编码(Coding)：JK/JXD240904001

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：	
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 103F3950(A1)
产品编号 PRODUCTCODE：	
版次 REV.NO：	B0
日期 DATE：	2024-9-4

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	张居见
			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。 Version formulation	鞠晓丽	李少媛
B0	2022/4/1	更新规格书版本格式，增加版次管控，细化规格纸。 Update for version form of datasheet,add to management and control for number of edition,refine to PN and draw.	王月婷	李少媛

1、产品型号说明 Product model specification

MF52	A	103	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)

③ 103： 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 (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

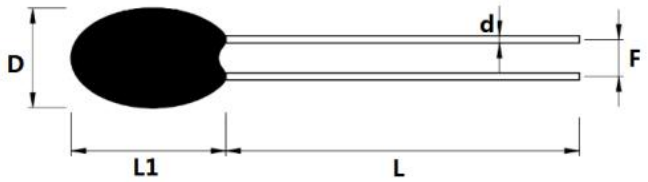
No.	项目 Item	符号 Symbol	测试条件 Test conditions	单位 Unit	性能要求 Requirements
2.1	25℃的零功率电阻值 Zero Power Resistance at 25℃	$R_{25℃}$	Ta=25±0.01℃ Test Power≤0.1mW	KΩ	10KΩ±1%
2.2	B 值 B-value	$B_{25/50}$	$B=[(T_a\times T_b)/(T_b-T_a)]\times\ln(R_a/R_b)$ Ta=25±0.01℃ T_b=50℃±0.01℃	K	3950±1%
2.3	耗散系数 Thermal dissipation 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 12
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	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

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 103F3950(A1)		审核 Approve:		日期 DATE	

尺寸 Dimensions：

（Unit：mm）



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：R25：10KΩ±1%(Zero Power Resistance: R25：10KΩ±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±5℃时间 2-3 秒 temperature : 245±5℃ for 2-3sec	着锡面积≥95% Coverage area ≥ 95%.
4.3	耐焊接热 Withstand weiling temp	IEC60068-2-20	锡锅温度：260±5℃，浸入深度距电阻体 6mm，时间 5±1 秒 Temperature of tin pot:260±5℃, insert deepth from body of resistance 6mm, time 5±1senconds	$\|\Delta R_{25}/R_{25}\|\leq 2\%$
4.3	稳态湿热 Steady humidity and heat	IEC60068-2-78	温度：40℃±2℃，湿度：93±2%，时间：500 小时 Temp：40℃±2℃，humidity：93±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℃30min→25℃5min→125℃ 30min→25℃5min，5cycles	$\|\Delta R_{25}/R_{25}\|\leq 2\%$
4.5	高温储存 High temperature storage	IEC60068-2-2	温度: 125℃±5℃ 时间:1000 小时 Temp : 125℃±5℃, Time :1000hrs	$\|\Delta R_{25}/R_{25}\|\leq 2\%$
4.6	低温储存 Low temperature storage	IEC60068-2-1	温度:-55℃时间:1000 小时 Temp : -55℃, 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×H＝11mm×12mm	

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

6.8 对于 MF52A、B、C、D 等型号的测温型 NTC 热敏电阻器，其均为径向引出线结构，不得将其两引线拉成 180° 轴向使用。” ″For the MF52A, B, C, D Type NTC thermistors, they are all radial lead-out structure, shall not be used to pull its two leads into 180° axial″.

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	UL 认证（E240991） UL certificate（E240991）	
8.7	TUV 认证（R50245892） TUV certificate（R50245892）	
8.8	产品通过 AEC-Q200 测试 Passed by AECQ-200	20172050557G

附表Ⅰ（Attachment I）

南京时恒阻温特性表 SHIHENG R-T Table

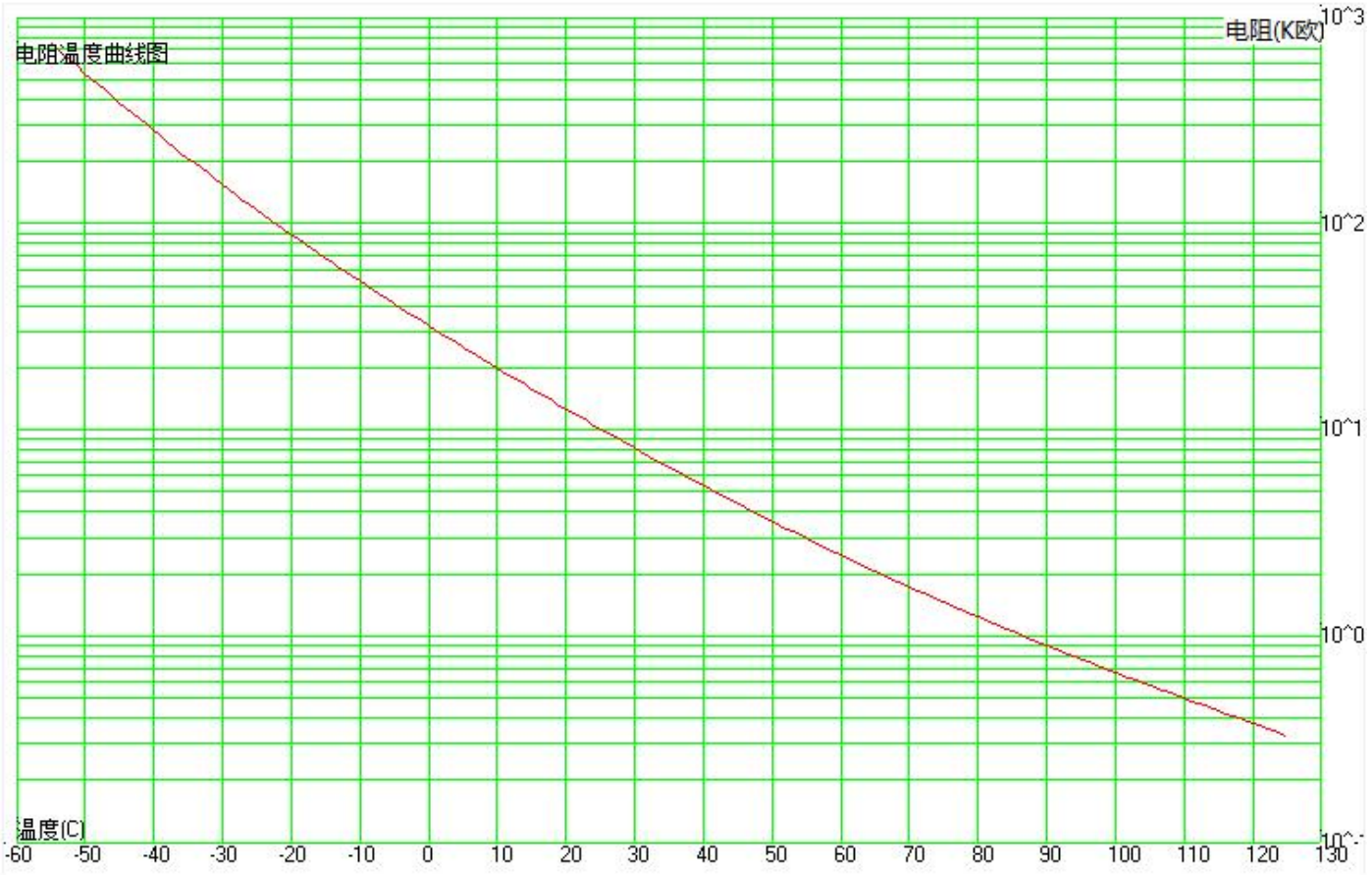
R25=10KΩ 精度:±1% B25/50=3950K 精度:±1%(P477-4B)							
温度(℃) TEMP(℃	电阻(KΩ) RESISTANCE(KΩ)			电阻精度(%) RESISST-TOL(%)		温度精度(℃) TEMP-TOL(℃)	
	最小值	中心值	最大值	△R	-△R	△T	-△T
-55	709.352	749.200	789.047	5.318	-5.318	0.721	-0.721
-54	662.784	699.508	736.232	5.249	-5.249	0.717	-0.717
-53	619.595	653.455	687.316	5.181	-5.181	0.714	-0.714
-52	579.499	610.733	641.966	5.114	-5.114	0.710	-0.710
-51	542.246	571.067	599.888	5.046	-5.046	0.706	-0.706
-50	507.611	534.215	560.819	4.980	-4.980	0.702	-0.702
-49	475.391	499.957	524.524	4.913	-4.913	0.698	-0.698
-48	445.403	468.095	490.787	4.847	-4.847	0.694	-0.694
-47	417.480	438.448	459.415	4.782	-4.782	0.690	-0.690
-46	391.470	410.851	430.232	4.717	-4.717	0.686	-0.686
-45	367.234	385.154	403.073	4.652	-4.652	0.682	-0.682
-44	344.643	361.217	377.791	4.588	-4.588	0.678	-0.678
-43	323.579	338.913	354.247	4.524	-4.524	0.674	-0.674
-42	303.931	318.123	332.315	4.461	-4.461	0.669	-0.669
-41	285.600	298.739	311.878	4.398	-4.398	0.665	-0.665
-40	268.491	280.660	292.828	4.335	-4.335	0.660	-0.660
-39	252.517	263.791	275.064	4.273	-4.273	0.656	-0.656
-38	237.598	248.046	258.494	4.212	-4.212	0.651	-0.651
-37	223.660	233.346	243.032	4.150	-4.150	0.647	-0.647
-36	210.632	219.615	228.598	4.090	-4.090	0.642	-0.642
-35	198.452	206.785	215.119	4.030	-4.030	0.637	-0.637
-34	187.058	194.792	202.525	3.970	-3.970	0.632	-0.632
-33	176.396	183.576	190.755	3.910	-3.910	0.627	-0.627
-32	166.415	173.082	179.749	3.851	-3.851	0.622	-0.622
-31	157.067	163.260	169.453	3.793	-3.793	0.617	-0.617
-30	148.307	154.062	159.817	3.735	-3.735	0.612	-0.612
-29	140.096	145.446	150.795	3.677	-3.677	0.607	-0.607
-28	132.395	137.369	142.343	3.620	-3.620	0.602	-0.602
-27	125.169	129.795	134.421	3.563	-3.563	0.596	-0.596
-26	118.386	122.689	126.993	3.507	-3.507	0.591	-0.591
-25	112.015	116.020	120.024	3.451	-3.451	0.586	-0.586
-24	106.028	109.756	113.483	3.396	-3.396	0.580	-0.580
-23	100.400	103.870	107.341	3.341	-3.341	0.574	-0.574
-22	95.106	98.338	101.570	3.286	-3.286	0.569	-0.569
-21	90.125	93.135	96.145	3.231	-3.231	0.563	-0.563
-20	85.434	88.238	91.043	3.177	-3.177	0.557	-0.557
-19	81.017	83.629	86.242	3.124	-3.124	0.551	-0.551

-18	76.853	79.288	81.723	3.070	-3.070	0.545	-0.545
-17	72.928	75.197	77.467	3.017	-3.017	0.539	-0.539
-16	69.226	71.341	73.456	2.965	-2.965	0.533	-0.533
-15	65.732	67.704	69.676	2.912	-2.912	0.527	-0.527
-14	62.433	64.272	66.111	2.860	-2.860	0.521	-0.521
-13	59.318	61.032	62.747	2.809	-2.809	0.514	-0.514
-12	56.374	57.972	59.571	2.757	-2.757	0.508	-0.508
-11	53.591	55.082	56.572	2.706	-2.706	0.502	-0.502
-10	50.959	52.350	53.740	2.655	-2.655	0.495	-0.495
-9	48.470	49.766	51.062	2.604	-2.604	0.488	-0.488
-8	46.113	47.322	48.531	2.554	-2.554	0.482	-0.482
-7	43.883	45.010	46.137	2.504	-2.504	0.475	-0.475
-6	41.770	42.821	43.872	2.454	-2.454	0.468	-0.468
-5	39.768	40.748	41.728	2.404	-2.404	0.461	-0.461
-4	37.871	38.785	39.699	2.355	-2.355	0.454	-0.454
-3	36.073	36.925	37.776	2.306	-2.306	0.447	-0.447
-2	34.368	35.161	35.955	2.257	-2.257	0.440	-0.440
-1	32.750	33.489	34.229	2.208	-2.208	0.433	-0.433
0	31.356	32.049	32.743	2.164	-2.164	0.425	-0.425
1	29.757	30.399	31.041	2.111	-2.111	0.419	-0.419
2	28.374	28.972	29.570	2.063	-2.063	0.411	-0.411
3	27.060	27.617	28.174	2.015	-2.015	0.404	-0.404
4	25.812	26.330	26.849	1.968	-1.968	0.396	-0.396
5	24.627	25.109	25.591	1.920	-1.920	0.389	-0.389
6	23.500	23.948	24.397	1.873	-1.873	0.381	-0.381
7	22.429	22.846	23.263	1.826	-1.826	0.373	-0.373
8	21.410	21.798	22.186	1.779	-1.779	0.366	-0.366
9	20.442	20.802	21.163	1.732	-1.732	0.358	-0.358
10	19.521	19.856	20.190	1.685	-1.685	0.350	-0.350
11	18.644	18.955	19.266	1.639	-1.639	0.342	-0.342
12	17.811	18.099	18.388	1.593	-1.593	0.333	-0.333
13	17.017	17.285	17.552	1.547	-1.547	0.325	-0.325
14	16.262	16.510	16.758	1.501	-1.501	0.317	-0.317
15	15.543	15.773	16.002	1.455	-1.455	0.308	-0.308
16	14.858	15.071	15.284	1.410	-1.410	0.300	-0.300
17	14.207	14.403	14.600	1.364	-1.364	0.291	-0.291
18	13.586	13.767	13.949	1.319	-1.319	0.282	-0.282
19	12.994	13.162	13.330	1.274	-1.274	0.272	-0.272
20	12.431	12.585	12.740	1.229	-1.229	0.262	-0.262
21	11.894	12.036	12.179	1.185	-1.185	0.252	-0.252
22	11.382	11.513	11.645	1.140	-1.140	0.240	-0.240
23	10.894	11.015	11.136	1.096	-1.096	0.225	-0.225
24	10.429	10.540	10.651	1.052	-1.052	0.199	-0.199
25	9.900	10.000	10.100	1.000	-1.000	0.190	-0.190

26	9.556	9.656	9.756	1.034	-1.034	0.297	-0.297
27	9.145	9.245	9.345	1.078	-1.078	0.276	-0.276
28	8.754	8.853	8.953	1.121	-1.121	0.279	-0.279
29	8.381	8.479	8.578	1.164	-1.164	0.286	-0.286
30	8.025	8.123	8.221	1.207	-1.207	0.295	-0.295
31	7.686	7.783	7.880	1.250	-1.250	0.305	-0.305
32	7.362	7.459	7.555	1.293	-1.293	0.316	-0.316
33	7.054	7.149	7.245	1.335	-1.335	0.327	-0.327
34	6.760	6.854	6.949	1.377	-1.377	0.338	-0.338
35	6.479	6.573	6.666	1.419	-1.419	0.349	-0.349
36	6.212	6.304	6.396	1.461	-1.461	0.361	-0.361
37	5.956	6.047	6.138	1.502	-1.502	0.373	-0.373
38	5.712	5.802	5.892	1.544	-1.544	0.384	-0.384
39	5.480	5.568	5.656	1.585	-1.585	0.396	-0.396
40	5.258	5.345	5.432	1.626	-1.626	0.409	-0.409
41	5.046	5.131	5.217	1.667	-1.667	0.421	-0.421
42	4.843	4.927	5.011	1.707	-1.707	0.433	-0.433
43	4.650	4.733	4.815	1.748	-1.748	0.446	-0.446
44	4.465	4.546	4.628	1.788	-1.788	0.458	-0.458
45	4.289	4.368	4.448	1.828	-1.828	0.471	-0.471
46	4.120	4.198	4.277	1.867	-1.867	0.483	-0.483
47	3.959	4.036	4.113	1.907	-1.907	0.496	-0.496
48	3.805	3.880	3.956	1.946	-1.946	0.509	-0.509
49	3.658	3.732	3.806	1.985	-1.985	0.522	-0.522
50	3.517	3.590	3.662	2.024	-2.024	0.535	-0.535
51	3.382	3.453	3.525	2.063	-2.063	0.548	-0.548
52	3.253	3.323	3.393	2.101	-2.101	0.561	-0.561
53	3.130	3.199	3.267	2.139	-2.139	0.575	-0.575
54	3.012	3.079	3.147	2.177	-2.177	0.588	-0.588
55	2.900	2.965	3.031	2.215	-2.215	0.601	-0.601
56	2.792	2.856	2.920	2.253	-2.253	0.615	-0.615
57	2.688	2.751	2.814	2.290	-2.290	0.628	-0.628
58	2.589	2.651	2.713	2.327	-2.327	0.642	-0.642
59	2.494	2.555	2.615	2.364	-2.364	0.656	-0.656
60	2.404	2.463	2.522	2.401	-2.401	0.670	-0.670
61	2.317	2.375	2.432	2.437	-2.437	0.684	-0.684
62	2.233	2.290	2.347	2.473	-2.473	0.698	-0.698
63	2.153	2.209	2.264	2.510	-2.510	0.712	-0.712
64	2.077	2.131	2.185	2.545	-2.545	0.726	-0.726
65	2.003	2.056	2.110	2.581	-2.581	0.740	-0.740
66	1.933	1.985	2.037	2.616	-2.616	0.754	-0.754
67	1.865	1.916	1.967	2.652	-2.652	0.769	-0.769
68	1.800	1.850	1.900	2.687	-2.687	0.783	-0.783
69	1.738	1.787	1.836	2.722	-2.722	0.798	-0.798

70	1.679	1.726	1.774	2.756	-2.756	0.812	-0.812
71	1.621	1.668	1.714	2.791	-2.791	0.827	-0.827
72	1.566	1.612	1.657	2.825	-2.825	0.842	-0.842
73	1.513	1.558	1.602	2.859	-2.859	0.857	-0.857
74	1.462	1.506	1.550	2.893	-2.893	0.872	-0.872
75	1.414	1.456	1.499	2.926	-2.926	0.887	-0.887
76	1.367	1.408	1.450	2.960	-2.960	0.902	-0.902
77	1.322	1.362	1.403	2.993	-2.993	0.917	-0.917
78	1.278	1.318	1.358	3.026	-3.026	0.932	-0.932
79	1.237	1.276	1.315	3.059	-3.059	0.947	-0.947
80	1.196	1.235	1.273	3.091	-3.091	0.963	-0.963
81	1.158	1.195	1.233	3.124	-3.124	0.978	-0.978
82	1.121	1.157	1.194	3.156	-3.156	0.993	-0.993
83	1.085	1.121	1.156	3.188	-3.188	1.009	-1.009
84	1.050	1.085	1.120	3.220	-3.220	1.025	-1.025
85	1.017	1.052	1.086	3.252	-3.252	1.040	-1.040
86	0.985	1.019	1.052	3.283	-3.283	1.056	-1.056
87	0.955	0.987	1.020	3.315	-3.315	1.072	-1.072
88	0.925	0.957	0.989	3.346	-3.346	1.088	-1.088
89	0.896	0.928	0.959	3.377	-3.377	1.104	-1.104
90	0.869	0.899	0.930	3.408	-3.408	1.120	-1.120
91	0.842	0.872	0.902	3.439	-3.439	1.136	-1.136
92	0.816	0.846	0.875	3.469	-3.469	1.153	-1.153
93	0.792	0.820	0.849	3.500	-3.500	1.169	-1.169
94	0.768	0.796	0.824	3.530	-3.530	1.185	-1.185
95	0.745	0.772	0.800	3.560	-3.560	1.202	-1.202
96	0.723	0.749	0.776	3.590	-3.590	1.218	-1.218
97	0.701	0.727	0.754	3.620	-3.620	1.235	-1.235
98	0.680	0.706	0.732	3.650	-3.650	1.251	-1.251
99	0.660	0.685	0.711	3.680	-3.680	1.268	-1.268
100	0.641	0.666	0.690	3.709	-3.709	1.285	-1.285
101	0.622	0.646	0.670	3.739	-3.739	1.302	-1.302
102	0.604	0.628	0.651	3.768	-3.768	1.319	-1.319
103	0.586	0.610	0.633	3.797	-3.797	1.336	-1.336
104	0.569	0.592	0.615	3.826	-3.826	1.353	-1.353
105	0.553	0.575	0.597	3.855	-3.855	1.370	-1.370
106	0.537	0.559	0.581	3.884	-3.884	1.387	-1.387
107	0.522	0.543	0.564	3.912	-3.912	1.404	-1.404
108	0.507	0.528	0.549	3.941	-3.941	1.422	-1.422
109	0.493	0.513	0.533	3.969	-3.969	1.439	-1.439
110	0.479	0.499	0.519	3.998	-3.998	1.457	-1.457
111	0.465	0.485	0.504	4.026	-4.026	1.474	-1.474
112	0.452	0.471	0.490	4.054	-4.054	1.492	-1.492
113	0.439	0.458	0.477	4.083	-4.083	1.509	-1.509

114	0.427	0.445	0.464	4.111	-4.111	1.527	-1.527
115	0.415	0.433	0.451	4.139	-4.139	1.545	-1.545
116	0.404	0.421	0.439	4.167	-4.167	1.563	-1.563
117	0.392	0.410	0.427	4.194	-4.194	1.581	-1.581
118	0.382	0.398	0.415	4.222	-4.222	1.599	-1.599
119	0.371	0.388	0.404	4.250	-4.250	1.617	-1.617
120	0.361	0.377	0.393	4.278	-4.278	1.635	-1.635
121	0.351	0.367	0.383	4.305	-4.305	1.653	-1.653
122	0.341	0.357	0.372	4.333	-4.333	1.671	-1.671
123	0.332	0.347	0.362	4.360	-4.360	1.690	-1.690
124	0.323	0.338	0.352	4.388	-4.388	1.708	-1.708
125	0.314	0.329	0.343	4.415	-4.415	1.727	-1.727



附表Ⅱ（Attachment Ⅱ）