Description 描述

GSH Series is a chip type surface mountable device that can protect against both overcurrent and overcharging. It comprises a fuse element to ensure stable operation under normal electrical current and to cut off the current when overcurrent occurs. It also comprises a resistive heating element that could be used in combination with a voltage detecting means, such as IC and FET. When overvoltage is detected, the heating element is electrically excited to generate heat to blow the fuse element to achieve overvoltage protection.

GSH 系列是一种表面贴装式电池保护器，可以防止过电流和过充电。它包括保险丝元件，以确保在正常电流下稳定运行，并在发生过电流时切断电流。它还包括电阻加热元件，该电阻加热元件可以与诸如 IC 和 FET 的电压检测装置组合使用。当检测到过电压时，加热元件被电激励以产生热量来熔断熔丝元件，从而实现过电压保护。

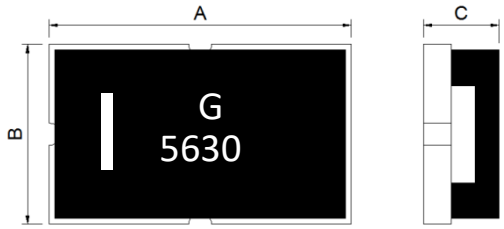
Features 特点

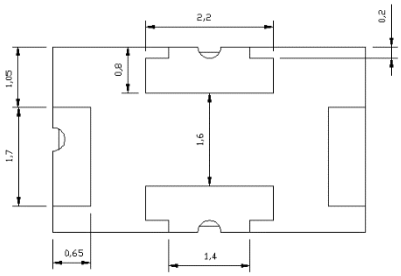
- Protect Li-ion battery from overcurrent and overcharge 锂电池过流过充保护
- Surface mount 表面贴装
- Halogen free / Sb free 无卤/无锑
- RoHS compliance 符合 RoHS
- Fast response time 响应快速

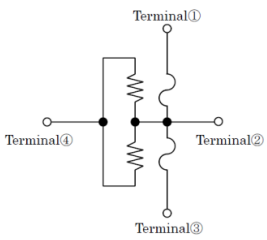
Application 应用

- Vacuum cleaner 吸尘器
- Powertools 电动工具
- Lawn mower 割草机
- Energy storage batteries 储能电池
- BMS 电池管理系统

Dimensions 尺寸







Code	A	B	C
Spec.(mm)	5.4 ±0.3	3.2 ±0.3	1.35max
* Without extra notification the tolerance is ± 0.20 mm 除非特殊注明，否则默认公差为 ±0.20 mm			

Specifications 规格

Part Number 料号	Irated 额定电流 (A)	Cells in series 电芯串联数	Vmax 额定电压 (Vdc)	Ibreak 分断 电流 (A)	Vop 加热电阻 动作电压范围 (V)	Resistance 电阻	
						R_{heater} 加热电阻 (Ω)	R_{fuse} 保险丝电阻 (mΩ)
GSH0830	30	2	62	80	7.5-9.6	2.3-4.0	0.5-2.5
GSH1230		3	62	80	9.9-13.5	4.2-7.0	0.5-2.5
GSH1630		4	62	80	13.4-18.4	7.7-12.9	0.5-2.5
GSH2030		5	62	80	17.1-23.5	12.6-21.0	0.5-2.5
GSH2430		6	62	80	19.8-28.8	18.9-28.0	0.5-2.5
GSH2830		7	62	80	23.0-31.5	22.6-37.7	0.5-2.5
GSH3230		8	62	80	26.4-36.0	29.5-49.8	0.5-2.5
GSH4030		10	62	80	34.2-46.9	63.8-86.2	0.5-2.5
GSH4830		12	62	80	39.6-55.2	80.0-112.0	0.5-2.5
GSH5630		13-14	62	80	49.0-62.0	130.2-175.8	0.5-2.5
GSH6830		15-17	62-80	80	51.0-76.5	146.3-200.0	0.5-2.5

Notes:

I_{rated} = Current carrying capacity that is measured at 25°C thermal equilibrium condition

I_{break} = The current that the fuse element is able to interrupt

V_{max} = The maximum voltage that can be cut off by fuse

V_{OP} = Range of operation voltage

R_{heater} = The resistance of the heating element

R_{fuse} = The resistance of the fuse element

Cells in series = Number of battery cells connected in series in the circuit.

• Specifications are subject to change without notice.

注意：

I_{rated}=在 25℃环境温度下测量的载流能力

I_{break}=保险丝元件能够切　　断的电流

V_{max}=保险丝可切断的最大电压

V_{OP}=工作电压范围

R_{heater}=加热元件的电阻

R_{fuse}=保险丝元件的电阻

Cells in series=电路中串联连接的锂电池芯单元数量

•规格如有更改，恕不另行通知。

Electrical Characteristics 电气特性

Items 项目	Conditions 条件	Specifications 规格
Current carrying capacity 载流能力	100% x I_{rated} 施加 100%额定电流	No melting. 不熔断
Fusing time 熔断时间	200% x I_{rated} 施加 200%额定电流	The fuse shall be melt within 1min. 保险丝在 1 分钟内熔断
	In operation voltage range 在产品加热电阻两端施加工作电压	
Operating temperature range 运行温度范围	The following examinations are executed respectively within the range from -10 to 65°C. 在-10 to 65°C 温度下分别进行以下测试: ● Fusing time test 熔断时间测试 ● Current carrying capacity test 电流负载能力测试	The fuse shall be passed each test. 保险丝能够通过每项测试

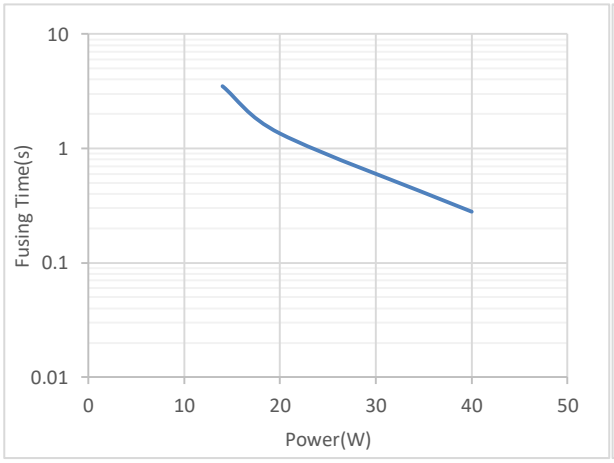
*[Electrical Characteristics] is influenced by thermal capacity of PCB, parts, pattern width, and so on. Therefore you should check it on your PCB.

电气特性受 PCB 的热容量、零件、图案宽度等因素的影响。因此，需要在您实际使用的 PCB 板上进行验证。

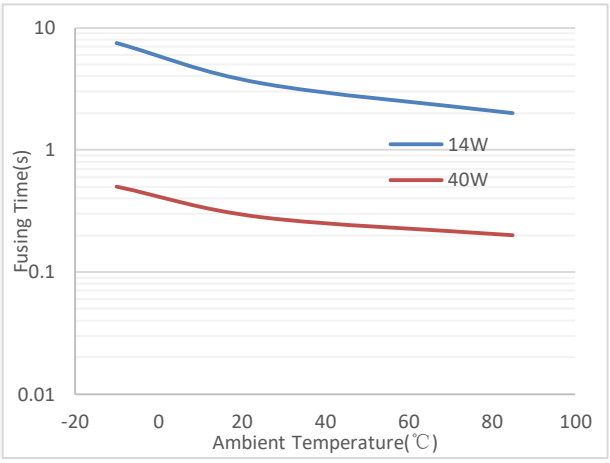
TypicalPerformanceData 性能曲线

Cut Time by Heater Operation (GSH30A series)

Various heater wattage at 25℃ ambient temperature

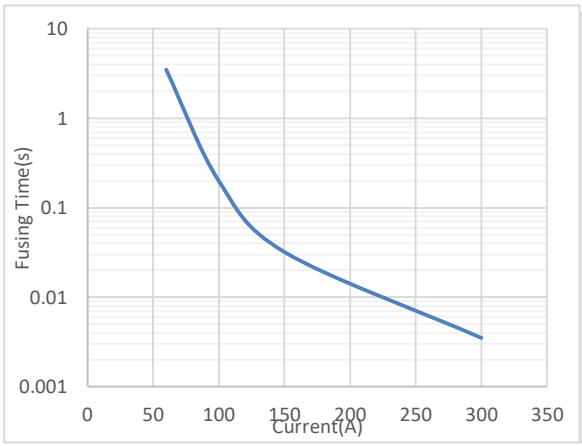


Constant heater wattage at various ambient tempera

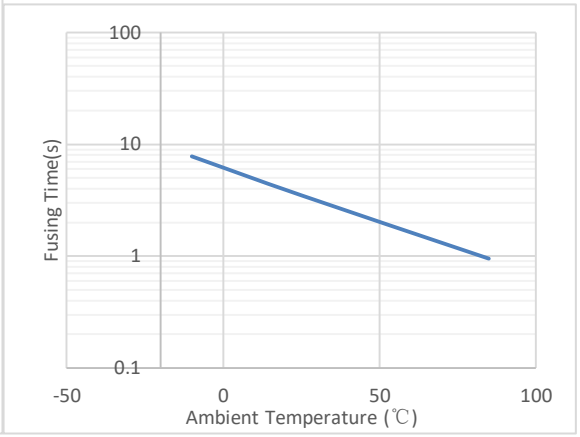


Cut Time by Current Operation (GSJ 30A series)

Various interrupting current at 25℃ ambient temperature Constant

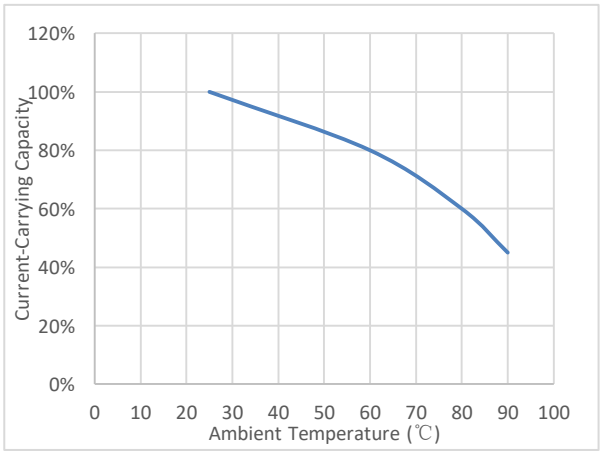


2x rated current at various ambient temperature

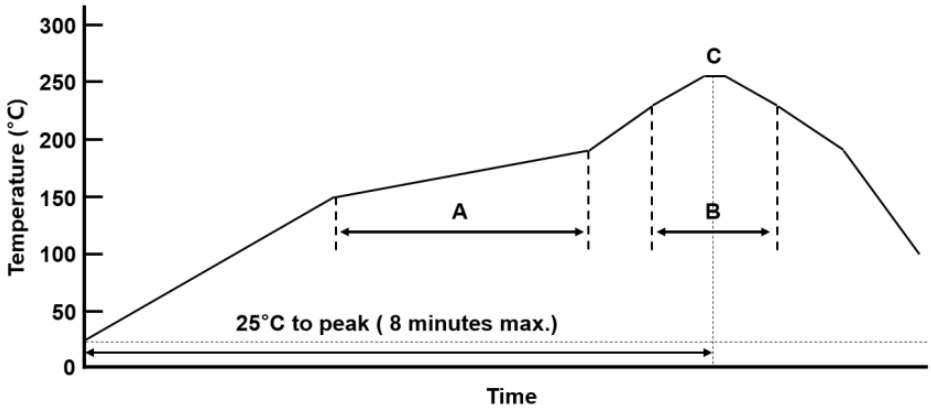


Current CarryingCapacity (GSH30A series)

Current Carrying Capacity at various ambient temperature

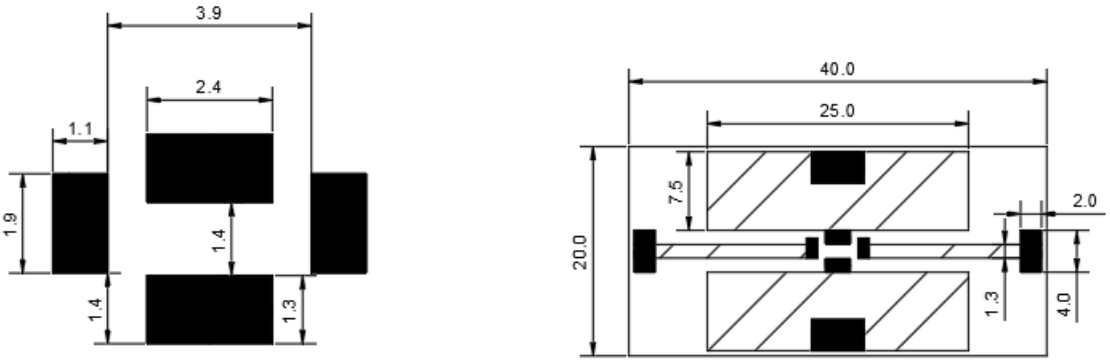


Reflow Profile 回流焊曲线



	A (Pre-Heating) 预热	B	C (Peak) 峰值
Temperature(℃) 温度	150~190℃	230±5℃	255±5℃
Time(s) 时间	90±30s	Max.30s 最大 30s	Max.5s 最大 5s

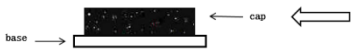
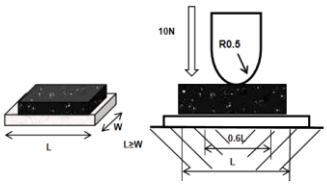
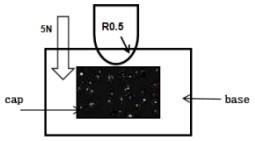
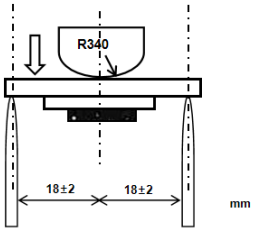
Recommended Solder Pad Dimension 推荐焊盘尺寸



Unit：mm

Type 规格	Materials 材质	Width of copper coating 覆铜宽度	Thickness 厚度	Copper thickness 铜厚	Wires 引出线
30A	FR-4	25mm	0.6 mm	2.0OZ	AWG10

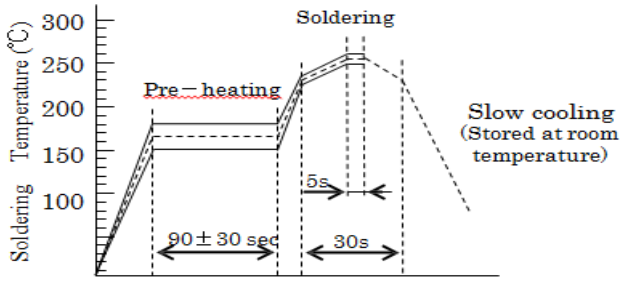
Mechanical Characteristics 机械性能

Items 项目	Conditions 条件	Specifications 规格
Adhesion strength between base and cap 上盖粘接强度	At 25℃±2℃,the fuse shall be sustained, and the cap is horizontally pushed. 添加在 25℃±2℃下,保险丝保持稳定，水平推动保险丝上盖。 	≥6N 破坏强度 6N 以上
Core body strength 瓷体强度	A static load of 10N using a R0.5 pressure rod shall be applied to the center in the direction of the arrow and held for 10sec. 应使用 R0.5 压杆在箭头方向的中心施加 10N 的静载荷，并保持 10 秒。 	Without mechanical damage. Electrical characteristics shall be satisfied. 无机械损伤。 应满足电气特性要求。
Adhesion 固着性	A static load of 5N using a R0.5 pressure rod shall be applied on the core of the component and in the direction of the arrow and held for 10sec. 应使用 R0.5 压杆将 5N 的静载荷沿箭头方向施加在部件芯上，并保持 10 秒 	Without mechanical damage. Electrical characteristics shall be satisfied. 无机械损伤。 应满足电气特性要求。
Board bending test 板材弯曲试验	Apply pressure in the direction of the arrow until bent width reaches 0.5mm and hold for 30sec. 沿箭头方向施加压力，直到弯曲宽度达到 0.5mm，并保持 30 秒。 	Without mechanical damage. Electrical characteristics shall be satisfied. 无机械损伤。 应满足电气特性要求。

Endurance Characteristics 耐久性能

Items 项目	Conditions 条件	Specifications 规格
Dry heat 高温放置	The fuse shall be stored at a temperature of 100±5℃ for 250h. And then it shall be subjected to standard atmospheric conditions for 24h, after which its measurement shall be made. 100±5℃的温度下储存 250 小时。放置于常温常湿下 24 小时，然后进行测量。	Without damage such as deformation or disconnection of fuse element. Internal resistance shall be relative to the value before test 110% or less. 没有损坏，如保险丝元件变形或断开。 内阻应相对于试验前的值为 110%或更小。
Cold 低温放置	The fuse shall be stored at a temperature of -20±3℃ for 500h. And then it shall be subjected to standard atmospheric conditions for 24h, after which its measurement shall be made. -20±3℃的温度下储存 500 小时。放置于常温常湿下 24 小时，然后进行测量。	
Damp heat 高温高湿	The fuse shall be stored at a temperature of 60±2℃ with relative humidity of 90~95%RH for 250h. And then it shall be subjected to standard atmospheric condition for 24h, after which its measurement shall be made. 60±2℃的温度和 90~95%RH 的相对湿度下储存 250h。放置于常温常湿下 24 小时，然后进行测量。	
Endurance test 耐久性测试	300% x I_{rated}shall be carried for a period of 5ms. The current is there switched off for a period of 995ms. This cycle is repeated 10000 times. 3 倍额定电流通电 5ms，995ms 断电，此循环重复 10000 次。	

Mounting Characteristics 安装特性

Items 项目	Conditions 条件	Specifications 规格
Resistance to soldering heat 耐焊接热	 ①Reflow soldering method Peak temp: 255℃±5℃ 5sec 230℃±5℃ 30sec At electrode temperature of the specimen.(Solder temperature) The specimen shall be passed through the reflow furnace with the condition shown in the above profile for 2times. The specimen shall be stored at standard atmospheric conditions for 24h after which the measurement shall be made. ①回流焊接法 峰值温度：255℃±5℃5 秒 230℃±5℃30 秒 在试样的电极温度下。（焊料温度） 通过上述回流焊两次，在常温常湿中放置 24 小时后测量。 ②Soldieringironmethod Bit temperature: 300±5℃ Application of soldering iron: 3±1s Apply the soldering iron to the electrode. The specimen shall be stored at standard atmospheric condition for 24h, after which the measurements shall be made. 电烙铁法 烙铁头温度：300±5℃ 烙铁的应用：3±1s 将烙铁涂抹在电极上。 在常温常湿中放置 24 小时后测量。	Without deformation of case or excessive looseness of caps. Electrical characteristics shall be satisfied. 外壳无变形，盖子无过度松动。 应满足电气特性要求。
Solderability 可焊性	Solder: Pb-free (Sn96.5/Ag3/Cu0.5[%]) Flux: 25wt％Rosin Ethanol solution Dipping depth: 2～2.5mm Temperature: 245±5℃ Dipping time: 3±0.5sec Dipping and drawing speed: 25±2.5mm/sec 焊料：无铅（Sn96.5/Ag3/Cu0.5[%]） 助熔剂：25wt%松香乙醇溶液 浸渍深度：2～2.5mm 温度：245±5℃ 浸渍时间：3±0.5 秒 浸渍和拉伸速度：25±2.5mm/sec	A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed. 焊料覆盖面积至少 95%

Part Number and Marking System 品名&标识

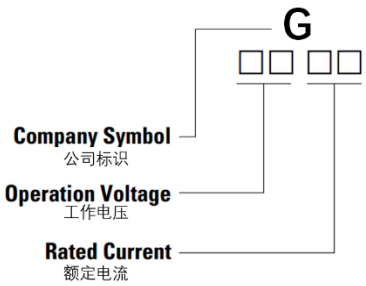
Part Number 物料 Part Marking 标识

GSHxx30

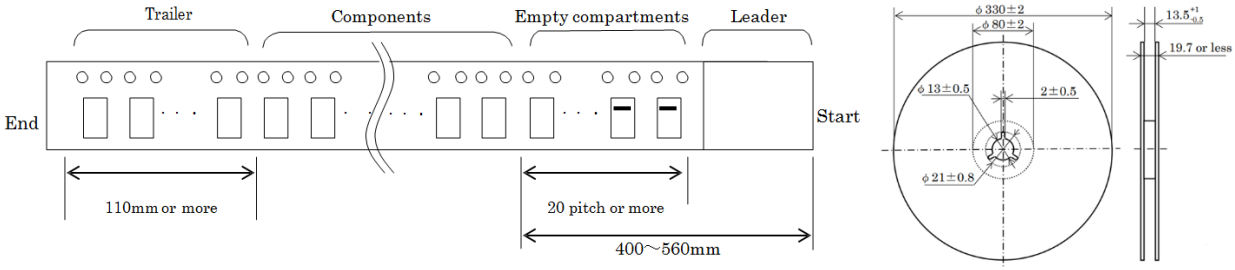
GSH: Goldensun5432 series

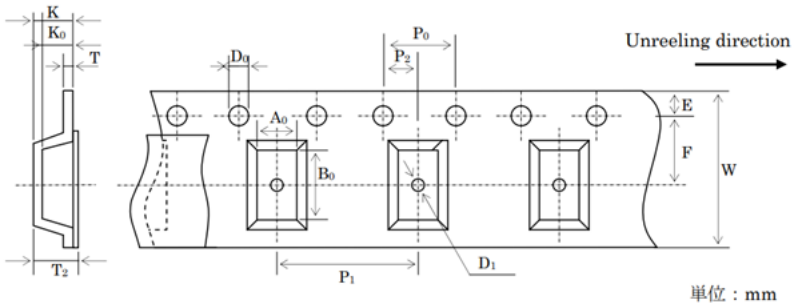
xx: Operation Voltage

30: Rated Current 30A



Tape and Reel Specifications (mm) 载带和圆盘规格（mm）





单位：mm
Unit：mm

A_0	B_0	W	F	E	P_1
3.75±0.1	5.95±0.1	12.0±0.2	5.5±0.2	1.75±0.2	8.0±0.1

P_2	P_0	D_0	T	T_2	K	K_0	D_1
2.0±0.05	4.0±0.1	1.55±0.05	0.3±0.1	2.5 以下 2.5 or less	2.4 以下 2.4 or less	1.7±0.1	1.5 以上 1.5 or more

Packaging 包装

5000pcs/reel or 1000pcs/reel

Storage 保管

This product must be stored in shaded area where it is not too dusty, under 40℃ or less with no sudden temperature change, with relative humidity of 60% or less, and no corrosive gas in the air. The maximum storage period under above condition is 12 months.
本产品必须存放于洁净、40℃以下避光处，无温度冲击变化；存储湿度不超过 60%，存储空间无腐蚀性气体；最长贮存期为 12 个月。

Precaution 注意事项

(1) It is necessary to foresee there are possibilities that “Current-Carrying Capacity” and “Heater Operation Characteristic” may be varied along with the condition change in the substrate thermal capacity, etc.
Therefore you should check it on your PCB. Generally, when thermal capacity of PCB increases, Current-carrying capacity will increase accordingly and Clearing-time will be longer.
“载流能力”和“加热电阻动作特性”应根据基板热容量等条件的变化来预测，因此，需根据实际使用的 PCB 板的状态确认其特性，一般来说，由于基板多层化、双面覆铜、基材厚度增加等热容量增加原因，可通电的极限电流值（允许通电电流）较大，切断时间较长。

(2) The data on this specification is measured with UL standard PCB (0.6t Glass Epoxy single-sided copper laminated). The characteristics are influenced by thermal capacity of PCB, so it is recommended checking it on actual PCB.
本规范中的数据是用 UL 标准 PCB 测量的。特性受 PCB 热容量的影响，因此建议在实际 PCB 上进行检查。

(3) Ultrasonic-cleaning or immersion-cleaning and so on must not be done to product before and after mounted. When cleaning is done, flux on element would flow, and it would not be satisfied its specification. Moreover, a similar influence happens when the product comes in contact with cleaning-solution. These products after cleaning will not be guaranteed.
安装前后不得进行超声波清洗或浸泡清洗等。因为清洗完成时，元件上的焊剂会流动，并且不符合其规格。此外，当产品与清洁溶液接触时，也会产生类似的影响。清洁后的这些产品将无法得到保证。

(4) Please avoid contacting fuse and resin-mold. The resin might infiltrate into the product, and it doesn’t meet the specification when the resin-mold is done to this product. These products after resin-mold will not be guaranteed.
请避免接触保险丝和树脂模具。树脂可能渗透到产品中，当对该产品进行树脂成型时，树脂不符合规格。树脂成型后的这些产品将无法得到保证。

(5) Please do not re-use of the fuse removed by the solder correction.
请不要使用二次拆除的保险丝。

(6) Make sure that the terminals of this product are connected property on the land of circuit board, and the value falls in the rated heater resistance between Terminal 1-2 and 3-2.
确保本产品的端子在电路板的焊盘上具有连接特性，并且该值在端子 1-2 和 3-2 之间的额定加热器电阻范围内。

(7) This product’s terminals use Ag or Au plating.Especially with Ag terminals, as they tend to easily get sulfurized or tarnished, please be cautious about their storage environment as follows.
Unopen packages also must be stored under the storage condition.
After opening packages, products shall be sealed in a bag with high gas barrier property (e.g. aluminum laminated bag), and must be stored under the storage condition.
该产品的端子使用 Ag 或 Au 镀层。尤其是 Ag 端子，因为它们很容易硫化或失去光泽，请注意以下存储环境。
未开封的包装也必须在储存条件下储存。
打开包装后，产品应密封在具有高气体阻隔性能的袋子（如铝层压袋）中，并且必须在储存条件下储存。

(8) This product is designed and produced for only general-use of electronics devices.
Therefore, we do not suppose that it is used for the applications [Military, Medical and so on] which may cause direct damages on life, bodies or properties of third party.
本产品的设计和生产仅适用于电子设备的一般用途。
因此，我们不认为它用于[军事、医疗等]可能对第三方的生命、身体或财产造成直接损害的应用。

(9) It is amended in conference with the supplier and the customer when the necessity of the change or doubt occurs in this specification.
当本规范中出现变更或疑问的必要性时，在与供应商和客户的会议上对其进行修订。