



规格承认书

SPECIFICATION FOR APPROVAL

客户(Customer):

品名(Product Name): NTC热敏传感器 NTC thermal sensor

维宏料号(Part Number): WHR282104F3950110-2P2.0-BMDZ

发布日期(Issue Date): 2024.6.19

发布版本(Rev. No.): V1.1

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

地址：山东省枣庄市峰城区科达西路汉芯半导体产业园

Address: Hanxin Semiconductor Industrial Park, Keda West Road, Yicheng District,
Zaozhuang City, Shandong Province

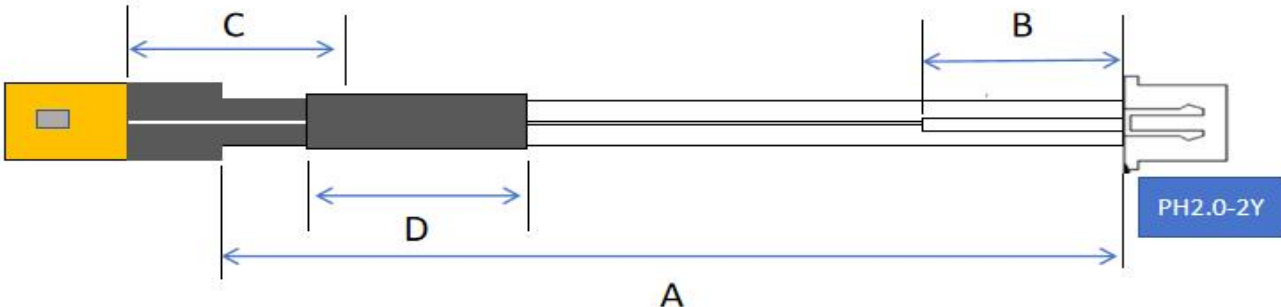
修订记录清单 Revised Record Sheet

版本 REV. NO	发布日期 REV. Date	修改内容 Revised Content
V1.1	2024.6.19	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	UL2651-28#	2	黑色 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=3950, 1%	1	/	4	硅胶 silica gel	硅胶 silica gel	1	透明 transp arent
5	端子 terminal	PH2.0	2	银色 silvery	6	连接器 connector	PH2.0-2Y	1	白色 white
7	热缩套管	前φ1.5 后φ2.0	2 1						
主要参数									
项目				数值					
R25阻值 resistance				100KΩ ±1%					
B25/50				3950K ±1%					

单位 (mm)



A	B	C	D
110±5mm	10±2mm	20±3mm	30±3mm

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	WHR282104F3950110- 2P2.0-BMDZ
V1.1	新做成	刘兆霞	2024.6.19	马国辉	日期date	2024.6.19

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

<u>WHR282</u>	<u>104</u>	<u>F</u>	<u>3950</u>	<u>110</u>	<u>2P2.0</u>	<u>BMDZ</u>
①	②	③	④	⑤	⑥	⑦

①WHR282:

- 维宏公司:28#并线产品

Weihong Company: 28 # Parallel products

②104: 标准阻值 Standard resistance value

- 25°C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%

④3950: B值

- B25/50°C 值: 3950K

⑤110: 产品长度 (mm) Product length (mm)

⑥2P2.0: 端子胶壳型号 Terminal rubber shell model

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	$R_{25^{\circ}\text{C}}$	$T_a=25\pm0.05^{\circ}\text{C}$ 测试功率 $\leq 0.1\text{mw}$	K Ω	$100\text{K}\Omega\pm 1\%$
3.2	B值	$B_{25/50}$	$B=\frac{[(T_a\times T_b)/(T_b-T_a)]\times\ln(R_a/R_b)}{T_b-50^{\circ}\text{C}\pm 0.05^{\circ}\text{C}}$	K	$3950\pm 1\%$
3.3	耗散系数 Dissipation coefficient	δ	静止空气中In still air	mW/°C	≥ 2
3.4	时间常数 time constant	τ	静止空气中In still air	sec	≤ 7
3.5	绝缘耐压 insulation resistance	/	300V/DC 1min	M Ω	≥ 300
3.6	工作温度范围 Operating temperature range	/	/	/	$-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$
3.7	最大额定功率 Maximum rated power	P_{max}	/	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: $260\pm5^{\circ}\text{C}$, 浸入深度距电阻体6mm, 时间 5 ± 1 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°C 5min $\rightarrow$ 105°C 30min $\rightarrow$ 25°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	$R_{25} \Delta R/R \leq \pm 5\%$

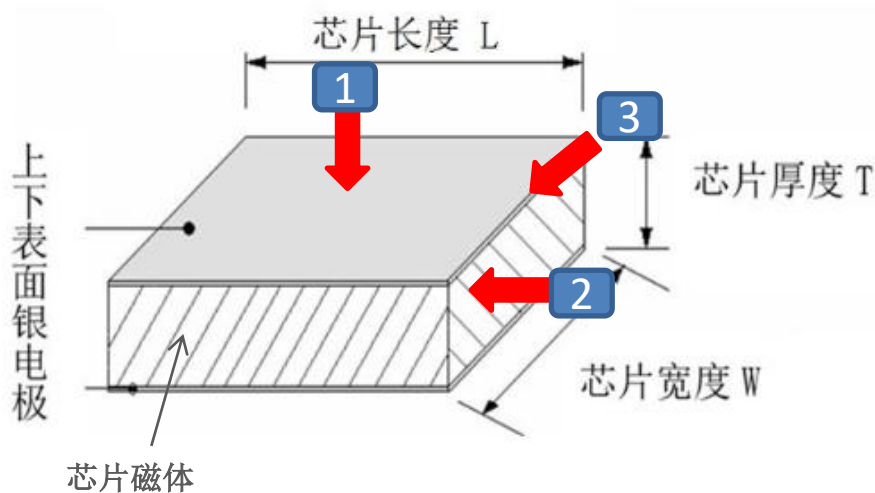
5. 机械性能: Mechanical performance:

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 $R_{25} \Delta R/R \leq \pm 2\%$

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.

8. 附表1: 阻温特性表 R-T table

R25=100K Ω , B25/50=3950K, 精度: $\pm 1\%$

温度 [°C]	R最大 [k Ω]	R中心 [k Ω]	R最小 [k Ω]	温度偏差 [°C]	
-50	6383	6065	5763	-0.8	+0.8
-49	5958	5665	5386	-0.8	+0.8
-48	5565	5295	5037	-0.8	+0.8
-47	5200	4951	4714	-0.8	+0.8
-46	4863	4633	4413	-0.8	+0.8
-45	4550	4337	4135	-0.8	+0.8
-44	4259	4063	3876	-0.8	+0.8
-43	3990	3809	3635	-0.8	+0.8
-42	3739	3572	3411	-0.8	+0.8
-41	3507	3352	3203	-0.8	+0.8
-40	3290	3147	3009	-0.8	+0.7
-39	3083	2951	2824	-0.7	+0.7
-38	2891	2768	2651	-0.7	+0.7
-37	2712	2599	2490	-0.7	+0.7
-36	2546	2441	2340	-0.7	+0.7
-35	2391	2294	2200	-0.7	+0.7
-34	2247	2157	2070	-0.7	+0.7
-33	2112	2029	1948	-0.7	+0.7
-32	1987	1909	1835	-0.7	+0.7
-31	1870	1798	1729	-0.7	+0.7
-30	1760	1694	1630	-0.7	+0.7
-29	1656	1595	1535	-0.7	+0.7
-28	1559	1502	1446	-0.7	+0.7
-27	1468	1415	1364	-0.7	+0.7
-26	1383	1334	1286	-0.7	+0.7
-25	1304	1258	1214	-0.7	+0.7
-24	1230	1187	1146	-0.6	+0.7
-23	1160	1121	1083	-0.6	+0.6
-22	1095	1059	1023	-0.6	+0.6
-21	1034	1000	967.8	-0.6	+0.6
-20	976.9	945.7	915.4	-0.6	+0.6

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
-19	922.2	893.2	865.1	-0.6	+0.6
-18	871.0	844.1	818.0	-0.6	+0.6
-17	822.9	798.0	773.7	-0.6	+0.6
-16	777.9	754.7	732.2	-0.6	+0.6
-15	735.6	714.1	693.2	-0.6	+0.6
-14	696.0	676.0	656.5	-0.6	+0.6
-13	658.7	640.2	622.1	-0.6	+0.6
-12	623.8	606.5	589.7	-0.6	+0.6
-11	590.9	574.8	559.2	-0.6	+0.6
-10	560.0	545.1	530.5	-0.6	+0.6
-9	530.4	516.5	503.0	-0.5	+0.5
-8	502.5	489.6	477.1	-0.5	+0.5
-7	476.3	464.4	452.7	-0.5	+0.5
-6	451.7	440.6	429.7	-0.5	+0.5
-5	428.5	418.2	408.1	-0.5	+0.5
-4	406.6	397.1	387.7	-0.5	+0.5
-3	386.1	377.1	368.4	-0.5	+0.5
-2	366.7	358.4	350.2	-0.5	+0.5
-1	348.4	340.7	333.1	-0.5	+0.5
0	331.1	324.0	316.9	-0.5	+0.5
1	314.6	308.0	301.4	-0.5	+0.5
2	299.1	292.9	286.8	-0.5	+0.5
3	284.4	278.7	273.0	-0.5	+0.5
4	270.5	265.2	259.9	-0.4	+0.5
5	257.4	252.5	247.6	-0.4	+0.4
6	245.1	240.5	235.9	-0.4	+0.4
7	233.4	229.1	224.9	-0.4	+0.4
8	222.3	218.3	214.4	-0.4	+0.4
9	211.8	208.2	204.5	-0.4	+0.4
10	201.9	198.5	195.1	-0.4	+0.4

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
11	192.4	189.2	186.1	-0.4	+0.4
12	183.4	180.5	177.6	-0.4	+0.4
13	174.9	172.1	169.4	-0.4	+0.4
14	166.8	164.3	161.8	-0.4	+0.4
15	159.1	156.8	154.5	-0.4	+0.4
16	151.9	149.7	147.6	-0.4	+0.4
17	145.0	143.0	141.0	-0.3	+0.3
18	138.5	136.6	134.8	-0.3	+0.3
19	132.3	130.6	128.9	-0.3	+0.3
20	126.4	124.8	123.3	-0.3	+0.3
21	120.8	119.3	117.9	-0.3	+0.3
22	115.5	114.1	112.8	-0.3	+0.3
23	110.4	109.2	107.9	-0.3	+0.3
24	105.6	104.5	103.3	-0.3	+0.3
25	101.0	100.0	99.00	-0.3	+0.3
26	96.72	95.72	94.72	-0.3	+0.3
27	92.65	91.65	90.65	-0.3	+0.3
28	88.77	87.78	86.78	-0.3	+0.3
29	85.08	84.09	83.10	-0.3	+0.3
30	81.57	80.58	79.60	-0.3	+0.3
31	78.19	77.21	76.24	-0.3	+0.3
32	74.97	74.00	73.04	-0.4	+0.4
33	71.91	70.95	69.99	-0.4	+0.4
34	68.99	68.04	67.09	-0.4	+0.4
35	66.20	65.26	64.33	-0.4	+0.4
36	63.55	62.62	61.70	-0.4	+0.4
37	61.02	60.10	59.19	-0.4	+0.4
38	58.60	57.70	56.80	-0.4	+0.4
39	56.29	55.40	54.52	-0.4	+0.4
40	54.09	53.21	52.35	-0.5	+0.5

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
41	51.96	51.10	50.25	-0.5	+0.5
42	49.93	49.08	48.24	-0.5	+0.5
43	47.99	47.16	46.33	-0.5	+0.5
44	46.14	45.32	44.51	-0.5	+0.5
45	44.37	43.56	42.76	-0.5	+0.5
46	42.68	41.88	41.10	-0.5	+0.5
47	41.06	40.28	39.51	-0.5	+0.5
48	39.51	38.75	37.99	-0.6	+0.6
49	38.03	37.28	36.54	-0.6	+0.6
50	36.62	35.88	35.15	-0.6	+0.6
51	35.25	34.53	33.81	-0.6	+0.6
52	33.94	33.23	32.53	-0.6	+0.6
53	32.69	31.99	31.31	-0.6	+0.6
54	31.49	30.80	30.13	-0.6	+0.6
55	30.34	29.67	29.01	-0.6	+0.6
56	29.24	28.58	27.94	-0.7	+0.7
57	28.18	27.54	26.91	-0.7	+0.7
58	27.17	26.54	25.93	-0.7	+0.7
59	26.20	25.59	24.98	-0.7	+0.7
60	25.28	24.67	24.08	-0.7	+0.7
61	24.38	23.79	23.21	-0.7	+0.7
62	23.52	22.94	22.37	-0.7	+0.7
63	22.69	22.12	21.57	-0.7	+0.7
64	21.90	21.34	20.80	-0.8	+0.8
65	21.14	20.60	20.06	-0.8	+0.8
66	20.41	19.88	19.36	-0.8	+0.8
67	19.71	19.19	18.68	-0.8	+0.8
68	19.03	18.53	18.03	-0.8	+0.8
69	18.39	17.89	17.41	-0.8	+0.8
70	17.77	17.28	16.81	-0.8	+0.8
71	17.17	16.69	16.23	-0.9	+0.9
72	16.59	16.12	15.67	-0.9	+0.9
73	16.04	15.58	15.13	-0.9	+0.9

NTC 热敏电阻规格书 Specifications for NTC thermistor

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
74	15.50	15.06	14.62	-0.9	+0.9
75	14.99	14.55	14.13	-0.9	+0.9
76	14.50	14.07	13.65	-0.9	+0.9
77	14.02	13.61	13.20	-0.9	+0.9
78	13.57	13.16	12.76	-1.0	+1.0
79	13.13	12.73	12.34	-1.0	+1.0
80	12.71	12.32	11.93	-1.0	+1.0
81	12.30	11.91	11.54	-1.0	+1.0
82	11.90	11.53	11.17	-1.0	+1.0
83	11.53	11.16	10.80	-1.0	+1.0
84	11.16	10.80	10.45	-1.0	+1.0
85	10.81	10.46	10.12	-1.1	+1.1
86	10.47	10.13	9.798	-1.1	+1.1
87	10.14	9.807	9.485	-1.1	+1.1
88	9.823	9.499	9.185	-1.1	+1.1
89	9.519	9.202	8.895	-1.1	+1.1
90	9.227	8.917	8.616	-1.1	+1.1
91	8.943	8.640	8.346	-1.1	+1.2
92	8.670	8.374	8.086	-1.2	+1.2
93	8.407	8.117	7.836	-1.2	+1.2
94	8.153	7.869	7.594	-1.2	+1.2
95	7.908	7.630	7.361	-1.2	+1.2
96	7.671	7.399	7.137	-1.2	+1.2
97	7.443	7.177	6.920	-1.2	+1.3
98	7.223	6.963	6.711	-1.3	+1.3
99	7.010	6.756	6.510	-1.3	+1.3
100	6.805	6.556	6.316	-1.3	+1.3
101	6.606	6.362	6.127	-1.3	+1.3
102	6.414	6.175	5.945	-1.3	+1.3
103	6.228	5.995	5.770	-1.3	+1.3
104	6.049	5.820	5.600	-1.3	+1.4
105	5.875	5.652	5.436	-1.4	+1.4

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
106	5.708	5.489	5.278	-1.4	+1.4
107	5.546	5.332	5.126	-1.4	+1.4
108	5.390	5.180	4.978	-1.4	+1.4
109	5.238	5.033	4.836	-1.4	+1.4
110	5.092	4.891	4.698	-1.5	+1.5
111	4.950	4.754	4.565	-1.5	+1.5
112	4.813	4.621	4.435	-1.5	+1.5
113	4.680	4.492	4.311	-1.5	+1.5
114	4.552	4.367	4.190	-1.5	+1.5
115	4.428	4.247	4.073	-1.5	+1.5
116	4.307	4.130	3.960	-1.6	+1.6
117	4.191	4.018	3.851	-1.6	+1.6
118	4.078	3.909	3.746	-1.6	+1.6
119	3.969	3.803	3.643	-1.6	+1.6
120	3.863	3.701	3.544	-1.6	+1.6
121	3.760	3.601	3.448	-1.6	+1.6
122	3.660	3.504	3.354	-1.6	+1.7
123	3.563	3.410	3.263	-1.7	+1.7
124	3.469	3.319	3.176	-1.7	+1.7
125	3.378	3.232	3.091	-1.7	+1.7
126	3.290	3.146	3.009	-1.7	+1.7
127	3.205	3.064	2.929	-1.7	+1.8
128	3.122	2.984	2.852	-1.8	+1.8
129	3.042	2.906	2.777	-1.8	+1.8
130	2.964	2.831	2.704	-1.8	+1.8
131	2.887	2.757	2.633	-1.8	+1.8
132	2.813	2.686	2.564	-1.8	+1.8
133	2.741	2.616	2.497	-1.8	+1.8
134	2.671	2.549	2.432	-1.8	+1.9
135	2.603	2.484	2.369	-1.9	+1.9
136	2.538	2.420	2.308	-1.9	+1.9
137	2.474	2.359	2.249	-1.9	+1.9

温度 [°C]	R最大 [kΩ]	R中心 [kΩ]	R最小 [kΩ]	温度偏差 [°C]	
138	2.412	2.299	2.192	-1.9	+1.9
139	2.352	2.242	2.136	-1.9	+1.9
140	2.294	2.186	2.082	-1.9	+1.9
141	2.236	2.130	2.029	-1.9	+1.9
142	2.180	2.076	1.977	-1.9	+2.0
143	2.126	2.024	1.926	-2.0	+2.0
144	2.073	1.973	1.878	-2.0	+2.0
145	2.022	1.924	1.830	-2.0	+2.0
146	1.972	1.876	1.785	-2.0	+2.0
147	1.924	1.830	1.740	-2.0	+2.1
148	1.877	1.785	1.697	-2.1	+2.1
149	1.832	1.741	1.655	-2.1	+2.1
150	1.788	1.699	1.614	-2.1	+2.1