



## 南京时恒电子科技有限公司

Nanjing Shiheng Electronics Co.,Ltd.

## 规格承认书

## APPROVAL SHEET

客户名称 CUSTOMER :

MF52 测温型 NTC 热敏电阻器

产品名称 PART NAME :

MF52 Series Temp Measurement NTC Thermistor

产品规格 PART NUMBER :

MF52D 503F395028L0074

产品编号 PRODUCTCODE:

版次 REV.NO:

B0

日期 DATE:

2023-11-2

确认

CONFIRM

客户 CLIENT		供货商/制造商 MANUFACTOR	
品保部 Quality Dep.		规格书制作 Design	刘星月
制造部 Production Dep.		业务部审核 Checked by sales	鞠小丽
工程部 Engineering Dep.		技术部审核 Checked by R&D	程鹏
		品质部审核 Checked by QA	李少媛

南京时恒电子科技有限公司

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## 1、产品型号说明 Product model specification

**MF52**    **D**    **503**    **F**    **3950**    **28**    **L**    **0074**


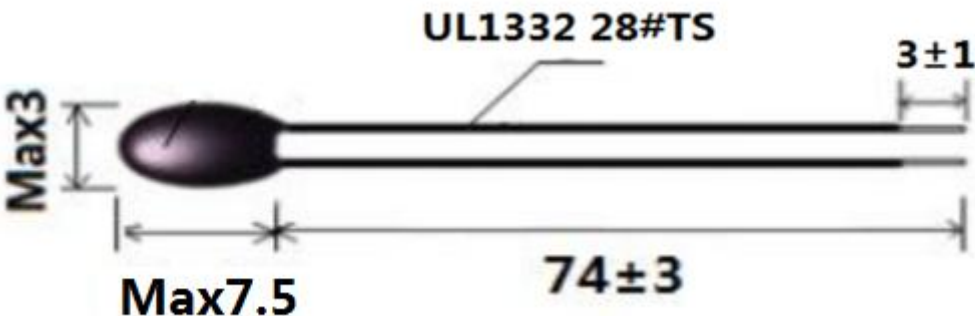
①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧

- ① MF52: 测温型 NTC 热敏电阻器系列 (Series Temp Measurement NTC Thermistor)
- ② D: 指引线为常温导线 (The lead wire is normal temperature wire)
- ③ 503: 25℃ 的零功率电阻值 50KΩ (Zero Power Resistance at 25℃ is 50KΩ)
- ④ F: 阻值精度代码 F-±1% G-±2% H-±3% J-±5% (Resistance precision code F-±1% G-±2% H-±3% J-±5%)
- ⑤ 3950: B25/50 值 3950K (B25/50:3950K)
- ⑥ 28: 线材规格: 28#电子线 (Wire type: 28# electronic wire)
- ⑦ L: 测量线材长度方式: L 指线长 Z 指总长 (Method of measuring Wire length: L=Line length Z=Total length)
- ⑧ 0074: 线材长度 0074=74mm。 (Wire length 0074=74mm)

## 2、电气性能 Electrical Characteristics

No.	项目 Item	符号 Symbol	测试条件 Test conditions	单位 Unit	性能要求 Requirements
2.1	25℃ 的零功率电阻值 Zero Power Resistance at 25℃	R <sub>25℃</sub>	T <sub>a</sub> =25±0.01℃ Test Power≤0.1mW	KΩ	50KΩ±1%
2.2	B 值 B-value	B <sub>25/50</sub>	$B=[(T_a \times T_b)/(T_b - T_a)] \times \ln(R_a/R_b)$ T <sub>a</sub> =25±0.01℃ T <sub>b</sub> =50℃±0.01℃	K	3950±1%
2.3	耗散系数 Thermal dissipation Coefficient	δ	静止空气中 In still air	mW/℃	约 2
2.4	时间常数 Thermal time constant	τ	静止空气中 In still air	sec	约 7
2.6	绝缘电阻 Insulation resistance	/	100V/DC 1min	MΩ	≥100
2.7	NTC 核心元件工作温度范围 NTC core element temperature	/	/	℃	-40℃~200℃
2.8	工作温度范围 Operating temperature range	/	/	℃	-40℃~200℃
2.9	最大额定功率 Maximum rated power	P <sub>max</sub>	/	mW	100
2.10	阻温特性 R&T-table	/	/	/	见附表 I See attached table I
2.11	阻值误差&B 值误差 Resistance tolerance& B-value tolerance	/	/	/	见附表 II See attached table II

## 3、产品图纸 Product drawing

 <b>产品图纸</b> Product drawing		客户确认 Customer confirm	客户名称 Customer:		
产品型号 MODEL NO.	MF52D 503F395028L0074		确认 Confirm		日期 DATE
			审核 Approve:		日期 DATE
<b>尺寸 Dimensions:</b> (Unit: mm)					
					
<b>技术要求 Technical requirements:</b>					
1) 零功率阻值: R25: 50KΩ ±1% (Zero Power Resistance: R25: 50KΩ±1%); 2) B25/50 数值: 3950K ±1% (B-value: B25/50: 3950K±1%); 3) 绝缘电阻: 100V/DC ≥100MΩ (Insulation resistance: 100V/DC ≥100MΩ); 4) 符合 RoHS 环保要求 (Meet environmental protection requirements: RoHS)。					
<b>材料规格 Material specifications</b>					
No.	名称 Name	材料规格 Material specifications	数量 Quantity	备注 note	
1	核心元件 Core element	热敏电阻芯片 50KΩ	1		
2	包封类 Coating material	环氧树脂	/	黑色 Black	
3	电子线 Electronic wire	UL1332 28#TS	1	黑色 Black	
4					
5					
6					
<b>更新履历 Revised record sheet</b>					
版本 REV. NO	更新时间 REV. DATE	更新内容 Change content	申请人 Applicant	批准人 Approved	
B0		版本发行			

#### 4、可靠性 Reliability

No.	项目 Item	试验标准	试验条件及方法 Test conditions and methods	性能要求 Requirements
4.1	引出端强度 Terminal strength	IEC60068-2-21	固定电阻端, 拉力: $5\pm 1$ N, 时间: $10\pm 1$ 秒 Fixed resistor end, Pull strength: $5\pm 1$ N, time: $10\pm 1$ sec	无可见性损伤 No obvious damage $ \Delta R_{25}/R_{25}  \leq 2\%$
4.2	可焊性 Solderability	IEC60068-2-20	温度 $245\pm 5$ °C 时间 2-3 秒 temperature : $245\pm 5$ °C for 2-3sec	着锡面积 $\geq 95\%$ Coverage area $\geq 95\%$ .
4.3	稳态湿热 Steady humidity and heat	IEC60068-2-78	温度: $40\text{°C}\pm 2\text{°C}$ , 湿度: $93\pm 2\%$ , 时间: 500 小时 Temp: $40\text{°C}\pm 2\text{°C}$ , humidity: $93\pm 2\%$ , Time : 500hrs	无可见性损伤 No obvious damage $ \Delta R_{25}/R_{25}  \leq 2\%$
4.4	温度快速变化 Rapid changes in temperature	IEC60068-2-14	$-40\text{°C} 30\text{min}\rightarrow 25\text{°C} 5\text{min}\rightarrow 200\text{°C} 30\text{min}\rightarrow 25\text{°C} 5\text{min}$ , 5cycles	无可见性损伤 No obvious damage $ \Delta R_{25}/R_{25}  \leq 2\%$
4.5	高温储存 High temperature storage	IEC60068-2-2	温度: $200\text{°C}\pm 5\text{°C}$ 时间:1000 小时 Temp : $200\text{°C}\pm 5\text{°C}$ , Time :1000hrs	无可见性损伤 No obvious damage $ \Delta R_{25}/R_{25}  \leq 2\%$
4.6	低温储存 Low temperature storage	IEC60068-2-1	温度: $-40\text{°C}$ 时间:1000 小时 Temp : $-40\text{°C}$ , Time :1000hrs	无可见性损伤 No obvious damage $ \Delta R_{25}/R_{25}  \leq 2\%$

▲注: 1) 稳态湿热及温度快速变化试验结束后, 样品需在常温环境下静置 2 小时后再做性能测试;

▲Note: 1) After the test of steady-state humid heat and rapid temperature change, the sample should be kept for 2 hours at room temperature before performance test ;

2) 高温存储及低温存储结束后, 需随测试环境自然恢复至常温, 再取出做性能测试。

2) After the test of high - and low-temperature storage is complete, and then take it out for performance test when the test environment naturally regain to normal temperature.

#### 5、产品包装 Product packaging

##### 5.1 包装方式 Packing Type

■ 散装方式 Bulk Type □ 盒装方式 Boxed Type □ 盘装方式 Reel Type

##### 5.2 包装规格 Packing specification

No.	包装规格 Packing specification	包装材料、尺寸 Packing material, size	产品数量 Quantity
1	包装袋 Packing bag	热封口袋(Heat sealing bag) $W\times H = \text{XXXmm}\times\text{XXXmm}$	
2	内包装盒 Inner box	纸箱(Carton), $L\times W\times H = \text{XXXmm}\times\text{XXXmm}\times\text{XXXmm}$	
3	外包装箱 Outer carton	纸箱(Carton), $L\times W\times H = \text{XXXmm}\times\text{XXXmm}\times\text{XXXmm}$	

## 6、存储&运输要求 STORAGE & Transportation Requirements

### 6.1 存储环境要求 Storage environment requirements

#### 6.1.1 储存温度: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ; 储存湿度: $\leq 75\% \text{ RH}$

(Storage temperature:  $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ; storage humidity:  $\leq 75\% \text{ RH}$ );

#### 6.1.2 避免存放在具有腐蚀性物质及气体的环境中、光照及辐射源的环境下

(Avoid storage in the environment of corrosive substances and gas, light and radiation source);

#### 6.1.3 包装打开后需重新密封保存, 贮存期 1 年, 超过贮存期, 可按本标准规定的项目重新检验, 如符合要求仍可使用

(After the package is opened, it should be re-sealed and stored for one year. If the storage period exceeds, it can be retested according to the items specified in this sheet. If it meets the requirements, it can still be used).

### 6.2 运输要求 Transportation requirements

#### 6.2.1 存储或运输过程中, 产品叠放高度不超过 4 箱产品

(During storage or transportation, the height of stacked products should not exceed the height of 4 boxes);

#### 6.2.2 避免产品在运输过程中强烈碰撞和跌落

(Avoid strong collision and fall during transportation);

#### 6.2.3 产品运输方式不限, 但需要避免雨水、雪、冰雹、海水的直接或间接淋袭

(The transportation method is not limited, but the direct or indirect attack of rain, snow, hail and sea water should be avoided).

## 7、安装&使用注意事项 Installation & Use precautions

### 7.1 本产品的用途: 温度测量与控制

(Usage of this product: Temperature measurement and control);

### 7.2 本产品适用于常规家用、工业产品上, 如果用于特殊设备/装置如: 航空航天、深海探测、医疗、军用、新能源电源、铁道交通、消防、交通信号等设备上, 请联系我司人员对相应的要求进行确认

(This product is used for conventional household and industrial products. If used in special equipment/device such as: aerospace, deep sea exploration, medical, military, new energy power supply, railway traffic, fire control, traffic signals and other equipment, please contact our staff to confirm the corresponding requirements).

### 7.3 产品使用的最大工作温度, 最大功率等, 依照规格书要求作业, 不可超出规格书范围

(The maximum working temperature, maximum power, etc. of the product shall be operated in accordance with the requirements of the specification, and shall not exceed the scope of the specification).

### 7.4 设计使用时, 避免过大的电流引起元件自身发热而产生测量误差

(When designing and using, avoid measuring error caused by excessive current);

### 7.5 产品外观发现变形、破损时, 不建议使用, 可能会影响产品电气性能

(If the product is deformed or damaged, do not use it. Otherwise, the electrical performance may be affected);

### 7.6 烙铁焊接时, 焊接处距包封头部距离至少 2mm, 焊接温度应低于 $360^{\circ}\text{C}$ , 焊接时间 $< 3\text{ses}$

(When soldering by soldering iron, the distance between the welding place and the coating head should be at least 2mm, the welding temperature should be lower than  $360^{\circ}\text{C}$ , and the welding time should be less than 3sec);

### 7.7 如在加工过程中需使用热缩管, 热缩管热缩时不可使用电吹风进行吹制, 建议热缩工艺, 将套好热缩管后的产品放入恒温烘箱中, 按 $110^{\circ}\text{C}/10 \sim 12\text{min}$ 进行热缩

(If the heat shrinkable tube is used in the manufacturing process, do not use a hair dryer to shrink the tube. This is a recommended heat shrinkable process that puts the product covered shrinkable tube into a constant temperature oven, and shrink them at  $110^{\circ}\text{C}/10 \sim 12\text{min}$ );

### 7.8 一般不建议做注塑加工, 因为注塑工艺的高温和高压会直接影响产品性能, 本产品如果采用注塑工艺加工, 需与我司确认具体的注塑工艺参数

(Generally, injection molding is not recommended, because the high temperature and high pressure of injection molding process will directly affect the product performance. If the product is processed by injection molding process, it is necessary to confirm the specific injection molding process parameters with our company);



7.9 产品核心芯片为陶瓷半导体，在使用过程中避免挤压或对环氧端头物理撞击，以免造成产品损伤

(The core chip of the product is a ceramic semiconductor. Avoid extrusion or physical impact on the epoxy end in the process of use, so as not to cause product damage);

7.10 产品引线需剪短加工时，裁剪处距环氧端头距离应不小于10mm，且裁切时夹紧端头处

(When the product leads need to be cut short, the cutting distance from the epoxy end should be no less than 10mm, and the end should be clamped when cutting)。

7.11 如产品需要引线折弯时，折弯半径应不小于1mm，折弯角度为90°，折弯次数依引线直径大小存在差异，需与我司确认

(If the product needs lead bending, bending radius should not be less than 1mm, bending angle is 90°. Bending times vary according to the lead diameter and need to be confirmed with our company);

7.12 本产品采用环氧树脂封装，具有一般的防水性，若使用环境湿度>80%RH或长期浸泡水中会导致封装端头渗水，造成绝缘和阻值性能偏低，如有相关的要求需与我司联系，产品增加防水层保护

(This product is encapsulated with epoxy resin, which is generally waterproof. If the ambient humidity is more than 80%RH or the product has long-term immersion in water, water seepage will occur at the end of the epoxy head, resulting in low insulation and resistance performance. If you have relevant requirements, please contact our company and add waterproof layer to the product)。

## 8、产品认证 Product certification

No.	项目 Projects	产品认证 Product certification
8.1	质量管理体系认证 Quality Management System Certification	ISO9001:2015
		IATF16949: 2016
8.2	环境管理体系认证 Environmental Management System Certification	ISO14001:2015
8.3	环保检测报告 Environmental test report	RoHS 2.0
8.4	江苏省高新技术产品认证 High-tech product certificate in Jiangsu Province	
8.5	产品 CQC 认证 (CQC07001019009) CQC certificate (CQC07001019009)	
8.6	UL 认证(E240991) ULcertificate(E240991)	
8.7	TUV 认证 (R50245892) TUV certificate (R50245892)	

附表 I (Attachment I)

## 南京时恒电子科技有限公司

R25=50K $\Omega$  精度:  $\pm 1\%$  B25/50=3950K 精度:  $\pm 1\%$  (P182-6B)

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	3868.86	4090	4311.13	5.406	-5.406	0.718	-0.718
-54	3557.59	3757.56	3957.53	5.321	-5.321	0.715	-0.715
-53	3286.45	3468.24	3650.03	5.241	-5.241	0.712	-0.712
-52	3047.61	3213.59	3379.58	5.165	-5.165	0.708	-0.708
-51	2835.06	2987.17	3139.28	5.092	-5.092	0.704	-0.704
-50	2644.19	2783.99	2923.79	5.021	-5.021	0.701	-0.701
-49	2471.4	2600.19	2728.98	4.953	-4.953	0.697	-0.697
-48	2313.87	2432.74	2551.62	4.886	-4.886	0.693	-0.693
-47	2169.37	2279.26	2389.15	4.821	-4.821	0.689	-0.689
-46	2036.15	2137.85	2239.55	4.757	-4.757	0.685	-0.685
-45	1912.78	2006.98	2101.19	4.693	-4.693	0.68	-0.68
-44	1798.12	1885.44	1972.76	4.631	-4.631	0.676	-0.676
-43	1691.25	1772.23	1853.21	4.569	-4.569	0.672	-0.672
-42	1591.39	1666.52	1741.64	4.507	-4.507	0.667	-0.667
-41	1497.92	1567.63	1637.34	4.446	-4.446	0.663	-0.663
-40	1410.31	1475	1539.68	4.385	-4.385	0.658	-0.658
-39	1328.09	1388.12	1448.15	4.324	-4.324	0.654	-0.654
-38	1250.87	1306.58	1362.3	4.264	-4.264	0.649	-0.649
-37	1178.31	1230.02	1281.73	4.203	-4.203	0.644	-0.644
-36	1110.1	1158.09	1206.08	4.143	-4.143	0.639	-0.639
-35	1045.98	1090.51	1135.04	4.083	-4.083	0.634	-0.634
-34	985.69	1027	1068.32	4.023	-4.023	0.629	-0.629
-33	928.997	967.336	1005.67	3.963	-3.963	0.625	-0.625
-32	875.693	911.266	946.838	3.903	-3.903	0.619	-0.619



-31	825.581	858.586	891.59	3.844	-3.844	0.614	-0.614
-30	778.476	809.097	839.718	3.784	-3.784	0.609	-0.609
-29	734.201	762.611	791.022	3.725	-3.725	0.604	-0.604
-28	692.592	718.952	745.312	3.666	-3.666	0.599	-0.599
-27	653.493	677.951	702.41	3.607	-3.607	0.594	-0.594
-26	616.755	639.45	662.146	3.549	-3.549	0.588	-0.588
-25	582.239	603.3	624.36	3.49	-3.49	0.583	-0.583
-24	549.81	569.356	588.902	3.433	-3.433	0.577	-0.577
-23	519.343	537.485	555.627	3.375	-3.375	0.572	-0.572
-22	490.719	507.56	524.401	3.318	-3.318	0.566	-0.566
-21	463.823	479.459	495.094	3.261	-3.261	0.561	-0.561
-20	438.55	453.069	467.587	3.204	-3.204	0.555	-0.555
-19	414.799	428.282	441.765	3.148	-3.148	0.549	-0.549
-18	392.474	404.998	417.521	3.092	-3.092	0.543	-0.543
-17	371.486	383.12	394.754	3.036	-3.036	0.538	-0.538
-16	351.75	362.56	373.37	2.981	-2.981	0.532	-0.532
-15	333.188	343.233	353.278	2.926	-2.926	0.526	-0.526
-14	315.724	325.06	334.397	2.872	-2.872	0.52	-0.52
-13	299.289	307.968	316.647	2.818	-2.818	0.513	-0.513
-12	283.817	291.886	299.956	2.764	-2.764	0.507	-0.507
-11	269.247	276.75	284.254	2.711	-2.711	0.501	-0.501
-10	255.521	262.5	269.478	2.658	-2.658	0.495	-0.495
-9	242.586	249.077	255.568	2.605	-2.605	0.488	-0.488
-8	230.392	236.43	242.468	2.553	-2.553	0.482	-0.482
-7	218.891	224.509	230.126	2.502	-2.502	0.475	-0.475
-6	208.04	213.267	218.493	2.45	-2.45	0.469	-0.469
-5	197.798	202.661	207.525	2.399	-2.399	0.462	-0.462
-4	188.127	192.652	197.177	2.348	-2.348	0.455	-0.455
-3	178.99	183.201	187.413	2.298	-2.298	0.449	-0.449

-2	170.355	174.274	178.193	2.248	-2.248	0.442	-0.442
-1	162.191	165.838	169.485	2.199	-2.199	0.435	-0.435
0	154.514	157.91	161.305	2.15	-2.15	0.428	-0.428
1	147.16	150.318	153.476	2.1	-2.1	0.421	-0.421
2	140.241	143.179	146.118	2.052	-2.052	0.414	-0.414
3	133.688	136.422	139.156	2.003	-2.003	0.406	-0.406
4	127.48	130.023	132.566	1.955	-1.955	0.399	-0.399
5	121.594	123.959	126.325	1.907	-1.907	0.392	-0.392
6	116.013	118.213	120.412	1.86	-1.86	0.384	-0.384
7	110.719	112.764	114.808	1.813	-1.813	0.377	-0.377
8	105.694	107.595	109.495	1.766	-1.766	0.369	-0.369
9	100.924	102.69	104.456	1.719	-1.719	0.361	-0.361
10	96.393	98.034	99.674	1.673	-1.673	0.354	-0.354
11	92.088	93.612	95.135	1.627	-1.627	0.346	-0.346
12	87.997	89.411	90.825	1.581	-1.581	0.338	-0.338
13	84.107	85.419	86.73	1.535	-1.535	0.33	-0.33
14	80.407	81.623	82.84	1.49	-1.49	0.322	-0.322
15	76.887	78.014	79.141	1.444	-1.444	0.313	-0.313
16	73.537	74.581	75.625	1.399	-1.399	0.305	-0.305
17	70.347	71.314	72.28	1.355	-1.355	0.297	-0.297
18	67.31	68.204	69.098	1.31	-1.31	0.288	-0.288
19	64.417	65.243	66.069	1.266	-1.266	0.279	-0.279
20	61.66	62.422	63.185	1.221	-1.221	0.27	-0.27
21	59.032	59.736	60.439	1.177	-1.177	0.261	-0.261
22	56.527	57.175	57.824	1.134	-1.134	0.251	-0.251
23	54.138	54.735	55.332	1.09	-1.09	0.239	-0.239
24	51.86	52.408	52.957	1.047	-1.047	0.221	-0.221
25	49.5	50	50.5	1	-1	0.213	-0.213
26	47.573	48.073	48.573	1.039	-1.039	0.265	-0.265

27	45.555	46.054	46.552	1.082	-1.082	0.265	-0.265
28	43.63	44.127	44.623	1.124	-1.124	0.272	-0.272
29	41.794	42.288	42.781	1.167	-1.167	0.282	-0.282
30	40.041	40.532	41.022	1.209	-1.209	0.293	-0.293
31	38.369	38.855	39.342	1.252	-1.252	0.303	-0.303
32	36.772	37.254	37.736	1.294	-1.294	0.315	-0.315
33	35.247	35.724	36.202	1.336	-1.336	0.326	-0.326
34	33.791	34.263	34.735	1.377	-1.377	0.338	-0.338
35	32.4	32.867	33.333	1.419	-1.419	0.349	-0.349
36	31.072	31.532	31.993	1.461	-1.461	0.361	-0.361
37	29.802	30.257	30.711	1.502	-1.502	0.373	-0.373
38	28.589	29.037	29.486	1.543	-1.543	0.385	-0.385
39	27.43	27.872	28.313	1.584	-1.584	0.397	-0.397
40	26.322	26.757	27.191	1.625	-1.625	0.409	-0.409
41	25.262	25.69	26.118	1.665	-1.665	0.421	-0.421
42	24.249	24.67	25.091	1.706	-1.706	0.434	-0.434
43	23.28	23.694	24.108	1.746	-1.746	0.446	-0.446
44	22.354	22.76	23.167	1.787	-1.787	0.458	-0.458
45	21.467	21.867	22.266	1.827	-1.827	0.471	-0.471
46	20.619	21.011	21.404	1.866	-1.866	0.484	-0.484
47	19.808	20.193	20.578	1.906	-1.906	0.496	-0.496
48	19.031	19.409	19.786	1.946	-1.946	0.509	-0.509
49	18.288	18.658	19.029	1.985	-1.985	0.522	-0.522
50	17.576	17.94	18.303	2.025	-2.025	0.535	-0.535
51	16.895	17.251	17.607	2.064	-2.064	0.548	-0.548
52	16.243	16.592	16.941	2.103	-2.103	0.561	-0.561
53	15.618	15.96	16.302	2.141	-2.141	0.574	-0.574
54	15.02	15.355	15.69	2.18	-2.18	0.587	-0.587
55	14.447	14.775	15.103	2.219	-2.219	0.601	-0.601

56	13.898	14.219	14.54	2.257	-2.257	0.614	-0.614
57	13.373	13.687	14.001	2.295	-2.295	0.627	-0.627
58	12.869	13.176	13.484	2.333	-2.333	0.641	-0.641
59	12.386	12.687	12.988	2.371	-2.371	0.654	-0.654
60	11.923	12.217	12.512	2.409	-2.409	0.668	-0.668
61	11.479	11.767	12.055	2.446	-2.446	0.682	-0.682
62	11.054	11.336	11.617	2.484	-2.484	0.696	-0.696
63	10.646	10.921	11.197	2.521	-2.521	0.71	-0.71
64	10.255	10.524	10.793	2.558	-2.558	0.724	-0.724
65	9.88	10.143	10.406	2.595	-2.595	0.738	-0.738
66	9.52	9.777	10.035	2.632	-2.632	0.752	-0.752
67	9.175	9.426	9.678	2.668	-2.668	0.766	-0.766
68	8.843	9.089	9.335	2.705	-2.705	0.78	-0.78
69	8.525	8.766	9.006	2.741	-2.741	0.795	-0.795
70	8.22	8.455	8.69	2.777	-2.777	0.809	-0.809
71	7.927	8.157	8.386	2.813	-2.813	0.823	-0.823
72	7.646	7.871	8.095	2.849	-2.849	0.838	-0.838
73	7.376	7.595	7.815	2.884	-2.884	0.853	-0.853
74	7.117	7.331	7.545	2.92	-2.92	0.867	-0.867
75	6.868	7.077	7.286	2.955	-2.955	0.882	-0.882
76	6.629	6.833	7.037	2.99	-2.99	0.897	-0.897
77	6.399	6.599	6.798	3.025	-3.025	0.912	-0.912
78	6.178	6.373	6.568	3.06	-3.06	0.927	-0.927
79	5.966	6.156	6.347	3.094	-3.094	0.942	-0.942
80	5.762	5.948	6.134	3.129	-3.129	0.957	-0.957
81	5.566	5.748	5.929	3.163	-3.163	0.972	-0.972
82	5.377	5.555	5.733	3.197	-3.197	0.988	-0.988
83	5.196	5.37	5.543	3.231	-3.231	1.003	-1.003
84	5.022	5.191	5.361	3.265	-3.265	1.018	-1.018

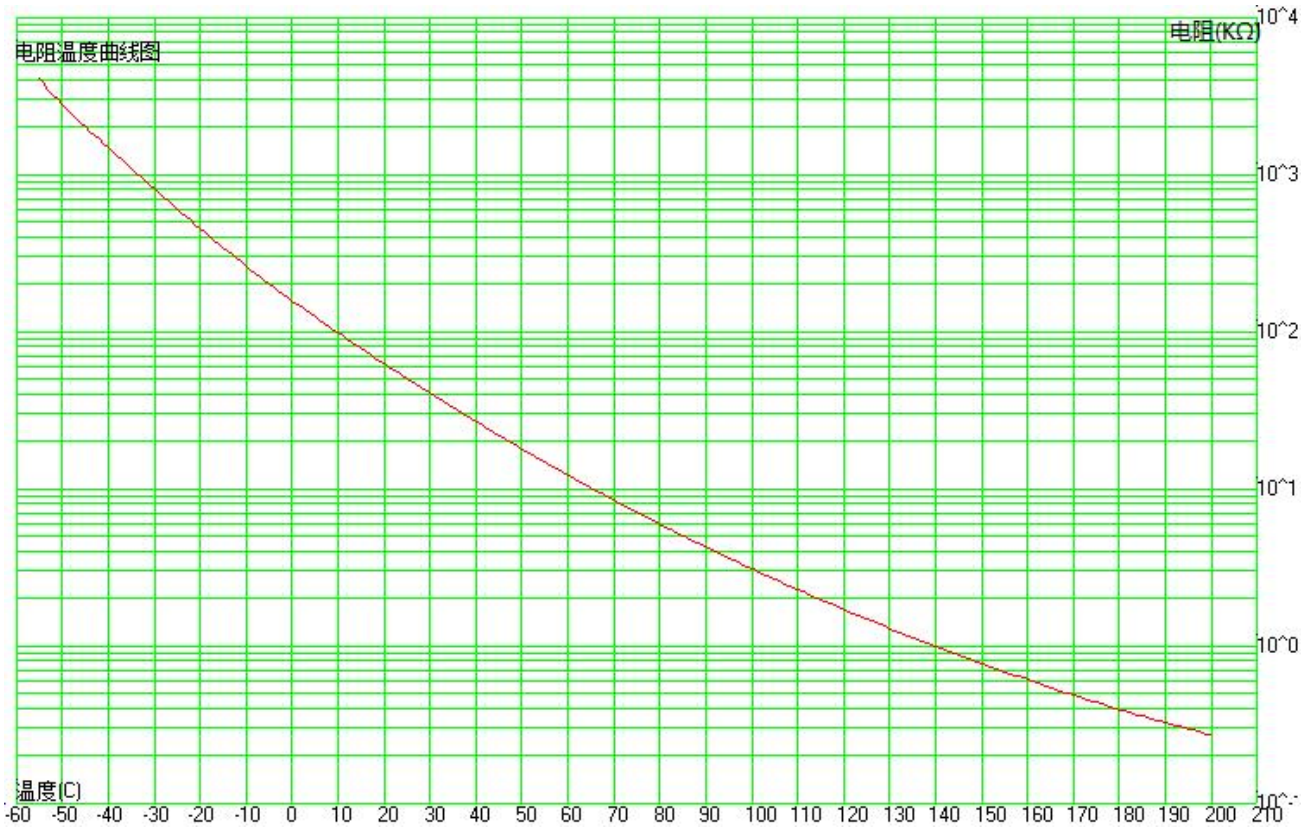
85	4.854	5.02	5.185	3.299	-3.299	1.034	-1.034
86	4.693	4.854	5.016	3.332	-3.332	1.05	-1.05
87	4.537	4.695	4.853	3.365	-3.365	1.065	-1.065
88	4.388	4.542	4.697	3.399	-3.399	1.081	-1.081
89	4.244	4.395	4.546	3.431	-3.431	1.097	-1.097
90	4.106	4.253	4.4	3.464	-3.464	1.113	-1.113
91	3.972	4.116	4.26	3.497	-3.497	1.129	-1.129
92	3.844	3.985	4.125	3.53	-3.53	1.145	-1.145
93	3.72	3.858	3.995	3.562	-3.562	1.161	-1.161
94	3.601	3.736	3.87	3.594	-3.594	1.177	-1.177
95	3.487	3.618	3.749	3.626	-3.626	1.193	-1.193
96	3.376	3.504	3.633	3.658	-3.658	1.21	-1.21
97	3.27	3.395	3.52	3.69	-3.69	1.226	-1.226
98	3.167	3.289	3.412	3.721	-3.721	1.242	-1.242
99	3.068	3.188	3.307	3.753	-3.753	1.259	-1.259
100	2.973	3.09	3.206	3.784	-3.784	1.276	-1.276
101	2.881	2.995	3.109	3.815	-3.815	1.292	-1.292
102	2.792	2.904	3.015	3.846	-3.846	1.309	-1.309
103	2.706	2.815	2.925	3.877	-3.877	1.326	-1.326
104	2.624	2.73	2.837	3.908	-3.908	1.343	-1.343
105	2.544	2.648	2.753	3.938	-3.938	1.36	-1.36
106	2.467	2.569	2.671	3.969	-3.969	1.377	-1.377
107	2.393	2.493	2.592	3.999	-3.999	1.394	-1.394
108	2.321	2.419	2.516	4.029	-4.029	1.411	-1.411
109	2.252	2.347	2.443	4.059	-4.059	1.429	-1.429
110	2.185	2.278	2.372	4.089	-4.089	1.446	-1.446
111	2.121	2.212	2.303	4.118	-4.118	1.463	-1.463
112	2.058	2.147	2.237	4.148	-4.148	1.481	-1.481
113	1.998	2.085	2.172	4.177	-4.177	1.498	-1.498

114	1.94	2.025	2.11	4.207	-4.207	1.516	-1.516
115	1.884	1.967	2.05	4.236	-4.236	1.534	-1.534
116	1.829	1.911	1.993	4.265	-4.265	1.552	-1.552
117	1.777	1.857	1.936	4.294	-4.294	1.569	-1.569
118	1.726	1.804	1.882	4.322	-4.322	1.587	-1.587
119	1.677	1.753	1.83	4.351	-4.351	1.605	-1.605
120	1.63	1.704	1.779	4.379	-4.379	1.623	-1.623
121	1.584	1.657	1.73	4.408	-4.408	1.642	-1.642
122	1.539	1.611	1.682	4.436	-4.436	1.66	-1.66
123	1.496	1.566	1.636	4.464	-4.464	1.678	-1.678
124	1.455	1.523	1.592	4.492	-4.492	1.696	-1.696
125	1.415	1.482	1.548	4.519	-4.519	1.715	-1.715
126	1.376	1.441	1.507	4.547	-4.547	1.733	-1.733
127	1.338	1.402	1.466	4.575	-4.575	1.752	-1.752
128	1.301	1.364	1.427	4.602	-4.602	1.771	-1.771
129	1.266	1.328	1.389	4.629	-4.629	1.789	-1.789
130	1.232	1.292	1.352	4.656	-4.656	1.808	-1.808
131	1.199	1.258	1.317	4.683	-4.683	1.827	-1.827
132	1.167	1.224	1.282	4.71	-4.71	1.846	-1.846
133	1.136	1.192	1.249	4.737	-4.737	1.865	-1.865
134	1.105	1.161	1.216	4.764	-4.764	1.884	-1.884
135	1.076	1.13	1.185	4.79	-4.79	1.903	-1.903
136	1.048	1.101	1.154	4.816	-4.816	1.923	-1.923
137	1.021	1.073	1.125	4.843	-4.843	1.942	-1.942
138	0.994	1.045	1.096	4.869	-4.869	1.961	-1.961
139	0.968	1.018	1.068	4.895	-4.895	1.981	-1.981
140	0.943	0.992	1.041	4.921	-4.921	2	-2
141	0.919	0.967	1.015	4.946	-4.946	2.02	-2.02
142	0.896	0.943	0.99	4.972	-4.972	2.04	-2.04



143	0.873	0.919	0.965	4.997	-4.997	2.059	-2.059
144	0.851	0.896	0.941	5.023	-5.023	2.079	-2.079
145	0.83	0.874	0.918	5.048	-5.048	2.099	-2.099
146	0.809	0.852	0.895	5.073	-5.073	2.119	-2.119
147	0.789	0.831	0.873	5.098	-5.098	2.139	-2.139
148	0.769	0.811	0.852	5.123	-5.123	2.159	-2.159
149	0.75	0.791	0.832	5.148	-5.148	2.18	-2.18
150	0.732	0.772	0.812	5.172	-5.172	2.2	-2.2
151	0.714	0.753	0.792	5.197	-5.197	2.22	-2.22
152	0.697	0.735	0.773	5.221	-5.221	2.241	-2.241
153	0.68	0.717	0.755	5.245	-5.245	2.261	-2.261
154	0.663	0.7	0.737	5.269	-5.269	2.282	-2.282
155	0.648	0.684	0.72	5.293	-5.293	2.302	-2.302
156	0.632	0.668	0.703	5.317	-5.317	2.323	-2.323
157	0.617	0.652	0.687	5.341	-5.341	2.344	-2.344
158	0.603	0.637	0.671	5.364	-5.364	2.365	-2.365
159	0.589	0.622	0.656	5.388	-5.388	2.386	-2.386
160	0.575	0.608	0.641	5.411	-5.411	2.407	-2.407
161	0.562	0.594	0.626	5.434	-5.434	2.428	-2.428
162	0.549	0.58	0.612	5.457	-5.457	2.449	-2.449
163	0.536	0.567	0.599	5.48	-5.48	2.47	-2.47
164	0.524	0.555	0.585	5.503	-5.503	2.492	-2.492
165	0.512	0.542	0.572	5.525	-5.525	2.513	-2.513
166	0.501	0.53	0.56	5.548	-5.548	2.534	-2.534
167	0.49	0.519	0.547	5.57	-5.57	2.556	-2.556
168	0.479	0.507	0.536	5.592	-5.592	2.578	-2.578
169	0.468	0.496	0.524	5.614	-5.614	2.599	-2.599
170	0.458	0.485	0.513	5.636	-5.636	2.621	-2.621
171	0.448	0.475	0.502	5.658	-5.658	2.643	-2.643

172	0.438	0.465	0.491	5.679	-5.679	2.665	-2.665
173	0.429	0.455	0.481	5.701	-5.701	2.687	-2.687
174	0.42	0.445	0.471	5.722	-5.722	2.709	-2.709
175	0.411	0.436	0.461	5.743	-5.743	2.731	-2.731
176	0.402	0.427	0.452	5.764	-5.764	2.753	-2.753
177	0.394	0.418	0.442	5.785	-5.785	2.776	-2.776
178	0.386	0.41	0.433	5.806	-5.806	2.798	-2.798
179	0.378	0.401	0.425	5.826	-5.826	2.821	-2.821
180	0.37	0.393	0.416	5.847	-5.847	2.843	-2.843
181	0.363	0.385	0.408	5.867	-5.867	2.866	-2.866
182	0.356	0.378	0.4	5.887	-5.887	2.888	-2.888
183	0.348	0.37	0.392	5.907	-5.907	2.911	-2.911
184	0.342	0.363	0.385	5.926	-5.926	2.934	-2.934
185	0.335	0.356	0.377	5.946	-5.946	2.957	-2.957
186	0.328	0.349	0.37	5.965	-5.965	2.98	-2.98
187	0.322	0.343	0.363	5.984	-5.984	3.003	-3.003
188	0.316	0.336	0.356	6.003	-6.003	3.026	-3.026
189	0.31	0.33	0.35	6.022	-6.022	3.05	-3.05
190	0.304	0.324	0.343	6.041	-6.041	3.073	-3.073
191	0.299	0.318	0.337	6.059	-6.059	3.097	-3.097
192	0.293	0.312	0.331	6.077	-6.077	3.12	-3.12
193	0.288	0.307	0.325	6.096	-6.096	3.144	-3.144
194	0.283	0.301	0.32	6.113	-6.113	3.167	-3.167
195	0.278	0.296	0.314	6.131	-6.131	3.191	-3.191
196	0.273	0.291	0.309	6.149	-6.149	3.215	-3.215
197	0.268	0.286	0.303	6.166	-6.166	3.239	-3.239
198	0.264	0.281	0.298	6.183	-6.183	3.263	-3.263
199	0.259	0.276	0.293	6.2	-6.2	3.287	-3.287
200	0.255	0.272	0.289	6.217	-6.217	3.311	-3.311



附表 II (Attachment II)

