



承 认 书

APPROVAL SHEET

客户名称(Customer): _____

产品名称: 抑制浪涌电流负温度系数热敏电阻器

(Part Name): Specification of NTC Thermistor for Surge Current Suppression

产品规格(Model/Type): NTC 2.5D-11

风华物料号(FENGHUA NO.): NTC2R5D11MF2E3S000GSN

客户物料号(Customer NO.): _____

版本号(Version): V1.0

日期(Date): 2024.04.02

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APPROVAL			APPROVAL		
拟制	审核	承认确认	检验	审核	批准
洗美兰	范梓君	王友平			



序号 No	目 录 TABLE OF CONTENTS
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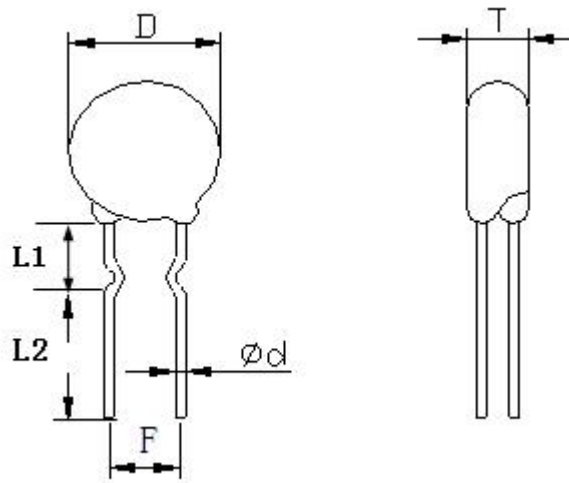
1.0 概述 Summary

NTC 热敏电阻是一种负温度系数电阻器，其阻值随环境温度的升高而降低，这种热敏电阻是由 2 种或 4 种铁、镍、钴、锰或铜的金属氧化物经过成型并在高温下烧结而制得。

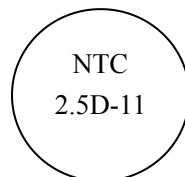
NTC Thermistor is a Negative Temperature Coefficient Resistor whose resistance changes with ambient temperature changes. Thermistor comprises 2 or 4 kinds of metal oxides of iron, nickel, cobalt, manganese and copper, being shaped and sintered at high temperature.

2.0 结构及尺寸 Structure And Dimensions

(1).外形图 Outline Fig



(2).标记 Mark



(3). 包封 Coating

■ 颜色 Color: 绿色 Green

(4).引线 Lead

■ 材料 Material: 镀锡 CP 线 Tinned CP leads

■ 形状 Shape: 内弯 Inside Kink

(5).尺寸 Shape and Dimension : (unit :mm)

D _{MAX}	F ± 0.5	Φd ± 0.08	L1 ± 2.0	L2 _{MIN}	T _{MAX}
11.5	7.5	0.8	5.0	20.0	5.0



3.0 订货方式 How to Order

NTC 2R5 D11 M F2 E3 S000 G SN

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

- ① **NTC** — NTC 热敏电阻器(NTC Thermistor)
- ② **2R5** — 标称零功率电阻值: 2.5 Ω (Rated Zero Power Resistance: 2.5 Ω)
- ③ **D11** — 瓷片最大直径: Φ 11mm (Diameter of Chip: Φ 11mm)
- ④ **M** — 误差为 $\pm 20\%$ (Tol: $\pm 20\%$)
- ⑤ **F2** — 引线脚型与间距 (Lead Style & Lead Spacing)
 - F:** 引线脚型: 内弯 (F: Lead Style: Inside Kink)
 - 2:** 间距: 7.5 mm (Lead Spacing: 7.5 mm)
- ⑥ **E3** — 引线材料及线径: (Lead Material & Wire diameter)
 - E:** 镀锡 CP 线 Tinned CP leads
 - 3:** 线径: 0.8mm (Wire diameter: Φ 0.8 mm)
- ⑦ **S000** — 散装/长脚 (Bulk/Long Lead)
- ⑧ **G** — 涂层颜色(Color)
 - G:** 绿色 Green
- ⑨ **SN:**内部控制码 (Internal control code)

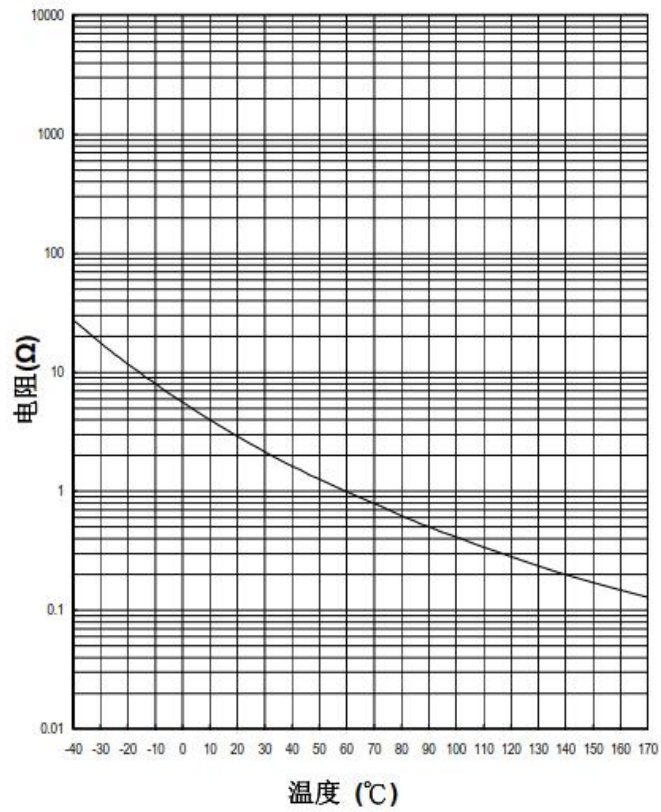


4.0 电气性能 Performance Specification

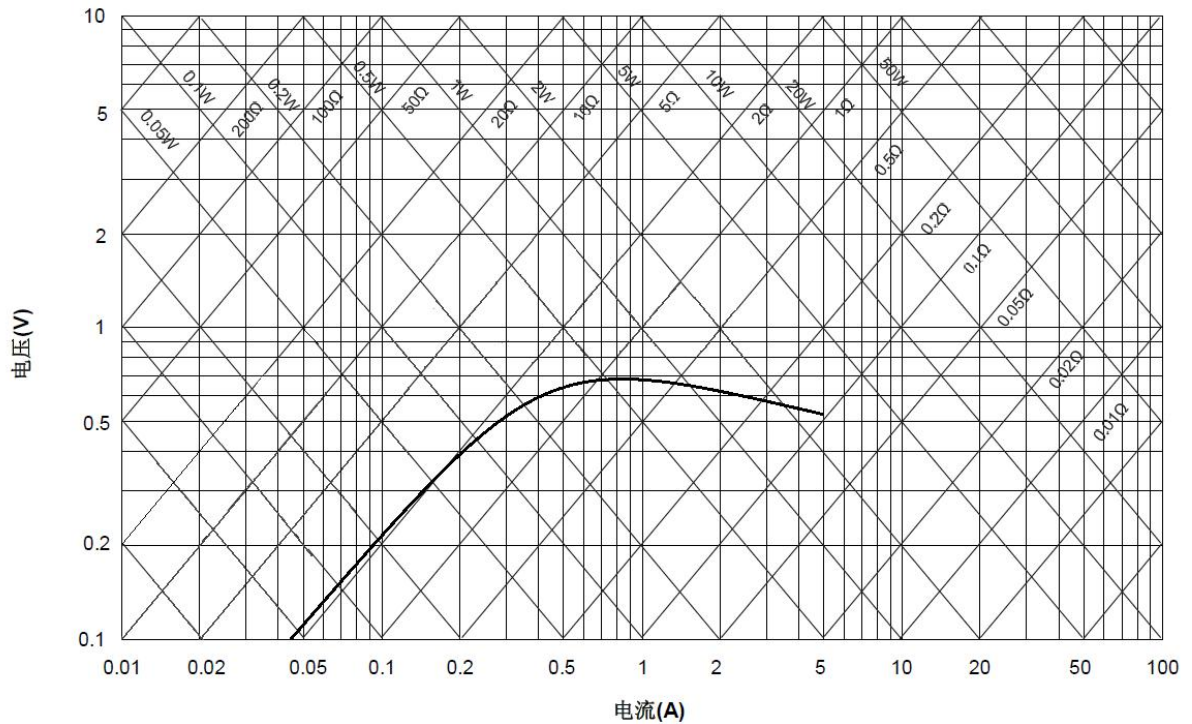
项目 Item	性能要求 Specification request
1. 标称零功率电阻值(25°C ±1°C) Rated Zero Power Resistance	2.5 Ω ± 20%
2. 最大稳态电流@25°C Max Steady State Current	5A
3. 最大电流时近似电阻值 @25°C Approx R of Max.Cur.	0.120 Ω
4. 在 240Vac 下最大电容值 Max Capacitance At AC 240V	470 μ F
5. 耗散系数 Thermal Dissipation Constant	13 mW / °C
6. 热时间常数 Thermal Time Constant	43 S
7. 最大额定功率@25°C Max Power Rating	2.4 W
8. B 值 (25°C/85°C) B value (25°C/85°C)	2600K ± 10%
9. 工作温度 Operation Range	-40°C ~ +170°C



■ 电阻-温度特性曲线图 R-T Characteristic Curves



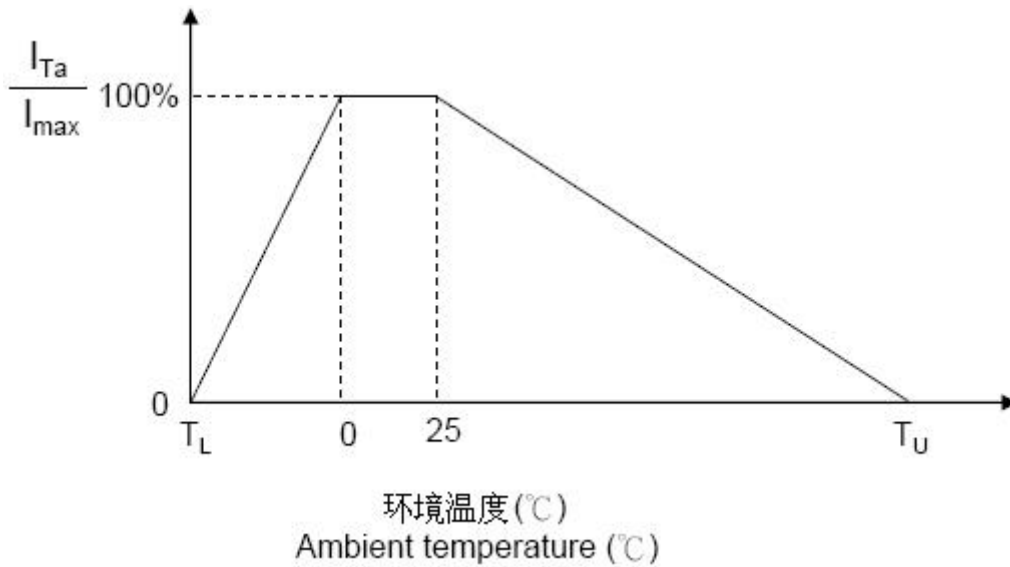
■ V-I 曲线图 V-I Characteristic Curve





■ 最大电流降额曲线图

Max. Current Derating Curve



Note:

T_U : 工作温度上限(°C)
Maximum operating temperature (°C)

T_L : 工作温度下限(°C)
Minimum operating temperature (°C)

T_a : 环境温度(°C)
Ambient temperature (°C)

$\geq 25^\circ\text{C}$: $I_{Ta} = [1 - (T_a - 25) / (T_u - 25)] \times I_{max}$

$\leq 0^\circ\text{C}$: $I_{Ta} = (T_a - T_L) / (0 - T_L) \times I_{max}$



5.0 可靠性 Reliability data

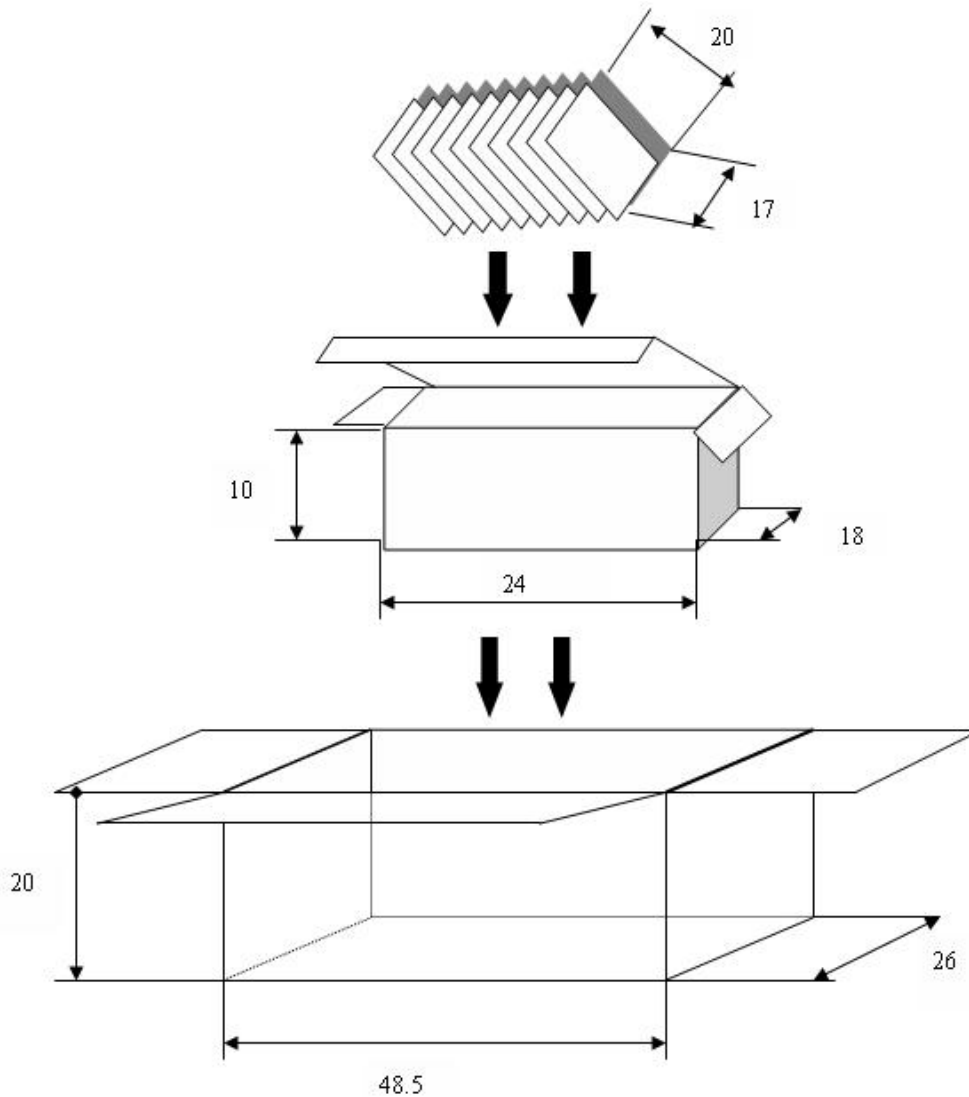
项目 Item	试验条件 Test conditions	性能要求 Specification request						
1. 引线端子的抗拉强度 Tensile Strength of Lead Wire Terminal	<p>固定热敏电阻本体，并沿轴向向每个端子逐渐施加负载，直至达到下表所示的值，将该负载保持10 ± 1秒。</p> <p>The load is gradually applied to each terminal of Thermistor until the force of the following table in the axial direction with fixing Thermistor body itself and this load is kept for 10 ± 1 sec.</p> <table border="1"> <thead> <tr> <th>线径 Terminal diameter (mm)</th> <th>拉力 Force (N)</th> </tr> </thead> <tbody> <tr> <td>$0.5 < d \leq 0.8$</td> <td>10.0</td> </tr> <tr> <td>$0.8 < d \leq 1.25$</td> <td>20.0</td> </tr> </tbody> </table>	线径 Terminal diameter (mm)	拉力 Force (N)	$0.5 < d \leq 0.8$	10.0	$0.8 < d \leq 1.25$	20.0	<p>无可见损伤 电阻变化率：$\pm 10\%$ No break out and damage Resistance change: within $\pm 10\%$</p>
线径 Terminal diameter (mm)	拉力 Force (N)							
$0.5 < d \leq 0.8$	10.0							
$0.8 < d \leq 1.25$	20.0							
2. 引线端子的弯曲强度 Bending Strength of Lead Wire Terminal	<p>将热敏电阻垂直于引线固定，在引线上沿轴向悬挂下列负载。</p> <p>将引线慢慢弯曲到90°并复原。然后再慢慢朝相反方向弯曲，并恢复到原始状态。</p> <p>Thermistor is held so that it is perpendicular to the lead wire with the following lead hanging in the axial direction of the lead wire.</p> <p>The lead wire is slowly bent to 90° and returned.</p> <p>Then it is slowly bent in the opposite direction and returned to original state.</p> <table border="1"> <thead> <tr> <th>线径 Terminal diameter (mm)</th> <th>拉力 Force (N)</th> </tr> </thead> <tbody> <tr> <td>$0.5 < d \leq 0.8$</td> <td>5.0</td> </tr> <tr> <td>$0.8 < d \leq 1.25$</td> <td>10.0</td> </tr> </tbody> </table>	线径 Terminal diameter (mm)	拉力 Force (N)	$0.5 < d \leq 0.8$	5.0	$0.8 < d \leq 1.25$	10.0	<p>引线不折断 电阻变化率：$\pm 10\%$ Lead wire does not come off Resistance change: within $\pm 10\%$</p>
线径 Terminal diameter (mm)	拉力 Force (N)							
$0.5 < d \leq 0.8$	5.0							
$0.8 < d \leq 1.25$	10.0							
3. 振动 vibration	<p>频率：$10 \sim 55$ Hz 振幅：0.75 mm 方向和时间：X、Y及Z轴各2小时 Frequency: $10 \sim 55$ Hz Amplitude modulation: 0.75 mm Dirction and time: X、Y and Z direction for 2 hrs each</p>	<p>无机械损伤 No substantial damage</p>						



项目 Item	试验条件 Test conditions	性能要求 Specification request
4. 可焊性 Solderability	焊锡槽 温度: $245 \pm 5^{\circ}\text{C}$ Temperature: $245 \pm 5^{\circ}\text{C}$ 时间: $3 \pm 0.5 \text{ s}$ Time: $3 \pm 0.5 \text{ s}$	涂布面积: $\geq 95\%$ Covered termination: $\geq 95\%$
5. 耐焊接热 Solder ability	把引端浸入 $260 \pm 5^{\circ}\text{C}$ 的焊锡 $4.0 \pm 0.8\text{mm}$ 深, 持续 10 ± 1 秒时间, 静置 24 小时后测试 the leadwires shall be dipped in a molten solder of $260 \pm 5^{\circ}\text{C}$ for 10 ± 1 seconds up to the point $4.0 \pm 0.8\text{mm}$.after the specimen shall be left at room ambient temperature for 24 hours,the resistance shall be measured	电阻变化率: $\pm 10\%$ Resistance change: within $\pm 10\%$
6. 高温放置 (高温保存) Dry heat (high temperature storage)	在 $170 \pm 2^{\circ}\text{C}$ 中放置 1000^{+48} 小时, 静置 2 小时后测试 Specimen shall be subjected to an ambient of $170 \pm 2^{\circ}\text{C}$ for 1000^{+48} hours.and after the specimen shall be left at room ambient for 1 to 2 hours,the resistance shall be measured	电阻变化率: $\pm 20\%$ Resistance change: within $\pm 20\%$
7. 低温放置 (低温保存) Cold (low temperature storage)	在 $-40 \pm 3^{\circ}\text{C}$ 中放置 1000^{+48} 小时, 静置 2 小时后测试 Specimen shall be subjected to an ambient of $-40 \pm 3^{\circ}\text{C}$ For 1000^{+48} hours.and after the specimen shall be left at room ambient for 1 to 2 hours,the resistance shall be measured	电阻变化率: $\pm 20\%$ Resistance change: within $\pm 20\%$
8. 稳态湿热 humidity test	$40 \pm 2^{\circ}\text{C}$ 90~95%RH, 1000 hrs	电阻变化率: $\pm 20\%$ Resistance change: within $\pm 20\%$
9. 温度快速变化 Temp Cycle test	$-40^{\circ}\text{C}/30'$ \longrightarrow $25^{\circ}\text{C}/5'$ \longrightarrow $+170^{\circ}\text{C}/30'$ \longrightarrow $25^{\circ}\text{C}/5'$ 循环五个周期 5 cycles	电阻变化率: $\pm 20\%$ Resistance change: within $\pm 20\%$



6.0 包装 Package



单位: cm

规格	D5	D7	D9	D11	D13	D15	D20
每包	1000 只	1000 只	500 只	500/1000 只	400/500 只	300/500 只	200 只
每盒	长脚 5 包	长脚 4 包	长脚 5 包	长脚 4 包	长脚 4 包	长脚 4 包	长脚 3 包
每盒	短脚 20 包	短脚 10 包	短脚 10 包	短脚 4 包	短脚 5 包	短脚 4 包	短脚 4 包
每箱	5 盒	5 盒	5 盒	5 盒	5 盒	5 盒	5 盒

可根据客户特殊要求进行包装

Packaging according to customer's requirement.



7.0 环保情况说明 Environmental Protection Statement

我司提供的所有热敏电阻物料均符合最新欧盟 ROHS 指令及 Reach 法规要求，请贵司放心使用。

We provide all materials conform to the requirements of the latest eu ROHS directive and the Reach regulation, please rest assured to use.

8.0 贮存方法 Storage Methods

元器件必须储存在清洁、通风、无腐蚀性气体的仓库内；除另有规定外，仓库的温度和相对湿度必须满足如下要求：a.温度：5~30℃；b 相对湿度： 20%~75%；储存期限:1 年。

Components must be stored in a clean, ventilated, non-corrosive gases warehouse; Unless otherwise specified, the warehouse temperature and relative humidity must meet the following requirements: a.Temperature: 5 ~ 30 °C ;b. Relative humidity: 20% ~ 75%; Period of Storage : 1 year.

9.0 使用注意事项 Precautions For Use

1、工作环境温度应该在技术条件规定的范围以内。

Working environment temperature should be within the prescribed scope of technical conditions.

2、不应该靠近发热或可燃元器件安装，最好有大于 3 毫米的间隔，以免损坏元器件。

Near a fever or flammable components should not be installed, it is better to have more than 3 mm intervals, so as not to damage the components.

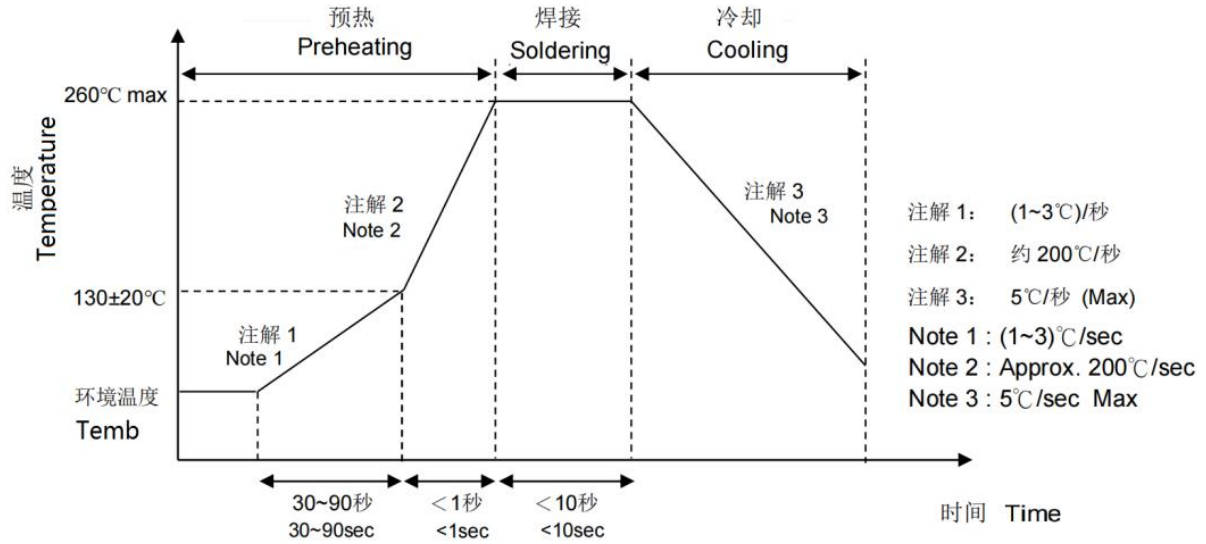
3、接触引脚时请先佩戴手套。

Please wear gloves when the contact pin.



10.0 推荐焊接条件 Soldering Recommendation

*波峰焊曲线 Wave soldering profile



*手工焊接 Iron soldering

项目 Item	条件 Conditions
烙铁头温度 Temperature of soldering Iron-tip	360°C (max.)
焊接时间 Soldering Time	3s (max.)
焊接位置与涂装层距离 Distance from Varistor	2mm (min.)

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