

Technical Data Sheet

Mini Top LEDs (Reverse Gull Wing)

65-21/T2C-FV1W2E/2AA

Features

- White SMT package.
- Optical indicator.
- Wide viewing angle.
- Soldering methods: IR reflow soldering
- Available on tape and reel
- Pb-free
- The product itself will remain within RoHS compliant version.



Descriptions

The white LED which was fabricated using a blue LED and a phosphor, and the phosphor is excited by blue light and emits yellow fluorescence.

The mixture of blue light and yellow light results in a white emission.

Applications

- Optical indicators.
- Coupling into light guides.
- Backlighting (LCD, cellular phones, switches, keys, displays, illuminated advertising, general lighting).
- Coupling into light guides; Interior automotive lighting (e.g. dashboard backlighting, etc.).

Device Selection Guide

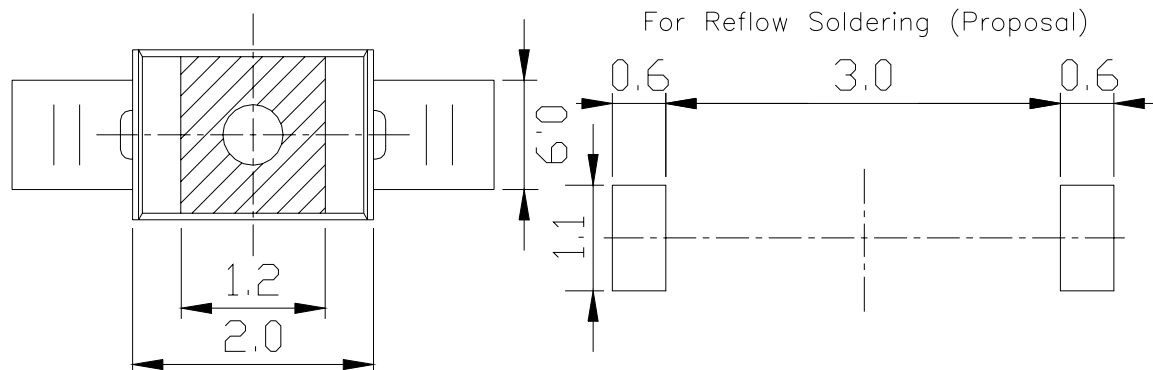
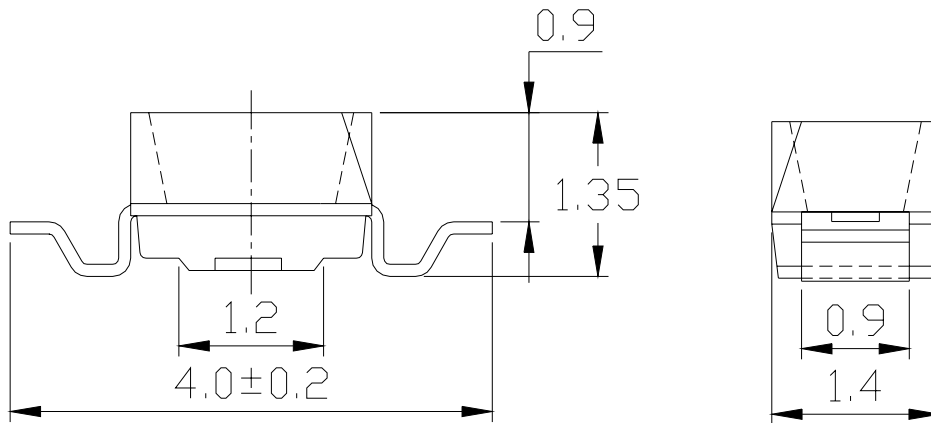
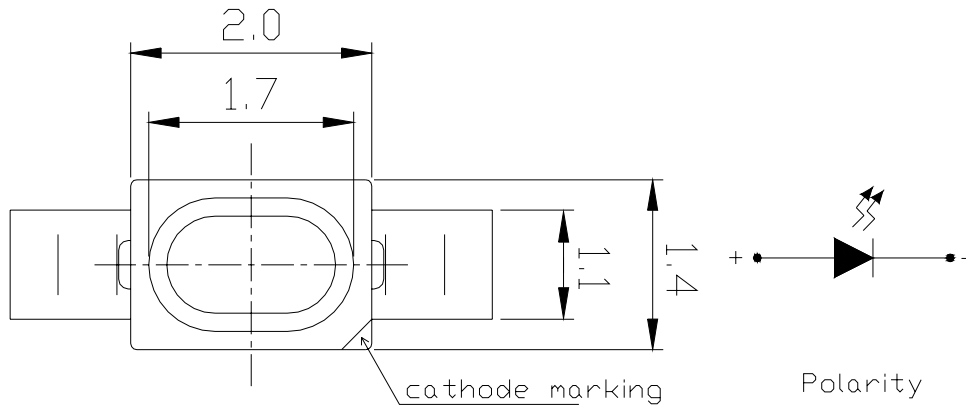
| Chip | Emitted Color | Resin Color |
|----------|---------------|-------------|
| Material | | |
| InGaN | White | Water Clear |

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Package Outline Dimensions



Note: Tolerance unless mentioned is ± 0.1 mm; Unit = mm

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Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|---|-----------------|---|------|
| Reverse Voltage | V _R | 5 | V |
| Forward Current | I _F | 30 | mA |
| Power Dissipation | P _d | 100 | mW |
| Peak Forward Current (Duty 1/10 @1KHz) | I _{FP} | 110 | mA |
| Electrostatic Discharge (HBM) | ESD | 1000 | V |
| Operating Temperature | Topr | -40 ~ +85 | °C |
| Storage Temperature | Tstg | -40 ~ +90 | °C |
| Soldering Temperature | Tsol | Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec. | |

Electro-Optical Characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|--------------------|----------------|-------|-------|-------|------|----------------------|
| Luminous Intensity | I _v | 715 | ----- | 1800 | mcd | I _F =20mA |
| Viewing Angle | 2θ 1/2 | ----- | 120 | ----- | deg | I _F =20mA |
| Forward Voltage | V _F | 2.75 | ----- | 3.65 | V | I _F =20mA |
| Reverse Current | I _R | ----- | ----- | 50 | μA | V _R =5V |

Notes:

1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.1V

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Bin Range of Luminous Intensity

| Bin Code | Min. | Max. | Unit | Condition |
|----------|------|------|------|----------------------|
| V1 | 715 | 900 | mcd | I _F =20mA |
| V2 | 900 | 1120 | | |
| W1 | 1120 | 1420 | | |
| W2 | 1420 | 1800 | | |

Bin Range of Forward Voltage

| Group | Bin | Min | Max | Unit | Condition |
|-------|-----|------|------|------|----------------------|
| E | 5 | 2.75 | 3.05 | V | I _F =20mA |
| | 6 | 3.05 | 3.35 | | |
| | 7 | 3.35 | 3.65 | | |

Notes:

1. Tolerance of Luminous Intensity: $\pm 11\%$
2. Tolerance of Forward Voltage: $\pm 0.1V$

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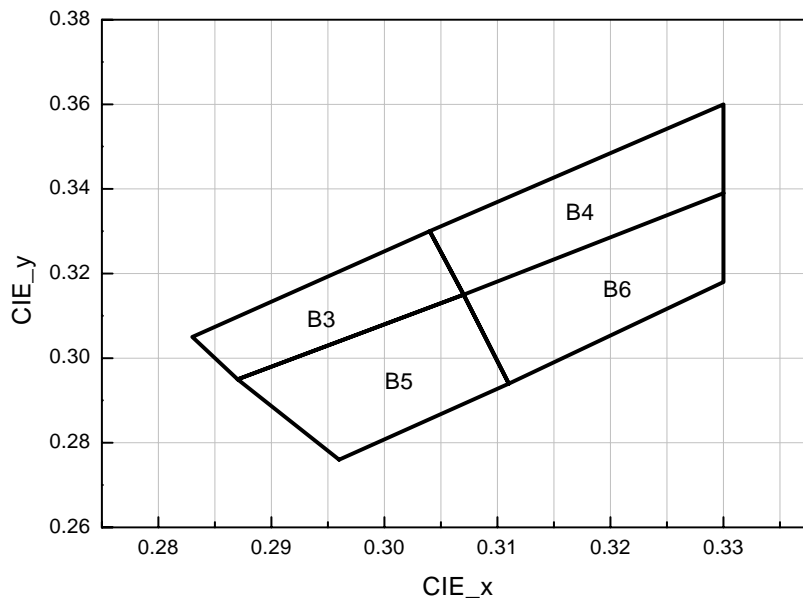
Bin Range of Chromaticity Coordinates

I_F=20mA

| Group | Bin Code | CIE_x | CIE_y | Bin Code | CIE_x | CIE_y |
|-------|----------|--------|--------|----------|--------|--------|
| F | B3 | 0.2870 | 0.2950 | B5 | 0.2960 | 0.2760 |
| | | 0.2830 | 0.3050 | | 0.2870 | 0.2950 |
| | | 0.3040 | 0.3300 | | 0.3070 | 0.3150 |
| | | 0.3070 | 0.3150 | | 0.3110 | 0.2940 |
| | B4 | 0.3070 | 0.3150 | B6 | 0.3110 | 0.2940 |
| | | 0.3040 | 0.3300 | | 0.3070 | 0.3150 |
| | | 0.3300 | 0.3600 | | 0.3300 | 0.3390 |
| | | 0.3300 | 0.3390 | | 0.3300 | 0.3180 |

Notes: Tolerance of Chromaticity Coordinates : ±0.01

The C.I.E. 1931 Chromaticity Diagram

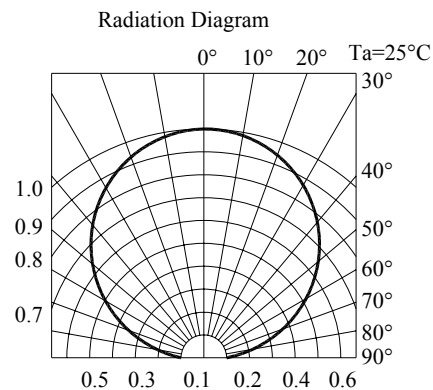
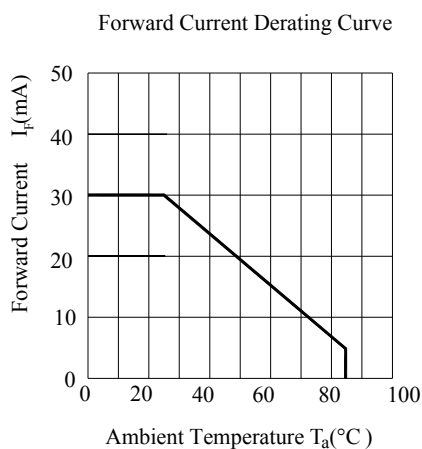
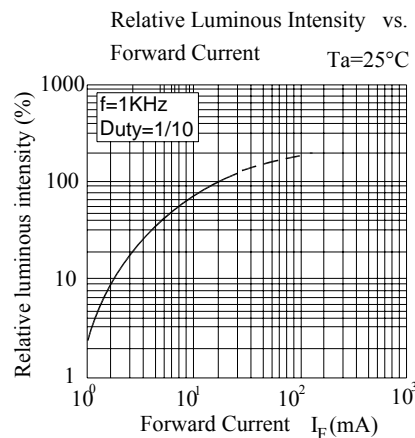
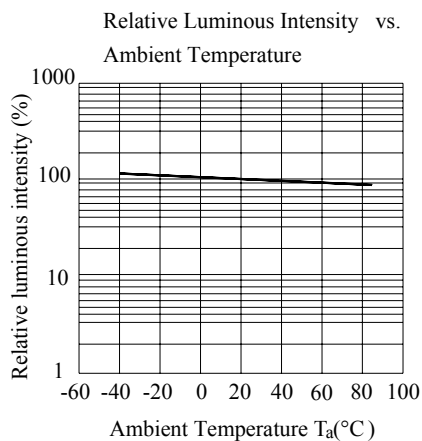
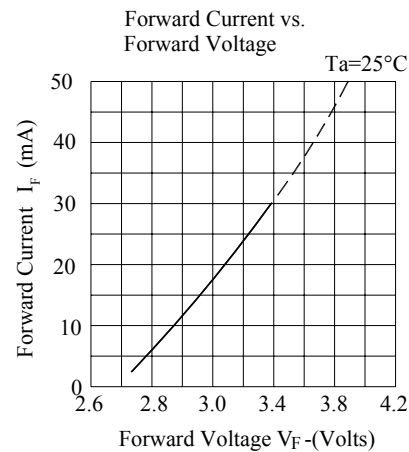
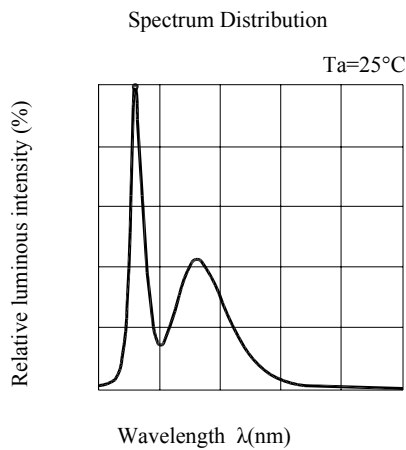


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Typical Electro-Optical Characteristics Curves



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Label Explanation

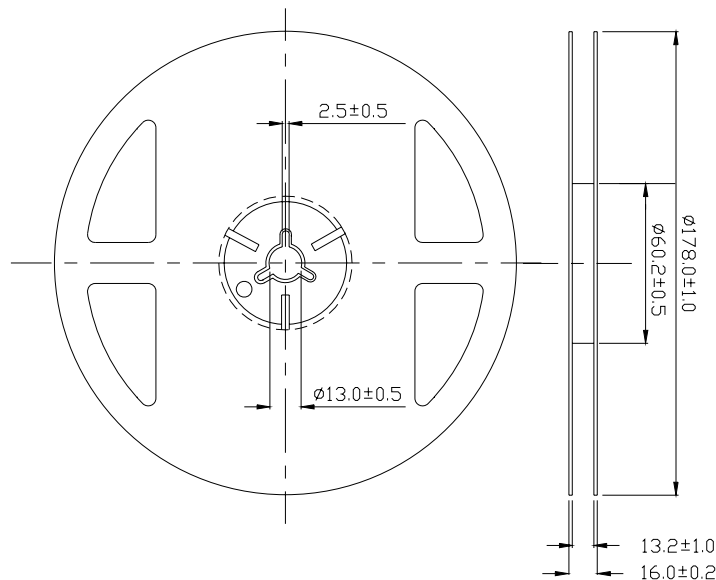
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



Reel Dimensions



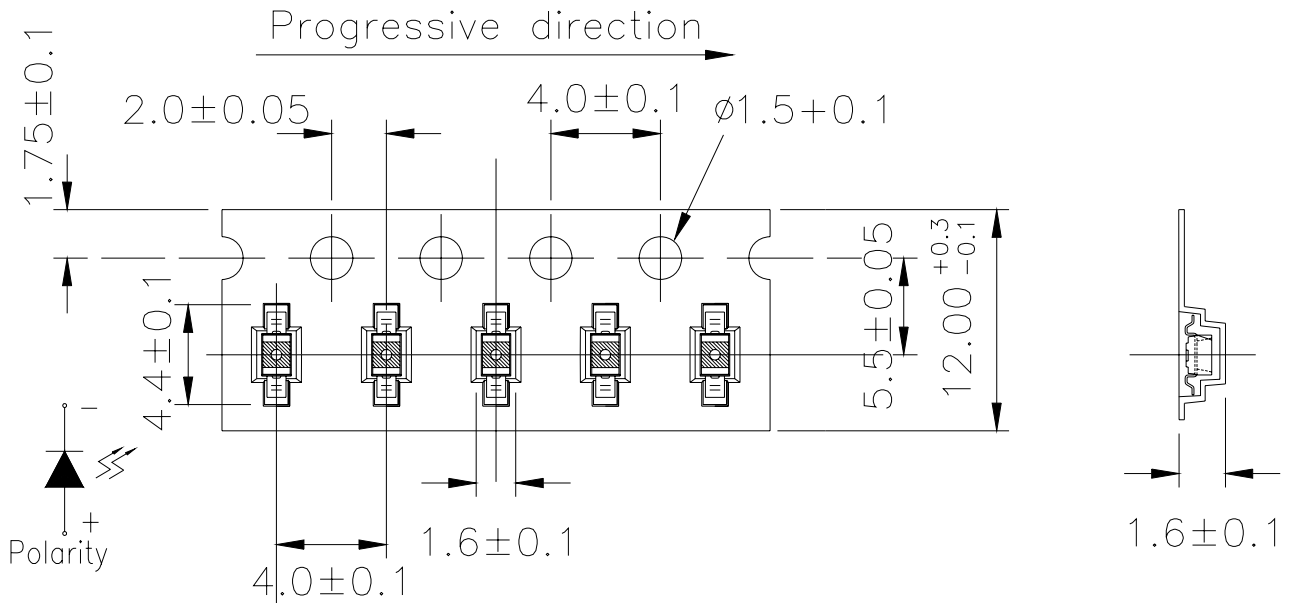
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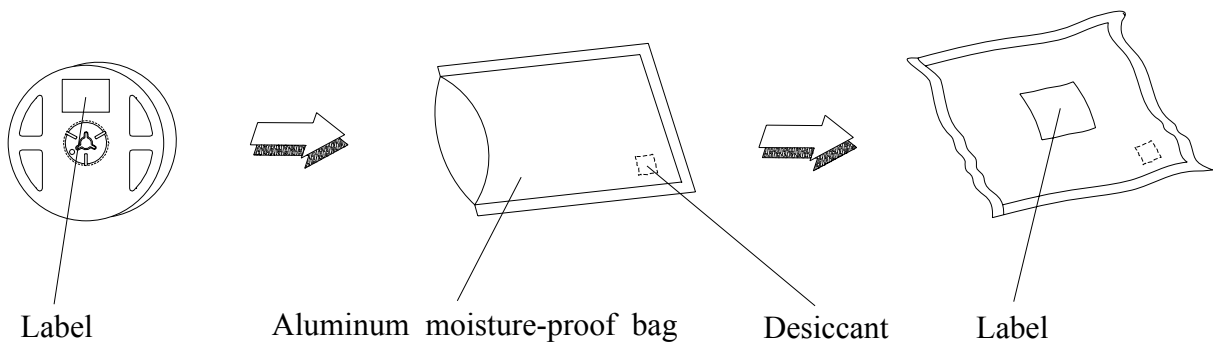
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Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel.



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Moisture Resistant Packaging



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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±5°C Min. 5sec. | 6 min | 22 PCS. | 0/1 |
| 2 | Temperature Cycle | H : +100°C 15min ∫ 5 min L : -40°C 15min | 300 Cycles | 22 PCS. | 0/1 |
| 3 | Thermal Shock | H : +100°C 5min ∫ 10 sec L : -10°C 5min | 300 Cycles | 22 PCS. | 0/1 |
| 4 | High Temperature Storage | Temp. : 100°C | 1000 Hrs. | 22 PCS. | 0/1 |
| 5 | Low Temperature Storage | Temp. : -40°C | 1000 Hrs. | 22 PCS. | 0/1 |
| 6 | DC Operating Life | I _F = 20 mA | 1000 Hrs. | 22 PCS. | 0/1 |
| 7 | High Temperature / High Humidity | 85°C / 85%RH | 1000 Hrs. | 22 PCS. | 0/1 |

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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.

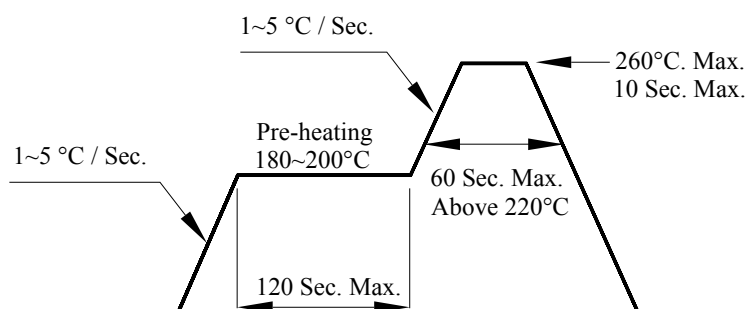
2.3 After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

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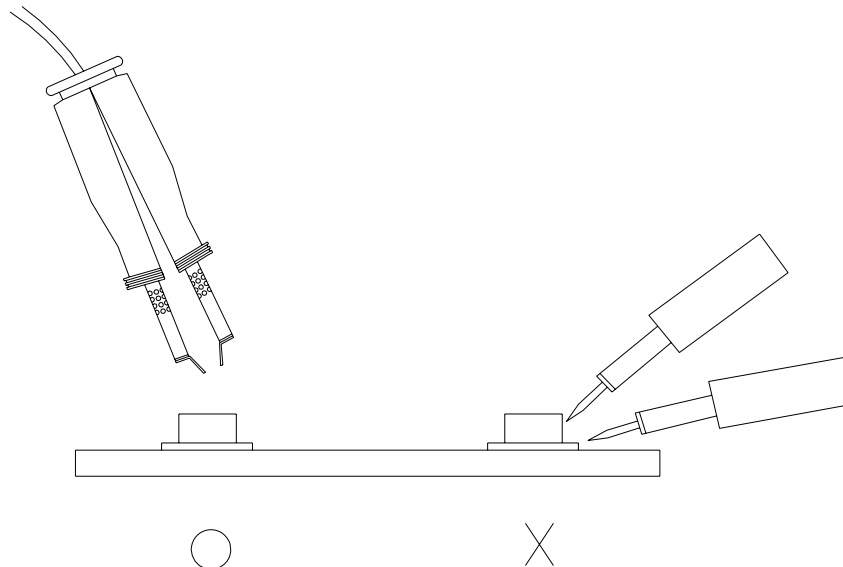
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4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 280°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.



EVERLIGHT ELECTRONICS CO., LTD.
Office: No 25, Lane 76, Sec 3, Chung Yang Rd,
Tucheng, Taipei 236, Taiwan, R.O.C

Tel: 886-2-2267-2000, 2267-9936
Fax: 886-2267-6244, 2267-6189, 2267-6306
<http://www.everlight.com>