻承认书

SPECIFICATION FOR APPROVAL

客 户 名 称

Customer :

品 名

Part Name :

环氧封装热敏电阻

Epoxy Encapsulated Thermistor

客户料号

Customer Part No:

承 認 規 格

Approve Item:

R25=10K Ω B25/100=3988 $\pm$ 1%

供应商料号

Part Number :

日 期

Date :

2022-06-07

客户承认

Customer approval

供应商承认

Supplier admit that



规格目录中所列的产品, 材料和尺寸其他内容如有更改, 恕不另行通知。

Specifications of products, materials and dimensions listed in the specification catalog are subject to change without prior notice.

技术规格书 Technical Specifications

1) 产品型号 Product Model: MF52A-103F3988L30

型号 Model	MF52	A	103	F	3988	L30mm
说明 Illustration	NTC 环氧封装 热敏电阻 NTC epoxy encapsulation thermistor	引线为 CP 线 CP lines as the leading wires	电阻值 Resistance value $10 \times 10^3 \Omega$	阻值精度 Resistance accuracy $F = \pm 1\%$	$B_{25/100} = 3988K$	引线长 Length of the terminal

本产品广泛应用于家用电器、汽车电子、工业设备的温度测量与控制，符合欧盟 ROHS 环保要求。
This product is widely used in household appliances, automotive electronics, industrial equipment temperature measurement and control, in line with the EU ROHS environmental protection requirements.

2) 产品外形尺寸 Product Dimensions:

单位 Unit (mm)



序号 Serial Number	D	L1	L2	d	F
规格 Specification	2.0 ± 0.3	3.5max	30 ± 1	0.4 ± 0.05	1.8 ± 0.3

3) 材料 Material:

1. 封装材料 Encapsulation material: epoxy resin
2. 引线 Leading wire: CP 线 CP line
3. 颜色 Color: 黑色 Black

4) 电气性能 Electrical Properties:

项目 Project	符号 Symbol	测试条件 Test Conditions	Rmin	Rnor	Rmax	单位 Unit
25°C 的电阻值 Resistance Value of 25°C	R25	$T_a = 25 \pm 0.05^\circ\text{C}$ $PT \leq 0.1\text{mw}$	9.900	10.000	10.100	K Ω
100°C 的电阻 值 Resistance	R100	$T_a = 100 \pm 0.05^\circ\text{C}$ $PT \leq 0.1\text{mw}$	/	0.688	/	K Ω

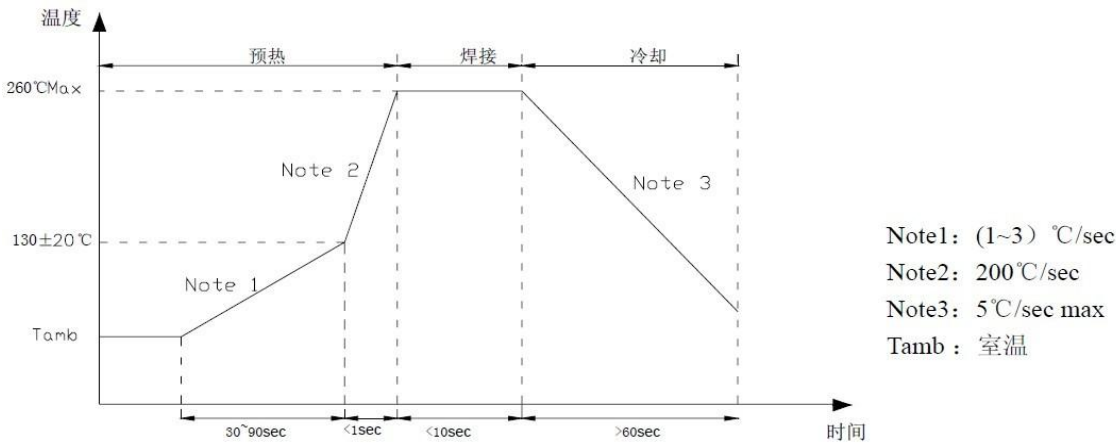
value at 100°C						
B 值 B Value	B25/100	$B = \frac{\ln(R_{T1}) - \ln(R_{T2})}{(1/T1 - 1/T2)}$	/	3988	/	K
耗散系数 Dissipation Coefficient	σ	Ta=25±0.5℃	3	/	/	mw/℃
热时间常数 Thermal Time Constant	τ	Ta=25±0.5℃ (在空气中 in the air)	/	/	12	sec
绝缘电阻 Insulation Resistance	/	500VDC	50	/	/	MΩ
使用温度范围 Operating Temperature Range	/	/	-30	/	+ 125	℃

5) 可靠性试验 Reliability Test:

项目 project	技术要求 Technical requirements	测试条件及方法 Test conditions and methods
可焊性 Solderability	引出端焊料自由流动和浸润良好, 上锡面积 95%以上 The solder of the terminal has free flow and good wetting, and the tin area is more than 95%	将引出端沾助焊剂后, 浸入温度为 230±5℃ 锡槽中, 锡面距 NTC 本体下端 2-2.5mm 处, 持续 2±0.5S (参照 IEC60068-2-20 试验 Ta /GB2423.28 Ta) After dipping the lead end with flux, immerse it in a tin bath with a temperature of 230±5℃, and the tin surface is 2-2.5mm away from the lower end of the NTC body for 2±0.5S (refer to IEC60068-2-20 test Ta /GB2423.28 Ta)
耐焊接热 Welding Heat Resistance	无可见性损伤 No visible damage $\Delta R/R_{25} \leq \pm 2\%$	将引出端浸入温度为 260±5℃ 锡槽中, 锡面距 NTC 本体下端 2-2.5mm 处, 持续时间: 10±1S (参照 IEC60068-2-20 试验 Tb/GB2423.28 Tb) Immerse the terminal into a tin bath with a temperature of 260±5℃, and the tin surface is 2-2.5mm away from the lower end of the NTC body, duration: 10±1S (refer to IEC60068-2-20 test Tb/GB2423.28 Tb)
引出端强度 Terminal Strength	无脱落 No shedding $\Delta R/R_{25} \leq \pm 2\%$	试验 Ua: 拉力 10N, 持续 10S; 试验 Ub: 弯曲 90 度, 拉力 5N, 连续两次; (参照 IEC60068-2-21 / GB2423.29 U 试验) Test Ua: tension 10N, lasting 10S; Test Ub: bend 90 degrees, pull 5N, twice in a row; (refer to IEC60068-2-21 / GB2423.29 U test)
高温试验 High Temperature Test	$\Delta R/R_{25} \leq \pm 2\%$	100±5℃, 通电 1000±24h, DC0.2mA (参照 IEC60068-2-2/GB2423.2 试验) 100±5℃, power on for 1000±24hrs, DC0.2mA (refer to IEC60068-2-2/GB2423.2 test)

低温试验 Low Temperature Test	$\Delta R/R_{25} \leq \pm 2\%$	- 40±5℃，通电 1000±24h，DC0.2mA (参照 IEC60068-2-1/GB2423.1 试验) -40±5℃, power on for 1000±24hrs, DC0.2mA (refer to IEC60068-2-1/GB2423.1 test)
耐潮湿试验 Moisture Resistance Test	$\Delta R/R_{25} \leq \pm 2\%$	40±2℃, 90%-95%RH 环境下放置 1000±24h (参照 IEC60068-2-3/GB2423.3 试验) Placed under 40±2℃, 90%-95%RH for 1000±24hrs (refer to IEC60068-2-3/GB2423.3 test)
温度冷热循环试验 Hot and Cold Cycle Test	$\Delta R/R_{25} \leq \pm 2\%$	- 40℃×30min→30℃×5min→100℃×30min→30℃×5min, 反复 5 次 (参照 IEC60068-2-14/GB2423.22 试验) -40℃×30min→30℃×5min→100℃×30min→30℃×5min, repeat 5 times (refer to IEC60068-2-14/GB2423.22 test)

6) 波峰焊示意图 Wave Soldering Schematic:



7) 包装方式 Packaging:

散装数量: 500Pcs/袋; 20 袋/盒; 10 盒/箱
Bulk quantity: 500Pcs/bag; 20 bags/box; 10 boxes/carton

8) 储存条件 Storage conditions:

- 1、存储温度(Storage Temperature): -10℃~+40℃
- 2、相对湿度(Relative Humidity): ≤75%RH
- 3、不要将本产品存放在有腐蚀性气体或是阳光直接照射的环境中保管。
Do not store this product in an environment with corrosive gases or direct sunlight.

9) R-T 特性表 (附件 1) R-T Characteristic Table (Annex 1)

NTC 热敏电阻 R-T 表 NTC Thermistor R-T Meter							
R25=10KΩ；精度 Precision: ±1%; B25/100=3988K; 精度 Precision: ±1%; (ZC2112-005)							
温度 Temperature (℃)	Rmin	Rnor	Rmax	温度 Temperature (℃)	Rmin	Rnor	Rmax
-20	93.762	96.884	100.100	16	14.798	15.008	15.220
-19	88.548	91.444	94.425	17	14.137	14.331	14.526

-18	83.656	86.342	89.106	18	13.509	13.688	13.868
-17	79.064	81.556	84.119	19	12.912	13.077	13.243
-16	74.751	77.064	79.440	20	12.344	12.497	12.650
-15	70.700	72.846	75.050	21	11.806	11.946	12.087
-14	66.892	68.884	70.929	22	11.293	11.422	11.552
-13	63.313	65.162	67.059	23	10.805	10.924	11.043
-12	59.946	61.663	63.423	24	10.342	10.451	10.560
-11	56.778	58.372	60.005	25	9.900	10.000	10.100
-10	53.796	55.276	56.792	26	9.471	9.571	9.671
-9	50.988	52.363	53.770	27	9.063	9.163	9.263
-8	48.344	49.621	50.926	28	8.676	8.775	8.874
-7	45.852	47.038	48.250	29	8.307	8.405	8.504
-6	43.504	44.605	45.730	30	7.954	8.052	8.150
-5	41.289	42.312	43.356	31	7.620	7.717	7.814
-4	39.199	40.149	41.118	32	7.301	7.397	7.494
-3	37.227	38.110	39.010	33	6.997	7.092	7.188
-2	35.367	36.187	37.022	34	6.707	6.801	6.896
-1	33.610	34.371	35.146	35	6.430	6.523	6.616
0	31.950	32.657	33.376	36	6.167	6.259	6.351
1	30.382	31.038	31.705	37	5.916	6.006	6.097
2	28.899	29.509	30.128	38	5.676	5.765	5.855
3	27.498	28.064	28.639	39	5.447	5.535	5.624
4	26.172	26.697	27.230	40	5.230	5.316	5.403
5	24.918	25.405	25.899	41	5.021	5.106	5.192
6	23.731	24.183	24.641	42	4.821	4.905	4.989
7	22.606	23.026	23.451	43	4.632	4.714	4.797
8	21.543	21.932	22.326	44	4.450	4.531	4.613
9	20.534	20.895	21.260	45	4.277	4.356	4.436
10	19.579	19.913	20.251	46	4.110	4.188	4.267
11	18.673	18.983	19.296	47	3.952	4.028	4.105
12	17.814	18.101	18.391	48	3.800	3.875	3.951
13	17.000	17.266	17.534	49	3.654	3.728	3.803
14	16.227	16.473	16.721	50	3.516	3.588	3.661
15	15.494	15.721	15.950	51	3.383	3.454	3.526
温度 Temperature (℃)	Rmin	Rnor	Rmax	温度 Temperature (℃)	Rmin	Rnor	Rmax
52	3.256	3.325	3.395	89	0.901	0.932	0.964
53	3.134	3.202	3.271	90	0.874	0.904	0.935
54	3.017	3.084	3.152	91	0.846	0.876	0.907

55	2.906	2.971	3.037	92	0.821	0.850	0.880
56	2.799	2.863	2.928	93	0.796	0.824	0.853
57	2.696	2.759	2.823	94	0.771	0.799	0.828
58	2.599	2.660	2.722	95	0.748	0.775	0.803
59	2.504	2.564	2.625	96	0.725	0.752	0.779
60	2.414	2.473	2.533	97	0.704	0.730	0.757
61	2.328	2.385	2.444	98	0.684	0.709	0.735
62	2.245	2.301	2.358	99	0.663	0.688	0.714
63	2.165	2.220	2.276	100	0.644	0.668	0.693
64	2.088	2.142	2.197	101	0.624	0.648	0.673
65	2.015	2.068	2.122	102	0.607	0.630	0.654
66	1.944	1.996	2.049	103	0.589	0.612	0.636
67	1.878	1.928	1.980	104	0.572	0.594	0.617
68	1.813	1.862	1.912	105	0.555	0.577	0.600
69	1.750	1.798	1.847	106	0.540	0.561	0.583
70	1.690	1.737	1.785	107	0.524	0.545	0.567
71	1.633	1.679	1.726	108	0.510	0.530	0.551
72	1.577	1.622	1.668	109	0.495	0.515	0.536
73	1.524	1.568	1.613	110	0.481	0.501	0.521
74	1.473	1.516	1.560	111	0.468	0.487	0.507
75	1.424	1.466	1.509	112	0.455	0.474	0.494
76	1.377	1.418	1.460	113	0.443	0.461	0.480
77	1.331	1.371	1.412	114	0.430	0.448	0.467
78	1.287	1.327	1.368	115	0.418	0.436	0.454
79	1.245	1.284	1.324	116	0.407	0.424	0.442
80	1.205	1.243	1.282	117	0.396	0.413	0.431
81	1.166	1.203	1.241	118	0.385	0.402	0.419
82	1.128	1.164	1.201	119	0.375	0.391	0.408
83	1.092	1.127	1.163	120	0.365	0.381	0.398
84	1.057	1.092	1.128	121	0.355	0.371	0.387
85	1.024	1.058	1.093	122	0.346	0.361	0.377
86	0.991	1.024	1.058	123	0.337	0.352	0.368
87	0.961	0.993	1.026	124	0.328	0.343	0.358
88	0.930	0.962	0.995	125	0.320	0.334	0.349