



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 502G3950(A1) (UL:E240991)

产品编号 PRODUCTCODE:

版次 REV.NO:

B0

日期 DATE:

2022-10-25

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 502 G 3950 (A1)


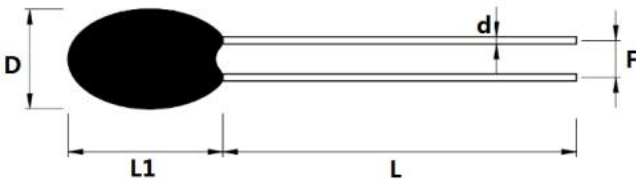
① ② ③ ④ ⑤ ⑥

- 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)
- ③ 502: 25℃ 的零功率电阻值 5KΩ (Zero Power Resistance at 25℃ is 5KΩ)
- ④ G: 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 (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	5KΩ±2%
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	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
2.5	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 502G3950(A1)	审核 Approve:		日期 DATE	
尺寸 Dimensions: (Unit: mm)					
					
D Max	L1 Max	L Min	$d \pm 0.05$	$F \pm 0.5$	
2.5	4.0	25	0.3	1.7	
技术要求 Technical requirements:					
1) 零功率阻值: R25: $5K\Omega \pm 2\%$ (Zero Power Resistance: R25: $5K\Omega \pm 2\%$); 2) B25/50 数值: $3950K \pm 1\%$ (B-value: B25/50: $3950K \pm 1\%$); 3) 线材: $\phi 0.3$ 镀锡铜包钢线 ($\Phi 0.3$ 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	UL 认证 UL certificate	E240991
8.7	TUV 认证 TUV certificate	

附表 I (Attachment I)

南京时恒阻温特性表 SHIHENG R-T Table

R25=5K Ω 精度: $\pm 2\%$ B25/50=3950K B25/85=3991K 精度: $\pm 1\%$ (P213-2A)

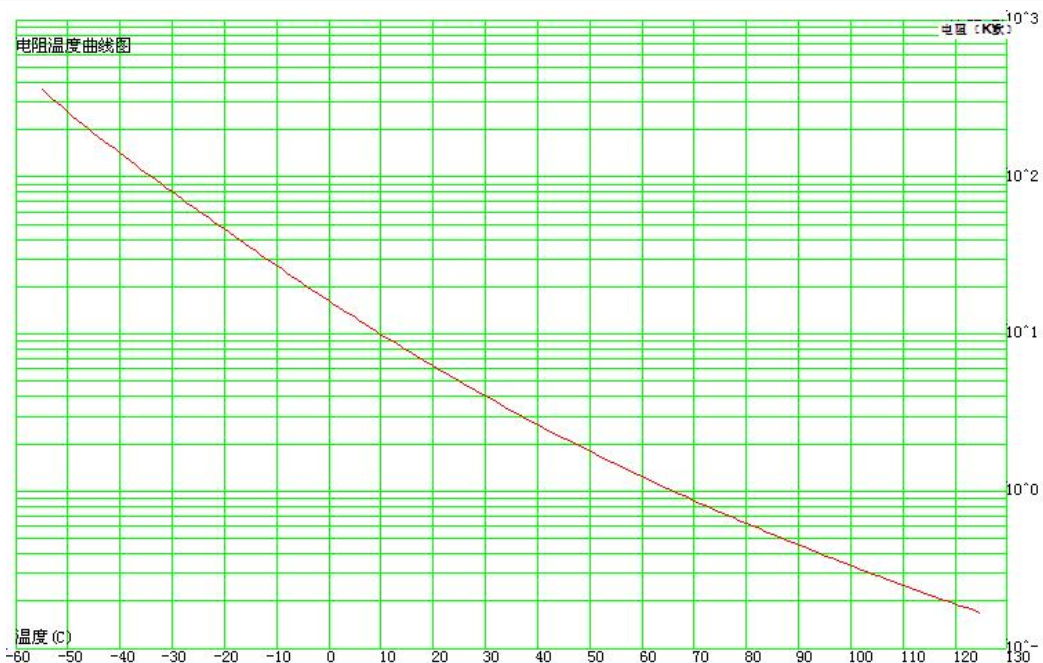
温度(°C) TEMP(°C)	电阻(K Ω) RESISTANCE(K Ω)			电阻精度(%) RESISST-TOL(%)		温度精度(°C) TEMP-TOL(°C)	
	最小值	中心值	最大值	ΔR	$-\Delta R$	ΔT	$-\Delta T$
-55	339.241	361.302	384.645	6.460	-6.106	0.883	-0.835
-54	316.670	337.029	358.554	6.386	-6.040	0.880	-0.833
-53	296.033	314.852	334.732	6.314	-5.976	0.877	-0.830
-52	277.107	294.525	312.913	6.243	-5.914	0.874	-0.828
-51	259.697	275.841	292.870	6.173	-5.852	0.871	-0.826
-50	243.641	258.620	274.410	6.105	-5.791	0.868	-0.823
-49	228.797	242.709	257.364	6.037	-5.731	0.865	-0.821
-48	215.042	227.975	241.588	5.971	-5.672	0.861	-0.818
-47	202.270	214.302	226.959	5.906	-5.614	0.858	-0.815
-46	190.389	201.591	213.367	5.841	-5.556	0.854	-0.813
-45	179.318	189.754	200.716	5.777	-5.499	0.851	-0.810
-44	168.985	178.712	188.924	5.713	-5.442	0.847	-0.807
-43	159.328	168.399	177.916	5.651	-5.386	0.843	-0.803
-42	150.291	158.754	167.627	5.588	-5.330	0.839	-0.800
-41	141.825	149.724	157.999	5.526	-5.275	0.835	-0.797
-40	133.885	141.260	148.980	5.465	-5.220	0.831	-0.794
-39	126.433	133.319	140.525	5.404	-5.165	0.827	-0.790
-38	119.431	125.864	132.590	5.343	-5.110	0.823	-0.787
-37	112.849	118.859	125.139	5.283	-5.056	0.818	-0.783
-36	106.657	112.273	118.138	5.223	-5.002	0.814	-0.780
-35	100.828	106.078	111.555	5.163	-4.948	0.810	-0.776
-34	95.339	100.246	105.363	5.104	-4.894	0.805	-0.772
-33	90.167	94.755	99.535	5.045	-4.841	0.801	-0.768
-32	85.292	89.581	94.048	4.986	-4.787	0.796	-0.764
-31	80.696	84.706	88.880	4.927	-4.734	0.791	-0.760
-30	76.360	80.110	84.011	4.869	-4.681	0.787	-0.756
-29	72.269	75.776	79.422	4.810	-4.628	0.782	-0.752
-28	68.409	71.689	75.096	4.752	-4.575	0.777	-0.748
-27	64.765	67.832	71.017	4.694	-4.522	0.772	-0.744
-26	61.324	64.194	67.170	4.637	-4.469	0.768	-0.740
-25	58.076	60.760	63.542	4.579	-4.417	0.763	-0.736

-24	55.007	57.518	60.119	4.522	-4.364	0.758	-0.731
-23	52.109	54.458	56.889	4.465	-4.312	0.753	-0.727
-22	49.371	51.568	53.842	4.408	-4.260	0.747	-0.722
-21	46.785	48.840	50.965	4.351	-4.208	0.742	-0.718
-20	44.340	46.263	48.250	4.294	-4.156	0.737	-0.713
-19	42.031	43.830	45.687	4.238	-4.104	0.732	-0.709
-18	39.848	41.531	43.268	4.182	-4.052	0.726	-0.704
-17	37.784	39.359	40.983	4.126	-4.001	0.721	-0.699
-16	35.834	37.307	38.826	4.070	-3.949	0.716	-0.694
-15	33.990	35.369	36.789	4.015	-3.898	0.710	-0.690
-14	32.246	33.537	34.865	3.959	-3.847	0.705	-0.685
-13	30.598	31.805	33.047	3.904	-3.796	0.699	-0.680
-12	29.039	30.169	31.330	3.849	-3.745	0.694	-0.675
-11	27.564	28.622	29.708	3.795	-3.695	0.688	-0.670
-10	26.170	27.160	28.176	3.740	-3.644	0.682	-0.665
-9	24.850	25.777	26.727	3.686	-3.594	0.677	-0.660
-8	23.602	24.470	25.359	3.632	-3.543	0.671	-0.654
-7	22.422	23.233	24.065	3.578	-3.493	0.665	-0.649
-6	21.304	22.064	22.842	3.525	-3.444	0.659	-0.644
-5	20.247	20.958	21.686	3.472	-3.394	0.653	-0.639
-4	19.246	19.912	20.593	3.419	-3.344	0.647	-0.633
-3	18.298	18.922	19.559	3.366	-3.295	0.641	-0.628
-2	17.401	17.985	18.581	3.314	-3.246	0.635	-0.622
-1	16.552	17.099	17.656	3.261	-3.197	0.629	-0.617
0	15.646	16.154	16.671	3.203	-3.142	0.625	-0.613
1	14.985	15.465	15.953	3.158	-3.100	0.617	-0.605
2	14.264	14.713	15.170	3.106	-3.052	0.610	-0.600
3	13.580	14.000	14.428	3.055	-3.003	0.604	-0.594
4	12.932	13.326	13.726	3.004	-2.955	0.598	-0.588
5	12.317	12.686	13.061	2.954	-2.908	0.591	-0.582
6	11.735	12.081	12.432	2.903	-2.860	0.585	-0.576
7	11.183	11.507	11.835	2.853	-2.813	0.579	-0.570
8	10.660	10.963	11.270	2.803	-2.766	0.572	-0.564
9	10.163	10.447	10.735	2.754	-2.719	0.565	-0.558
10	9.666	9.932	10.200	2.702	-2.670	0.560	-0.554
11	9.245	9.494	9.747	2.656	-2.626	0.552	-0.546
12	8.821	9.054	9.290	2.607	-2.580	0.545	-0.540
13	8.418	8.637	8.858	2.559	-2.534	0.539	-0.533
14	8.036	8.241	8.448	2.511	-2.488	0.532	-0.527
15	7.673	7.865	8.059	2.463	-2.442	0.525	-0.521
16	7.328	7.508	7.689	2.415	-2.397	0.518	-0.514

17	7.001	7.169	7.339	2.368	-2.352	0.511	-0.508
18	6.689	6.847	7.006	2.321	-2.307	0.504	-0.501
19	6.393	6.542	6.690	2.274	-2.263	0.497	-0.494
20	6.112	6.251	6.390	2.228	-2.218	0.490	-0.488
21	5.845	5.975	6.105	2.181	-2.174	0.483	-0.481
22	5.591	5.712	5.834	2.136	-2.130	0.475	-0.474
23	5.349	5.463	5.577	2.090	-2.086	0.468	-0.467
24	5.119	5.225	5.332	2.045	-2.043	0.461	-0.461
25	4.900	5.000	5.100	2.000	-2.000	0.454	-0.454
26	4.687	4.785	4.882	2.044	-2.043	0.467	-0.466
27	4.485	4.580	4.676	2.089	-2.085	0.480	-0.479
28	4.292	4.385	4.479	2.133	-2.128	0.493	-0.492
29	4.109	4.200	4.292	2.177	-2.170	0.506	-0.505
30	3.935	4.024	4.113	2.221	-2.212	0.520	-0.518
31	3.768	3.855	3.943	2.265	-2.254	0.533	-0.531
32	3.610	3.695	3.781	2.308	-2.295	0.547	-0.544
33	3.460	3.542	3.626	2.351	-2.337	0.560	-0.557
34	3.316	3.397	3.478	2.394	-2.377	0.574	-0.570
35	3.179	3.258	3.338	2.437	-2.418	0.588	-0.583
36	3.049	3.126	3.203	2.480	-2.459	0.602	-0.597
37	2.924	2.999	3.075	2.522	-2.499	0.616	-0.610
38	2.806	2.879	2.953	2.564	-2.539	0.630	-0.624
39	2.693	2.764	2.836	2.606	-2.579	0.644	-0.637
40	2.584	2.654	2.724	2.647	-2.618	0.658	-0.651
41	2.481	2.549	2.618	2.689	-2.657	0.673	-0.665
42	2.383	2.449	2.516	2.730	-2.696	0.687	-0.679
43	2.289	2.353	2.419	2.771	-2.735	0.702	-0.693
44	2.199	2.262	2.326	2.812	-2.774	0.716	-0.707
45	2.113	2.175	2.237	2.852	-2.812	0.731	-0.721
46	2.031	2.091	2.151	2.892	-2.850	0.746	-0.735
47	1.953	2.011	2.070	2.932	-2.888	0.760	-0.749
48	1.878	1.935	1.992	2.972	-2.925	0.775	-0.763
49	1.806	1.862	1.918	3.012	-2.963	0.790	-0.777
50	1.742	1.796	1.850	3.049	-2.998	0.807	-0.793
51	1.672	1.725	1.778	3.091	-3.037	0.821	-0.806
52	1.610	1.661	1.713	3.130	-3.073	0.836	-0.821
53	1.549	1.599	1.650	3.169	-3.110	0.851	-0.836
54	1.492	1.540	1.590	3.207	-3.146	0.867	-0.850
55	1.437	1.484	1.532	3.246	-3.182	0.882	-0.865
56	1.384	1.430	1.477	3.284	-3.218	0.898	-0.880
57	1.334	1.378	1.424	3.322	-3.254	0.913	-0.895

58	1.285	1.329	1.374	3.360	-3.289	0.929	-0.910
59	1.239	1.281	1.325	3.397	-3.324	0.945	-0.925
60	1.194	1.236	1.278	3.435	-3.359	0.961	-0.940
61	1.152	1.192	1.233	3.472	-3.394	0.977	-0.955
62	1.111	1.150	1.190	3.509	-3.429	0.993	-0.970
63	1.071	1.110	1.149	3.546	-3.463	1.009	-0.986
64	1.034	1.071	1.110	3.583	-3.497	1.025	-1.001
65	0.998	1.034	1.072	3.619	-3.531	1.042	-1.017
66	0.963	0.998	1.035	3.655	-3.565	1.058	-1.032
67	0.930	0.964	1.000	3.692	-3.599	1.075	-1.048
68	0.898	0.931	0.966	3.728	-3.632	1.091	-1.063
69	0.867	0.900	0.934	3.763	-3.665	1.108	-1.079
70	0.837	0.869	0.902	3.799	-3.698	1.125	-1.095
71	0.809	0.840	0.872	3.834	-3.731	1.142	-1.111
72	0.782	0.812	0.844	3.870	-3.764	1.158	-1.127
73	0.755	0.785	0.816	3.905	-3.796	1.175	-1.143
74	0.730	0.759	0.789	3.940	-3.829	1.193	-1.159
75	0.706	0.734	0.763	3.974	-3.861	1.210	-1.175
76	0.683	0.710	0.739	4.009	-3.893	1.227	-1.191
77	0.660	0.687	0.715	4.043	-3.925	1.244	-1.208
78	0.639	0.665	0.692	4.078	-3.956	1.262	-1.224
79	0.618	0.643	0.670	4.112	-3.988	1.279	-1.241
80	0.598	0.623	0.649	4.146	-4.019	1.297	-1.257
81	0.579	0.603	0.628	4.179	-4.050	1.314	-1.274
82	0.560	0.584	0.608	4.213	-4.081	1.332	-1.290
83	0.542	0.565	0.589	4.246	-4.112	1.350	-1.307
84	0.525	0.548	0.571	4.280	-4.142	1.368	-1.324
85	0.508	0.531	0.553	4.313	-4.173	1.386	-1.341
86	0.492	0.514	0.536	4.346	-4.203	1.404	-1.358
87	0.477	0.498	0.520	4.378	-4.233	1.422	-1.375
88	0.462	0.483	0.504	4.411	-4.263	1.440	-1.392
89	0.448	0.468	0.489	4.443	-4.293	1.459	-1.409
90	0.434	0.454	0.474	4.476	-4.322	1.477	-1.426
91	0.421	0.440	0.460	4.508	-4.352	1.495	-1.444
92	0.408	0.427	0.446	4.540	-4.381	1.514	-1.461
93	0.395	0.414	0.433	4.572	-4.410	1.533	-1.478
94	0.384	0.401	0.420	4.604	-4.439	1.551	-1.496
95	0.372	0.389	0.407	4.635	-4.468	1.570	-1.513
96	0.361	0.378	0.396	4.667	-4.497	1.589	-1.531
97	0.350	0.367	0.384	4.698	-4.525	1.608	-1.549
98	0.340	0.356	0.373	4.729	-4.554	1.627	-1.567

99	0.330	0.346	0.362	4.760	-4.582	1.646	-1.584
100	0.320	0.336	0.352	4.791	-4.610	1.665	-1.602
101	0.311	0.326	0.342	4.822	-4.638	1.685	-1.620
102	0.302	0.316	0.332	4.852	-4.666	1.704	-1.638
103	0.293	0.307	0.322	4.883	-4.694	1.723	-1.657
104	0.284	0.299	0.313	4.913	-4.721	1.743	-1.675
105	0.276	0.290	0.304	4.943	-4.749	1.763	-1.693
106	0.268	0.282	0.296	4.974	-4.776	1.782	-1.711
107	0.261	0.274	0.288	5.003	-4.803	1.802	-1.730
108	0.253	0.266	0.280	5.033	-4.830	1.822	-1.748
109	0.246	0.259	0.272	5.063	-4.857	1.842	-1.767
110	0.239	0.252	0.264	5.092	-4.884	1.862	-1.785
111	0.233	0.245	0.257	5.122	-4.910	1.882	-1.804
112	0.226	0.238	0.250	5.151	-4.937	1.902	-1.823
113	0.220	0.231	0.243	5.180	-4.963	1.922	-1.842
114	0.214	0.225	0.237	5.209	-4.989	1.943	-1.861
115	0.208	0.219	0.231	5.238	-5.015	1.963	-1.880
116	0.202	0.213	0.224	5.267	-5.041	1.984	-1.899
117	0.197	0.207	0.218	5.295	-5.067	2.004	-1.918
118	0.192	0.202	0.213	5.324	-5.093	2.025	-1.937
119	0.186	0.196	0.207	5.352	-5.118	2.046	-1.956
120	0.181	0.191	0.202	5.381	-5.144	2.067	-1.976
121	0.177	0.186	0.196	5.409	-5.169	2.088	-1.995
122	0.172	0.181	0.191	5.437	-5.194	2.109	-2.014
123	0.167	0.177	0.186	5.465	-5.219	2.130	-2.034
124	0.163	0.172	0.181	5.492	-5.244	2.151	-2.054
125	0.159	0.168	0.177	5.520	-5.269	2.172	-2.073



附表 II (Attachment II)

