

# Specifications for Approval

Customer Part No.:

Inhere Part No.: S3528EPWD-007

Part Name: 3528 白光 LED

Spec Issue Date: 2018-07-23

Revision No.: A

To Customer:

We submit here with the following information for your approval:

- Sample       OQC Inspection Record       LED Dimension  
 Electrical Characteristics Curve       Internal Circuit Diagram  
 Soldering recommendation

Prepared by: Lily  
Date: 2018-07-23

Checked by: Tom  
Date: 2018-07-23

Approved by: Wangxiaojun  
Date: 2018-07-23

Customer Opinion

- Approve and no objection  
 Reject with the following reason:

**inhere**   
light for your mind  
银河光电

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## Features

3.5mm × 2.8mm SMD LED, 1.9mm thickness

Low power consumption

Wide view angle

Package: 2000pcs/reel

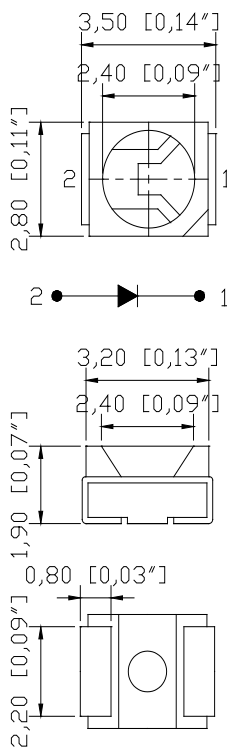
RoHS Compliant

## Applications

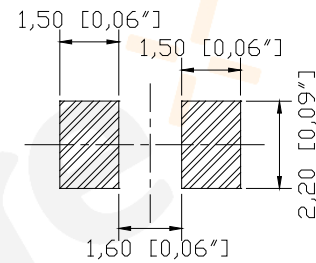
Ideal for back light and indicator

Various colors and lens types available

### Package outlines



### Recommend Pad Layout



| Part No.      | Emitted color | Dice      | Lens color |
|---------------|---------------|-----------|------------|
| S3528EPWD-007 | White         | InGaN/GaN | Yellow     |

### Notes:

All dimensions are in millimeters (inches);

Tolerances are  $\pm 0.1\text{mm}$  (0.004inch) unless otherwise noted.

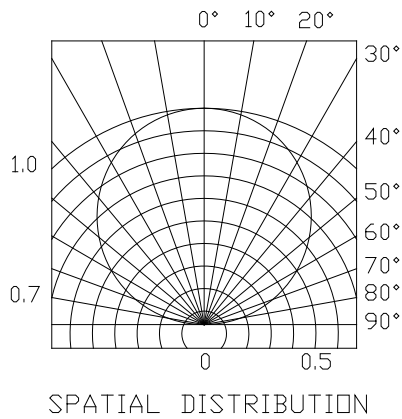
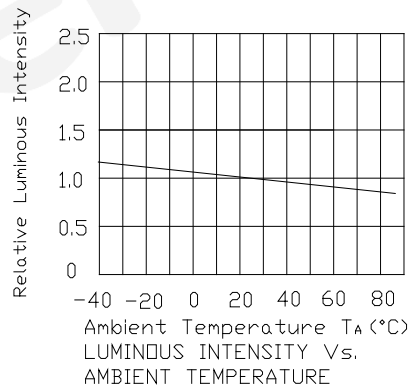
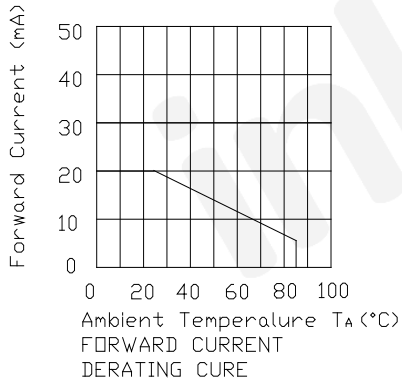
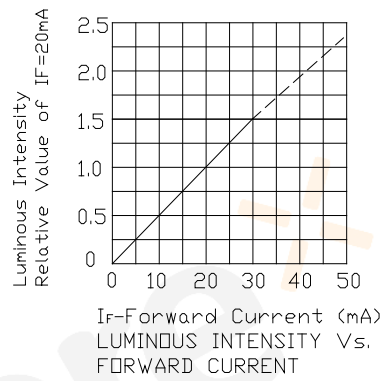
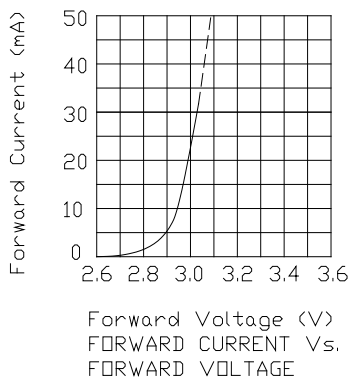
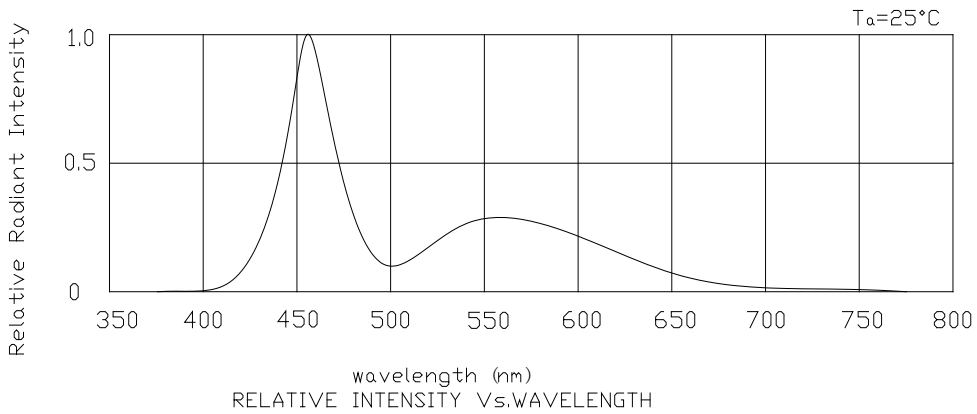
**Absolute Maximum Ratings (TA=25°C)**

| Parameter                              | Symbol | Value    | Unit |
|--|--------|----------|------|
| Forward current                        | If     | 30       | mA   |
| Reverse voltage                        | Vr     | 5        | V    |
| Power dissipation                      | Pd     | 105      | mW   |
| Operating temperature                  | Top    | -40 ~+80 | °C   |
| Storage temperature                    | Tstg   | -40 ~+85 | °C   |
| Peak pulsing current (1/8 duty f=1kHz) | Ifp    | 125      | mA   |

**Electro-Optical Characteristics (TA=25°C)**

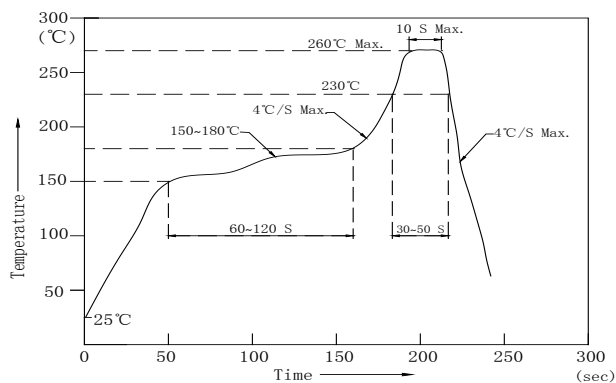
| Parameter               | Test Condition | Symbol | Value  |      |        | Unit |
|-------------------------|----------------|--------|--------|------|--------|------|
|                         |                |        | Min    | Typ  | Max    |      |
| CIE Coordinates         | If=20mA        | X      | 0.2795 | --   | 0.3122 | --   |
|                         |                | Y      | 0.2563 | --   | 0.3240 |      |
| Forward voltage         | If=20mA        | Vf     | 2.6    | --   | 3.2    | V    |
| Luminous intensity      | If=20mA        | Iv     | 2000   | 2500 | --     | mcd  |
| Viewing angle at 50% Iv | If=10mA        | 2θ 1/2 | --     | 120  | --     | Deg  |
| Reverse current         | Vr=5V          | Ir     | --     | --   | 10     | μA   |
| Color rendering         | If=20mA        | Ra     | 70     | --   | 98     | --   |

**Optical Characteristic Curves**



## Reflow Profile

### ■ Reflow Temp/Time



### Notes:

1. We recommend the reflow temperature  $245^{\circ}\text{C} (\pm 5^{\circ}\text{C})$ . the maximum soldering temperature should be limited to  $260^{\circ}\text{C}$ .
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Times of reflow process shall be 2 or less.

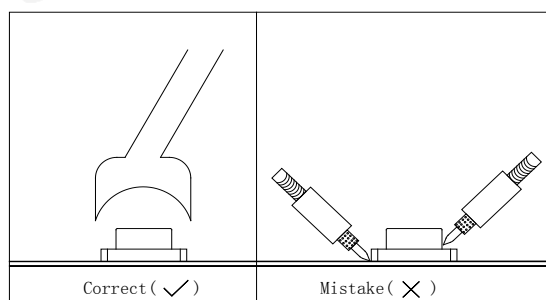
### ■ Soldering iron

Basic spec is  $\leq 5\text{sec}$  when  $320^{\circ}\text{C} (\pm 20^{\circ}\text{C})$ . If temperature is higher, time should be shorter ( $+10^{\circ}\text{C} \rightarrow -1\text{sec}$ ).

Power dissipation of iron should be smaller than 20W, and temperatures should be controllable. Surface temperature of the device should be under  $350^{\circ}\text{C}$ .

### ■ Rework

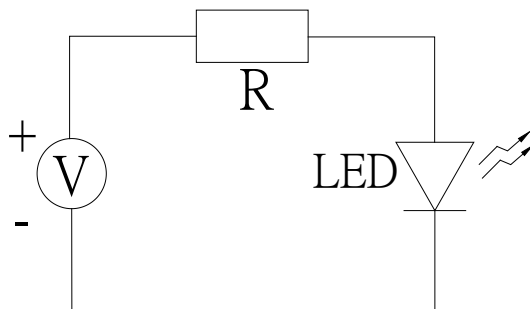
1. Customer must finish rework within 5 sec under  $340^{\circ}\text{C}$ .
2. The head of iron cannot touch copper foil
3. Twin-head type is preferred.



- Avoid rubbing or scraping the resin by any object, during high temperature, for example reflow solder etc.

## Test circuit and handling precautions

### ■ Test circuit



### ■ Handling precautions

#### 1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

#### 2. Storage

##### 2.1 It is recommended to store the products in the following conditions:

Humidity: 60% R.H. Max.

Temperature : 5°C~30°C(41°F~86°F)

2.2 Shelf life in sealed bag: 12 month at <math>< 5^{\circ}\text{C}\sim 30^{\circ}\text{C}</math> and <math>< 30\%</math> R.H. after the package is opened, the products should be used within a week or they should be keeping to stored at  $\leq 20$  R.H. with zip-lock sealed.

#### 3. Baking

It is recommended to baking before soldering. The Conditions is:  $60\pm 5^{\circ}\text{C}/24\text{hrs}$

### Test Items and Results of Reliability

| Test Item                               | Test Conditions                                      | Standard Test Method | Note      | Number of Test |
|---|--|----------------------|-----------|----------------|
| Reflow Soldering                        | Ta=260±5℃,Time=10±2S                                 | JB/T 10845-2008      | 3times    | 0/22           |
| Salt Atmosphere                         | Ta=35±3℃,PH=6.5~7.2                                  | GB/T 2423.17-2008    | 24hrs     | 0/22           |
| Temperature Cycling                     | -40±5℃ 30±1min<br>↑→(25℃/5±1min) ↓<br>100±5℃ 30±1min | GB/T 2423.22-2012    | 100cycles | 0/22           |
| Thermal Shock                           | Ta=-40±5℃~100±5℃,<br>15±1min dwell                   | GB/T 2423.22-2012    | 100cycles | 0/22           |
| High Humidity High Temp. Cycling        | Ta=30±5℃~65±5℃,<br>90±5%RH,24hrs/1cycle              | GB/T 2423.4-2008     | 10cycles  | 0/22           |
| High Humidity High Temp. Storage Life   | Ta=85±5℃,ψ(%)=85±5%RH                                | GB/T 2423.3-2006     | 1000hrs   | 0/22           |
| High Temperature Storage Life           | Ta=100±5℃,non-operating                              | GB/T 2423.2-2008     | 1000hrs   | 0/22           |
| Low Temperature Storage Life            | Ta=-40±5℃,non-operating                              | GB/T 2423.1-2008     | 1000hrs   | 0/22           |
| Life Test                               | Ta=26±5℃,@20mA,<br>ψ(%)=25%RH~55%RH                  | --                   | 1000hrs   | 0/22           |
| High Humidity High Temp. Operating Life | Ta=85±5℃,@20mA,<br>ψ(%)=85%RH                        | GB/T 2423.3-2006     | 500hrs    | 0/22           |
| Low Temperature Operating Life          | Ta=-20±5℃,@20mA                                      | GB/T 2423.1-2008     | 1000hrs   | 0/22           |

**Forward Voltage Rank Combination (IF=20mA)**

| Rank | Min. | Max. | Unit |
|------|------|------|------|
| 20   | 2.6  | 2.8  | V    |
| 22   | 2.8  | 3.0  |      |
| 24   | 3.0  | 3.2  |      |

**Luminous Intensity Rank Combination (IF=20mA)**

| Rank | Min. | Max. | Unit |
|------|------|------|------|
| W    | 2000 | 2500 | mcd  |
| X    | 2500 | 3200 |      |
| Y    | 3200 | --   |      |

**Chromaticity Coordinates Ranks Combination (IF=20mA)**

| Rank  | Chromaticity Coordinates |        |        |        |        |
|-------|--------------------------|--------|--------|--------|--------|
|       | NEW-0                    | X      | 0.2915 | 0.2997 | 0.3046 |
|       | Y                        | 0.2666 | 0.2829 | 0.2715 | 0.2563 |
| NEW-1 | X                        | 0.2855 | 0.2948 | 0.2997 | 0.2915 |
|       | Y                        | 0.2769 | 0.2943 | 0.2829 | 0.2666 |
| NEW-2 | X                        | 0.2795 | 0.2899 | 0.2948 | 0.2855 |
|       | Y                        | 0.2872 | 0.3057 | 0.2943 | 0.2769 |
| NEW-3 | X                        | 0.2997 | 0.3091 | 0.3122 | 0.3046 |
|       | Y                        | 0.2829 | 0.2960 | 0.2820 | 0.2715 |
| NEW-4 | X                        | 0.2948 | 0.3060 | 0.3091 | 0.2997 |
|       | Y                        | 0.2943 | 0.3100 | 0.2960 | 0.2829 |
| NEW-5 | X                        | 0.2899 | 0.3029 | 0.3060 | 0.2948 |
|       | Y                        | 0.3057 | 0.3240 | 0.3100 | 0.2943 |

**Group Name on Label (Example DATA: 20XNEW-1 20)**

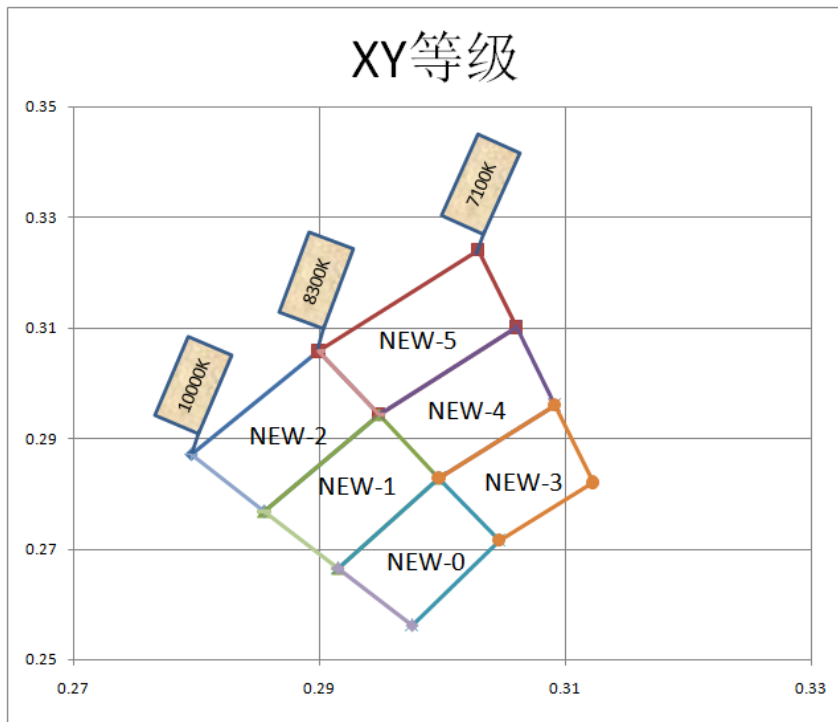
| DATA: 20XNEW-1 20 | Vf(V)   | Iv (mcd)  | CIE(X,Y)                          | Test Condition |
|-------------------|---------|-----------|-----------------------------------|----------------|
| 20→X→NEW-1→20     | 2.6~2.8 | 2500~3200 | X(0.2855~0.2997),Y(0.2666~0.2943) | IF=20mA        |

**Notes:**

- 1.The tolerance of luminous intensity (Iv )is  $\pm 15\%$  .
2. The tolerance of CIE Coordinates(X, Y) is  $\pm 0.01$ .
3. This specification is preliminary.
4. This specification is a standard specification of our factory, can make in accordance with customer's special requirement.



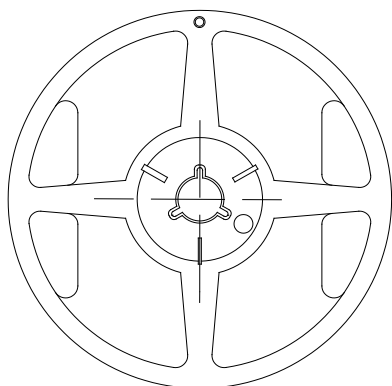
# XY Chromaticity Coordinate



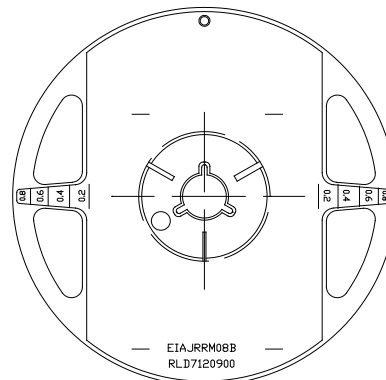
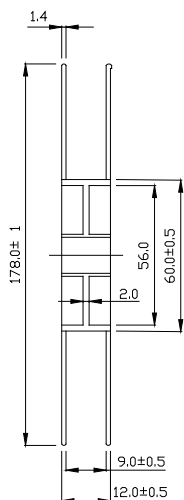
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### 3528 Series SMD Chip LED Lamps Packaging Specifications

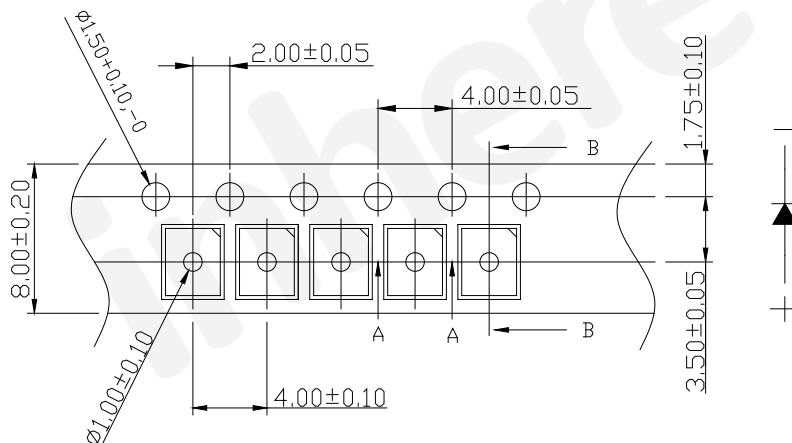
● Feeding Direction



● Dimensions of Reel (Unit: mm)



● Dimensions of Tape (Unit: mm)

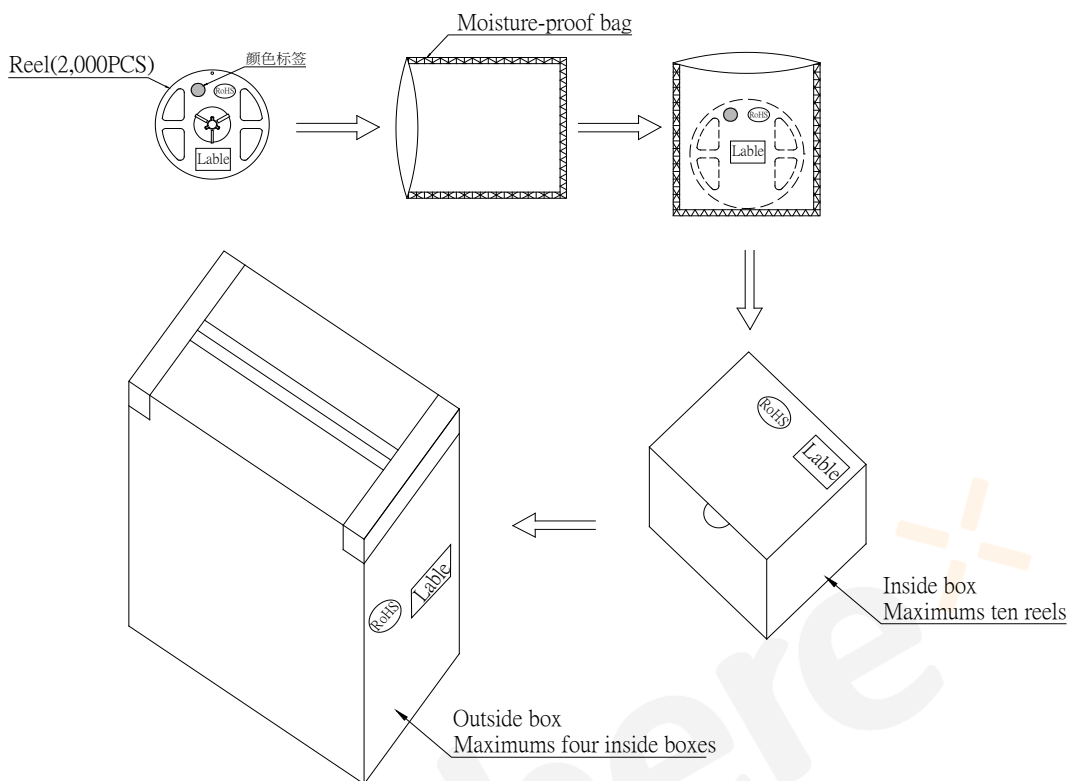


Notes:

1. Empty component pockets are sealed with top cover tape;
2. The maximum number of missing lamps is two;
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.
4. 2,000pcs/Reel.

## 3528 Series SMD Chip LED Lamps Packaging Specifications

- Packaging specifications



### Notes:

Reeled products (numbers of products are 2,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, ten moisture-proof bag of maximums (total maximum number of products are 20,000pcs) packed in an inside box (about size: 240x 230x 130mm) and four inside boxes of maximums are put in the outside box (about size: 545mm x 260mm x 250mm) Together with buffer material, and it is packed. (Part No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. and quantity should appear on the label on the cardboard box.) The number of the loading steps of outside box (cardboard box) has it to three steps.