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规格书 Specification For Approval

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产品名称 Product Name	温度保险丝 Thermal-link
产品型号 Model No.	C3
产品编码 Product Code	100100303001
产品描述 Product Description	温度保险丝(径向型) Thermal-link(Radial Shape) GP C3 115 °C 3 A 250 Vac, 镀锡铜线, 总长70mm。Tinned Copper Wire, Total Length 70 mm
额定电流, 电压 Rated Current & Voltage	3 A, 250 Vac
认证 Agency Approval	UL cUL CCC TUV
制造商 Manufacturer	
产地 Country of Origin	中国 China

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1 适用 Scope

本规格书适用于温度保险丝 C3（以下简称温度保险丝）之规定。

The specification is available for Thermal-link product, and the product mode is C3, hereinafter referred to as Thermal-link.

2 术语 Glossary

2.1 热熔断体 Thermal-link (TCO)

热熔断体也称为热断路器或温度保险丝，在本文中这些不同名词都代表同样的产品，为一次性动作而不可复位的装置。

Thermal-link/Thermal Cutoff (TCO), known as thermal fuse. All the names are the same in this context, functioning once only, non-resettable.

2.2 额定动作温度 Rated Function Temperature (T_f)

通 10 mA 的负载电流时，加热使温度保险丝断开的温度。

The temperature of the Thermal-link which causes it to change the state of conductivity with a detection current up to 10 mA as the only load.

允许偏差 Tolerance: $T_f \pm 0^\circ \text{C}$ (GB 9816, EN 60691, K60691).

允许偏差 Tolerance: $T_f \pm 7^\circ \text{C}$ (J60691).

2.3 实测熔断温度 Fusing Temperature

置于油池中，通 10 mA 以下的负载电流，每分钟升温 $0.5^\circ\text{C} \sim 1^\circ\text{C}$ ，测断开温度。

The temperature of the Thermal-link which causes it to change its state of conductivity is measured with silicone oil bath in which the temperature is increased at the rate of $0.5^\circ\text{C} \sim 1^\circ\text{C}/\text{min}$, with a detection current up to 10 mA as the only load.

2.4 保持温度 Holding Temperature (T_h)

持续通额定电流 168 小时不断开的最高温度。

The Maximum temperature at which a Thermal-link will not change its state of conductivity when conducting rated current for 168 h.

2.5 极限温度 Maximum Temperature Limit (T_m)

在规定的时间内不破坏机械和电气特性所能承受的最高温度。

The temperature of the Thermal-link stated by the manufacturer, up to which the mechanical and electrical properties of the Thermal-link having changed its state of conductivity, will not be impaired for a given time.

2.6 额定电流 Rated Current (I_r)

温度保险丝分类用，允许用于电路并安全断开的最大电流。

The current used to classify a Thermal-link, which is the Maximum current that Thermal-link allows to carry and is able to Cut off the circuit safely.

2.7 额定电压 Rated Voltage (U_r)

温度保险丝分类用，允许用于电路并安全断开的最高电压。

The voltage used to classify a Thermal-link, which is the Maximum voltage that Thermal-link allows to carry and is able to Cut off the circuit safely.

2.8

瞬态过载电流 Transient Overload Current (I_p)

温度保险丝在不破坏特性的情况下，所能承受的最大瞬态过载电流。

A direct current pulse at which the Thermal-link is able to withstand without impairing it's characteristics.

3

结构尺寸 Structure and Dimension

3.1

结构图 Structure

温度保险丝由合金、助熔断剂、外壳、封口树脂及引脚等组成。

Thermal-link is made up of fusible alloy, flux resin, case, sealant and lead wire.

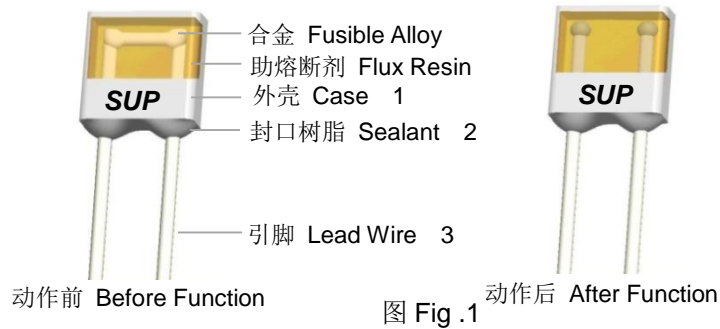


图 Fig .1

3.2

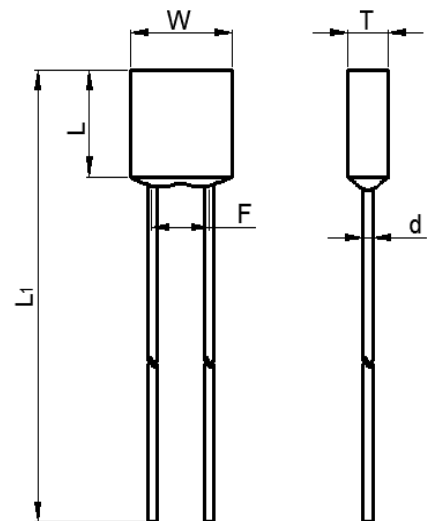
主要原材料明细 Main Material List (详见图 As Show in Fig. 1)

项目	编号 No.		
	1	2	3
零件名 Part Name	外壳 Case	封口树脂 Sealant	引脚 Lead Wire
材质 Materials	塑料 Plastic Case	环氧树脂 Sealant Epoxy	镀锡铜线 Tinned Copper Wire

3.3

尺寸 Dimension (mm)

L	5.8±0.5
W	5.8±0.5
T	2.3±0.3
L ₁	70±2
d	Φ0.54±0.05
F	3.7±0.5



4 安规认证 Agency Approvals

认证机构 Agency	标准 Standards	认证号 File NO.	类别 Category
 UL	UL60691	E504471	XCMQ2
 cUL	CAN-CSA-E60691	E504471	XCMQ8
 CCC	GB9816	2020980205000007	N/A
 TUV	EN60691	R50442306	N/A

5 技术参数表 Specifications

额定动作温度 Rated Functioning Temp. T_f	实际动作温度 Fuse Temp.	保持温度 Holding Temp. T_h	极限温度 Maximum Temp. Limit T_m	额定电流 Rated Current I_r	额定电压 Rated Voltage U_r
(°C)	(°C)	(°C)	(°C)	(A)	(V)
115	112±2	91	200	3	AC 250
					AC 300

6 检验方法和标准 Inspection Method & Standards

序号 No.	项目 Items	检验工具 Inspection Tools	检验标准 Inspection Standards
1	外观 Appearance	目视 Visual	在充足光线下观察引脚无氧化发黑。 Observe the lead wire in bright room, and it can't be black for oxidation.
2	尺寸 Dimension	千分尺 Micrometer 游标卡尺 Calipers	采用千分尺或游标卡尺测量, 需符合 3.3 要求。 Using a micrometer or caliper measurements, the dimension must meet requirement listed in 3.3.
3	拉力 Pull	推拉试验仪 Push Pull Tester	引脚承受的 4.58 N 拉力 1 分钟, 不损伤、脱落。 The lead wire won't be broken down when it is endured a pull force of 4.58 N for 1 min.
4	扭转 Twist	手工测试 Manual Testing	引脚扭转 180°×4 次, 不损伤、松动。 The lead wire won't be broken down when it is bent 180° for 4 times.
5	动作温度准确性 The Accuracy of Fuse Temperature	动作温度试验仪 (油池) Function Temperature Tester	依照 IEC60691 及 UL60691 检验方法,用油池测量,需符合 5.0 要求。 According to approach provided in IEC60691 and UL60691. Test it in a silicon oil bath, the result must meet the requirements list in 5.0.

6	绝缘电阻 Insulation Resistance	绝缘电阻表 Insulation Resistance Meter	动作后，两引脚间绝缘电阻 $> 0.2 \text{ M}\Omega$ ，测试电压为 $2 \times U_r$ (Vdc)。 After function under a testing voltage of $2 \times U_r$ (Vdc), the insulation resistance between lead wires is at least $0.2 \text{ M}\Omega$.
			引脚与外壳间绝缘电阻 $> 2 \text{ M}\Omega$ ，测试电压为 $2 \times U_r$ (Vdc)。 After function under a testing voltage of $2 \times U_r$ (Vdc), the insulation resistance between case and lead wires is at least $2 \text{ M}\Omega$.
7	耐压 Dielectric Strength test	耐压试验仪 Voltage Withstand Tester	动作后，两引脚间承受： $(2 \times U_r) \text{ V} \times 1$ 分钟，不击穿。 After function, it won't breakdown when the lead wires endured a voltage of $(2 \times U_r) \text{ V}$ for 1 min.
			引脚与外壳间承受： $1000 + (2 \times U_r) \text{ V} \times 1$ 分钟，不击穿。 After function, it won't breakdown when a voltage of $1000 + (2 \times U_r) \text{ V}$ is applied between lead wire and case for 1 min.

备注：测试条件为温度 $25 \pm 10 \text{ }^\circ\text{C}$ 、湿度 $65 \pm 15 \%$ 。

Remark: Test Conditions: Temperature is $25 \pm 10 \text{ }^\circ\text{C}$, RH $65 \pm 15 \%$.

7 安全预防措施 Safety Precautions

7.1 使用中须注意，每个型号的温度保险丝都有其特定的电流、电压规格以及温度规格，包括 T_f （额定动作温度）、 T_h （保持温度）、 T_m （极限温度）以及其电流、电压的规格，详见技术参数表。

Each Thermal-link has specific electrical and temperature ratings and must be used with the prescribed ratings. These ratings include T_f (Rated Functioning Temp.), T_h (Holding Temp.), T_m (Max. Temp. Limit), and the electrical Ratings. Please refer to technical data sheet.

7.2 温度保险丝是不可修复的产品。基于安全原因，替换时应使用同类别同型号的温度保险丝并且严格按照同样的方法正确安装。

Thermal-link is a non-repairable product. For safety aspect, it shall be replaced by an equivalent Thermal-link, and mounted in the same way.

7.3 安装温度保险丝时要确保其安装位置的环境温度及温度保险丝带载时的产品表面温度不会超过其相应规格中的保持温度。

When mounting Thermal-link, please guarantee the ambient temperature of the mounting position and the surface temperature of Thermal-link itself at working are not exceeding the holding temperature specified in the related specifications.

7.4 终端产品需要确保温度保险丝仅能从预定的热源处（辐射源、对流源、和热传导）感受温度。例如应用于加热器，温度保险丝不能让导线过多受热，这样会加速保险丝熔化断裂；如用

于变压器或发动机，温度应该由变压器或发动机线圈控制,这时温度保险丝就需与变压器或发动机线圈之间有良好的热传导。

The terminal product should be designed to ensure that Thermal-link detects only from intended heat source (radiant, convection, and conductance). For example, in a heater application, Thermal-link lead wires should not be heated so much, because it will accelerate the fusing off of the Thermal-link. In transformer or motor application, where the temperature should be controlled by the transformer or motor coil, Thermal-link should have good Thermo-coupling with the transformer or motor coil.

7.5

建议采用内置热电偶式的仿真温度保险丝来确定适合的温度要求和安装位置。

It is recommended that a dummy Thermal-link with inbuilt Thermo-couple shall be used to determine the proper temperature and location of the Thermal-link.

7.6

勿将温度保险丝安装在可能经常出现剧烈振动的地方。

Do not locate the Thermal-link in a place where severe vibration always occurs.

7.7

需对最终产品进行测试，以确保潜在的异常状况不会导致温度保险丝超过其极限温度。

The terminal product should be tested to ensure that potential abnormal conditions do not cause ambient temperature to exceed the Tm of the Thermal-link.

7.8

保险丝的封口及主体不能受损，烧伤或者过度受热。

The seal or body of Thermal-link must not be damaged, burned or over heated.

7.9

安装温度保险丝 Mounting Thermal-link

7.9.1

将温度保险丝安装在可使其温度可以平稳上升的部位。

Mount the Thermal-link at the location where temperature rises evenly.

7.9.2

确保引脚足够长，且其安装方法不会造成强行按压、拉伸及扭转引脚之现象。

Ensure that the lead wire is long enough, and avoid actions such as press, tensile or twist.

7.10

引脚弯曲 Lead Wire Bending

7.10.1

如果一定要弯折引脚，那么应确保弯折处与主体间的距离，如表 1。

If the lead wire has to be bent, please pay attention to the distance between body and the bending point. Refer to the table 1.

表 Table 1

D	$\leq \Phi 1.0 \text{ mm}$	$> \Phi 1.0 \text{ mm}$
L	$\geq 3 \text{ mm}$	$\geq 5 \text{ mm}$

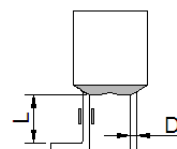


图 Fig. 2

7.10.2

弯折引脚时请使用钳子或其它工具固定（如图 2 所示），以免损坏产品。

When bending the leads, please use pincher or similar tools to fix the product as shown in Fig.2, to avoid damaging the product.

- 7.10.3 在成形和安装过程中，对引脚进行裁切、切割、弯折时，请勿用力过猛，以免造成产品断裂或本体损伤。
During forming and mounting, lead wire should not be cut, nicked, bent sharply, to avoid breaking the product.
- 7.10.4 在避免直接对引脚根部施加外力（比如与温度保险丝主体成一定角度推或拉），以免损坏温度保险丝封口。
Tangential forces on the leads must be avoided (i.e. pushing or pulling on the leads at angle to Thermal-link body) as such forces may damage the seal of Thermal-links.
- 7.11 必须保证外壳与封口完好，无表面损坏、烧焦、过热等现象。
The seal or body must not be damaged, burned or overheated.
- 7.12 设计终端产品时应考虑到与引脚接触的零部件因膨胀及收缩所造成的应力、振动或其他运动，应采用柔韧的、易弯曲的引脚或者低阻抗引线来连接温度保险丝。
Stress, vibration or other movement caused by expansion and contraction of the parts connected to the leads should be considered when designing the terminal product. A flexible lead or lead with low resistance should be used to connect the Thermal-link.
- 7.13 应确保接触电阻为最小值，需要对连接点进行检查以确保引脚与被连接物连接可靠，不正确的连接可能造成温度保险丝提前失效，引起封口或其他部份的损坏，并且不良连接产生的高阻抗可能导致器件过热而引起断路或损坏。
Contact resistance should be minimal. Improper connection may cause Thermal-link to fail in advance. The joints should be inspected to ensure adequate mechanical bonding of Thermal-link leads and connection parts. Improper connections may cause damage to the seal or other parts. Improper connections may cause high resistance, which may result in open circuit or nuisance tripping of the devices.
- 7.14 与引脚的连接及连接的材料 Connecting leads and connection materials
- 7.14.1 若需外露一定长度的引脚，应该采取相应措施，防止温度保险丝引脚歪斜或损坏。
If it is necessary to expose the lead of Thermal-link, there shall be some measurements to avoid the lead deflection or damage.
- 7.14.2 所采用的连接材料或夹具应为抗腐蚀材料。
Connection materials or pinchers should be materials of anti-corrosion.
- 7.14.3 应采用长度及柔韧度充足的引脚，温度保险丝和连接物结合应是可靠的，以避免在正常工作状态下发生的振动或弯折对温度保险丝造成损伤。
Leads should be sufficiently long and flexible. The joints of Thermal-link leads and connecting parts should be reliable to avoid the damage caused by the vibration or bending during normal operation.

7.15 引脚焊接 Soldering

7.15.1 焊接必须在表 2 所列的条件下进行。

Soldering should be carried out under the soldering conditions listed in table 2.

表 Table 2: 焊接时间 Soldering Time (s)

额定温度 Rated Functioning Temp. T_f (°C)	最大允许焊接时间 Max. Allowable Soldering Time (s)			焊接温度 Soldering Temp. (°C)	图示 Show
	引线长度 Length of Lead Wire (L)				
	10 mm	20 mm	30 mm		
76~101	1 ^a	2	3	400	 Soldering Position
102~115	1 ^a	2	3		
116~135	1 ^a	3	5		
136~150	3	5	5		
151~221	4	6	7		

a: 为防止温度保险丝被焊断, 焊接时视需要增加辅助散热装置。

Auxiliary heat sink fixture is required to avoid Thermal-link cutting off unexpectedly.

7.15.2 由于温度保险丝中与引脚连接的易熔合金是可熔化的合金, 因此不正确的焊接操作 (例如: 温度过高、焊时长、引脚过短等) 可能导致易熔合金被引脚传递的过高热量所影响, 从而使得温度保险丝提前断开。
The thermal element of Thermal-link is fusible alloy, improper soldering operation (too high soldering temperature, too long soldering time, too short lead wire etc.) will cause thermal element to melt in advance.

7.15.3 若需要在比表 2 规定更为严苛环境下进行焊接时, 应在焊接点和温度保险丝主体间的引脚上使用散热装置。

When soldering conditions are more severe than those listed in table 2, a heat sink fixture should be used between solder point and Thermal-link body.

7.15.4 焊接时应小心, 以避免温度保险丝主体和引脚遭受到推/拉力以及扭力。

Perform the soldering operation carefully so that the pull/push and twist tensions are not applied to Thermal-link body and leads.

7.15.5 焊接后应让其自然冷却 20 秒以上, 在冷却期间, 勿移动温度保险丝本体和引脚。

After soldering, leave it for natural cooling for longer than 20 s. During this cooling time, never move the Thermal-link body and leads.

7.16 安装温度保险丝时应注意防潮。如果温度保险丝是用于咖啡壶、热水器、干燥机、湿度调节器等环境下, 那么应将温度保险丝安装在无水泄漏或低湿度的部位。

Mounting Thermal-link, damp proof will be considered. If Thermal-link is applied to coffeepot, hot water heater, dryer, hygostat, etc., Thermal-link should be located at the position where there is no leaking water or low humidity.

7.17 安装完成后, 应确保整体结构符合应用标准的要求。



After mounting, the whole construction shall comply with the application standards.

7.18 在使用产品前，请认真阅读产品使用说明书。

Please carefully read instruction manual before using the product.

8 标示及包装 Marks and Package

8.1 产品本体标示 Marking on Products


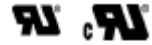


商标 Trademark	SUP	
型号 Model No.	C3	115°C 额定动作温度 Rated Temp.
额定电流 Rated Current	3A	 UL/cUL 认证 UL/cUL Certificate
生产年份/季度 Date Code Year / Quarter	BXX	 认证 CCC Certificate

备注：生产年份：A 代表 2018 年，B 代表 2019 年，以此类推；

Note: Date Code Year : A Stands for 2018, B for 2019, and so on

8.2 小包装袋标示以下事项 Marking on Package

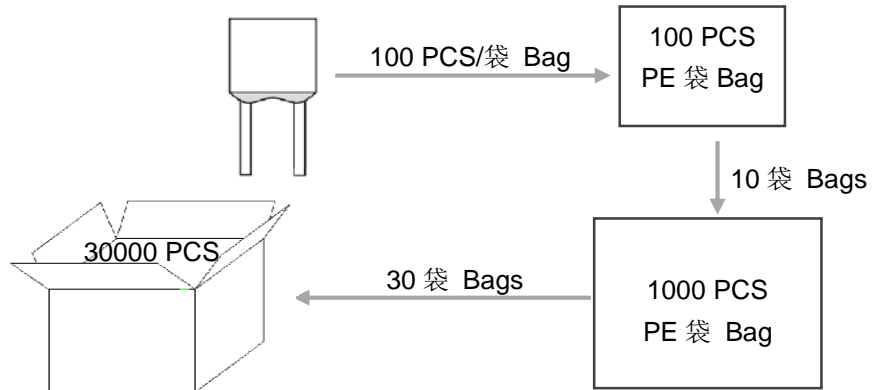
- 商标 Trademark
- RoHS 标志 Mark
- 品名 Product Name
- 安规认证标志 Certificate Mark
- 产品型号 Model No.
- 额定动作温度 Rated Function Temp. (T_f)
- 保持温度 Holding Temp. (T_h)
- 极限温度 Max Temp. (T_m)
- 额定电流 Rated Current (I_r)
- 额定电压 Rated Voltage (U_r)
- 数量 Quantity
- 批号 Lot No.
- 安规认证标准 Certificate Standards
- 制造公司名称 Manufacturer's Name

 Thermal link	
  	
Model	C3
Function Temp. T_f	115 °C
Holding Temp. T_h	91 °C
Max Temp. T_m	200 °C
Rated Current I_r	3 A
Rated Volt U_r	250 Vac
Quantity	pcs
Lot No.	

8.3 包装 Packaging

包装方式与要求 Packing Method and Requirement			
	小包装袋 Small Package	大包装袋 Big Package	装箱 A Boxful
数量 Quantity	100 PCS	10 Bags *100 PCS=1000 PCS	30 Bags *1000 PCS =30000 PCS

包装示意图 Packaging Drawing:



9 产品批号&追溯号识别 Lot No. & Tracing No. System

9.1 产品批号识别 Lot No. System

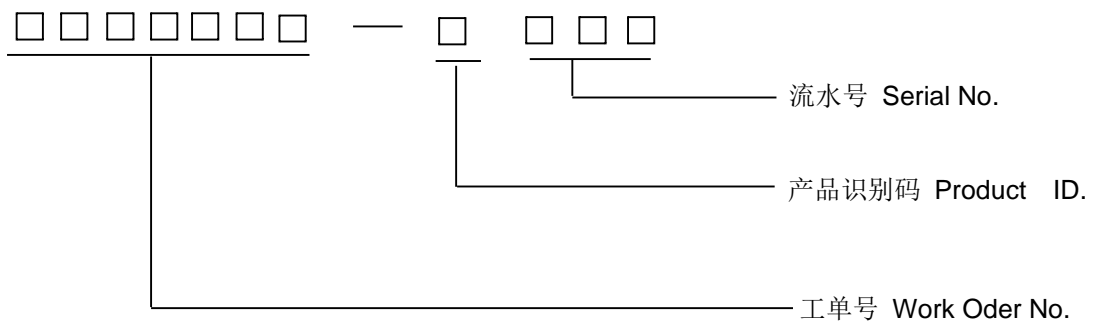


图 Fig. 3 产品批号识别 Lot No. System

9.2 产品追溯号识别 Tracing No. System

外包装追溯号, 如图 4:

Tracing No. on the Outer Package:

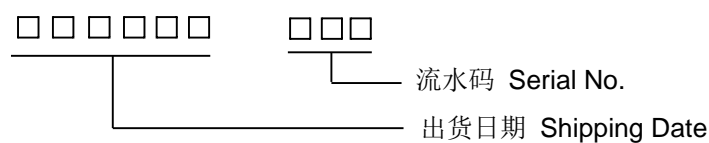


图 Fig. 4 外包装追溯号 Tracing No. on the Outer Package

10 储存条件和有效日期 **Store Conditions and Effective Date**

温度保险丝的保存期为贵公司入库后 12 个月。温度保险丝必须避免日光照射及污染的环境，且在温度 10 °C~30 °C 、湿度 30 %~70 %的条件下保存。

The validity period of Thermal-link is 12 months after you receive it. And Thermal-link must be kept in a place with no sunshine or no pollution, with temperature 10 °C-30 °C and humidity within 30 %-70 %.

11 规格书之有效性 **Validity**

11.1 有关修订之协议 **Agreement of Revision**

本承认书的内容若有不充分或有必要修订时，得由两公司协议后再行修订。

If the content of this specifications is inadequate or need revising, it will be revised after both parties' agreement.

11.2 有效性 **Validity**

本承认书提出后，於贵公司承认期间，可暂时使用，若经过 1 个月后贵公司无异议或无签回承认本时，则视同有效文件运用。

The specifications can be used temporarily during the period of approval. If you have no any objection or not return one hardcopy to us within one month, this specifications will be operated as a valid document.

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