

1. Description

LITEON FLASH is a compact power LED light source specifically designed to provide greater amounts of light where needed, enabling higher resolution pictures to be taken in lower level ambient light environments at greater distances.

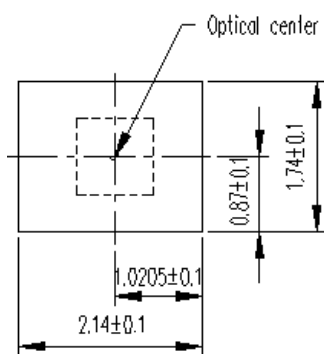
Features

- Highest brightness SMD Flash LED
- Instant Turn On. Very small emitter size
- RoHS Compliant

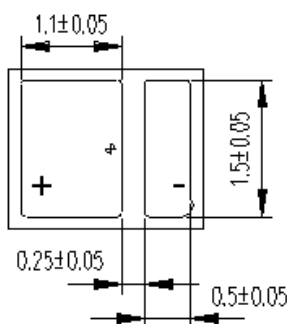
Applications

- Camera phones
- Handhelds
- Digital still cameras

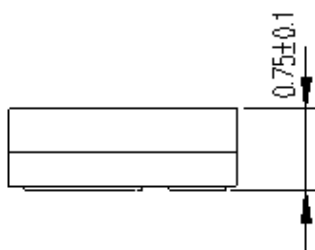
2. Outline Dimensions



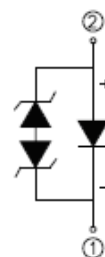
Top view



Bottom view



Side view



Polarity

Notes

1. All dimensions are in millimeters and dimension tolerances are $\pm 0.1\text{mm}$.
2. Dimensions without tolerances are for reference only.

3. Rating and Characteristics

Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Rating | Unit |
|--|-----------|-----------|------|
| Power Dissipation (Pulse Mode) | P_o | 5.98 | W |
| DC Operating Current | I_F | 350 | mA |
| Pulsed Forward Current (50ms:ON , 950ms: OFF) | I_{FP} | 1500 | mA |
| Reverse Voltage | V_R | 5 | V |
| Junction Temperature | T_j | 115 | °C |
| ESD Sensitivity | ESD | 8000 | V |
| Operating Temperature Range | T_{opr} | -40 ~ 85 | °C |
| Storage Temperature Range | T_{stg} | -40 ~ 100 | °C |

Notes : Forbid to operating at reverse voltage condition for long.

Electro-Optical Characteristics at Ta=25°C

| Parameter | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
|----------------------------|-----------------|------|------|-------|-------------------------|---------------|
| Luminous Flux ¹ | Φ_V | -- | 80 | -- | $I_{FP} = 350\text{mA}$ | lm |
| Forward Voltage | V_F | -- | 3.4 | -- | | V |
| Luminous Flux ¹ | Φ_V | 75 | 104 | 147.7 | $I_{FP} = 500\text{mA}$ | lm |
| Forward Voltage | V_F | 3.27 | 3.6 | 3.99 | | V |
| Color Temperature | CCT | 4500 | -- | 7500 | | K |
| Viewing Angle ² | $2\theta_{1/2}$ | -- | 120 | -- | | Deg |
| Reverse Current | I_R | -- | -- | 100 | $V_R = 5V$ | μA |

Notes:

1. Luminous flux measurement tolerance: $\pm 10\%$
2. Forward voltage measurement tolerance: $\pm 0.1V$
3. Electric and optical data is tested at 50ms pulse condition.

4. Typical Electrical / Optical Characteristics Curves

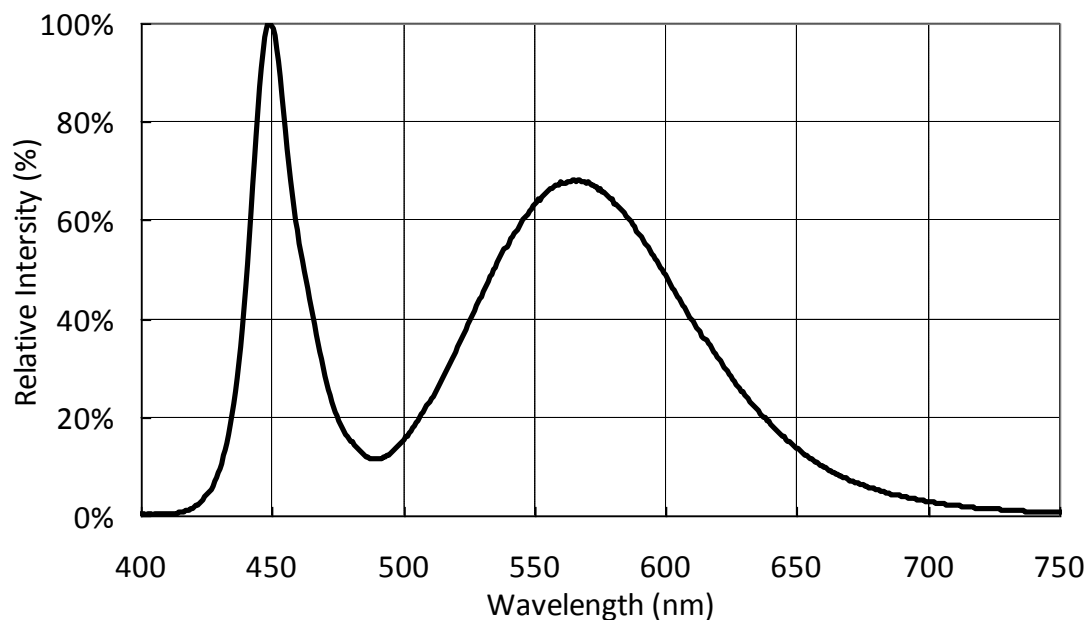


Fig 1. Relative Spectrum of Emission

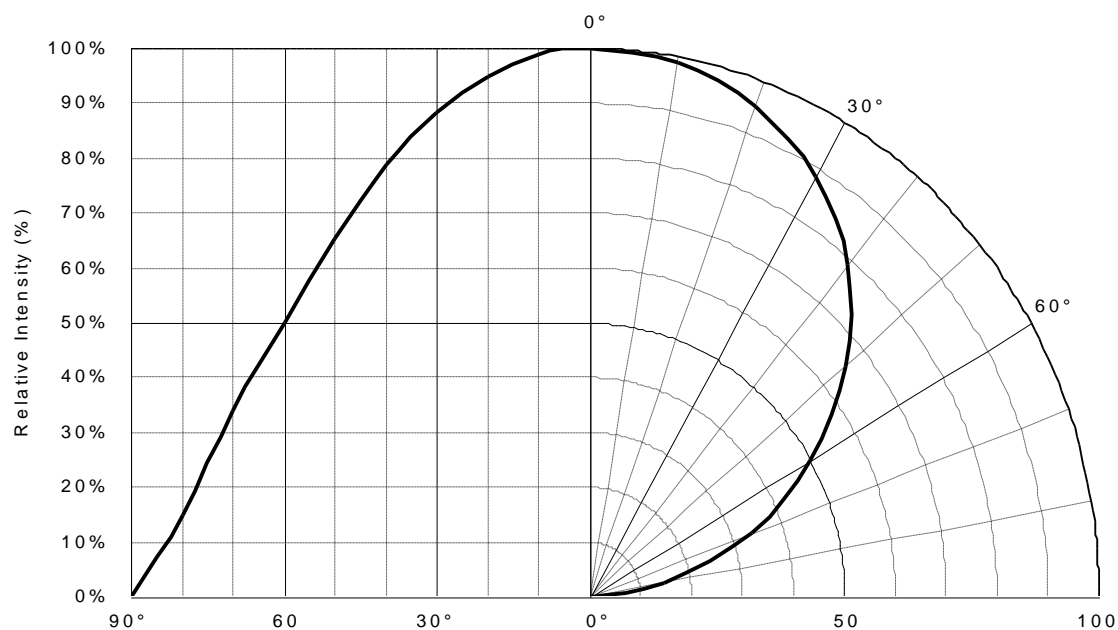


Fig 2. Radiation Characteristics

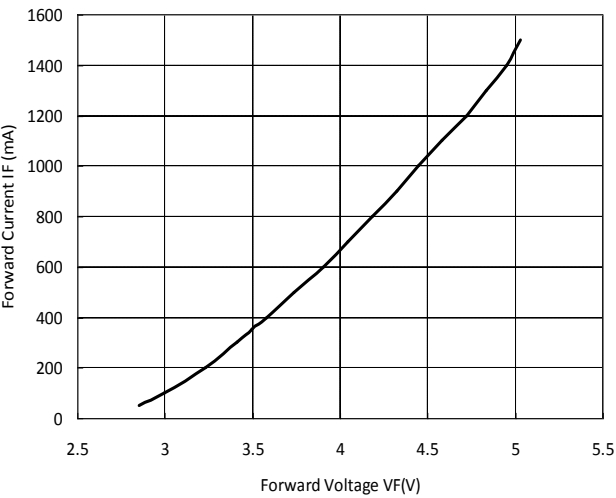


Fig 3. Forward Current

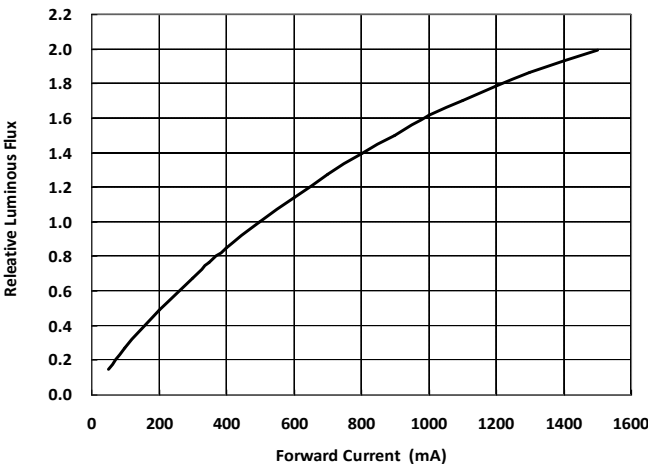


Fig 4. Relative Luminous Flux

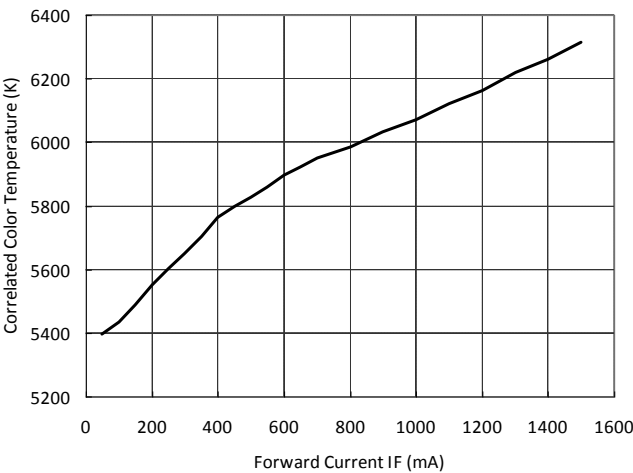
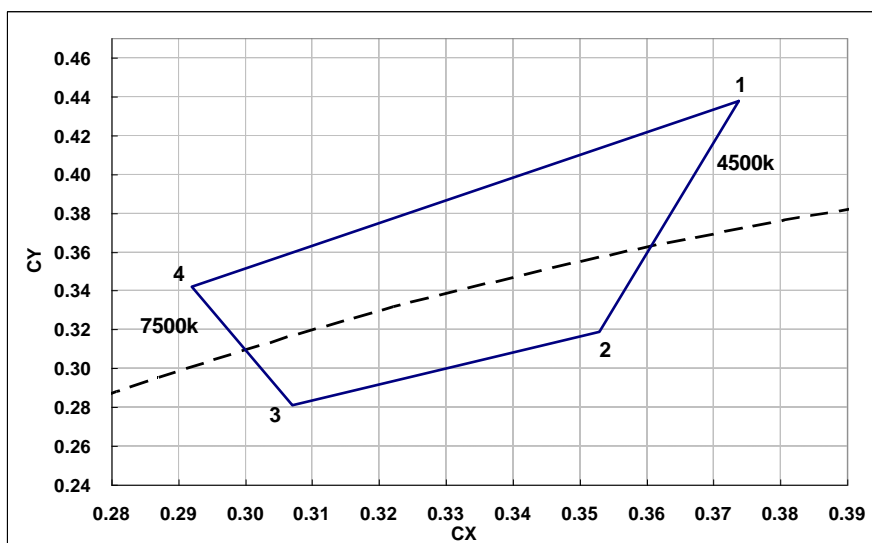


Fig 5. Correlated Color Temperature (CCT)Shift

4.1 Category Code Table



| Point | x | y |
|-------|-------|-------|
| 1 | 0.373 | 0.437 |
| 2 | 0.353 | 0.319 |
| 3 | 0.307 | 0.281 |
| 4 | 0.292 | 0.342 |

Notes

1. The value is all dies operated performance.
2. The chromaticity coordinates (x, y) is derived from the CIE 1931 chromaticity diagram.
3. IS CAS140B is for the luminous flux (lm) and the CIE1931 chromaticity coordinates (x, y) testing.

The chromaticity coordinates (x, y) guarantee should be added ± 0.01 tolerance.

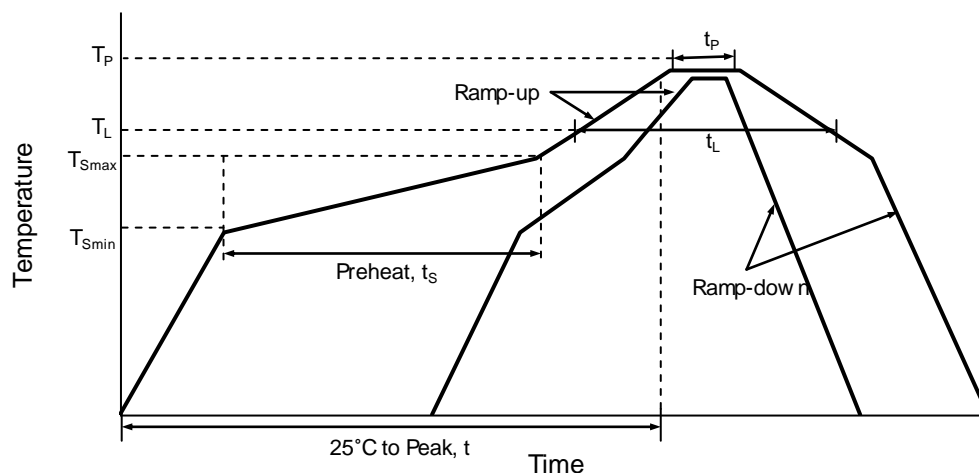
4.2 Forward Voltage Binning

| Parameter | Bin | Symbol | Min | Typ. | Max | Unit | Condition |
|-----------------|-----|--------|------|------|------|------|------------------|
| Forward Voltage | I | VF | 3.27 | -- | 3.51 | V | $I_{FP} = 500mA$ |
| | K | | 3.51 | -- | 3.75 | | |
| | L | | 3.75 | -- | 3.99 | | |

4.3 Luminous Flux Binning

| Parameter | Bin | Symbol | Min | Typ. | Max | Unit | Condition |
|---------------|-----|----------|-------|------|-------|------|------------------|
| Luminous Flux | T2 | ΦV | 75.0 | -- | 87.4 | lm | $I_{FP} = 500mA$ |
| | U1 | | 87.4 | -- | 100.0 | | |
| | U2 | | 100.0 | -- | 113.6 | | |
| | W0 | | 113.6 | -- | 147.7 | | |

5. Reflow Soldering Characteristics



| Profile Feature | Lead Free Assembly |
|--|--------------------|
| Average Ramp-Up Rate (T _{Smax} to T _P) | 3°C / second max |
| Preheat Temperature Min (T _{Smin}) | 150°C |
| Preheat Temperature Max (T _{Smax}) | 200°C |
| Preheat Time (t _{Smin} to t _{Smax}) | 60 – 180 seconds |
| Time Maintained Above Temperature (T _L) | 217°C |
| Time Maintained Above Time (t _L) | 60 – 150 seconds |
| Peak / Classification Temperature (T _P) | 260°C |
| Time Within 5°C of Actual Peak Temperature (t _p) | 5 seconds |
| Ramp – Down Rate | 6°C / second max |
| Time 25°C to Peak Temperature | 8 minutes max |

Notes:

1. The LEDs can be soldered using the reflow soldering or hand soldering method. The recommended hand soldering condition is 350°C max. and 2secs max. for one time only.
2. All temperatures refer to topside of the package, measured on the package body surface.
3. The soldering condition referring to J-STD-020D. If the LEDs were unpacked more than 168hrs, baking the LEDs at 60°C for 60 mins before soldering process.
4. The soldering profile could be further referred to different soldering grease material characteristic. The grease vendor will provide this information.
5. A rapid-rate process is not recommended for the LEDs cooling down from the peak temperature.
6. Although the recommended reflow conditions are specified above, the reflow or hand soldering condition at the lowest possible temperature is desirable for the LEDs.
7. LiteOn cannot make a guarantee on the LEDs which have been already assembled using the dip soldering method.

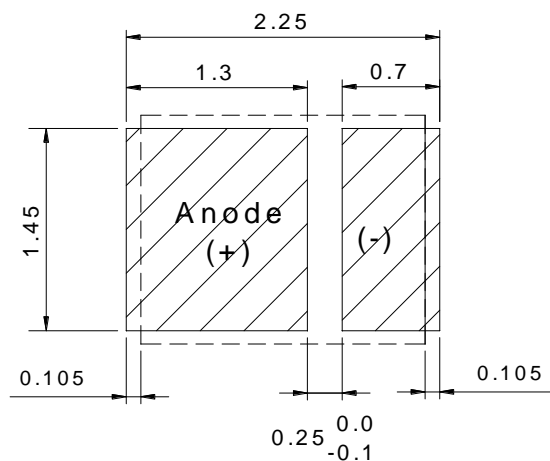
6. Reliability Test Plan

| Stress Test | Stress Condition | Stress Duration |
|-------------------------------------|---|-----------------|
| Thermal Cycling | - 40°C (30min)/100°C (30min) transition time 5 min @ 25°C | 1000 cycles |
| Thermal Shock | - 40°C (20min)/100°C (20min) transition time 20 secs | 500 cycles |
| Room Temperature Operation Life | 25°C, IF=350mA | 1000hr |
| Low Temperature Storage Life | - 40°C | 1000hr |
| High Temperature Storage Life | 100°C | 1000hr |
| Resistance to solder heat | T _{sol} =260°C, 10sec, 6min | 3 times |
| Wet High Temperature Operation Life | 85°C/85% | 1000hr |
| Pulse test | I _F =1000mA 400ms on /3600 ms off @25°C | 30000times |
| ESD HBM | 8000V, Interval:0.5sec | 3times |

Notes:

1. All reliability items are mounted on thermal heat sink with 2cmX 2cm Metal Core PCB.
2. V_F: Forward Voltage difference < 20%.
3. Luminous Flux is decayed < 50% within 1000hrs.

7. Recommend Soldering Pad Layout

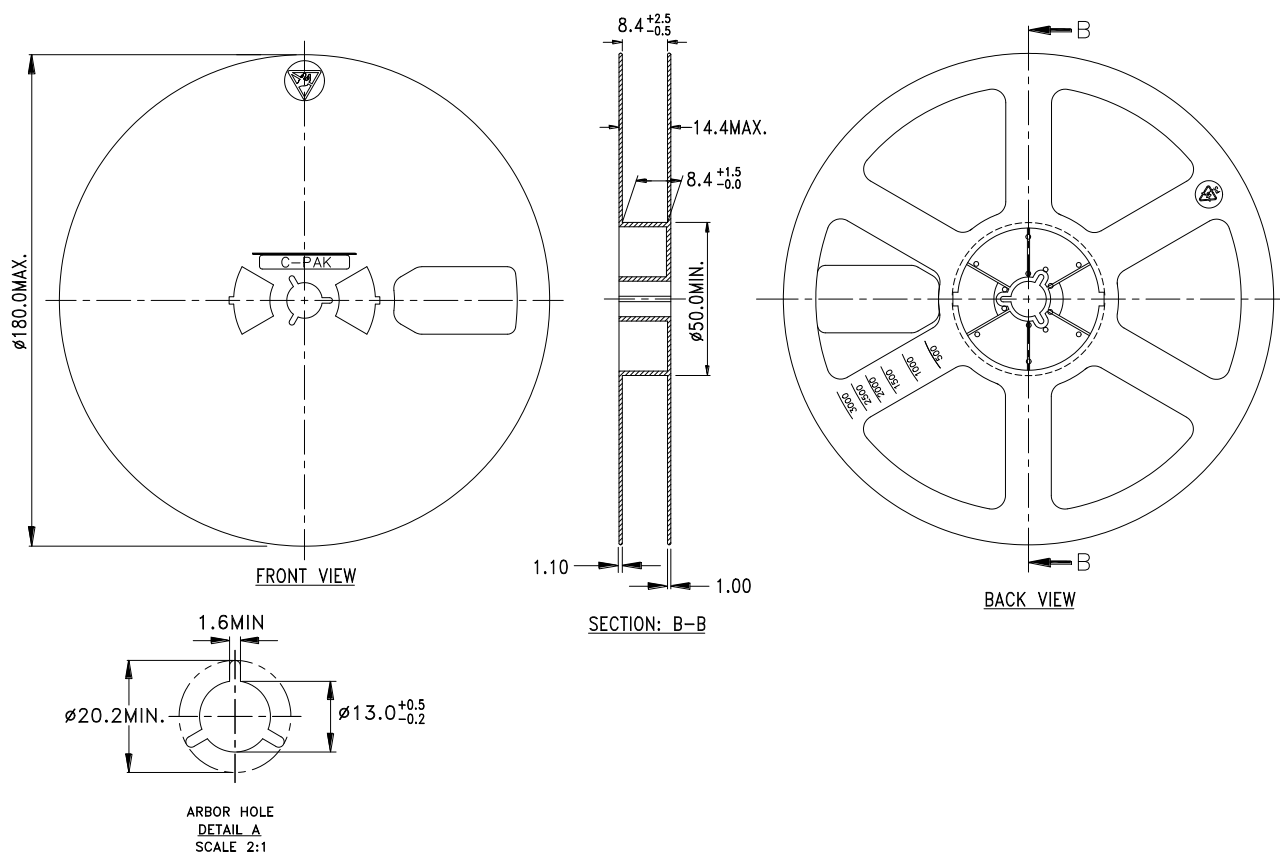


Notes:

1. Suggest stencil thickness is maximum 0.10mm

8. Package Dimensions of Tape and Reel

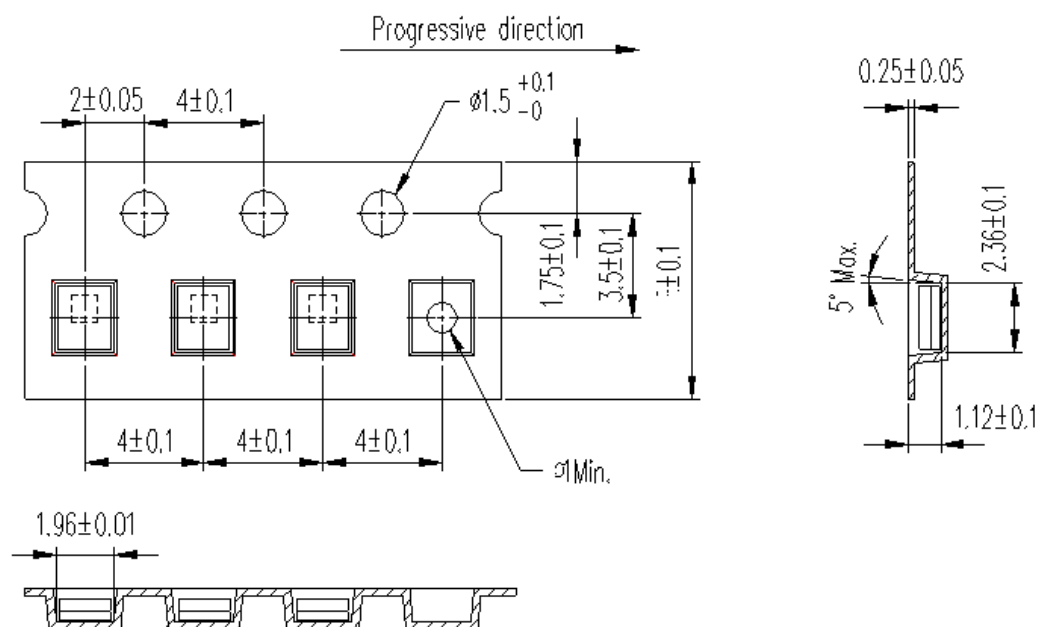
Reel Packaging



Note:

1. Drawings not to scale.
2. All dimensions are in millimeters.
3. All dimensions without tolerances are for reference only.
4. Minimum package quantity is 500 pieces for remainders.
5. 7 inch reel-2000 pieces.

Emitter Packaging

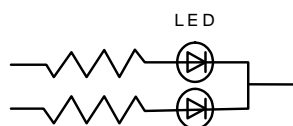


Note:

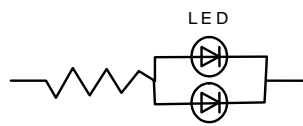
1. Drawings not to scale.
2. All dimensions are in millimeters.
3. All dimensions without tolerances are for reference only.

9. Cautions

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.



Circuit model A



Circuit model B

(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents.

To verify for ESD damage, check for "lightup" and V_F of the suspect LEDs at low currents.



Storage

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handling this moisture sensitive product is important to ensure the reliability of the product.

The package is sealed:

The LEDs should be stored at 30°C or less and 90%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

The package is opened:

The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If the Humidity Indicator shows the pink color in 10% even higher or exceed the storage limiting time since opened, that we recommended to baking LEDs at 60°C at least 48hrs. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.