

Surface Mount Type Handling Precautions 【注意事项】

■防潮包装

□当在 SMT 封装部件吸潮后,它可能在焊接时导致界面剥离。造成剥离的原因是由于 SMT 吸潮后在回流加热过程内部水气蒸发膨胀,导致支架和胶体分离。因此,防潮包装可以让包装内的水气含量达到最少。

□防潮包吸水材料(硅胶干燥剂)放入到铝箔防潮袋。硅胶干燥剂吸湿的变化从蓝色到红色。

■保管

□储存条件:

打开包装之前:

LED 应保持在 30℃ 以下,相对湿度 60% 以下或在 6 个月内使用。另外,建议在密闭容器使用硅胶干燥剂。

在开封后:

本包装开包后,产品在应用到回流焊或者等条件下的工艺中时必须遵循以下两点:

a) 产品必须在 12 小时内完成焊接,且车间环境要保持在温度 $\leq 30^{\circ}\text{C}$, 相对湿度 $\leq 60\% \text{RH}$ 中。

b) 万一有未使用完的 LED 时,应存放在密闭容器并使用硅胶干燥剂防潮包,将 LED 返回到原来的防潮袋,并再次重新密封防潮包装。必须保存在相对湿度 $\leq 20\% \text{RH}$ 环境中

□ 上記已超过存储时间时,实施以下条件的烘烤处理,另外,在保管期间内如没有蓝色硅胶干燥剂,请同样进行烘烤处理,烘烤条件: $80 \pm 5^{\circ}\text{C}$, 超过 24 小时。且相对湿度需 $< 10\% \text{RH}$

□ 请避免在环境温度的快速转换,特别是在高湿度环境中可能发生结露。

■静电

□ 静电或浪涌电压可能会造成损坏发光二极管及信赖性下降。建议使用时,用防静电手腕带或防静电手套。

□ 所有设备、治具、装置类和作业区域必须正确接地。建议采取预防措施,设备安装时防止浪涌电压。

■Moisture Proof Package

□ When moisture is absorbed into the SMT package it may vaporize and expand during soldering. There is a possibility that this can cause exfoliation of the contacts and damage the optical characteristics of the LEDs. For this reason, the moisture proof package is used to keep moisture to a minimum in the package.

□ The moisture proof package is made absorbent material (silica gel desiccants) is inserted into the aluminium moisture proof bag.

The silica gel desiccants change from blue to red if moisture had penetrated bags

■Storage

□ Storage Conditions

Before opening the package:

The LEDs should be kept at 30°C or less and $60\% \text{RH}$ or less.

The LEDs should be used within 6 months

When storing the LEDs, moisture proof packaging with absorbent material (silica gel desiccants) is recommended.

After opening the package:

After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be:

a) Mounted within 12 hours at factory condition of $\leq 30^{\circ}\text{C}/60\% \text{RH}$

b) If unused LEDs remain, they should be stored in the moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel desiccants). It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again. Stored at $\leq 20\% \text{RH}$.

□ If the moisture absorbent material (silica gel desiccants) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following condition.

Baking treatment : more than 24 hours at $85 \pm 5^{\circ}\text{C}$ and $< 10\% \text{RH}$.

□ Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

■ Static Electricity

□ Static electricity or surge voltage damages the LEDs.

It is recommended that a wrist band or an anti-electrostatic glove be used when handing the LEDs

□ All devices equipment and machinery must be properly grounded. It is recommended that precautions be taken against surge voltage to the equipment that mounts the LEDs

■ Soldering Conditions

	Reflow Soldering		Hand Soldering	
	Pattern①	Pattern②		
Pre-heat	120℃~150℃	180℃~200℃	Temperature Soldering time	350℃ Max 3sec.Max (one time only)
Pre-heat time	120sec.Max	120sec.Max		
Peak temperature	240℃ Max	260℃ Max		
Dipping time	10sec.Max	10sec.Max		
Condition	Refer to Temperature-profile①	Refer to Temperature-profile②		

※ Recommended soldering conditions vary according to the type of LED.

※ General solder is recommended pattern①.

※ Although the recommended soldering conditions are specified in the above table, reflow or hand soldering at the lowest possible temperature is desirable for the LEDs.

□ ALL SMT LED products are Pb-free soldering available

□ Occasionally there is an optical degradation caused by the influence of heat or ambient atmosphere during air reflow method.

□ Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. it should be confirmed beforehand whether the characteristics of the LEDs will not be damaged by repairing.

□ Reflow soldering should not be done more than two times.

□ When soldering, do not put stress on the LEDs during heating.

□ After soldering, do not warp the circuit board.

■ 焊接条件

	回流焊		手工焊接	
	模式①	模式②		
预热	120℃—150℃	180℃—200℃	温度 焊接时间	350℃ Max 3sec. Max (仅一次)
预热时间	120sec. Max	120sec. Max		
峰值温度	最大240℃	最大260℃		
浸渍时间	10sec. Max	10sec. Max		
条件	请参阅温度剖面①	请参阅温度剖面②		

※根据不同类型的 LED,推荐焊接条件

※一般焊料建议模式①。

※虽然上表有提示焊接条件,但回流焊时,手工焊接的峰值温度尽可能选择低的温度。

※考虑到从峰值温度到冷却温度是一个逐渐降温的过程,请避免急速冷却。

□所有的 SMT LED 产品用无铅焊锡。

□在空气回流中,受回流焊过程的热量或环境气氛的影响,它可能会导致光学变化。回流时建议使用氮气回流。

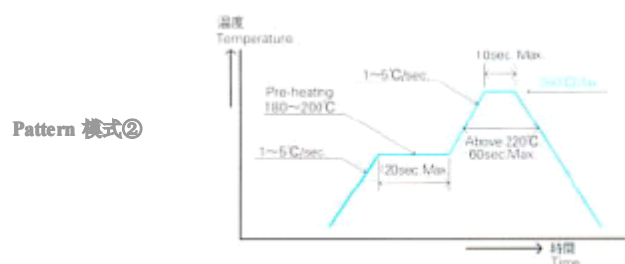
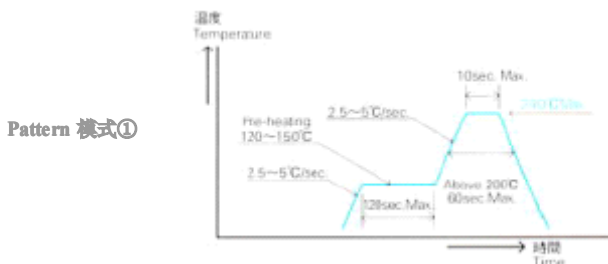
□基本不做安装后的焊接修复,当修复已经是不可避免时,请使用双头烙铁。另外,请预先确认因修复原因而可能损坏 LED 哪些特性。

□回流焊不应该超过 2 次

□焊接时,在加热的状态下,不要对 LED 施加压力。

□焊接后,请不要弯曲电路板。

Temperature-Profile(Surface of Circuit Board) 电路板的表面温度资料



■ 热的发生

- 终端产品的热设计是非常重要的。
- 做系统设计时要考虑到 LED 的发热。每个输入电功率的温度增加系数受电路板热阻力，LED 最终放置的位置及其他因素的影响。应避免剧烈的发热，操作应在规格书给的最高标准内进行。
- 驱动电流应在考虑 LED 最高温度后再决定。

■ Thermal Management

- **Thermal design of the end product is paramount importance.**
Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.
- **The drive current should be decided after considering the ambient maximum temperature (Ta) of LEDs.**

■ 清洗

- 推荐用异丙醇作为溶剂清洗 LED。如用其他溶剂，应提前确认是否溶剂会溶解包装和树脂。因国际法规规定，氟利昂溶剂不应该用来清洗 LED。
- 不要用超声波清洗 LED。如果一定要用，超声波清洗对 LED 的影响由超声波功率和组装条件决定。清洗之前，应做一个提前测试，以确保是否对 LED 有任何损害。
- 对于某些特定的 LED 不推荐用异丙醇作为溶剂清洗。想要更多种 LED 适当的清洗方法，请参考其分别的规格书。

■ Cleaning

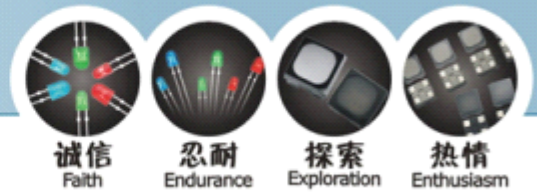
- **it is recommended that isopropyl alcohol be used as a solvent for cleaning the LEDs. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the LEDs because of worldwide regulations.**
- **Do not clean the LEDs by the ultrasonic. When it is absolutely necessary, the influence of ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power and the assembled condition. Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.**
- **it is not recommended to use isopropyl alcohol as solvent for cleaning on certain LEDs. For more information about proper cleaning methods of each LED. Please refer its respective specification sheet.**

■ 目的安全性

- 2006 年由国际电工委员会 (IEC) 颁布了 IEC62471 灯和灯系统的光生物学的安全，LED 也适用这个标准范围。
- 根据 IEC62471:2006, 美卡乐的大多数 LED 可以分为豁免级或 1 类危险两种。LED 的光学特征如输出功率，光谱，配光等因素影响危险群的判定。尤其是高功率的 LED，因其发出的光中包含蓝色成分，可能会归为 2 类危险群。当直视在强电流驱动下的 LED 或者用可能会大大增加对眼睛伤害的光学仪器直视 LED 时，都应加倍小心。

■ Safety Guideline for Human Eyes

- **The international Commission (IEC) published in 2006 IEC 62471:2006 Photobiological safety of lamps and lamp systems which includes LEDs within its scope.**
- **Following IEC 62471:2006, most of Multi-Color LEDs can be classified as belonging to either Exempt Group or Risk Group 1. Optical characteristics of a LED such as output power, spectrum and light distribution are factors that affect the risk group determination of the LED. Especially a high-power LED, that emits light containing blue wavelengths, may be in Risk Group 2. Great care should be taken when viewing directly the LED driven at high current or the LED with optical instruments which may greatly increase the hazard to your eyes.**



Lamp Type Handling Precautions 【注意事项】

■引脚成形

- 引脚成形时, 引脚至少应在离环氧树脂底座 3mm 处打弯。不要使用支架的底部作为折弯点。
- 引脚形成必需在焊接前进行。
- 不要对引脚的底部施加任何压力。这种压力可能会损害 LED 参数或者是破坏 LED。
- 当把 LED 嵌入到印刷电路板上时, 电路板上的洞孔应该与 LED 的引脚完全吻合。如果镶嵌时压到引脚, 可能导致环氧树脂损坏, 同时 LED 的品质也会降低。

■Lead Forming

- When forming leads, the leads should be bent at a point at least 3mm from the base of the epoxy bulb. Do not use the base of the leadframe as a fulcrum during lead forming.
- Lead forming should be done before soldering.
- DO not apply any bending stress to the base of the lead. The stress to the base may damage the LED's characteristics or it may break the LEDs.
- When mounting the LEDs onto a printed circuit board, the holes on the circuit board should be exactly aligned with the leads of the LEDs. If the LEDs are mounted with stress at the leads, it causes deterioration of the epoxy resin and this will degrade the LEDs.

■保管

- 从美卡乐起运后, LED 应储存在 30℃ 或以下, 相对湿度 60% 或以下, 储存期限是 3 个月。如果超过 3 个月, 放置在填充氮气和吸水材料(硅胶干燥剂)的封闭容器内, 可储存 1 年。
- 引脚部分可能会受含腐蚀性物质的环境影响。请避免可能导致 LED 腐蚀, 晦暗, 褪色的环境条件。腐蚀和褪色可能会引起焊接操作困难。建议尽快用完 LED。
- 请避免在环境温度的快速转换, 特别是在高湿度环境中可能发生结露。

■Storage

- The LEDs should be stored at 30°C or less and 60%RH or less after being shipped from Multi-Color and the storage life limits are 3 months. If the LEDs are stored for 3 months or more, they can be stored for a year in a sealed container with a nitrogen atmosphere and moisture absorbent material (silica gel desiccants).
- The lead part may be affected by environments which contain corrosive substances. please avoid conditions which may cause the LED to corrode, tarnish or discolor. This corrosion or discoloration may cause difficulty during soldering operations. It is recommended that the LEDs be used as soon as possible.
- Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

■静电

- 静电或浪涌电压可能会造成损坏发光二极管及信赖性下降。建议使用时, 用防静电手腕带或防静电手套。
- 所有设备、治具、装置类和作业区域必须正确接地。建议采取预防措施, 设备安装时防止浪涌电压。

■ Static Electricity

- Static electricity or surge voltage damages the LEDs. It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs
- All devices equipment and machinery must be properly grounded. It is recommended that precautions be taken against surge voltage to the equipment that mounts the LEDs

■ Soldering Conditions

	Others		
Pre-Heat	120℃ Max	Temperature	350℃ Max
Pre-Heat time	60 seconds Max		
Solder Bath temperature	260℃ Max	Position	No closer than 3mm from the base of the epoxy bulb
Dipping Time	10 seconds Max		
Dipping Position	No lower than 3mm from the base of the epoxy bulb		

※ Solder the LED no closer than 3mm from the base of the epoxy bulb. Soldering beyond the base of the tie bar is recommended.

- ALL lamp Type LED products are Pb-free soldering available
- MULTI-COLOR LED lead frames are silver plating copper alloy or Ag Plating Iron. This substance has a low thermal coefficient (easily conducts heat). Careful attention should be paid during soldering.
- Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the LEDs.
- A rapid-rate process is not recommended for cooling the LEDs down from the peak temperature.
- Dip soldering should not be done more than one time.
- Hand soldering should not be done more than one time.
- Do not apply any stress to the lead particularly when heated.
- The LEDs must not be repositioned after soldering.
- After soldering the LEDs, the epoxy bulb should be protected from

mechanical shock or vibration until the LEDs return to room temperature.

- Direct soldering onto a PC board should be avoided. Mechanical stress to the resin may be caused from warping of the PC board or from the clenching and cutting of the leadframes. When it is absolutely necessary, the LEDs may be mounted in this fashion but the Customer will assume responsibility for any problems. Direct soldering should only be done after testing has confirmed that no damage, such as wire bond failure or resin deterioration, will occur. MULTI-COLOR LEDs should not be soldered directly to double sided PC boards because the heat will deteriorate the epoxy resin.
- When it is necessary to clamp the LEDs to prevent soldering failure, it is important to minimize the mechanical stress on the LEDs.
- Cut the LED leadframes at room temperature. Cutting the leadframes at high temperatures may cause failure of the LEDs.

■ 焊接条件

	浸焊	手工焊接
预热	模式②	
预热时间	最大120℃	
焊接温度	60秒(最大值)	温度
	最大260℃	焊接时间
浸渍时间	10秒 Max	位置
浸渍位置	不低于环氧树脂底部3mm	
		最大350℃
		3秒 Max
		不低于环氧树脂底部3mm

※焊接LED时应离环氧树脂底部不小于3mm处,建议焊接不要超过卡点位置。

- 所有的直插灯系列产品用无铅焊接。
- 美卡乐LED支架是铜镀银或者铁镀银。这些材料有很低的热系数,在焊接时应注意。
- 虽然建议的焊接条件已经在上面详细明确,但理想的焊接方式是尽可能在最低温度下进行手动焊接或浸焊。
- 从最高温度到冷却温度是一个逐渐降温的过程,请避免急速冷却LED。
- 浸焊应不超过一次
- 手动焊接不应超过一次
- 焊接时,在加热的状态下,不要对LED施加压力。
- 焊接后的LED不能重新再改变位置。

焊接后,直到恢复到常温前,环氧树脂应免受机器摇晃或震动。

应避免在电路板上的直接焊接。弯曲电路板或者支架钉牢或切割会引起对树脂的压力。当确实需要在电路板上直接焊接时,客户要为可能会引起的任何问题负责。只有在测试后并确定没有引线固定失败或树脂损坏等问题,才可以进行直接焊接。美卡乐的LED不能直接焊接到双面的PC板上,因为热会损坏环氧树脂。

为防止LED焊接失败,需要钳住LED时,减少机械压力是很重要的。

常温下切断支架。如在高温下切断支架,可能会引起LED的失效。

■ 热的发生

□ 终端产品的热设计是非常重要的。

做系统设计时要考虑到 LED 的发热。每个输入电功率的温度增加系数受电路板热阻力，LED 最终放置的位置及其他因素的影响。应避免剧烈的发热，操作应在规格书给的最高标准内进行。

□ 驱动电流应在考虑 LED 最高温度后再决定。

■ Thermal Management

□ Thermal design of the end product is paramount importance.

Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

□ The drive current should be decided after considering the ambient maximum temperature (T_a) of LEDs.

■ 清洗

□ 推荐用异丙醇作为溶剂清洗 LED。如用其他溶剂，应提前确认是否溶剂会溶解包装和树脂。因国际法规规定，氟利昂溶剂不应该用来清洗 LED。

□ 不要用超声波清洗 LED。如果一定要用，超声波清洗对 LED 的影响由超声波功率和组装条件决定。清洗之前，应做一个提前测试，以确保是否对 LED 有任何损害。

■ Cleaning

□ it is recommended that isopropyl alcohol be used as a solvent for cleaning the LEDs. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the LEDs because of worldwide regulations.

□ Do not clean the LEDs by the ultrasonic. When it is absolutely necessary, the influence of ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power and the assembled condition. Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

■ 目的安全性

□ 2006 年由国际电工委员会 (IEC) 颁布了 IEC62471 灯和灯系统的光生物学的安全，LED 也适用这个标准范围。

□ 根据 IEC62471:2006, 美卡乐的大多数 LED 可以分为豁免级或 1 类危险两种。LED 的光学特征如输出功率，光谱，配光等因素影响危险群的判定。尤其是高功率的 LED，因其发出的光中包含蓝色成分，可能会归为 2 类危险群。当直视在强电流驱动下的 LED 或者用可能会大大增加对眼睛伤害的光学仪器直视 LED 时，都应加倍小心。

■ Safety Guideline for Human Eyes

□ The international Commission (IEC) published in 2006 IEC 62471:2006 Photobiological safety of lamps and lamp systems which includes LEDs within its scope.

□ Following IEC 62471:2006, most of Multi-Color LEDs can be classified as belonging to either Exempt Group or Risk Group 1. Optical characteristics of a LED such as output power, spectrum and light distribution are factors that affect the risk group determination of the LED. Especially a high-power LED, that emits light containing blue wavelengths, may be in Risk Group 2. Great care should be taken when viewing directly the LED driven at high current or the LED with optical instruments which may greatly increase the hazard to your eyes.