



## 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 :

MF52 D 104F3950

产品编号 PRODUCT CODE:

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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### 变更记录表 REVISED RECORD SHEET

版次 REV. NO	变更日期 REV.DATE	变更内容 CHANGE CONTENT	申请人 APPLICANT	批准人 APPROVED
A0	2015/10/11	版本制定。	鞠晓丽	李少媛
B0	2021/9/24	更新规格书版本格式，增加版次管控，细化规格图纸。	王月婷	李少媛



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

**MF52    D    104    F    3950    28    L    0030**

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)
- ③ 103: 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 0030: 线材长度 0030=30mm。 (Wire length 0030=30mm)

## 2、电气性能 Electrical Characteristics

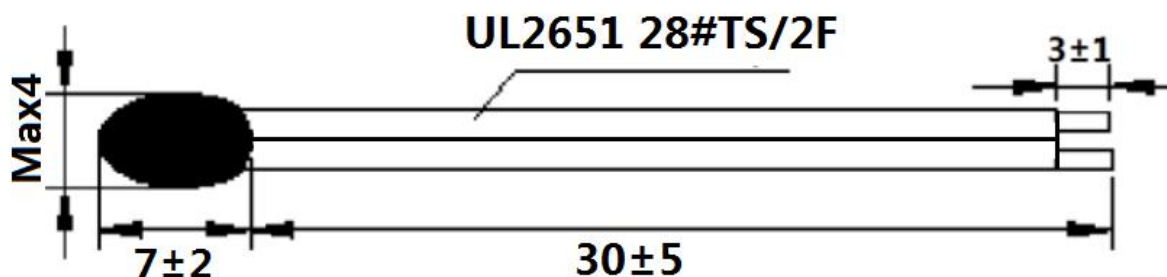
No.	项目 Item	符号 Symbol	测试条件 Test conditions	单位 Unit	性能要求 Requirements
2.1	25℃的零功率电阻值 Zero Power Resistance at 25℃	R <sub>25℃</sub>	T <sub>a</sub> =25±0.01℃ Test Power≤0.1mW	KΩ	100KΩ±1%
2.2	B 值 B-value	B <sub>25/50</sub>	$B=[(T_a \times T_b)/(T_b - T_a)] \times \ln(R_a/R_b)$ T <sub>a</sub> =25±0.01℃ T <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℃~105℃
2.8	工作温度范围 Operating temperature range	/	/	℃	-20℃~105℃
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:			
		确认 Confirm		日期 DATE	
产品型号 MODEL NO.	MF52D 104F395028L0030	审核 Approve:		日期 DATE	

尺寸 Dimensions:

(Unit: mm)



技术要求 Technical requirements:

- 1) 零功率阻值: R25: 100K Ω ± 1% (Zero Power Resistance: R25: 100KΩ±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)。

材料规格 Material specifications

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 10K Ω	1	
2	包封类 Coating material	环氧树脂	1	黑色 Black
3	电子线 Electronic wire	UL2651 28#TS/2F	1	黑色 Black
4				
5				
6				

更新履历 Revised record sheet

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 $R_{25} \Delta R/R \leq \pm 2\%$
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	$-20^\circ\text{C}$ 30min $\rightarrow$ $25^\circ\text{C}$ 5min $\rightarrow$ $105^\circ\text{C}$ 30min $\rightarrow$ $25^\circ\text{C}$ 5min, 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: $105^\circ\text{C} \pm 5^\circ\text{C}$ 时间: 1000 小时 Temp : $125^\circ\text{C} \pm 5^\circ\text{C}$ , 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: $-20^\circ\text{C}$ 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 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	产品 CQC 认证 CQC certificate	
8.5	苏省高新技术产品认证 High-tech product certificate in Jiangsu Province	

## 南京时恒电子科技有限公司

R25=100K $\Omega$ 精度: $\pm 1\%$				B25/50=3950K 精度: $\pm 1\%$ (P209-15A)			
温度( $^{\circ}\text{C}$ )	电阻(K $\Omega$ )			电阻精度(%)		温度精度( $^{\circ}\text{C}$ )	
	最小值	中心值	最大值	$\Delta R$	$-\Delta R$	$\Delta T$	$-\Delta T$
-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



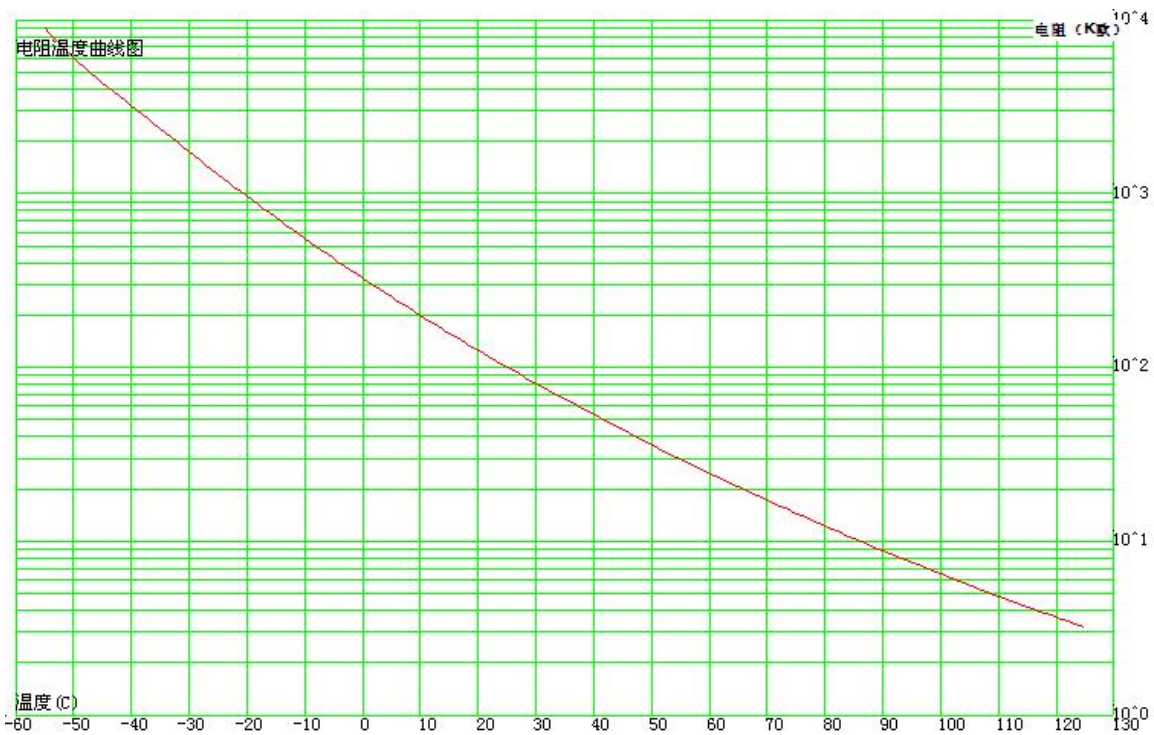
-18	832.387	859.074	886.528	3.195	-3.106	0.546	-0.531
-17	787.025	811.797	837.266	3.137	-3.051	0.540	-0.525
-16	744.361	767.359	790.988	3.079	-2.996	0.534	-0.520
-15	704.229	725.581	747.505	3.021	-2.942	0.528	-0.514
-14	666.472	686.296	706.640	2.964	-2.888	0.521	-0.508
-13	630.940	649.348	668.227	2.907	-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



附表 II (Attachment II)

