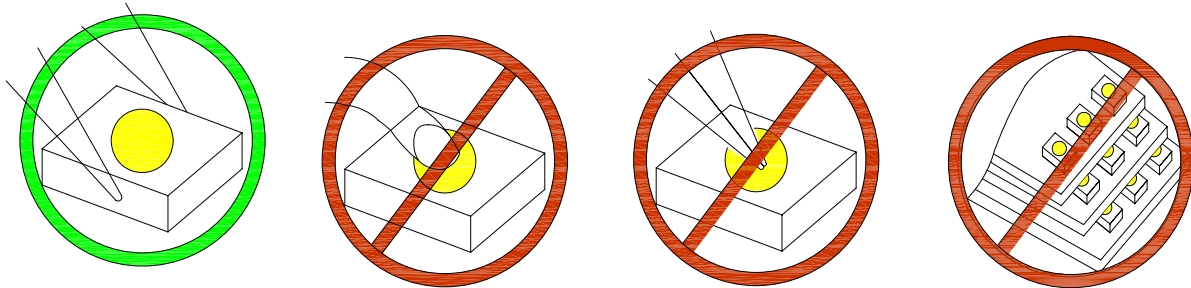


1. Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Luckylight's sales team in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

2. Handling Precautions

- 2.1 Handle the component along the side surfaces by using forceps or appropriate tools.
- 2.2 Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.
- 2.3 Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



3. Storage

- 3.1 The package is sealed:

The LEDs should be stored at 30°C or less and 60%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

- 3.2 The package is opened:

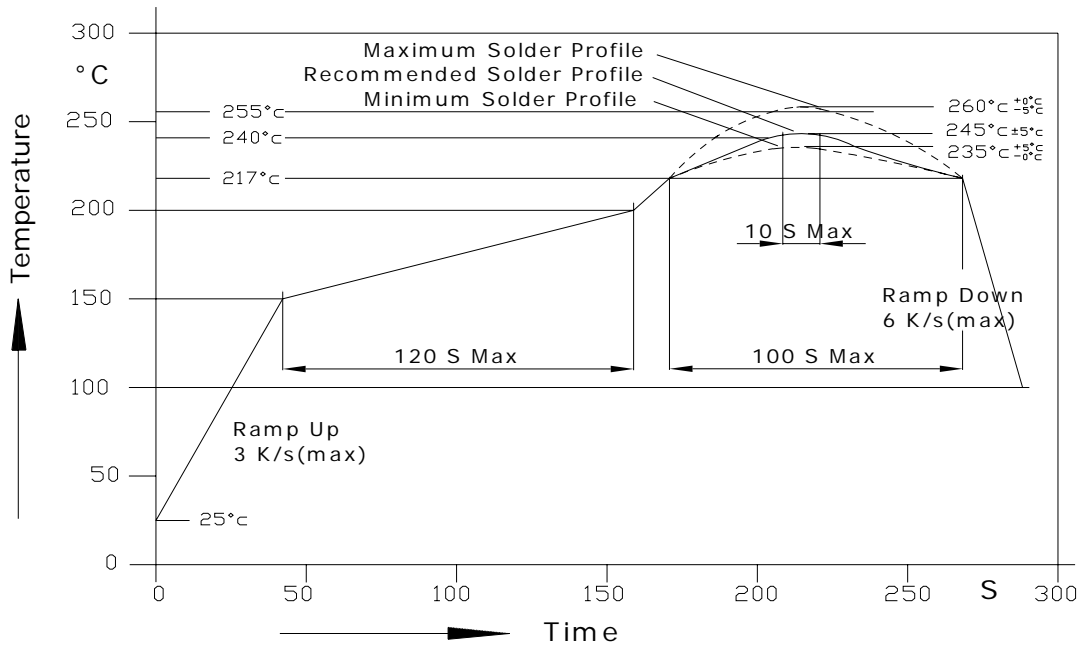
The storage ambient for the LEDs should not exceed 30°C temperature or 60% relative humidity. It is recommended that LEDs out of their original packaging are IR-reflowed within 24 hours. For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant, or in a desiccator with nitrogen ambient. LEDs stored out of their original packaging for more than 48 hours should be baked at about 60 deg C for at least 20 hours before solder assembly.

- 3.3 Do not open moisture proof bag before the products are ready to use.

4. Soldering Condition

Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations. However, you can successfully mount your packages to the PCB by following the proper guidelines and

PCB-specific characterization. You should adhere to the JEDEC profile limits as well as specifications and recommendations from the solder paste manufacturer to avoid damaging the device and create a reliable solder joint.



4.1 Recommended soldering conditions:

Reflow soldering		Soldering iron	
Pre-heat	150~200°C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	260°C Max.		(one time only)
Soldering time	10Sec. Max. (Max. two times)		

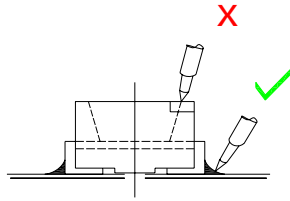
4.2 Do not apply stress to the leads when the component is heated above 85°C, otherwise internal wire bonds may be damaged.

4.3 SMD LED products must be mounted according to specified soldering pad patterns. Refer to the product datasheet for details. Solder paste must be evenly applied to each soldering pad to insure proper bonding and positioning of the component.

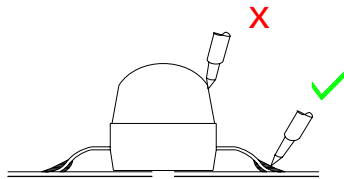
4.4 After soldering, allow at least three minutes for the component to cool to room temperature before further operations.

4.5 Manual soldering is not recommended unless necessary such as when repair or rework is required.

4.6 Soldering iron power shall not exceed 30W. The recommended maximum temperature for lead and unlead soldering is 300°C and 350°C respectively. For blue (typical λ_d 465nm), blue-green (typical λ_d 525nm), and all white LEDs, the maximum soldering iron temperature is 280°C. Do not place the soldering iron on the component for more than 3 seconds.



The tip of the soldering iron should never touch the LED body

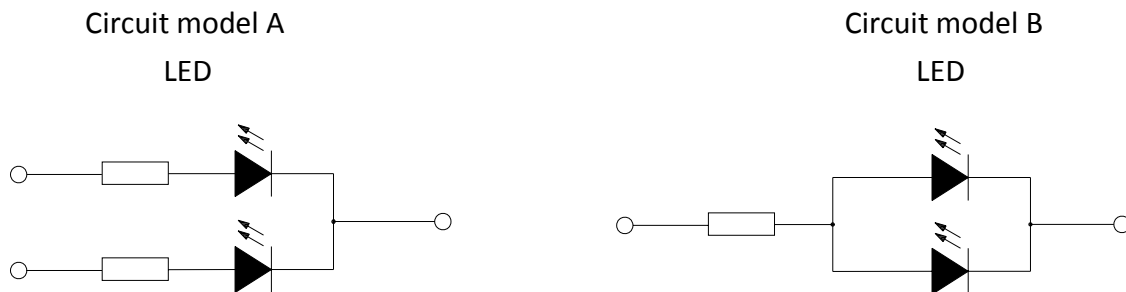


The tip of the soldering iron should never touch the lens

4.7 For the rework of SMD LED without side surface leads, refer to QFN rework methods. Special attention should be made for proper thermal isolation of surrounding electronic components.

5. Drive Method

5.1 LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.



- a. Recommended circuit.
- b. The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

6. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents. To verify for ESD damage, check for "lightup" and Vf of the suspect LEDs at low currents. The Vf of "good" LEDs should be $>2.0V@0.1mA$ for InGaN product and $>1.4V@0.1mA$ for AlInGaP product.

7. Disclaimer

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