

## Technical Data Sheet

### Mini Top LEDs (Reverse Gull Wing)

#### 65-21/S2C-AR2T2B/3AA

#### 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 65-21 series is available in soft orange, green, blue, and yellow. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. Besides, LED is mounted top down and emits through the PCB. This feature makes the ideal for light pipe application.

#### 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

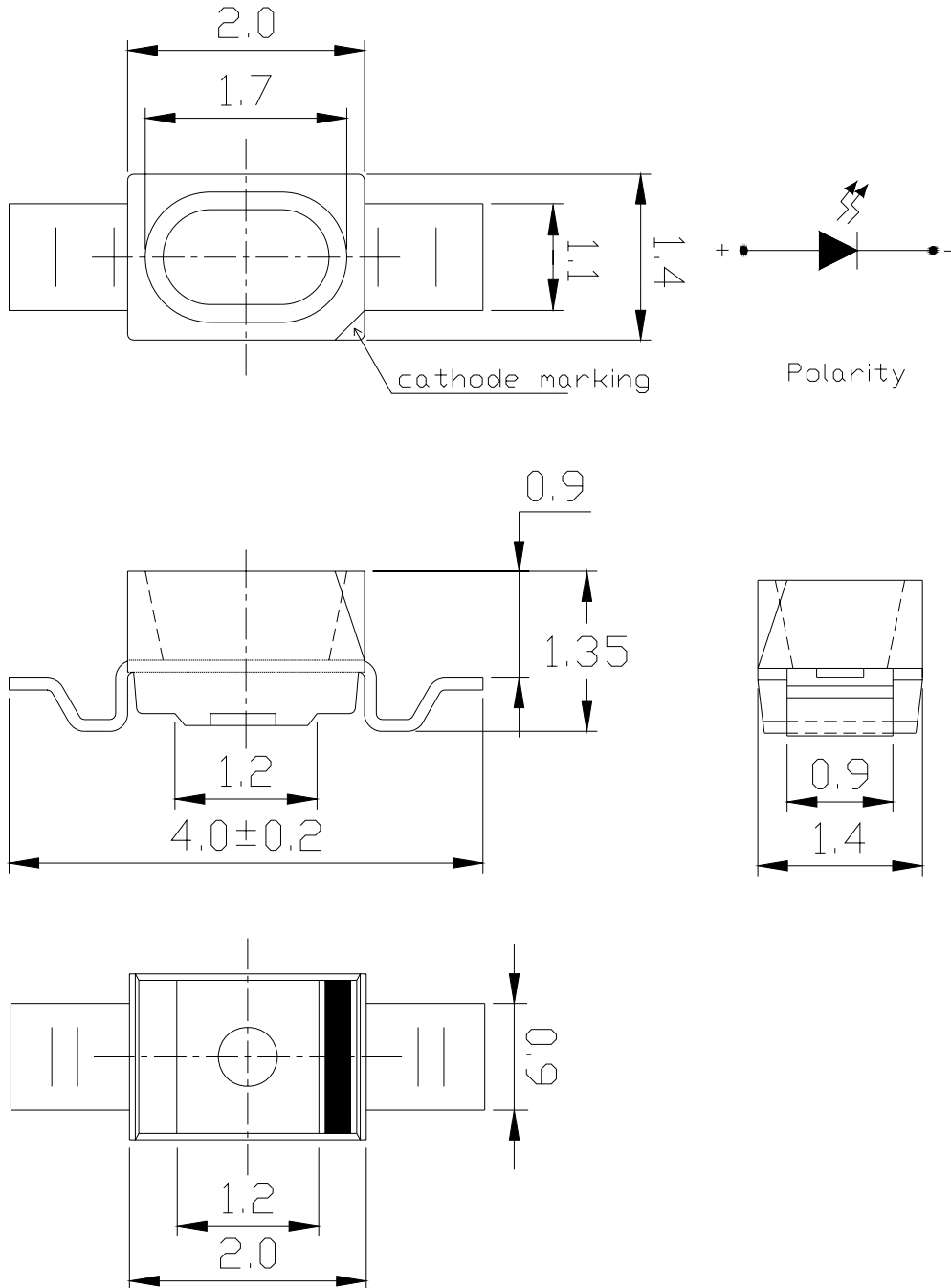
Chip	Emitted Color	Resin Color
Material		
AlGaInP	Brilliant Orange	Water Clear

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Package Outline Dimensions



**Notes:** All dimensions are in millimeters.

Tolerances unspecified are  $\pm 0.1$  mm.

**Technical Data Sheet****Mini Top LEDs (Reverse Gull Wing)****65-21/S2C-AR2T2B/3AA****Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Forward Current	I <sub>F</sub>	50	mA
Peak Forward Current (Duty 1/10 @1KHz)	I <sub>FP</sub>	100	mA
Power Dissipation	P <sub>d</sub>	120	mW
Electrostatic Discharge(HBM)	ESD	2000	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 <sub>v</sub>	140	-----	450	mcd	I <sub>F</sub> =20mA
Viewing Angle	2θ 1/2	-----	120	-----	deg	I <sub>F</sub> =20mA
Peak Wavelength	λ <sub>p</sub>	-----	611	-----	nm	I <sub>F</sub> =20mA
Dominant Wavelength	λ <sub>d</sub>	600.5	-----	612.5	nm	I <sub>F</sub> =20mA
Spectrum Radiation Bandwidth	Δλ	-----	20	-----	nm	I <sub>F</sub> =20mA
Forward Voltage	V <sub>F</sub>	1.75	-----	2.35	V	I <sub>F</sub> =20mA
Reverse Current	I <sub>R</sub>	-----	-----	10	μA	V <sub>R</sub> =5V

**Notes:**

1. Tolerance of Luminous Intensity ±11%
2. Tolerance of dominant wavelength ±1nm.
3. Tolerance of Forward Voltage ±0.1V

**Technical Data Sheet****Mini Top LEDs (Reverse Gull Wing)****65-21/S2C-AR2T2B/3AA****Bin Range of Luminous Intensity**

Bin Code	Min.	Max.	Unit	Condition
R2	140	180	mcd	I <sub>F</sub> =20mA
S1	180	225		
S2	225	285		
T1	285	360		
T2	360	450		

**Bin Range of Dom. Wavelength**

Group	Bin	Min	Max	Unit	Condition
A	D8	600.5	603.5	nm	I <sub>F</sub> =20mA
	D9	603.5	606.5		
	D10	606.5	609.5		
	D11	609.5	612.5		

**Bin Range of Forward Voltage**

Group	Bin	Min	Max	Unit	Condition
B	0	1.75	1.95	V	I <sub>F</sub> =20mA
	1	1.95	2.15		
	2	2.15	2.35		

**Notes:**

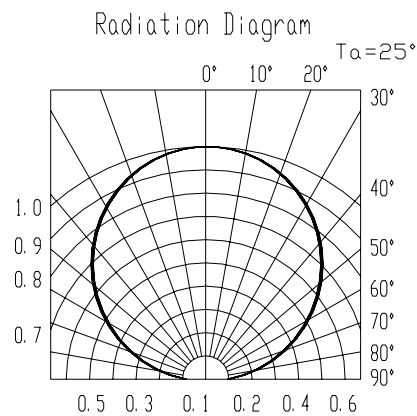
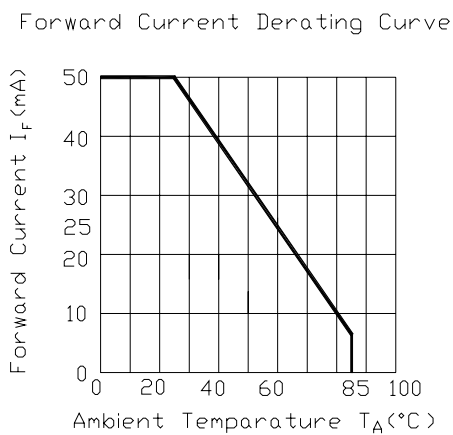
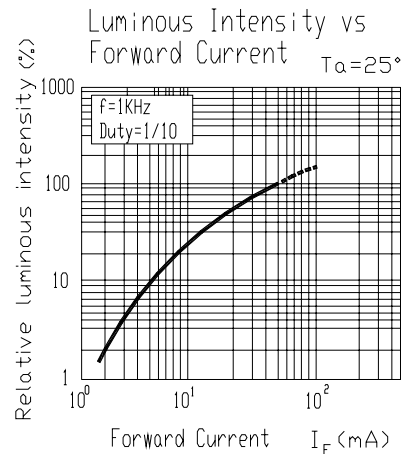
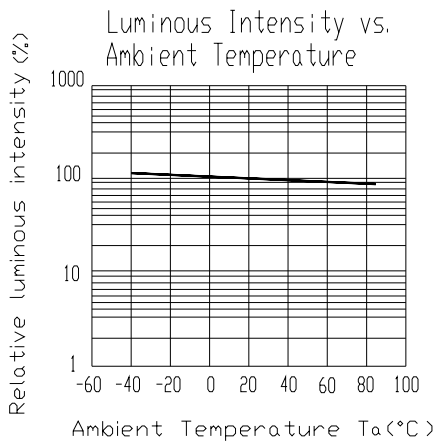
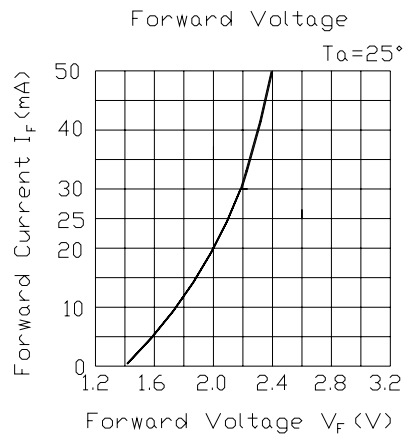
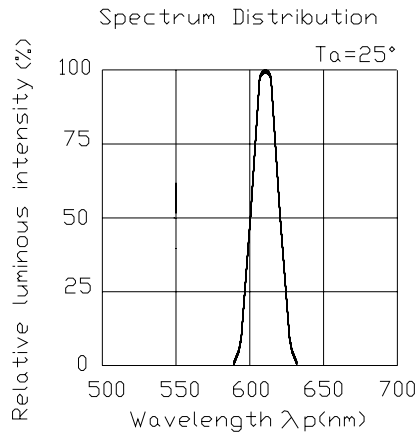
- 1.Tolerance of Luminous Intensity  $\pm 11\%$
- 2.Tolerance of dominant wavelength  $\pm 1\text{nm}$ .
- 3.Tolerance of Forward Voltage  $\pm 0.1\text{V}$

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**65-21/S2C-AR2T2B/3AA**

Typical Electro-Optical Characteristics Curves





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Mini Top LEDs (Reverse Gull Wing)

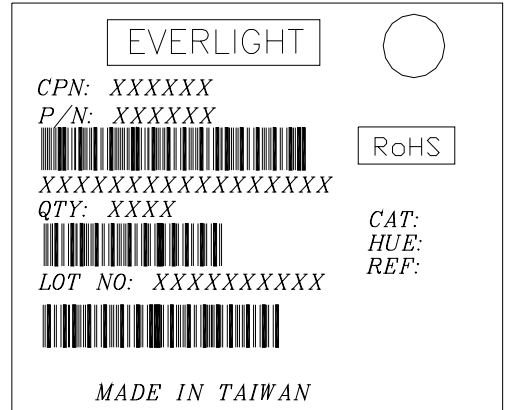
**65-21/S2C-AR2T2B/3AA**

Label explanation

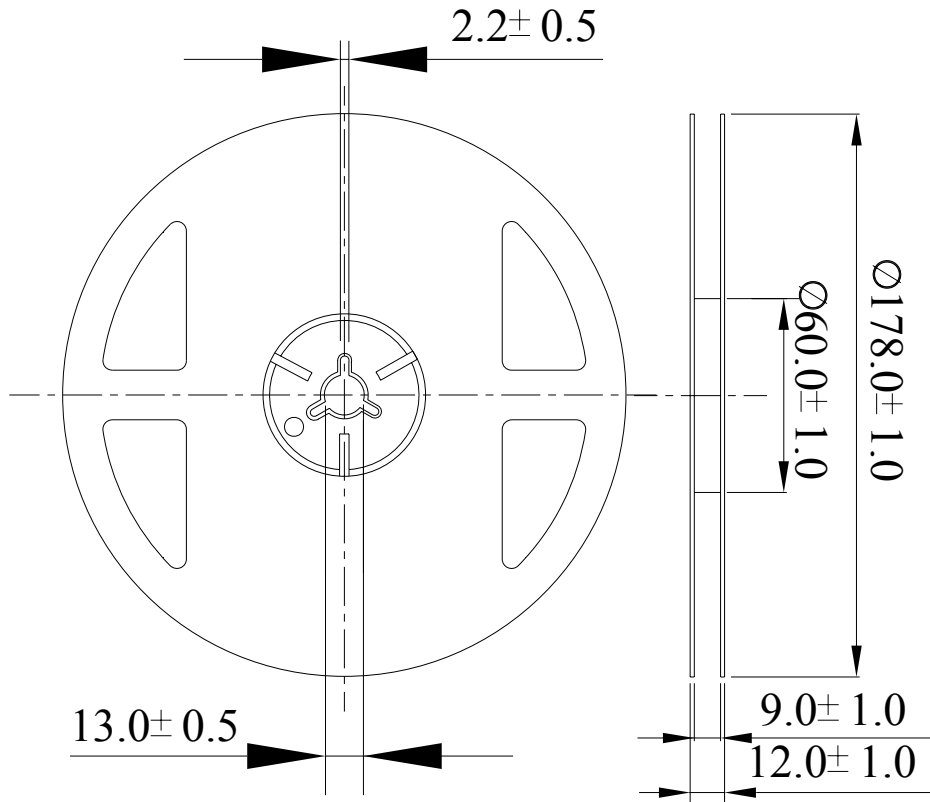
**CAT:** Luminous Intensity Rank

**HUE:** Dom. Wavelength Rank

**REF:** Forward Voltage Rank



Reel Dimensions



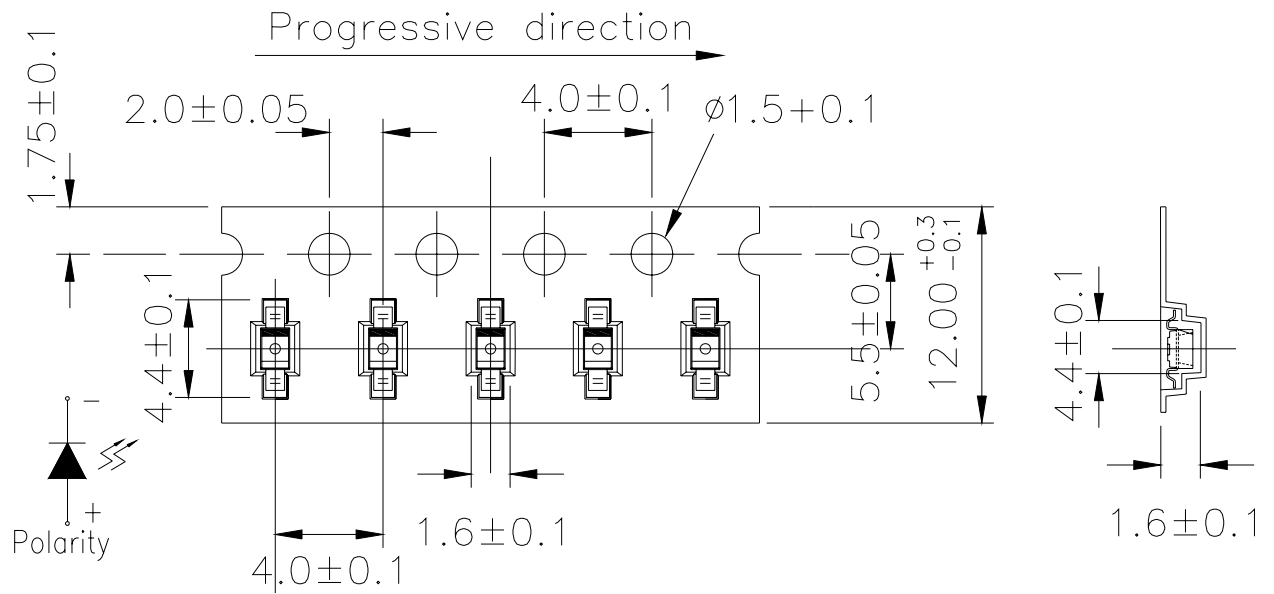
Note : Tolerances unless dimension ±0.1mm. Unit = mm

**Technical Data Sheet**

**Mini Top LEDs (Reverse Gull Wing)**

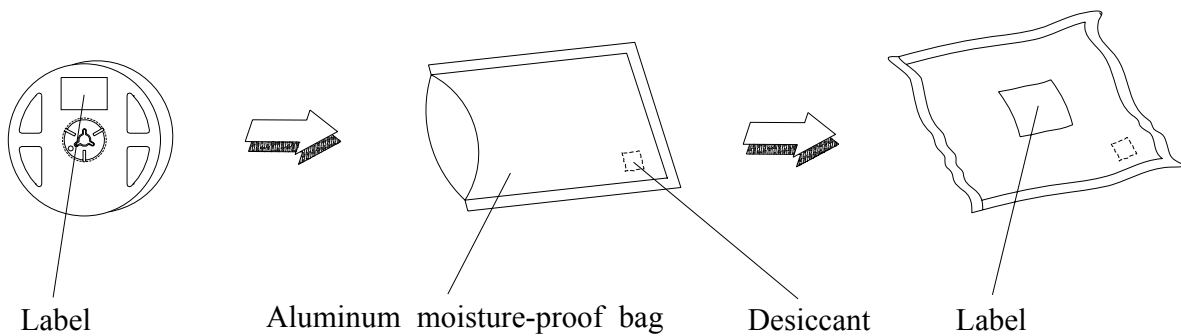
**65-21/S2C-AR2T2B/3AA**

**Carrier Tape Dimensions; Loaded quantity per reel 3000 PCS/reel**



**Note:** The tolerances unless mentioned is  $\pm 0.1$ mm, Unit = mm

**Moisture Resistant Packaging**



**Technical Data Sheet****Mini Top LEDs (Reverse Gull Wing)****65-21/S2C-AR2T2B/3AA****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 <sub>F</sub> = 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.

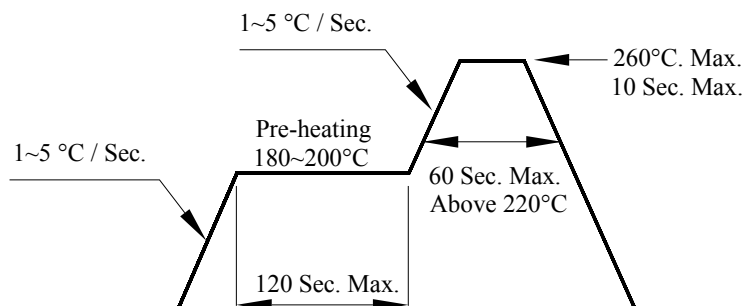
If unused LEDs remain, it should be stored in moisture proof packages.

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.

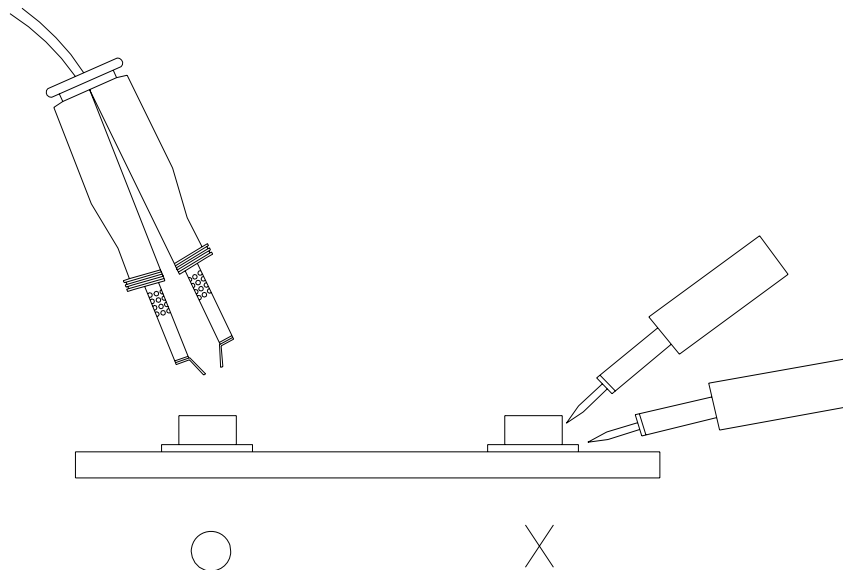
3.4 After soldering, do not warp the circuit board.

**Technical Data Sheet****Mini Top LEDs (Reverse Gull Wing)****65-21/S2C-AR2T2B/3AA****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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