



Data Sheet

Customer: _____
Part No: CL-SP150USO
Sample No: _____
Description: 3216 SMD Orange Color
Item No: _____

| Customer | | | |
|----------|------------|----------|------|
| Check | Inspection | Approval | Date |
| | | | |

■ Features:

- Compatible with automatic placement equipment
- Compatible with reflow solder process

■ Applications:

- Automotive Telecommunication
- Indicators
- LCD Back-lights
- Illuminations

| | | |
|---------------|------------------|-------------|
| Dice Material | Light Color | Lens Color |
| AlGaInP | Ultra High Amber | Water Clear |

■ Absolute Maximum Ratings
(Ta=25°C)

| Item | Symbol | Maximum | Unit |
|--|--------|------------|------|
| Power Dissipation | PD | 78 | mW |
| Continuous Forward Current | IF | 30 | mA |
| Peak Forward Current (1/10 Duty Cycle 0.1ms Pulse Width) | IFP | 100 | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temperature Range | Topr | -40 to +85 | °C |
| Storage Temperature Range | Tstg | -40 to +85 | °C |

■ Electrical / Optical Characteristics
(Ta=25°C)

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------|-------------------|-----------|------|------|------|------|
| Forward Voltage | V _F | IF=20mA | 1.8 | 2 | 2.3 | V |
| Reverse Current | IR | VR=5V | | | 10 | uA |
| Peak Emission Wavelength | λ _P | IF=20mA | | 610 | | nm |
| Dominant Wavelength | λ _D | IF=20mA | | 602 | | nm |
| Viewing Angle | 2θ _{1/2} | IF=20mA | | 140 | | Deg |
| Luminous Intensity | I _v | IF=20mA | 57 | 72 | 115 | mcd |

| | | | |
|-------|----------------|-----------|--------|
| ISSUE | DIMENSION NO : | VERSION : | DATE : |
| | APPROVAL : | CHECK : | EDIT : |

■ Packing coding principle

Bin code (e.g): J2-0-4

| Bin code | Stands For |
|----------|---------------------------|
| J2 | Luminous Intensity Grade |
| 0 | Dominant Wavelength Grade |
| 4 | Forward Voltage Grade |

■ The Luminous Intensity Grade of Ultra High Amber Chip-LED Products

Test Condition: $I_f=20\text{mA}$, $T_a=25^\circ\text{C}$

| Bin code | Range,mcd | Bin code | Range,mcd | Bin code | Range,mcd |
|----------|-----------|----------|-----------|----------|-----------|
| J2 | 57/72 | K1 | 72/90 | K2 | 90/115 |

* Luminous Intensity Tolerance: $\pm 10\%$

■ Dominant Wavelength Grade of Ultra High Amber Chip-LED Products

Test Condition: $I_f=20\text{mA}$, $T_a=25^\circ\text{C}$

| Bin code | Range, nm | Bin code | Range, nm | Bin code | Range, nm |
|----------|-----------|----------|-----------|----------|-----------|
| 0 | 598/600 | 1 | 600/602 | 2 | 602/604 |
| 3 | 604/606 | | | | |

* Dominant Wavelength Tolerance: $\pm 1\text{nm}$

■ Forward Voltage Grade of Ultra High Amber Chip-LED Products

Test Condition: $I_f=20\text{mA}$, $T_a=25^\circ\text{C}$

| Bin code | Range,V | Bin code | Range,V | Bin code | Range,V |
|----------|---------|----------|---------|----------|---------|
| 4 | 1.8/1.9 | 5 | 1.9/2.0 | 6 | 2.0/2.1 |
| 7 | 2.1/2.2 | 8 | 2.2/2.3 | | |

* Forward Voltage Tolerance: $\pm 0.1\text{V}$

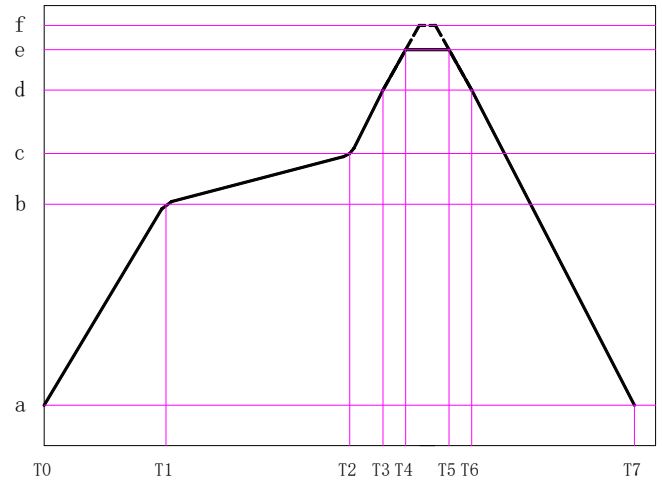
■ Reliability Test Items And Conditions

| NO. | Item | Test Conditions | Test Hours / Cycle | Sample Q'ty | Ac / Re |
|-----|----------------------------------|--|--------------------|-------------|---------|
| 1 | Solder Heat | TEMP: 260°C ± 5°C | 5 sec | 36 pcs | 0 / 1 |
| 2 | Temperature Cycle | H: +100°C 30min. ∫ 5min. L: -40°C 30min. | 50 cycle | 36 pcs | 0 / 1 |
| 3 | Thermal Shock | H: +100°C 15min. ∫ 10sec L: -40°C 15min. | 100 cycle | 36 pcs | 0 / 1 |
| 4 | High Temperature Storage | TEMP: 100°C | 1000 hrs | 36 pcs | 0 / 1 |
| 5 | Low Temperature Storage | TEMP: -40°C | 1000 hrs | 36 pcs | 0 / 1 |
| 6 | DC Operating Life | I _F =20mA | 1000 hrs | 36 pcs | 0 / 1 |
| 7 | High Temperature / High Humidity | 85°C / 90~95%R.H. | 1000 hrs | 36 pcs | 0 / 1 |

■ Reflow Temp. / Time

Please refer to the following figure:

| Temp. (°C) | Time (Sec) | |
|------------|--------------|---------------|
| a 25 | T0~T1 | Max. 3°C/sec |
| b 150 | T1~T2 | 90~130 sec |
| c 200 | T2~T4 | Max. 3°C/sec |
| d 220 | T3~T6 | Max. 50sec |
| e 245 | | |
| f Max. 260 | | Max. 10sec |
| | T5~T7 | Max. -3°C/sec |
| Blet Speed | 70~90 cm/min | |


■ Soldering Iron

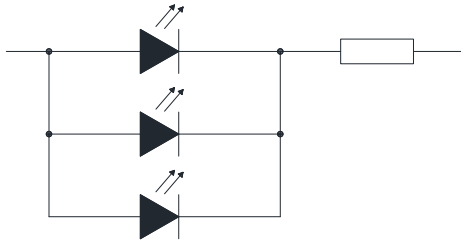
Temperature at tip of iron: 300°C Max. (25W Max.)

Soldering time: 5 ± 1sec.

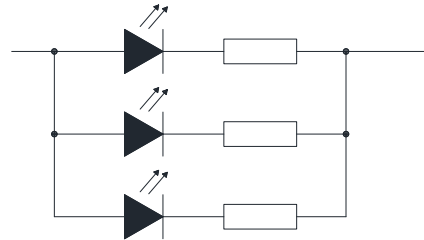
■ Precautions For Use

◆ Circuit design

1. Customer must apply resistors for protection and stable, Circuit B is recommended, If using Circuit A, the current through the LEDs may vary due to the variation in Forward Voltage characteristics of the LEDs(burn out will happen).



A (✗)

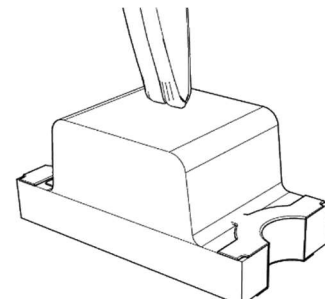
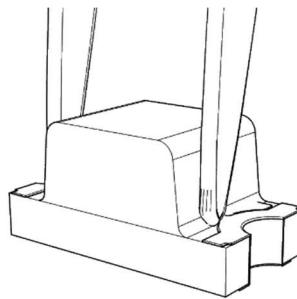
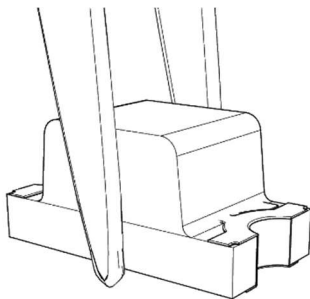


B (✓)

2. Current change may lead to LED color change. If there is a big difference among spectral color separation current and actual service current, color difference may happen.
3. This product should be operated using forward current. Subjecting it to continuous reverse voltage may cause migration, which may cause damage to the LED die.

◆ Handling Precautions

1. When handling the product with tweezers, be careful not to apply excessive force to the resin. Otherwise, the resin can be cut, chipped, delaminate or deformed, causing wire-bond breaks.



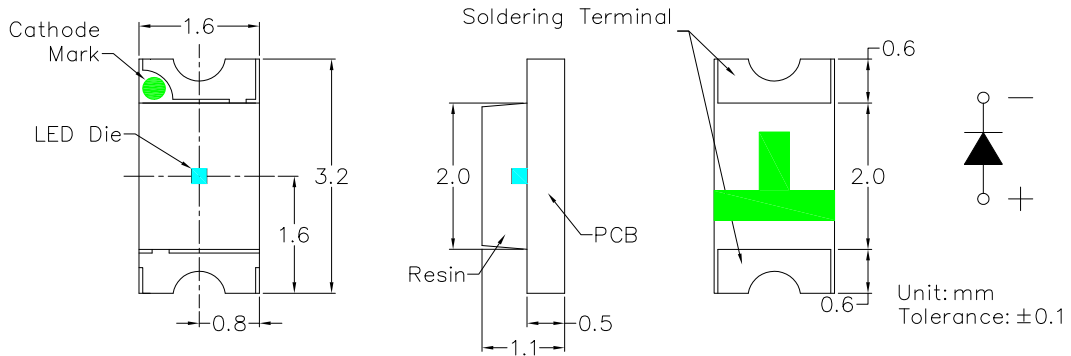
2. Reflow soldering must not be performed more than twice. Hand soldering must not be performed more than once.
3. When soldering, do not put stress on the LEDs during heating.
4. The product are sensitive to static electricity or surge voltage. ESD can damage a die and its reliability.
5. Do not stack assembled PCBs together. Failure to comply can cause the resin portion of the product to be cut, chipped, delaminated and/or deformed. It may leading to catastrophic failures.

■ Storage

1. The operation of temperature and R.H. are: $5^{\circ}\text{C} \sim 30^{\circ}\text{C}$, R.H.60% Max..
2. The LEDs should be used within a year (from production date) .
3. Once the package is opened, the products should be used within 72 hrs. Otherwise, they should be kept in a dampproof box with desiccating regent.
4. It's recommended to bake before soldering when the package is unsealed after 72 hrs. The condition is : $70^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 24hrs.

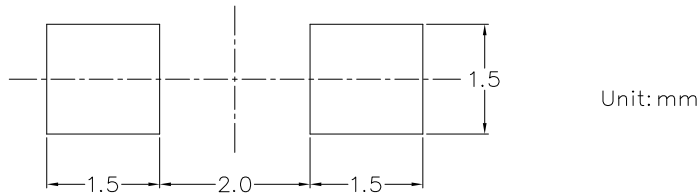
■ Package Dimensions

◆ Package Dimensions of Device (CL-SP150 Series)



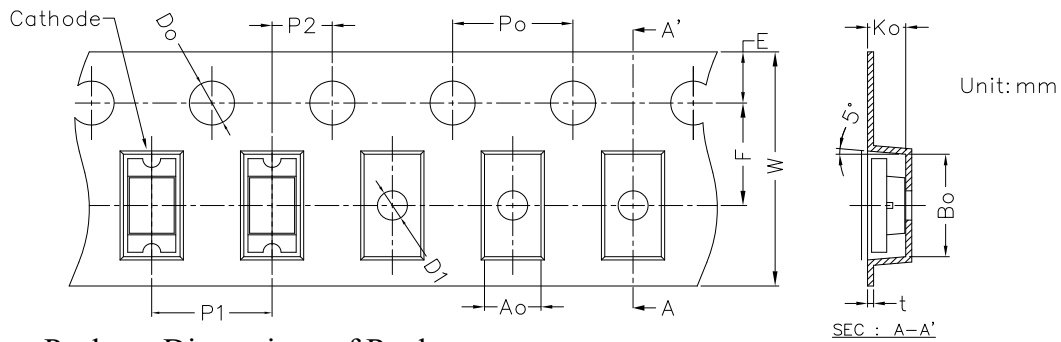
- Soldering terminal may shift in x, y direction.
- Polarity referring onto the cathode mark is reversed on the UR/HR/SR

◆ Recommended Soldering Pad Dimensions

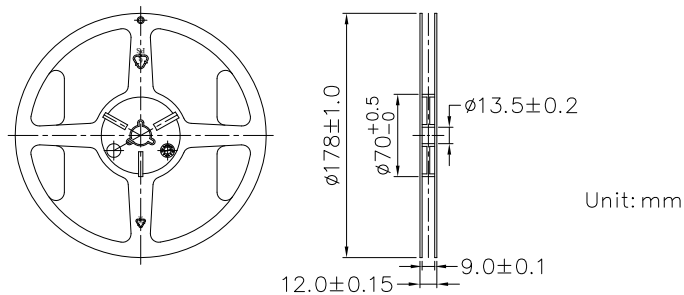


◆ Tape Specification : 3000pcs Per Reel

| Packing Size | | | | | | | | | | | | | |
|--------------|------------|------------|------------|------------|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Item | W | P1 | E | F | Do | D1 | Po | 10Po | P2 | Ao | Bo | Ko | t |
| Spec. | 8.00 | 4.00 | 1.75 | 3.50 | 1.50 | 1.00 | 4.00 | 40.00 | 2.00 | 1.85 | 3.45 | 1.27 | 0.22 |
| Tolerance | ± 0.20 | ± 0.10 | ± 0.10 | ± 0.05 | $^{+0.10}_{-0.00}$ | ± 0.05 | ± 0.05 | ± 0.20 | ± 0.05 | ± 0.10 | ± 0.10 | ± 0.10 | ± 0.05 |

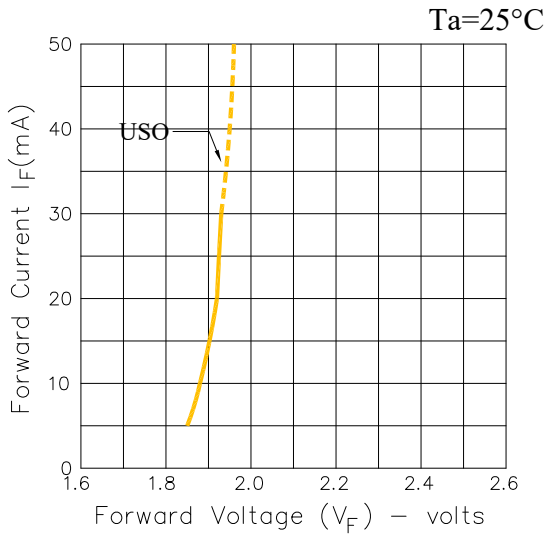


◆ Package Dimensions of Reel :

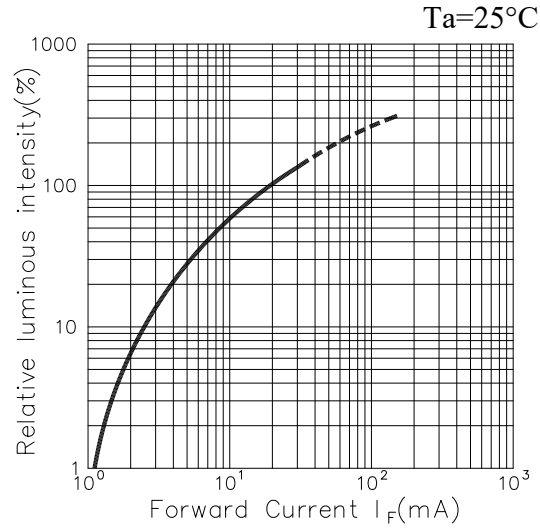


■ Typical optical characteristics curves

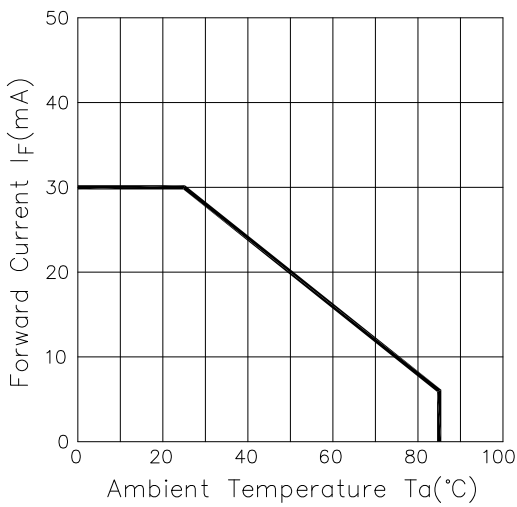
Forward Current Vs. Forward Voltage



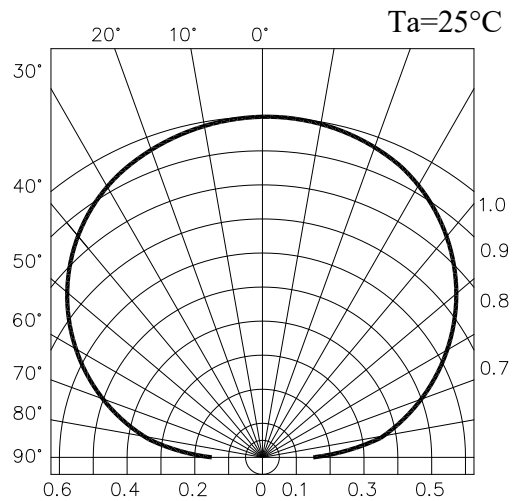
Luminous Intensity Vs. Forward Current



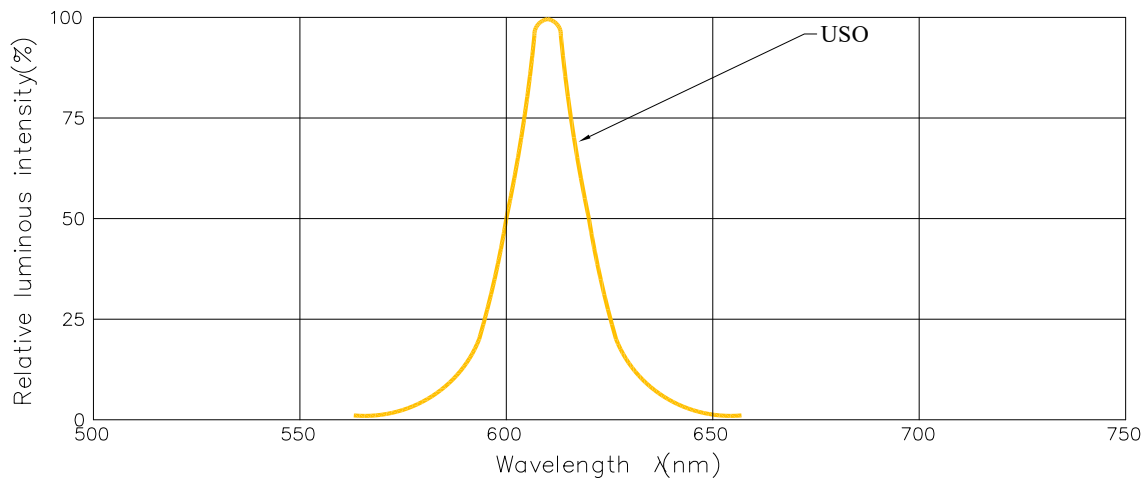
Forward Current Derating Curve



Radiation Diagram



Spectrum Distribution



■ Outer Packing Dimensions

