

# SPECIFICATION

**Product : Topview 3528 Orange SMD LED**

**Part No. : IWS-L3512-UO-K1**

**Date : 2012. 11. 08 Ver. 1.0**

| Proposed By | Checked By | Checked By | Checked By | Approval |
|-------------|------------|------------|------------|----------|
| 결재완료        |            |            |            |          |

**Comment**



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# Topview 3528 SMD LED

## IWS-L3512-UO-K1



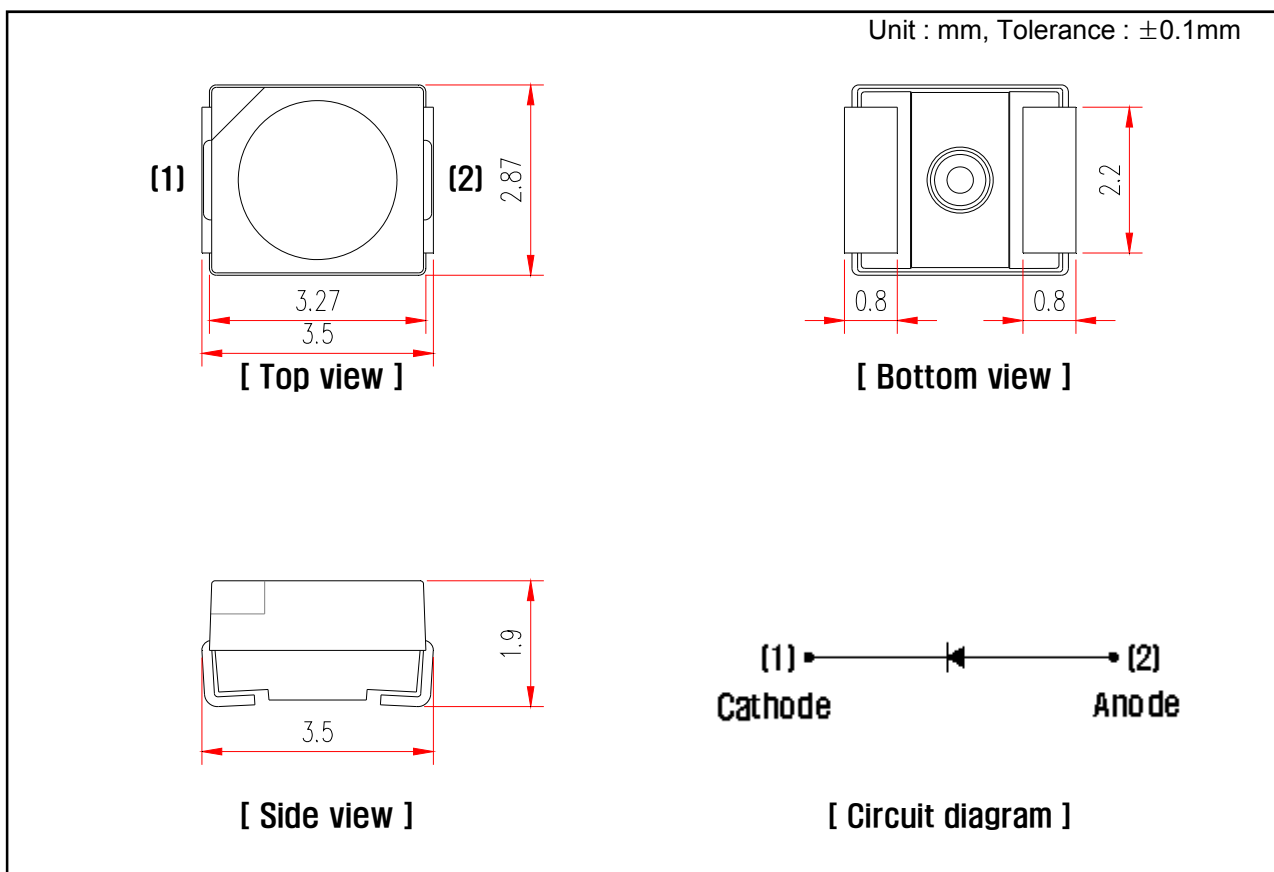
### 1. Features

- 1 Chip High-Luminosity SMD LED
- 3.5 x 2.8 x 1.9 mm (L x W x H), Small Size Surface Mount Type
- Wide Viewing Angle
- Long Operating Life

### 2. Applications

- Automotive: Backlight in Dashboard and Switch
- Lighting Device: Indicator, General Lighting
- Camera Flash, Hand Carrier Flash
- General Use

### 3. Outline Drawing and Dimension



#### Note

1. All dimensions are in millimeters
2. All dimensions without tolerances are for reference only

### 4. Absolute Maximum Ratings( $T_a = 25\text{ }^\circ\text{C}$ )

| Parameter                          | Symbol    | Value      | Unit             |
|------------------------------------|-----------|------------|------------------|
| Power Dissipation                  | $P_d$     | 72         | mW               |
| Continuous Forward Current         | $I_F$     | 30         | mA               |
| Peak Forward Current <sup>*1</sup> | $I_{FP}$  | 100        | mA               |
| Operating Temperature              | $T_{opr}$ | -30 ~ 85   | $^\circ\text{C}$ |
| Storage Temperature                | $T_{stg}$ | -40 ~ 100  | $^\circ\text{C}$ |
| Soldering Temperature              | $T_{sol}$ | 260 (5sec) | $^\circ\text{C}$ |

\*1 Duty ratio = 1/10, Pulse width = 0.1ms

### 5. Electro-optical Characteristics( $T_a = 25\text{ }^\circ\text{C}$ )

| Parameter                         | Symbol          | Conditions           | Min. | Typ. | Max. | Unit.         |
|-----------------------------------|-----------------|----------------------|------|------|------|---------------|
| Forward Voltage                   | $V_F$           | $I_F = 20\text{ mA}$ | 1.8  | -    | 2.4  | V             |
| Reverse Current                   | $I_R$           | $V_R = 5\text{ V}$   | -    | -    | 10   | $\mu\text{A}$ |
| Luminous Intensity <sup>*2</sup>  | $I_v$           | $I_F = 20\text{ mA}$ | 190  | -    | 425  | mcd           |
| Dominant Wavelength <sup>*3</sup> | $W_D$           | $I_F = 20\text{ mA}$ | 600  | -    | 610  | nm            |
| Viewing Angle <sup>*4</sup>       | $2\theta_{1/2}$ | $I_F = 20\text{ mA}$ | -    | 120  | -    | $^\circ$      |

\*2 Luminous Intensity is tested by a tester calibrated by CAS 140B(CIE LED\_B) and has an accuracy of 10%

\*3 Dominant Wavelength has an accuracy of  $\pm 2\text{ nm}$

\*4 Viewing Angle is the angle until 50% of brightness measured from the front part of LED.

#### 5.1 Luminous Intensity Rank

| Rank | Luminous Intensity (mcd) |
|------|--------------------------|
| D    | 190 ~ 250                |
| E    | 250 ~ 325                |
| F    | 325 ~ 425                |

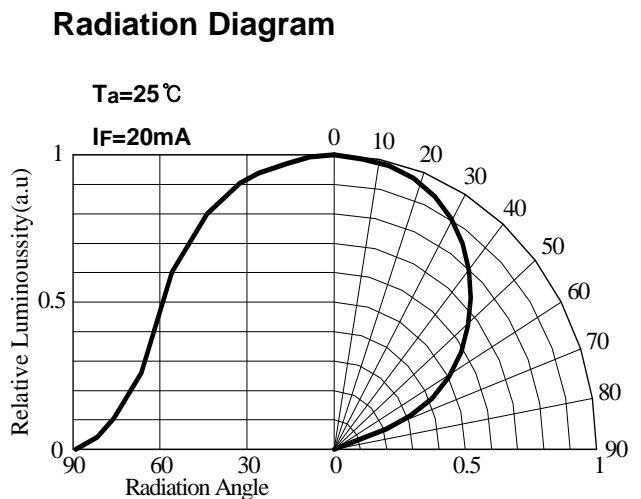
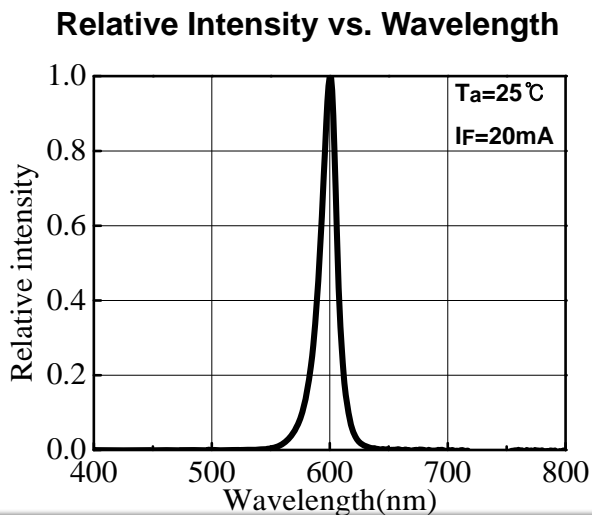
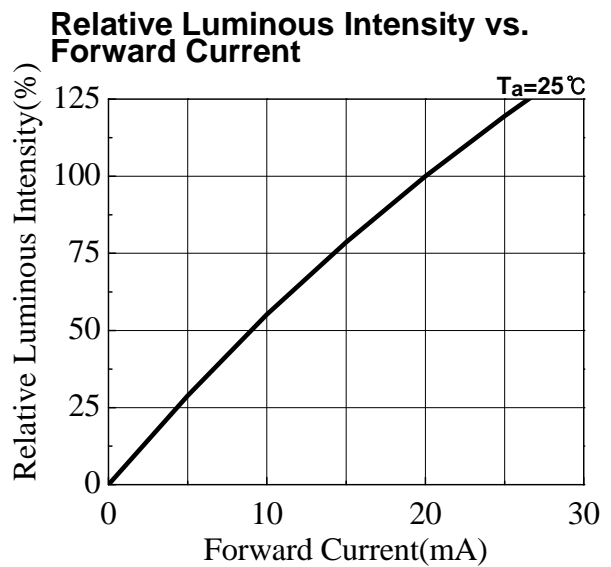
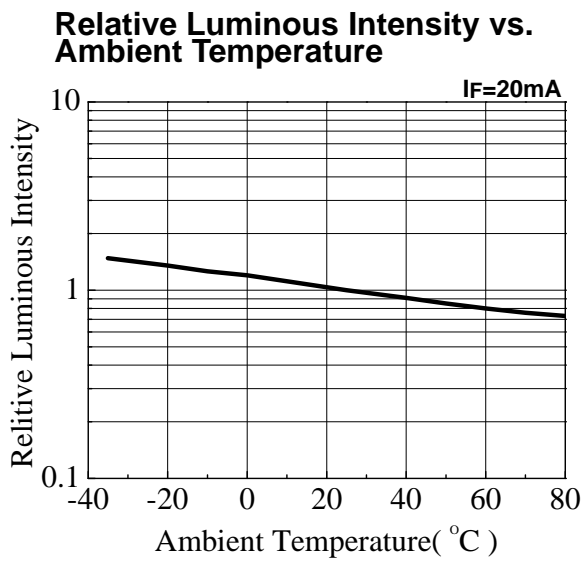
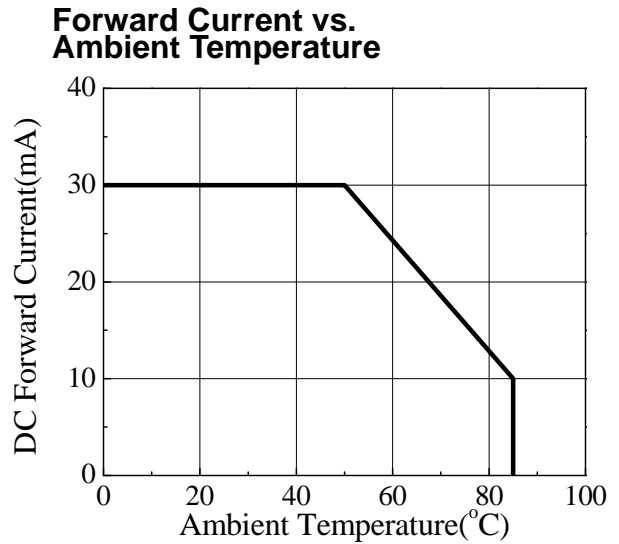
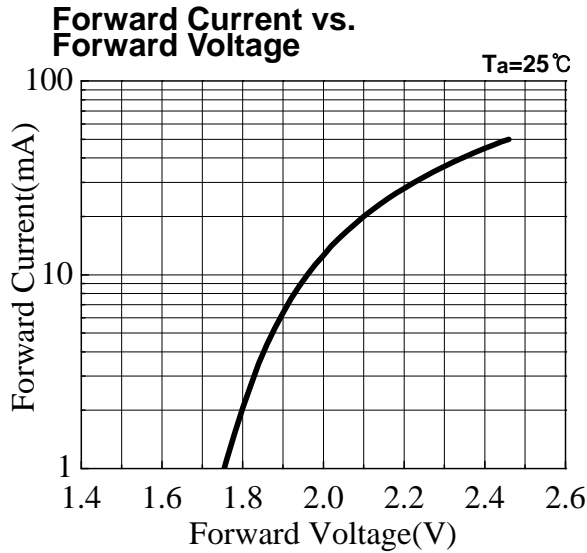
#### 5.2 Forward Voltage Rank

| Rank | Forward Voltage (V) |
|------|---------------------|
| 1    | 1.8 ~ 2.1           |
| 2    | 2.1 ~ 2.4           |

#### 5.3 Dominant Wavelength Rank

| Rank | Dominant Wavelength (nm) |
|------|--------------------------|
| A    | 600 ~ 605                |
| B    | 605 ~ 610                |

### 6. Typical Characteristics Curves

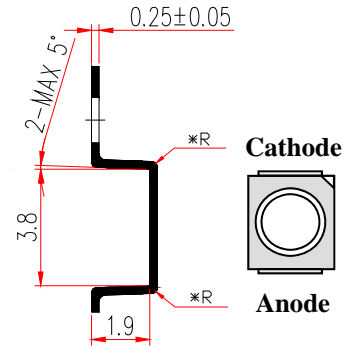
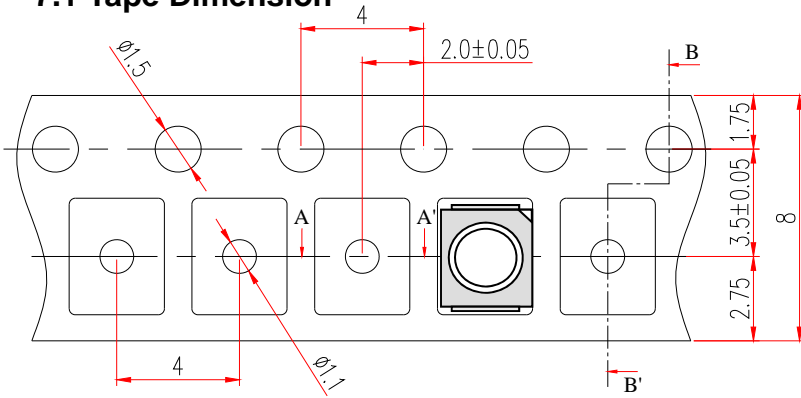


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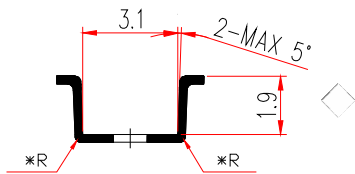


## 7. Dimension of Tape / Reel

### 7.1 Tape Dimension



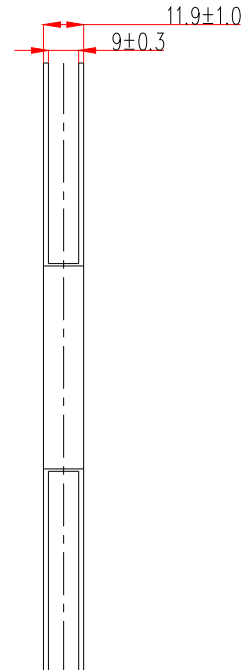
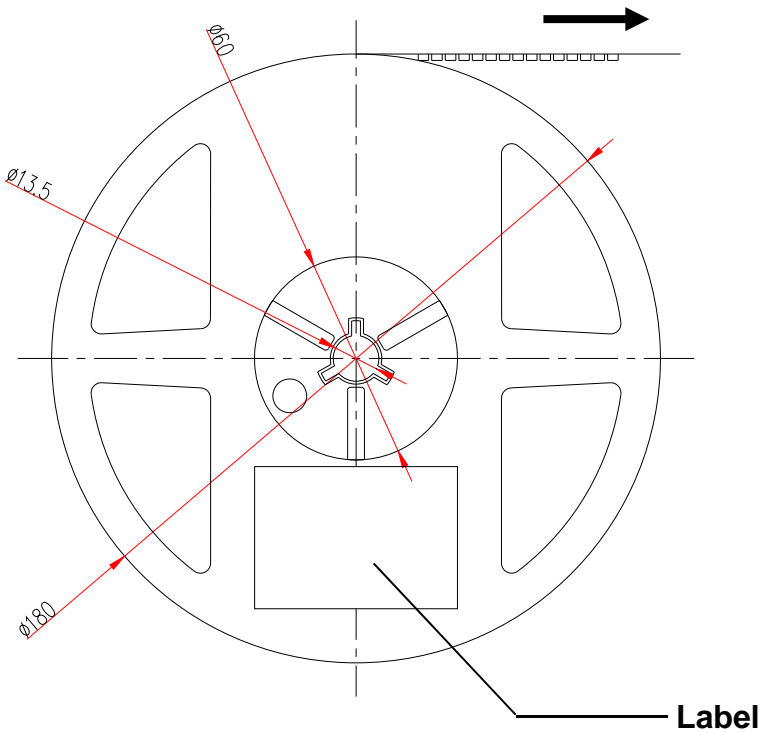
< SECTION B-B >



Tolerance  $\pm 0.1$  , Unit: mm

< SECTION A-A >

### 7.2 Reel Dimension



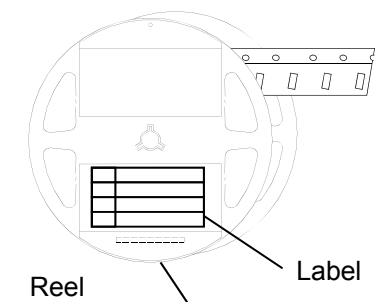
# Topview 3528 SMD LED IWS-L3512-UO-K1



## 8. Packing Dimension

Unit :mm

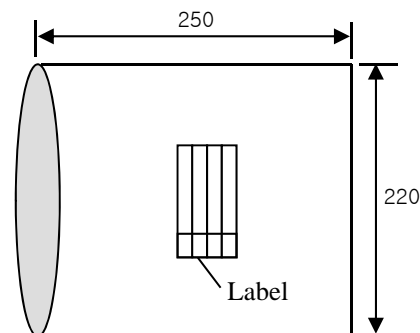
**Reel**



Bake: 60°C, 48hrs



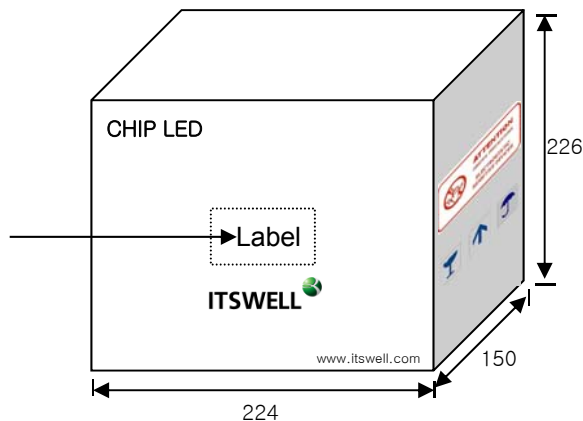
**Aluminum Shield Bag**



Including Silica gel in a bag



**Card board Box**



**Al Pack Label, Reel Label**

(70 × 37)

|                       |                 |     |     |     |
|-----------------------|-----------------|-----|-----|-----|
| <b>ITSWELL</b>        |                 |     |     |     |
| Lot :                 | IWS-L3512-UO-K1 |     |     |     |
|                       | MIN             | AVG | MAX | STD |
| V <sub>F</sub> [volt] |                 |     |     |     |
| I <sub>v</sub> [mcd]  |                 |     |     |     |
| W <sub>d</sub> [nm]   |                 |     |     |     |
| Q'ty :                | yyyy/mm/dd      |     |     |     |

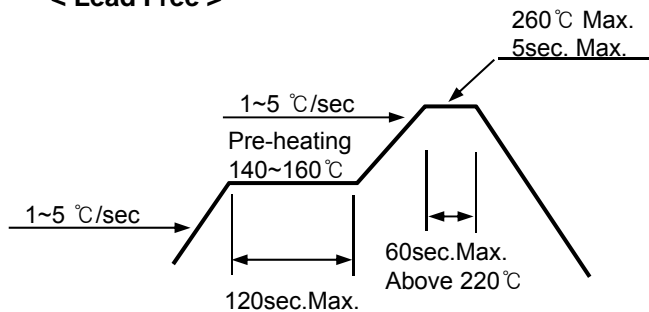
|                | Dimensions (mm)       | Reel / Box | Q'ty / Box(pcs) |
|----------------|-----------------------|------------|-----------------|
| Reel           | Φ180mm,<br>12mm Width | -          | 2,000 Max       |
| Al Shield Bag  | 250x220               | -          | 2,000 Max       |
| Card board Box | 224x150x226           | 10 Max     | 20,000 Max      |

## 9. Precaution in use

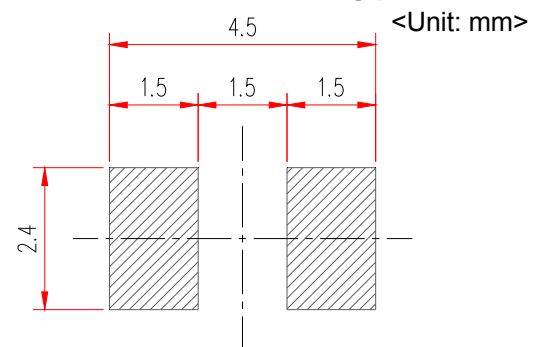
### 9.1 Soldering Conditions

- When soldering Power SMD, Heat may affect the electrical and optical characteristics of the LEDs.
- In soldering, do not stress the lead frame and the resin part under the high temperature.
- The silicone part should be protected from mechanical stress or vibration until the Power SMD return to room temperature after soldering.
- Preliminary heating to be at 160 °C max. for 120 Seconds max.
- Soldering heat to be at 260 °C max. for 5 sec. Max.
- For manual Soldering is Not more than 3 sec @MAX 350 °C, under soldering iron

#### < Lead Free >



#### <Recommendable soldering pattern>



### 9.2 Storage

- Before opening the package, the LEDs should be kept at 30 °C or less and 70%RH or less.
- The LEDs should be used within a year.
- After opening the package, the LEDs should be kept at 30 °C or less and 30%RH or less.
- The LEDs should be used within 168 hours (7 day) after opening the package.
- If the moisture absorbent material (silicagel) has faded away or the LED have exceeded the storage time, baking treatment should be performed using the following conditions.  
Baking treatment: 60 °C ±5 for 48 hours.

### 9.3 Static Electricity

- Static electricity or surge voltage damages the Power SMD . It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
- A tip soldering iron is requested to be grounded. An ionizer should also be installed where risk of static.
- All devices, equipment and machinery must be properly grounded (via 1MΩ). It is recommended that measures be taken against surge voltage to the equipment that mounts the Power SMD.

### 9.4 Cleaning

- Isopropyl Alcohol or Ethylene Alcohol is recommended in 5 minutes at room temperature. Don't use unspecified chemical may cause crack or haze on the surface of the epoxy resin.
- Before cleaning, a pre-test should be done to confirm whether any damage to the LED will occur.
- Freon solvents should not be used to clean the LEDs because of worldwide regulations.

### 9.5 Heat Generation

- When the LEDs are illuminating, operating current should be decided after being considering the ambient maximum temperature.
- Please consider the heat generation of the LED when it is designed the PCB.

## 10. Reliability

### 10.1 Reliability Test Item

| Test Items  | Test Conditions                     | Notes |
|---|-------------------------------------|-------|
| High Temperature Storage                          | 100℃, 1,000hr.                      | 0/25  |
| Low Temperature Storage                           | -40℃, 1,000hr.                      | 0/25  |
| Temp. Humidity Storage                            | 60℃, 90% RH, 1,000hr.               | 0/25  |
| Steady State Operating life                       | 25℃, 30mA, 1,000hr.                 | 0/25  |
| High Temperature Operating Life                   | 85℃, 10mA, 1,000hr                  | 0/25  |
| Low Temperature Operating Life                    | -30℃, 20mA, 1,000hr.                | 0/25  |
| Steady State Operating life Of High Humidity Heat | 60℃, 90% RH, 15mA, 1,000hr.         | 0/25  |
| Thermal Shock                                     | -40℃(30min)↔100℃(30min.), 100 cycle | 0/20  |
| ESD   | HBM, 100 pF, 1.5 kohm, 3 times      | 0/20  |

### 10.2 Criteria for Judging the Damage

| Parameters                   | Test Conditions       | Criteria for judgment |
|------------------------------|-----------------------|-----------------------|
| Forward Voltage ( $V_F$ )    | $I_F = 20 \text{ mA}$ | Less than 110% of U   |
| Luminous Intensity ( $I_v$ ) | $I_F = 20 \text{ mA}$ | > 70% of S            |

\* U means the upper limit of specified characteristics, S means initial value.

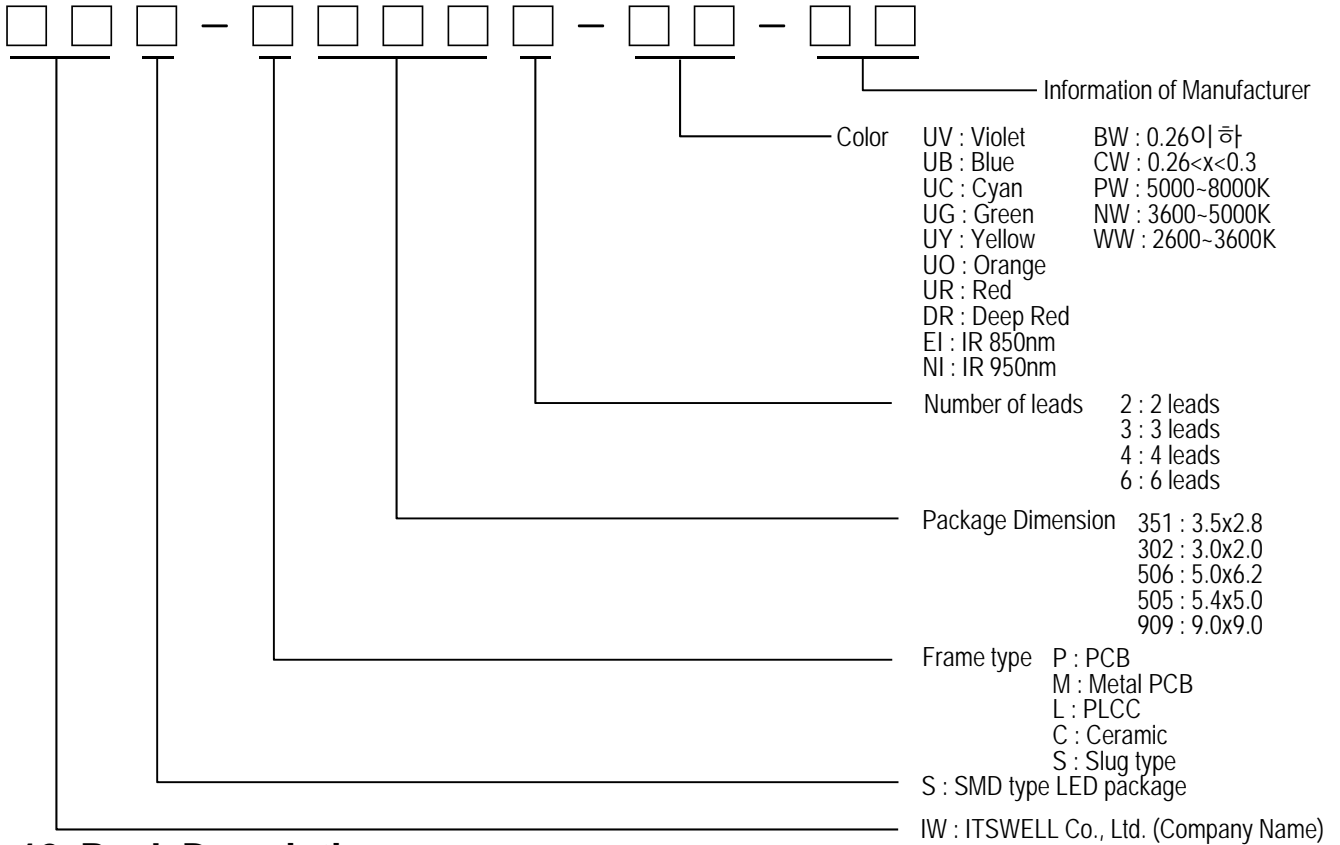


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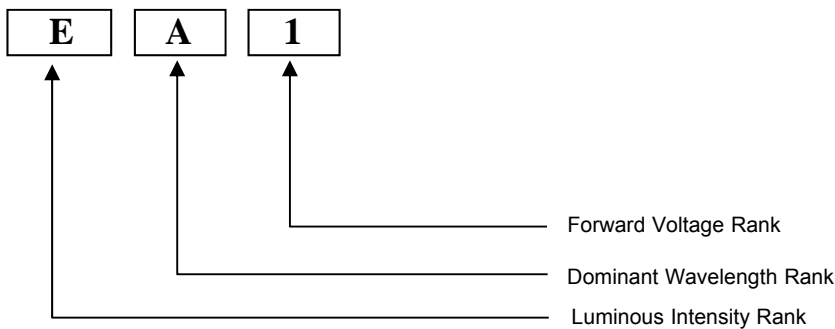
## IWS-L3512-UO-K1



### 11. Part Name Description



### 12. Rank Description



### 13. Attention : Electric Static Discharge (ESD) Protection



The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still Necessary even though they are safe in low static-electric discharge. Material in AlInGaP, GaP, or/and InGaN based chips are STATIC SENSITIVE devices. ESD protection has to considered and taken in the initial design stage. If manual work/process is needed, please ensure the device is well protective From ESD during all the process.

