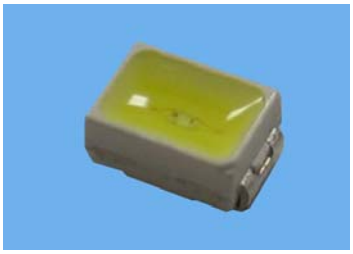
Technical Data Sheet

Top View LEDs

45-21UMC/S856-5/TR8

Features



- Top View White LEDs
- Lead frame package with individual 2 pins
- Wide viewing angle
- Soldering methods: IR reflow soldering
- Pb-free
- The product itself will remain within RoHS compliant version.

Descriptions

- Due to the package design, 45-21 has wide viewing angle, low power consumption and white LEDs are devices which are materialized by combing blue chips and special phosphor. This feature makes the LED ideal for light guide application.

Applications

- LCD back light
- Mobile phones
- Indicators
- Illuminations
- Switch Lights

Device Selection Guide

Chip Material	Emitted Color	Resin Color
InGaN	White	Water Clear

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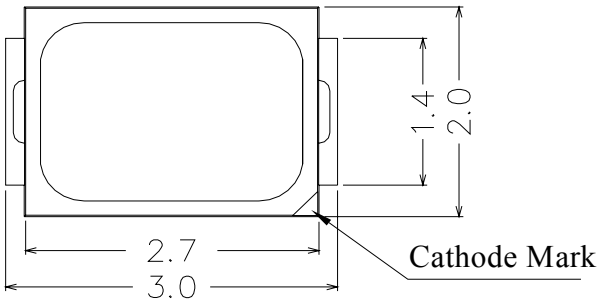
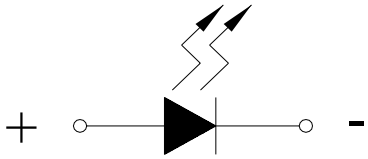
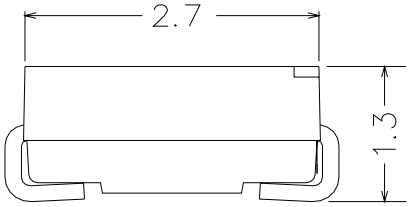
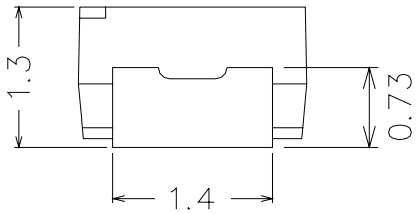
Package Outline Dimensions

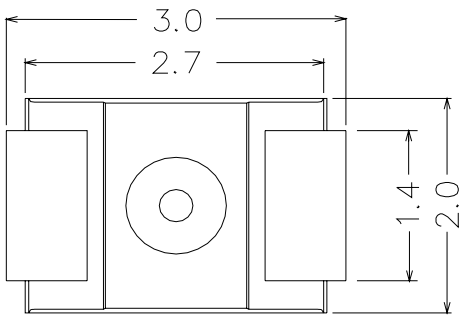


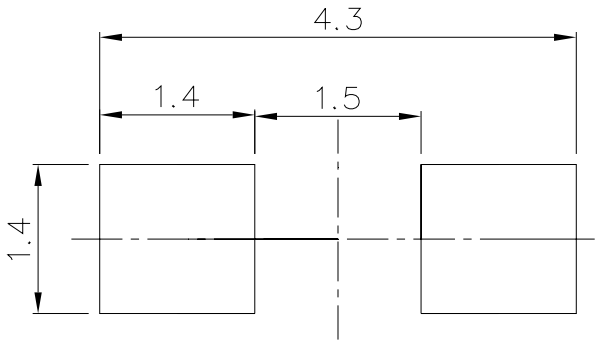


Polarity









Recommended soldering pad design

Note: Tolerances unless dimension are ±0.1mm, unit = mm.

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Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	100	mA
Power Dissipation	Pd	110	mW
Electrostatic Discharge(HBM)*[1]	ESD	1000	V
Operating Temperature	Topr	-40 ~ +85	℃
Storage Temperature	Tstg	-40 ~ +90	℃
Soldering Temperature	Tsol	Reflow Soldering: 260 ℃ for 10 sec. Hand Soldering: 350 ℃ for 3 sec.	

Note: The products are sensitive to static electricity and must be carefully taken when handling products.

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_V	1800	-----	2300	mcd	I_F=20mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=20mA
Forward Voltage	V_F	3.00	-----	3.40	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: ± 0.05V

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Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
B	1800	2050	mcd	I_F=20mA
C	2050	2300		

Note: Tolerance of Luminous Intensity: ±11%

Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
37	3.00	3.10	V	I_F=20mA
38	3.10	3.20		
39	3.20	3.30		
40	3.30	3.40		

Note: Tolerance of Forward Voltage: ±0.05V

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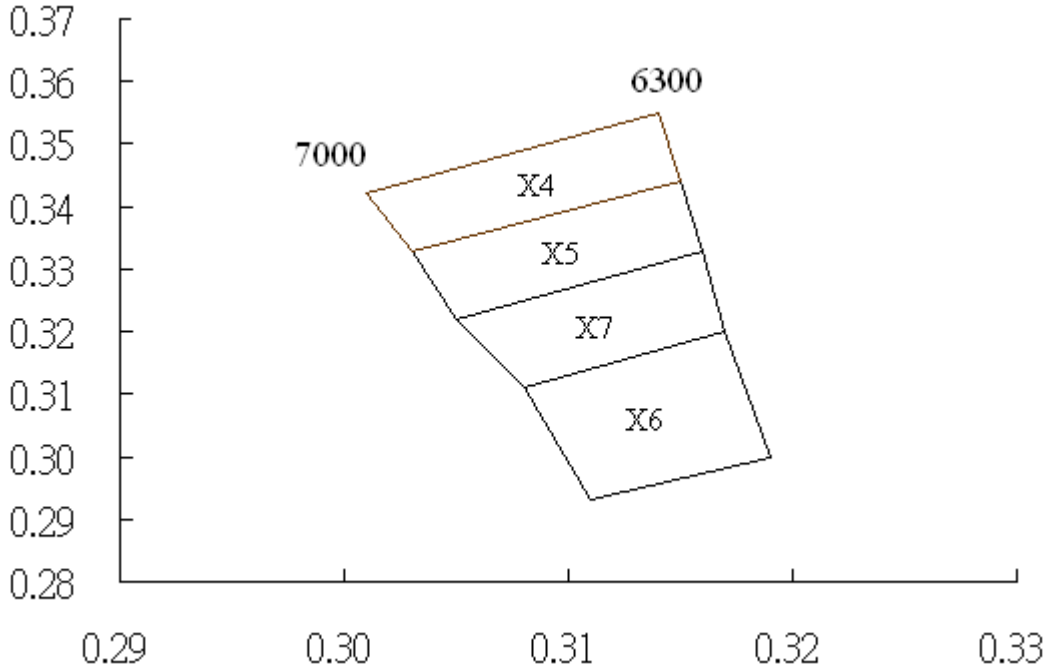
Bin Range of Chromaticity Coordinates

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
X4	0.3010	0.3420	X6	0.3080	0.3110
	0.3140	0.3550		0.3050	0.3220
	0.3150	0.3440		0.3160	0.3330
	0.3030	0.3330		0.3170	0.3200
X5	0.3050	0.3220	X7	0.3080	0.3110
	0.3030	0.3330		0.3170	0.3200
	0.3150	0.3440		0.3190	0.3000
	0.3160	0.3330		0.3110	0.2930

Note: Tolerance of Chromaticity Coordinates: ±0.005

The C.I.E. 1931 Chromaticity Diagram



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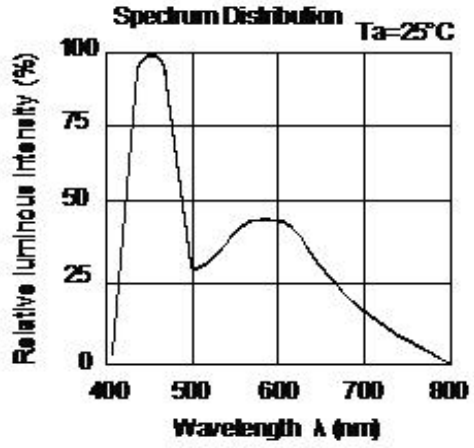
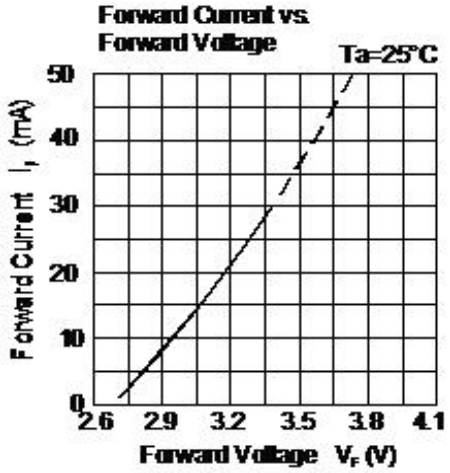
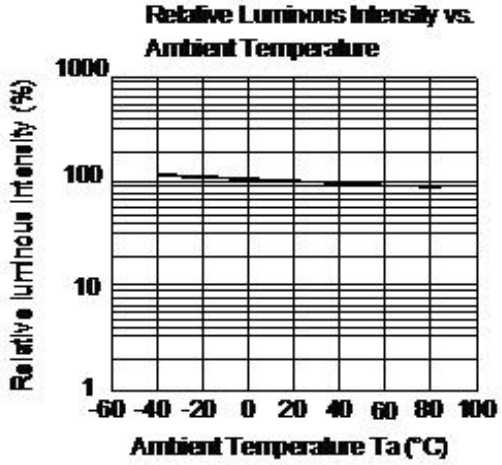
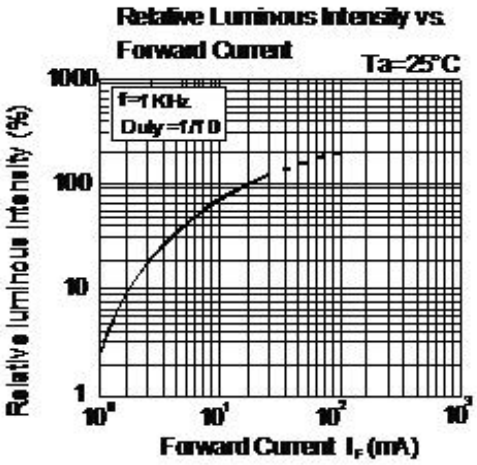
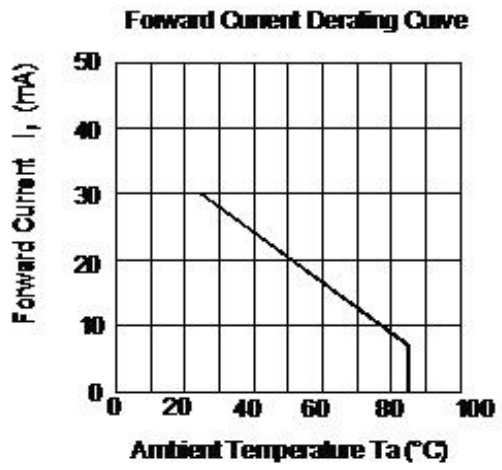
Typical Electro-Optical Characteristics Curves

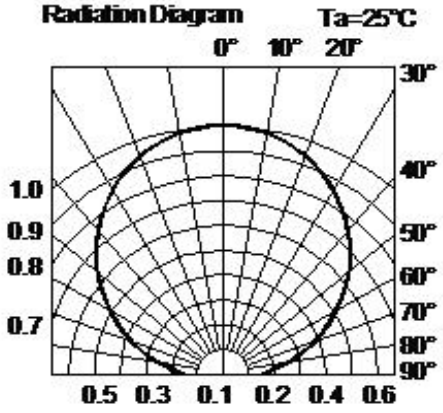












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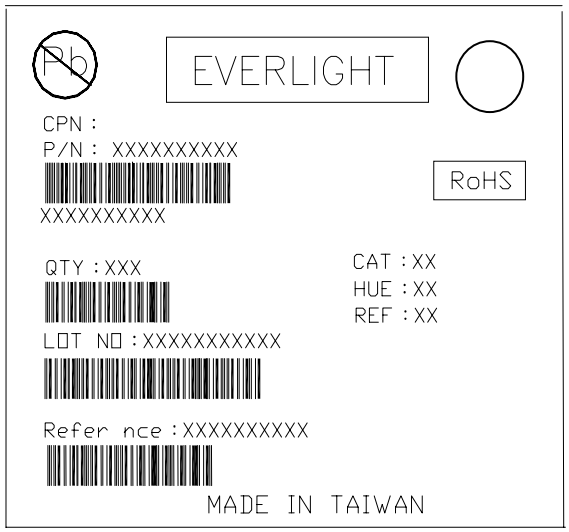
Label Explanation

CAT: Luminous Intensity Rank

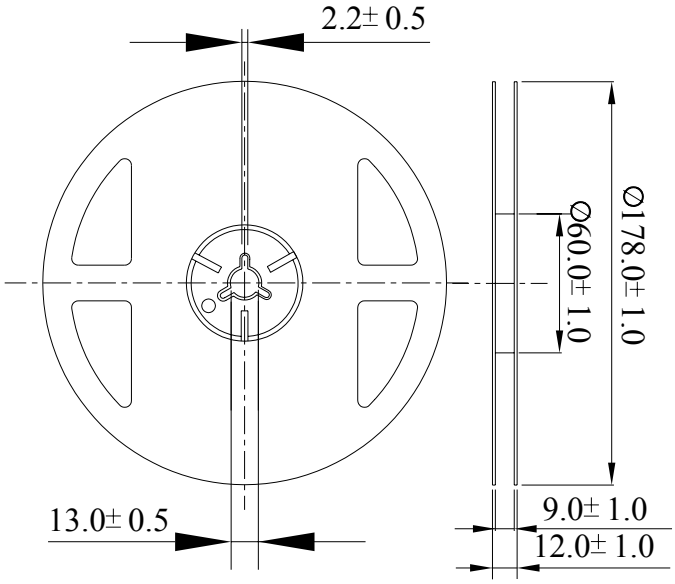
HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



e

Reel Dimensions



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

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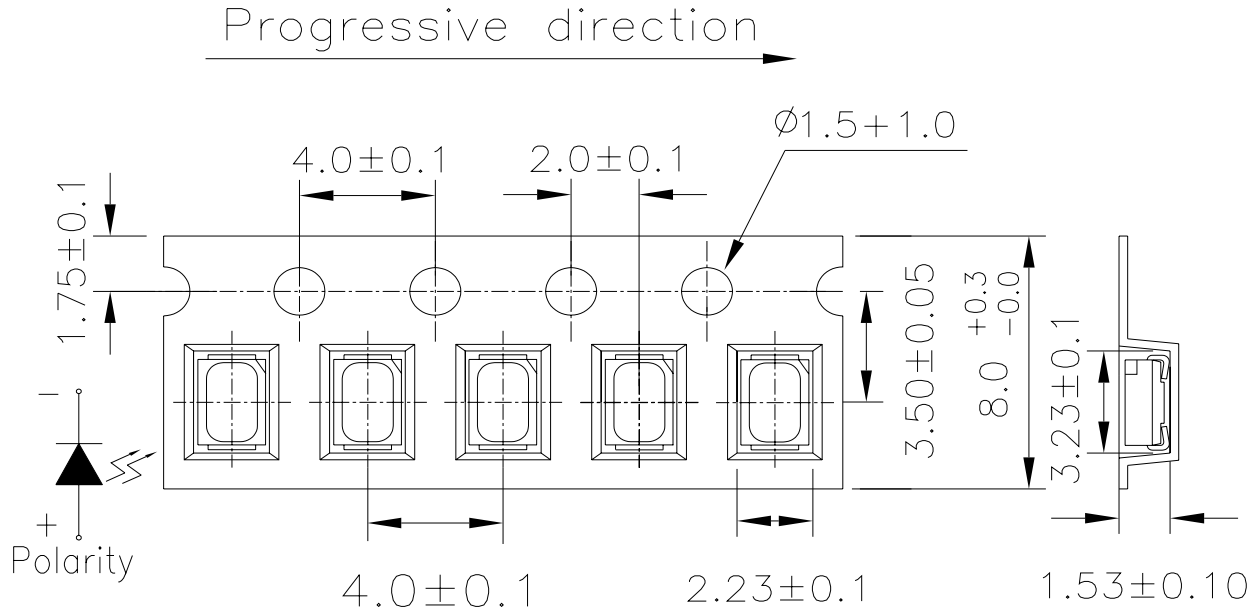
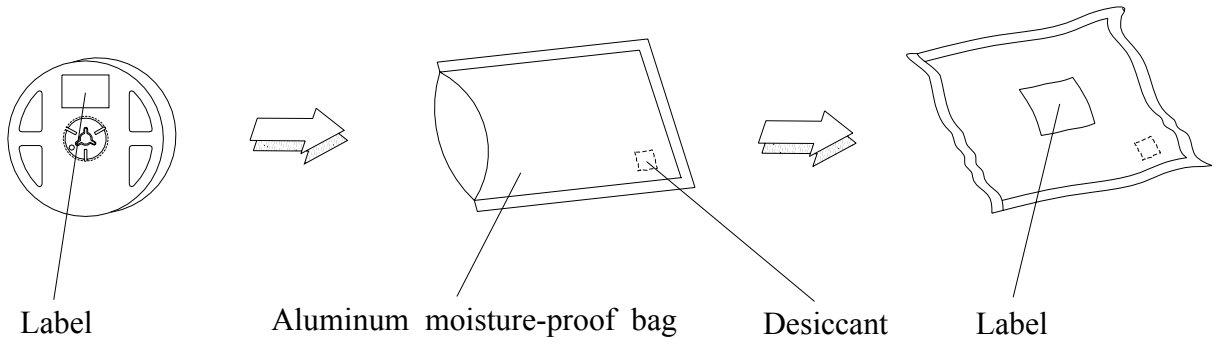
Carrier Tape Dimensions: Loaded Quantity 2000 pcs. Per Reel



Note: Tolerances unless dimension are ±0.1mm, unit = mm.

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℃±5℃ Min. 10 sec.	6 Min.	22 PCS.	0/1
2	Temperature Cycle	H : +100℃ 15min ∫ 5 min L : -40℃ 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100℃ 5min ∫ 10 sec L : -10℃ 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100℃	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40℃	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	I_F = 20 mA / 25℃	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85℃/85%RH	1000 Hrs.	22 PCS.	0/1

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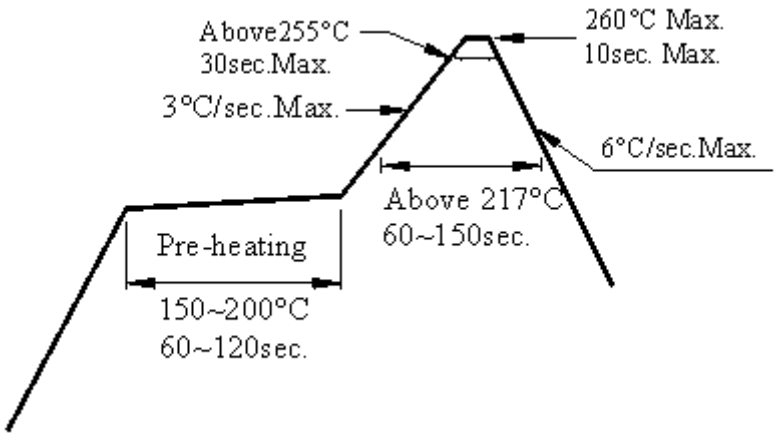
Precautions for Use

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℃ or less and 90%RH or less.
   2.3 After opening the package: The LED's floor life is 1 year under 30℃ 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℃ for 24 hours.

3. Soldering Condition
   3.1 Pb-free solder temperature profile



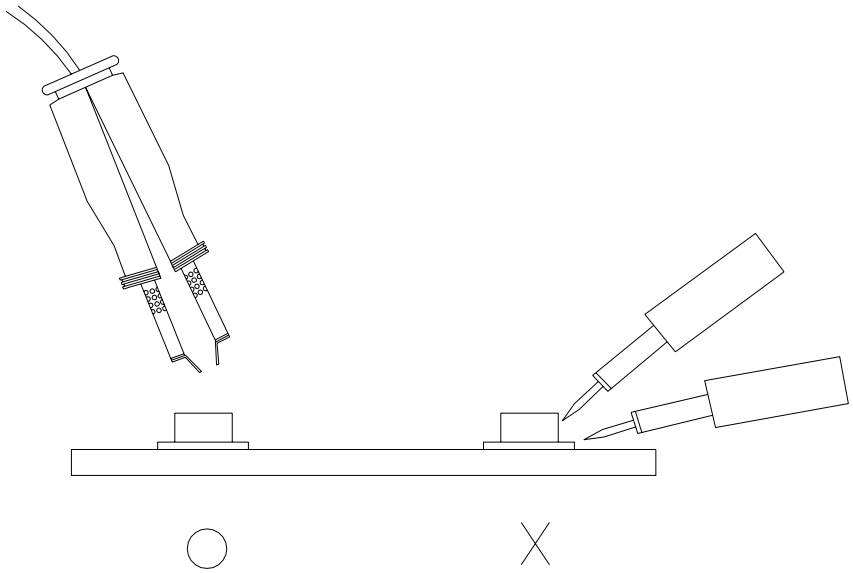
   3.2 Reflow soldering should not be done more than two times.
   3.3 When soldering, do not put stress on the LEDs during heating.
   3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350℃ 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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