



南京时恒电子科技有限公司

Nanjing Shiheng Electronics Co.,Ltd.

规格承认书

APPROVAL SHEET

客户料号 CUSTOMER :

21010037

产品名称 PART NAME :

MF52 测温型 NTC 热敏电阻器

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:

2023-9-12

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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变更记录表

REVISED RECORD SHEET

[illegible]

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℃	$R_{25^{\circ}\text{C}}$	$T_a=25\pm0.01^{\circ}\text{C}$ Test Power $\leq 0.1\text{mW}$	KΩ	$10\text{K}\Omega\pm 1\%$
2.2	B 值 B-value	$B_{25/50}$	$B=[(T_a\times T_b)/(T_b-T_a)]\times\ln(R_a/R_b)$ $T_a=25\pm0.01^{\circ}\text{C}$ $T_b=50^{\circ}\text{C}\pm0.01^{\circ}\text{C}$	K	$4100\pm 1\%$
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	/	/	℃	$-55^{\circ}\text{C}\sim 125^{\circ}\text{C}$
2.7	最大额定功率 Maximum rated power	Pmax	/	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

Product drawing

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	无可见性损伤 No obvious damage $ \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	无可见性损伤 No obvious damage $ \Delta R_{25}/R_{25} \leq 2\%$
4.4	温度快速变化 Rapid changes in temperature	IEC60068-2-14	-55°C 30min $\rightarrow$ 25°C 5min $\rightarrow$ 125°C 30min $\rightarrow$ 25°C 5min, 5cycles	无可见性损伤 No obvious damage $ \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	无可见性损伤 No obvious damage $ \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	无可见性损伤 No obvious damage $ \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	产品 CQC 认证 (CQC07001019009) CQC certificate (CQC07001019009)	
8.5	UL 认证(E240991) ULcertificate(E240991)	
8.6	TUV 认证 (R50245892) TUV certificate (R50245892)	

附表 I (Attachment I)

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R25=10K Ω 精度: $\pm 1\%$ B25/50=4100K 精度: $\pm 1\%$ (P186-16)

温度($^{\circ}\text{C}$)	电阻(K Ω)			电阻精度(%)		温度精度($^{\circ}\text{C}$)	
	最小值	中心值	最大值	ΔR	$-\Delta R$	ΔT	$-\Delta T$
-55	857.958	908	958.041	5.511	-5.511	0.715	-0.715
-54	785.532	830.565	875.597	5.421	-5.421	0.712	-0.712
-53	724.151	764.999	805.847	5.339	-5.339	0.709	-0.709
-52	671.293	708.585	745.877	5.262	-5.262	0.705	-0.705
-51	625.097	659.32	693.544	5.19	-5.19	0.701	-0.701
-50	584.173	615.711	647.249	5.122	-5.122	0.697	-0.697
-49	547.477	576.634	605.792	5.056	-5.056	0.693	-0.693
-48	514.214	541.239	568.263	4.993	-4.993	0.689	-0.689
-47	483.78	508.875	533.97	4.931	-4.931	0.685	-0.685
-46	455.713	479.047	502.381	4.87	-4.87	0.68	-0.68
-45	429.656	451.373	473.09	4.811	-4.811	0.676	-0.676
-44	405.334	425.558	445.782	4.752	-4.752	0.671	-0.671
-43	382.535	401.374	420.214	4.693	-4.693	0.667	-0.667
-42	361.092	378.643	396.195	4.635	-4.635	0.662	-0.662
-41	340.875	357.226	373.576	4.577	-4.577	0.657	-0.657
-40	321.78	337.01	352.239	4.518	-4.518	0.652	-0.652
-39	303.726	317.906	332.086	4.46	-4.46	0.648	-0.648
-38	286.642	299.841	313.04	4.401	-4.401	0.643	-0.643
-37	270.473	282.754	295.034	4.343	-4.343	0.638	-0.638
-36	255.169	266.591	278.012	4.284	-4.284	0.633	-0.633
-35	240.688	251.306	261.924	4.225	-4.225	0.628	-0.628
-34	226.99	236.857	246.724	4.165	-4.165	0.622	-0.622
-33	214.038	223.204	232.37	4.106	-4.106	0.617	-0.617
-32	201.801	210.312	218.823	4.046	-4.046	0.612	-0.612

-31	190.245	198.145	206.046	3.987	-3.987	0.607	-0.607
-30	179.338	186.67	194.002	3.927	-3.927	0.601	-0.601
-29	169.051	175.853	182.655	3.867	-3.867	0.596	-0.596
-28	159.355	165.664	171.972	3.808	-3.808	0.591	-0.591
-27	150.22	156.07	161.92	3.748	-3.748	0.585	-0.585
-26	141.618	147.042	152.466	3.688	-3.688	0.58	-0.58
-25	133.521	138.55	143.578	3.629	-3.629	0.574	-0.574
-24	125.904	130.565	135.226	3.569	-3.569	0.568	-0.568
-23	118.739	123.059	127.38	3.51	-3.51	0.563	-0.563
-22	112.003	116.007	120.011	3.451	-3.451	0.557	-0.557
-21	105.67	109.381	113.092	3.392	-3.392	0.551	-0.551
-20	99.718	103.158	106.597	3.334	-3.334	0.545	-0.545
-19	94.125	97.312	100.5	3.275	-3.275	0.539	-0.539
-18	88.868	91.823	94.777	3.217	-3.217	0.534	-0.534
-17	83.929	86.667	89.406	3.159	-3.159	0.527	-0.527
-16	79.287	81.825	84.364	3.102	-3.102	0.521	-0.521
-15	74.924	77.277	79.63	3.045	-3.045	0.515	-0.515
-14	70.823	73.005	75.186	2.988	-2.988	0.509	-0.509
-13	66.968	68.991	71.013	2.931	-2.931	0.503	-0.503
-12	63.344	65.219	67.094	2.875	-2.875	0.496	-0.496
-11	59.935	61.674	63.413	2.819	-2.819	0.49	-0.49
-10	56.728	58.341	59.953	2.763	-2.763	0.484	-0.484
-9	53.711	55.206	56.701	2.708	-2.708	0.477	-0.477
-8	50.871	52.258	53.644	2.653	-2.653	0.47	-0.47
-7	48.197	49.483	50.769	2.599	-2.599	0.464	-0.464
-6	45.679	46.872	48.064	2.545	-2.545	0.457	-0.457
-5	43.306	44.413	45.519	2.491	-2.491	0.45	-0.45
-4	41.07	42.096	43.122	2.437	-2.437	0.443	-0.443
-3	38.962	39.914	40.866	2.384	-2.384	0.437	-0.437



-2	36.974	37.857	38.739	2.331	-2.331	0.43	-0.43
-1	35.099	35.917	36.736	2.278	-2.278	0.422	-0.422
0	33.5	34.265	35.029	2.231	-2.231	0.415	-0.415
1	31.657	32.361	33.065	2.174	-2.174	0.408	-0.408
2	30.079	30.731	31.383	2.122	-2.122	0.401	-0.401
3	28.587	29.192	29.797	2.071	-2.071	0.393	-0.393
4	27.178	27.738	28.299	2.02	-2.02	0.386	-0.386
5	25.845	26.364	26.884	1.969	-1.969	0.379	-0.379
6	24.584	25.066	25.547	1.918	-1.918	0.371	-0.371
7	23.392	23.837	24.283	1.868	-1.868	0.363	-0.363
8	22.263	22.676	23.088	1.818	-1.818	0.356	-0.356
9	21.194	21.576	21.958	1.769	-1.769	0.348	-0.348
10	20.182	20.536	20.889	1.719	-1.719	0.34	-0.34
11	19.224	19.55	19.877	1.67	-1.67	0.332	-0.332
12	18.315	18.617	18.919	1.621	-1.621	0.324	-0.324
13	17.454	17.732	18.011	1.572	-1.572	0.316	-0.316
14	16.637	16.894	17.152	1.524	-1.524	0.307	-0.307
15	15.862	16.1	16.337	1.476	-1.476	0.299	-0.299
16	15.127	15.346	15.565	1.428	-1.428	0.291	-0.291
17	14.43	14.632	14.834	1.38	-1.38	0.282	-0.282
18	13.767	13.953	14.139	1.333	-1.333	0.273	-0.273
19	13.139	13.31	13.481	1.285	-1.285	0.264	-0.264
20	12.542	12.699	12.856	1.238	-1.238	0.254	-0.254
21	11.974	12.119	12.263	1.192	-1.192	0.244	-0.244
22	11.435	11.568	11.7	1.145	-1.145	0.233	-0.233
23	10.923	11.044	11.166	1.099	-1.099	0.219	-0.219
24	10.436	10.547	10.658	1.053	-1.053	0.196	-0.196
25	9.9	10	10.1	1	-1	0.188	-0.188
26	9.525	9.625	9.725	1.038	-1.038	0.273	-0.273





27	9.098	9.198	9.298	1.083	-1.083	0.261	-0.261
28	8.692	8.792	8.891	1.128	-1.128	0.265	-0.265
29	8.307	8.405	8.504	1.173	-1.173	0.273	-0.273
30	7.94	8.037	8.135	1.218	-1.218	0.283	-0.283
31	7.59	7.688	7.785	1.262	-1.262	0.294	-0.294
32	7.258	7.354	7.451	1.307	-1.307	0.304	-0.304
33	6.942	7.037	7.132	1.351	-1.351	0.315	-0.315
34	6.641	6.735	6.829	1.395	-1.395	0.327	-0.327
35	6.355	6.448	6.541	1.438	-1.438	0.338	-0.338
36	6.083	6.174	6.266	1.482	-1.482	0.35	-0.35
37	5.823	5.913	6.003	1.525	-1.525	0.362	-0.362
38	5.576	5.664	5.753	1.568	-1.568	0.374	-0.374
39	5.34	5.427	5.515	1.611	-1.611	0.386	-0.386
40	5.115	5.201	5.287	1.653	-1.653	0.398	-0.398
41	4.901	4.986	5.071	1.695	-1.695	0.41	-0.41
42	4.697	4.781	4.864	1.737	-1.737	0.423	-0.423
43	4.503	4.585	4.666	1.779	-1.779	0.435	-0.435
44	4.318	4.398	4.478	1.821	-1.821	0.448	-0.448
45	4.141	4.219	4.298	1.862	-1.862	0.46	-0.46
46	3.972	4.049	4.126	1.904	-1.904	0.473	-0.473
47	3.811	3.886	3.962	1.945	-1.945	0.486	-0.486
48	3.657	3.731	3.805	1.985	-1.985	0.499	-0.499
49	3.51	3.583	3.656	2.026	-2.026	0.512	-0.512
50	3.37	3.442	3.513	2.066	-2.066	0.525	-0.525
51	3.237	3.306	3.376	2.106	-2.106	0.538	-0.538
52	3.109	3.177	3.245	2.146	-2.146	0.551	-0.551
53	2.987	3.054	3.12	2.186	-2.186	0.564	-0.564
54	2.87	2.935	3.001	2.225	-2.225	0.577	-0.577
55	2.759	2.823	2.887	2.264	-2.264	0.591	-0.591





56	2.652	2.715	2.777	2.303	-2.303	0.604	-0.604
57	2.55	2.611	2.673	2.342	-2.342	0.618	-0.618
58	2.453	2.513	2.572	2.381	-2.381	0.631	-0.631
59	2.36	2.418	2.477	2.419	-2.419	0.645	-0.645
60	2.27	2.328	2.385	2.457	-2.457	0.659	-0.659
61	2.185	2.241	2.297	2.495	-2.495	0.673	-0.673
62	2.103	2.158	2.213	2.533	-2.533	0.687	-0.687
63	2.025	2.079	2.132	2.57	-2.57	0.701	-0.701
64	1.95	2.002	2.055	2.608	-2.608	0.715	-0.715
65	1.878	1.93	1.981	2.645	-2.645	0.729	-0.729
66	1.81	1.86	1.91	2.682	-2.682	0.743	-0.743
67	1.744	1.793	1.841	2.718	-2.718	0.758	-0.758
68	1.681	1.728	1.776	2.755	-2.755	0.772	-0.772
69	1.62	1.667	1.713	2.791	-2.791	0.786	-0.786
70	1.562	1.608	1.653	2.827	-2.827	0.801	-0.801
71	1.507	1.551	1.596	2.863	-2.863	0.816	-0.816
72	1.453	1.497	1.54	2.899	-2.899	0.83	-0.83
73	1.402	1.445	1.487	2.934	-2.934	0.845	-0.845
74	1.353	1.394	1.436	2.97	-2.97	0.86	-0.86
75	1.306	1.346	1.387	3.005	-3.005	0.875	-0.875
76	1.261	1.3	1.34	3.04	-3.04	0.89	-0.89
77	1.217	1.256	1.294	3.074	-3.074	0.905	-0.905
78	1.175	1.213	1.251	3.109	-3.109	0.92	-0.92
79	1.135	1.172	1.209	3.143	-3.143	0.935	-0.935
80	1.097	1.133	1.169	3.177	-3.177	0.95	-0.95
81	1.06	1.095	1.13	3.211	-3.211	0.966	-0.966
82	1.024	1.059	1.093	3.245	-3.245	0.981	-0.981
83	0.99	1.024	1.057	3.279	-3.279	0.996	-0.996
84	0.957	0.99	1.023	3.312	-3.312	1.012	-1.012

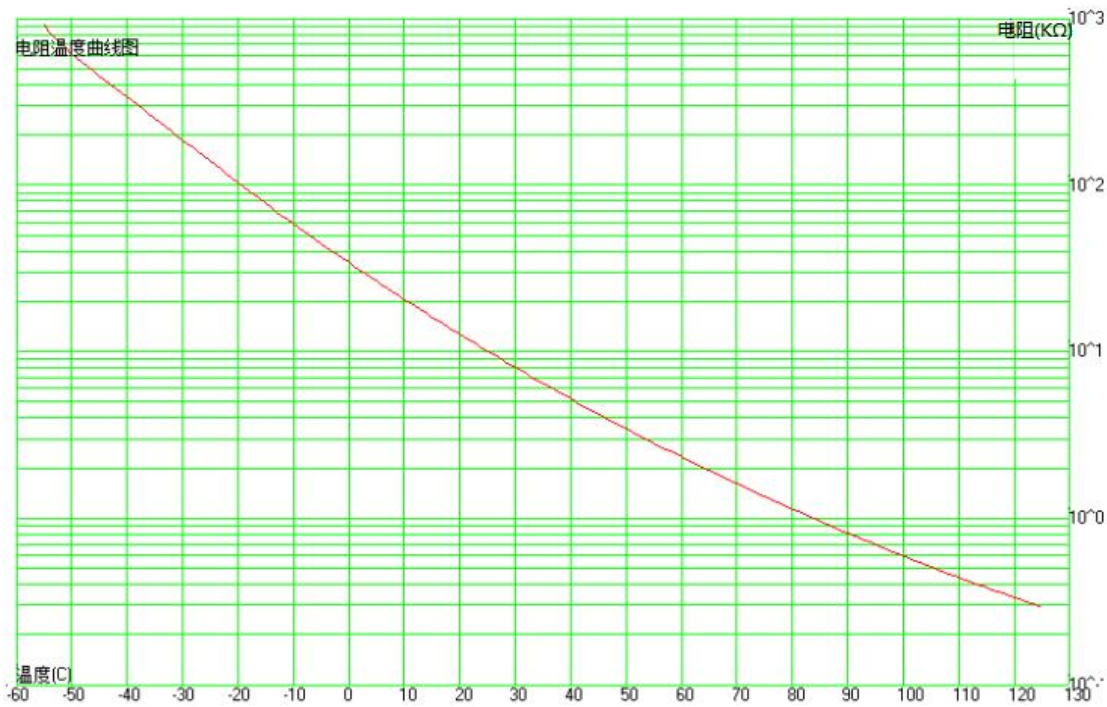




85	0.925	0.958	0.99	3.345	-3.345	1.028	-1.028
86	0.895	0.926	0.958	3.379	-3.379	1.043	-1.043
87	0.866	0.896	0.927	3.411	-3.411	1.059	-1.059
88	0.838	0.867	0.897	3.444	-3.444	1.075	-1.075
89	0.81	0.84	0.869	3.477	-3.477	1.091	-1.091
90	0.784	0.813	0.841	3.509	-3.509	1.107	-1.107
91	0.759	0.787	0.815	3.541	-3.541	1.123	-1.123
92	0.735	0.762	0.79	3.573	-3.573	1.139	-1.139
93	0.712	0.738	0.765	3.605	-3.605	1.155	-1.155
94	0.689	0.715	0.741	3.637	-3.637	1.172	-1.172
95	0.668	0.693	0.719	3.669	-3.669	1.188	-1.188
96	0.647	0.672	0.697	3.7	-3.7	1.204	-1.204
97	0.627	0.651	0.675	3.731	-3.731	1.221	-1.221
98	0.607	0.631	0.655	3.762	-3.762	1.237	-1.237
99	0.589	0.612	0.635	3.793	-3.793	1.254	-1.254
100	0.571	0.594	0.616	3.824	-3.824	1.271	-1.271
101	0.553	0.576	0.598	3.854	-3.854	1.288	-1.288
102	0.537	0.558	0.58	3.885	-3.885	1.305	-1.305
103	0.521	0.542	0.563	3.915	-3.915	1.321	-1.321
104	0.505	0.526	0.547	3.945	-3.945	1.339	-1.339
105	0.49	0.51	0.531	3.975	-3.975	1.356	-1.356
106	0.476	0.495	0.515	4.004	-4.004	1.373	-1.373
107	0.462	0.481	0.501	4.034	-4.034	1.39	-1.39
108	0.448	0.467	0.486	4.063	-4.063	1.407	-1.407
109	0.435	0.454	0.472	4.092	-4.092	1.425	-1.425
110	0.423	0.441	0.459	4.121	-4.121	1.442	-1.442
111	0.411	0.428	0.446	4.15	-4.15	1.46	-1.46
112	0.399	0.416	0.434	4.178	-4.178	1.477	-1.477
113	0.388	0.405	0.422	4.207	-4.207	1.495	-1.495



114	0.377	0.393	0.41	4.235	-4.235	1.513	-1.513
115	0.366	0.383	0.399	4.263	-4.263	1.531	-1.531
116	0.356	0.372	0.388	4.291	-4.291	1.549	-1.549
117	0.346	0.362	0.378	4.318	-4.318	1.567	-1.567
118	0.337	0.352	0.367	4.346	-4.346	1.585	-1.585
119	0.328	0.343	0.358	4.373	-4.373	1.603	-1.603
120	0.319	0.334	0.348	4.4	-4.4	1.621	-1.621
121	0.31	0.325	0.339	4.426	-4.426	1.64	-1.64
122	0.302	0.316	0.33	4.453	-4.453	1.658	-1.658
123	0.294	0.308	0.322	4.479	-4.479	1.676	-1.676
124	0.287	0.3	0.314	4.505	-4.505	1.695	-1.695
125	0.279	0.293	0.306	4.531	-4.531	1.714	-1.714



附表 II（Attachment II）

