*TAIWAN TONGJIA OPTOELECTRONICS TECHNOLOGY CO., LTD*

# 承 認 書

# Specification For Approval

Customer: (客戶) _____

Description:(產品描述) **3527 双色温灯珠**

Part number:(產品型號) _____

Date: (日期) _____

Approved By: (客戶承認)

Prepared By:(我司承認)

| Approval | Check | Design | Sales |
|---|---|---|---|
| 核准 | 審核 | 製作 | 業務 |

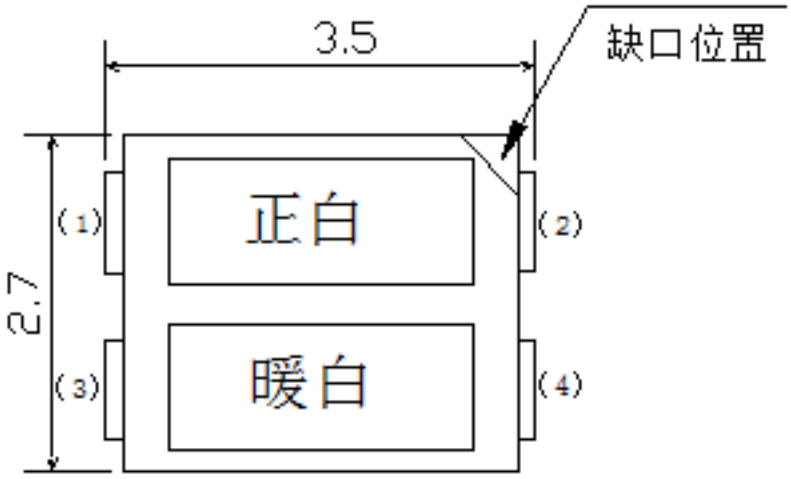
Customer Service Hotline：**400-676-8616**

TEL：0769-8662 5999 FAX：0769-8200 2227

E-MIAL：dg@togialed.com WEB：www.togialed.com

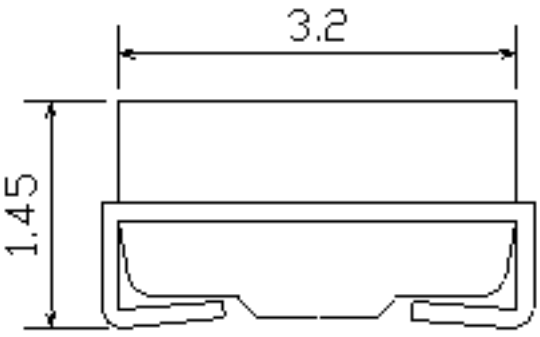
● **Features:**

1. Emitted Color: White.
2. Lens Appearance: Yellow Diffuse.
3. 3.5x2.7x1.45mm mm standard package.
4. Suitable for all SMT assembly methods.
5. Compatible with infrared and vapor phase reflow solder process.
6. Compatible with automatic placement equipment.
7. This product doesn't contain restriction Substance, comply ROHS standard.

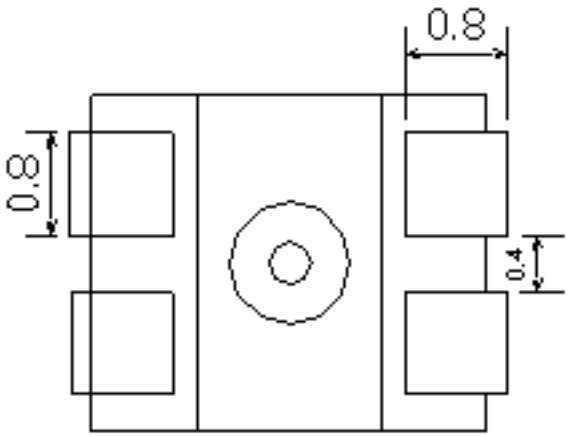



● **Applications:**

1. Automotive: Dashboards, stop lamps, turn signals.
2. Backlighting: LCDs, Key pads advertising
3. Status indicators: Consumer & industrial electronics.
4. General use.







## ● Absolute Maximum Ratings（Ta=25℃）

| Item | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation/DICE | PD | 70 | mW |
| DC Forward Current/DICE | IF | 20 | mA |
| Single Chip Pulsed Forward Current | IFP | 100※ | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temperature | Topr | -30～+80■ | ℃ |
| Storage Temperature | Tstg | -40～+100 | ℃ |
| Soldering Temperature | Tsol | 260for7sec△ | ℃ |

※Duty 1/10， Pulse Width 0.1ms.
△Soldering time max 10sec

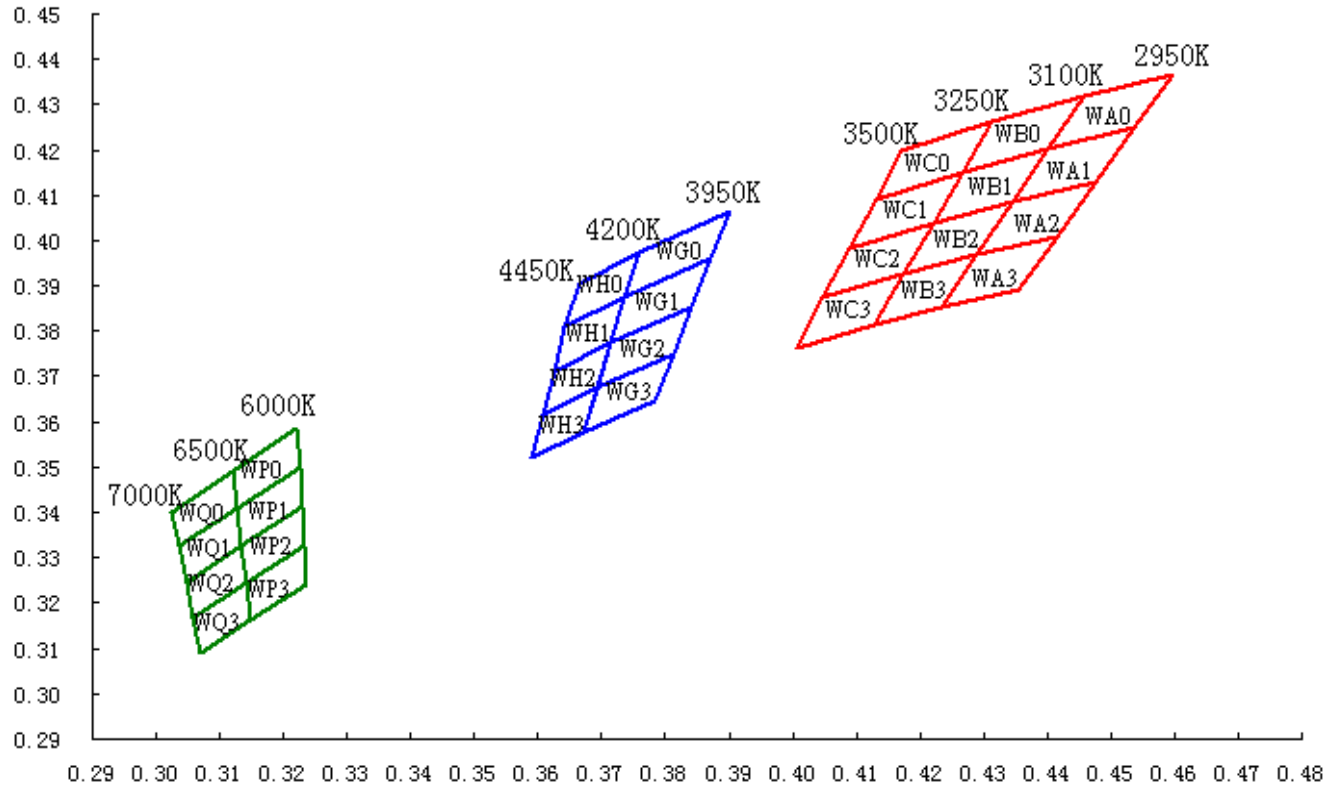
## ● Warm –white

| Parameter | Symbol | Value | | | Unit | Test condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Forward Voltage | Vf | - | 3.3 | - | V | If=20mA |
| Reverse Current | Ir | - | - | 10 | μA | Vr=5V |
| Viewing angle | 2θ1/2 | - | 120 | - | Deg | If=20mA |
| Chromaticity coordinate | X | - | | - | - | If=20mA |
| | Y | - | | - | - | |
| Color Temperature | CCT | - | 3000 | - | K | If=20mA |
| Luminous intensity | Iv | | 7 | - | LM | If=20mA |
| Color Rendering Index | CRI | - | **70** | - | - | If=20mA |

## ● Cool—white

| Parameter | Symbol | Value | | | Unit | Test condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Forward Voltage | Vf | - | 3.3 | - | V | If=20mA |
| Reverse Current | Ir | - | - | 10 | μA | Vr=5V |
| Viewing angle | 2θ1/2 | - | 120 | - | Deg | If=20mA |
| Chromaticity coordinate | X | - | | - | - | If=20mA |
| | Y | - | | - | - | |
| Color Temperature | CCT | - | 6500 | - | K | If=20mA |
| Luminous intensity | Iv | | 7 | - | LM | If=20mA |
| Color Rendering Index | CRI | - | **70** | - | - | If=20mA |

## ●Color Bin Limits (At 20mA)




## ●Color Bin Limits (At 20mA)

**Warm White**

| Bin Code | X | Y | Bin Code | X | Y | Bin Code | X | Y |
|---|---|---|---|---|---|---|---|---|
| | 0.4598 | 0.4368 | | 0.4458 | 0.4321 | | 0.4313 | 0.4261 |
| | 0.4538 | 0.4249 | | 0.4400 | 0.4204 | | 0.4269 | 0.4150 |
| WA0 | 0.4400 | 0.4204 | WB0 | 0.4269 | 0.4150 | WC0 | 0.4131 | 0.4090 |
| | 0.4458 | 0.4321 | | 0.4313 | 0.4261 | | 0.4172 | 0.4199 |
| | 0.4598 | 0.4368 | | 0.4458 | 0.4321 | | 0.4313 | 0.4261 |
| | 0.4538 | 0.4249 | | 0.4400 | 0.4204 | | 0.4269 | 0.4150 |
| | 0.4477 | 0.4130 | | 0.4345 | 0.4087 | | 0.4222 | 0.4039 |
| WA1 | 0.4345 | 0.4087 | WB1 | 0.4222 | 0.4039 | WC1 | 0.4090 | 0.3981 |
| | 0.4400 | 0.4204 | | 0.4269 | 0.4150 | | 0.4131 | 0.4090 |
| | 0.4538 | 0.4249 | | 0.4400 | 0.4204 | | 0.4269 | 0.4150 |
| | 0.4477 | 0.4130 | | 0.4345 | 0.4087 | | 0.4222 | 0.4039 |
| | 0.4416 | 0.4010 | | 0.4289 | 0.3971 | | 0.4175 | 0.3927 |
| WA2 | 0.4289 | 0.3971 | WB2 | 0.4175 | 0.3927 | WC2 | 0.4048 | 0.3873 |
| | 0.4345 | 0.4087 | | 0.4222 | 0.4039 | | 0.4090 | 0.3981 |
| | 0.4477 | 0.4130 | | 0.4345 | 0.4087 | | 0.4222 | 0.4039 |
| | 0.4416 | 0.4010 | | 0.4289 | 0.3971 | | 0.4175 | 0.3927 |
| | 0.4355 | 0.3891 | | 0.4234 | 0.3854 | | 0.4128 | 0.3816 |
| WA3 | 0.4234 | 0.3854 | WB3 | 0.4128 | 0.3816 | WC3 | 0.4007 | 0.3764 |
| | 0.4289 | 0.3971 | | 0.4175 | 0.3927 | | 0.4048 | 0.3873 |
| | 0.4416 | 0.4010 | | 0.4289 | 0.3971 | | 0.4175 | 0.3927 |

**Natural White**

| Bin Code | X | Y | Bin Code | X | Y |
|---|---|---|---|---|---|
| WG0 | 0.3902 | 0.4063 | WH0 | 0.3758 | 0.3973 |
| | 0.3871 | 0.3959 | | 0.3736 | 0.3874 |
| | 0.3736 | 0.3874 | | 0.3642 | 0.3809 |
| | 0.3758 | 0.3973 | | 0.3664 | 0.3907 |
| | 0.3902 | 0.4063 | | 0.3758 | 0.3973 |
| WG1 | 0.3871 | 0.3959 | WH1 | 0.3736 | 0.3874 |
| | 0.3842 | 0.3855 | | 0.3714 | 0.3775 |
| | 0.3714 | 0.3775 | | 0.3625 | 0.3712 |
| | 0.3736 | 0.3874 | | 0.3642 | 0.3809 |
| | 0.3871 | 0.3959 | | 0.3736 | 0.3874 |
| WG2 | 0.3842 | 0.3855 | WH2 | 0.3714 | 0.3775 |
| | 0.3813 | 0.3751 | | 0.3692 | 0.3677 |
| | 0.3692 | 0.3677 | | 0.3608 | 0.3616 |
| | 0.3714 | 0.3775 | | 0.3625 | 0.3712 |
| | 0.3842 | 0.3855 | | 0.3714 | 0.3775 |
| WG3 | 0.3813 | 0.3751 | WH3 | 0.3692 | 0.3669 |
| | 0.3784 | 0.3647 | | 0.3670 | 0.3578 |
| | 0.3670 | 0.3578 | | 0.3591 | 0.3522 |
| | 0.3692 | 0.3677 | | 0.3608 | 0.3616 |
| | 0.3813 | 0.3751 | | 0.3692 | 0.3677 |

**Cool White**

| Bin Code | X | Y | Bin Code | X | Y |
|---|---|---|---|---|---|
| WP0 | 0.3222 | 0.3587 | WQ0 | 0.3121 | 0.3491 |
| | 0.3226 | 0.3500 | | 0.3127 | 0.3411 |
| | 0.3127 | 0.3411 | | 0.3036 | 0.3326 |
| | 0.3121 | 0.3491 | | 0.3025 | 0.3401 |
| | 0.3222 | 0.3587 | | 0.3121 | 0.3491 |
| WP1 | 0.3226 | 0.3500 | WQ1 | 0.3127 | 0.3411 |
| | 0.3229 | 0.3413 | | 0.3134 | 0.3328 |
| | 0.3134 | 0.3328 | | 0.3047 | 0.3247 |
| | 0.3127 | 0.3411 | | 0.3036 | 0.3326 |
| | 0.3226 | 0.3500 | | 0.3127 | 0.3411 |
| WP2 | 0.3229 | 0.3413 | WQ2 | 0.3134 | 0.3328 |
| | 0.3233 | 0.3327 | | 0.3142 | 0.3246 |
| | 0.3142 | 0.3246 | | 0.3058 | 0.3168 |
| | 0.3134 | 0.3328 | | 0.3047 | 0.3247 |
| | 0.3229 | 0.3413 | | 0.3134 | 0.3328 |
| WP3 | 0.3233 | 0.3327 | WQ3 | 0.3142 | 0.3246 |
| | 0.3236 | 0.3240 | | 0.3149 | 0.3163 |
| | 0.3149 | 0.3163 | | 0.3069 | 0.3089 |
| | 0.3142 | 0.3246 | | 0.3058 | 0.3168 |
| | 0.3233 | 0.3327 | | 0.3142 | 0.3246 |

## ● Typical Electro-Optical Characteristics Curves

Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

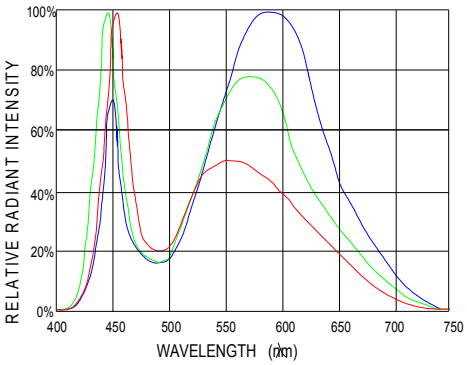



Fig.2 FORWARD CURRENT VS. AMBIENT TEMPERATURE

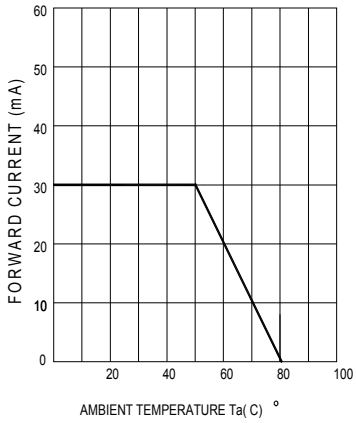



Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

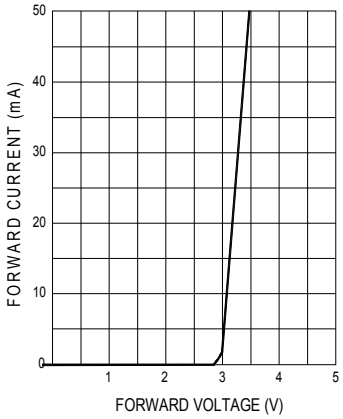



Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

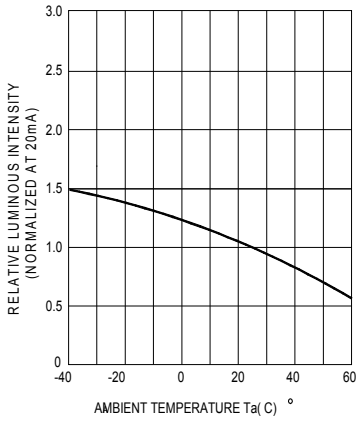



Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

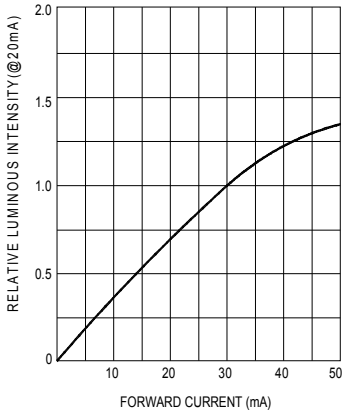
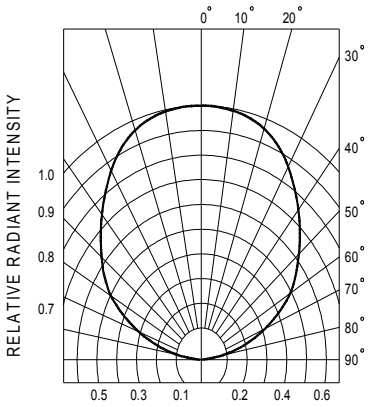
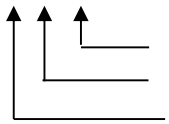



Fig.6 RADIATION DIAGRAM




● BIN : x x x



Color BIN CODE
Intensity BIN CODE
$V_F$ BIN CODE

Notes:

1. $V_F$ : Tolerance for each Bin limit is ±0.05
2. Iv : Tolerance for each Bin limit is ± 10 %
3. Color : Tolerance for each Bin limit is ± 0.005.
4. Bin categories are established for classification of products.
   Products may not be available in all bin categories.

● **Test items and results of reliability**

| Type | Test Item | Test Conditions | Note | Number of Damaged |
|---|---|---|---|---|
| Operation Sequence | Life Test | $T_a$=25℃<br>$I_F$=30mA | 1000 hrs | 0/22 |
| | High Humidity Heat Life Test | 85℃ RH=85%<br>$I_F$=30mA | 500 hrs | 0/22 |
| | Low Temperature Life Test | $T_a$=-20℃<br>$I_F$=30mA | 1000 hrs | 0/22 |
| Environmental Sequence | Temperature Cycle | -45℃ 30min<br>↑↓20 min<br>105℃ 30min | 100 cycle | 0/22 |
| | Thermal Shock | -10℃ 15min<br>↑↓5sec<br>100℃ 15min | 100 cycle | 0/22 |
| | High Humidity Heat Cycle | 30℃⇔ 65℃<br>90%RH 24hrs/1cycle | 10 cycle | 0/22 |
| | High Temperature Storage | $T_a$=100℃ | 1000 hrs | 0/22 |
| | Humidity Heat Storage | $T_a$=85℃<br>RH=85% | 1000 hrs | 0/22 |
| | Low Temperature Storage | $T_a$=-40℃ | 1000 hrs | 0/22 |

● **Judgment criteria of failure for the reliability**

| Measuring items | Symbol | Measuring conditions | Judgment criteria for failure |
|---|---|---|---|
| Forward voltage | $V_F$ (V) | $I_F$=20mA | Over $U^1$x1.2 |
| Reverse current | $I_R$ (uA) | $V_R$=5V | Over $U^1$x2 |
| Luminous intensity | Iv ( mcd) | $I_F$=20mA | Below $S^1$X0.5 |

Note: .1. U means the upper limit of specified characteristics. S means initial value.

2. After each test, remove test pieces, wait for 2 hours and test pieces have returned to ambient temperature, then take next measurement.

## ● Soldering :

1. Manual Soldering

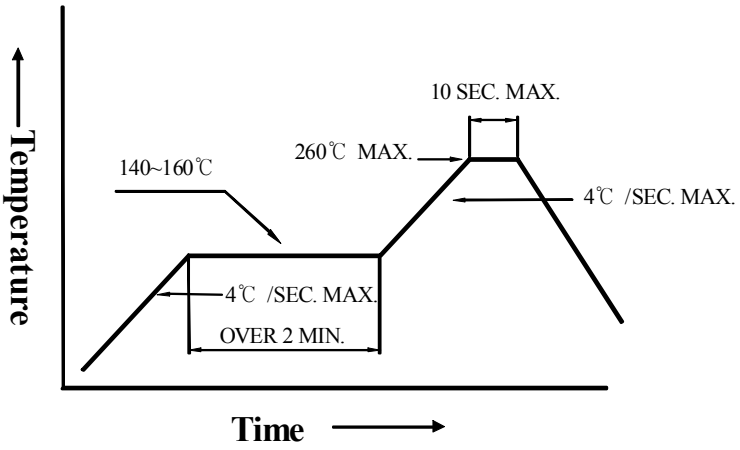
The temperature of the iron tip should not be higher than 350℃and Soldering time to be within 3 seconds per solder-pad.

2. Reflow Soldering

Preheating : 140℃~160℃±5℃,within 2 minutes.

Operation heating : 260℃(Max.) within 10 seconds.(Max)

Gradual Cooling (Avoid quenching).

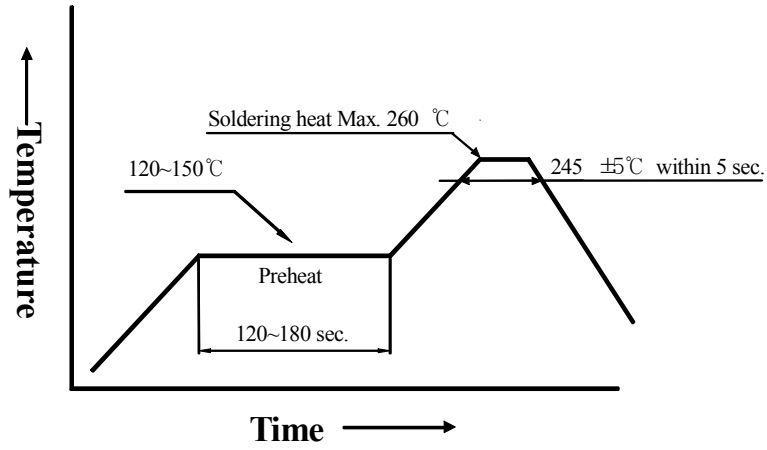



3. DIP soldering (Wave Soldering) :

Preheating : 120℃~150℃,within 120~180 sec.

Operation heating : 245℃±5℃ within 5 sec.260℃ (Max)

Gradual Cooling (Avoid quenching).



● **Handling :**

Care must be taken not to damage LED's epoxy resin while exposing to high temperature or contact LED's epoxy resin with hard or sharp objects, such as metal hook, tweezer or sand blasting**.**

● **Notes for designing:**

Current limiting resistor must be used in the circuit to drive LEDs within the rated figures and not to overload BINGRI LEDs with instantaneous voltage at the turning ON and OFF cycles.

When using pulse driving, the average current must be within the rated figures. And the circuit should be designed to avoid reverse voltage when turning off the LEDs.

● **Storage:**

In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following:

(1) Temperature : 5℃-30℃(41℉)Humidity : RH 60% Max.

(2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:

a. Completed within 168 hours.

b. Stored at less than 30% RH.

(3) Devices require baking before mounting, if:

(2) a or (2) b is not met.

(4) If baking is required, devices must be baked under below conditions:

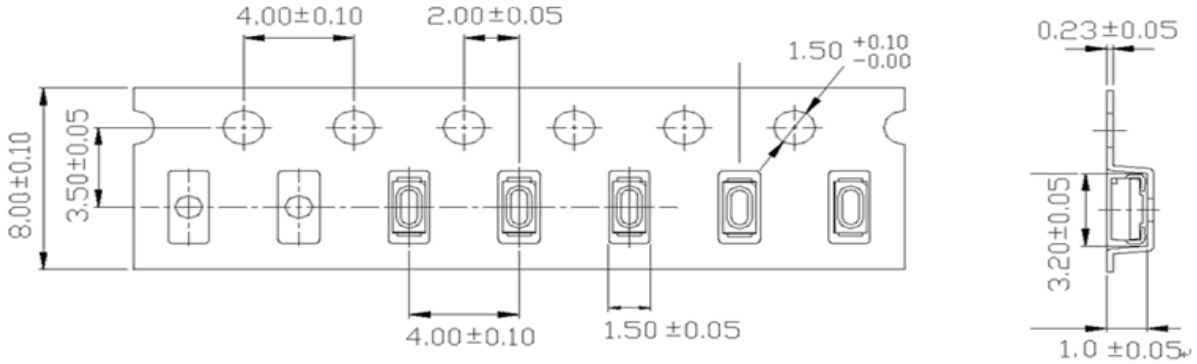
48 hours at 60℃±3℃.

● **Package and Label of Products:**

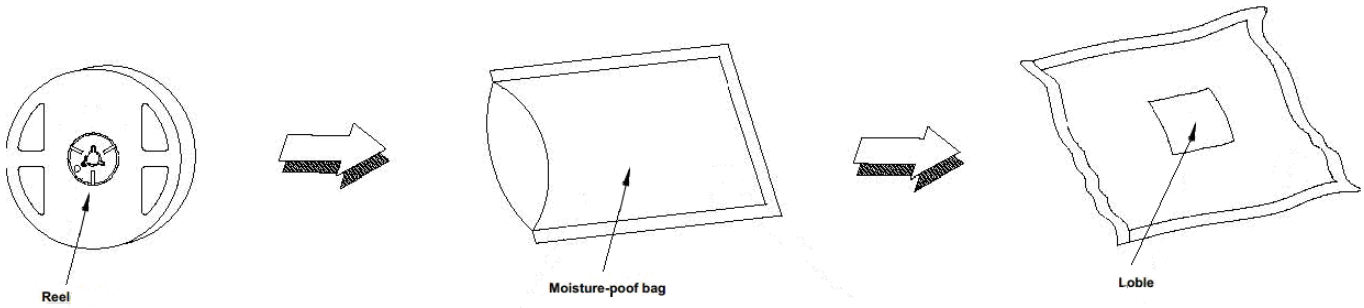
（1）Package: Products are packed in one bag of 3000 pcs (one taping reel) and a label is attached to each bag.

## ● Tapping and packaging specifications(Units: mm)

Note: The tolerances unless dimension are ± 0.1mm.




Label Aluminum moisture-proof bag Desiccant Label




## ● Package Method unit: mm)