MEC

产 品 规 格 书

（第　1　次送样）

客　户:

名　称：温补型 NTC 热敏电阻器

型　号:　　**MF11 103M4200**

拟制		审查		批准	
日期	2016-4-13	日期	2016-4-13	日期	2016-4-13

客 户 承 认

兹同意此规格书作为我公司 MF11 10K 系列电阻

的验收标准。

工程 _____　　品质 _____　　采购 _____

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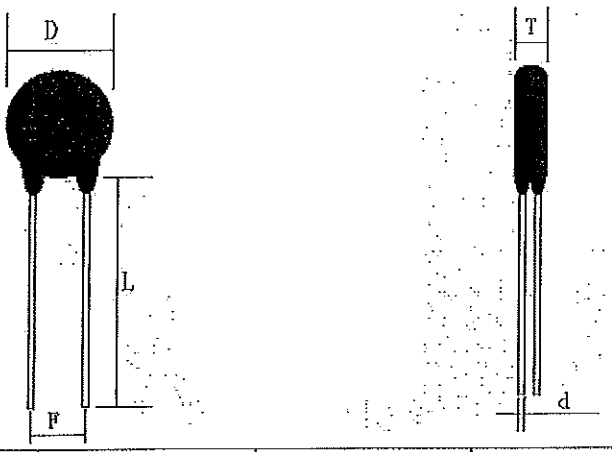
1 、一般参数（Common Parameters）：

（1）尺寸（mm）（Size）



DMax	LMin	F	TMax	d
6.5	25.0	2.5±1.0	5.0	0.45±0.06

（2）材料 （Materials）

①封装材料（Wrapper） ： 环氧树脂（Silicone）

②引线（Down-lead） ： 镀锡电子线（Tinned Electron Wire）

③颜色（Coating color） ： 黑色（Black）

2、主要技术参数（Parameters of Technology）：

①25℃时零功率电阻值（Ω）（Zero Power Resistance at 25℃） ： 10000±20%

②B 值 25/50℃（K）（B Value） ： 4200±5%

③热时间常数(S) (Thermal Time Constant) ： ≤30

④热耗散系数（mW/℃）(Thermal Dissipation Constant) ： ≥6

⑤工作温度（℃）(Operating Temperature) ： -40 - +125

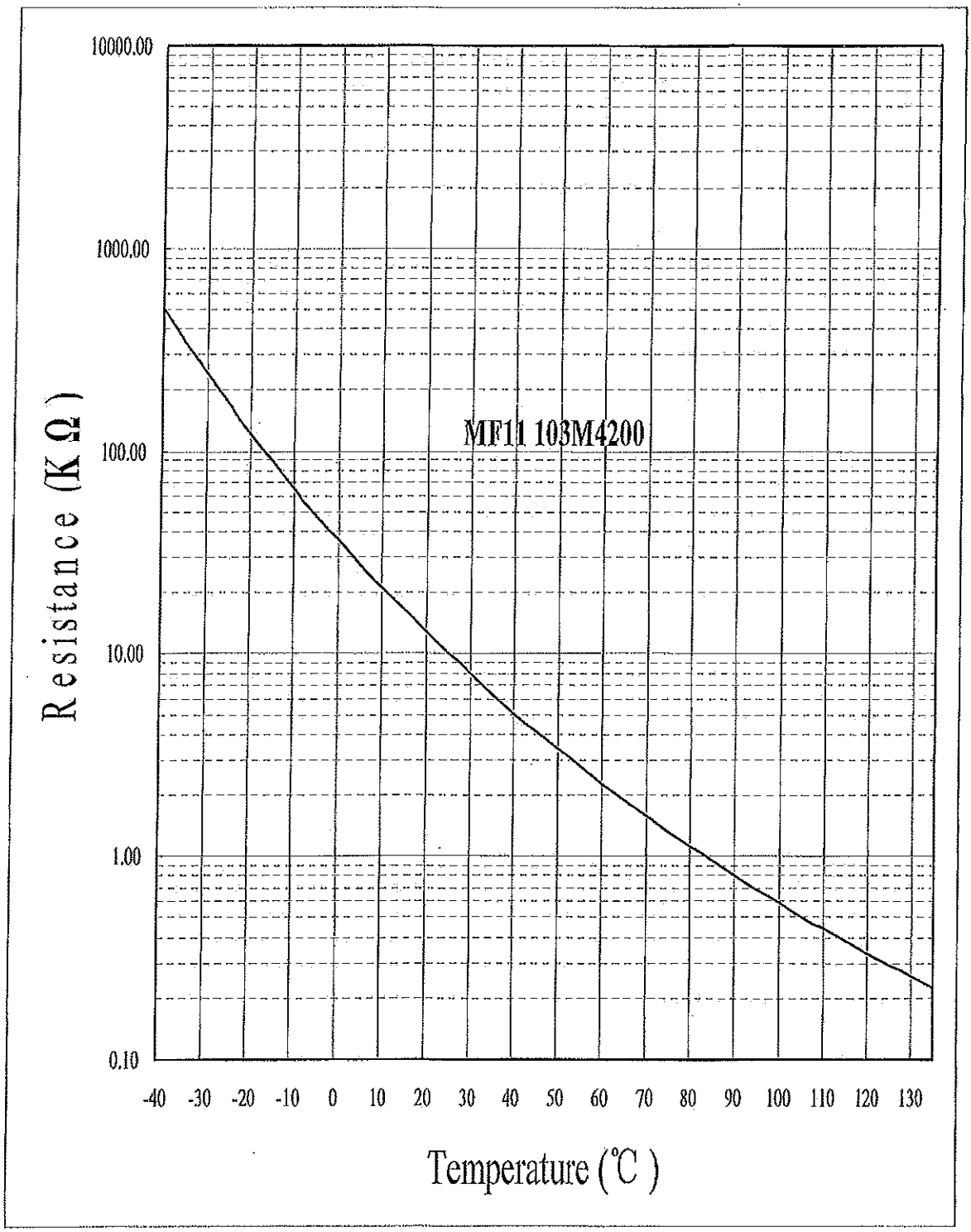
⑥绝缘电阻(MΩ)（Insulating Resistance） ： ≥100

3. 电气性能及要求（electrical properties and requirements）

项目	测试方法	性能要求
零功率电阻值 Zero Power Resistance	在25℃下，当由于电阻体内部发热引起的电阻值变化相对于总测量误差可以忽略不计时所测得的电阻值。 At 25℃, the measured resistance value can be neglected compared to the general tolerance when the change of the resistance is made through its self-heat of the resistor.	见电特性参数 See Electrical Parameters
B 值 B-value	B值可以用25℃和50℃时的零功率电阻值计算出来。其计算公式是： $B=\frac{T1*T2}{T2-T1}*\ln\left(\frac{R1}{R2}\right)$ The B value can be calculated using the zero power resistance value at 25℃ and 50℃. The equation is as above.	见电特性参数 See Electrical Parameters
热耗散系数 Thermal Dissipation Constant	在规定的温度下，热敏电阻中耗散的功率变化与热敏电阻相应温度变化之比。其单位：mw/℃ The ratio of the change of the dissipation power to the corresponding change of the temperature at specified temperature. The unit is: mw/℃	见电特性参数 See Electrical Parameters
热时间常数 ThermalTimeConstant	在零功率条件下，当温度发生变化时，热敏电阻的温度变化为其初始的和最终的温度差的63.2%所需的时间。 Under zero power condition, thermal time constant is the time required by a thermistor that its body temperature reach 63.2% of the difference between its initial and final temperature.	见电特性参数 See Electrical Parameters
工作温度 Operating Temperature	热敏电阻器长期连续工作所允许的温度范围。 Allowable temperature range while the thermistor work continuously for long time	-40~+125℃

稳态湿热 Damp Heat	温度 40±2℃，相对湿度 93±3%，存放 1000±2 小时后，在正常状态下 1 小时。 The sample should be subjected to 40±2℃, relative humidity 93±3% for 1000±2 hours, then stored at room temperature and humidity for 1 hour.	无可见损伤、标志清晰、无击穿或飞弧，绝缘电阻大于 100MΩ。电阻值的最大变化率在±15%以内。 No visible damage, the mark is clear, no breakdown or arcing. Insulating resistance is>100MΩ. The change ratio of the resistance is within ±15%.
耐 电 压 Withstand Voltage	施加 700ACV 电压，时间 60S，电压加在电阻器引线与绝缘层之间 Applied AC voltage of 700v between the lead of the resistor and the insulating coating for 60S	无击穿或飞弧 No breakdown or arcing
耐焊接热 Resistance to Soldering Heat	将热敏电阻器引线在 260±10℃ 的焊锡液里，液面距电阻体 6mm 时间 10S。在室温下恢复到原来的状态。 Immerse the lead of the resistor into tin liquor of 260±10℃ for 10S, the distance from the liquor surface to the resistor is 6mm. Then resume to the original state.	无可见损伤、电阻值的最大变化率在±15%以内 No visible damage. The max change ratio of the resistance is within±15%
可 焊 性 Solderability	引线浸在 260±10℃的锡液里，时间 3 秒。 浸锡温度：260±5℃ 手锡温度：260±5℃(5s) Immerse the lead into tin liquor of 260±10℃ for 3 sec. The temperature of immerse welding: 260±5℃, The temperature of hand welding: 260±5℃ (5s)	焊锡涂布面积在 90%以上 The covered surface area should be above 90%
引出端变曲强度 Bending Strength of Terminals	固定电阻体，在一根引出端悬挂 0.5kg 重力变曲 90 度；然后再回复，再把方向弯曲 90 度 Fix the resistor, hanging a force of 0.5kg to one terminal to bend it by 90 degree, then resume to the original state, bend it by 90 degree again.	无可见损伤 NO visible damage

振　动 Vibration	频率：10-50HZ；振幅：1.55mm 方向和时间：X、Y 及 Z 轴各 2 个小时 Frequency: 10-50HZ, Wave Amplitude:1.55mm. Direction and Time: 2 hours respectively for X, Y and Z axis.	无机械损伤 No mechanical damage
绝缘电阻 Insulation resistance	施加 500DCV 电压，时间 60s，电压加在电阻器引线与绝缘层之间 Applied DC voltage of 500v between the lead of the resistor and the insulating coating for 60s	伤绝缘电阻≥100MΩ 无击穿或飞弧 Insulation resistance ≥ 100MΩ No breakdown or arcing
温度快速变化 Temperature Rapid Change	-40℃/30 ⟶ 25℃/5 ⟶ +160℃/30 ⟶ 25℃/5	电阻变化率±20% The change ratio of the resistance is± 20%
储存条件 Storage conditions	-10℃ ～ 40℃　RH≤75%	


10000.00
1000.00
100.00
10.00
1.00
0.10
Resistance (KΩ)
MF11 103M4200
-40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130
Temperature (℃)

MEC

型号： **MF11 103M4200**

R： 10000 ohms ± 20%
B： 4200 °K ± 5%

温度	阻值 (Ω)			温度系数	阻值精度偏差 (%)		测温精度偏差 (℃)	
(℃)	上限值	中心值	下限值	(%/℃)	最小	最大	最小	最大
0.0	27231.7471	36306.5311	46469.2047	-5.63	-24.99	27.99	-4.97	4.44
0.5	26514.4482	35300.5678	45118.2266	-5.61	-24.89	27.81	-4.96	4.44
1.0	25818.5590	34325.9979	43811.2431	-5.59	-24.78	27.63	-4.94	4.43
1.5	25143.3704	33381.7387	42546.6771	-5.57	-24.68	27.45	-4.93	4.43
2.0	24488.1988	32466.7484	41323.0132	-5.55	-24.57	27.28	-4.92	4.43
2.5	23852.3856	31580.0242	40138.7947	-5.53	-24.47	27.10	-4.90	4.43
3.0	23235.2957	30720.6005	38992.6213	-5.51	-24.37	26.93	-4.89	4.42
3.5	22636.3167	29887.5482	37883.1470	-5.49	-24.26	26.75	-4.87	4.42
4.0	22054.8584	29079.9722	36809.0774	-5.47	-24.16	26.58	-4.86	4.42
4.5	21490.3515	28297.0108	35769.1677	-5.45	-24.05	26.41	-4.85	4.41
5.0	20942.2470	27537.8340	34762.2208	-5.43	-23.95	26.23	-4.83	4.41
5.5	20410.0152	26801.6426	33787.0853	-5.41	-23.85	26.06	-4.82	4.41
6.0	19893.1453	26087.6663	32842.6534	-5.39	-23.75	25.89	-4.80	4.41
6.5	19391.1446	25395.1632	31927.8596	-5.37	-23.64	25.72	-4.79	4.40
7.0	18903.5375	24723.4186	31041.6783	-5.35	-23.54	25.56	-4.78	4.40
7.5	18429.8651	24071.7434	30183.1227	-5.33	-23.44	25.39	-4.76	4.39
8.0	17969.6845	23439.4738	29351.2430	-5.31	-23.34	25.22	-4.75	4.39
8.5	17522.5685	22825.9699	28545.1250	-5.30	-23.23	25.06	-4.73	4.39
9.0	17088.1043	22230.6148	27763.8886	-5.28	-23.13	24.89	-4.72	4.38
9.5	16665.8937	21652.8136	27006.6864	-5.26	-23.03	24.73	-4.70	4.38
10.0	16255.5522	21091.9931	26272.7025	-5.24	-22.93	24.56	-4.69	4.38
10.5	15856.7083	20547.6002	25561.1511	-5.22	-22.83	24.40	-4.67	4.37
11.0	15469.0036	20019.1016	24871.2755	-5.20	-22.73	24.24	-4.66	4.37
11.5	15092.0916	19505.9829	24202.3466	-5.18	-22.63	24.08	-4.64	4.37
12.0	14725.6379	19007.7480	23553.6623	-5.17	-22.53	23.92	-4.63	4.36
12.5	14369.3193	18523.9181	22924.5459	-5.15	-22.43	23.76	-4.61	4.36
13.0	14022.8237	18054.0315	22314.3454	-5.13	-22.33	23.60	-4.60	4.35
13.5	13685.8492	17597.6424	21722.4326	-5.11	-22.23	23.44	-4.59	4.35

14.0	13358.1045	17154.3208	21148.2020	-5.09	-22.13	23.28	-4.57	4.34
14.5	13039.3079	16723.6515	20591.0698	-5.08	-22.03	23.13	-4.56	4.34
15.0	12729.1871	16305.2340	20050.4735	-5.06	-21.93	22.97	-4.54	4.34
15.5	12427.4789	15898.6813	19525.8705	-5.04	-21.83	22.81	-4.53	4.33
16.0	12133.9290	15503.6201	19016.7378	-5.02	-21.73	22.66	-4.51	4.33
16.5	11848.2913	15119.6897	18522.5711	-5.01	-21.64	22.51	-4.50	4.32
17.0	11570.3280	14746.5421	18042.8837	-4.99	-21.54	22.35	-4.48	4.32
17.5	11299.8092	14383.8408	17577.2066	-4.97	-21.44	22.20	-4.47	4.31
18.0	11036.5125	14031.2611	17125.0870	-4.95	-21.34	22.05	-4.45	4.31
18.5	10780.2227	13688.4893	16686.0885	-4.94	-21.25	21.90	-4.43	4.30
19.0	10530.7317	13355.2222	16259.7895	-4.92	-21.15	21.75	-4.42	4.30
19.5	10287.8384	13031.1670	15845.7837	-4.90	-21.05	21.60	-4.40	4.29
20.0	10051.3479	12716.0408	15443.6785	-4.89	-20.96	21.45	-4.39	4.29
20.5	9821.0718	12409.5700	15053.0955	-4.87	-20.86	21.30	-4.37	4.28
21.0	9596.8278	12111.4905	14673.6690	-4.85	-20.76	21.15	-4.36	4.28
21.5	9378.4394	11821.5468	14305.0463	-4.84	-20.67	21.01	-4.34	4.27
22.0	9165.7359	11539.4920	13946.8866	-4.82	-20.57	20.86	-4.33	4.27
22.5	8958.5520	11265.0873	13598.8610	-4.81	-20.48	20.72	-4.31	4.26
23.0	8756.7276	10998.1020	13260.6519	-4.79	-20.38	20.57	-4.30	4.26
23.5	8560.1079	10738.3129	12931.9525	-4.77	-20.28	20.43	-4.28	4.25
24.0	8368.5427	10485.5042	12612.4666	-4.76	-20.19	20.28	-4.26	4.24
24.5	8181.8870	10239.4672	12301.9079	-4.74	-20.09	20.14	-4.25	4.24
25.0	8000.0000	10000.0000	12000.0000	-4.72	-20.00	20.00	-4.23	4.23
25.5	7804.3171	9766.9074	11734.1183	-4.71	-20.09	20.14	-4.28	4.27
26.0	7614.0513	9540.0004	11474.9874	-4.69	-20.19	20.28	-4.32	4.30
26.5	7429.0362	9319.0963	11222.4158	-4.68	-20.28	20.42	-4.37	4.34
27.0	7249.1111	9104.0182	10976.2176	-4.66	-20.37	20.56	-4.41	4.37
27.5	7074.1208	8894.5950	10736.2129	-4.65	-20.47	20.70	-4.46	4.40
28.0	6903.9150	8690.6610	10502.2274	-4.63	-20.56	20.84	-4.50	4.44
28.5	6738.3487	8492.0561	10274.0921	-4.62	-20.65	20.98	-4.55	4.47
29.0	6577.2815	8298.6249	10051.6435	-4.60	-20.74	21.12	-4.59	4.51
29.5	6420.5777	8110.2174	9834.7226	-4.59	-20.83	21.26	-4.64	4.54
30.0	6268.1061	7926.6880	9623.1759	-4.57	-20.92	21.40	-4.68	4.58
30.5	6119.7399	7747.8961	9416.8541	-4.56	-21.01	21.54	-4.73	4.61
31.0	5975.3562	7573.7052	9215.6128	-4.54	-21.10	21.68	-4.77	4.65
31.5	5834.8365	7403.9833	9019.3119	-4.53	-21.19	21.82	-4.82	4.68
32.0	5698.0657	7238.6026	8827.8154	-4.51	-21.28	21.95	-4.87	4.72
32.5	5564.9330	7077.4391	8640.9916	-4.50	-21.37	22.09	-4.91	4.75
33.0	5435.3306	6920.3730	8458.7127	-4.48	-21.46	22.23	-4.96	4.79

33.5	5309.1547	6767.2880	8280.8549	-4.47	-21.55	22.37	-5.01	4.82
34.0	5186.3046	6618.0716	8107.2979	-4.45	-21.63	22.50	-5.05	4.86
34.5	5066.6828	6472.6145	7937.9252	-4.44	-21.72	22.64	-5.10	4.89
35.0	4950.1950	6330.8111	7772.6235	-4.42	-21.81	22.77	-5.15	4.93
35.5	4836.7500	6192.5589	7611.2832	-4.41	-21.89	22.91	-5.20	4.97
36.0	4726.2594	6057.7586	7453.7979	-4.39	-21.98	23.05	-5.24	5.00
36.5	4618.6375	5926.3140	7300.0641	-4.38	-22.07	23.18	-5.29	5.04
37.0	4513.8017	5798.1318	7149.9816	-4.37	-22.15	23.32	-5.34	5.07
37.5	4411.6716	5673.1215	7003.4532	-4.35	-22.24	23.45	-5.39	5.11
38.0	4312.1696	5551.1955	6860.3843	-4.34	-22.32	23.58	-5.44	5.14
38.5	4215.2204	5432.2687	6720.6832	-4.32	-22.40	23.72	-5.48	5.18
39.0	4120.7512	5316.2586	6584.2610	-4.31	-22.49	23.85	-5.53	5.22
39.5	4028.6912	5203.0854	6451.0313	-4.30	-22.57	23.98	-5.58	5.25
40.0	3938.9723	5092.6714	6320.9101	-4.28	-22.65	24.12	-5.63	5.29
40.5	3851.5279	4984.9415	6193.8161	-4.27	-22.74	24.25	-5.68	5.33
41.0	3766.2941	4879.8226	6069.6700	-4.26	-22.82	24.38	-5.73	5.36
41.5	3683.2084	4777.2442	5948.3952	-4.24	-22.90	24.52	-5.78	5.40
42.0	3602.2107	4677.1373	5829.9169	-4.23	-22.98	24.65	-5.83	5.43
42.5	3523.2425	4579.4355	5714.1627	-4.22	-23.06	24.78	-5.88	5.47
43.0	3446.2471	4484.0741	5601.0622	-4.20	-23.14	24.91	-5.93	5.51
43.5	3371.1696	4390.9904	5490.5470	-4.19	-23.23	25.04	-5.98	5.54
44.0	3297.9568	4300.1235	5382.5506	-4.18	-23.31	25.17	-6.03	5.58
44.5	3226.5570	4211.4142	5277.0086	-4.16	-23.39	25.30	-6.08	5.62
45.0	3156.9202	4124.8053	5173.8582	-4.15	-23.46	25.43	-6.13	5.66
45.5	3088.9980	4040.2410	5073.0384	-4.14	-23.54	25.56	-6.18	5.69
46.0	3022.7431	3957.6673	4974.4901	-4.12	-23.62	25.69	-6.23	5.73
46.5	2958.1100	3877.0318	4878.1555	-4.11	-23.70	25.82	-6.28	5.77
47.0	2895.0544	3798.2834	4783.9788	-4.10	-23.78	25.95	-6.33	5.80
47.5	2833.5333	3721.3727	4691.9055	-4.08	-23.86	26.08	-6.38	5.84
48.0	2773.5051	3646.2517	4601.8829	-4.07	-23.94	26.21	-6.44	5.88
48.5	2714.9293	3572.8737	4513.8594	-4.06	-24.01	26.34	-6.49	5.92
49.0	2657.7668	3501.1933	4427.7850	-4.05	-24.09	26.47	-6.54	5.95
49.5	2601.9795	3431.1665	4343.6113	-4.03	-24.17	26.59	-6.59	5.99
50.0	2547.5304	3362.7506	4261.2908	-4.02	-24.24	26.72	-6.64	6.03