

Surface Mounted Chip LED

CL-SP1615UHYDNB-02

◆ 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 _{FP} | 100 | mA |
| Reverse Voltage | V _R | 5 | V |
| Derating Linear From 25°C | | 0.4 | mA/°C |
| Operating Temperature Range | T _{opr} | -40 to +85 | °C |
| Storage Temperature Range | T _{stg} | -40 to +85 | °C |

◆ Electrical/Optical Characteristics

(Ta=25°C)

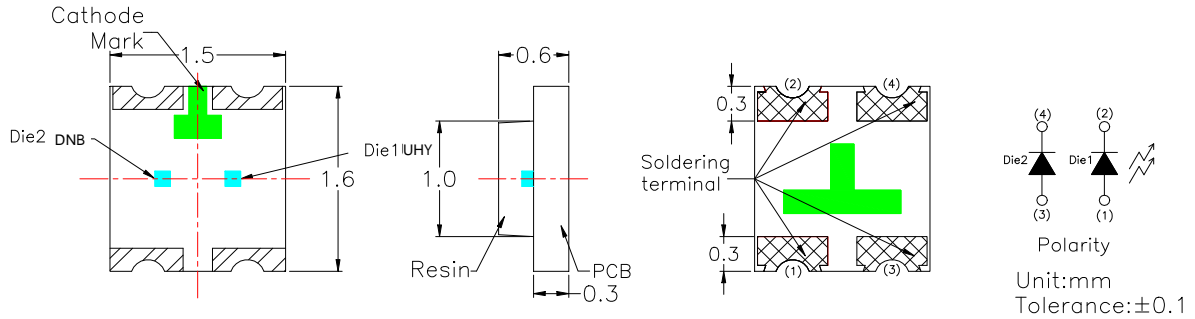
| Chip | | | Lens Appearance | Absolute Maximum Rating | | | Electro-optical Data (At 20mA) | | | | Viewing Angle 201/2 (deg) |
|--------------------------------|---------------------|---------------------|--------------------|-------------------------|---------------------|------------------------|-----------------------------------|------|----------------------|------|---------------------------------|
| Emitted Color | λ _P (nm) | λ _D (nm) | | Δλ (nm) | P _D (mW) | I _{Fmax} (mA) | V _F (V) | | I _v (mcd) | | |
| | | | | | | | Typ. | Max. | Min. | Typ. | |
| Ultra High Yellow (Die 1) | 592 | 590 | Water Clear | 20 | 78 | 30 | 1.9 | 2.2 | 57 | 90 | 120° |
| Bl(Die 2) | 467 | 467 | | 15 | 100 | 30 | 2.9 | 3.3 | 90 | 145 | |

※The measuring tolerance → Luminous intensity ±15%
Wavelength (λ_D) ±2nm

| | | | |
|----------|----------------|-----------|------------|
| APPROVER | DIMENSION NO : | VERSION : | DATE : |
| | | A2 | 2012-12-11 |
| | ISSUE : | CHECKER : | ENGINEER : |
| | | | |

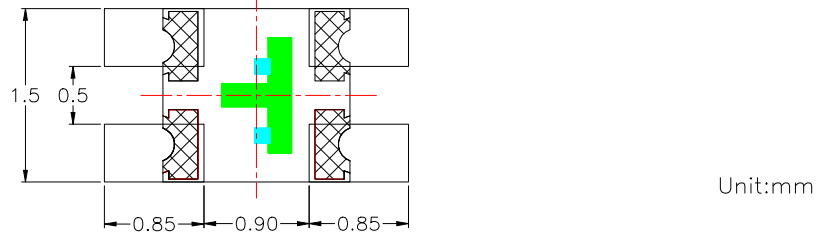
◆ Dimensions / Taping and Package Spec.

● Package Dimensions of Device (SP195 Die1 Die2 Series)



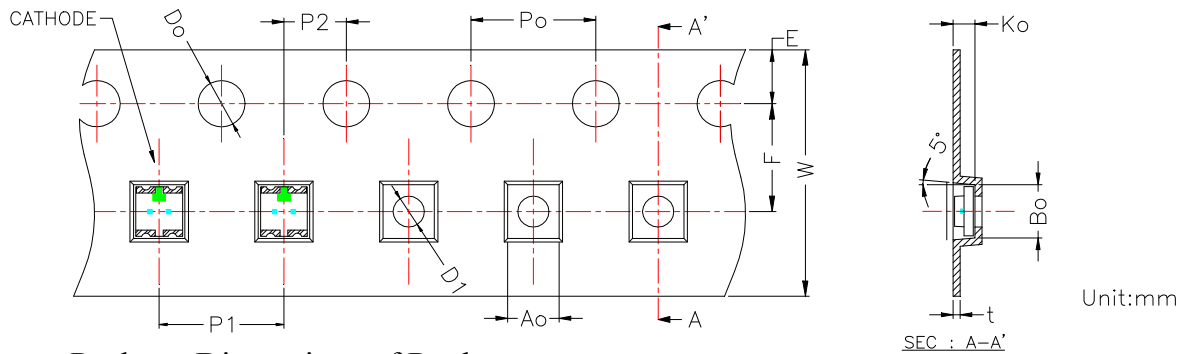
1. Soldering terminal may shift in x, y direction.

● Recommended Soldering Pad Dimensions

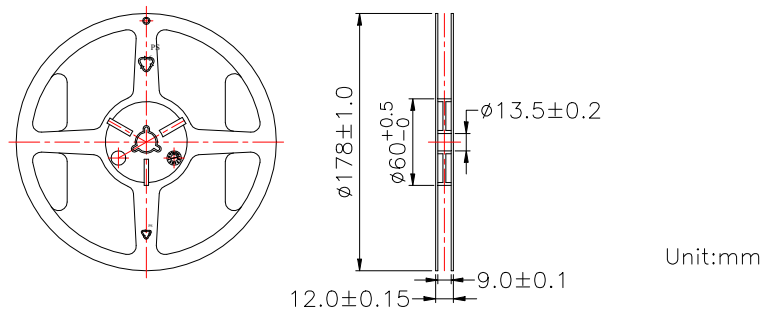


● Tape Specification :4000pcs Per Reel

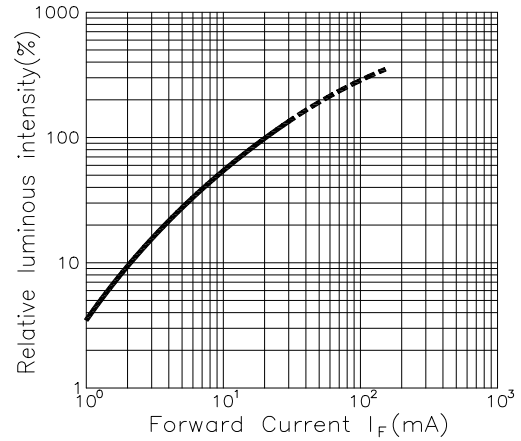
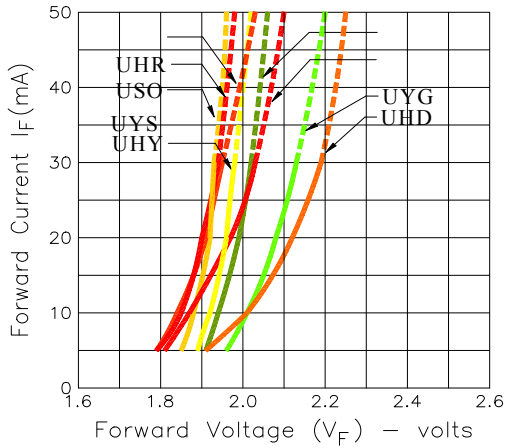
| Packing Size | | | | | | | | | | | | | |
|--------------|----------------|-------|-------|-------|----------------|----------------|-------|-------|-------|-------|-------|-------|-------|
| Item | W | P1 | E | F | Do | D1 | Po | 10Po | P2 | Ao | Bo | Ko | t |
| Spec. | 8.00 | 4.00 | 1.75 | 3.50 | 1.50 | 1.00 | 4.00 | 40.00 | 2.00 | 1.65 | 1.75 | 0.70 | 0.229 |
| Tolerance | +0.30 -0.10 | ±0.10 | ±0.10 | ±0.05 | +0.10 -0.00 | +0.25 -0.00 | ±0.05 | ±0.20 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.02 |



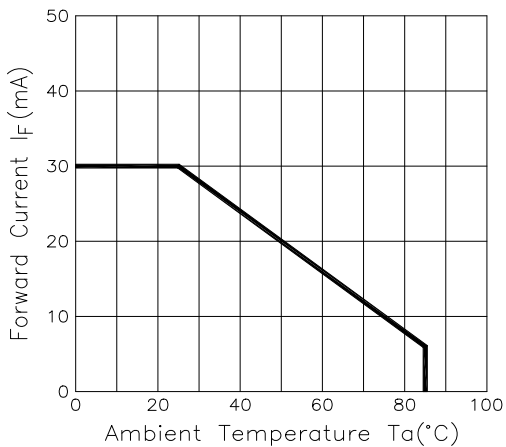
● Package Dimensions of Reel :



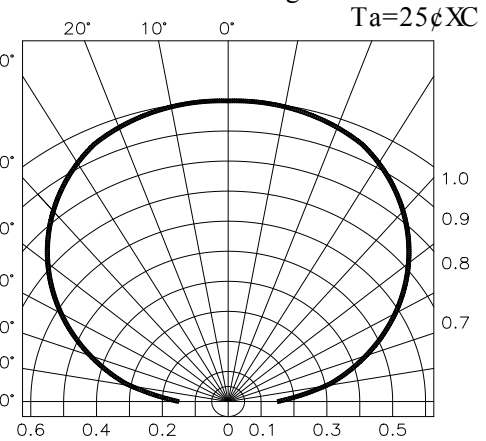
◆ **Typical Electro-Optical Characteristic Curves**
SPXXUHYDNB4



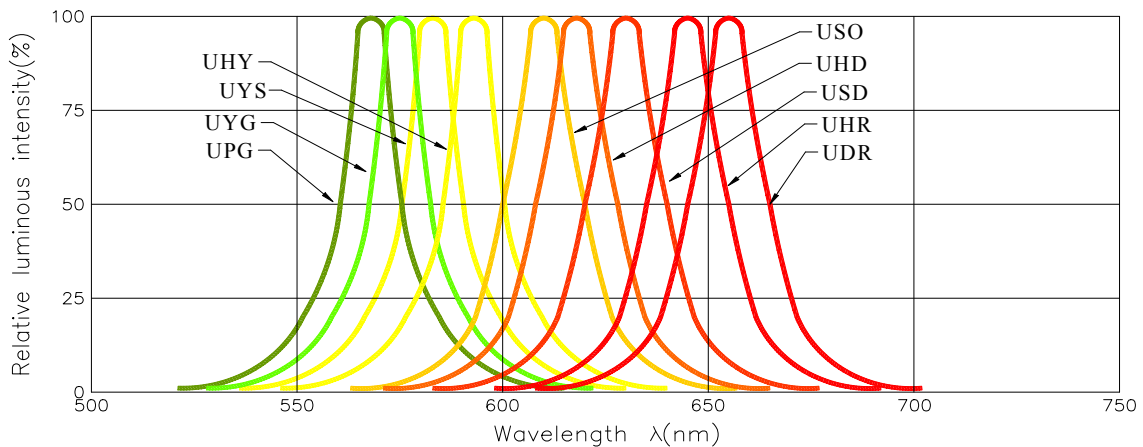
Forward Current Derating Curve



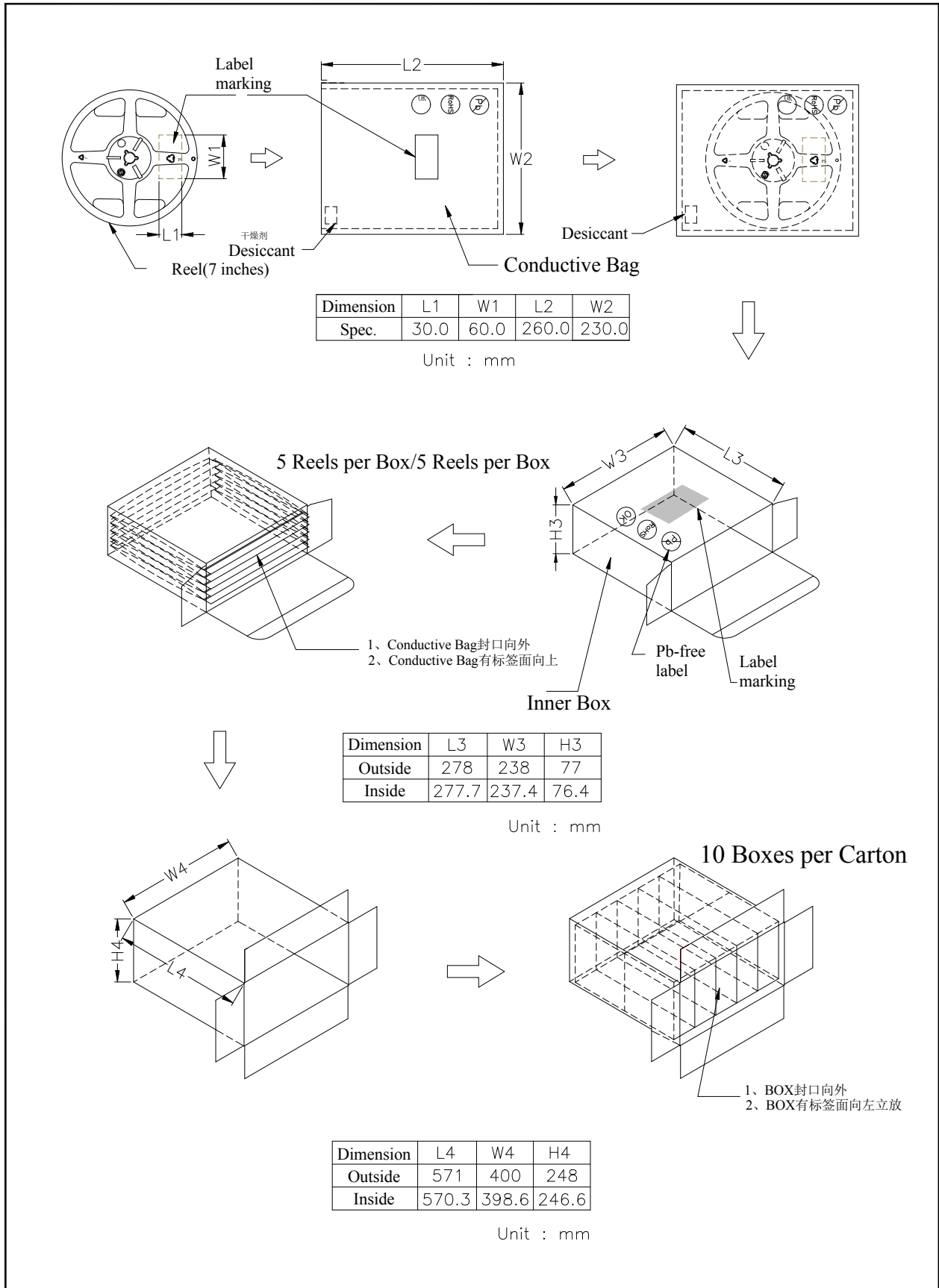
Radiation Diagram



Spectrum Distribution



◆ Packing and Shipping Instruction



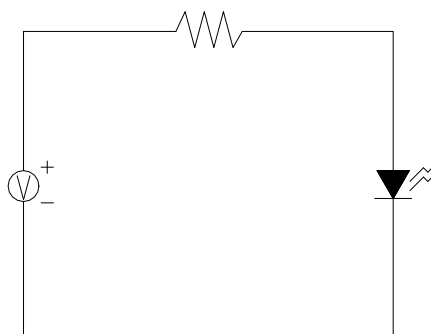
◆ **Descriptions :**

- 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 hr/cycle/time | Sample Q'ty | Ac / Re |
|--|--------------------------------|--|--------------------|-------------|---------|
| 1 | Solder Heat | TEMP :260°C±5°C ;10±1 sec | 2 times | 30 pcs | 0 / 1 |
| 2 | Solderbility Test ※ | TEMP :235°C±5°C ;3±1 sec | 1 time | 5 pcs | 0 / 1 |
| 3 | Temperature Cycle | H : +85°C 30min. ∫ 5min. L : -40°C 30min. | 100 cycles | 20 pcs | 0 / 1 |
| 4 | Thermal Shock | H : +85°C 5min. ∫ L : -40°C 5min. | 50 cycles | 20 pcs | 0 / 1 |
| 5 | High Temperature Storage | TEMP : 85°C | 1000 hrs | 20 pcs | 0 / 1 |
| 6 | Low Temperature Storage | TEMP : -40°C | 1000 hrs | 20 pcs | 0 / 1 |
| 7 | DC Operating Life | $I_F = I_{Fmax}$ | 1000 hrs | 20 pcs | 0 / 1 |
| 8 | High Temperature High Humidity | 85°C / 90~95%R.H. | 1000 hrs | 20 pcs | 0 / 1 |
| 9 | Shocking test | 100~2000Hz ; 98.1m/s ² 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_F | | V_F Max-Increase < 1.1x | | | |
| Reverse Current I_R | | I_R Max-Increase < I_{Rmax} | | | |
| Luminous Intensity I_V | | I_V Decay < 40% | | | |
| ※Tolerability 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**

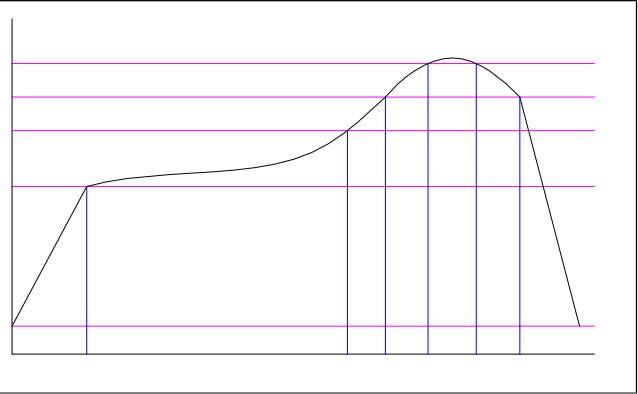


◆ **Precautions For Use :**

- 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 :**

| TEMP ($^{\circ}\text{C}$) | | TIME (sec) | |
|-----------------------------|-----|----------------|-------------------------------------|
| a | 25 | T0~T1 | $5^{\circ}\text{C}/\text{sec}$ max |
| b | 150 | T1~T2 | 90~130 |
| c | 200 | T2~T3 | $5^{\circ}\text{C}/\text{sec}$ max |
| d | 230 | T3~T6 | 60~90 |
| e | 260 | T4~T5 | 10 ± 1 |
| | | T6~T7 | $-6^{\circ}\text{C}/\text{sec}$ max |
| MSL level | | Level 4 | |



◆ **Hand Soldering Iron :**

- Temperature at tip of iron : 400°C Max. (35W Max.)
- Soldering time : 3 ± 1 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

1st Number(Package Code) : Standard Type→1 、 Routing Type→2 、 Lens Type→3

2nd 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

3rd 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)**

Model NO : SP195UHYDNB

◆ **Luminous Intensity BIN Limits**

| BIN Code | Test condition : @20mA | |
|----------|-------------------------|-------------------------|
| UHY | I _{Vmin} (mcd) | I _{Vmax} (mcd) |
| K | 72 | 115 |
| L | 115 | 180 |

| BIN Code | Test condition : @20mA | |
|----------|-------------------------|-------------------------|
| DNB | I _{Vmin} (mcd) | I _{Vmax} (mcd) |
| K | 72 | 115 |
| L | 115 | 180 |

◆ **Dominant Wavelength BIN Limits**

| BIN Code | Test condition : @20mA | |
|----------|------------------------|------------------------|
| DHY | λ _{Dmin} (nm) | λ _{Dmax} (nm) |
| 1 | 586 | 588 |
| 2 | 588 | 591 |
| 3 | 591 | 594 |

| BIN Code | Test condition : @20mA | |
|----------|------------------------|------------------------|
| DNB | λ _{Dmin} (nm) | λ _{Dmax} (nm) |
| 2 | 460 | 465 |
| 3 | 465 | 470 |
| 4 | 470 | 475 |

◆ **Label Marking**

