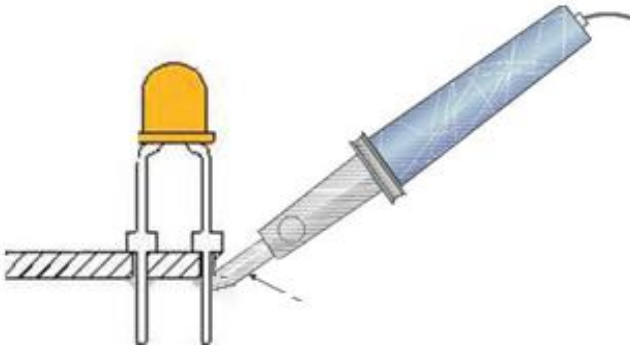
LED lamp 使用说明

Soldering 焊接

- **General Notes 注意事项**

1 . Manual welding operation.
We recommend manual soldering operations only for repair and rework purposes.
. The soldering iron should not exceed 30W in power. The maximum soldering temperature is 300 ℃ for Pb –Sn solder and 350℃ for lead –free solder for normal lamps and displays . For blue （ 425nm） , and blue – green （ 525nm ） LEDs , 针对所有的 LED Lamp 产品焊接，建议在产品胶体以下 4mm 处焊接操作，the maximum soldering iron temperature is 280℃ . Do not place the soldering iron on the component for more than 5 seconds.

我们建议修复和返工时才手工焊接操作。焊接烙铁功率不能超过 30W。常规 LED 和数码管 Pb –Sn 焊料最大焊接温度是 300 度，无铅焊接温度最大为 350 度。蓝光，蓝绿光 LED，最大焊接烙铁温度是 280 度。烙铁接触元器件不能超过 5 秒。



Keep Solder Paste Smoothly

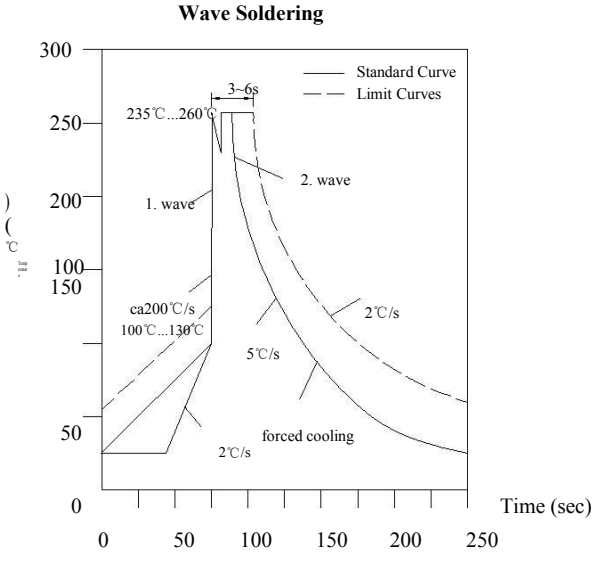
2. Do not apply stress to the leads when the component is heated above 85℃ , otherwise internal wire bonds may be damaged.
当元器件加热到 85 度以上时，注意不要施加外力作用于 PIN 脚上，否则内部连线会被破坏。

3. After soldering, allow at least three minutes for the component to cool to room temperature before further operations.
焊接后，至少要等三分钟让元件冷却到室温，再进行下一步操作。

- **Recommended Wave Soldering Profiles For Luckylight Thru-Hole Products**

建议直插产品的波峰焊条件

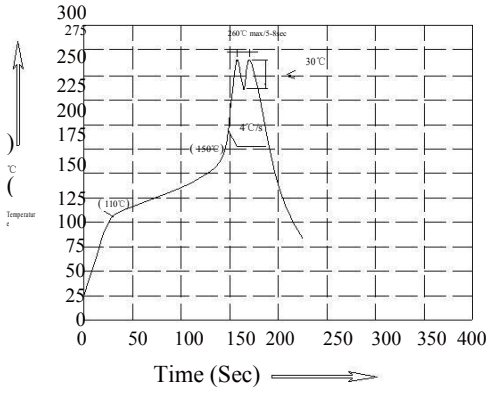
1. Wave Soldering Profile With Pb-Sn Solder
Pb-Sn Solder 波峰焊



2. Lead-Free Wave Soldering Profile

无铅波峰焊

Wave Soldering Profile for Lead-free Through-hole LED



Notes:

1.Recommend the wave temperature 245~260℃. The maximum soldering temperature should be less than 260℃. 建议波峰焊温度 245-260 度。最大焊接温度应该小于 260 度。

2.Do not apply stress on epoxy resins when temperature is over 85 degrees (℃). 当温度达到 85 度以上时，不要施加外力作用于胶体上。

3.The soldering profile apply to the lead free soldering (Sn/Gu/Ag alloy). 此份焊接条件使用于无铅焊接（Sn/Gu/Ag alloy）。

4.No more than once. 一次完成。

5. The maximum temperature for Through-hole LED Display is 260℃ for 3 to 5seconds.

5.针对直插产品的最大温度是 260 度，时间 2-5 秒

APPLICATION NOTES

• Static Electricity and Voltage Spikes in InGaN/GaN Products

InGaN/GaN 产品的静电和电压峰值

InGaN/GaN products are sensitive to electrostatic discharge (ESD) and other transient voltage spikes. ESD and voltage spikes can affect the component's reliability, increase reverse current, and decrease forward voltage. This may result in reduced light intensity or cause component failure.

InGaN/GaN 产品对静电放电和其他电压峰值比较敏感。 ESD 和电压峰值会影响到元器件产品的可靠性，增加反向电流，减少进向电压。这会导致亮度降低或者产品失效。

Luckylight InGaN/GaN products are stored in anti-static packaging for protection during transport and storage. Please note the anti-static measures below when handling Luckylight InGaN/GaN products.

LUCKYLIGHT 的 InGaN/GaN 产品是包装在防静电袋中。在使用 InGaN/GaN products，请注意以下防静电措施。

• Design Precautions 预防设计

Products using InGaN/GaN components must incorporate protection circuitry to prevent ESD and voltage spikes from reaching the vulnerable component.

InGaN/GaN 产品必须用保护电路来预防受 ESD 和电压峰值破坏。

• ESD Protection During Production 生产时的 ESD 保护

Static discharge can result when static-sensitive products come in contact with the operator or other conductors. The following procedures may decrease the possibility of ESD damage:

当对静电敏感的产品与操作员或者其他导体接触时，会产生静电放电。以下程序会减少 ESD 破坏的可能性。

a. Minimize friction between the product and surroundings to avoid static buildup.

尽量减少产品和周边的摩擦，避免产生静电。

b. All production machinery and test instruments must be electrically grounded.

所有的生产设备和测试仪器必须接地。

c. Operators must wear anti-static bracelets.

操作员要戴防静电环。

d. Wear anti-static suit when entering work areas with conductive machinery.

当进入有机器导体的工作区时，要穿防静电服。

e. Set up ESD protection areas using grounded metal plating for component handling.

f. All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.

建议 ESD 防护区，元器件操作时使用接地的金属电镀

g. Maintain a humidity level of 50% or higher in production areas.

生产区的湿度保持在 50%或者更高。

h. Use anti-static packaging for transport and storage.

储存和运输时，使用防静电包装。

I. All anti-static equipment and procedures should be periodically inspected and evaluated for proper functionality.

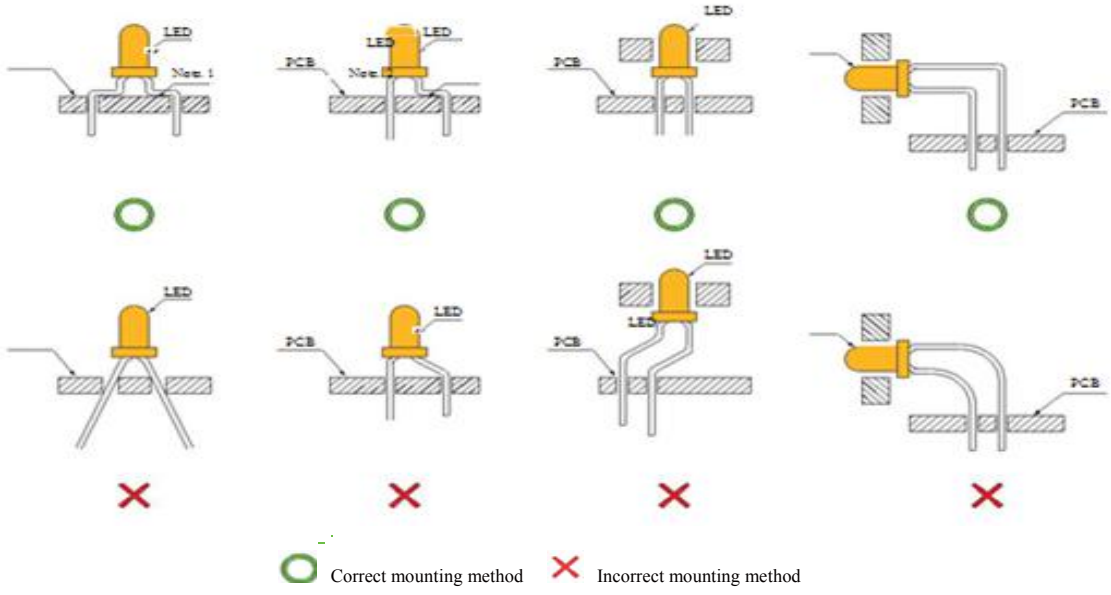
必须对所有的防静电设备和程序进行周期性检查和评估。

APPLICATION NOTES

- **LED Mounting Method ： LED 组装方法**

1. The lead pitch of the LED must match the pitch of the mounting holes on the PCB during component placement. Lead-forming may be required to insure the lead pitch matches the hole pitch. Refer to the figure below for proper lead forming procedures. (Fig. 1)

当放置元件时，LED 的 PIN 脚斜度必须符合 PCB 板上组装孔的斜度。请参照以下正确的操作方式。



Note 1~2 : Do not route PCB trace in the contact area between the leadframe and the PCB to prevent short-circuits.

Fig. 1

2. When soldering wire to the LED, use individual heat-shrink tubing to insulate the exposed leads to prevent accidental contact short-circuit. (Fig. 2)
当焊线接 LED 时，使用单独的热缩管来隔离暴露在外的 PIN 脚，预防意外接触短路。

Fig. 2

3. Use stand-offs (Fig. 3) or spacers (Fig. 4) to securely position the LED above the PCB.
使用卡点或者间隔柱，可以把 LED 安全地放置在 PCB 上。

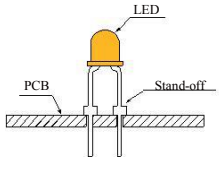


Fig. 3

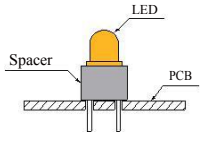


Fig. 4

- **Lead Forming Procedures**

1. Maintain a minimum of 2mm clearance between the base of the LED lens and the first lead bend.
(Fig. 5 & 6) LED 的灯体下方和第一次弯脚处之间要保留至少 2MM 的空间。

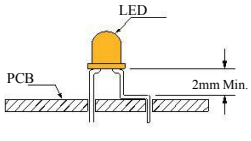


Fig. 5

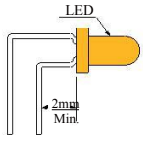


Fig. 6

APPLICATION NOTES

2. Lead forming or bending must be performed before soldering, never during or after soldering.
LED 的 PIN 脚的塑形或者折弯必须在焊接前完成，不要在焊接时或者焊接后进行。

3. Do not stress the LED lens during lead-forming in order to prevent fractures in the lens epoxy and damage the internal structures.
在 LED 的 PIN 脚塑形时，不要施加外力在 LED 胶体上，以免造成胶体的破裂和破坏内部结构。

4. During lead forming, use tools or jigs to hold the leads securely so that the bending force will not be transmitted to the LED leds and its internal structures. Do not perform lead forming once the component has been mounted onto the PCB. (Fig. 7)
在 LED 的 PIN 脚塑形时，使用工具或者治具来安全固定 PIN 脚，这样弯曲力不会传导到 LED 的胶体或者内部结果上。一旦 LED 已经焊到 PCB 板上了，就请不要在进行任何的 PIN 脚塑形了。

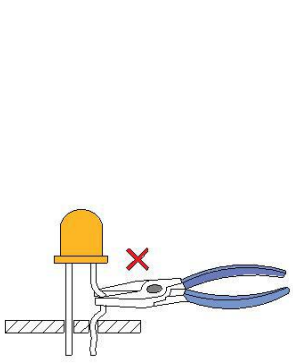


Fig. 7

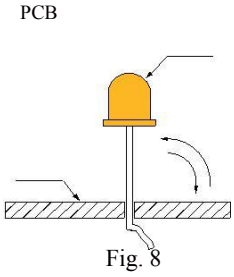


Fig. 8

5. Do not bend the leads more than twice. (Fig. 8) 弯脚次数不能多于两次。

6. After soldering or other high-temperature assembly, allow the LED to cool down to 50℃ before applying outside force (Fig. 9). on the general, avoid placing excess force on the LED to avoid damage. For any questions please consult with Luckylight representative for proper handling procedures.

在焊接或者其他高温组装后，在 LED 冷却到 50 度前，不要施加外力作用于 LED 上，避免破坏 LED。

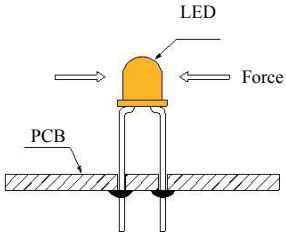


Fig. 9

Cleaning 清洁

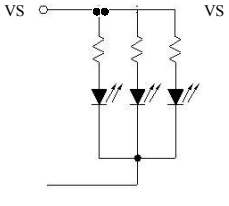
1. Do not use harsh organic solvents such as trichloroethylene, acetone, Chlorosen, and Diflon S3MC for cleaning because they may cloud or damage the LED lens. 不要使用刺激的有机溶剂清洁，例如三氯乙烯，丙酮，次氯酸钠，和 DIFLON S3MC，因为这类溶剂可能玷污或者破坏 LED 胶体。
2. Isopropyl alcohol or deionized water are recommended solvents for cleaning.建议使用异丙酮或者脱离子水进行清洁。
3. Special attention should be taken if other chemicals are used for cleaning because other solvents may damage the epoxy in the lens or housing. 如果使用其他化学剂清洁，就要特别注意是否会破坏胶体或者灯套。
4. The cleaning process should take place at room temperature and the devices should not be washed for more than one minute.请在室温条件下清洁，并且产品设备清洁时间不能超过一分钟。
5. When water is used in the cleaning process, immediately remove excess moisture from the LED via forced-air drying afterwards.

当清洁过程中用到了水，事后请立即使用烘干机去除 LED 上的多余水分。

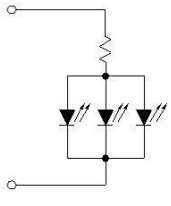
- **Miscellaneous Design Notes**

1. Protective current-limiting resistors may be necessary to operate the LEDs within the specified range.
在指定的条件下使用 LED，还必须用到保护限流电阻。
2. LEDs mounted in parallel should each be placed in series with its own current-limiting resistor.
LED 并列组装一起时，每个 LED 必须串联一个限流电阻。

Recommended Set-Up



Invalid Set-Up



3. The driving circuit should be designed to avoid reverse voltages and transient voltage spikes when the circuit is powered up or shut down.

设计驱动线路时，关闭或者启动时，都要避免反向电压和瞬时的电压峰值。

4. During soldering, SMD components should be mounted such that the leads are placed perpendicular to the direction of PCB travel to insure the solder on each lead melts simultaneously during reflow. 焊接时，组装 SMD 器件时，PIN 脚要垂直于 PCB 走行方向，以确保回流焊时，每只脚上的焊料能同时熔化。