



# 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 :

MF52C 103F395028L0350

产品编号 PRODUCTCODE:

版次 REV.NO:

日期 DATE:

确认

CONFIRM

客户 CLIENT		供货商/制造商 MANUFACTOR	
品保部 Quality Dep.		规格书制作 Design	吴仪
制造部 Production Dep.		业务部审核 Checked by sales	
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**    **C**    **103**    **F**    **3950**    **28**    **L**    **0350**


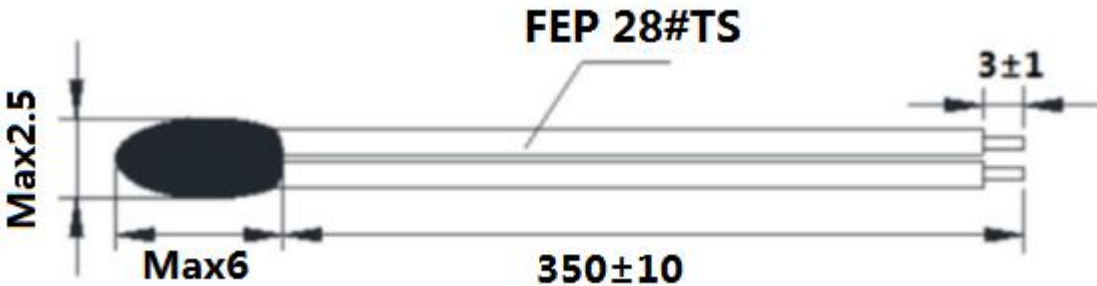
①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧

- ① MF52: 测温型 NTC 热敏电阻器系列 (Series Temp Measurement NTC Thermistor)
- ② C: 指引线为高温导线 (The lead wire is high temperature wire)
- ③ 103: 25℃ 的零功率电阻值 10KΩ (Zero Power Resistance at 25℃ is 10KΩ)
- 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 0350: 线材长度 0350=350mm。 (Wire length 0350=350mm)

## 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	10KΩ±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/℃	≥2
2.4	时间常数 Thermal time constant	τ	静止空气中 In still air	sec	≤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	50
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.	MF52C 103F395028L0350		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: 10KΩ ±1% (Zero Power Resistance: R25: 10KΩ±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 10KΩ	1			
2	包封类 Coating material	高温环氧树脂	/	黑色 Black		
3	电子线 Electronic wire	FEP 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: $20\pm 1$ N, time: $10\pm 1$ sec	无可见性损伤 No obvious damage $R_{25} \Delta R/R \leq \pm 2\%$
4.2	可焊性 Solderability	IEC60068-2-20	温度 $245\pm 5^\circ\text{C}$ 时间 2-3 秒 temperature : $245\pm 5^\circ\text{C}$ 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: $40^\circ\text{C}\pm 2^\circ\text{C}$ , 湿度: $93\pm 2\%$ , 时间: 500 小时 Temp: $40^\circ\text{C}\pm 2^\circ\text{C}$ , humidity: $93\pm 2\%$ , Time : 500hrs	无可见性损伤 No obvious damage $R_{25} \Delta R/R \leq \pm 2\%$
4.4	温度快速变化 Rapid changes in temperature	IEC60068-2-14	$-40^\circ\text{C} 30\text{min} \rightarrow 25^\circ\text{C} 5\text{min} \rightarrow 200^\circ\text{C} 30\text{min} \rightarrow 25^\circ\text{C} 5\text{min}$ , 5cycles	无可见性损伤 No obvious damage $R_{25} \Delta R/R \leq \pm 2\%$
4.5	高温储存 High temperature storage	IEC60068-2-2	温度: $200^\circ\text{C}\pm 5^\circ\text{C}$ 时间:1000 小时 Temp : $200^\circ\text{C}\pm 5^\circ\text{C}$ , Time :1000hrs	无可见性损伤 No obvious damage $R_{25} \Delta R/R \leq \pm 2\%$
4.6	低温储存 Low temperature storage	IEC60068-2-1	温度: $-40^\circ\text{C}$ 时间:1000 小时 Temp : $-20^\circ\text{C}$ , Time :1000hrs	无可见性损伤 No obvious damage $R_{25} \Delta R/R \leq \pm 2\%$

▲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 BoxedType □ 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	苏省高新技术产品认证 High-tech product certificate in Jiangsu Province	
8.5	产品 CQC 认证 CQC certificate	
8.6	核心元件 UL 认证(E240991) UL certificate(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  
 SHIHENG R-T Table

R25=10K $\Omega$ 精度: $\pm 1\%$ B25/50=3950K 精度: $\pm 1\%$ (P477-4B)							
温度( $^{\circ}\text{C}$ ) TEMP( $^{\circ}\text{C}$ )	电阻(K $\Omega$ ) RESISTANCE(K $\Omega$ )			电阻精度(%) RESISST-TOL(%)		温度精度( $^{\circ}\text{C}$ ) TEMP-TOL( $^{\circ}\text{C}$ )	
	最小值 MIN	中心值 CENTER	最大值 MAX	$\Delta R$	$-\Delta R$	$\Delta T$	$-\Delta T$
-40	268.491	280.66	292.828	4.335	-4.335	0.66	-0.66
-39	262.593	274.43	286.267	4.313	-4.313	0.654	-0.654
-38	253.069	264.373	275.677	4.275	-4.275	0.648	-0.648
-37	241.242	251.891	262.54	4.227	-4.227	0.643	-0.643
-36	228.17	238.102	248.033	4.171	-4.171	0.638	-0.638
-35	214.639	223.838	233.036	4.109	-4.109	0.633	-0.633
-34	201.203	209.683	218.162	4.043	-4.043	0.628	-0.628
-33	188.226	196.021	203.816	3.976	-3.976	0.624	-0.624
-32	175.927	183.082	190.237	3.908	-3.908	0.619	-0.619
-31	164.422	170.987	177.553	3.839	-3.839	0.615	-0.615
-30	153.754	159.781	165.808	3.771	-3.771	0.61	-0.61
-29	143.919	149.456	154.994	3.705	-3.705	0.605	-0.605
-28	134.882	139.977	145.072	3.639	-3.639	0.601	-0.601
-27	126.593	131.287	135.981	3.575	-3.575	0.596	-0.596
-26	118.991	123.324	127.656	3.512	-3.512	0.591	-0.591
-25	112.015	116.02	120.024	3.451	-3.451	0.586	-0.586
-24	105.602	109.31	113.018	3.392	-3.392	0.58	-0.58
-23	99.695	103.133	106.572	3.333	-3.333	0.575	-0.575
-22	94.24	97.433	100.626	3.277	-3.277	0.569	-0.569
-21	89.189	92.157	95.126	3.221	-3.221	0.564	-0.564
-20	84.498	87.261	90.024	3.166	-3.166	0.558	-0.558
-19	80.129	82.703	85.278	3.113	-3.113	0.552	-0.552
-18	76.048	78.449	80.85	3.06	-3.06	0.546	-0.546



-17	72.226	74.466	76.706	3.008	-3.008	0.54	-0.54
-16	68.638	70.729	72.82	2.956	-2.956	0.534	-0.534
-15	65.261	67.214	69.167	2.905	-2.905	0.528	-0.528
-14	62.076	63.9	65.725	2.855	-2.855	0.521	-0.521
-13	59.067	60.771	62.476	2.804	-2.804	0.515	-0.515
-12	56.219	57.811	59.404	2.754	-2.754	0.508	-0.508
-11	53.52	55.008	56.496	2.705	-2.705	0.502	-0.502
-10	50.959	52.35	53.74	2.655	-2.655	0.495	-0.495
-9	48.528	49.826	51.125	2.606	-2.606	0.488	-0.488
-8	46.217	47.43	48.643	2.556	-2.556	0.482	-0.482
-7	44.02	45.153	46.285	2.507	-2.507	0.475	-0.475
-6	41.931	42.988	44.045	2.458	-2.458	0.468	-0.468
-5	39.943	40.929	41.915	2.409	-2.409	0.461	-0.461
-4	38.051	38.971	39.891	2.36	-2.36	0.454	-0.454
-3	36.25	37.108	37.966	2.311	-2.311	0.447	-0.447
-2	34.537	35.337	36.136	2.262	-2.262	0.44	-0.44
-1	32.907	33.652	34.397	2.213	-2.213	0.432	-0.432
0	31.356	32.049	32.743	2.164	-2.164	0.425	-0.425
1	29.88	30.526	31.172	2.116	-2.116	0.418	-0.418
2	28.476	29.078	29.679	2.067	-2.067	0.411	-0.411
3	27.142	27.701	28.26	2.018	-2.018	0.403	-0.403
4	25.872	26.392	26.913	1.97	-1.97	0.396	-0.396
5	24.666	25.149	25.633	1.922	-1.922	0.388	-0.388
6	23.519	23.968	24.417	1.874	-1.874	0.381	-0.381
7	22.429	22.846	23.263	1.826	-1.826	0.373	-0.373
8	21.393	21.78	22.167	1.778	-1.778	0.366	-0.366
9	20.408	20.768	21.127	1.73	-1.73	0.358	-0.358
10	19.521	19.856	20.19	1.685	-1.685	0.35	-0.35

11	18.584	18.893	19.202	1.636	-1.636	0.343	-0.343
12	17.739	18.026	18.312	1.589	-1.589	0.335	-0.335
13	16.937	17.202	17.467	1.542	-1.542	0.327	-0.327
14	16.174	16.42	16.665	1.495	-1.495	0.319	-0.319
15	15.449	15.677	15.904	1.449	-1.449	0.311	-0.311
16	14.761	14.971	15.181	1.403	-1.403	0.303	-0.303
17	14.106	14.3	14.494	1.357	-1.357	0.295	-0.295
18	13.484	13.663	13.842	1.312	-1.312	0.287	-0.287
19	12.892	13.057	13.223	1.266	-1.266	0.279	-0.279
20	12.329	12.482	12.634	1.221	-1.221	0.27	-0.27
21	11.794	11.934	12.075	1.176	-1.176	0.262	-0.262
22	11.285	11.414	11.543	1.132	-1.132	0.254	-0.254
23	10.8	10.919	11.038	1.087	-1.087	0.245	-0.245
24	10.339	10.448	10.557	1.043	-1.043	0.237	-0.237
25	9.9	10	10.1	1	-1	0.228	-0.228
26	9.473	9.573	9.673	1.043	-1.043	0.24	-0.24
27	9.067	9.167	9.266	1.086	-1.086	0.251	-0.251
28	8.68	8.78	8.879	1.13	-1.13	0.263	-0.263
29	8.312	8.411	8.51	1.172	-1.172	0.274	-0.274
30	7.962	8.06	8.158	1.215	-1.215	0.286	-0.286
31	7.628	7.725	7.822	1.258	-1.258	0.298	-0.298
32	7.309	7.406	7.502	1.3	-1.3	0.31	-0.31
33	7.006	7.101	7.196	1.342	-1.342	0.322	-0.322
34	6.716	6.811	6.905	1.384	-1.384	0.334	-0.334
35	6.44	6.533	6.627	1.425	-1.425	0.346	-0.346
36	6.177	6.269	6.361	1.466	-1.466	0.358	-0.358
37	5.926	6.016	6.107	1.508	-1.508	0.37	-0.37
38	5.686	5.775	5.865	1.548	-1.548	0.382	-0.382

39	5.457	5.545	5.633	1.589	-1.589	0.395	-0.395
40	5.238	5.325	5.411	1.63	-1.63	0.407	-0.407
41	5.029	5.114	5.2	1.67	-1.67	0.42	-0.42
42	4.829	4.913	4.997	1.71	-1.71	0.432	-0.432
43	4.638	4.721	4.804	1.75	-1.75	0.445	-0.445
44	4.456	4.537	4.618	1.79	-1.79	0.457	-0.457
45	4.281	4.361	4.441	1.829	-1.829	0.47	-0.47
46	4.115	4.193	4.271	1.869	-1.869	0.483	-0.483
47	3.955	4.032	4.109	1.908	-1.908	0.496	-0.496
48	3.803	3.878	3.954	1.947	-1.947	0.509	-0.509
49	3.657	3.731	3.805	1.985	-1.985	0.522	-0.522
50	3.517	3.59	3.662	2.024	-2.024	0.535	-0.535
51	3.383	3.454	3.526	2.062	-2.062	0.548	-0.548
52	3.255	3.325	3.395	2.101	-2.101	0.561	-0.561
53	3.132	3.201	3.269	2.139	-2.139	0.575	-0.575
54	3.015	3.082	3.149	2.176	-2.176	0.588	-0.588
55	2.903	2.968	3.034	2.214	-2.214	0.602	-0.602
56	2.795	2.859	2.924	2.251	-2.251	0.615	-0.615
57	2.692	2.755	2.818	2.289	-2.289	0.629	-0.629
58	2.593	2.655	2.717	2.326	-2.326	0.642	-0.642
59	2.498	2.559	2.619	2.363	-2.363	0.656	-0.656
60	2.407	2.467	2.526	2.399	-2.399	0.67	-0.67
61	2.32	2.378	2.436	2.436	-2.436	0.684	-0.684
62	2.237	2.294	2.35	2.472	-2.472	0.698	-0.698
63	2.157	2.212	2.268	2.508	-2.508	0.712	-0.712
64	2.08	2.134	2.189	2.544	-2.544	0.726	-0.726
65	2.007	2.06	2.113	2.579	-2.579	0.74	-0.74
66	1.936	1.988	2.04	2.615	-2.615	0.755	-0.755

67	1.868	1.919	1.97	2.65	-2.65	0.769	-0.769
68	1.803	1.853	1.903	2.685	-2.685	0.783	-0.783
69	1.741	1.789	1.838	2.72	-2.72	0.798	-0.798
70	1.681	1.728	1.776	2.755	-2.755	0.813	-0.813
71	1.623	1.67	1.716	2.789	-2.789	0.827	-0.827
72	1.568	1.613	1.659	2.824	-2.824	0.842	-0.842
73	1.515	1.559	1.604	2.858	-2.858	0.857	-0.857
74	1.464	1.507	1.551	2.892	-2.892	0.872	-0.872
75	1.415	1.457	1.5	2.925	-2.925	0.887	-0.887
76	1.368	1.409	1.451	2.959	-2.959	0.902	-0.902
77	1.322	1.363	1.404	2.992	-2.992	0.917	-0.917
78	1.279	1.319	1.359	3.025	-3.025	0.932	-0.932
79	1.237	1.276	1.315	3.058	-3.058	0.947	-0.947
80	1.197	1.235	1.273	3.091	-3.091	0.963	-0.963
81	1.158	1.195	1.233	3.124	-3.124	0.978	-0.978
82	1.121	1.157	1.194	3.156	-3.156	0.994	-0.994
83	1.085	1.121	1.157	3.188	-3.188	1.009	-1.009
84	1.051	1.085	1.12	3.22	-3.22	1.025	-1.025
85	1.017	1.052	1.086	3.252	-3.252	1.04	-1.04
86	0.985	1.019	1.052	3.283	-3.283	1.056	-1.056
87	0.954	0.987	1.02	3.315	-3.315	1.072	-1.072
88	0.925	0.957	0.989	3.346	-3.346	1.088	-1.088
89	0.896	0.927	0.959	3.377	-3.377	1.104	-1.104
90	0.869	0.899	0.93	3.408	-3.408	1.12	-1.12
91	0.842	0.872	0.902	3.439	-3.439	1.136	-1.136
92	0.816	0.846	0.875	3.47	-3.47	1.153	-1.153
93	0.792	0.82	0.849	3.5	-3.5	1.169	-1.169
94	0.768	0.796	0.824	3.53	-3.53	1.185	-1.185

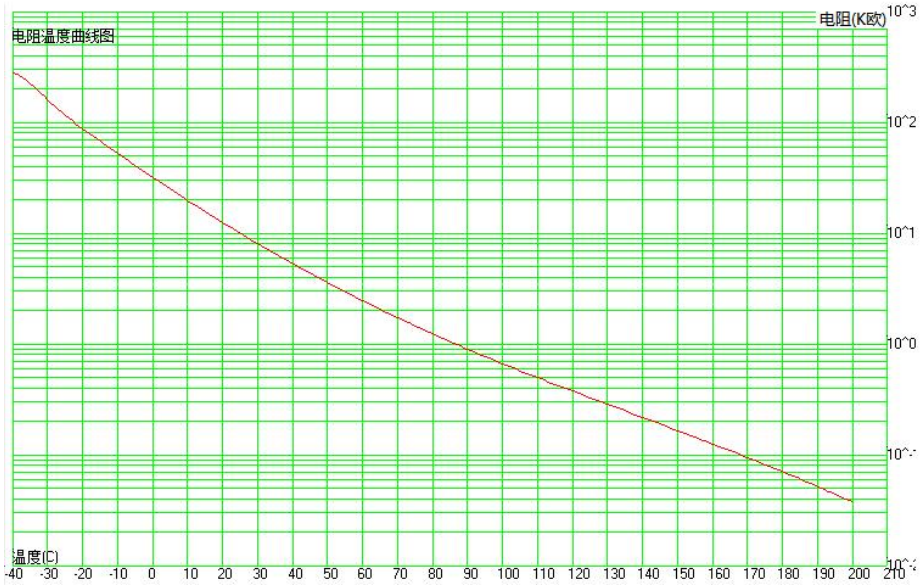
95	0.745	0.772	0.8	3.561	-3.561	1.202	-1.202
96	0.722	0.749	0.776	3.591	-3.591	1.218	-1.218
97	0.701	0.727	0.754	3.62	-3.62	1.235	-1.235
98	0.68	0.706	0.732	3.65	-3.65	1.251	-1.251
99	0.66	0.685	0.711	3.68	-3.68	1.268	-1.268
100	0.641	0.666	0.69	3.709	-3.709	1.285	-1.285
101	0.622	0.646	0.67	3.739	-3.739	1.302	-1.302
102	0.604	0.628	0.651	3.768	-3.768	1.319	-1.319
103	0.586	0.61	0.633	3.797	-3.797	1.336	-1.336
104	0.57	0.592	0.615	3.826	-3.826	1.353	-1.353
105	0.553	0.575	0.598	3.855	-3.855	1.37	-1.37
106	0.537	0.559	0.581	3.883	-3.883	1.387	-1.387
107	0.522	0.543	0.565	3.912	-3.912	1.404	-1.404
108	0.507	0.528	0.549	3.941	-3.941	1.422	-1.422
109	0.493	0.513	0.534	3.969	-3.969	1.439	-1.439
110	0.479	0.499	0.519	3.998	-3.998	1.457	-1.457
111	0.465	0.485	0.504	4.026	-4.026	1.474	-1.474
112	0.452	0.471	0.491	4.054	-4.054	1.492	-1.492
113	0.44	0.458	0.477	4.082	-4.082	1.509	-1.509
114	0.427	0.446	0.464	4.11	-4.11	1.527	-1.527
115	0.415	0.433	0.451	4.138	-4.138	1.545	-1.545
116	0.404	0.421	0.439	4.166	-4.166	1.563	-1.563
117	0.393	0.41	0.427	4.194	-4.194	1.581	-1.581
118	0.382	0.399	0.415	4.222	-4.222	1.599	-1.599
119	0.371	0.388	0.404	4.249	-4.249	1.617	-1.617
120	0.361	0.377	0.393	4.277	-4.277	1.635	-1.635
121	0.351	0.367	0.383	4.305	-4.305	1.653	-1.653
122	0.341	0.357	0.372	4.332	-4.332	1.671	-1.671

123	0.332	0.347	0.362	4.36	-4.36	1.69	-1.69
124	0.323	0.338	0.353	4.388	-4.388	1.708	-1.708
125	0.314	0.329	0.343	4.415	-4.415	1.727	-1.727
126	0.305	0.32	0.334	4.442	-4.442	1.745	-1.745
127	0.297	0.311	0.325	4.47	-4.47	1.764	-1.764
128	0.289	0.303	0.316	4.497	-4.497	1.782	-1.782
129	0.281	0.294	0.308	4.525	-4.525	1.801	-1.801
130	0.273	0.286	0.299	4.552	-4.552	1.82	-1.82
131	0.266	0.279	0.291	4.579	-4.579	1.838	-1.838
132	0.259	0.271	0.284	4.607	-4.607	1.857	-1.857
133	0.252	0.264	0.276	4.634	-4.634	1.876	-1.876
134	0.245	0.257	0.269	4.662	-4.662	1.895	-1.895
135	0.238	0.25	0.261	4.689	-4.689	1.914	-1.914
136	0.232	0.243	0.255	4.716	-4.716	1.933	-1.933
137	0.225	0.236	0.248	4.744	-4.744	1.953	-1.953
138	0.219	0.23	0.241	4.771	-4.771	1.972	-1.972
139	0.213	0.224	0.235	4.798	-4.798	1.991	-1.991
140	0.207	0.218	0.228	4.826	-4.826	2.01	-2.01
141	0.202	0.212	0.222	4.853	-4.853	2.03	-2.03
142	0.196	0.206	0.216	4.88	-4.88	2.049	-2.049
143	0.191	0.201	0.211	4.908	-4.908	2.069	-2.069
144	0.186	0.195	0.205	4.935	-4.935	2.088	-2.088
145	0.18	0.19	0.199	4.962	-4.962	2.108	-2.108
146	0.176	0.185	0.194	4.99	-4.99	2.128	-2.128
147	0.171	0.18	0.189	5.017	-5.017	2.148	-2.148
148	0.166	0.175	0.184	5.045	-5.045	2.167	-2.167
149	0.161	0.17	0.179	5.072	-5.072	2.187	-2.187
150	0.157	0.166	0.174	5.1	-5.1	2.207	-2.207

151	0.153	0.161	0.169	5.127	-5.127	2.227	-2.227
152	0.149	0.157	0.165	5.155	-5.155	2.247	-2.247
153	0.144	0.152	0.16	5.183	-5.183	2.268	-2.268
154	0.14	0.148	0.156	5.21	-5.21	2.288	-2.288
155	0.137	0.144	0.152	5.238	-5.238	2.308	-2.308
156	0.133	0.14	0.148	5.266	-5.266	2.328	-2.328
157	0.129	0.136	0.144	5.293	-5.293	2.349	-2.349
158	0.125	0.133	0.14	5.321	-5.321	2.369	-2.369
159	0.122	0.129	0.136	5.349	-5.349	2.39	-2.39
160	0.119	0.125	0.132	5.377	-5.377	2.41	-2.41
161	0.115	0.122	0.129	5.405	-5.405	2.431	-2.431
162	0.112	0.119	0.125	5.433	-5.433	2.451	-2.451
163	0.109	0.115	0.122	5.461	-5.461	2.472	-2.472
164	0.106	0.112	0.118	5.489	-5.489	2.493	-2.493
165	0.103	0.109	0.115	5.517	-5.517	2.514	-2.514
166	0.1	0.106	0.112	5.546	-5.546	2.535	-2.535
167	0.097	0.103	0.109	5.574	-5.574	2.556	-2.556
168	0.094	0.1	0.106	5.602	-5.602	2.577	-2.577
169	0.092	0.097	0.103	5.631	-5.631	2.598	-2.598
170	0.089	0.094	0.1	5.659	-5.659	2.619	-2.619
171	0.087	0.092	0.097	5.688	-5.688	2.64	-2.64
172	0.084	0.089	0.094	5.717	-5.717	2.661	-2.661
173	0.082	0.087	0.092	5.745	-5.745	2.682	-2.682
174	0.079	0.084	0.089	5.774	-5.774	2.704	-2.704
175	0.077	0.082	0.087	5.803	-5.803	2.725	-2.725
176	0.075	0.079	0.084	5.832	-5.832	2.747	-2.747
177	0.073	0.077	0.082	5.861	-5.861	2.768	-2.768
178	0.07	0.075	0.079	5.891	-5.891	2.79	-2.79

179	0.068	0.073	0.077	5.92	-5.92	2.811	-2.811
180	0.066	0.071	0.075	5.949	-5.949	2.833	-2.833
181	0.064	0.068	0.073	5.979	-5.979	2.855	-2.855
182	0.062	0.066	0.07	6.009	-6.009	2.877	-2.877
183	0.061	0.065	0.068	6.039	-6.039	2.898	-2.898
184	0.059	0.063	0.066	6.069	-6.069	2.92	-2.92
185	0.057	0.061	0.064	6.099	-6.099	2.942	-2.942
186	0.055	0.059	0.063	6.129	-6.129	2.964	-2.964
187	0.054	0.057	0.061	6.16	-6.16	2.986	-2.986
188	0.052	0.055	0.059	6.191	-6.191	3.008	-3.008
189	0.05	0.054	0.057	6.222	-6.222	3.031	-3.031
190	0.049	0.052	0.055	6.253	-6.253	3.053	-3.053
191	0.047	0.05	0.054	6.284	-6.284	3.075	-3.075
192	0.046	0.049	0.052	6.316	-6.316	3.097	-3.097
193	0.044	0.047	0.05	6.347	-6.347	3.12	-3.12
194	0.043	0.046	0.049	6.379	-6.379	3.142	-3.142
195	0.041	0.044	0.047	6.411	-6.411	3.164	-3.164
196	0.04	0.043	0.046	6.444	-6.444	3.187	-3.187
197	0.039	0.041	0.044	6.477	-6.477	3.209	-3.209
198	0.037	0.04	0.043	6.51	-6.51	3.232	-3.232
199	0.036	0.039	0.041	6.543	-6.543	3.255	-3.255
200	0.035	0.038	0.04	6.577	-6.577	3.277	-3.277





附表 II (Attachment II)

