



规格承认书

SPECIFICATION FOR APPROVAL

客户(Customer):

品名(Product Name): **NTC 温度传感器规格书** NTC Temperature
Sensor Specification

维宏料号(Part Number): WHQ0104F4100 20-2

发布日期(Issue Date): 2025.8.15

发布版本(Rev. No.): V1.0

文件编号(Doc. No.): WH-0-01

客户承认Customer Approved

判定结果 Result		
检验 Inspector	审核 Checked	核准 Approved

维宏感应（山东）科技有限公司

Weihong Induction (Shandong) Technology Co., Ltd

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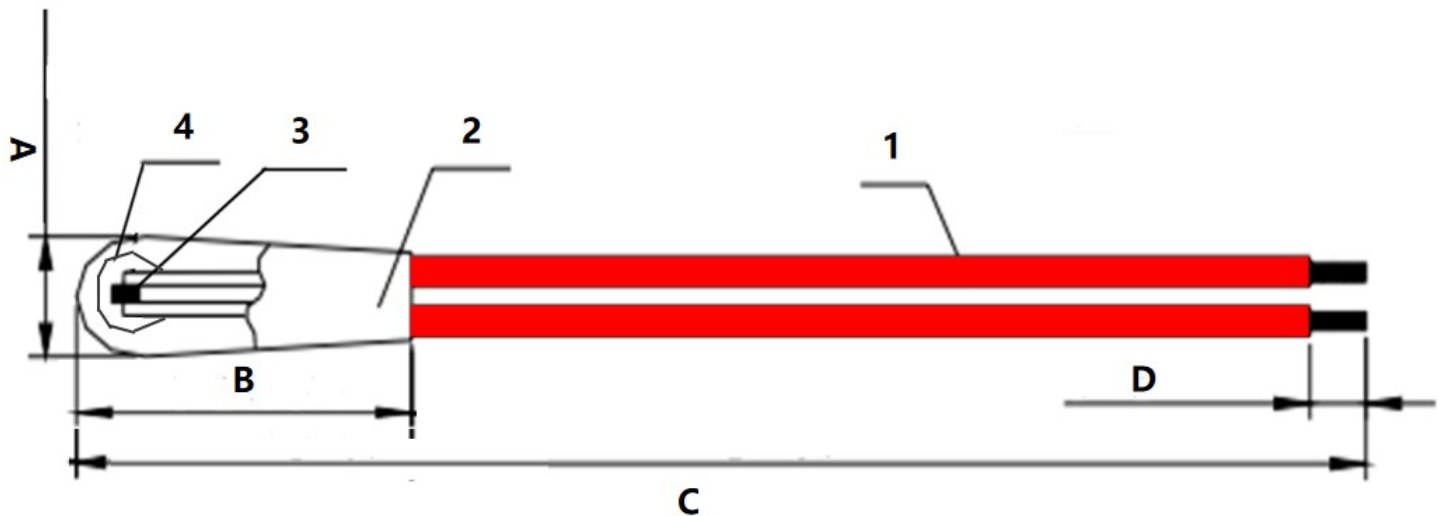
修订记录清单 Revised Record Sheet

版本 REV. NO	发布日期 REV. Date	修改内容 Revised Content
V1.1	2025.8.15	新版本发布(New Released)

1. 外形尺寸 Shape and Dimensions:

材料清单 Bill of Material									
NO	名称name	材料规格Material specifications	数量number	备注notes	NO	名称name	材料规格Material specifications	数量number	备注notes
1	线材 wire rod	0.27漆包线 Pure copper enameled wire	2	红色 red	2	环氧树脂 epoxy resin	包封类环氧树脂 Encapsulated epoxy resin	1	黑色 black
3	芯片 chip	R25=100KΩ, B25/50=4100 1%	1	/	4	硅胶 silica gel	硅胶 silica gel	1	透明 transp arent
主要参数									
项目				数值					
R25阻值 resistance				100KΩ ±1%					
B25/50				4100K ±1%					

单位 (mm)



A	B	C	D
Max 2.0	Max 4.5	20±3	2±0.5

版本	修改内容 REVISION	修改者 Modified By	修改日期 modification date	确认 confirm	维宏料号 Weihong part number	WHQ0104F410020-2
V1.0	新作成	刘兆霞	2025.8.15	马国辉	日期date	2025.8.15

2. 产品型号说明 Product Identification(Part Number):

WHQ0	104	F	4100	20	2
①	②	③	④	⑤	⑥

①WHQ0:

- 维宏公司:漆包线产品

Weihong Company: Pure copper enameled wire products

②104: 标准阻值 Standard resistance value

- 25℃的零功率电阻值100KΩ Zero power resistance value of 100K Ω at 25 °C

③F: 阻值允许偏差代号

Code for allowable deviation of resistance value

- F: ±1%, G: ±2%, H: ±3%, J: ±5%, K: ±10%

④4100: B值

- B25/50℃ 值: 4100F

⑤20: 产品长度 (mm) Product length (mm)

⑥2: 尾部侵锡长度 (mm) Tail tin penetration length (mm)

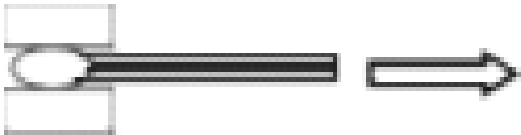
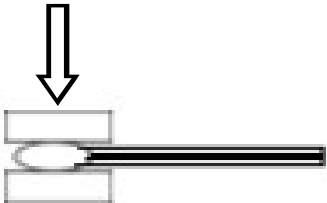
3. 电气特性 Electrical Characteristics:

序号	项目 project	符号 symbol	测试条件 Test conditions	单位 unit	性能要求 Performance Requirement
3.1	25℃的零功率电阻Zero power resistance value at 25 °C	R25℃	Ta=25±0.05℃ 测试功率≤0.1mw	KΩ	100KΩ±1%
3.2	B值	B25/50	$B = \frac{(T_a \times T_b)}{(T_b - T_a)} \times \ln(R_a/R_b)$ Tb=50℃±0.05℃	K	4100±1%
3.3	耗散系数 Dissipation coefficient	δ	静止空气中In still air	mW/℃	≥2
3.4	时间常数 time constant	τ	静止空气中In still air	sec	≤7
3.5	耐压测试（水中） insulation resistance	/	500V AC ≤0.2mA	S	> 5S
3.6	工作温度范围 Operating temperature range	/	/	/	-40℃ ~ 125℃
3.7	最大额定功率 Maximum rated power	Pmax	/	mW	10
3.8	阻温特性 Resistance temperature characteristic	/	/	/	见附表1

4. 信赖性试验 Reliability Test:

项目 project	测试条件 Test conditions	技术要求 technical requirement
4.1尾部焊接 soldering resistance	温度: $260\pm 5^{\circ}\text{C}$, 浸入深度距电阻体6mm, 时间 0.4~1.0 秒	$R_{25} \Delta R/R \leq \pm 2\%$
4.2稳态湿热 Damp heat steady state	温度: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 湿度: $93 \pm 2\%$, 时间: 500小 时	$R_{25} \Delta R/R \leq \pm 2\%$
4.3冷热冲击 Thermal Shock	-40°C 30min $\rightarrow 25^{\circ}\text{C}$ 5min $\rightarrow 105^{\circ}\text{C}$ 30min $\rightarrow 25^{\circ}\text{C}$ 5min, 反复5次	$R_{25} \Delta R/R \leq \pm 2\%$
4.4低温储存 low temperature storage	温度: -40°C 时间:1000小时	$R_{25} \Delta R/R \leq \pm 2\%$
4.5高温高湿老化 High temperature and high humidity storage	温度: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 湿度: 85% 时间:1000小时 Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Humidity: 85% Time: 1000 hours	$R_{25} \Delta R/R \leq \pm 5\%$

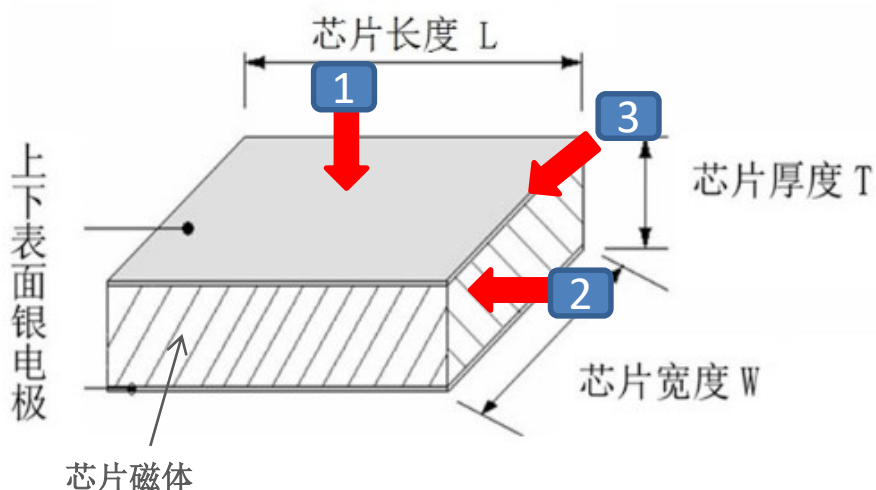
5. 机械性能: Mechanical performance:

项目 project	测试条件 Test conditions	技术要求 technical requirement
5.1自由跌落 free fall	跌落高度: 1.0m Drop height: 1.0m 跌落次数: 3次 Number of drops: 3 times 跌落面: 木板 Falling surface: wooden board	外观无损伤 $\Delta R_{25} / R_{25}$ $\leq 1\%$ $\Delta B / B$ $\leq 1\%$
5.2 水平拉力 Horizontal tensile force	 固定环氧头部: 拉力: $F=5\pm 1\text{N}$, 时间: 10 ± 1 秒 Fixed resistor end: tension: $5 \pm 1\text{ N}$, time: 10 ± 1 seconds	无可见性损伤 No visible damage $R_{25} \Delta R/R \leq \pm 2\%$
5.3垂直拉力 Vertical tension	 固定产品两端引线 $F=1\text{N}$, 1min Fixed product leads at both ends $F=1\text{N}$, 1min	外观无损伤 $\Delta R_{25} / R_{25}$ $\leq 2\%$ $\Delta B / B$ $\leq 2\%$
5.3 压力测试 Stress testing	 常规室温接通阻值测试仪/万用表, 阻值稳定后施加50N压力持续5秒 Connect the resistance tester/multimeter to the conventional room temperature at the tail line, and apply 50N pressure for 5 seconds after the resistance stabilizes	$R_{25} \Delta R/R \leq \pm 2\%$

6.高精度NTC热敏电阻芯片特性:

Characteristics of high-precision NTC thermistor chip:

芯片结构chip structure



芯片压力极限测试: Chip Pressure Limit Test

受力方向 Direction of force	极限压力值 Ultimate pressure value	受损部位 Damaged area
①正面 Frontal	80N	电极表面OK, 芯片磁体破损。 The electrode surface is OK, and the chip magnet is damaged.
②侧面 Sides	40N	芯片电极/磁体均出现破损 Both chip electrodes and magnets are damaged
③侧面45度 45 degrees on the side	10N	芯片电极/磁体开裂分离 Chip electrode/magnet cracking separation
芯片电极与磁体结合力 Bonding force between chip electrode and magnet	2N	芯片电极/磁体交接处分离 Separation of chip electrode/magnet junction

7. 使用注意事项 Notes & Warnings:

7.1 本产品的用途：温度测量与控制；

The purpose of this product: temperature measurement and control;

7.2 避免流过热敏电阻芯片的电流引起元件自身发热而产生测量误差；

To avoid measurement errors caused by the heating of the component itself caused by the current flowing through the thermistor chip;

7.3 焊接时，焊接温度应低于 275℃，焊接时间<3ses；

When welding, the welding temperature should be lower than 275 °C and the welding time should be less than 3 seconds;

7.4 允许任何方法运输，但要避免雨/雪直接或间接的淋袭。

Any method of transportation is allowed, but direct or indirect rain/snow should be avoided.

7.5 生产、运输或使用过程中应避免80N以上的外力挤压或损伤。

During production, transportation, or use, external forces exceeding 80N should be avoided from squeezing or damaging.

7.6 存储：Storage:

最佳存储温度： 25℃±3℃ 湿度：30%~60%

Class I: Storage temperature: 25 °C ± 3 °C Humidity: 30%~60%

存储有效期12个月内阻值变化3%以内（仅限整包密封包装），不排除锡脚表面氧化的可能。The resistance change within 12 months of storage validity is within 3% (limited to whole package vacuum packaging), and the possibility of oxidation on the surface of the tin feet cannot be ruled out.

常规存储温度：-10℃~40℃ 湿度：<75%

Class II: Storage temperature: -10 °C ~40 °C Humidity:<75%

存储有效期6个月内阻值变化3%以内（仅限整包密封包装），不排除锡脚表面氧化的可能。The resistance change within 6 months of storage is within 3% (limited to whole package vacuum packaging), and the possibility of oxidation on the surface of the tin feet cannot be ruled out.

R-T表

品名: 104F4100F

R25 = 100.0kΩ±1.0%

B25/50 = 4100K±1.0%

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
-50	9296	8801	8331	-0.8	+0.8
-49	8603	8150	7721	-0.8	+0.8
-48	7966	7553	7160	-0.7	+0.8
-47	7381	7004	6645	-0.7	+0.8
-46	6844	6499	6171	-0.7	+0.7
-45	6351	6035	5734	-0.7	+0.7
-44	5896	5607	5332	-0.7	+0.7
-43	5478	5213	4961	-0.7	+0.7
-42	5093	4850	4618	-0.7	+0.7
-41	4738	4515	4302	-0.7	+0.7
-40	4410	4206	4010	-0.7	+0.7
-39	4104	3917	3737	-0.7	+0.7
-38	3822	3650	3485	-0.7	+0.7
-37	3561	3403	3252	-0.7	+0.7
-36	3320	3175	3036	-0.7	+0.7
-35	3097	2964	2836	-0.7	+0.7
-34	2891	2768	2650	-0.7	+0.7
-33	2700	2587	2479	-0.7	+0.7
-32	2523	2419	2319	-0.7	+0.7
-31	2359	2263	2171	-0.7	+0.7
-30	2207	2119	2034	-0.7	+0.7
-29	2064	1983	1905	-0.7	+0.7
-28	1931	1857	1785	-0.6	+0.7
-27	1808	1740	1673	-0.6	+0.6
-26	1694	1631	1569	-0.6	+0.6
-25	1588	1529	1473	-0.6	+0.6
-24	1489	1435	1383	-0.6	+0.6
-23	1397	1347	1299	-0.6	+0.6
-22	1312	1266	1221	-0.6	+0.6
-21	1232	1189	1148	-0.6	+0.6
-20	1158	1118	1080	-0.6	+0.6
-19	1088	1051	1016	-0.6	+0.6
-18	1022	988.8	956.7	-0.6	+0.6
-17	960.9	930.4	900.7	-0.6	+0.6
-16	904.1	875.9	848.4	-0.6	+0.6
-15	851.0	824.9	799.6	-0.6	+0.6
-14	801.4	777.3	753.9	-0.6	+0.6
-13	755.0	732.8	711.1	-0.6	+0.6
-12	711.7	691.1	671.0	-0.6	+0.6
-11	671.1	652.1	633.5	-0.5	+0.5
-10	633.1	615.5	598.4	-0.5	+0.5

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
-9	597.2	580.9	565.0	-0.5	+0.5
-8	563.5	548.5	533.8	-0.5	+0.5
-7	532.0	518.1	504.5	-0.5	+0.5
-6	502.5	489.6	477.0	-0.5	+0.5
-5	474.8	462.9	451.2	-0.5	+0.5
-4	448.8	437.8	427.0	-0.5	+0.5
-3	424.4	414.2	404.2	-0.5	+0.5
-2	401.5	392.1	382.8	-0.5	+0.5
-1	380.0	371.3	362.7	-0.5	+0.5
0	359.8	351.7	343.8	-0.5	+0.5
1	340.6	333.1	325.8	-0.5	+0.5
2	322.5	315.6	308.8	-0.4	+0.5
3	305.5	299.2	292.9	-0.4	+0.4
4	289.6	283.7	277.9	-0.4	+0.4
5	274.6	269.1	263.7	-0.4	+0.4
6	260.4	255.4	250.4	-0.4	+0.4
7	247.1	242.4	237.9	-0.4	+0.4
8	234.5	230.2	226.0	-0.4	+0.4
9	222.7	218.7	214.8	-0.4	+0.4
10	211.6	207.9	204.3	-0.4	+0.4
11	200.9	197.5	194.2	-0.4	+0.4
12	190.9	187.8	184.7	-0.4	+0.4
13	181.4	178.6	175.7	-0.4	+0.4
14	172.5	169.8	167.2	-0.4	+0.4
15	164.1	161.6	159.2	-0.3	+0.4
16	156.1	153.8	151.6	-0.3	+0.3
17	148.6	146.5	144.4	-0.3	+0.3
18	141.5	139.5	137.6	-0.3	+0.3
19	134.7	133.0	131.2	-0.3	+0.3
20	128.4	126.7	125.1	-0.3	+0.3
21	122.3	120.8	119.3	-0.3	+0.3
22	116.5	115.2	113.8	-0.3	+0.3
23	111.1	109.8	108.6	-0.3	+0.3
24	105.9	104.8	103.6	-0.3	+0.3
25	101.0	100.0	99.00	-0.3	+0.3
26	96.45	95.44	94.44	-0.3	+0.3
27	92.12	91.12	90.12	-0.3	+0.3
28	88.02	87.02	86.02	-0.3	+0.3
29	84.12	83.13	82.14	-0.3	+0.3
30	80.42	79.44	78.46	-0.3	+0.3
31	76.88	75.91	74.94	-0.3	+0.3
32	73.52	72.56	71.60	-0.3	+0.3
33	70.33	69.37	68.42	-0.4	+0.4
34	67.29	66.35	65.41	-0.4	+0.4
35	64.41	63.48	62.55	-0.4	+0.4
36	61.66	60.74	59.83	-0.4	+0.4
37	59.05	58.15	57.25	-0.4	+0.4
38	56.57	55.68	54.79	-0.4	+0.4
39	54.20	53.32	52.46	-0.4	+0.4
40	51.95	51.09	50.23	-0.4	+0.4

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
41	49.79	48.94	48.10	-0.4	+0.5
42	47.72	46.89	46.07	-0.5	+0.5
43	45.76	44.94	44.13	-0.5	+0.5
44	43.89	43.08	42.29	-0.5	+0.5
45	42.10	41.32	40.54	-0.5	+0.5
46	40.40	39.63	38.87	-0.5	+0.5
47	38.78	38.02	37.28	-0.5	+0.5
48	37.23	36.49	35.76	-0.5	+0.5
49	35.76	35.03	34.31	-0.6	+0.6
50	34.35	33.63	32.93	-0.6	+0.6
51	32.99	32.29	31.60	-0.6	+0.6
52	31.69	31.01	30.33	-0.6	+0.6
53	30.45	29.78	29.12	-0.6	+0.6
54	29.27	28.61	27.97	-0.6	+0.6
55	28.14	27.50	26.87	-0.6	+0.6
56	27.06	26.43	25.82	-0.6	+0.6
57	26.02	25.41	24.81	-0.7	+0.7
58	25.04	24.44	23.85	-0.7	+0.7
59	24.09	23.51	22.93	-0.7	+0.7
60	23.19	22.62	22.06	-0.7	+0.7
61	22.32	21.76	21.21	-0.7	+0.7
62	21.49	20.94	20.40	-0.7	+0.7
63	20.69	20.15	19.63	-0.7	+0.7
64	19.93	19.40	18.89	-0.7	+0.7
65	19.19	18.68	18.18	-0.8	+0.8
66	18.49	18.00	17.51	-0.8	+0.8
67	17.82	17.34	16.86	-0.8	+0.8
68	17.18	16.70	16.24	-0.8	+0.8
69	16.57	16.10	15.65	-0.8	+0.8
70	15.98	15.52	15.08	-0.8	+0.8
71	15.41	14.96	14.53	-0.8	+0.8
72	14.86	14.42	14.00	-0.9	+0.9
73	14.33	13.91	13.50	-0.9	+0.9
74	13.83	13.42	13.01	-0.9	+0.9
75	13.35	12.95	12.55	-0.9	+0.9
76	12.89	12.49	12.11	-0.9	+0.9
77	12.44	12.06	11.68	-0.9	+0.9
78	12.02	11.64	11.27	-0.9	+1.0
79	11.61	11.24	10.88	-1.0	+1.0
80	11.21	10.85	10.50	-1.0	+1.0
81	10.83	10.48	10.14	-1.0	+1.0
82	10.46	10.12	9.793	-1.0	+1.0
83	10.11	9.778	9.457	-1.0	+1.0
84	9.770	9.447	9.134	-1.0	+1.0
85	9.445	9.129	8.824	-1.0	+1.0
86	9.131	8.823	8.525	-1.1	+1.1
87	8.830	8.529	8.238	-1.1	+1.1
88	8.540	8.246	7.962	-1.1	+1.1
89	8.261	7.974	7.697	-1.1	+1.1
90	7.993	7.713	7.442	-1.1	+1.1

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
91	7.733	7.460	7.196	-1.1	+1.1
92	7.484	7.217	6.959	-1.1	+1.2
93	7.244	6.983	6.731	-1.2	+1.2
94	7.012	6.758	6.512	-1.2	+1.2
95	6.790	6.541	6.301	-1.2	+1.2
96	6.575	6.333	6.098	-1.2	+1.2
97	6.369	6.132	5.903	-1.2	+1.2
98	6.170	5.938	5.715	-1.2	+1.3
99	5.978	5.752	5.534	-1.3	+1.3
100	5.793	5.572	5.359	-1.3	+1.3
101	5.614	5.398	5.190	-1.3	+1.3
102	5.441	5.230	5.027	-1.3	+1.3
103	5.275	5.069	4.870	-1.3	+1.3
104	5.114	4.913	4.719	-1.3	+1.3
105	4.959	4.762	4.573	-1.3	+1.4
106	4.810	4.617	4.432	-1.4	+1.4
107	4.665	4.477	4.297	-1.4	+1.4
108	4.526	4.342	4.166	-1.4	+1.4
109	4.392	4.212	4.040	-1.4	+1.4
110	4.262	4.087	3.918	-1.4	+1.4
111	4.136	3.965	3.800	-1.4	+1.5
112	4.015	3.847	3.686	-1.5	+1.5
113	3.897	3.733	3.576	-1.5	+1.5
114	3.784	3.624	3.470	-1.5	+1.5
115	3.674	3.518	3.368	-1.5	+1.5
116	3.569	3.416	3.269	-1.5	+1.5
117	3.466	3.317	3.173	-1.5	+1.6
118	3.368	3.221	3.081	-1.6	+1.6
119	3.272	3.129	2.992	-1.6	+1.6
120	3.180	3.040	2.906	-1.6	+1.6
121	3.090	2.953	2.821	-1.6	+1.6
122	3.002	2.868	2.740	-1.6	+1.6
123	2.918	2.787	2.661	-1.6	+1.7
124	2.836	2.708	2.585	-1.7	+1.7
125	2.757	2.632	2.512	-1.7	+1.7
126	2.681	2.558	2.441	-1.7	+1.7
127	2.607	2.487	2.372	-1.7	+1.7
128	2.535	2.418	2.306	-1.7	+1.7
129	2.466	2.351	2.241	-1.7	+1.8
130	2.399	2.287	2.179	-1.8	+1.8
131	2.334	2.224	2.119	-1.8	+1.8
132	2.271	2.163	2.060	-1.8	+1.8
133	2.210	2.104	2.004	-1.8	+1.8
134	2.151	2.048	1.949	-1.8	+1.8
135	2.093	1.992	1.896	-1.8	+1.9
136	2.038	1.939	1.845	-1.9	+1.9
137	1.984	1.887	1.795	-1.9	+1.9
138	1.932	1.837	1.747	-1.9	+1.9
139	1.882	1.789	1.701	-1.9	+1.9
140	1.833	1.742	1.656	-1.9	+2.0

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
141	1.785	1.696	1.612	-2.0	+2.0
142	1.739	1.652	1.569	-2.0	+2.0
143	1.694	1.609	1.528	-2.0	+2.0
144	1.650	1.567	1.488	-2.0	+2.0
145	1.608	1.527	1.449	-2.0	+2.0
146	1.567	1.487	1.411	-2.0	+2.1
147	1.528	1.449	1.375	-2.1	+2.1
148	1.489	1.413	1.340	-2.1	+2.1
149	1.452	1.377	1.305	-2.1	+2.1
150	1.416	1.342	1.272	-2.1	+2.1