EVERLIGHT ELECTRONICS CO.,LTD.

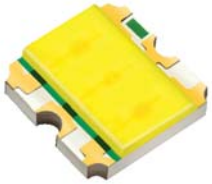
# Technical Data Sheet

# Luminosity White Color LED

**47-23UWD/TR8**

## Features

- Super luminosity white LED.
- Built in 3 LED chips.
- Wide viewing angle.
- Soldering methods: Reflow soldering.
- High performance.
- Package in 12mm tape on 7″ diameter reel.
- Pb-free.
- The product itself will remain within RoHS compliant version.



## Descriptions

- The 47-23 SMD LED is much smaller than lead frame type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.
- Besides, lightweight makes them ideal for miniature applications. etc.

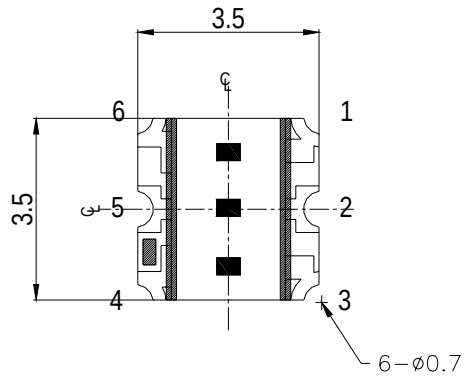
## Applications

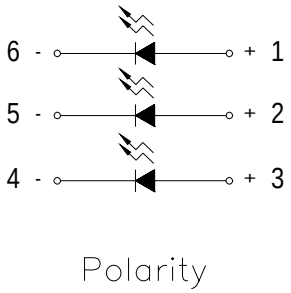
- Amusement equipment.
- Information boards.
- Flashlight for digital camera of cellular phone.
- Lighting for small size device.

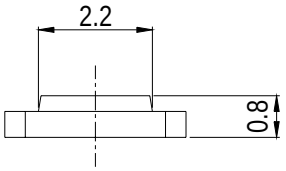
## Device Selection Guide

| Chip | | Lens Color |
|---|---|---|
| **Material** | **Emitted Color** | |
| InGaN | White | Yellow diffused |

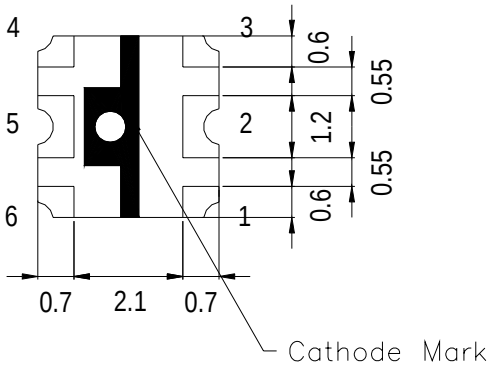
## Package Outline Dimensions

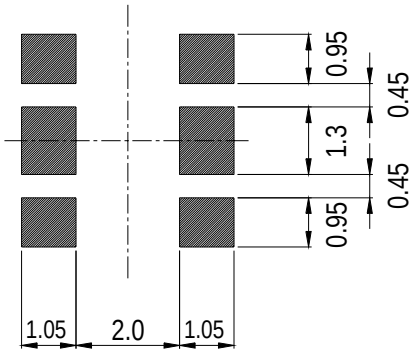



For Reflow Soldering(Propose)




**Note:** The tolerance unless mentioned is ±0.1mm ,unit is mm

## Absolute Maximum Ratings (Ta=25℃)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Reverse Voltage | $V_R$ | 5 | V |
| Forward Current | $I_F$ | 30 | mA |
| Operating Temperature | Topr | -40 ~ +85 | ℃ |
| Storage Temperature | Tstg | -40 ~ +90 | ℃ |
| Electrostatic Discharge(HBM) | ESD | 1000 | V |
| Power Dissipation | Pd | 111 | mW |
| Peak Forward Current (Duty 1/10 @400ms) | $I_{FP}$ | 100 | mA |
| Soldering Temperature | Tsol | Reflow Soldering : 260 ℃ for 10 sec.<br>Hand Soldering : 350 ℃ for 3 sec. | |

*. The value is based on the 1-die performance.

## Electro-Optical Characteristics (Ta=25℃)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|
| Luminous Intensity*1 | Iv | 1500 | 2000 | ----- | mcd | $I_F$=20mA*2 |
| Viewing Angle*1 | $2\theta_{1/2}$ | ----- | 130 | ----- | deg | |
| Forward Voltage*2 | $V_F$ | 2.7 | ----- | 3.7 | V | |
| Reverse Current*2 | $I_R$ | ----- | ----- | 50 | $\mu$A | $V_R$=5V*2 |

*1 When three LED dies are operated simultaneously.

*2 For each die.

Note:

1. The products are sensitive to static electricity and care must be fully taken when handling products.
2. We only guarantee the ESD <1000V after customer to process.

**Color Ranks**

| | Rank A0 | | | |
|---|---|---|---|---|
| x | 0.280 | 0.264 | 0.283 | 0.296 |
| y | 0.248 | 0.267 | 0.305 | 0.276 |

| | Rank B3 | | | |
|---|---|---|---|---|
| x | 0.287 | 0.283 | 0.304 | 0.307 |
| y | 0.295 | 0.305 | 0.330 | 0.315 |

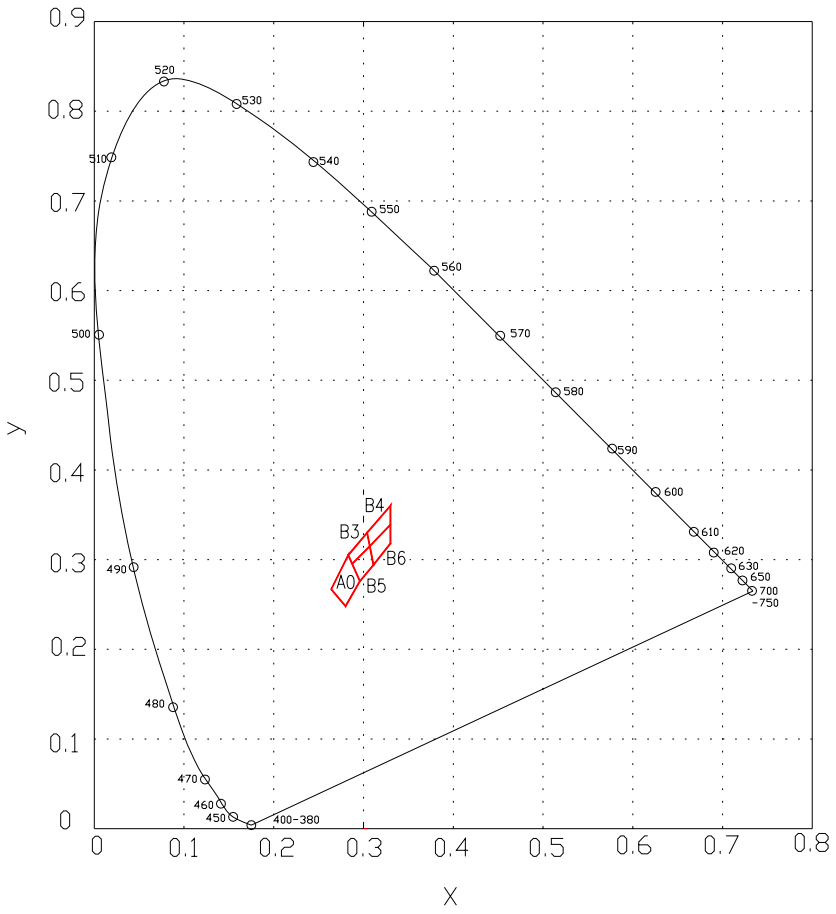
| | Rank B4 | | | |
|---|---|---|---|---|
| x | 0.307 | 0.304 | 0.330 | 0.330 |
| y | 0.315 | 0.330 | 0.360 | 0.339 |

| | Rank B5 | | | |
|---|---|---|---|---|
| x | 0.296 | 0.287 | 0.307 | 0.311 |
| y | 0.276 | 0.295 | 0.315 | 0.294 |

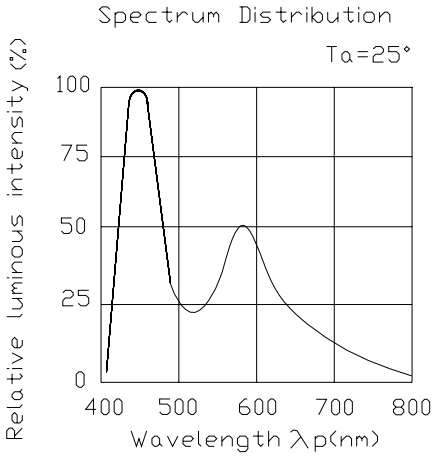
| | Rank B6 | | | |
|---|---|---|---|---|
| x | 0.311 | 0.307 | 0.330 | 0.330 |
| y | 0.294 | 0.315 | 0.339 | 0.318 |

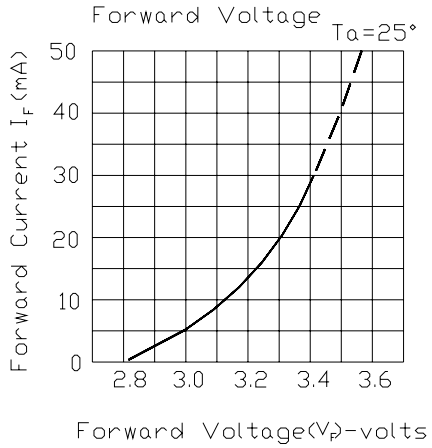
*The C.I.E. 1931 chromaticity diagram ( Tolerance ±0.01).

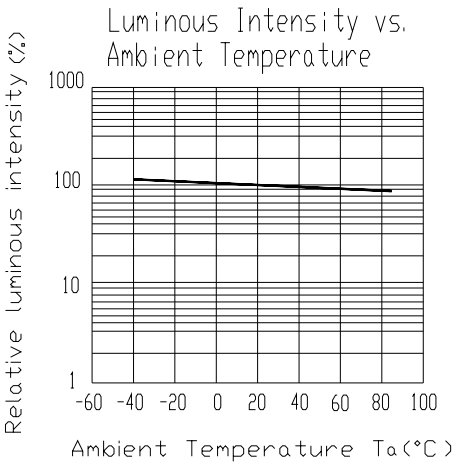
## CIE Chromaticity Diagram

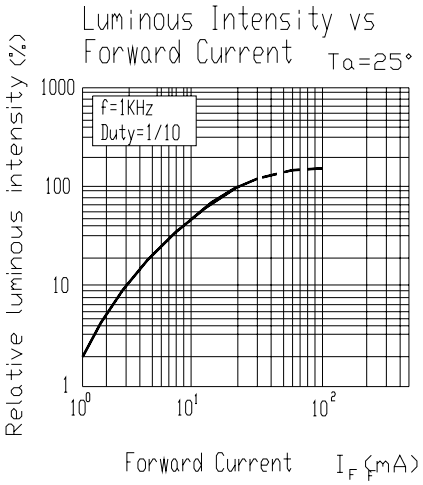


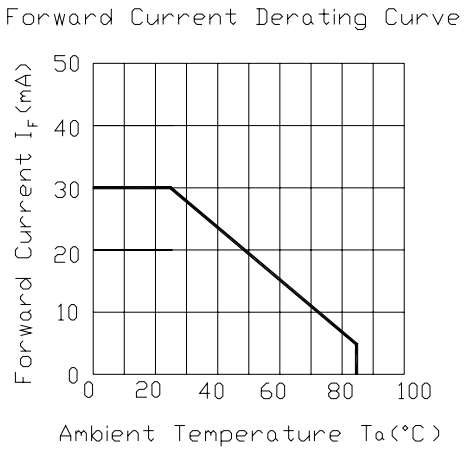
## Typical Electro-Optical Characteristics Curves

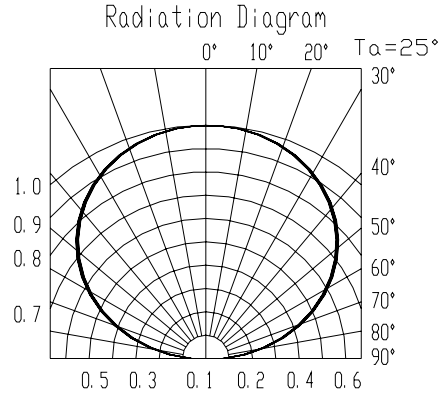


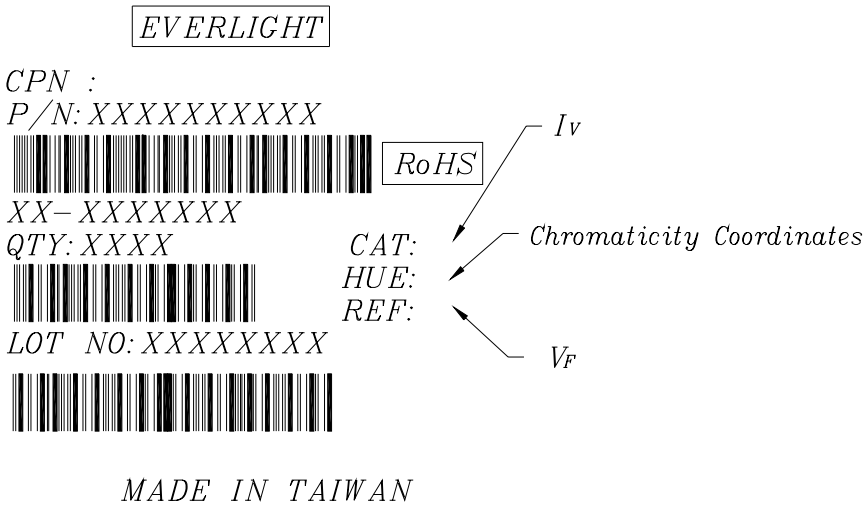



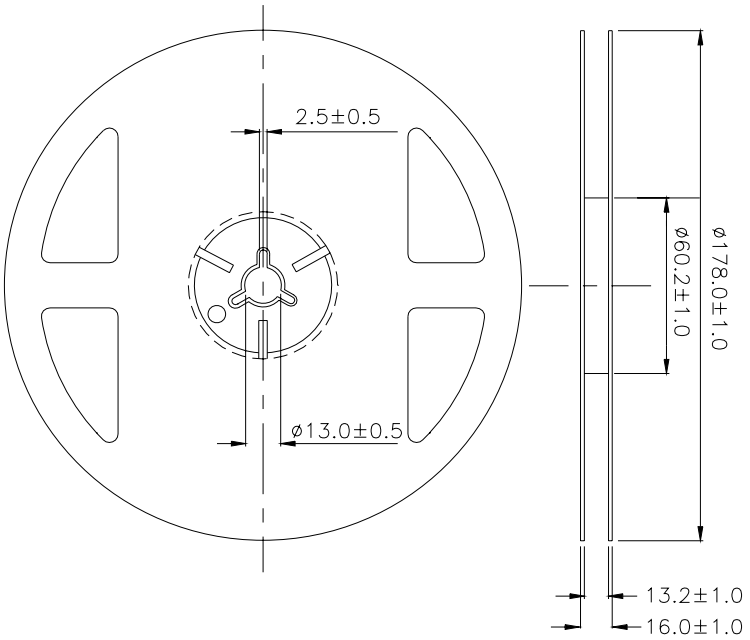



## Label explanation

**CAT: Luminous Intensity Rank HUE: Chromaticity Coordinates REF: Forward Voltage Rank**

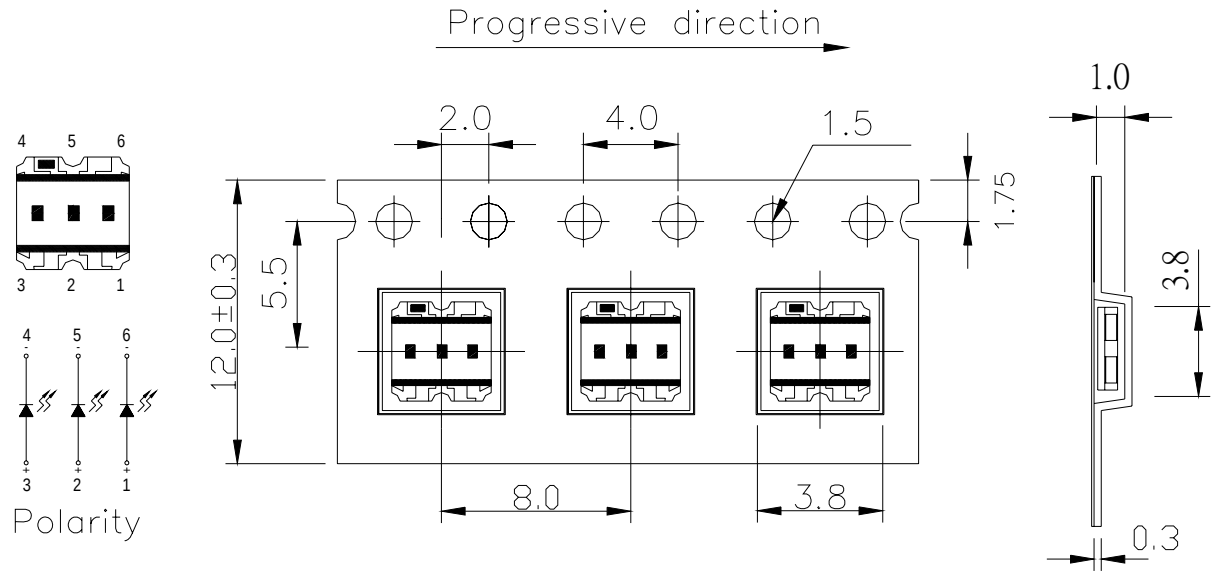



## Reel Dimensions




**Note:** The tolerance unless mentioned is ±0.1mm ,unit is mm

## Carrier Tape Dimensions: Taping Quantity: 1000 pcs

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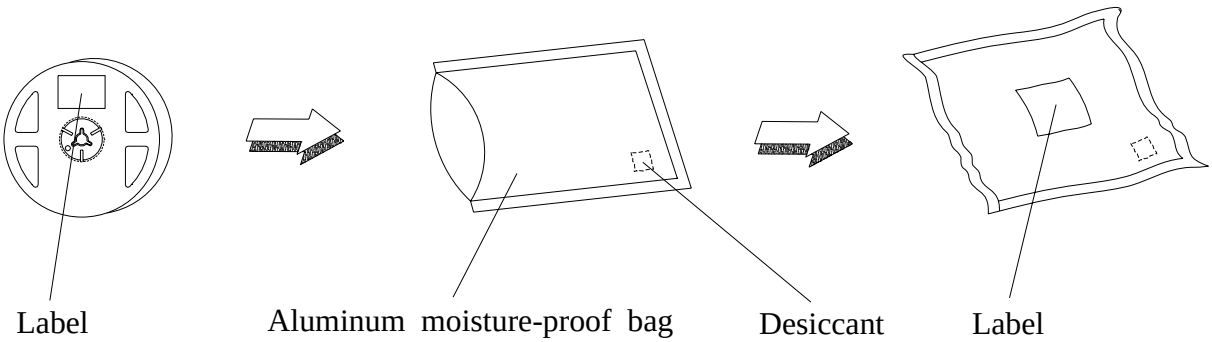
## Moisture Resistant Packaging



## 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℃±5℃<br>Min. 5sec. | 6 Min. | 22 PCS. | 0/1 |
| 2 | Temperature Cycle | H : +100℃ 15min<br>∫ 5 min<br>L : -40℃ 15min | 300 Cycles | 22 PCS. | 0/1 |
| 3 | Thermal Shock | H : +100℃ 5min<br>∫ 10 sec<br>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 | 1000 Hrs. | 22 PCS. | 0/1 |
| 7 | High Temperature / High Humidity | 85℃/ 85%RH | 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.

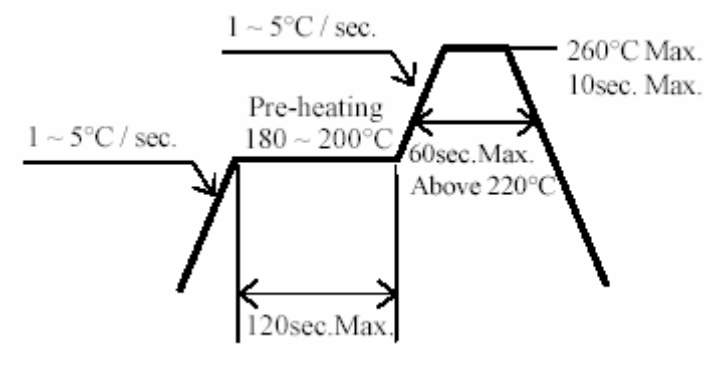
   2.2 Before opening the package: The LEDs should be kept at 30℃ or less and 90%RH or less.

   2.3 After opening the package: The LED's floor life is 1 year under 30 deg 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℃ 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.

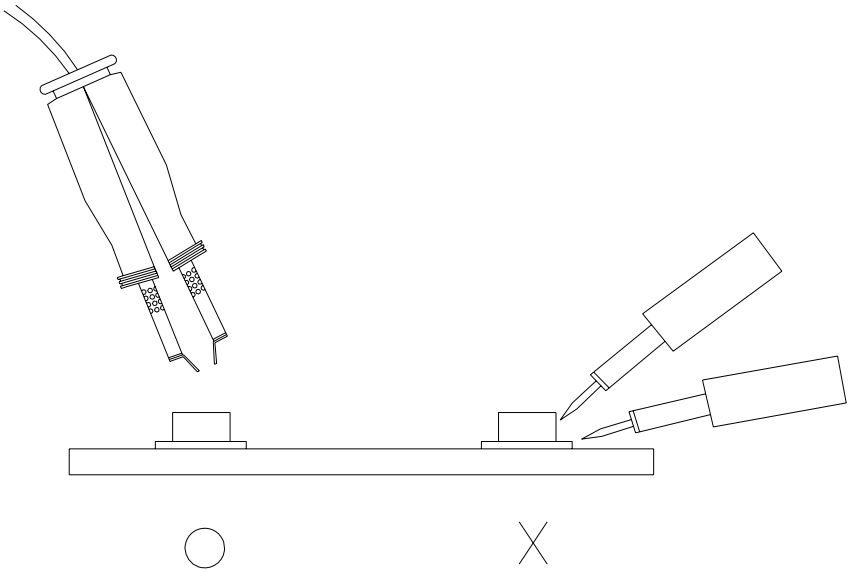
3.4 After soldering, do not warp the circuit board.

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.



***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*