编码(Coding)：JK/JXD231117016

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：	
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 104F3950(A1)
产品编号 PRODUCTCODE：	
版次 REV.NO：	B0
日期 DATE：	2024-11-17

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	104	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)

③ 104： 25℃的零功率电阻值 100KΩ(Zero Power Resistance at 25℃is 100KΩ)

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

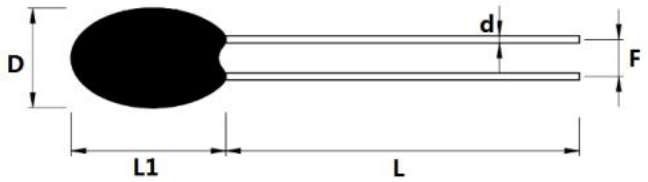
No.	项目 Item	符号 Symbol	测试条件 Test conditions	单位 Unit	性能要求 Requirements
2.1	25℃的零功率电阻值 Zero Power Resistance at 25℃	$R_{25℃}$	Ta=25±0.01℃ Test Power≤0.1mW	KΩ	100KΩ±1%
2.2	B 值 B-value	$B_{25/50}$	$B=[(T_a\times T_b)/(T_b-T_a)]\times\ln(R_a/R_b)$ Ta=25±0.01℃ T_b=50℃±0.01℃	K	3950±1%
2.3	耗散系数 Thermal dissipation 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 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	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 104F3950(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：R25：100KΩ±1%(Zero Power Resistance: R25：100KΩ±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

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	UL 认证（E240991） UL certificate（E240991）	
8.8	TUV 认证（R50245892） TUV certificate（R50245892）	

附表Ⅰ（Attachment I）

南京时恒电子科技有限公司

R25=100KΩ 精度:±1% B25/50=3950K 精度:±1%（P209-15A）

温度(℃)	电阻(KΩ)			电阻精度(%)		温度精度(℃)	
	最小值	中心值	最大值	△R	-△R	△T	-△T
-55	8494.5	8989	9483.49	5.501	-5.501	0.715	-0.715
-54	7796.4	8242.68	8688.97	5.414	-5.414	0.712	-0.712
-53	7188.1	7592.96	7997.83	5.332	-5.332	0.709	-0.709
-52	6652.5	7021.38	7390.27	5.253	-5.253	0.705	-0.705
-51	6176.43	6513.75	6851.07	5.178	-5.178	0.702	-0.702
-50	5749.67	6059.06	6368.44	5.106	-5.106	0.698	-0.698
-49	5364.21	5648.68	5933.14	5.035	-5.035	0.694	-0.694
-48	5013.72	5275.8	5537.88	4.967	-4.967	0.69	-0.69
-47	4693.17	4935.02	5176.87	4.9	-4.9	0.686	-0.686
-46	4398.51	4621.99	4845.47	4.835	-4.835	0.682	-0.682
-45	4126.5	4333.22	4539.93	4.77	-4.77	0.678	-0.678
-44	3874.47	4065.84	4257.21	4.706	-4.706	0.673	-0.673
-43	3640.25	3817.52	3994.79	4.643	-4.643	0.669	-0.669
-42	3422.02	3586.31	3750.61	4.581	-4.581	0.664	-0.664
-41	3218.28	3370.6	3522.91	4.519	-4.519	0.66	-0.66
-40	3027.74	3169	3310.25	4.457	-4.457	0.655	-0.655
-39	2849.32	2980.33	3111.35	4.395	-4.395	0.65	-0.65
-38	2682.07	2803.6	2925.13	4.334	-4.334	0.646	-0.646
-37	2525.17	2637.91	2750.64	4.273	-4.273	0.641	-0.641
-36	2377.88	2482.47	2587.05	4.212	-4.212	0.636	-0.636
-35	2239.56	2336.58	2433.6	4.152	-4.152	0.631	-0.631
-34	2109.62	2199.62	2289.63	4.091	-4.091	0.626	-0.626
-33	1987.52	2071.02	2154.51	4.031	-4.031	0.621	-0.621
-32	1872.78	1950.23	2027.68	3.971	-3.971	0.616	-0.616

-31	1764.94	1836.79	1908.63	3.911	-3.911	0.611	-0.611
-30	1663.59	1730.23	1796.87	3.851	-3.851	0.606	-0.606
-29	1568.33	1630.15	1691.96	3.792	-3.792	0.6	-0.6
-28	1478.8	1536.14	1593.47	3.732	-3.732	0.595	-0.595
-27	1394.65	1447.84	1501.02	3.673	-3.673	0.59	-0.59
-26	1315.56	1364.9	1414.23	3.614	-3.614	0.584	-0.584
-25	1241.24	1287	1332.75	3.555	-3.555	0.579	-0.579
-24	1171.38	1213.82	1256.27	3.496	-3.496	0.573	-0.573
-23	1105.72	1145.09	1184.47	3.438	-3.438	0.567	-0.567
-22	1044	1080.53	1117.06	3.38	-3.38	0.562	-0.562
-21	986.001	1019.89	1053.77	3.322	-3.322	0.556	-0.556
-20	931.471	962.912	994.354	3.265	-3.265	0.55	-0.55
-19	880.206	909.379	938.552	3.208	-3.208	0.545	-0.545
-18	832.004	859.074	886.144	3.151	-3.151	0.539	-0.539
-17	786.677	811.797	836.918	3.094	-3.094	0.533	-0.533
-16	744.046	767.359	790.672	3.038	-3.038	0.527	-0.527
-15	703.943	725.581	747.219	2.982	-2.982	0.521	-0.521
-14	666.212	686.296	706.38	2.926	-2.926	0.515	-0.515
-13	630.705	649.348	667.992	2.871	-2.871	0.508	-0.508
-12	597.283	614.59	631.897	2.816	-2.816	0.502	-0.502
-11	565.816	581.883	597.951	2.761	-2.761	0.496	-0.496
-10	536.181	551.1	566.018	2.706	-2.706	0.489	-0.489
-9	508.266	522.117	535.969	2.652	-2.652	0.483	-0.483
-8	481.962	494.824	507.686	2.599	-2.599	0.477	-0.477
-7	457.17	469.113	481.056	2.545	-2.545	0.47	-0.47
-6	433.796	444.886	455.976	2.492	-2.492	0.463	-0.463
-5	411.751	422.05	432.348	2.44	-2.44	0.457	-0.457
-4	390.954	400.518	410.081	2.387	-2.387	0.45	-0.45
-3	371.328	380.209	389.089	2.335	-2.335	0.443	-0.443

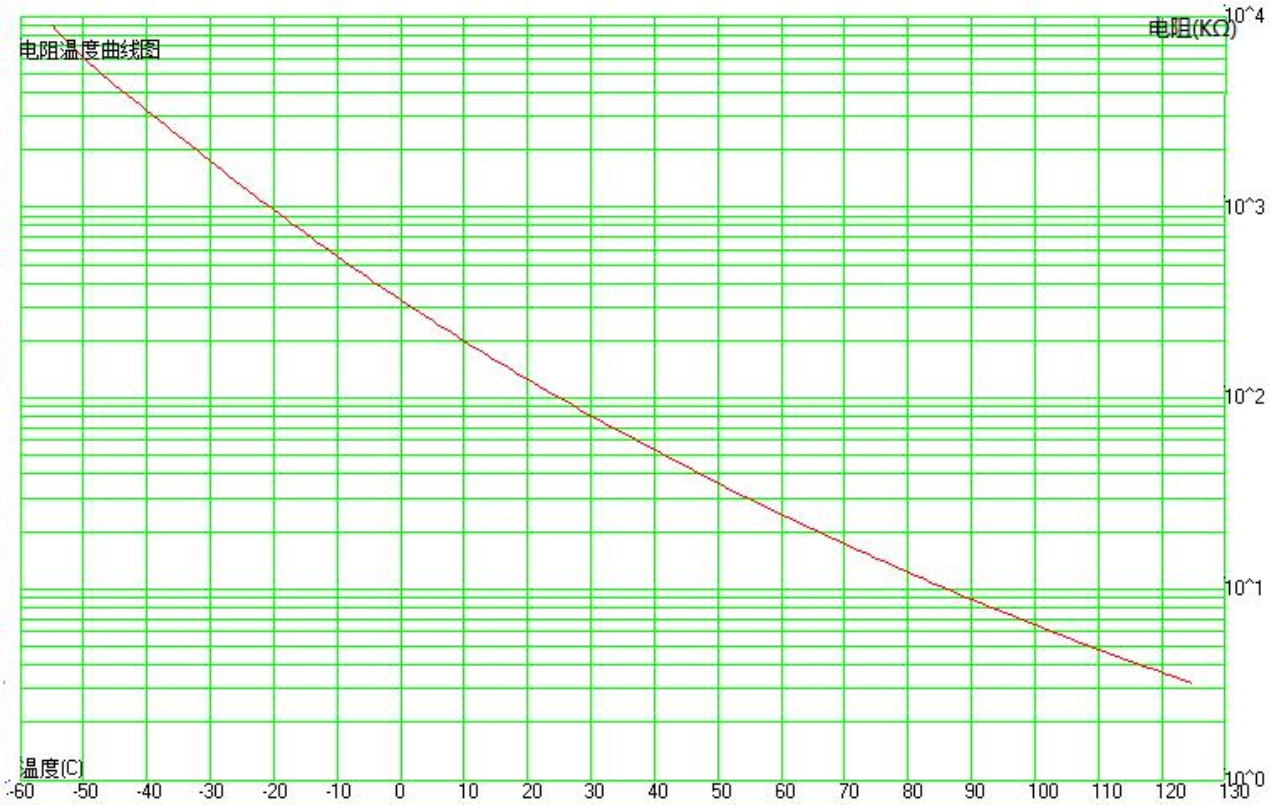
-2	352.801	361.048	369.294	2.283	-2.283	0.436	-0.436
-1	335.306	342.963	350.62	2.232	-2.232	0.429	-0.429
0	319.429	326.56	333.69	2.183	-2.183	0.422	-0.422
1	303.163	309.764	316.364	2.13	-2.13	0.415	-0.415
2	288.402	294.529	300.656	2.08	-2.08	0.408	-0.408
3	274.444	280.131	285.819	2.03	-2.03	0.401	-0.401
4	261.242	266.52	271.798	1.98	-1.98	0.394	-0.394
5	248.75	253.647	258.545	1.93	-1.93	0.387	-0.387
6	236.926	241.47	246.013	1.881	-1.881	0.379	-0.379
7	225.731	229.946	234.16	1.832	-1.832	0.372	-0.372
8	215.128	219.036	222.944	1.784	-1.784	0.364	-0.364
9	205.083	208.706	212.328	1.735	-1.735	0.357	-0.357
10	195.562	198.92	202.277	1.687	-1.687	0.349	-0.349
11	186.536	189.647	192.757	1.64	-1.64	0.341	-0.341
12	177.977	180.857	183.737	1.592	-1.592	0.334	-0.334
13	169.857	172.523	175.189	1.545	-1.545	0.326	-0.326
14	162.151	164.618	167.085	1.498	-1.498	0.318	-0.318
15	154.837	157.118	159.399	1.451	-1.451	0.31	-0.31
16	147.892	150	152.109	1.405	-1.405	0.302	-0.302
17	141.296	143.243	145.191	1.359	-1.359	0.294	-0.294
18	135.029	136.827	138.624	1.313	-1.313	0.286	-0.286
19	129.074	130.731	132.389	1.267	-1.267	0.278	-0.278
20	123.412	124.94	126.467	1.222	-1.222	0.269	-0.269
21	118.029	119.435	120.842	1.177	-1.177	0.261	-0.261
22	112.908	114.202	115.495	1.132	-1.132	0.253	-0.253
23	108.036	109.225	110.413	1.088	-1.088	0.244	-0.244
24	103.4	104.491	105.581	1.043	-1.043	0.236	-0.236
25	99	100	101	1	-1	0.228	-0.228
26	94.7	95.699	96.698	1.043	-1.043	0.238	-0.238

27	90.621	91.617	92.614	1.087	-1.087	0.25	-0.25
28	86.738	87.731	88.723	1.13	-1.13	0.261	-0.261
29	83.042	84.028	85.015	1.174	-1.174	0.273	-0.273
30	79.522	80.501	81.481	1.216	-1.216	0.285	-0.285
31	76.168	77.14	78.112	1.259	-1.259	0.297	-0.297
32	72.973	73.936	74.899	1.301	-1.301	0.308	-0.308
33	69.928	70.881	71.834	1.344	-1.344	0.32	-0.32
34	67.025	67.968	68.91	1.386	-1.386	0.332	-0.332
35	64.257	65.188	66.119	1.427	-1.427	0.344	-0.344
36	61.618	62.537	63.455	1.469	-1.469	0.357	-0.357
37	59.099	60.006	60.912	1.51	-1.51	0.369	-0.369
38	56.696	57.59	58.484	1.551	-1.551	0.381	-0.381
39	54.403	55.283	56.164	1.592	-1.592	0.393	-0.393
40	52.213	53.08	53.947	1.633	-1.633	0.406	-0.406
41	50.123	50.976	51.829	1.673	-1.673	0.418	-0.418
42	48.126	48.965	49.804	1.714	-1.714	0.431	-0.431
43	46.218	47.044	47.869	1.754	-1.754	0.443	-0.443
44	44.396	45.207	46.018	1.793	-1.793	0.456	-0.456
45	42.654	43.451	44.247	1.833	-1.833	0.469	-0.469
46	40.989	41.771	42.554	1.873	-1.873	0.482	-0.482
47	39.397	40.165	40.933	1.912	-1.912	0.495	-0.495
48	37.874	38.628	39.382	1.951	-1.951	0.508	-0.508
49	36.418	37.157	37.897	1.99	-1.99	0.521	-0.521
50	35.024	35.75	36.475	2.028	-2.028	0.534	-0.534
51	33.691	34.402	35.113	2.067	-2.067	0.547	-0.547
52	32.414	33.112	33.809	2.105	-2.105	0.56	-0.56
53	31.193	31.876	32.559	2.143	-2.143	0.574	-0.574
54	30.022	30.692	31.361	2.181	-2.181	0.587	-0.587
55	28.902	29.558	30.214	2.218	-2.218	0.601	-0.601

56	27.828	28.471	29.113	2.256	-2.256	0.614	-0.614
57	26.8	27.429	28.058	2.293	-2.293	0.628	-0.628
58	25.814	26.43	27.046	2.33	-2.33	0.642	-0.642
59	24.869	25.472	26.075	2.367	-2.367	0.655	-0.655
60	23.963	24.554	25.144	2.404	-2.404	0.669	-0.669
61	23.095	23.672	24.25	2.44	-2.44	0.683	-0.683
62	22.261	22.827	23.392	2.477	-2.477	0.697	-0.697
63	21.462	22.016	22.569	2.513	-2.513	0.711	-0.711
64	20.695	21.237	21.778	2.549	-2.549	0.725	-0.725
65	19.96	20.489	21.019	2.585	-2.585	0.739	-0.739
66	19.253	19.771	20.29	2.621	-2.621	0.754	-0.754
67	18.575	19.082	19.589	2.656	-2.656	0.768	-0.768
68	17.924	18.42	18.916	2.691	-2.691	0.782	-0.782
69	17.299	17.784	18.269	2.727	-2.727	0.797	-0.797
70	16.698	17.172	17.647	2.762	-2.762	0.811	-0.811
71	16.121	16.585	17.049	2.796	-2.796	0.826	-0.826
72	15.566	16.02	16.474	2.831	-2.831	0.841	-0.841
73	15.033	15.477	15.921	2.866	-2.866	0.856	-0.856
74	14.521	14.955	15.389	2.9	-2.9	0.87	-0.87
75	14.029	14.453	14.877	2.934	-2.934	0.885	-0.885
76	13.555	13.97	14.384	2.968	-2.968	0.9	-0.9
77	13.1	13.505	13.911	3.002	-3.002	0.915	-0.915
78	12.661	13.058	13.454	3.036	-3.036	0.93	-0.93
79	12.24	12.628	13.015	3.069	-3.069	0.946	-0.946
80	11.834	12.213	12.592	3.102	-3.102	0.961	-0.961
81	11.444	11.815	12.185	3.136	-3.136	0.976	-0.976
82	11.068	11.431	11.793	3.169	-3.169	0.992	-0.992
83	10.707	11.061	11.415	3.202	-3.202	1.007	-1.007
84	10.358	10.705	11.051	3.234	-3.234	1.023	-1.023

85	10.023	10.362	10.7	3.267	-3.267	1.038	-1.038
86	9.7	10.031	10.362	3.299	-3.299	1.054	-1.054
87	9.389	9.712	10.036	3.332	-3.332	1.07	-1.07
88	9.089	9.405	9.722	3.364	-3.364	1.086	-1.086
89	8.8	9.11	9.419	3.396	-3.396	1.102	-1.102
90	8.522	8.824	9.127	3.428	-3.428	1.118	-1.118
91	8.254	8.549	8.845	3.459	-3.459	1.134	-1.134
92	7.995	8.284	8.573	3.491	-3.491	1.15	-1.15
93	7.746	8.028	8.311	3.522	-3.522	1.166	-1.166
94	7.505	7.782	8.058	3.553	-3.553	1.182	-1.182
95	7.273	7.544	7.814	3.585	-3.585	1.199	-1.199
96	7.05	7.314	7.579	3.615	-3.615	1.215	-1.215
97	6.834	7.093	7.351	3.646	-3.646	1.231	-1.231
98	6.626	6.879	7.132	3.677	-3.677	1.248	-1.248
99	6.425	6.673	6.92	3.707	-3.707	1.265	-1.265
100	6.231	6.474	6.716	3.738	-3.738	1.281	-1.281
101	6.045	6.281	6.518	3.768	-3.768	1.298	-1.298
102	5.864	6.096	6.327	3.798	-3.798	1.315	-1.315
103	5.69	5.916	6.143	3.828	-3.828	1.332	-1.332
104	5.522	5.743	5.965	3.857	-3.857	1.349	-1.349
105	5.36	5.576	5.793	3.887	-3.887	1.366	-1.366
106	5.203	5.415	5.627	3.916	-3.916	1.383	-1.383
107	5.051	5.259	5.467	3.945	-3.945	1.4	-1.4
108	4.905	5.108	5.312	3.975	-3.975	1.418	-1.418
109	4.764	4.963	5.162	4.003	-4.003	1.435	-1.435
110	4.628	4.822	5.017	4.032	-4.032	1.452	-1.452
111	4.496	4.687	4.877	4.061	-4.061	1.47	-1.47
112	4.369	4.555	4.742	4.089	-4.089	1.488	-1.488
113	4.246	4.428	4.611	4.118	-4.118	1.505	-1.505

114	4.127	4.306	4.484	4.146	-4.146	1.523	-1.523
115	4.012	4.187	4.362	4.174	-4.174	1.541	-1.541
116	3.902	4.073	4.244	4.201	-4.201	1.559	-1.559
117	3.794	3.962	4.13	4.229	-4.229	1.577	-1.577
118	3.691	3.855	4.019	4.256	-4.256	1.595	-1.595
119	3.591	3.751	3.912	4.284	-4.284	1.613	-1.613
120	3.494	3.651	3.809	4.311	-4.311	1.631	-1.631
121	3.4	3.555	3.709	4.337	-4.337	1.649	-1.649
122	3.31	3.461	3.612	4.364	-4.364	1.668	-1.668
123	3.223	3.371	3.519	4.391	-4.391	1.686	-1.686
124	3.138	3.283	3.428	4.417	-4.417	1.705	-1.705
125	3.056	3.199	3.341	4.443	-4.443	1.723	-1.723



附表Ⅱ（Attachment Ⅱ）