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Top Crystal Technology Inc.,

Power Light Source

Introduction :

THCB-ALV is one the highest flux LEDs in the world.
Due to the special design of chip and package, the
THCB-ALV is designed by particular package for high
power LED



Feature :

- Long operating life
- Energy efficiency
- Compact design
- Superior ESD protection
- ROHS compatibility

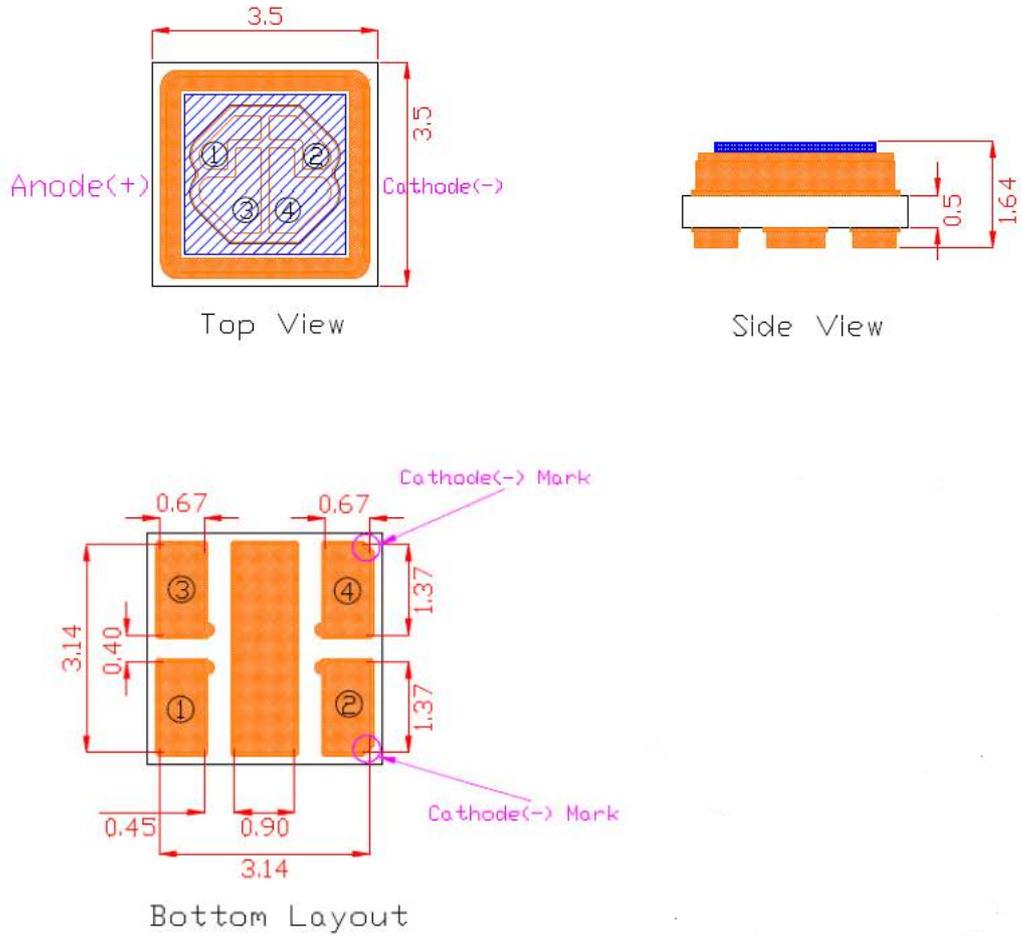
Typical Applications:

- Counterfeit currency
- Defect detection
- Medical treatment



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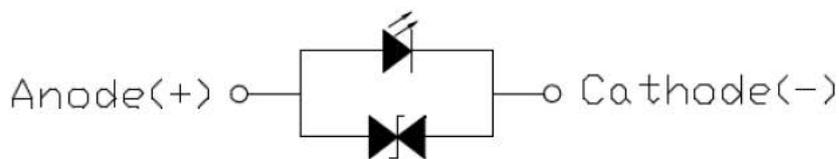
Package Dimensions:



Notes :

1. All dimensions are in millimeters
2. Tolerance is $\pm 0.25\text{mm}$

Circuit Diagram





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Absolute Maximum Ratings

Parameter	Value
DC Forward Current (mA)	100
Peak Pulse Current (mA) (less than 1/10 duty cycle@1KHz)	120
LED Junction Temperature (°C)	100
Operating Board Temperature (°C)	-30°C ~60°C
Storage Temperature (°C)	-40°C ~100°C
Soldering Temperature	JEDEC 020c 240°C.
Allowable Reflow Cycles	3
Reverse Voltage	Not design to be driven in reverse bias
ESD Sensitivity	> 2,000V Human Body Model (HBM)

Electrical/Optical Characteristics@100mA, Junction Temperature Tj=25°C

Parameter	Units	Min.	Avg.	Max
Radiant Flux (nW)	mW	--	10	16
Dominate Wavelength (λ P)	nm	265	--	285
Forward Voltage (VF)	V	5	7	10
Viewing Angle[2] (2θ1/2)	degrees	--	120	--



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RELIABILITY ITEMS and SPECTIONS

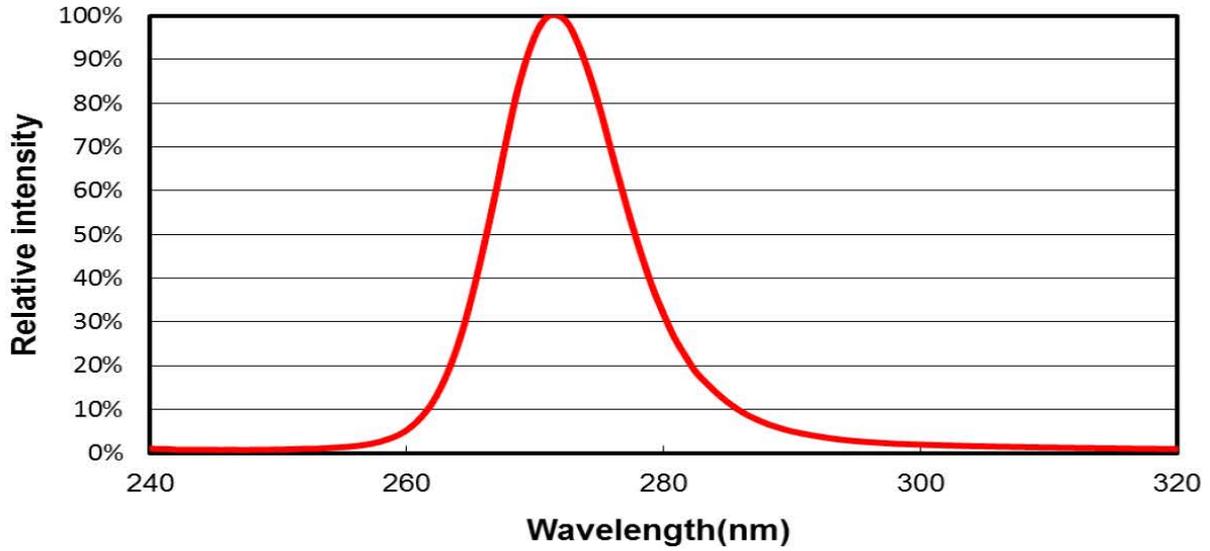
No	Test Item	Test Conditions	Remark
1	Room Temperature Operating Life	25°C	1000 hrs
2	High Temperature Storage	Temperature : 110°C	1000 hrs
3	Thermal shock	-40°C to 120°C, 20 min. dwell, <20 sec. transfer	200 cycles
4	High Temperature , High Humidity Storage	85°C/85%RH	1000 hrs
5	Low Temperature Storage	- 40°C	1000 hrs
6	Solderability	Tp = 260°C for 5 sec	3 times
7	Drop test	120 cm height , fall freely onto stainless board	3 times
8	Temperature Cycle (TMCL)	-40°C to 120°C, 30 min. dwell, <5 min. transfer	200 cycles

Failure Criteria :

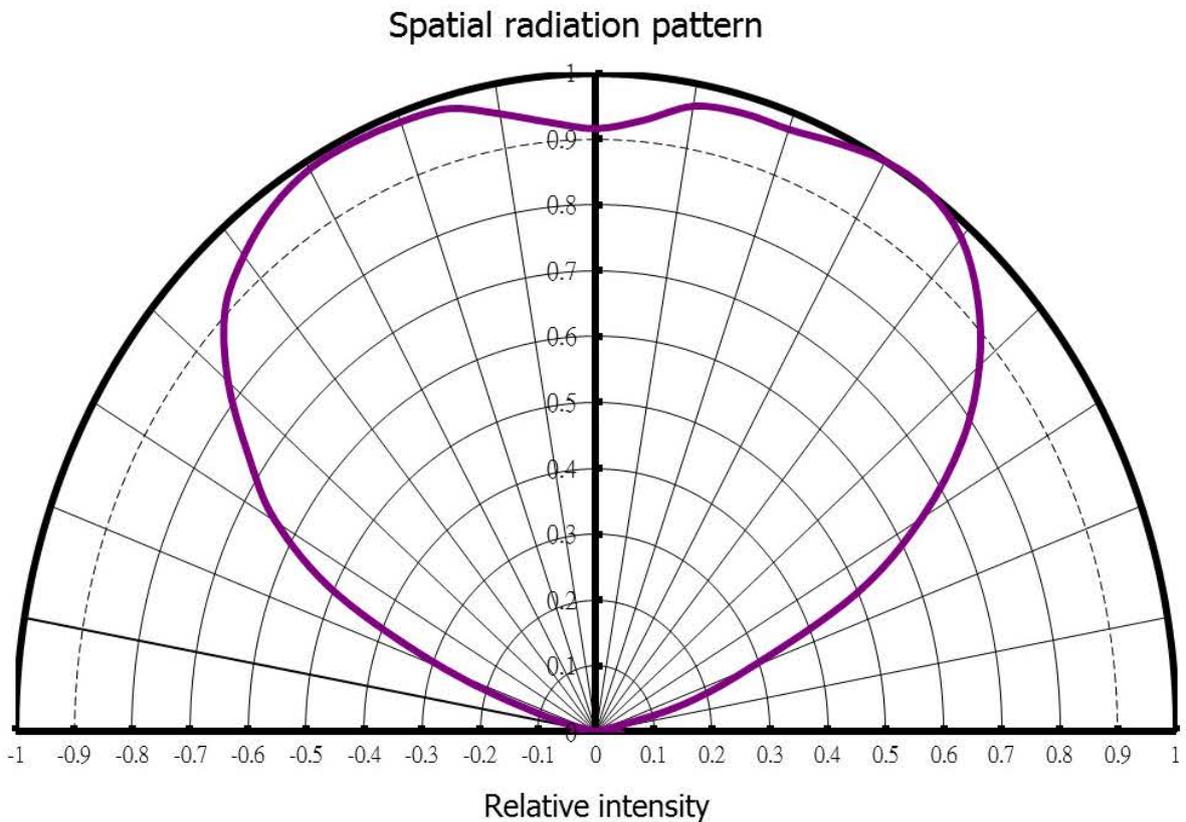
1. Forward Voltage (VF) \geq Initial Level x 1.1
2. Luminous Flux or Radiometric Power (ΦV) \leq Initial Level x 0.7
3. Reverse Current (IR) \geq 10 μ A
4. Resistance to Soldering Heat : No dead lamps or visual damage.



Spectrum Distribution, $T_J = 25^\circ\text{C}$



Typical Spatial Radiation Pattern



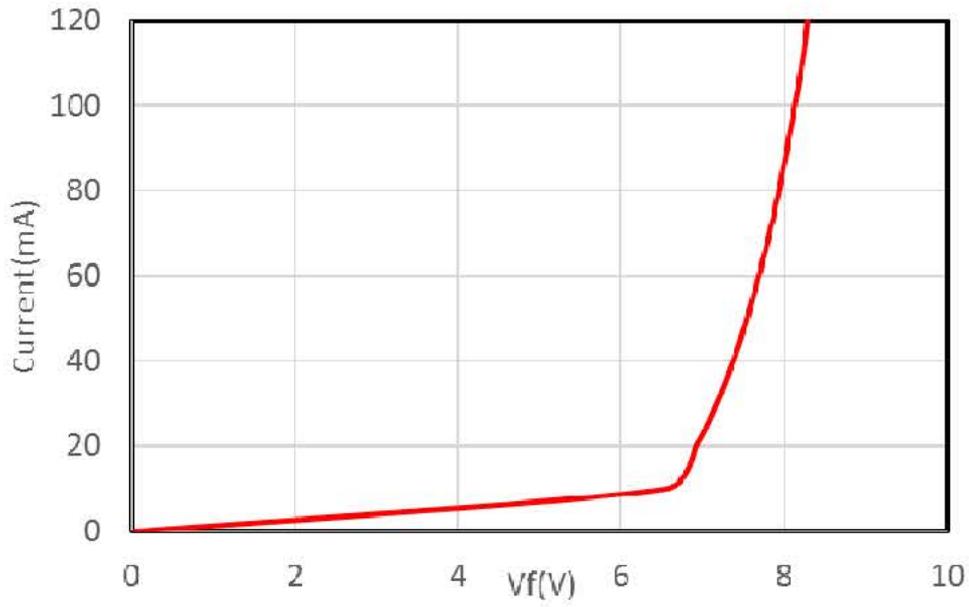


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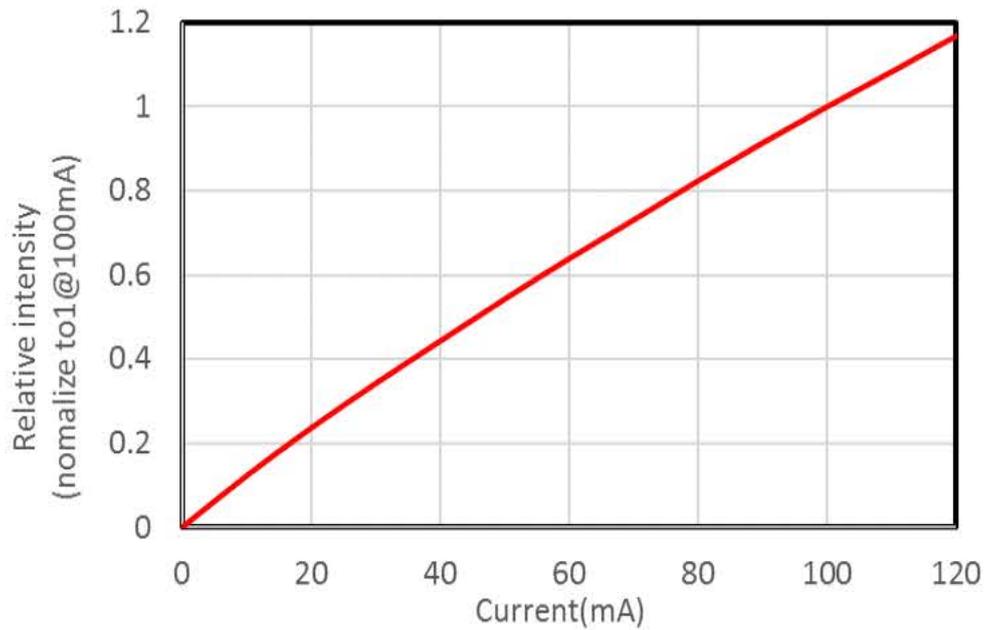
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Forward Current Characteristics, $T_J = 25^\circ\text{C}$

Forward Voltage vs. Forward Current

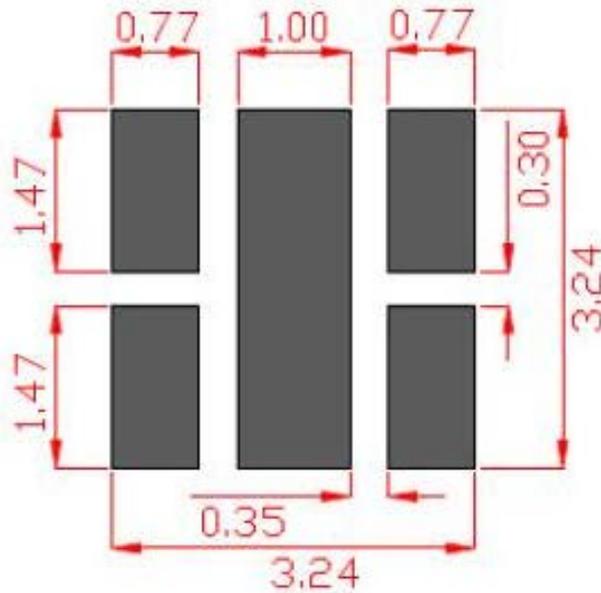


Forward Current vs. Luminous Flux





Recommended Solder Pad Design



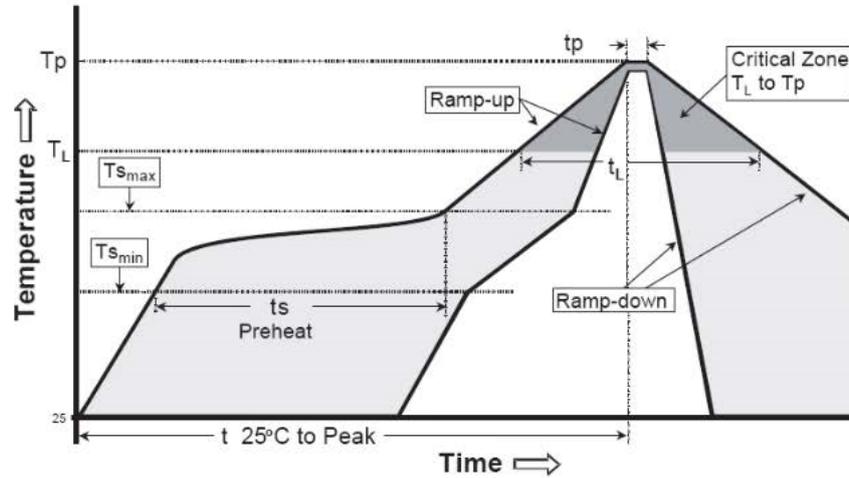
- All dimensions are in millimeters.
- Electrical isolation is required between Slug and Solder Pad



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Reflow Soldering Temperature Profile



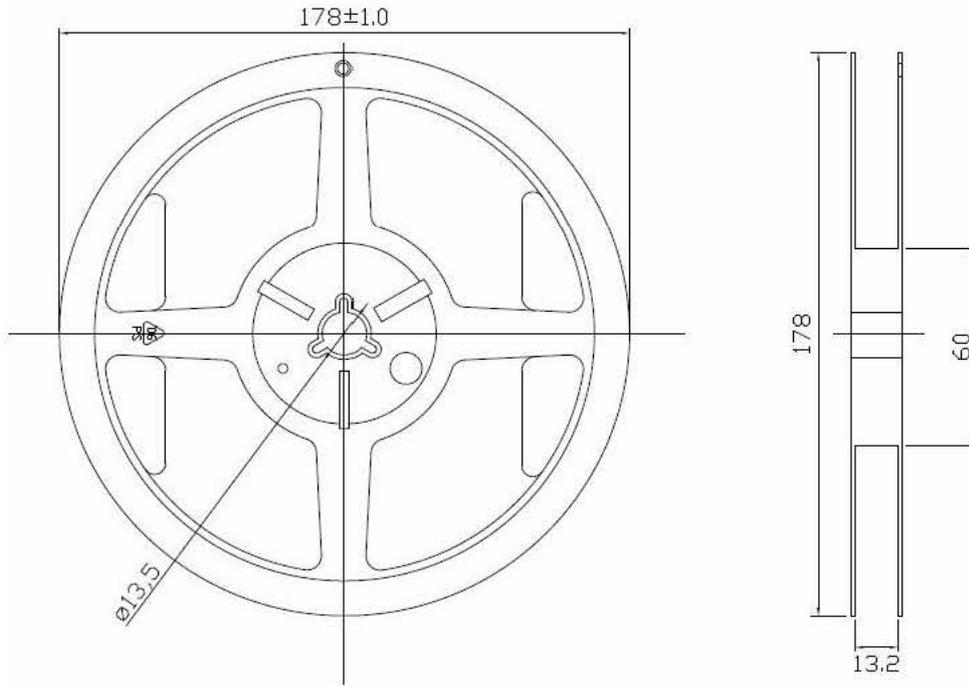
Profile Feature	Typical parameters
Average Ramp-Up Rate ($T_{S_{max}}$ to T_p)	3 °C/second max.
Preheat Temperature Min ($T_{S_{min}}$)	100 °C
Preheat Temperature Max ($T_{S_{max}}$)	150 °C
Time ($T_{S_{min}}$ to $T_{S_{max}}$)	60-120 seconds
Time maintained above Temperature (T_L)	180 °C
Time maintained above Time (T_L)	60-150 seconds
Peak/Classification Temperature (T_p)	200 °C
Time within 5 °C of Actual Peak Temperature (T_p)	5 seconds
Ramp-Down Rate	6 °C/second max.
Time 25 °C to Peak Temperature	6 minutes max.

- All temperatures refer to topside of the package, measured on the package body surface.
- 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 or will not be damaged by repairing.
- Reflow soldering should not be done more than three times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

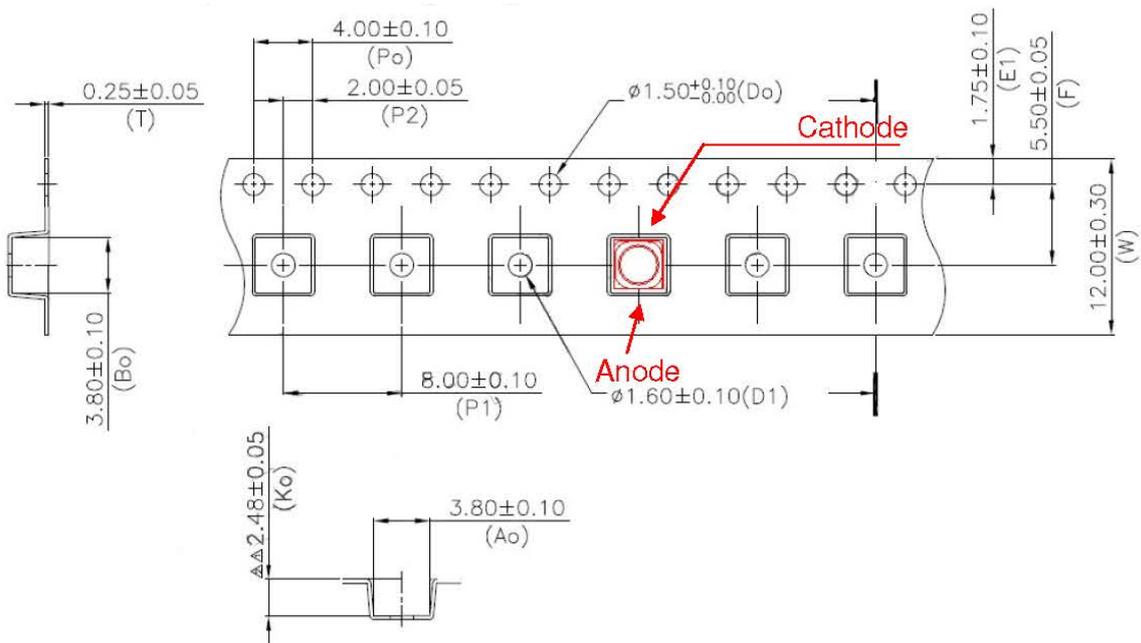


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Tape and Reel Packaging Specifications



Carrier tape dimensions



Note

All dimensions are in millimeters



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Notice

1. In order to avoid absorption of moisture, it is recommended that the products are stored in the dry box (or desiccators) with a desiccants. Alternatively the following environment is recommended: Storage temperature : 5°C~30°C Humidity:60% HR max.
2. If the storage conditions are of high humidity the product should be dried before use. Recommended drying conditions: 12 hours at 60°C±5°C.
3. Any mechanical force or any excess vibration should be avoid during the cooling process after soldering.
4. Reflow rapidly cooling should be avoided.
5. Components should not be mounted on distorted Printed Circuit Boards.
6. Devices should not contact with any types of fluid, such as water , oil , organic solvents.... etc.
7. The maximum ambient temperature should be taken into consideration when determining the operating current.
8. Devices should be soldered within 7 days after opening the moisture-proof packing.
9. Repack unused product in anti-moisture packing, fold to close any opening and store in a dry place.
10. The appearance and specifications of devices may be modified for improvement without notice.
11. ESD Precautions Static Electricity and surge damages LEDs. It is recommended that wrist bands or anti-electrostatic gloves be used when handing the LEDs . All devices, equipment and machinery should be properly grounded.
12. This product must be driven by constant power supplier.

