## Features

- 3535 High Power LED
- ROHS and REACH Compliant
- MSL2 qualified according to J-STD 020
- ESD 2KV

## Applications

- Portable lighting
- Indoor/ Outdoor lighting
- Commercial lighting
- Industrial lighting

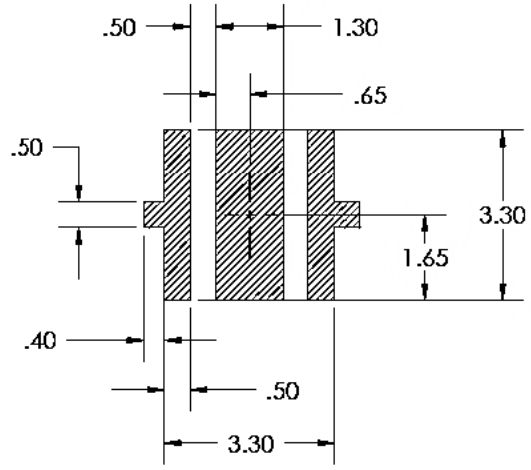
## Description

The IN-C33(X)TL(X) is a high-power LED. It is a SMD type LED which can be used in various applications.

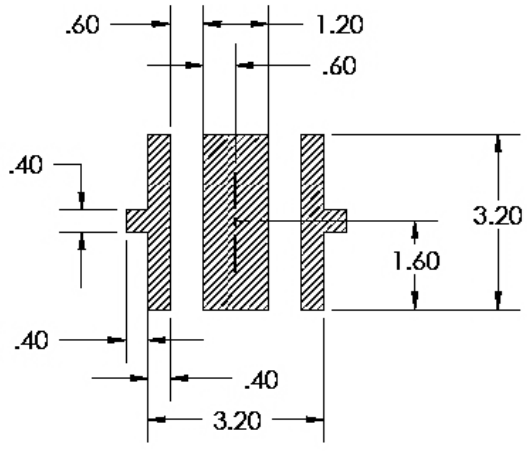
| Outline | | |
|---|---|---|
| 60D | 120D | 90D |
| 3.5x3.5x2.8 | 3.5x3.5x2.0 | 3.5x3.5x2.34 |
| IN-C33BTL(X) | IN-C33CTL(X) | IN-C33ETL(X) |

## Recommended Solder Pattern

(Suggest Stencil t=0.12 mm)




Recommended PCB Solder PAD

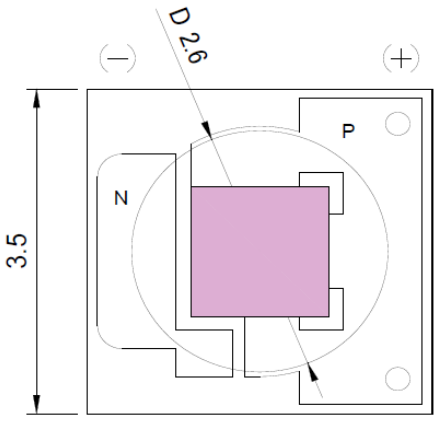


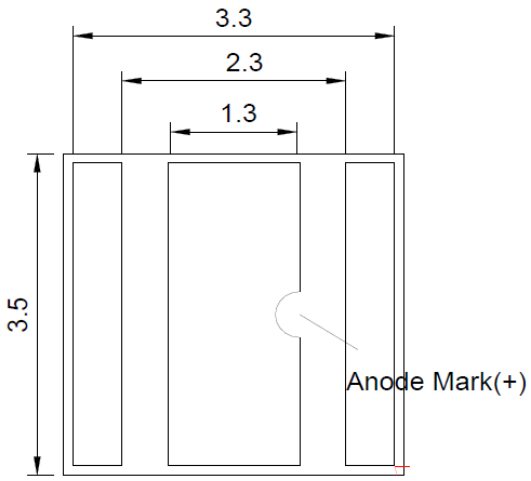

Recommended Stencil Pattern(Hatched Area is Opening)

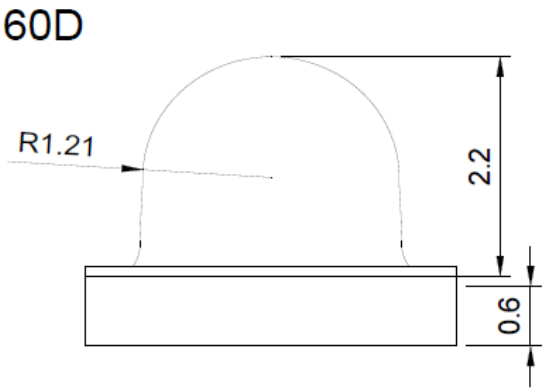
**Figure 1. IN-C33(X)TL(X) Recommended Solder Pattern**

## Package Dimensions

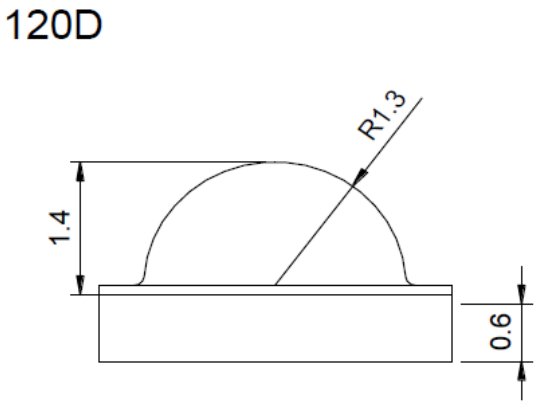
(All dimensions are in mm, tolerance is ±0.13mm)



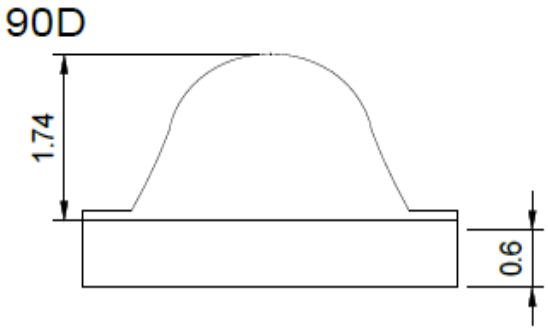




**IN-C33BTL(X)**




**IN-C33CTL(X)**




**IN-C33ETL(X)**

**Figure 2. IN-C33(X)TL(X) Series Package Dimension**

## Absolute Maximum Rating( Ta=25°C)

| Characteristics | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| DC Forward Current[1] | $I_F$ | | 350 | 700 | mA |
| Pulse Forward Current[2] | $I_{PF}$ | | | 1000 | mA |
| Forward Voltage - Blue/Green/ Royal Blue | $V_F$ | 2.8 | | 3.8 | V |
| Forward Voltage - Red/ Yellow/ Deep Red | $V_F$ | 1.4 | | 2.8 | V |
| Reverse Voltage | $V_R$ | | -5 | | V |
| Leakage Current (5V) | $I_R$ | | | 10 | μA |
| Junction Temperature[3] | Tj | | 115 | | ℃ |
| Storage Temperature Range | $T_{stg}$ | -40 | - | 100 | ℃ |
| Soldering Temperature | $T_{sol}$ | | 260 | | ℃ |
| Thermal Resistance Junction / Solder Point | $R_{th}$ | 6 | 8 | 12 | ℃/W |
| Viewing Angle | $2\theta_{1/2}$ | | 125 | | Deg |

**Notes**

1. For other ambient, limited setting of current will depend on de-rating curves.
2. D=0.01s duty 1/10.
3. When drive on maximum current , Tj must be kept below 115℃
4. Viewing angle(2θ1/2) ±10°

## ESD Precaution

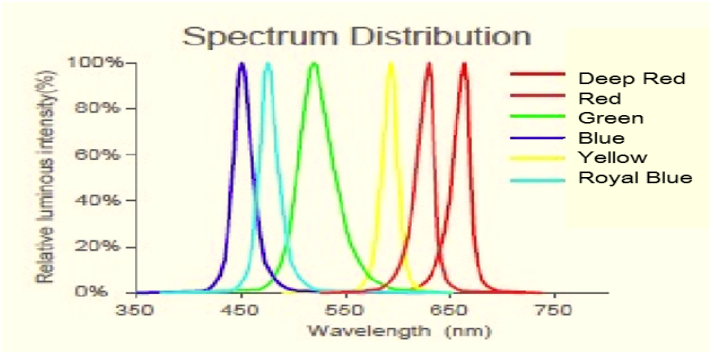
ATTENTION: Electrostatic Discharge (ESD) protection

The symbol above denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are STATIC SENSITIVE devices. ESD precaution must be taken during design and assembly.
If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

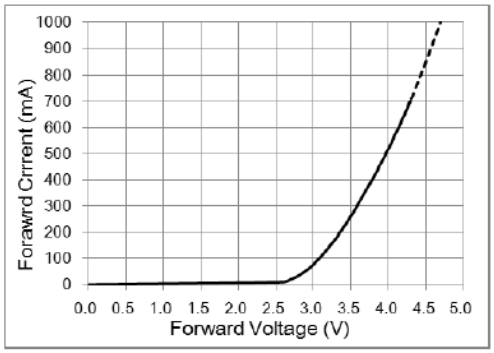
Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

## Electronic-Optical Characteristics

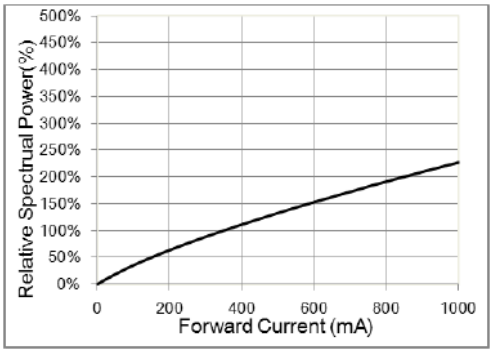
Spectrum Distribution



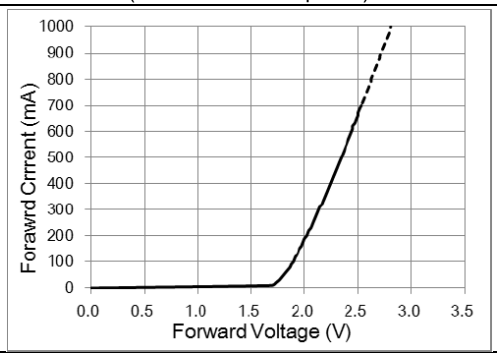

Forward Current VS. Forward Voltage (Ta=25℃)
(Blue/ Green / Royal Blue)



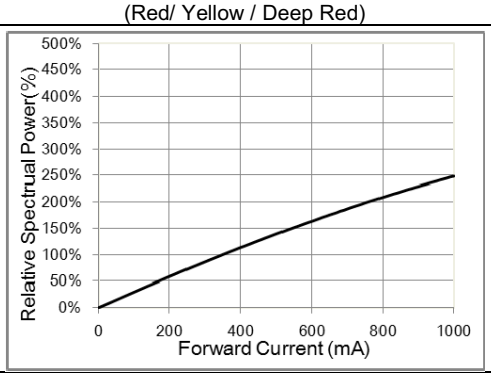

Relative luminous Flux vs. Forward Current (Ta=25℃)
(Blue/ Green / Royal Blue)




Forward Current VS. Forward Voltage (Ta=25℃)
(Red/ Yellow / Deep Red)

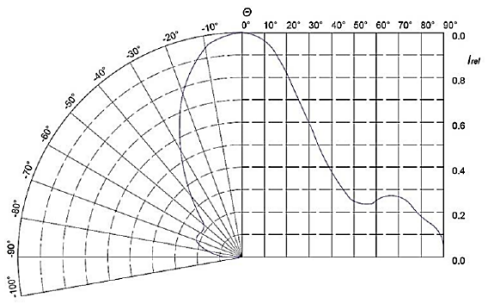



Relative luminous Flux vs. Forward Current (Ta=25℃)
(Red/ Yellow / Deep Red)

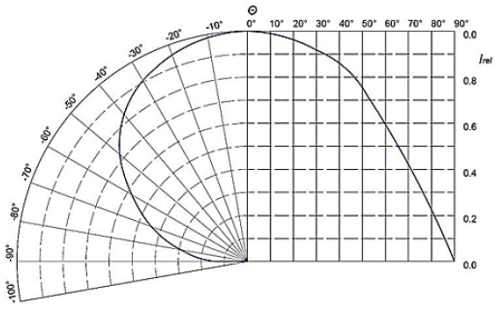



Typical Spatial Distribution

60°



120°



## Product List

| Part Number | Color | Luminous Flux (lm@350mA) | | Wavelength (nm) | Forward Voltage (V) | |
|---|---|---|---|---|---|---|
| | | Min | Max | | Min | Max |
| IN-C33(X)TLB | Blue | 25 | 35 | 460-470 | 2.8 | 3.6 |
| IN-C33(X)TLG | Green | 90 | 110 | 515-535 | 3.0 | 3.6 |
| IN-C33(X)TLR | Red | 40 | 60 | 620-630 | 1.8 | 2.6 |
| IN-C33(X)TLY | Yellow | 50 | 70 | 585-595 | 1.8 | 2.6 |
| IN-C33(X)TLDR | Deep Red | 15 | 30 | 650-670 | 1.4 | 2.6 |
| IN-C33(X)TLRB | Royal Blue | 15 | 30 | 450-460 | 2.8 | 3.6 |

## Bin Code information

■Forward Voltage Binning

| Bin Code (@350mA) | Min. VF(V) | Max. VF(V) |
|---|---|---|
| V14 | 1.4 | 1.6 |
| V16 | 1.6 | 1.8 |
| V18 | 1.8 | 2.0 |
| V20 | 2.0 | 2.2 |
| V22 | 2.2 | 2.4 |
| V24 | 2.4 | 2.6 |
| V26 | 2.6 | 2.8 |
| V28 | 2.8 | 3.0 |
| V30 | 3.0 | 3.2 |
| V32 | 3.2 | 3.4 |
| V34 | 3.4 | 3.6 |
| V36 | 3.6 | 3.8 |

■Flux Binning

| Color | Luminous Flux (lm@350mA) | | |
|---|---|---|---|
| | Group | Min | Max |
| Blue | B15 | 15 | 20 |
| | B20 | 20 | 25 |
| | B25 | 25 | 30 |
| Green | G80 | 80 | 90 |
| | G90 | 90 | 100 |
| | GH1 | 100 | 110 |
| Red | R40 | 40 | 45 |
| | R45 | 45 | 50 |
| | R50 | 50 | 55 |
| | R55 | 55 | 60 |
| Yellow | A50 | 50 | 55 |
| | A55 | 55 | 60 |
| | A60 | 60 | 65 |
| | A65 | 65 | 70 |
| Deep Red | R15 | 15 | 20 |
| | R20 | 20 | 25 |
| | R25 | 25 | 30 |
| Royal Blue | B15 | 15 | 20 |
| | B20 | 20 | 25 |
| | B25 | 25 | 30 |

**Note:**

1. Tolerance of luminous flux (Φv) ±5%.

■Wavelength Binning

| Color | Wavelength (Wd nm@350mA) | | |
|---|---|---|---|
| | Group | Min | Max |
| Blue | B1 | 460 | 465 |
| | B2 | 465 | 470 |
| Green | G1 | 515 | 520 |
| | G2 | 520 | 525 |
| | G3 | 525 | 530 |
| | G4 | 530 | 535 |
| Red | R1 | 620 | 625 |
| | R2 | 625 | 630 |
| Yellow | A1 | 585 | 590 |
| | A2 | 590 | 595 |
| Deep Red | DR1 | 650 | 660 |
| | DR2 | 660 | 670 |
| Royal Blue | RB1 | 450 | 455 |
| | RB2 | 455 | 460 |

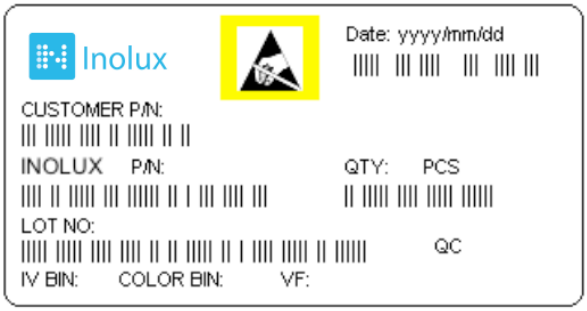
**Note:**

1. Tolerance of Wavelength ±nm.
2. Wavelength of Deep Red is meaning peak wavelength only.

## Ordering Information

| Orderable Part Number | Color | Angle | Luminous Flux (lm@350mA) | | Wavelength (nm) | Forward Voltage (V) | |
|---|---|---|---|---|---|---|---|
| | | | Min | Max | | Min | Max |
| IN-C33BTLB | Blue | 60 | 25 | 35 | 460-470 | 2.8 | 3.6 |
| IN-C33ETLB | | 90 | 25 | 35 | 460-470 | 2.8 | 3.6 |
| IN-C33CTLB | | 120 | 25 | 35 | 460-470 | 2.8 | 3.6 |
| IN-C33BTLG | Green | 60 | 90 | 110 | 515-535 | 3.0 | 3.6 |
| IN-C33ETLG | | 90 | 90 | 110 | 515-535 | 3.0 | 3.6 |
| IN-C33CTLG | | 120 | 90 | 110 | 515-535 | 3.0 | 3.6 |
| IN-C33BTLR | Red | 60 | 40 | 60 | 620-630 | 1.8 | 2.6 |
| IN-C33ETLR | | 90 | 40 | 60 | 620-630 | 1.8 | 2.6 |
| IN-C33CTLR | | 120 | 40 | 60 | 620-630 | 1.8 | 2.6 |
| IN-C33BTLY | Yellow | 60 | 50 | 70 | 585-595 | 1.8 | 2.6 |
| IN-C33ETLY | | 90 | 50 | 70 | 585-595 | 1.8 | 2.6 |
| IN-C33CTLY | | 120 | 50 | 70 | 585-595 | 1.8 | 2.6 |
| IN-C33BTLDR | Deep Red | 60 | 15 | 30 | 650-670 | 1.4 | 2.6 |
| IN-C33ETLDR | | 90 | 15 | 30 | 650-670 | 1.4 | 2.6 |
| IN-C33CTLDR | | 120 | 15 | 30 | 650-670 | 1.4 | 2.6 |
| IN-C33BTLRB | Royal Blue | 60 | 15 | 30 | 450-460 | 2.8 | 3.6 |
| IN-C33ETLRB | | 90 | 15 | 30 | 450-460 | 2.8 | 3.6 |
| IN-C33CTLRB | | 120 | 15 | 30 | 450-460 | 2.8 | 3.6 |

## Label Specifications



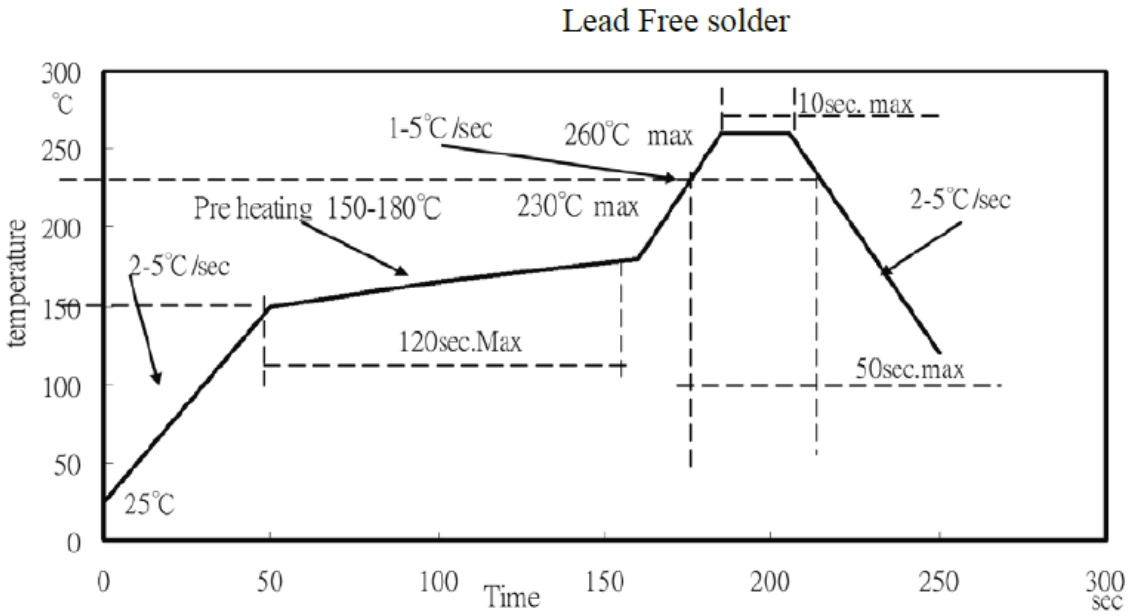

## Inolux P/N:

| I | N | - | C | 3 | 3 | (X) | T | L | | (X) | - | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Material | Package | | Variation | Orientation | Current | Lens | Color | | Customized Stamp-off | | | |
| Inolux SMD | | | C = Ceramic Type | 33B = 3.5 x 3.5, 60 Deg.<br>33C = 3.5 x 3.5, 120 Deg.<br>33E = 3.5 x 3.5, 90 Deg. | | | T = Top Mount | L = 350mA | (Blank) = Clear | B = 470nm<br>G = 520nm<br>R = 630nm<br>Y = 590nm<br>DR = 660nm<br>RB = 450nm | | | | | |

## Lot No.:

| Z | 2 | 0 | 1 | 7 | 01 | 24 | 001 |
|---|---|---|---|---|---|---|---|
| Internal Tracker | Year (2017, 2018, …..) | | | | Month | Date | Serial |

## Reflow Soldering




## Soldering Iron

Basic Spec is ≦ 4 sec. when 260°C (+10°C ➔ -1 second). Power dissipation of Iron should be less than 15W. Surface temperature should be under 230°C

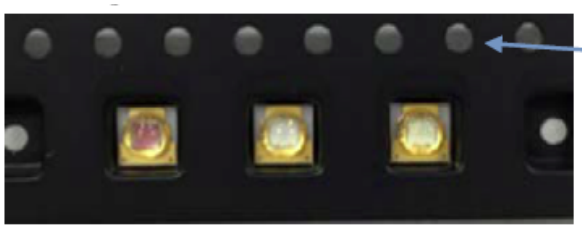
## Rework

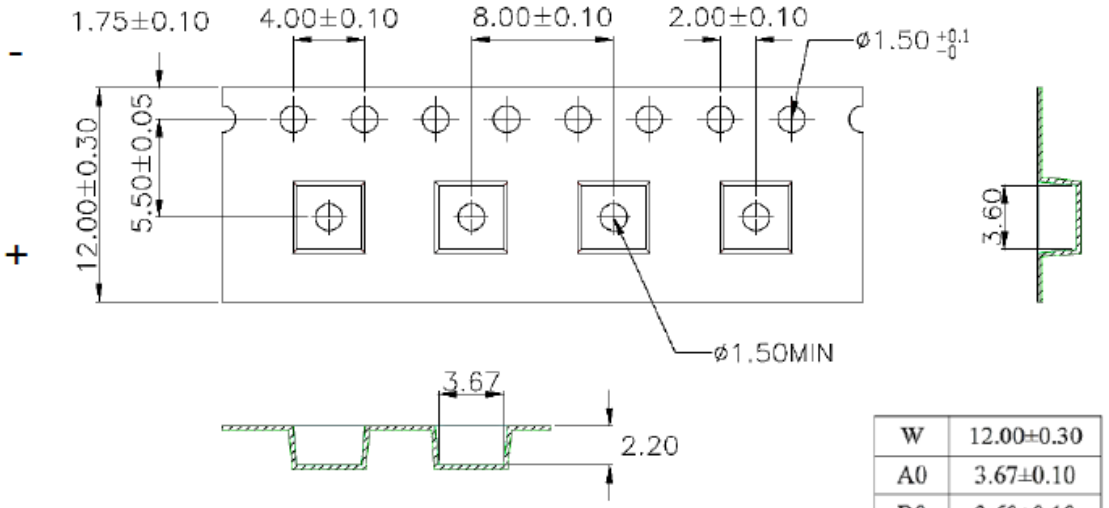
Rework should be completed within 4 second under 245°C

## Notes

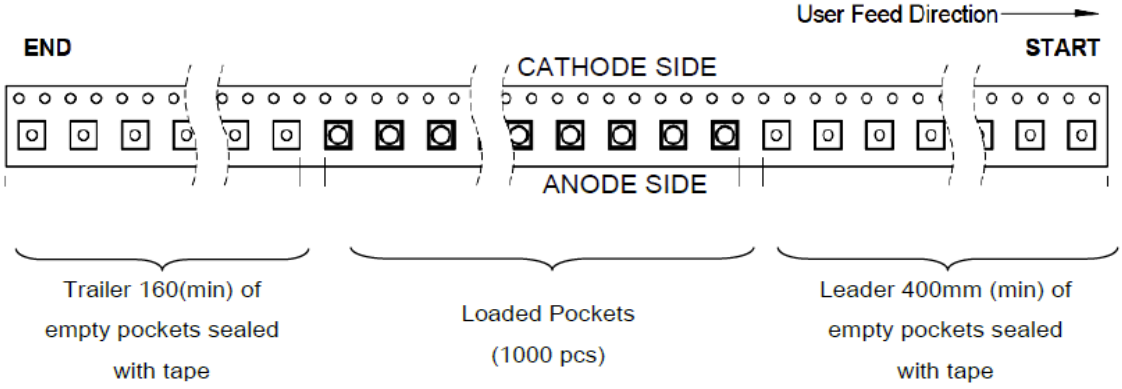
1. Do not stress the silicone resin while it is exposed to high temperature.
2. The number of reflow process should not exceed 3 times.

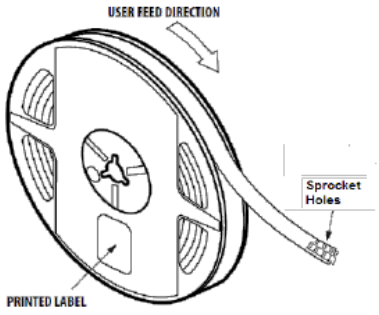
# Packing

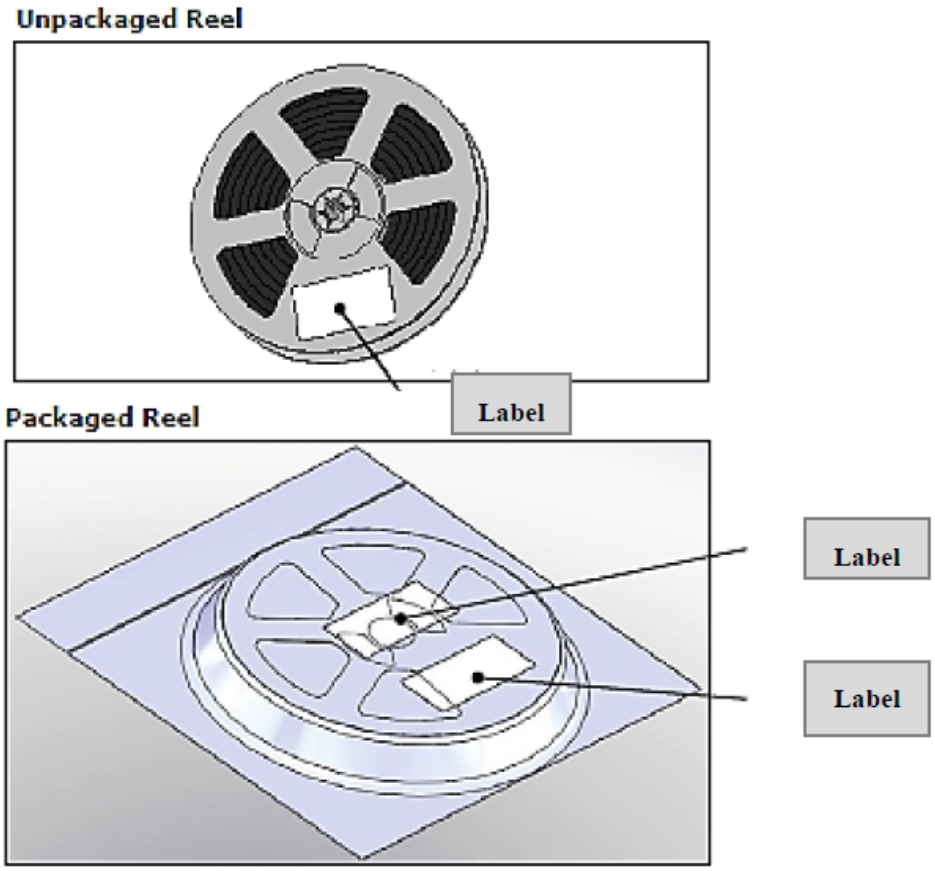



| | |
|---|---|
| W | 12.00±0.30 |
| A0 | 3.67±0.10 |
| B0 | 3.60±0.10 |
| K0 | 2.20±0.10 |






Notes:

1. Each Reel (minimum number of pieces is 100 and maximum is 500 (60D)/1000 (120D) is packed in a moisture-proof bag along with 2 packs of desiccant and a humidity indicator card;
2. A maximum of 5 moisture-proof bags are packed in an inner box (size: 240mm x 200mm x 105mm ±5mm)
3. A maximum of 4 inner boxes are put in an outer box (size: 410mm x 255mm x 230mm ±5mm)
4. Part No., Lot No., quantity should be indicated on the label of the moisture-proof bag and the cardboard box.

# Precautions

1. Recommendation for using LEDs

   1.1 The lens of LEDs should not be exposed to dust or debris. Excessive dust and debris may cause a drastic decrease in the luminosity.

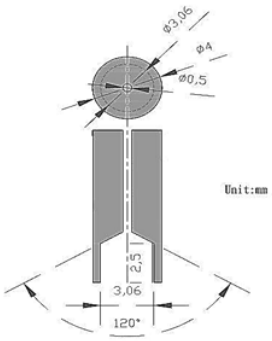
   1.2 Avoid mechanical stress on LED lens.

   1.3 Do not touch the LED lens surface. It would affect the optical performance of the LED due to the LED lens' damage.

   1.4 Pick & place tools are recommended for the remove of LEDs from the factory tape & reel packaging

2. Pick & place nozzle

   The pickup tool was recommended and shown as below




3. Lens handling

   Please follow the guideline to pick LEDs

   3.1 Use tweezers to pick LEDs

   3.2 Do not touch the lens by using tweezers

   3.3 Do not touch lens with fingers

   3.4 Do not apply more than 4N of lens (400g) directly onto the lens

4. Lens cleaning

   In the case which a small amount of dirt and dust particles remain on the lens surface, a suitable cleaning solution can be applied.

   4.1 Try a gentle wiping with dust-free cloth

   4.2 If needed, use dust-free cloth and isopropyl alcohol to gently clean the dirt from the lens surface.

   4.3 Do not use other solvents as they may directly react with the LED assembly

   4.4 Do not use ultrasonic cleaning which will damage the LEDs

# Test Items and Results of Reliability

| Test Item | Test Conditions | Duration/ Cycle | Number of Damage | Reference |
|---|---|---|---|---|
| Thermal Shock | –40℃ 30min<br>↑↓5min<br>125℃ 30min | 100 cycles | 0/22 | AECQ101 |
| High Temperature Storage | Ta=100℃ | 1000 hrs | 0/22 | EIAJ ED-4701<br>200 201 |
| Humidity Heat Storage | Ta=85℃<br>RH=85% | 1000 hrs | 0/22 | EIAJ ED-4701<br>100 103 |
| Low Temperature Storage | Ta=-40℃ | 1000 hrs | 0/22 | EIAJ ED-4701<br>200 202 |
| Life Test | Ta=25℃<br>If=350mA | 1000 hrs | 0/22 | Tested with UVT standard |
| High Humidity Heat Life Test | 85℃ RH=85%<br>If=350mA | 1000 hrs | 0/22 | Tested with UVT standard |
| High Temperature Life Test | Ta=85℃ | 1000 hrs | 0/22 | Tested with UVT standard |
| ESD(HBM) | 2KV at 1.5kΩ;100pf | 3 Times | 0/22 | MIL-STD-883 |

| Criteria for Judging the Damage | | | | |
|---|---|---|---|---|
| Item | Symbol | Condition | Criteria for Judgment | |
| | | | Min | Max |
| Forward Voltage | $V_F$ | If=350mA | - | USL[1] ×1.1 |
| Reverse Current | $I_R$ | VR =5V | - | 100μA |
| Luminous Intensity | $I_v$ | If=350mA | LSL[2] ×0.7 | - |

Notes:

1. USL: Upper specification level
2. LSL: Lower specification level

## Revision History

| Changes since last revision | Page | Version No. | Revision Date |
|---|---|---|---|
| Initial Release | | 1.0 | 04-17-2018 |
| Update format | | 1.1 | 06-28-2018 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

# OCEAN CHIPS
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## Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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