

SMD ■ A

91-21SYGC/S530-XX/XXX-AFM

Features

- Package in 12mm tape on 7" diameter reel.
- Compatible with automatic placement equipment.
- EIA Std. package.
- Mono-color type.
- Pb-free.
- The product itself will remain within RoHS compliant version.

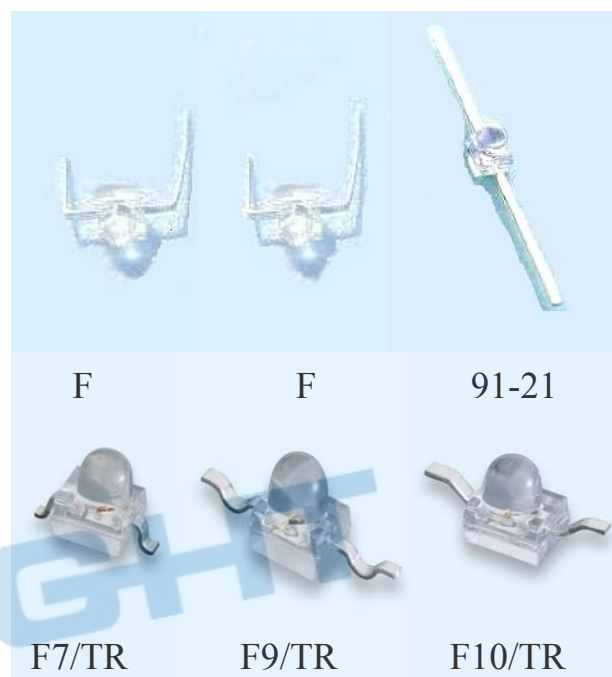
Description

- The 91-21 SMD LED is much smaller than leaded components .

Thus enable smaller board size. Higher packing density. Reduced storage space and finally smaller equipment to be obtained.

Applications

- Small indicator for indoor applications.
- Flat backlight for LCD, switches and symbols.
- Indicator and backlight in office equipment.
- Indicator and backlight for battery driven equipment.
- Indicator and backlight for audio and video equipment.
- Backlighting in dashboards and switches.
- Telecommunication : indicator and backlighting in telephone and fax.



Device Selection Guide

Chip Materials	Emitted Color	Resin Color
AlGaInP	Brilliant Yellow Green	Water Clear

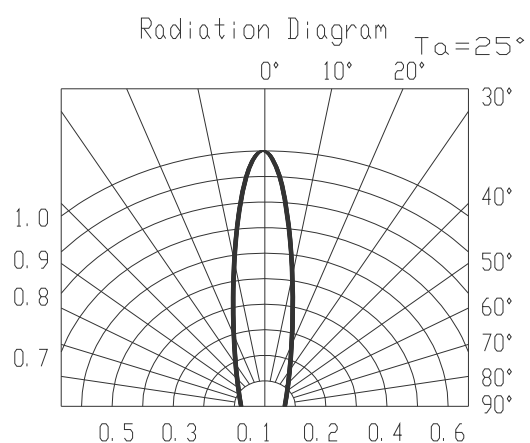
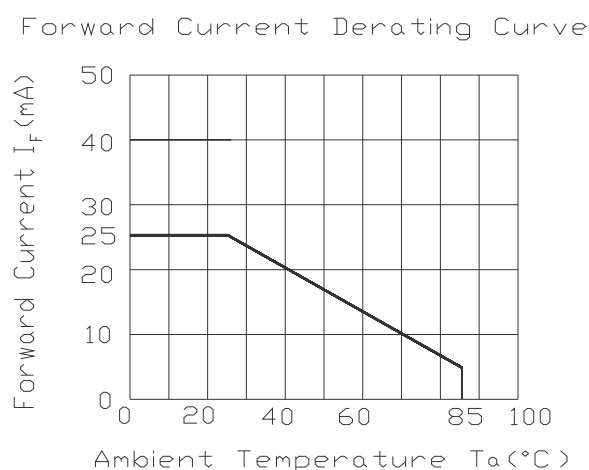
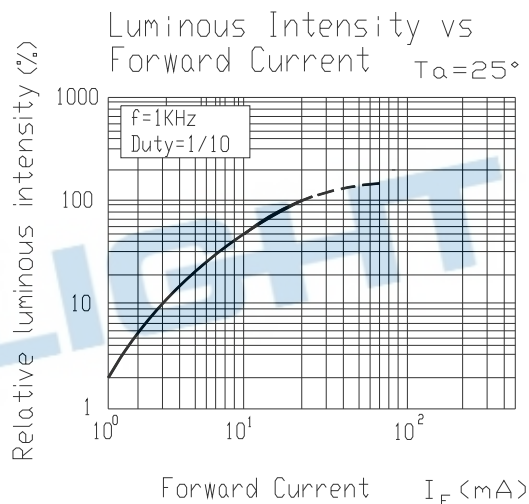
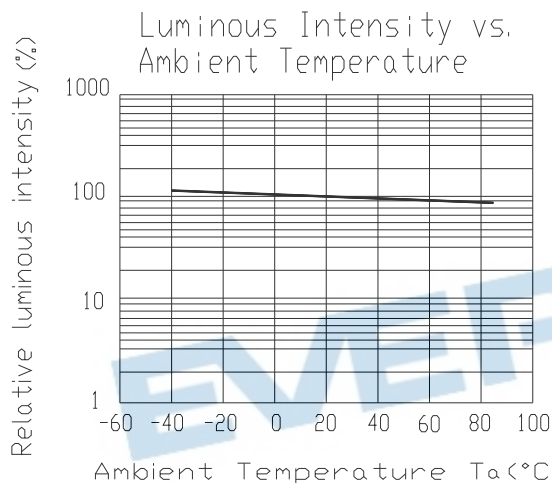
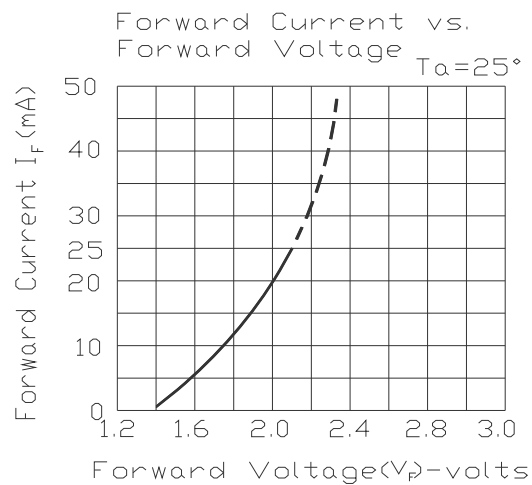
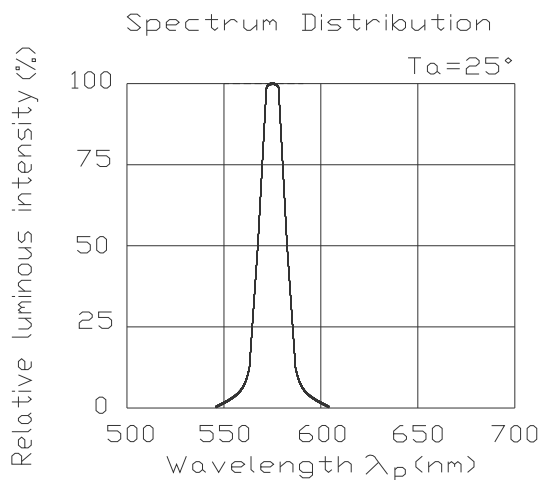
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	25	mA
Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	60	mA
Power Dissipation	P_d	60	mW
Operating Temperature	T_{opr}	-40 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Electrostatic Discharge	ESD_{HBM}	2000	V
Soldering Temperature	T_{sol}	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	ChipRank	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_v	E2	264	330	-----	mcd	$I_F=20mA$
		E3	396	462	-----		
		E4	528	594	-----		
Viewing Angle	$2\theta_{1/2}$		-----	25	-----	deg	$I_F=20mA$
Peak Wavelength	λ_p		-----	575	-----	nm	$I_F=20mA$
Dominant Wavelength	λ_d		-----	573	-----	nm	$I_F=20mA$
Spectrum Radiation Bandwidth	$\Delta \lambda$		-----	20	-----	nm	$I_F=20mA$
Forward Voltage	V_F		-----	2.0	2.4	V	$I_F=20mA$
Reverse Current	I_R		-----	-----	10	μA	$V_R=5V$

Typical Electro-Optical Characteristics Curves



Technical drawing of a cathode probe. The drawing includes two views: a top view and a side view. The top view shows a central circular feature with a diameter of $\phi 1.9 \pm 0.2$ and a square feature with a side length of 2.5 ± 0.1 . The side view shows the probe's profile with a total length of 2.0 ± 0.2 and a central section of 0.4 ± 0.1 . The probe is labeled "Cathode" and "Polarity". Dimensions are given in millimeters (mm).

Technical drawing of a cathode ray tube (CRT) assembly. The drawing shows a side view of the tube with a cathode at the left end and a polarity symbol at the right end. Dimensions are given in millimeters with tolerances. Key dimensions include: cathode diameter 1.9 ± 0.2 , cathode length 0.5 ± 0.1 , tube diameter 2.5 ± 0.1 , tube length 2.0 ± 0.2 , and various internal dimensions for the internal structure. A note "6.0min." is shown for the total length, and "1.5min." for the internal structure length.

[illegible]

Technical drawing of a cathode component. The drawing includes two views: a top view and a side view. The top view shows a circular cathode with a diameter of $\phi 1.9 \pm 0.2$ and a central feature with a diameter of 2.5 ± 0.1 . The side view shows the cathode's profile with a total height of 2.0 ± 0.2 and a base thickness of 0.4 ± 0.1 . The cathode is labeled "Cathode" and "Polarity" with a lightning bolt symbol. Dimensions are given in millimeters.

Technical drawing of a cathode assembly. The drawing shows a cross-section of the assembly with various dimensions and labels. Key features include:

- Top View:** A circular cathode with a diameter of $\phi 1.9 \pm 0.2$ mm. The distance from the cathode center to the center of the mounting hole is 2.5 ± 0.1 mm. The mounting hole has a diameter of 1.1 ± 0.2 mm. The distance from the cathode center to the center of the mounting hole is 1.4 ± 0.2 mm. The distance from the cathode center to the center of the mounting hole is 1.4 ± 0.2 mm. The distance from the cathode center to the center of the mounting hole is 1.4 ± 0.2 mm.
- Side View:** The cathode has a height of 0.5 ± 0.1 mm. The mounting hole has a depth of 0.4 ± 0.1 mm. The distance from the cathode center to the center of the mounting hole is 2.0 ± 0.2 mm.
- Bottom View:** The cathode has a diameter of $\phi 1.9 \pm 0.2$ mm. The mounting hole has a diameter of 1.1 ± 0.2 mm. The distance from the cathode center to the center of the mounting hole is 1.4 ± 0.2 mm. The distance from the cathode center to the center of the mounting hole is 1.4 ± 0.2 mm. The distance from the cathode center to the center of the mounting hole is 1.4 ± 0.2 mm.
- Labels:** "Cathode" and "Polarity" are labeled on the drawing.
- Dimensions:**
 - Top View: $\phi 1.9 \pm 0.2$, 2.5 ± 0.1 , 1.1 ± 0.2 , 1.4 ± 0.2 , 1.4 ± 0.2 , 1.4 ± 0.2 .
 - Side View: 0.5 ± 0.1 , 0.4 ± 0.1 , 2.0 ± 0.2 .
 - Bottom View: $\phi 1.9 \pm 0.2$, 1.1 ± 0.2 , 1.4 ± 0.2 , 1.4 ± 0.2 , 1.4 ± 0.2 .

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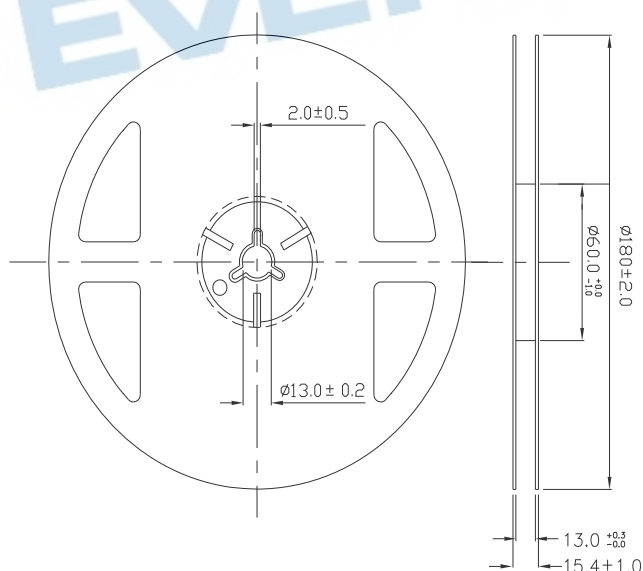
Moisture Resistant Packing Materials

Label Explanation



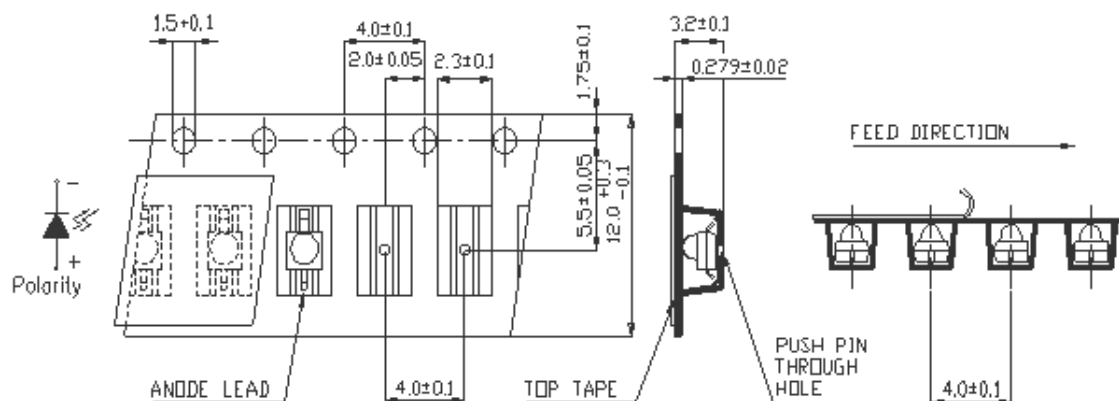
- CPN: Customer's Product Number
- P/N: Product Number
- LOT No: Lot Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank

Reel & Carrier Tape Dimensions

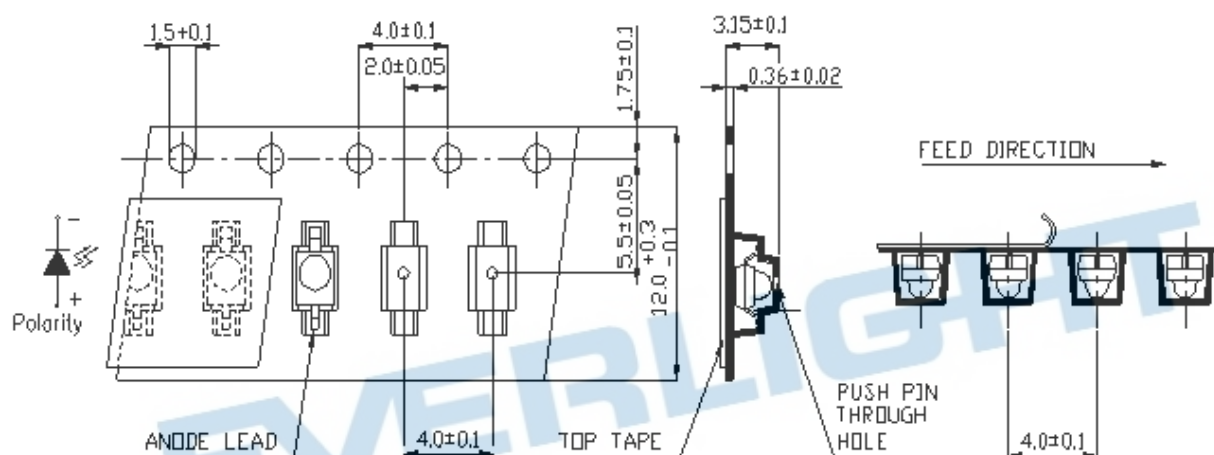


Note: The tolerances unless mentioned are ±0.1, unit=mm

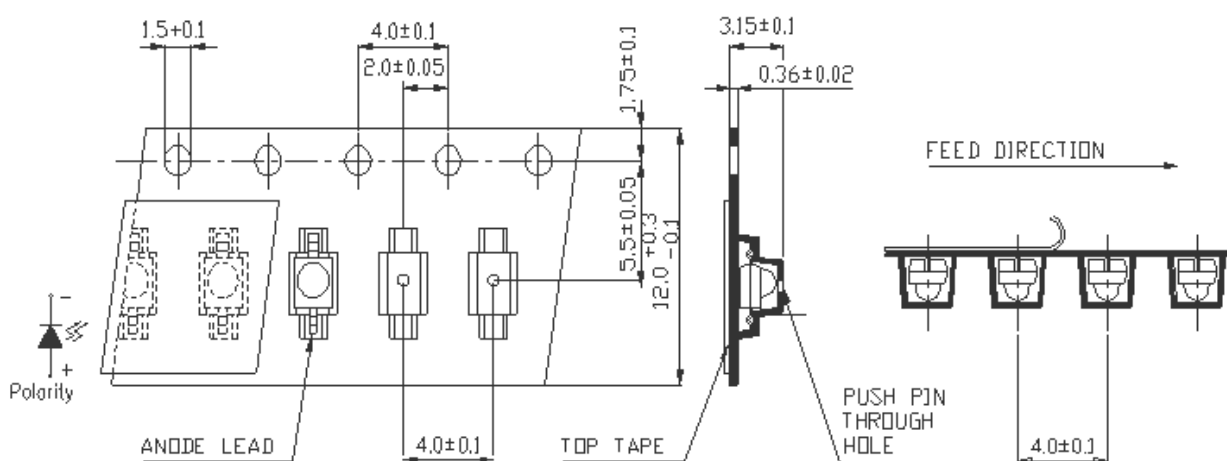
Loaded quantity 1000 PCS/reel



TR7



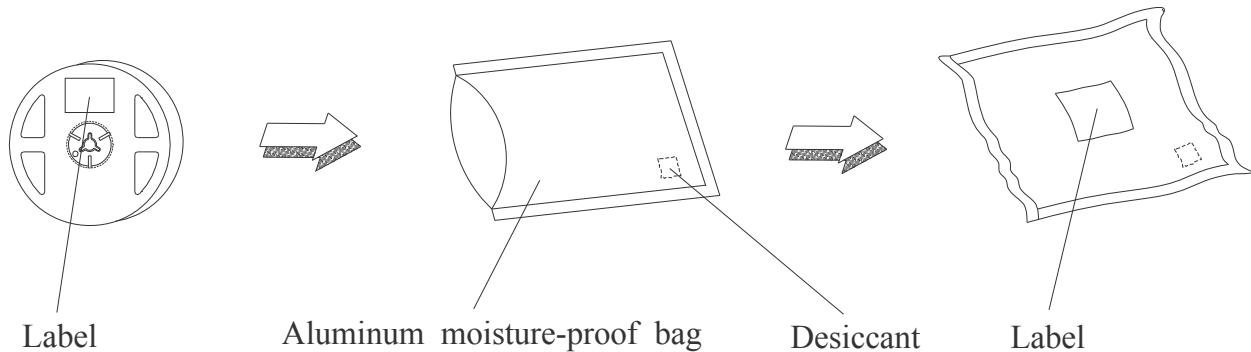
TR10



TR9

Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$, Unit = mm

Moisture Resistant Packaging



Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C/10sec.	6 Min.	22 PCS.	0/1
2	Thermal Shock	H : +100°C 5min § 10 sec L : -10°C 5min	300 Cycles	22 PCS.	0/1
3	Temperature Cycle	H : +100°C 15min § 5 min L : -40°C 15min	300 Cycles	22 PCS.	0/1
4	High Temperature/High Humidity	Ta=85°C,85%RH, I _F = 20 mA	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Ta=-40°C	1000 Hrs.	22 PCS.	0/1
6	High Temperature Storage	Ta=100°C	1000 Hrs.	22 PCS.	0/1
7	DC Operation Life	Ta=25°C, I _F = 20 mA	1000 Hrs.	22 PCS.	0/1

Precautions For Use

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

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

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

2.3 After opening the package: The LED's floor life is 72 hours under 30°C or less and 60% RH or less.

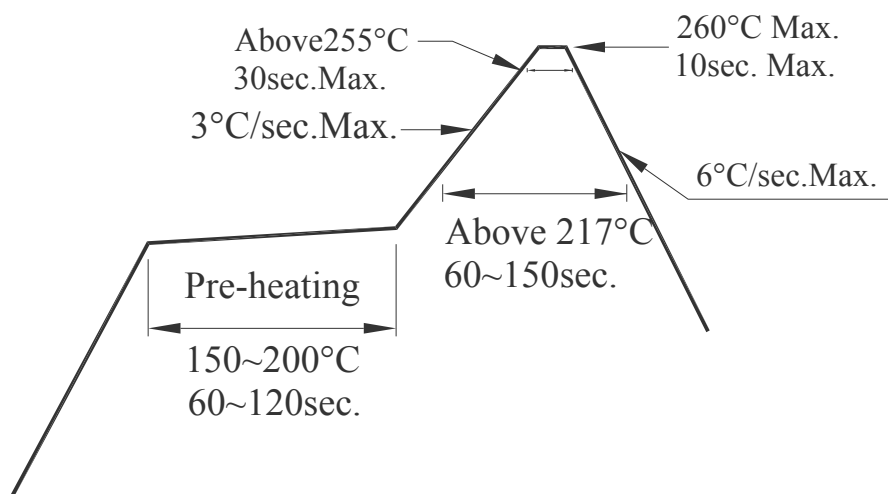
If unused LEDs remain, it should be stored in moisture proof packages.

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

Baking treatment : 60±5°C for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



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

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

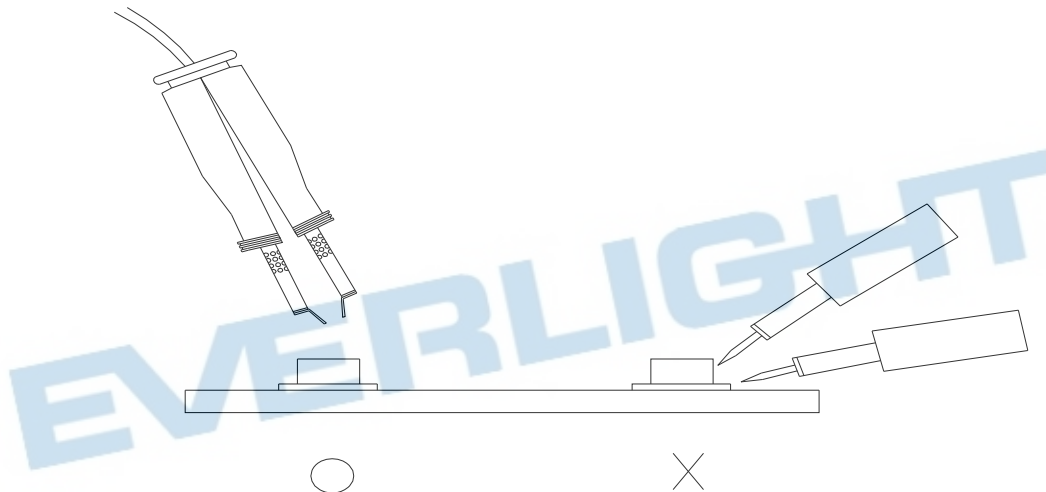
3.4 After soldering, do not warp the circuit board.

4.Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5.Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



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