

# SPECIFICATION

**Product : Topview 5050 White SMD LED**

**Part No. : IWS-S5552-WW-K3**

**Date : 2011. 12. 29 Ver. 1.0**

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

**Comment**



ITSWELL Co., Ltd  
58B-4L, 626-3 Gojan-dong, Namdong-gu, Incheon 405-817 KOREA  
TEL:+82-32-813-1801, FAX:+82+32-816-1900  
URL: <http://www.itswell.com>

# Topview 5450 SMD LED

## IWS-S5552-WW-K3



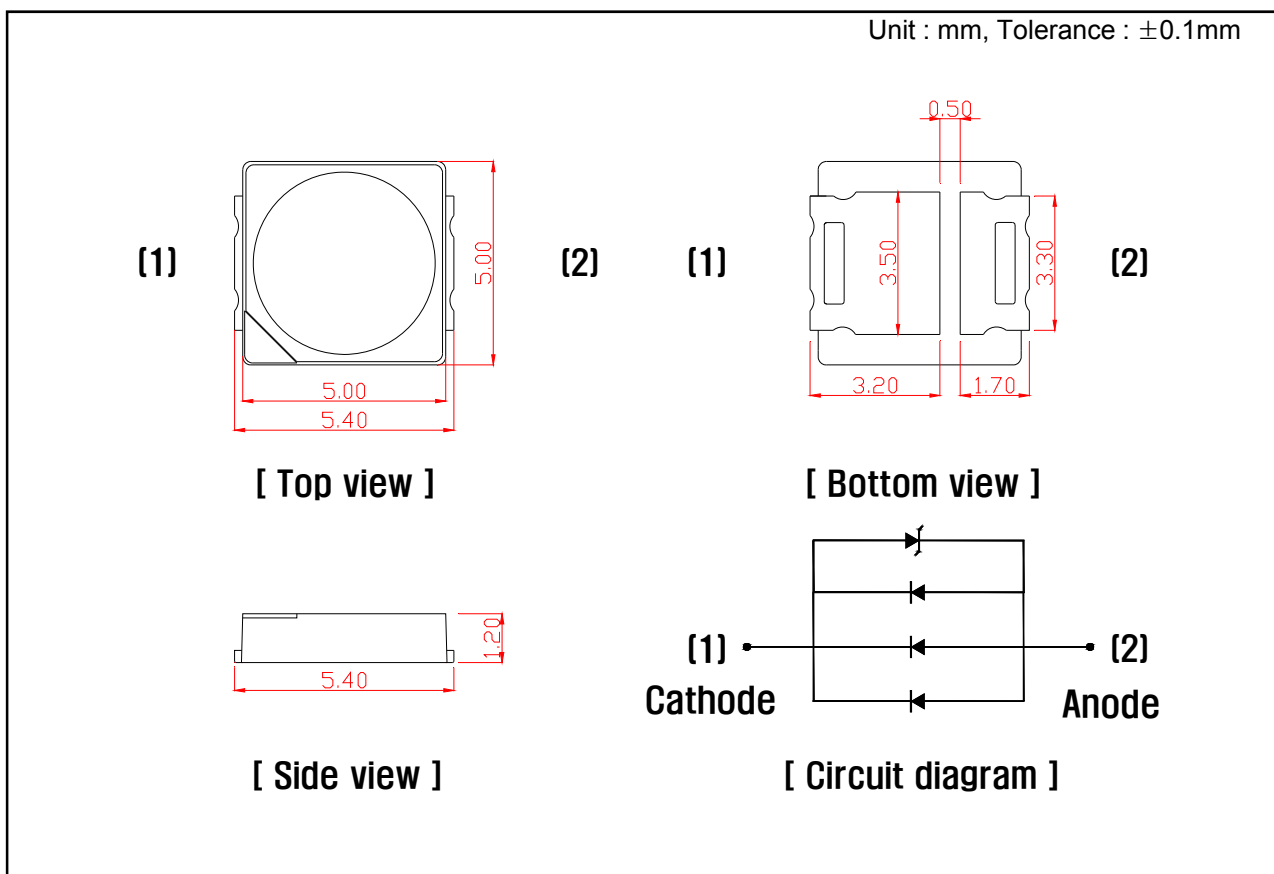
### 1. Features

- 3 Chip High-Luminosity SMD LED
- 5.4 x 5.0 x 1.2 mm (L x W x H), 2-Pin, 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          | $P_d$     | 540        | mW               |
| Continuous Forward Current | $I_F$     | 150        | mA               |
| Peak Forward Current *1    | $I_{FP}$  | 300        | 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      | $V_F$           | $I_F = 150\text{mA}$  | 2.8                             | -    | 3.6  | V        |
| Reverse Voltage      | $V_R$           | $I_R = 5\text{ mA}$   | 0.7                             | 0.8  | 1.5  | V        |
| Luminous Flux*2      | $\Phi_V$        | $I_F = 150\text{mA}$  | 29                              | -    | 60   | lm       |
| Color Coordinates *3 | CIE x<br>CIE y  | $I_F = 150\text{ mA}$ | Refer to Color Coordinates Rank |      |      |          |
| Viewing Angle *4     | $2\theta_{1/2}$ | $I_F = 150\text{ mA}$ | -                               | 125  | -    | $^\circ$ |

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

\*3 Color Coordinates has an accuracy of  $\pm 0.01$ .

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

**5.1 Luminous Flux Rank**

| Rank | Luminous Flux (lm) |
|------|--------------------|
| J    | 29 ~ 35            |
| K    | 35 ~ 42            |
| L    | 42 ~ 50            |
| M    | 50 ~ 60            |

**5.2 Forward Voltage Rank**

| Rank | Forward Voltage (V) |
|------|---------------------|
| 0    | 2.8 ~ 3.0           |
| 2    | 3.0 ~ 3.2           |
| 4    | 3.2 ~ 3.4           |
| 6    | 3.4 ~ 3.6           |

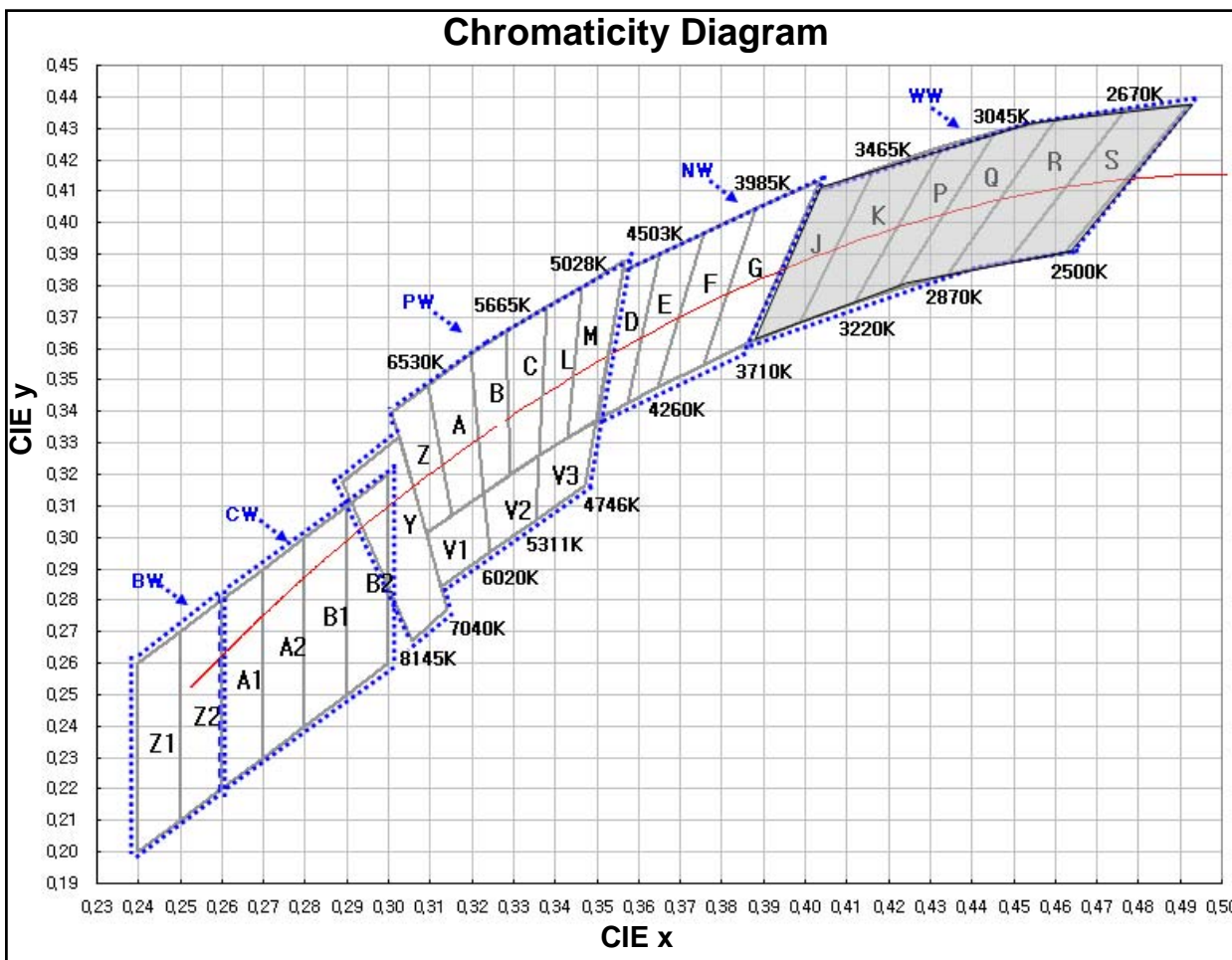
# Topview 5450 SMD LED

## IWS-S5552-WW-K3



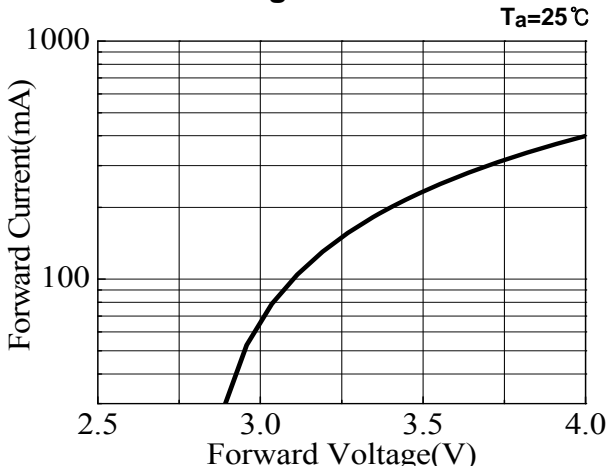
### 5.3 Color Coordinates Rank ( $I_F = 150 \text{ mA}$ , $T_a = 25 \text{ }^\circ\text{C}$ )

| BW          |        |             |        | CW          |        |             |        |             |        |             |        |             |        |
|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|
| Z1          |        | Z2          |        | A1          |        | A2          |        | B1          |        | B2          |        |             |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |             |        |
| 0.2400      | 0.2000 | 0.2500      | 0.2100 | 0.2600      | 0.2200 | 0.2700      | 0.2300 | 0.2800      | 0.2400 | 0.2900      | 0.2500 |             |        |
| 0.2400      | 0.2600 | 0.2500      | 0.2700 | 0.2600      | 0.2800 | 0.2700      | 0.2900 | 0.2800      | 0.3000 | 0.2900      | 0.3100 |             |        |
| 0.2500      | 0.2700 | 0.2600      | 0.2800 | 0.2700      | 0.2900 | 0.2800      | 0.3000 | 0.2900      | 0.3100 | 0.3000      | 0.3200 |             |        |
| 0.2500      | 0.2100 | 0.2600      | 0.2200 | 0.2700      | 0.2300 | 0.2800      | 0.2400 | 0.2900      | 0.2500 | 0.3000      | 0.2600 |             |        |
| PW          |        |             |        |             |        |             |        |             |        |             |        |             |        |
| 7500K       |        | 7040K-4746K |        |             |        | 6500K       |        |             |        | 5700K       |        |             |        |
| 8145-7040K  |        | 7040K-6020K |        | 6020K-5331K |        | 5331K-4746K |        | 7040K-6530K |        | 6530K-6020K |        | 6020K-5665K |        |
| Y           |        | V1          |        | V2          |        | V3          |        | Z           |        | A           |        | B           |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |
| 0.3057      | 0.2671 | 0.3125      | 0.2842 | 0.3243      | 0.2951 | 0.3353      | 0.3053 | 0.3089      | 0.3012 | 0.3152      | 0.3070 | 0.3229      | 0.3142 |
| 0.2891      | 0.3175 | 0.3089      | 0.3012 | 0.3229      | 0.3142 | 0.3362      | 0.3259 | 0.3008      | 0.3399 | 0.3095      | 0.3484 | 0.3198      | 0.3585 |
| 0.3025      | 0.3321 | 0.3229      | 0.3142 | 0.3362      | 0.3259 | 0.3500      | 0.3371 | 0.3095      | 0.3484 | 0.3198      | 0.3585 | 0.3282      | 0.3652 |
| 0.3140      | 0.2770 | 0.3243      | 0.2951 | 0.3353      | 0.3053 | 0.3472      | 0.3164 | 0.3152      | 0.3070 | 0.3229      | 0.3142 | 0.3292      | 0.3200 |
| PW          |        |             |        |             |        | NW          |        |             |        |             |        |             |        |
| 5700K       |        | 5000K       |        |             |        | 4500K       |        |             |        |             |        |             |        |
| 5665K-5311K |        | 5311K-5028K |        | 5028K-4746K |        | 4746K-4503K |        | 4503K-4260K |        | 4260K-3985K |        | 3985K-3710K |        |
| C           |        | L           |        | M           |        | D           |        | E           |        | F           |        | G           |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |
| 0.3292      | 0.3200 | 0.3362      | 0.3259 | 0.3429      | 0.3317 | 0.3500      | 0.3371 | 0.3574      | 0.3428 | 0.3648      | 0.3479 | 0.3755      | 0.3550 |
| 0.3282      | 0.3652 | 0.3381      | 0.3732 | 0.3465      | 0.3797 | 0.3562      | 0.3843 | 0.3650      | 0.3899 | 0.3756      | 0.3966 | 0.3882      | 0.4044 |
| 0.3381      | 0.3732 | 0.3465      | 0.3797 | 0.3567      | 0.3881 | 0.3650      | 0.3899 | 0.3756      | 0.3966 | 0.3882      | 0.4044 | 0.4035      | 0.4134 |
| 0.3362      | 0.3259 | 0.3429      | 0.3317 | 0.3500      | 0.3371 | 0.3574      | 0.3428 | 0.3648      | 0.3479 | 0.3755      | 0.3550 | 0.3865      | 0.3617 |
| WW          |        |             |        |             |        |             |        |             |        |             |        |             |        |
| 3500K       |        |             |        | 3000K       |        |             |        | 2700K       |        |             |        |             |        |
| 3710K-3465K |        | 3465K-3220K |        | 3220K-3045K |        | 3045K-2870K |        | 2870K-2670K |        | 2670K-2500K |        |             |        |
| J           |        | K           |        | P           |        | Q           |        | R           |        | S           |        |             |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |             |        |
| 0.3865      | 0.3617 | 0.3988      | 0.3684 | 0.4117      | 0.3745 | 0.4221      | 0.3790 | 0.4599      | 0.4329 | 0.4767      | 0.4360 |             |        |
| 0.4022      | 0.4094 | 0.4165      | 0.4169 | 0.4332      | 0.4241 | 0.4456      | 0.4287 | 0.4767      | 0.4360 | 0.4921      | 0.4374 |             |        |
| 0.4165      | 0.4169 | 0.4332      | 0.4241 | 0.4456      | 0.4287 | 0.4599      | 0.4329 | 0.4486      | 0.3875 | 0.4621      | 0.3902 |             |        |
| 0.3988      | 0.3684 | 0.4117      | 0.3745 | 0.4221      | 0.3790 | 0.4344      | 0.3833 | 0.4344      | 0.3833 | 0.4486      | 0.3875 |             |        |

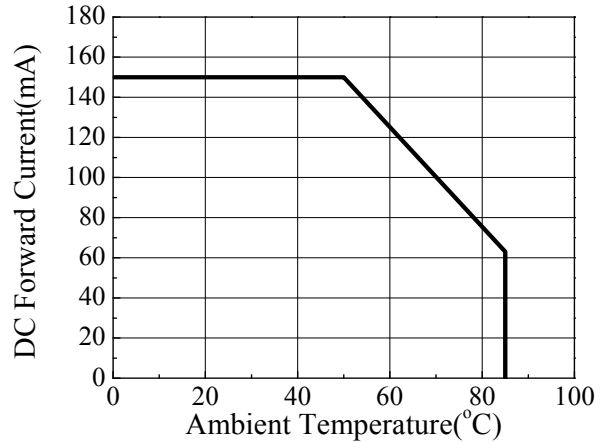


**6. Typical Characteristics Curves**

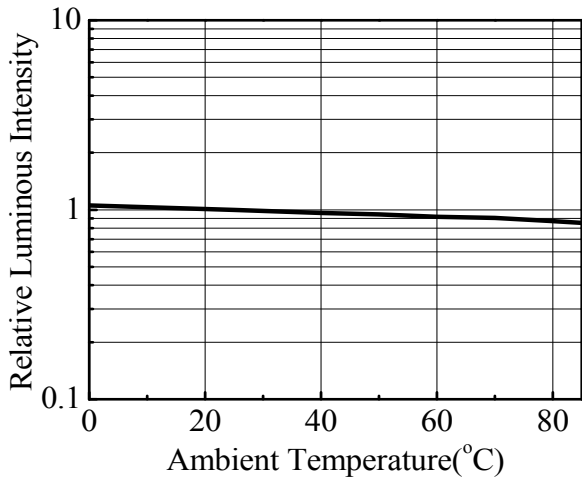
**Forward Current vs. Forward Voltage**



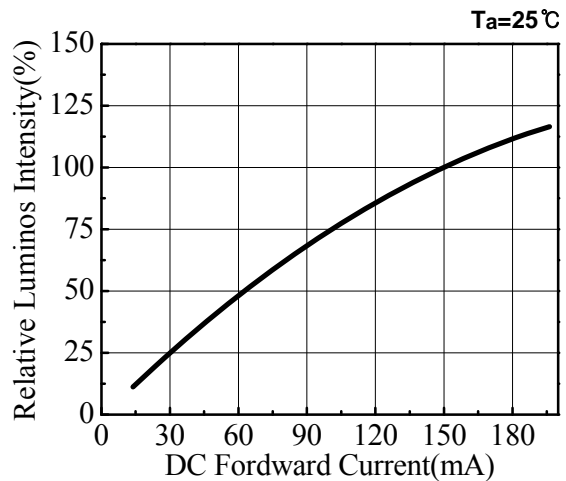
**Forward Current vs. Ambient Temperature**



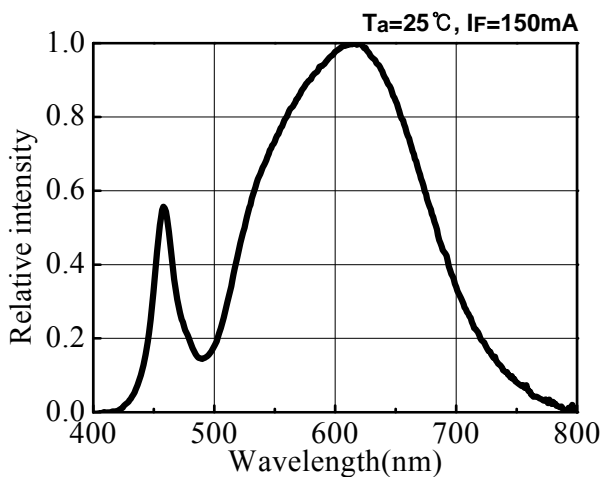
**Relative Luminous Intensity vs. Ambient Temperature**



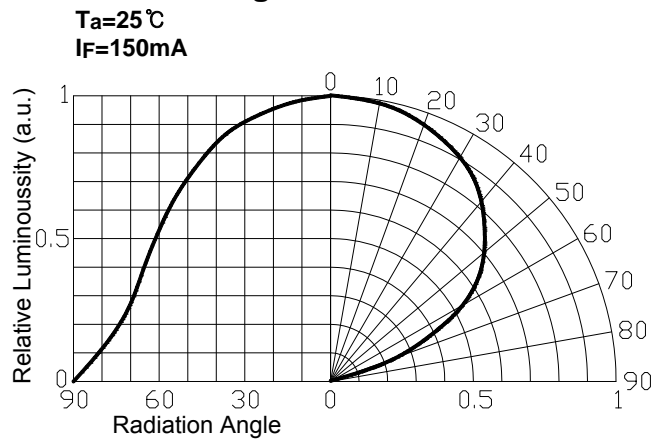
**Relative Luminous Intensity vs. Forward Current**



**Relative Intensity vs. Wavelength**



**Radiation Diagram**

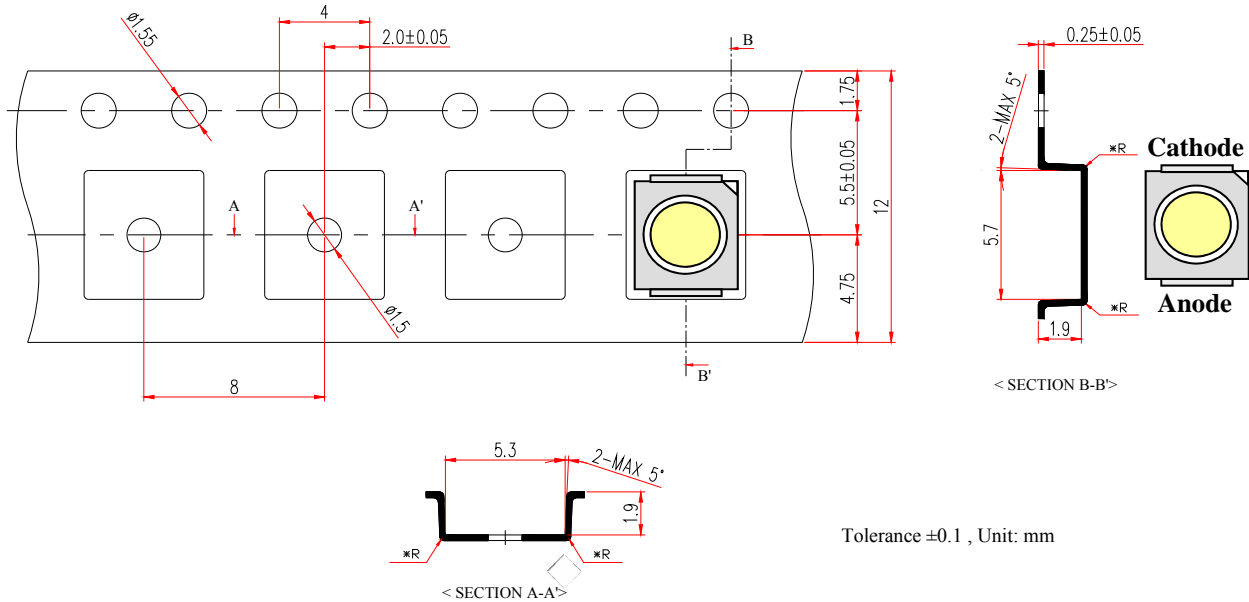


# Topview 5450 SMD LED IWS-S5552-WW-K3

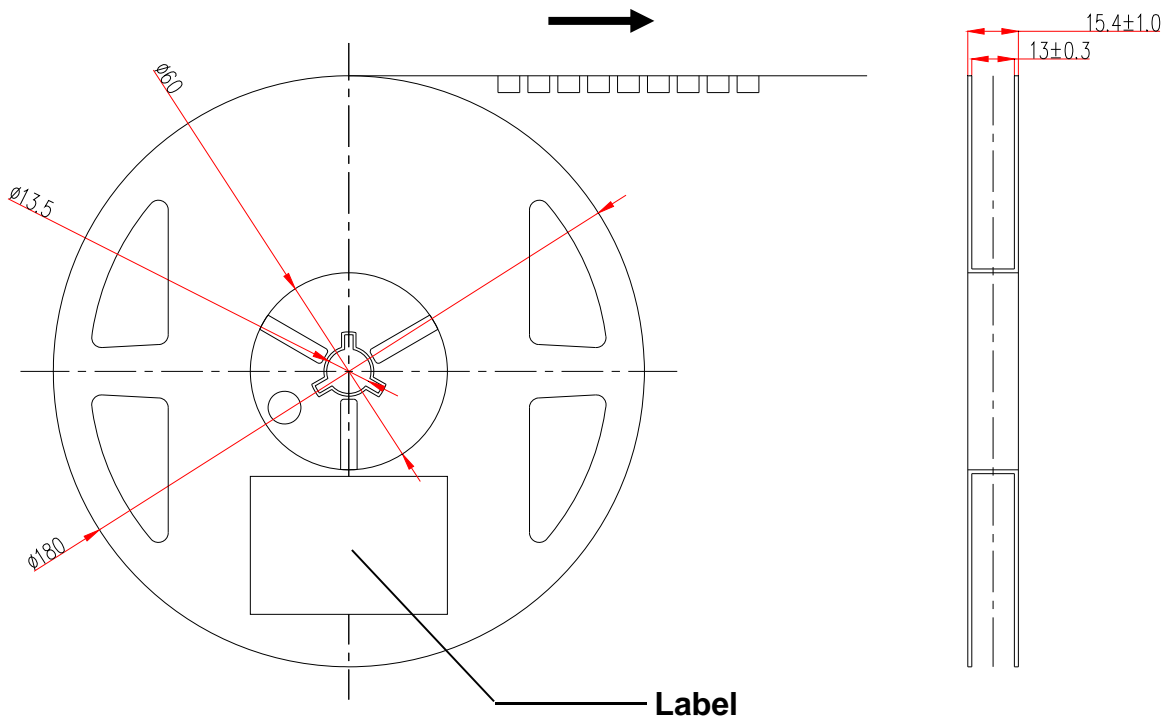


## 7. Dimension of Tape / Reel

### 7.1 Tape Dimension



### 7.2 Reel Dimension



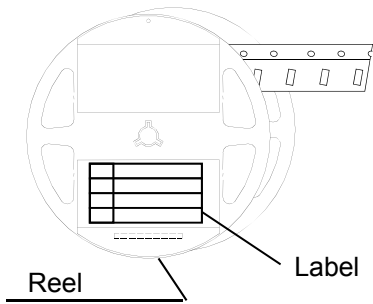
# Topview 5450 SMD LED IWS-S5552-WW-K3



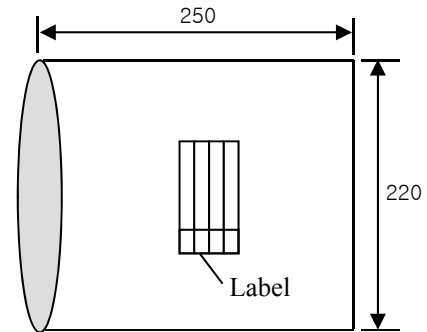
## 8. Packing Dimension

Unit :mm

**Reel**



**Aluminum Shield Bag**



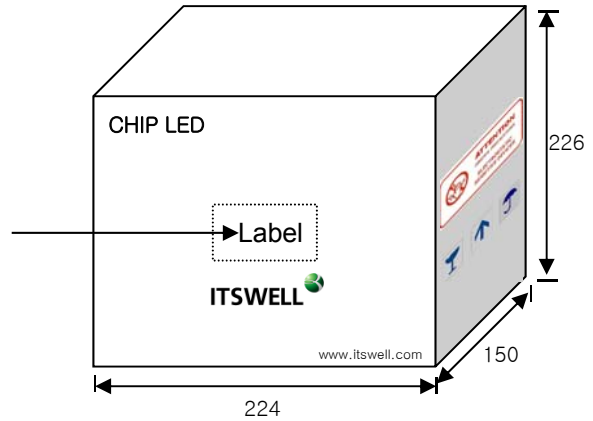
Bake: 60°C, 48hrs



Including Silica gel in a bag



**Card Board Box**



**Al Pack Label, Reel Label** (70 × 37)

|                       |                 |     |     |     |
|-----------------------|-----------------|-----|-----|-----|
| <b>ITSWELL</b>        |                 |     |     |     |
| Lot :                 | IWS-S5552-WW-K3 |     |     |     |
|                       | MIN             | AVG | MAX | STD |
| V <sub>F</sub> [Volt] |                 |     |     |     |
| Φ <sub>v</sub> [lm]   |                 |     |     |     |
| CCT[K]                |                 |     |     |     |
| Q'ty :                | yyyy/mm/dd      |     |     |     |

|                | Dimensions (mm)       | Reel / Box | Total Q'ty / Box(pcs) |
|----------------|-----------------------|------------|-----------------------|
| Reel           | Φ180mm,<br>15mm Width | -          | 1,000 Max             |
| Al Shield Bag  | 250x220               | -          | 1,000 Max             |
| Card Board Box | 224x150x226           | 9 Max      | 9,000 Max             |

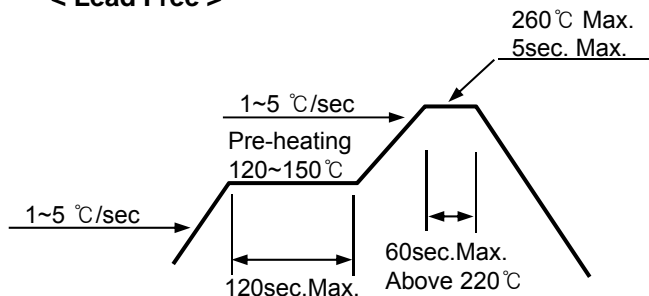


## 9. Precaution in Use

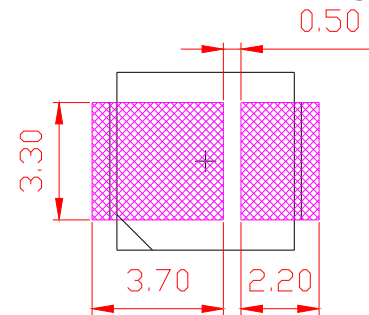
### 9.1 Soldering Conditions

- 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 120~150 °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>



<Cathdoe>

<Anode>

<Unit: mm>

### 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℃, 180mA, 1,000hr.                | 0/25  |
| High Temperature Operating Life                   | 85℃, 75mA, 1,000hr                  | 0/25  |
| Low Temperature Operating Life                    | -30℃, 150mA, 1,000hr.               | 0/25  |
| Steady State Operating life Of High Humidity Heat | 60℃, 90% RH, 112.5mA, 1,000hr.      | 0/25  |
| Thermal Shock                                     | -40℃(30min)→100℃(30min.), 100 cycle | 0/20  |
| ESD   | HBM, 100 pF, 1.5K ohm, 3 times      | 0/20  |

### 10.2 Criteria for Judging the Damage

| Items                      | Test Conditions      | Criteria for judgment      |
|----------------------------|----------------------|----------------------------|
| Luminous Flux ( $\Phi_V$ ) | $I_F = 150\text{mA}$ | > 70% of S                 |
| Forward Voltage ( $V_F$ )  | $I_F = 150\text{mA}$ | Less than $\pm 110\%$ of U |

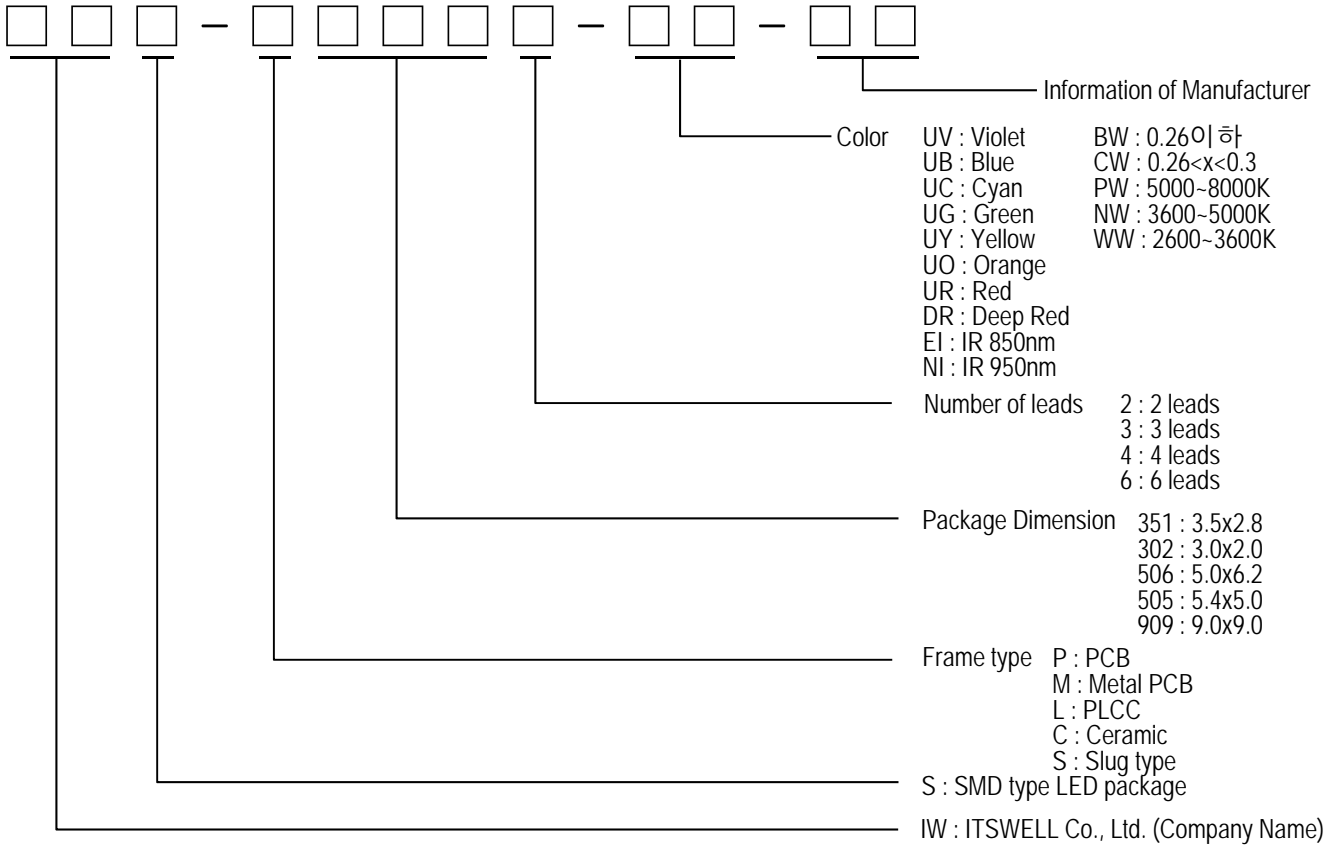
\* U means the upper limit of specified characteristics, S means initial value.

# Topview 5450 SMD LED

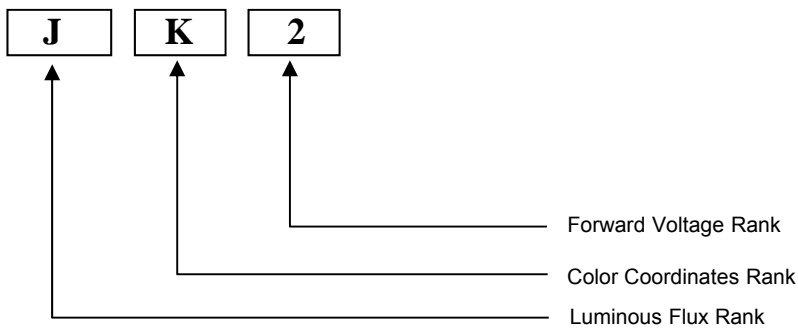
## IWS-S5552-WW-K3



### 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.

