

# SPECIFICATION

Model. NO: IE-2012O-SB-C-11

Document. NO:

REV NO: V1.0

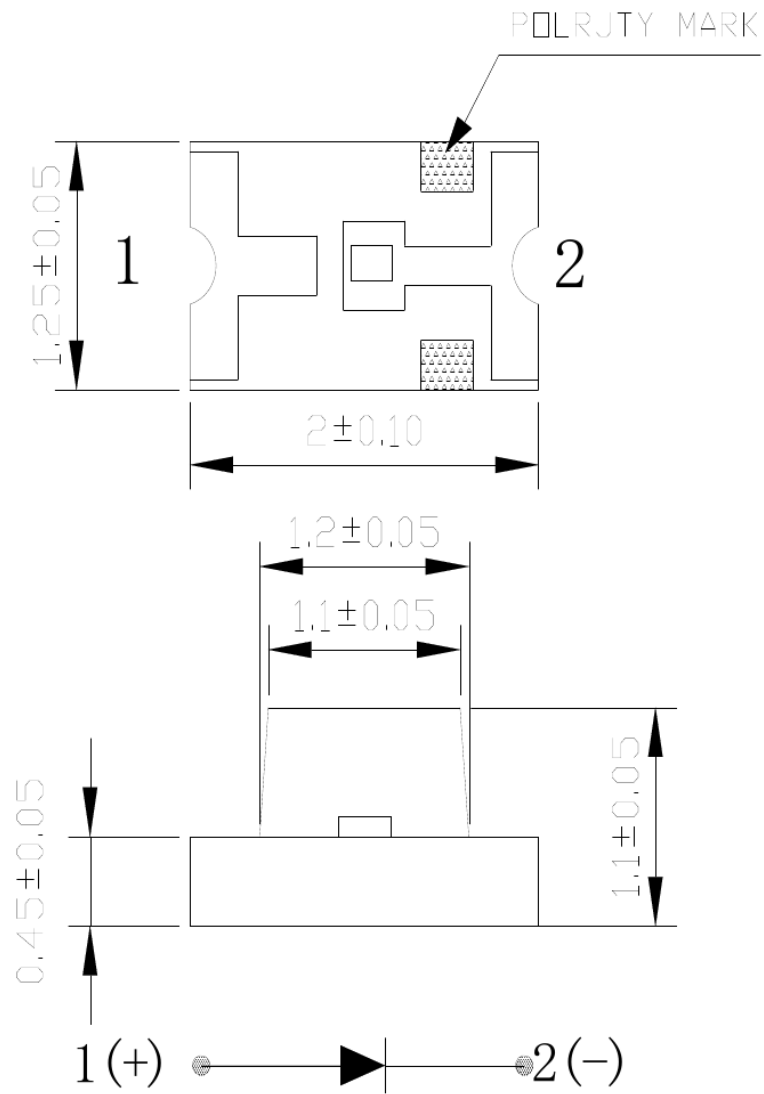
## Description:

- 2.0×1.25mm Chip SMD
- Colloid Color: Water Transparent
- Emission Color: Orange
- Viewing Angle :120°

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1. **Dimensions**

(Units): (mm)



All dimensions are in mm tolerance is  $\pm 0.05$  mm unless otherwise noted.

## 2. Electrical / Optical characteristics

### (1) Absolute Maximum Ratings (TA=25° C)

| Item                  | Symbol | Absolute Maximum Rating                             | Unit                    |
|-----------------------|--------|---|-------------------------|
| Forward Current       | IF     | 50  | mA                      |
| Pulse Forward Current | IFP    | 195   | mA                      |
| Reverse Voltage       | VR     | 9   | V                       |
| Power Dissipation     | PD     | 350   | mW                      |
| Operating Temperature | Topr   | -40° C To +85° C                                    | °C                      |
| Storage Temperature   | Tstg   | -40° C To +85° C                                    | °C                      |
| Soldering Temperature | Tsld   | Reflow Soldering: 260° C<br>Hand Soldering : 350° C | for 10sec.<br>for 3sec. |

IFP Conditions : 1/10 Duty Cycle, 0.1 msec Pulse Width.

### (2) Initial Electrical/Optical Characteristics (TA=25° C)

| Symbol                | Item                | Units | Min. | Typ. | Max. | Test Conditions |
|-----------------------|---------------------|-------|------|------|------|-----------------|
| VF                    | Forward Current     | V     | 1.8  |      | 2.3  | IF=20mA         |
| IR                    | Reverse Current     | uA    | -    | -    | 10   | VR=9V           |
| $\Delta\lambda_{1/2}$ | Viewing Angle       | °     | -    | 120° | -    | IF=20mA         |
| IV                    | Luminous Intensity  | Mcd   | 125  | -    | 163  | IF=20mA         |
| $\lambda_D$           | Dominate Wavelength | Nm    | 600  |      | 605  | IF=20mA         |

Tolerance of measurement of Vf is  $\pm 0.05$  V..

Luminous Intensity Measurement allowance is  $\pm 10\%$ .

Color Coordinates Measurement allowance is  $\pm 1$ nm.

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(3) Luminous Intensity Ranking (TA=25° C)

| Item               | Symbol | Test Conditions | Min. | Max. | Units |
|--------------------|--------|-----------------|------|------|-------|
| Luminous Intensity | Iv     | IF=20mA         | 125  | 163  | Mcd   |

Luminous Intensity Measurement allowance is  $\pm 10\%$ .

Above are the reference for minimum and maximum of luminous intensity which rank in the rate of 1:1.3 in the process of light splitting when manufacturing massively.

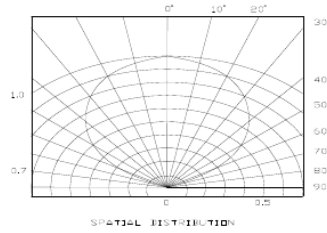
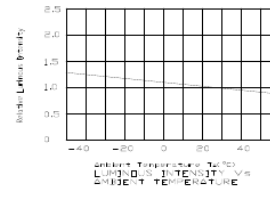
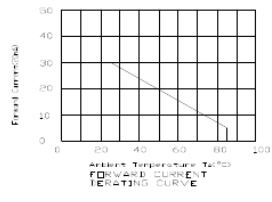
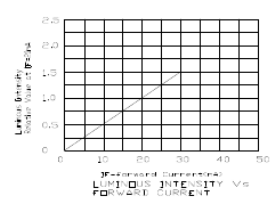
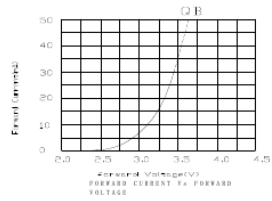
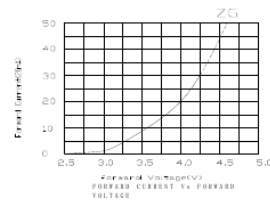
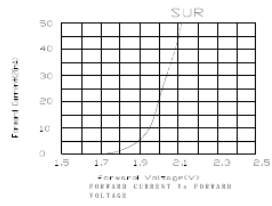
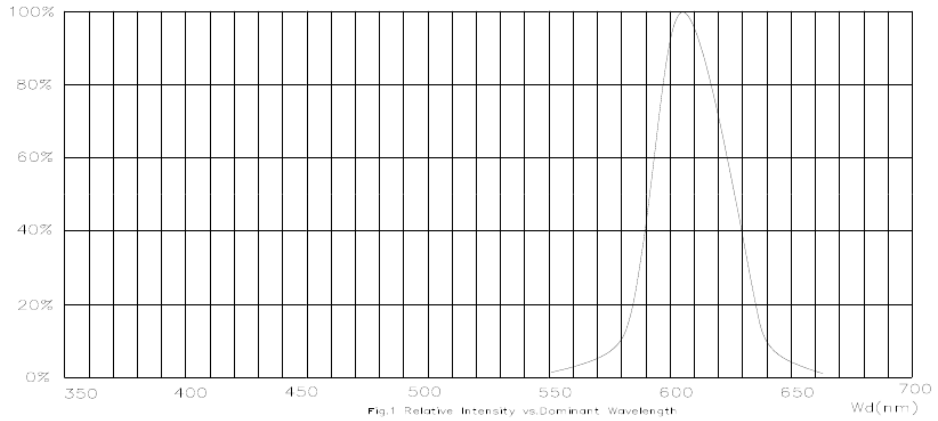
(4) Color Coordinates Ranking (TA=25° C)

| Item                | Symbol      | Test Conditions | Min. | Max. | Units |
|---------------------|-------------|-----------------|------|------|-------|
| Dominate Wavelength | $\lambda D$ | IF=20mA         | 600  | 605  | Nm    |

Color Coordinates Measurement allowance is  $\pm 0.5\text{nm}$ .

Above are the reference for minimum and maximum of wavelength, while it ranks as:R:5nm/G:2.5nm/B:2.5nm, when light splitting in mass manufacturing.

### 3. Characteristic curve



#### 4. RELIABILITY

##### (1) Test Items and Results

| Test Item   | Standard Test Method     | Test Conditions                                       | Note              | Number of Damaged |
|---|--------------------------|---|-------------------|-------------------|
| Resistance to Soldering Heat (Reflow Soldering)   | JEITA ED-4701<br>300 301 | Tsld=260°C, 10sec.<br>(Pre treatment 30°C,70%,168hrs) | 2 times           | 0/50              |
| Solderability (Reflow Soldering)                  | JEITA ED-4701<br>300 303 | Tsld=215±5°C, 3sec.<br>(Leader Solder)                | 1time<br>over 95% | 0/50              |
| Thermal Shock                                     | JEITA ED-4701<br>300 307 | -40°C~100°C<br>5min. 5min.                            | 100cycles         | 0/50              |
| Temperature Cycle                                 | JEITA ED-4701<br>100 105 | -40°C~25°C~100°C~25°C<br>30min. 5min. 30min. 5min.    | 100cycles         | 0/50              |
| Moisture Resistance Cycle                         | JEITA ED-4701<br>200 203 | 25°C~65°C~10°C<br>90%RH 24hrs./1cycle                 | 10 cycles         | 0/50              |
| High Temperature Storage                          | JEITA ED-4701<br>200 201 | Ta=100°C  | 1000 hrs          | 0/50              |
| High Temperature High Humidity Storage            | JEITA ED-4701<br>100 103 | Ta=60°C, 90%RH  | 1000 hrs          | 0/50              |
| Low Temperature Storage                           | JEITA ED-4701<br>200 202 | Ta=-40°C  | 1000 hrs          | 0/50              |
| Steady State Operating Life                       |                          | Ta=25°C, If=60MA                                      | 1000 hrs          | 0/50              |
| Steady State Operating Life of High Temperature   |                          | Ta=85°C, If=60MA                                      | 1000 hrs          | 0/50              |
| Steady State Operating Life of High Humidity Heat |                          | 60°C, 90%RH, If=160MA                                 | 500 hrs           | 0/50              |
| Steady State Operating Life of Low Temperature    |                          | Ta=-30°C, If=60MA                                     | 1000 hrs          | 0/50              |
| Drop  |                          | H=75cm  | 3 cycles          | 0/50              |
| Substrate Bending                                 | JEITA ED-4702            | 3mm, 5 ± 1 sec.                                       | 1 time            | 0/50              |
| Stick   | JEITA ED-4702            | 5N, 10 ± 1 sec.                                       | 1 time            | 0/50              |

##### (2) Criteria For Judging Damage

| Item               | Symbol         | Test Conditions        | Criteria for Judgement |              |
|--------------------|----------------|------------------------|------------------------|--------------|
|                    |                |                        | Min.                   | Max.         |
| Forward Voltage    | V <sub>F</sub> | I <sub>F</sub> =3x20MA | -                      | U.S.L.*)X1.1 |
| Reverse Current    | I <sub>R</sub> | V <sub>R</sub> =5V     | -                      | U.S.L.*)X2.0 |
| Luminous Intensity | I <sub>v</sub> | I <sub>F</sub> =3x20MA | L.S.L.***)X0.7         | -            |

\*) U.S.L.: Upper Standard Level

\*\*) L.S.L.: Lower Standard Level

## 5. Cautions

### (1) Soldering Conditions

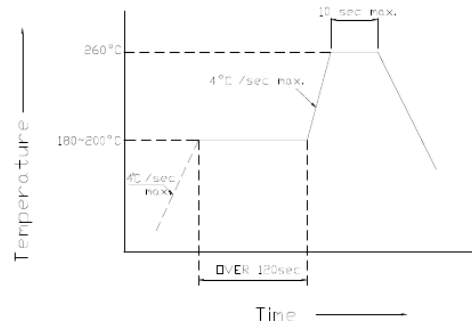
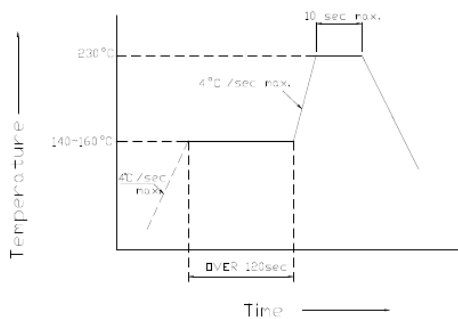
Number of reflow process shall be less than 2 times and cooling process to normal temperature is required between first and Second soldering process.

(Recommended soldering conditions)

|                          | Reflow Soldering |                  | Hand Soldering |                 |
|--------------------------|------------------|------------------|----------------|-----------------|
|                          | Lead Solder      | Lead-free Solder | Temperature    | 350°C Max.      |
| Pre-heat                 | 140 ~ 160°C      | 180 ~ 200°C      | Soldering time | 3 sec. Max.     |
| Pre-heat time            | 120 sec. Max.    | 120 sec. Max.    |                | (one time only) |
| Peak temperature         | 230°C Max.       | 260°C Max.       |                |                 |
| Soldering time Condition | 10 sec. Max.     | 10 sec. Max.     |                |                 |

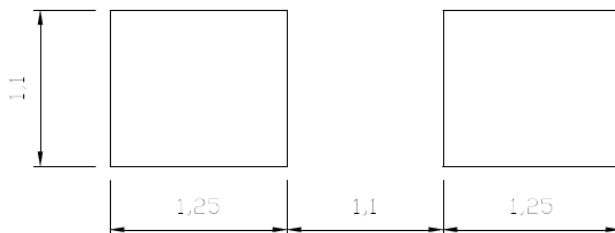
(Lead Solder)

(Lead-Free Solder)



(Recommended Soldering Pattern)

( Units:mm)



### (2) Static Electricity

It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.

All devices, equipment and machinery must be properly grounded.

Damaged LEDs will show some unusual characteristics such as the forward voltage becomes lower, or the LEDs do not light at the low current. Criteria : (VF > 2.0V at IF=0.5mA)

### (3) Moisture Proof Package

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It is recommended that moisture proof package be used .

(4) 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.

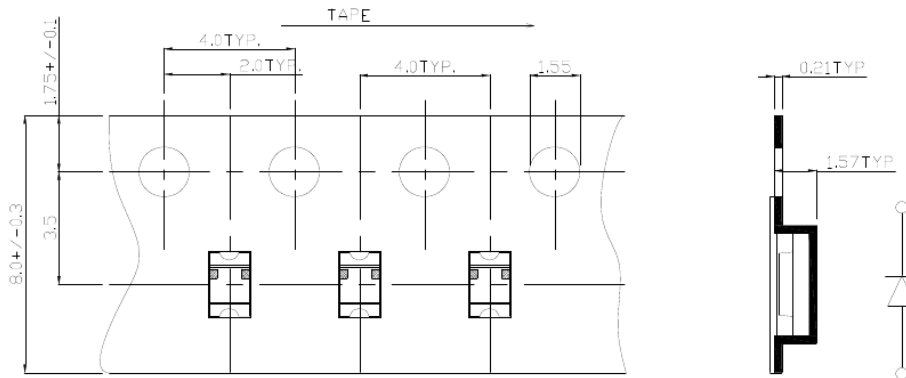
(5)

After opening the package, The LEDs should be soldered within 24 hours (1days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel).

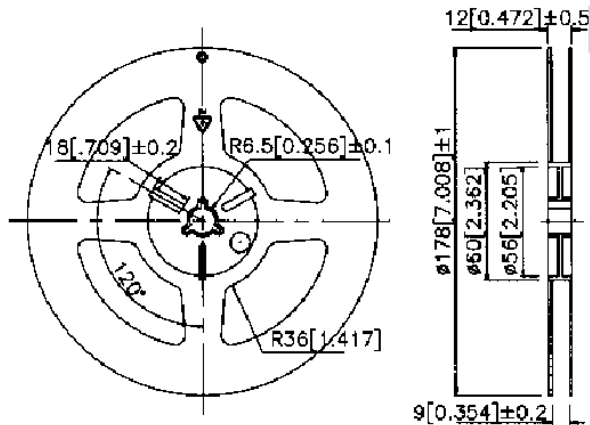
If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions Baking treatment : more than 12 hours at  $75 \pm 5^{\circ}\text{C}$ .

## 6. PACKAGING

- (1) The LEDs are packed in cardboard boxes after taping.
- (2) Taping Specifications (Units:mm)



- (3) Reel Dimension



PACKAGE: 3000Pcs/Reel

- (4) The label on the minimum packing unit shows ; Part Number, Lot Number, Ranking, Quantity.
- (5) Keep away from water, moisture in order to protect the LEDs.
- (6) The LEDs may be damaged if the boxes are dropped or receive a strong impact against them. so precautions must be taken to prevent any damage.