

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 : MF11 补偿型 NTC 热敏电阻器  
MF11 Compensation NTC Thermistor  
产品规格 PART NUMBER : MF11-474K  
产品编号 PRODUCTCODE: \_\_\_\_\_  
版次 REV.NO: B0  
日期 DATE: 2023-01-04

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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## 1、产品型号说明 Product model specification


**MF11** **474** **K**  
 ①            ②            ③            ④

①  : 时恒品牌

② MF11: 补偿型 NTC 热敏电阻

③ 474: 25℃的零功率电阻值 470KΩ

④ K: 阻值精度代码 J-±5% K-±10% M-±20%

## 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 <sub>25℃</sub>	T <sub>a</sub> =25±0.5℃ (测试功率 ≤0.1mW 空气中测试) Test Power≤0.1mW, in air)	KΩ	470KΩ ±10%
2.2	B 值 B-value	B <sub>25/50</sub>	$B = [(T_a \times T_b) / (T_b - T_a)] \times \ln(R_a / R_b)$ T <sub>a</sub> =25±0.01℃ T <sub>b</sub> =50℃±0.01℃	K	4750±10%
2.3	耗散系数 Thermal dissipation Coefficient	δ	静止空气中 In still air	mW/℃	约 4.5
2.4	时间常数 Thermal time constant	τ	静止空气中 In still air	sec	约 20
2.5	绝缘电阻 Insulation resistance	/	1000V/DC 1min	MΩ	≥500
2.9	工作温度范围 Operating temperature range	/	/	℃	-30 ~ 125
2.10	最大额定功率 Maximum rated power	P <sub>max</sub>	/	mW	450

### 3、产品图纸 Product drawing

<b>产品图纸</b> 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.	MF11 474K	审核 Approve:		日期 DATE		
<b>尺寸 Dimensions:</b> <div style="text-align: right;">1 (Unit: mm)</div> <div style="text-align: center;"> </div>						
DMax	L1	L2	F±1	T	d±0.05	
5.2	Min25	Max2.5	2.5	Max4	0.45	
<b>技术要求 Technical requirements:</b> <ol style="list-style-type: none"> <li>1) 零功率阻值: R25: 100K Ω ± 10% (Zero Power Resistance: R25: 100KΩ±10%);</li> <li>2) B25/50 数值: 4750K ± 10% (B-value: B25/50: 4750K±10%);</li> <li>3) 线材: 镀锡铜包钢线 ( tinned copper-weld steel wire);</li> <li>4) 封装: 绿色环氧树脂 (Green Epoxy resin) ;</li> <li>5) 符合 RoHS 环保要求 (Meet environmental protection requirements:RoHS) 。</li> </ol>						
<b>更新履历 Revised record sheet</b>						
版本 REV. NO	更新时间 REV.DATE	更新内容 Change content		申请人 Applicant	批准人 Approved	
A0	2015. 4. 10	版本制定。 Version formulation		王月婷	李少媛	
B0	2022. 4. 1	更新规格书版本格式, 增加版次管控 Update for version form of datasheet, add to management and control for number of edition		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	线径 <u>拉力(N)</u> lead diameter(mm) <u>Pull strength(N)</u> 0.35<d≤0.5 5 0.5<d≤0.8 10 时间: 10±1 秒 time: 10±1 sec	无可见性损伤 No obvious damage R <sub>25</sub> ΔR/R≤±3%
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 10±1 秒 Temperature of tin pot: 260±5℃, insert depth from body of resistance 6mm, time 10±1 seconds	R <sub>25</sub> ΔR/R≤±3%
4.4	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	R <sub>25</sub> ΔR/R≤±3%
4.5	温度快速变化 Rapid changes in temperature	IEC60068-2-14	-30℃ 30min→25℃ 5min→125℃ 30min→25℃ 5min, 5cycles	R <sub>25</sub> ΔR/R≤±3%
4.6	高温储存 High temperature storage	IEC60068-2-2	温度: 125℃±5℃ 时间: 1000 小时 Temp: 125℃±5℃, Time: 1000hrs	R <sub>25</sub> ΔR/R≤±5%
4.7	低温储存 Low temperature storage	IEC60539-1	温度: -30℃±5℃ 时间: 1000 小时 Temp: -30℃±5℃, Time: 1000hrs	R <sub>25</sub> ΔR/R≤±5%

▲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/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/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×H=11mm×12mm	1000
2	编带带包装盒 reel packing box	包装盒 packing box W×G×H=335mm×240mm×50mm	1000

## 6、安装&使用注意事项 Installation & Use precautions

6.1 本产品的用途：用于温度补偿；

Purpose of product: Be used for temperature compensation;

6.2 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

6.3 储存温度：-10℃ ~ 40℃；储存湿度：≤75% RH；

storage temp: -10℃ ~ 40℃；storage humidity: ≤75% RH


6.4 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

6.5 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.

## 7、产品认证 Product certification

No.	项目 Projects	产品认证 Product certification
7.1	质量管理体系认证 Quality Management System Certification	ISO9001:2015
		IATF16949: 2016
7.2	环境管理体系认证 Environmental Management System Certification	ISO14001:2015
7.3	环保检测报告 Environmental test report	RoHS 2.0
7.4	CQC 认证 CQC certificate	
7.5	TUV 认证 TUV certificate	R50245892
7.6	UL 认证 UL certificate	E240991
7.7	江苏省高新技术产品认证 High-tech product certificate in Jiangsu Province	



## 时恒电子(电阻温度表)

R25=470K $\Omega$ 

B25/50=4750K

T	R	T	R	T	R	T	R	T	R	T	R
-30	17263.1	-4	2640.44	22	552.377	48	151.653	74	50.19	100	18.8
-29	15922.2	-3	2472.38	23	523.214	49	144.906	75	48.245	101	18.769
-28	14702.8	-2	2316.03	24	495.794	50	138.496	76	46.386	102	18.165
-27	13591.3	-1	2170.52	25	470	51	132.403	77	44.608	103	17.586
-26	12575.9	0	2021	26	445.724	52	126.611	78	42.908	104	17.03
-25	11646.6	1	1908.89	27	422.869	53	121.103	79	41.282	105	16.497
-24	10794.4	2	1791.35	28	401.34	54	115.862	80	39.727	106	15.986
-23	10011.9	3	1681.8	29	381.052	55	110.876	81	38.239	107	15.495
-22	9292.32	4	1579.67	30	361.925	56	106.129	82	36.815	108	15.025
-21	8629.79	5	1484.41	31	343.885	57	101.61	83	35.452	109	14.574
-20	8019.14	6	1395.52	32	326.862	58	97.306	84	34.148	110	14.141
-19	7455.75	7	1312.56	33	310.793	59	93.206	85	32.9	111	13.725
-18	6935.51	8	1235.09	34	295.616	60	89.3	86	31.704	112	13.327
-17	6454.74	9	1162.72	35	281.278	61	85.576	87	30.56	113	12.944
-16	6010.14	10	1095.1	36	267.725	62	82.026	88	29.464	114	12.577
-15	5598.72	11	1031.87	37	254.91	63	78.641	89	28.414	115	12.225
-14	5217.79	12	972.735	38	242.788	64	75.413	90	27.409	116	11.887
-13	4864.9	13	917.4	39	231.315	65	72.333	91	26.446	117	11.563
-12	4537.83	14	865.601	40	220.454	66	69.394	92	25.523	118	11.252
-11	4234.55	15	817.091	41	210.168	67	66.589	93	24.639	119	10.953
-10	3953.21	16	771.641	42	200.422	68	63.911	94	23.792	120	10.667
-9	3692.13	17	729.04	43	191.185	69	61.355	95	22.98	121	10.392
-8	3449.75	18	689.091	44	182.427	70	58.913	96	22.202	122	10.128
-7	3224.64	19	651.613	45	174.12	71	56.581	97	21.456	123	9.875
-6	3015.51	20	616.437	46	166.238	72	54.353	98	20.742	124	9.632
-5	2821.14	21	583.406	47	158.757	73	52.224	99	20.056	125	9.4



