



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 153F3950(A1)

产品编号 PRODUCTCODE:

版次 REV.NO:

B0

日期 DATE:

2023-12-4

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	
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** **153** **F** **3950** **(A1)**


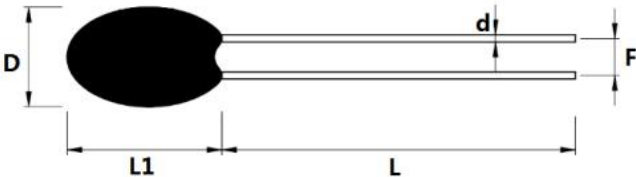
① ② ③ ④ ⑤ ⑥

- 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)
- ③ 153: 25℃ 的零功率电阻值 15KΩ (Zero Power Resistance at 25℃ is 15KΩ)
- 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 (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	15KΩ±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	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
2.5	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	100
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 153F3950(A1)	审核 Approve:		日期 DATE										
尺寸 Dimensions: (Unit: mm)														
														
<table border="1"> <thead> <tr> <th>DMax</th> <th>L1Max</th> <th>LMin</th> <th>d±0.05</th> <th>F±0.5</th> </tr> </thead> <tbody> <tr> <td>2.5</td> <td>4.0</td> <td>25</td> <td>0.3</td> <td>1.7</td> </tr> </tbody> </table>					DMax	L1Max	LMin	d±0.05	F±0.5	2.5	4.0	25	0.3	1.7
DMax	L1Max	LMin	d±0.05	F±0.5										
2.5	4.0	25	0.3	1.7										
技术要求 Technical requirements:														
1) 零功率阻值: R25: 15KΩ ±1% (Zero Power Resistance: R25: 15KΩ±1%); 2) B25/50 数值: 3950K±1% (B-value:B25/50: 3950K±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 $ \Delta R_{25}/R_{25} \leq 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	$ \Delta R_{25}/R_{25} \leq 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	$ \Delta R_{25}/R_{25} \leq 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	$ \Delta R_{25}/R_{25} \leq 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	$ \Delta R_{25}/R_{25} \leq 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	$ \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 □ 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) $W\times H=11\text{mm}\times 12\text{mm}$	

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 (CQC07001019009) CQC certificate (CQC07001019009)	
8.5	江苏省高新技术产品认证 High-tech product certificate in Jiangsu Province	
8.6	产品通过 AEC-Q200 测试 Passed by AECQ-200	20172050557G
8.7	TUV 认证 (R50245892) TUV certificate (R50245892)	
8.8	UL 认证(E240991) ULcertificate(E240991)	

附表 I (Attachment I)

南京时恒电子科技有限公司

R25=15K Ω 精度: $\pm 1\%$ B25/50=3950K 精度: $\pm 1\%$ (P261-12D)

温度(°C)	电阻(K Ω)			电阻精度(%)		温度精度(°C)	
	最小值	中心值	最大值	ΔR	$-\Delta R$	ΔT	$-\Delta T$
-55	1044.77	1103.25	1161.72	5.3	-5.3	0.721	-0.721
-54	969.646	1023.1	1076.55	5.224	-5.224	0.718	-0.718
-53	902.594	951.623	1000.65	5.152	-5.152	0.715	-0.715
-52	842.203	887.296	932.39	5.082	-5.082	0.711	-0.711
-51	787.381	828.945	870.508	5.013	-5.013	0.707	-0.707
-50	737.277	775.652	814.028	4.947	-4.947	0.703	-0.703
-49	691.223	726.702	762.181	4.882	-4.882	0.699	-0.699
-48	648.688	681.524	714.359	4.817	-4.817	0.695	-0.695
-47	609.251	639.664	670.076	4.754	-4.754	0.691	-0.691
-46	572.57	600.756	628.941	4.691	-4.691	0.687	-0.687
-45	538.367	564.5	590.632	4.629	-4.629	0.683	-0.683
-44	506.411	530.648	554.886	4.567	-4.567	0.679	-0.679
-43	476.511	498.995	521.479	4.505	-4.505	0.674	-0.674
-42	448.502	469.363	490.224	4.444	-4.444	0.67	-0.67
-41	422.243	441.601	460.959	4.383	-4.383	0.666	-0.666
-40	397.61	415.575	433.539	4.322	-4.322	0.661	-0.661
-39	374.494	391.167	407.839	4.262	-4.262	0.656	-0.656
-38	352.796	368.27	383.744	4.201	-4.201	0.652	-0.652
-37	332.426	346.789	361.152	4.141	-4.141	0.647	-0.647
-36	313.302	326.634	339.967	4.081	-4.081	0.642	-0.642
-35	295.346	307.723	320.1	4.022	-4.022	0.638	-0.638
-34	278.488	289.979	301.47	3.962	-3.962	0.633	-0.633
-33	262.661	273.33	284	3.903	-3.903	0.628	-0.628
-32	247.802	257.709	267.617	3.844	-3.844	0.623	-0.623

-31	233.851	243.053	252.255	3.785	-3.785	0.618	-0.618
-30	220.753	229.3	237.848	3.727	-3.727	0.613	-0.613
-29	208.455	216.396	224.337	3.669	-3.669	0.607	-0.607
-28	196.907	204.286	211.665	3.612	-3.612	0.602	-0.602
-27	186.063	192.921	199.779	3.554	-3.554	0.597	-0.597
-26	175.878	182.253	188.628	3.497	-3.497	0.592	-0.592
-25	166.31	172.237	178.164	3.441	-3.441	0.586	-0.586
-24	157.32	162.832	168.344	3.385	-3.385	0.581	-0.581
-23	148.871	153.998	159.125	3.329	-3.329	0.575	-0.575
-22	140.928	145.699	150.469	3.273	-3.273	0.57	-0.57
-21	133.46	137.899	142.337	3.218	-3.218	0.564	-0.564
-20	126.434	130.566	134.697	3.164	-3.164	0.558	-0.558
-19	119.824	123.67	127.516	3.109	-3.109	0.552	-0.552
-18	113.601	117.182	120.763	3.056	-3.056	0.547	-0.547
-17	107.741	111.076	114.411	3.002	-3.002	0.541	-0.541
-16	102.22	105.327	108.433	2.949	-2.949	0.535	-0.535
-15	97.017	99.911	102.805	2.896	-2.896	0.529	-0.529
-14	92.112	94.808	97.505	2.844	-2.844	0.522	-0.522
-13	87.485	89.997	92.51	2.791	-2.791	0.516	-0.516
-12	83.118	85.46	87.802	2.74	-2.74	0.51	-0.51
-11	78.996	81.179	83.361	2.688	-2.688	0.504	-0.504
-10	75.102	77.137	79.172	2.637	-2.637	0.497	-0.497
-9	71.423	73.32	75.217	2.586	-2.586	0.491	-0.491
-8	67.945	69.714	71.482	2.536	-2.536	0.484	-0.484
-7	64.656	66.305	67.953	2.486	-2.486	0.477	-0.477
-6	61.544	63.081	64.618	2.436	-2.436	0.471	-0.471
-5	58.598	60.031	61.464	2.386	-2.386	0.464	-0.464
-4	55.808	57.144	58.48	2.337	-2.337	0.457	-0.457
-3	53.166	54.411	55.656	2.288	-2.288	0.45	-0.45

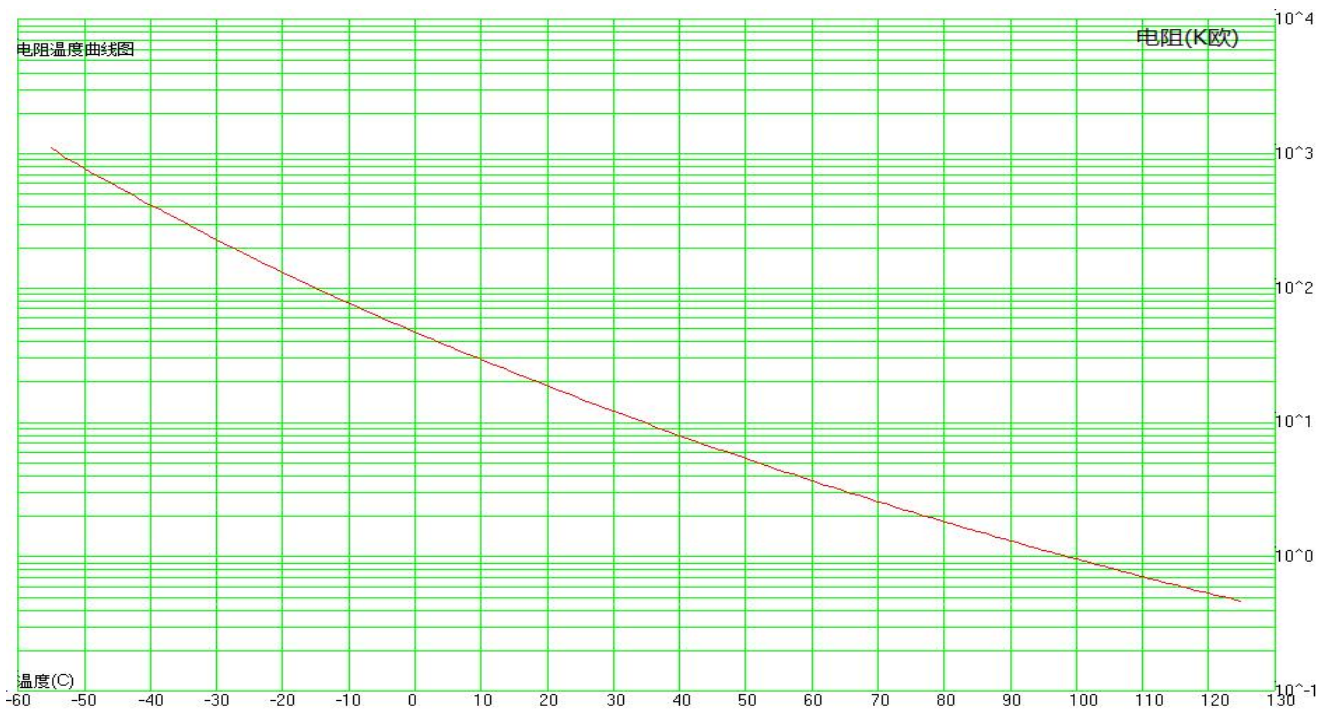
-2	50.661	51.822	52.983	2.239	-2.239	0.443	-0.443
-1	48.287	49.369	50.451	2.191	-2.191	0.436	-0.436
0	45.937	46.942	47.947	2.14	-2.14	0.429	-0.429
1	43.899	44.838	45.778	2.095	-2.095	0.422	-0.422
2	41.871	42.746	43.622	2.047	-2.047	0.414	-0.414
3	39.946	40.761	41.576	1.999	-1.999	0.407	-0.407
4	38.118	38.877	39.636	1.952	-1.952	0.4	-0.4
5	36.381	37.087	37.794	1.905	-1.905	0.392	-0.392
6	34.73	35.388	36.045	1.858	-1.858	0.385	-0.385
7	33.161	33.773	34.385	1.811	-1.811	0.377	-0.377
8	31.669	32.238	32.807	1.765	-1.765	0.369	-0.369
9	30.25	30.779	31.308	1.718	-1.718	0.362	-0.362
10	28.9	29.392	29.884	1.672	-1.672	0.354	-0.354
11	27.616	28.073	28.529	1.626	-1.626	0.346	-0.346
12	26.393	26.817	27.241	1.581	-1.581	0.338	-0.338
13	25.229	25.623	26.016	1.535	-1.535	0.33	-0.33
14	24.121	24.486	24.851	1.49	-1.49	0.322	-0.322
15	23.065	23.404	23.742	1.444	-1.444	0.313	-0.313
16	22.06	22.373	22.686	1.399	-1.399	0.305	-0.305
17	21.102	21.392	21.682	1.354	-1.354	0.297	-0.297
18	20.189	20.457	20.725	1.31	-1.31	0.288	-0.288
19	19.319	19.567	19.814	1.265	-1.265	0.279	-0.279
20	18.49	18.718	18.947	1.221	-1.221	0.271	-0.271
21	17.699	17.91	18.12	1.177	-1.177	0.262	-0.262
22	16.945	17.139	17.333	1.133	-1.133	0.252	-0.252
23	16.225	16.404	16.583	1.089	-1.089	0.241	-0.241
24	15.539	15.704	15.868	1.045	-1.045	0.227	-0.227
25	14.85	15	15.15	1	-1	0.218	-0.218
26	14.249	14.399	14.549	1.04	-1.04	0.255	-0.255

27	13.642	13.791	13.941	1.083	-1.083	0.259	-0.259
28	13.062	13.211	13.36	1.126	-1.126	0.269	-0.269
29	12.51	12.658	12.806	1.169	-1.169	0.279	-0.279
30	11.983	12.13	12.277	1.212	-1.212	0.29	-0.29
31	11.481	11.627	11.773	1.254	-1.254	0.301	-0.301
32	11.001	11.146	11.29	1.296	-1.296	0.312	-0.312
33	10.544	10.687	10.83	1.338	-1.338	0.324	-0.324
34	10.107	10.249	10.39	1.38	-1.38	0.336	-0.336
35	9.69	9.83	9.97	1.422	-1.422	0.347	-0.347
36	9.292	9.43	9.568	1.464	-1.464	0.359	-0.359
37	8.912	9.049	9.185	1.505	-1.505	0.371	-0.371
38	8.55	8.684	8.818	1.546	-1.546	0.383	-0.383
39	8.203	8.335	8.468	1.587	-1.587	0.396	-0.396
40	7.872	8.002	8.133	1.628	-1.628	0.408	-0.408
41	7.556	7.684	7.812	1.668	-1.668	0.42	-0.42
42	7.254	7.38	7.506	1.709	-1.709	0.433	-0.433
43	6.965	7.089	7.213	1.749	-1.749	0.445	-0.445
44	6.689	6.811	6.933	1.789	-1.789	0.458	-0.458
45	6.425	6.545	6.665	1.829	-1.829	0.47	-0.47
46	6.173	6.291	6.408	1.868	-1.868	0.483	-0.483
47	5.932	6.047	6.163	1.908	-1.908	0.496	-0.496
48	5.701	5.815	5.928	1.947	-1.947	0.509	-0.509
49	5.481	5.592	5.703	1.986	-1.986	0.522	-0.522
50	5.27	5.379	5.487	2.025	-2.025	0.535	-0.535
51	5.068	5.174	5.281	2.064	-2.064	0.548	-0.548
52	4.874	4.979	5.084	2.102	-2.102	0.561	-0.561
53	4.689	4.792	4.894	2.141	-2.141	0.574	-0.574
54	4.512	4.613	4.713	2.179	-2.179	0.588	-0.588
55	4.342	4.441	4.539	2.217	-2.217	0.601	-0.601

56	4.18	4.276	4.373	2.254	-2.254	0.614	-0.614
57	4.024	4.119	4.213	2.292	-2.292	0.628	-0.628
58	3.875	3.968	4.06	2.329	-2.329	0.642	-0.642
59	3.732	3.823	3.913	2.367	-2.367	0.655	-0.655
60	3.595	3.684	3.773	2.404	-2.404	0.669	-0.669
61	3.464	3.551	3.638	2.44	-2.44	0.683	-0.683
62	3.338	3.423	3.508	2.477	-2.477	0.697	-0.697
63	3.218	3.301	3.384	2.513	-2.513	0.711	-0.711
64	3.102	3.183	3.264	2.55	-2.55	0.725	-0.725
65	2.991	3.07	3.15	2.586	-2.586	0.739	-0.739
66	2.884	2.962	3.04	2.622	-2.622	0.753	-0.753
67	2.782	2.858	2.934	2.657	-2.657	0.768	-0.768
68	2.684	2.758	2.832	2.693	-2.693	0.782	-0.782
69	2.59	2.662	2.735	2.728	-2.728	0.797	-0.797
70	2.499	2.57	2.641	2.764	-2.764	0.811	-0.811
71	2.412	2.482	2.551	2.799	-2.799	0.826	-0.826
72	2.329	2.397	2.464	2.834	-2.834	0.84	-0.84
73	2.248	2.315	2.381	2.868	-2.868	0.855	-0.855
74	2.171	2.236	2.301	2.903	-2.903	0.87	-0.87
75	2.097	2.161	2.224	2.937	-2.937	0.885	-0.885
76	2.026	2.088	2.15	2.971	-2.971	0.9	-0.9
77	1.957	2.018	2.079	3.006	-3.006	0.915	-0.915
78	1.891	1.951	2.01	3.039	-3.039	0.93	-0.93
79	1.828	1.886	1.944	3.073	-3.073	0.945	-0.945
80	1.767	1.824	1.88	3.107	-3.107	0.96	-0.96
81	1.708	1.764	1.819	3.14	-3.14	0.976	-0.976
82	1.652	1.706	1.76	3.174	-3.174	0.991	-0.991
83	1.597	1.65	1.703	3.207	-3.207	1.006	-1.006
84	1.545	1.597	1.649	3.24	-3.24	1.022	-1.022

85	1.495	1.545	1.596	3.272	-3.272	1.038	-1.038
86	1.446	1.496	1.545	3.305	-3.305	1.053	-1.053
87	1.399	1.448	1.496	3.338	-3.338	1.069	-1.069
88	1.354	1.401	1.449	3.37	-3.37	1.085	-1.085
89	1.311	1.357	1.403	3.402	-3.402	1.101	-1.101
90	1.269	1.314	1.359	3.435	-3.435	1.117	-1.117
91	1.229	1.273	1.317	3.467	-3.467	1.133	-1.133
92	1.19	1.233	1.276	3.498	-3.498	1.149	-1.149
93	1.152	1.194	1.237	3.53	-3.53	1.165	-1.165
94	1.116	1.157	1.198	3.562	-3.562	1.181	-1.181
95	1.081	1.121	1.162	3.593	-3.593	1.197	-1.197
96	1.047	1.087	1.126	3.624	-3.624	1.214	-1.214
97	1.015	1.054	1.092	3.656	-3.656	1.23	-1.23
98	0.984	1.021	1.059	3.687	-3.687	1.247	-1.247
99	0.953	0.99	1.027	3.718	-3.718	1.263	-1.263
100	0.924	0.96	0.996	3.748	-3.748	1.28	-1.28
101	0.896	0.931	0.967	3.779	-3.779	1.297	-1.297
102	0.869	0.903	0.938	3.809	-3.809	1.314	-1.314
103	0.843	0.876	0.91	3.84	-3.84	1.33	-1.33
104	0.817	0.85	0.883	3.87	-3.87	1.347	-1.347
105	0.793	0.825	0.857	3.9	-3.9	1.364	-1.364
106	0.769	0.801	0.832	3.93	-3.93	1.381	-1.381
107	0.746	0.777	0.808	3.96	-3.96	1.399	-1.399
108	0.724	0.754	0.785	3.99	-3.99	1.416	-1.416
109	0.703	0.732	0.762	4.019	-4.019	1.433	-1.433
110	0.682	0.711	0.74	4.049	-4.049	1.451	-1.451
111	0.663	0.691	0.719	4.078	-4.078	1.468	-1.468
112	0.643	0.671	0.698	4.107	-4.107	1.486	-1.486
113	0.625	0.652	0.679	4.136	-4.136	1.503	-1.503

114	0.607	0.633	0.66	4.165	-4.165	1.521	-1.521
115	0.59	0.615	0.641	4.193	-4.193	1.539	-1.539
116	0.573	0.598	0.623	4.222	-4.222	1.556	-1.556
117	0.557	0.581	0.606	4.25	-4.25	1.574	-1.574
118	0.541	0.565	0.589	4.278	-4.278	1.592	-1.592
119	0.526	0.55	0.573	4.307	-4.307	1.61	-1.61
120	0.511	0.534	0.558	4.334	-4.334	1.628	-1.628
121	0.497	0.52	0.542	4.362	-4.362	1.647	-1.647
122	0.483	0.506	0.528	4.39	-4.39	1.665	-1.665
123	0.47	0.492	0.514	4.417	-4.417	1.683	-1.683
124	0.457	0.479	0.5	4.444	-4.444	1.702	-1.702
125	0.445	0.466	0.487	4.471	-4.471	1.72	-1.72



附表 II (Attachment II)

