

## Data Sheet

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Customer: \_\_\_\_\_

Part No: \_\_\_\_\_ CL-SP117RYB-02 \_\_\_\_\_

Sample No: \_\_\_\_\_

Description: \_\_\_\_\_

Item No: \_\_\_\_\_

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

## Surface Mounted Chip LED

### ◆Features :

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

### ◆Applications :

- Automotive\_Telecommunication
- Indicators
- LCD Back-lights
- Illuminations

### ◆Absolute Maximum Ratings

( Ta=25°C )

| Item                                                    | Symbol          | Maximum    | Unit  |
|---------------------------------------------------------|-----------------|------------|-------|
| Peak Forward Current(1/10 Duty Cycle 0.1ms Pulse Width) | I <sub>FP</sub> | 100        | mA    |
| Reverse Voltage                                         | V <sub>R</sub>  | 5          | V     |
| Derating Linear From 25°C                               |                 | 0.4        | mA/°C |
| Operating Temperature Range                             | Topr            | -40 to +85 | °C    |
| Storage Temperature Range                               | Tstg            | -40 to +85 | °C    |

### ◆Electrical / Optical Characteristics

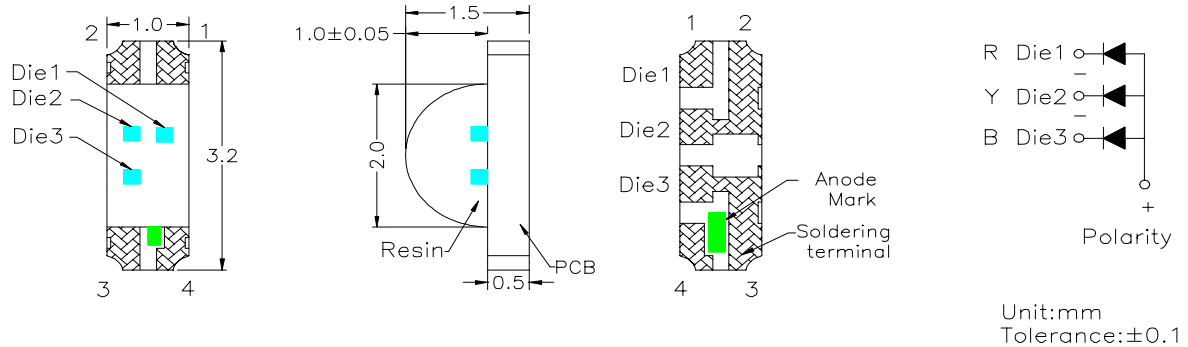
( Ta=25°C )

| Chip                          |                        |                        | Lens<br>Appearance | Absolute Maximun<br>Rating |                        |                           | Electro-optical Data<br>(At 20mA) |      |                     |      | Viewing<br>Angle<br>2 θ 1/2<br>(deg) |
|-------------------------------|------------------------|------------------------|--------------------|----------------------------|------------------------|---------------------------|-----------------------------------|------|---------------------|------|--------------------------------------|
| Emitted<br>Color              | λ <sub>p</sub><br>(nm) | λ <sub>D</sub><br>(nm) |                    | △λ<br>(nm)                 | P <sub>D</sub><br>(mW) | I <sub>Fmax</sub><br>(mA) | V <sub>F</sub> (V)                |      | I <sub>V</sub> mcd) |      |                                      |
|                               |                        |                        |                    |                            |                        |                           | Typ.                              | Max. | Min.                | Typ. |                                      |
| Ultra High Red<br>( Die 1)    | 645                    | 631                    | Water Clear        | 20                         | 78                     | 30                        | 2.1                               | 2.6  | 45.0                | 72.0 | 110°                                 |
| Ultra High Yellow<br>( Die 2) | 594                    | 591                    |                    | 20                         | 78                     | 30                        | 2.0                               | 2.6  | 45.0                | 72.0 |                                      |
| Blue<br>( Die 3)              | 468                    | 470                    |                    | 25                         | 108                    | 30                        | 3.2                               | 4.2  | 45.0                | 72.0 |                                      |

※The measuring tolerance → Luminous intensity ±15%  
Wavelength (λ<sub>D</sub>) ±2nm

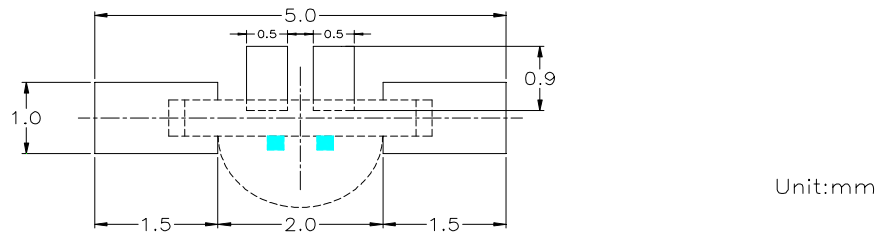
# ◆ Dimensions / Taping and Package Spec.

## ● Package Dimensions of Device ( SP117 Common Anode Die1 Die2 Die3 Series )



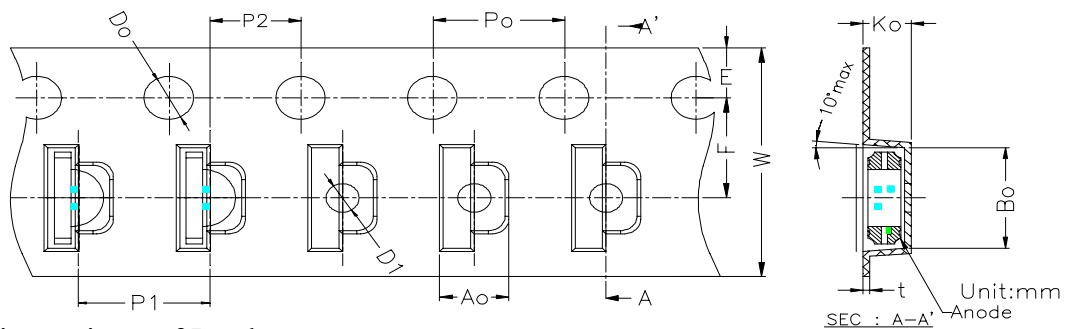
1. Soldering terminal may shift in x, y direction.

## ● Recommended Soldering Pad Dimensions

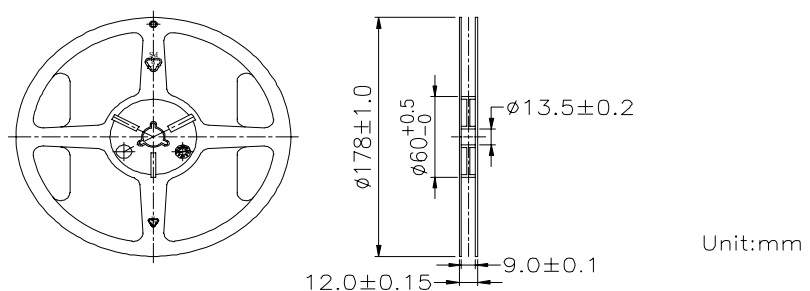


## ● Tape Specification : 3000pcs Per Reel

| 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  | 1.75  | 3.40  | 1.25  | 0.23  |
| Tolerance    | +0.30<br>-0.10 | ±0.10 | ±0.10 | ±0.05 | +0.10<br>-0.00 | +0.25<br>-0.00 | ±0.10 | ±0.20 | ±0.05 | ±0.10 | ±0.10 | ±0.10 | ±0.02 |

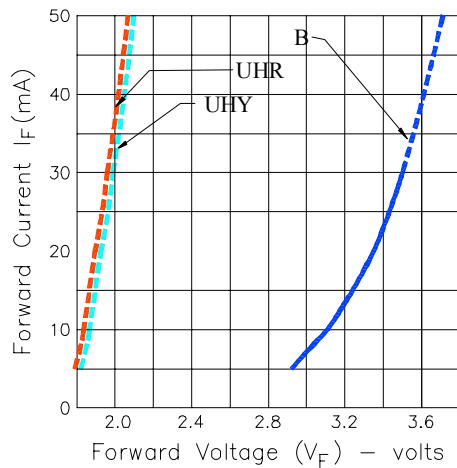


## ● Package Dimensions of Reel :

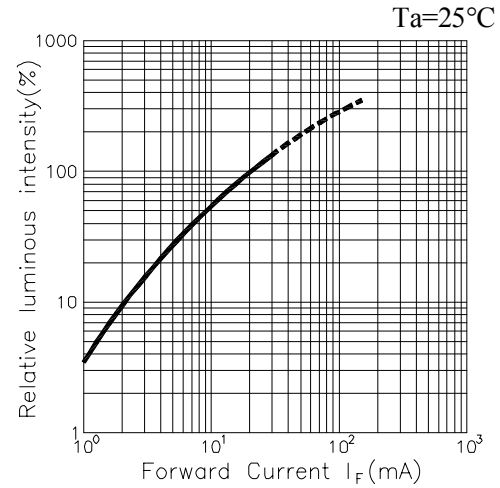


◆ **Typical Electro-Optical Characteristic Curves**  
**SP117RYB-02**

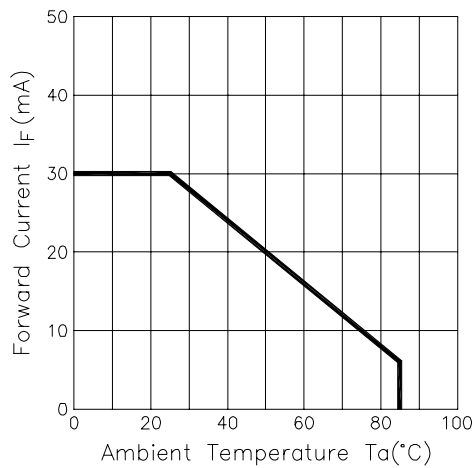
**Forward Current Vs. Forward Voltage**



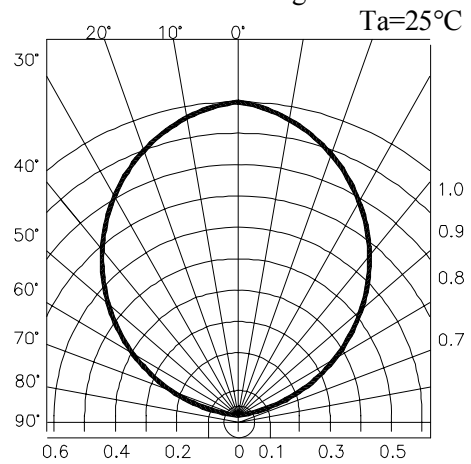
**Luminous Intensity Vs. Forward Current**



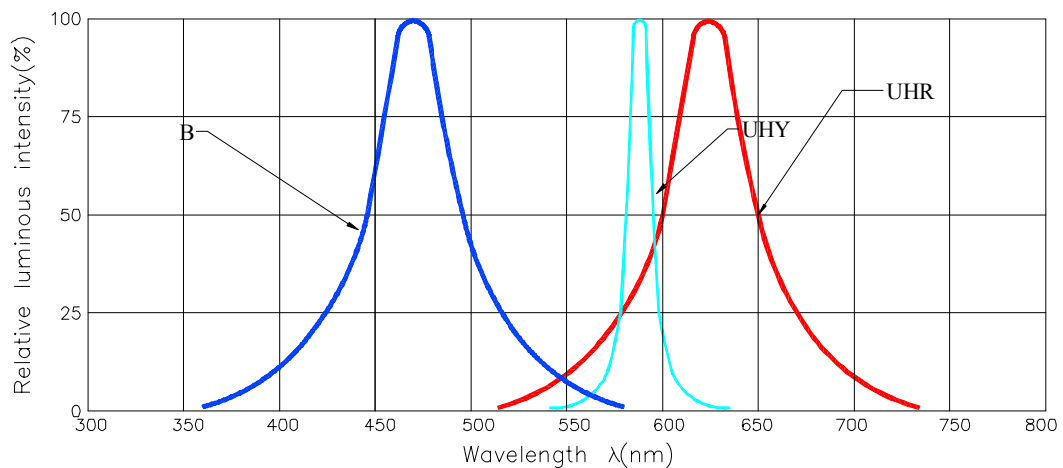
**Forward Current Derating Curve**



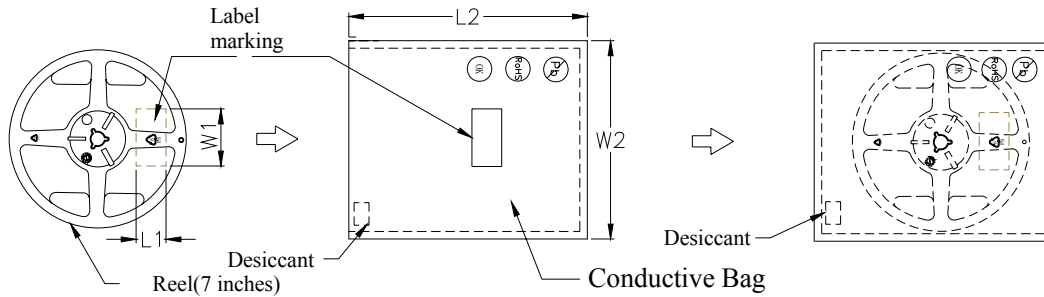
**Radiation Diagram**



**Spectrum Distribution**

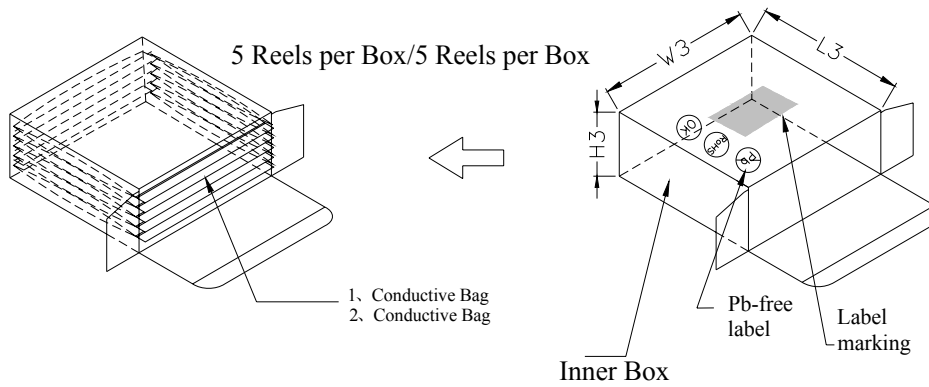


## ◆ Packing and Shipping Instruction



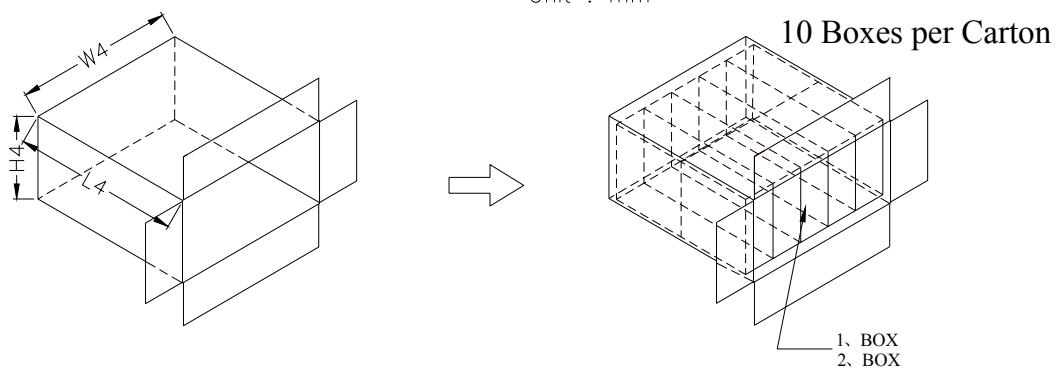
| Dimension | L1   | W1   | L2    | W2    |
|-----------|------|------|-------|-------|
| Spec.     | 30.0 | 60.0 | 260.0 | 230.0 |

Unit : mm



| Dimension | L3    | W3    | H3   |
|-----------|-------|-------|------|
| Outside   | 278   | 238   | 77   |
| Inside    | 277.7 | 237.4 | 76.4 |

Unit : mm



| Dimension | L4    | W4    | H4    |
|-----------|-------|-------|-------|
| Outside   | 571   | 400   | 248   |
| Inside    | 570.3 | 398.6 | 246.6 |

Unit : mm

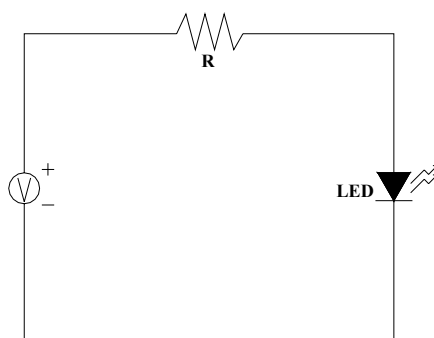
### ◆ Descriptions :

- The Chip-LED Taping 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 application, etc.

### ◆ Reliability Test Items And Conditions :

| No.                                                                                                                                    | Item                              | Test Conditions                                      | Test<br>hr/cycle/time | Sample<br>Q'ty | Ac / Re |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------|-----------------------|----------------|---------|
| 1                                                                                                                                      | Solder Heat                       | TEMP : 260℃±5℃ ; 10±1 sec                            | 2 times               | 30 pcs         | 0 / 1   |
| 2                                                                                                                                      | Solderbility Test ※               | TEMP : 235℃±5℃ ; 3±1 sec                             | 1 time                | 5 pcs          | 0 / 1   |
| 3                                                                                                                                      | Temperature Cycle                 | H : +85℃ 30min.<br>∫ 5min.<br>L : -40℃ 30min.        | 100 cycles            | 20 pcs         | 0 / 1   |
| 4                                                                                                                                      | Thermal Shock                     | H : +85℃ 5min.<br>∫<br>L : -40℃ 5min.                | 50 cycles             | 20 pcs         | 0 / 1   |
| 5                                                                                                                                      | High Temperature Storage          | TEMP : 85℃                                           | 1000 hrs              | 20 pcs         | 0 / 1   |
| 6                                                                                                                                      | Low Temperature Storage           | TEMP : -40℃                                          | 1000 hrs              | 20 pcs         | 0 / 1   |
| 7                                                                                                                                      | DC Operating Life                 | I <sub>F</sub> = I <sub>Fmax</sub>                   | 1000 hrs              | 20 pcs         | 0 / 1   |
| 8                                                                                                                                      | High Temperature<br>High Humidity | 85℃ / 90~95%R.H.                                     | 1000 hrs              | 20 pcs         | 0 / 1   |
| 9                                                                                                                                      | Shocking test                     | 100~2000Hz ; 98.1m/s <sup>2</sup><br>X,Y,Z direction | 2 hrs                 | 20 pcs         | 0 / 1   |
| 10                                                                                                                                     | Dropping test                     | Put on pallet ; height : 75cm                        | 3 times               | 20 pcs         | 0 / 1   |
| Judgment Criteria                                                                                                                      |                                   |                                                      |                       |                |         |
| Forward Voltage V <sub>F</sub>                                                                                                         |                                   | V <sub>F</sub> Max-Increase < 1.1x                   |                       |                |         |
| Reverse Current I <sub>R</sub>                                                                                                         |                                   | I <sub>R</sub> Max-Increase < I <sub>Rmax</sub>      |                       |                |         |
| Luminous Intensity I <sub>V</sub>                                                                                                      |                                   | I <sub>V</sub> Decay < 40%                           |                       |                |         |
| ※Solderbility test criteria : coverage is not less than 95%                                                                            |                                   |                                                      |                       |                |         |
| Note : Measurement shall be taken after the tested samples have been returned to normal ambient conditions (generally after two hours) |                                   |                                                      |                       |                |         |

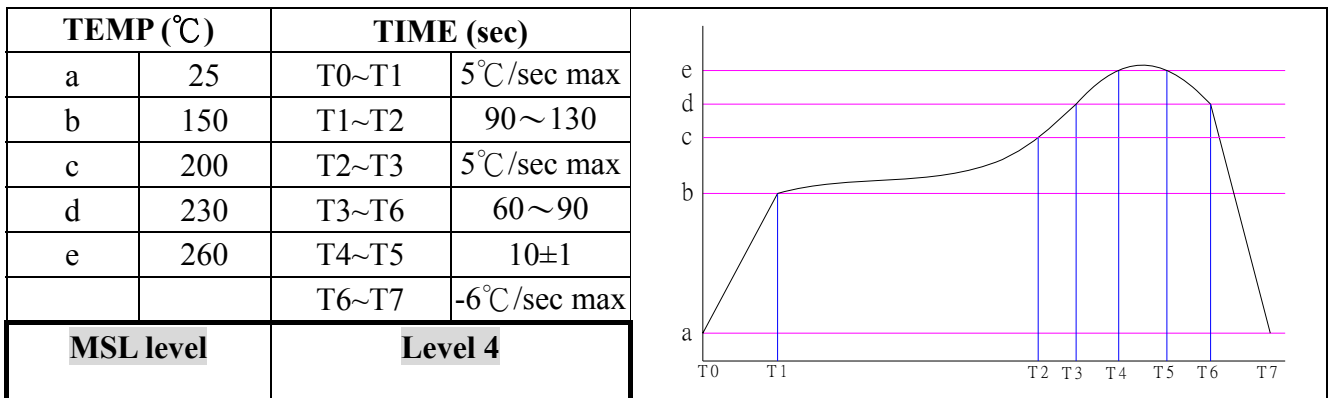
### ◆ Test Circuit



### ◆ Precautions For Use :

- Overdrive current proof  
Customer must apply resistors for protection, otherwise slight voltage shift will cause current change with great deal. ( Burn out will happen )
- Storage
  1. The operation of temperature and R.H. are :  $5^{\circ}\text{C} \sim 30^{\circ}\text{C}$  , 60%R.H. Max..
  2. Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp-proof box with desiccant. Considering the tape life, we suggest our customers to use our products within 1.5 year ( from production date ) .
  3. It's recommended to bake before soldering when the package is unsealed more than 72 hrs. The condition is :  $60^{\circ}\text{C} \pm 5^{\circ}\text{C}$  for 15hrs.

### ◆ Reflow Temp. / Time :



### ◆ Hand Soldering Iron :

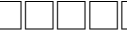
- Temperature at tip of iron :  $350^{\circ}\text{C}$  Max. ( 35W Max. )
- Soldering time :  $3 \pm 1\text{sec}$ .

# ◆ Numbering System : SMD LED

## ● Mono-Color :

1. -- : **Company Code**
2. -- : **Product Code** : SMD→S 、 DIP→D
3. --- : **Structure Code** : PCB Type→P 、 L/F Type→L
4. ---- : **Model Code** : 1206→150 、 0805→170,172 、 0603→190  
**1<sup>st</sup> Number(Package Code)** : Standard Type→1 、 Routing Type→2 、 Lens Type→3  
**2<sup>nd</sup> Number(Size Code)** : 1204 side-view→1 、 0402→2 、 0802 side-view→3 、 0803 side-view→4 、 1206→5 、 0603 side-view→6 、 0805→7 、 1104 side-view→8 、 0603→9 、 3Φ→A 、 5Φ→B 、 1205→C 、 1.6Φ→D  
**3<sup>rd</sup> Number (Type Code)** : 1 Chip→0 、 2 Chips→5 、 3 Chips→7
5. ---- : **Color Code (2~3 Code)**
6. --- : **Internal Code**
7. --- : **Appearance Code** : Color Diffused→1 、 Color Transparent→2 、 White Diffused→3 、 Water Clear→4
8. -- : **Assistant Code(0~6 Code)**

## ● Multi-Color

1. --- : **The Same With The Mono-Color Type**
2. ---- : **Color Code(4~6 Code)**
3. --- : **Appearance Code** : White Diffused→3 、 Water Clear→4
4. -- : **Assistant Code(0~2 Code)**



**◆ Luminous Intensity BIN Limits**

| BIN Code   | Test condition : @20mA        |                               |
|------------|-------------------------------|-------------------------------|
| <b>UHR</b> | <b>I<sub>Vmin</sub> (mcd)</b> | <b>I<sub>Vmax</sub> (mcd)</b> |
| <b>J</b>   | 45                            | 72                            |
| <b>K</b>   | 72                            | 115                           |
| BIN Code   | Test condition : @20mA        |                               |
| <b>UHY</b> | <b>I<sub>Vmin</sub> (mcd)</b> | <b>I<sub>Vmax</sub> (mcd)</b> |
| <b>J</b>   | 45.0                          | 72.0                          |
| <b>K</b>   | 72.0                          | 115.0                         |
| <b>L</b>   | 115.0                         | 180.0                         |
| BIN Code   | Test condition : @20mA        |                               |
| <b>DNB</b> | <b>I<sub>Vmin</sub> (mcd)</b> | <b>I<sub>Vmax</sub> (mcd)</b> |
| <b>J</b>   | 45                            | 72                            |
| <b>K</b>   | 72                            | 115                           |
| <b>L</b>   | 115                           | 180                           |

**◆ Dominant Wavelength BIN Limits**

| BIN Code   | Test condition : @20mA       |                              |
|------------|------------------------------|------------------------------|
| <b>UHR</b> | <b>λ<sub>Dmin</sub> (nm)</b> | <b>λ<sub>Dmax</sub> (nm)</b> |
| <b>1</b>   | 624                          | 640                          |
| BIN Code   | Test condition : @20mA       |                              |
| <b>UHY</b> | <b>λ<sub>Dmin</sub> (nm)</b> | <b>λ<sub>Dmax</sub> (nm)</b> |
| <b>2</b>   | 585                          | 588                          |
| <b>3</b>   | 588                          | 591                          |
| <b>4</b>   | 591                          | 594                          |
| <b>5</b>   | 594                          | 596                          |
| BIN Code   | Test condition : @20mA       |                              |
| <b>DNB</b> | <b>λ<sub>Dmin</sub> (nm)</b> | <b>λ<sub>Dmax</sub> (nm)</b> |
| <b>1</b>   | 465                          | 470                          |
| <b>2</b>   | 470                          | 475                          |