



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 :

MF52A 103F4100(A1)

产品编号 PRODUCTCODE:

版次 REV.NO:

B0

日期 DATE:

2022-11-23

确认

CONFIRM

客户 CLIENT		供货商/制造商 MANUFACTOR	
品保部 Quality Dep.		规格书制作 Design	吴迎丽
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 **A** **103** **F** **4100** **(A1)**


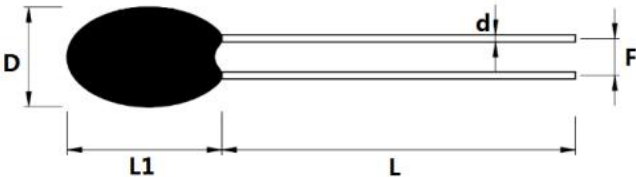
① ② ③ ④ ⑤ ⑥

- ① MF52: 测温型 NTC 热敏电阻器系列 (Series Temp Measurement NTC Thermistor)
- ② A: 指引线为镀锡线 (Refers to tinned lead)
- 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 4100: B25/50 值 4100K (B25/50:4100K)
- ⑥ (A1): 线材规格: 引线外径 Φ0.3mm (Wire dimension: The outer diameter of lead wire is Φ0.3mm)

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 _{25℃}	T _a =25±0.01℃ Test Power≤0.1mW	KΩ	10KΩ±1%
2.2	B 值 B-value	B _{25/50}	$B=[(T_a \times T_b)/(T_b - T_a)] \times \ln(R_a/R_b)$ T _a =25±0.01℃ T _b =50℃±0.01℃	K	4100±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
2.5	绝缘电阻 Insulation resistance	/	100V/DC 1min	MΩ	≥100
2.6	工作温度范围 Operating temperature range	/	/	℃	-55℃~125℃
2.7	最大额定功率 Maximum rated power	P _{max}	/	mW	50
2.8	阻温特性 R&T-table	/	/	/	见附表 I See attached table I
2.9	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

 产品图纸 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.	MF52A 103F4100(A1)	审核 Approve:		日期 DATE										
尺寸 Dimensions: (Unit: mm)														
														
<table border="1"> <thead> <tr> <th>D</th> <th>L1</th> <th>L</th> <th>d±0.05</th> <th>F±0.5</th> </tr> </thead> <tbody> <tr> <td>Max2.5</td> <td>Max4.0</td> <td>Min25</td> <td>0.3</td> <td>1.7</td> </tr> </tbody> </table>					D	L1	L	d±0.05	F±0.5	Max2.5	Max4.0	Min25	0.3	1.7
D	L1	L	d±0.05	F±0.5										
Max2.5	Max4.0	Min25	0.3	1.7										
技术要求 Technical requirements:														
1) 零功率阻值: R25: 10KΩ ±1% (Zero Power Resistance: R25: 10KΩ±1%); 2) B25/50 数值: 4100K±1% (B-value:B25/50: 4100K±1%); 3) 线材: Φ0.3 镀锡铜包钢线 (Φ0.3 tinned copper-weld steel wire); 4) 封装: 黑色改性环氧树脂包封 (Black function improvement Epoxy resin); 5) 符合 RoHS 环保要求 (Meet environmental protection requirements:RoHS)。														
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		王月婷	李少媛									

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 ± 1 N, 时间: 10 ± 1 秒 Fixed resistor end, Pull strength: 5 ± 1 N, time: 10 ± 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	耐焊接热 Withstand weiling temp	IEC60068-2-20	锡锅温度: $260\pm 5^\circ\text{C}$, 浸入深度距电阻体 6mm, 时间 5 ± 1 秒 Temperature of tin pot: $260\pm 5^\circ\text{C}$, insert depth from body of resistance 6mm, time 5 ± 1 seconds	$R_{25} \Delta R/R \leq \pm 2\%$
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	$R_{25} \Delta R/R \leq \pm 2\%$
4.4	温度快速变化 Rapid changes in temperature	IEC60068-2-14	$-55^\circ\text{C} 30\text{min} \rightarrow 25^\circ\text{C} 5\text{min} \rightarrow 125^\circ\text{C} 30\text{min} \rightarrow 25^\circ\text{C} 5\text{min}$, 5cycles	$R_{25} \Delta R/R \leq \pm 2\%$
4.5	高温储存 High temperature storage	IEC60068-2-2	温度: $125^\circ\text{C}\pm 5^\circ\text{C}$ 时间: 1000 小时 Temp : $125^\circ\text{C}\pm 5^\circ\text{C}$, Time : 1000hrs	$R_{25} \Delta R/R \leq \pm 2\%$
4.6	低温储存 Low temperature storage	IEC60068-2-1	温度: -55°C 时间: 1000 小时 Temp : -55°C , Time : 1000hrs	$R_{25} \Delta R/R \leq \pm 2\%$

▲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 □ 编带方式 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	自封口袋(self sealing bag) $W\times H=11\text{mm}\times 12\text{mm}$	500

6、安装&使用注意事项 Installation & Use precautions

6.1 本产品的用途：温度测量与控制；application:test and control for temperature

6.2 避免过大的电流引起元件自身发热而产生测量误差；To avoid of testing tolerance caused by huge current upon the self-heat of component.

6.3 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℃，焊接时间<3ses；

When welded by soldering iron,weld spot should be 2mm at least from head,weld temperature should be under 360℃,time<3ses

6.4 储存温度：-10℃ ~ 40℃；储存湿度：≤75% RH；storage temp:-10℃ ~ 40℃；storage humidity:≤75% RH

6.5 避免存放在具有腐蚀性气体及光照的环境下；To avoid of leaving with such environment as corrosive gases and illumination

6.6 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；

The packing need to be resealed since opened,storage period 1 year.once valid,it should be retest according to regulated of criterion and can be still used if meet the requirement.

6.7 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℃/10-12min 进行热缩；

In case of useing heat-shrink tube,hair drier is prohibited.we suggest that put the product with heat shrink into constant-temperature box and heat shrink under 110℃/10-12min

7、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	CQC 认证 CQC certificate	
8.5	江苏省高新技术产品认证 High-tech product certificate in Jiangsu Province	
8.6	TUV 认证 TUV certificate	

附表 I (Attachment I)

南京时恒阻温特性表 SHIHENG R-T Table

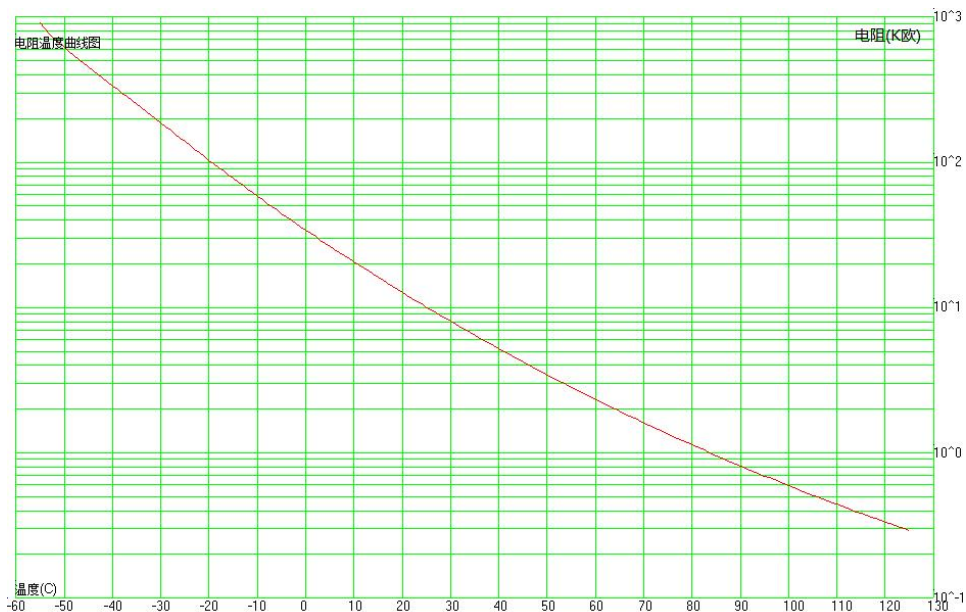
R25=10KΩ 精度:±1% B25/50=4100K 精度:±1%(P186-16)							
温度(°C) TEMP(°C)	电阻(KΩ) RESISTANCE(KΩ)			电阻精度(%) RESISST-TOL(%)		温度精度(°C) TEMP-TOL(°C)	
	最小值	中心值	最大值	ΔR	-ΔR	ΔT	-ΔT
-55	859.290	908.000	959.374	5.657	-5.364	0.734	-0.696
-54	786.710	830.565	876.776	5.563	-5.280	0.731	-0.693
-53	725.202	764.999	806.898	5.477	-5.202	0.727	-0.690
-52	672.238	708.585	746.822	5.396	-5.129	0.723	-0.687
-51	625.952	659.320	694.399	5.320	-5.061	0.719	-0.684
-50	584.950	615.711	648.026	5.248	-4.996	0.715	-0.680
-49	548.185	576.634	606.500	5.179	-4.933	0.710	-0.676
-48	514.861	541.239	568.911	5.112	-4.873	0.706	-0.673
-47	484.373	508.875	534.563	5.047	-4.814	0.701	-0.669
-46	456.257	479.047	502.925	4.984	-4.757	0.696	-0.665
-45	430.155	451.373	473.590	4.922	-4.700	0.692	-0.660
-44	405.793	425.558	446.241	4.860	-4.644	0.687	-0.656
-43	382.956	401.374	420.636	4.798	-4.588	0.682	-0.652
-42	361.479	378.643	396.583	4.737	-4.533	0.677	-0.647
-41	341.231	357.226	373.933	4.676	-4.477	0.672	-0.643
-40	322.108	337.010	352.566	4.615	-4.421	0.667	-0.638
-39	304.026	317.906	332.386	4.554	-4.366	0.661	-0.634
-38	286.918	299.841	313.315	4.493	-4.310	0.656	-0.629
-37	270.726	282.754	295.287	4.432	-4.253	0.651	-0.625
-36	255.401	266.591	278.244	4.370	-4.197	0.645	-0.620
-35	240.900	251.306	262.136	4.309	-4.140	0.640	-0.615
-34	227.183	236.857	246.918	4.247	-4.084	0.635	-0.610
-33	214.215	223.204	232.547	4.185	-4.027	0.629	-0.605
-32	201.963	210.312	218.985	4.123	-3.970	0.624	-0.600
-31	190.392	198.145	206.193	4.061	-3.912	0.618	-0.595
-30	179.473	186.670	194.136	3.999	-3.855	0.612	-0.590
-29	169.174	175.853	182.778	3.937	-3.798	0.607	-0.585
-28	159.467	165.664	172.084	3.875	-3.740	0.601	-0.580
-27	150.322	156.070	162.022	3.813	-3.683	0.595	-0.575
-26	141.710	147.042	152.558	3.751	-3.625	0.590	-0.570
-25	133.605	138.550	143.662	3.690	-3.568	0.584	-0.564
-24	125.980	130.565	135.302	3.628	-3.511	0.578	-0.559

-23	118.809	123.059	127.449	3.567	-3.454	0.572	-0.554
-22	112.066	116.007	120.074	3.506	-3.397	0.566	-0.548
-21	105.728	109.381	113.150	3.445	-3.340	0.560	-0.543
-20	99.770	103.158	106.649	3.384	-3.283	0.554	-0.537
-19	94.172	97.312	100.547	3.324	-3.227	0.547	-0.531
-18	88.911	91.823	94.820	3.264	-3.170	0.541	-0.526
-17	83.967	86.667	89.445	3.204	-3.114	0.535	-0.520
-16	79.322	81.825	84.399	3.145	-3.059	0.529	-0.514
-15	74.956	77.277	79.662	3.086	-3.003	0.522	-0.508
-14	70.852	73.005	75.215	3.027	-2.948	0.516	-0.502
-13	66.994	68.991	71.040	2.969	-2.893	0.509	-0.496
-12	63.367	65.219	67.118	2.911	-2.839	0.503	-0.490
-11	59.956	61.674	63.434	2.854	-2.784	0.496	-0.484
-10	56.747	58.341	59.972	2.797	-2.730	0.489	-0.478
-9	53.728	55.206	56.719	2.740	-2.677	0.483	-0.471
-8	50.886	52.258	53.660	2.684	-2.623	0.476	-0.465
-7	48.211	49.483	50.783	2.628	-2.570	0.469	-0.459
-6	45.691	46.872	48.077	2.572	-2.517	0.462	-0.452
-5	43.318	44.413	45.530	2.517	-2.465	0.455	-0.446
-4	41.081	42.096	43.133	2.462	-2.412	0.448	-0.439
-3	38.972	39.914	40.875	2.407	-2.360	0.441	-0.432
-2	36.983	37.857	38.748	2.353	-2.309	0.434	-0.425
-1	35.106	35.917	36.743	2.299	-2.257	0.426	-0.419
0	33.507	34.265	35.036	2.251	-2.211	0.418	-0.411
1	31.663	32.361	33.071	2.193	-2.155	0.412	-0.405
2	30.084	30.731	31.389	2.140	-2.105	0.404	-0.398
3	28.592	29.192	29.801	2.087	-2.054	0.397	-0.390
4	27.182	27.738	28.303	2.035	-2.004	0.389	-0.383
5	25.849	26.364	26.887	1.983	-1.955	0.381	-0.376
6	24.588	25.066	25.550	1.932	-1.905	0.374	-0.368
7	23.395	23.837	24.286	1.881	-1.856	0.366	-0.361
8	22.266	22.676	23.091	1.830	-1.807	0.358	-0.353
9	21.197	21.576	21.960	1.779	-1.758	0.350	-0.346
10	20.184	20.536	20.891	1.729	-1.709	0.342	-0.338
11	19.225	19.550	19.878	1.679	-1.661	0.334	-0.330
12	18.316	18.617	18.920	1.629	-1.613	0.326	-0.322
13	17.455	17.732	18.013	1.580	-1.565	0.317	-0.314
14	16.638	16.894	17.153	1.531	-1.517	0.309	-0.306
15	15.863	16.100	16.338	1.482	-1.470	0.300	-0.298
16	15.128	15.346	15.566	1.433	-1.423	0.292	-0.290
17	14.430	14.632	14.834	1.385	-1.376	0.283	-0.281

18	13.768	13.953	14.140	1.337	-1.329	0.274	-0.272
19	13.139	13.310	13.481	1.289	-1.282	0.265	-0.263
20	12.542	12.699	12.857	1.241	-1.236	0.255	-0.254
21	11.975	12.119	12.264	1.194	-1.190	0.245	-0.244
22	11.436	11.568	11.701	1.147	-1.144	0.233	-0.233
23	10.923	11.044	11.166	1.100	-1.098	0.219	-0.219
24	10.436	10.547	10.658	1.053	-1.052	0.196	-0.196
25	9.900	10.000	10.100	1.000	-1.000	0.188	-0.188
26	9.525	9.625	9.725	1.038	-1.037	0.273	-0.272
27	9.098	9.198	9.298	1.084	-1.082	0.261	-0.260
28	8.693	8.792	8.891	1.130	-1.127	0.266	-0.265
29	8.307	8.405	8.504	1.175	-1.171	0.274	-0.273
30	7.940	8.037	8.136	1.220	-1.215	0.284	-0.283
31	7.591	7.688	7.785	1.265	-1.259	0.294	-0.293
32	7.259	7.354	7.451	1.310	-1.303	0.305	-0.304
33	6.943	7.037	7.133	1.355	-1.347	0.316	-0.315
34	6.642	6.735	6.830	1.399	-1.390	0.328	-0.326
35	6.355	6.448	6.541	1.444	-1.433	0.340	-0.337
36	6.083	6.174	6.266	1.488	-1.476	0.352	-0.349
37	5.823	5.913	6.004	1.531	-1.518	0.364	-0.360
38	5.576	5.664	5.754	1.575	-1.561	0.376	-0.372
39	5.340	5.427	5.515	1.619	-1.603	0.388	-0.384
40	5.116	5.201	5.288	1.662	-1.644	0.400	-0.396
41	4.902	4.986	5.071	1.705	-1.686	0.413	-0.408
42	4.698	4.781	4.864	1.748	-1.727	0.425	-0.420
43	4.504	4.585	4.667	1.790	-1.768	0.438	-0.432
44	4.318	4.398	4.478	1.833	-1.809	0.451	-0.445
45	4.141	4.219	4.298	1.875	-1.850	0.463	-0.457
46	3.972	4.049	4.127	1.917	-1.890	0.476	-0.470
47	3.811	3.886	3.963	1.958	-1.931	0.489	-0.482
48	3.658	3.731	3.806	2.000	-1.971	0.502	-0.495
49	3.511	3.583	3.656	2.041	-2.010	0.515	-0.508
50	3.371	3.442	3.513	2.082	-2.050	0.529	-0.520
51	3.237	3.306	3.376	2.123	-2.089	0.542	-0.533
52	3.109	3.177	3.246	2.164	-2.128	0.555	-0.546
53	2.987	3.054	3.121	2.205	-2.167	0.569	-0.559
54	2.871	2.935	3.001	2.245	-2.205	0.583	-0.572
55	2.759	2.823	2.887	2.285	-2.244	0.596	-0.585
56	2.653	2.715	2.778	2.325	-2.282	0.610	-0.599
57	2.551	2.611	2.673	2.365	-2.320	0.624	-0.612
58	2.453	2.513	2.573	2.404	-2.357	0.638	-0.625

59	2.360	2.418	2.477	2.443	-2.395	0.652	-0.639
60	2.271	2.328	2.385	2.482	-2.432	0.666	-0.652
61	2.186	2.241	2.297	2.521	-2.469	0.680	-0.666
62	2.104	2.158	2.213	2.560	-2.506	0.694	-0.679
63	2.026	2.079	2.133	2.598	-2.542	0.708	-0.693
64	1.951	2.002	2.055	2.637	-2.579	0.723	-0.707
65	1.879	1.930	1.981	2.675	-2.615	0.737	-0.721
66	1.810	1.860	1.910	2.713	-2.651	0.752	-0.735
67	1.744	1.793	1.842	2.750	-2.686	0.766	-0.749
68	1.681	1.728	1.777	2.788	-2.722	0.781	-0.763
69	1.621	1.667	1.714	2.825	-2.757	0.796	-0.777
70	1.563	1.608	1.654	2.862	-2.792	0.811	-0.791
71	1.507	1.551	1.596	2.899	-2.827	0.826	-0.805
72	1.454	1.497	1.541	2.936	-2.862	0.841	-0.820
73	1.403	1.445	1.488	2.972	-2.896	0.856	-0.834
74	1.354	1.394	1.436	3.009	-2.930	0.871	-0.848
75	1.306	1.346	1.387	3.045	-2.965	0.886	-0.863
76	1.261	1.300	1.340	3.081	-2.998	0.902	-0.878
77	1.218	1.256	1.295	3.117	-3.032	0.917	-0.892
78	1.176	1.213	1.251	3.152	-3.066	0.933	-0.907
79	1.136	1.172	1.210	3.188	-3.099	0.948	-0.922
80	1.097	1.133	1.169	3.223	-3.132	0.964	-0.937
81	1.060	1.095	1.131	3.258	-3.165	0.980	-0.952
82	1.025	1.059	1.093	3.293	-3.197	0.995	-0.967
83	0.990	1.024	1.058	3.328	-3.230	1.011	-0.982
84	0.958	0.990	1.023	3.362	-3.262	1.027	-0.997
85	0.926	0.958	0.990	3.396	-3.295	1.043	-1.012
86	0.895	0.926	0.958	3.431	-3.326	1.059	-1.027
87	0.866	0.896	0.927	3.465	-3.358	1.076	-1.043
88	0.838	0.867	0.898	3.499	-3.390	1.092	-1.058
89	0.811	0.840	0.869	3.532	-3.421	1.108	-1.074
90	0.785	0.813	0.842	3.566	-3.453	1.125	-1.089
91	0.760	0.787	0.815	3.599	-3.484	1.141	-1.105
92	0.735	0.762	0.790	3.632	-3.515	1.158	-1.120
93	0.712	0.738	0.765	3.665	-3.545	1.175	-1.136
94	0.690	0.715	0.742	3.698	-3.576	1.191	-1.152
95	0.668	0.693	0.719	3.731	-3.606	1.208	-1.168
96	0.647	0.672	0.697	3.763	-3.637	1.225	-1.184
97	0.627	0.651	0.676	3.796	-3.667	1.242	-1.200
98	0.608	0.631	0.655	3.828	-3.696	1.259	-1.216
99	0.589	0.612	0.636	3.860	-3.726	1.276	-1.232

100	0.571	0.594	0.617	3.892	-3.756	1.294	-1.248
101	0.554	0.576	0.598	3.924	-3.785	1.311	-1.265
102	0.537	0.558	0.581	3.955	-3.814	1.328	-1.281
103	0.521	0.542	0.563	3.986	-3.843	1.346	-1.297
104	0.505	0.526	0.547	4.018	-3.872	1.363	-1.314
105	0.490	0.510	0.531	4.049	-3.901	1.381	-1.330
106	0.476	0.495	0.516	4.079	-3.929	1.399	-1.347
107	0.462	0.481	0.501	4.110	-3.957	1.416	-1.364
108	0.449	0.467	0.487	4.141	-3.985	1.434	-1.380
109	0.436	0.454	0.473	4.171	-4.013	1.452	-1.397
110	0.423	0.441	0.459	4.201	-4.041	1.470	-1.414
111	0.411	0.428	0.446	4.231	-4.069	1.488	-1.431
112	0.399	0.416	0.434	4.261	-4.096	1.506	-1.448
113	0.388	0.405	0.422	4.290	-4.123	1.525	-1.465
114	0.377	0.393	0.410	4.320	-4.150	1.543	-1.483
115	0.367	0.383	0.399	4.349	-4.177	1.562	-1.500
116	0.356	0.372	0.388	4.378	-4.204	1.580	-1.517
117	0.347	0.362	0.378	4.406	-4.230	1.599	-1.535
118	0.337	0.352	0.368	4.435	-4.256	1.617	-1.552
119	0.328	0.343	0.358	4.463	-4.282	1.636	-1.570
120	0.319	0.334	0.349	4.491	-4.308	1.655	-1.587
121	0.311	0.325	0.339	4.519	-4.333	1.674	-1.605
122	0.302	0.316	0.331	4.547	-4.359	1.693	-1.623
123	0.295	0.308	0.322	4.574	-4.384	1.712	-1.641
124	0.287	0.300	0.314	4.602	-4.409	1.731	-1.659
125	0.280	0.293	0.306	4.629	-4.433	1.751	-1.677



附表 II (Attachment II)

