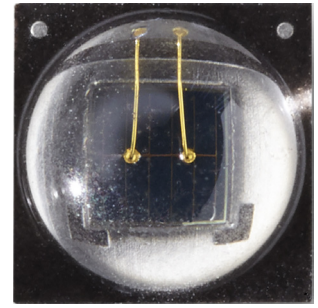


Bridgelux® IR 3535 1.0W Series

Product Data Sheet DS300

Introduction

IR 3535



Bridgelux IR products are infrared LEDs that offer superior performance in a cost effective and robust package. The outstanding efficiency and high radiant power of IR products are designed for a broad range of indoor and outdoor security system applications and enable greater design flexibility and lower fixture cost. The IR 3535 is engineered on an industry standard footprint allowing for easy integration and rapid time to market. The Bridgelux IR 3535 utilizes state of the art LED technology providing security and industrial applications with a highly efficient, powerful, robust and reliable infrared light source.

Features

- Optical performance is 14% more efficient than top competitors
- Radiant power options ranging from nominal 800mW to 1100mW
- Peak wavelength of 850nm for high camera sensitivity
- Industry standard 3535 footprint
- Thermal resistance is 20% lower than top competitors
- 90° and 120° viewing angle options
- Reliable operation at high drive currents

Benefits

- Broad application coverage for indoor and outdoor surveillance systems
- High radiant power output from small package reduces BOM cost and improves design flexibility
- Industry standard 3535 footprint allows for ease of design and rapid go-to-market
- Uniform, consistent illumination
- Multiple viewing angle options allow for wide and narrow applications
- Short, medium and long distance coverage
- Environmentally friendly



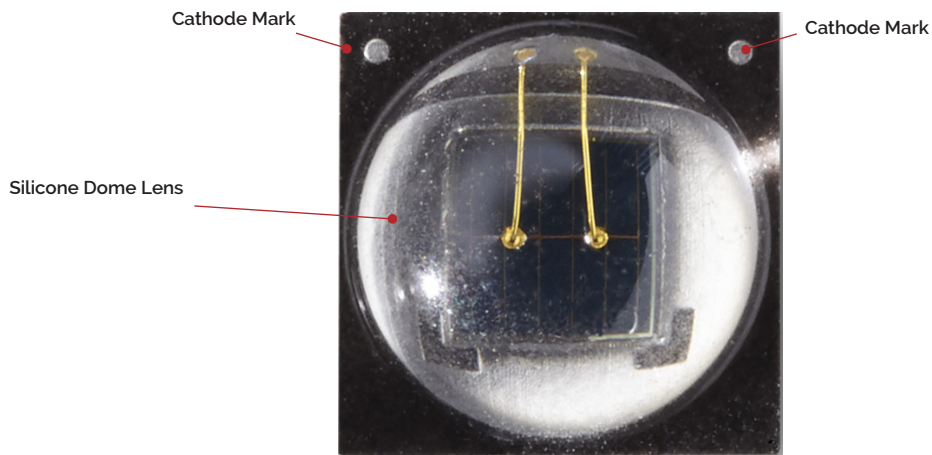
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Product Feature Map

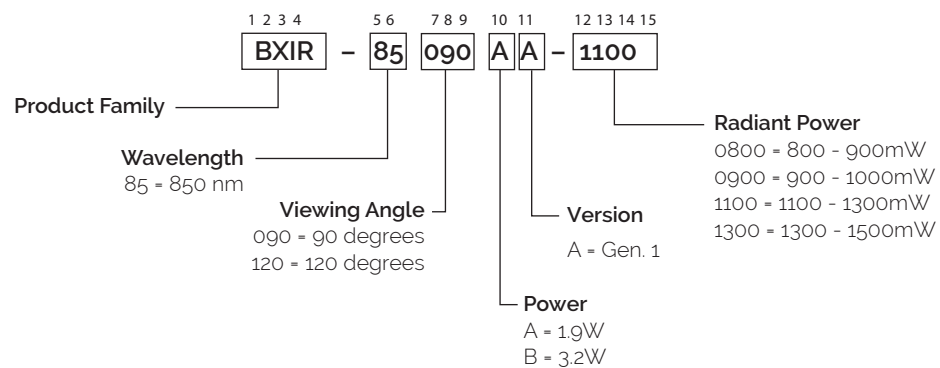
The Bridgelux IR products deliver superior optical performance in a robust, cost-efficient package. The high radiant power output enables industry-leading system level performance, while lowering overall end

product cost. With its compact size, industry leading performance, and flexible beam angles, Bridgelux IR products provide exceptional design flexibility and added value for an assortment of infrared applications.



Product Nomenclature

The part number designation for Bridgelux IR 3535 1.0W is explained as follows:



Electrical Characteristics

Table 1: Characteristics

| Part Number | Viewing Angle | Nominal Drive Current (mA) | Typical Peak Wavelength (nm) | Min. Radiant Power ^{1,2} T _a = 25°C (mW) | Max. Radiant Power ^{1,2} T _a = 25°C (mW) | Min. Radiant Intensity ^{1,2} T _a = 25°C (mW/sr) | Max. Radiant Intensity ^{1,2} T _a = 25°C (mW/sr) | Forward Voltage @ 1A (V) | | |
|-------------------|---------------|----------------------------|------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|------|------|
| | | | | | | | | Min. | Typ. | Max. |
| BXIR-85120AA-xxxx | 120° | 1000 | 850 | 800 | 900 | 240 | 270 | 1.6 | 1.9 | 2.4 |
| BXIR-85120AA-xxxx | 120° | 1000 | 850 | 900 | 1000 | 270 | 310 | 1.6 | 1.9 | 2.4 |
| BXIR-85090AA-xxxx | 90° | 1000 | 850 | 800 | 900 | 310 | 345 | 1.6 | 1.9 | 2.4 |
| BXIR-85090AA-xxxx | 90° | 1000 | 850 | 900 | 1000 | 345 | 385 | 1.6 | 1.9 | 2.4 |

Notes for Table 1:

1. Bridgelux maintains a ± 7% tolerance on radiant power measurements and a ± 0.1V tolerance on forward voltage measurements.
2. Parts are tested in pulsed conditions, T_a = 25°C. Pulse width is 10 ms at nominal drive current.

Table 2: Characteristics

| Part Number | Typ. Peak Wavelength (nm) | Centroid Wavelength (nm) | Spectral Line Half-Width (nm) | Rise and Fall Time ³ (ns) | Temp. Coefficient of I _e ^{1,2} (%/K) | Temp. Coefficient of V _f ^{1,2} (mV/K) | Temp. Coefficient of wavelength (nm/K) | Thermal Resistance (K/W) |
|-------------------|---------------------------|--------------------------|-------------------------------|--------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|----------------------------------------|--------------------------|
| BXIR-85xxxAA-xxxx | 850 | 830-860 | 39.5 | 51.9/62.2 | -0.37 | -1.2 | 0.29 | 8 |

Notes for Table 2:

1. Bridgelux maintains a ± 7% tolerance on radiant power measurements and a ± 0.1V tolerance on forward voltage measurements.
2. Parts are tested in pulsed conditions, T_a = 25°C. Pulse width is 10 ms at nominal drive current.
3. Rise and Fall Time condition: Standby current: 2mA, Delay time: 70.0ns, Pulse width: 200ns.

Absolute Maximum Ratings

Table 3: Maximum Ratings

| Parameter | Maximum Rating |
|------------------------------------|----------------|
| DC Forward Current | 1500mA |
| Pulse Forward Current ¹ | 1800mA |
| Reverse Voltage ² | -5V |
| Reverse Current (-5V) | 10 μ A |
| Junction Temperature | 150°C |
| Operating Temperature Range | -40°C-85°C |
| Storage Temperature Range | -40°C-105°C |
| Soldering Temperature | 260°C |
| ESD Withstand Voltage ³ | 2kV |
| Power Consumption | 3.6W |

Notes for Table 3:

1. Bridgelux recommends a maximum duty cycle of 10% and pulse width of 10 ms when operating LED Emitter at maximum peak pulsed current specified. Maximum peak pulsed currents indicate values where LED Emitter can be driven without catastrophic failures.
2. Light emitting diodes are not designed to be driven in reverse voltage and will not produce light under this condition. Maximum rating provided for reference only.
3. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Performance Curves

Figure 1: Relative Spectral Power Distribution

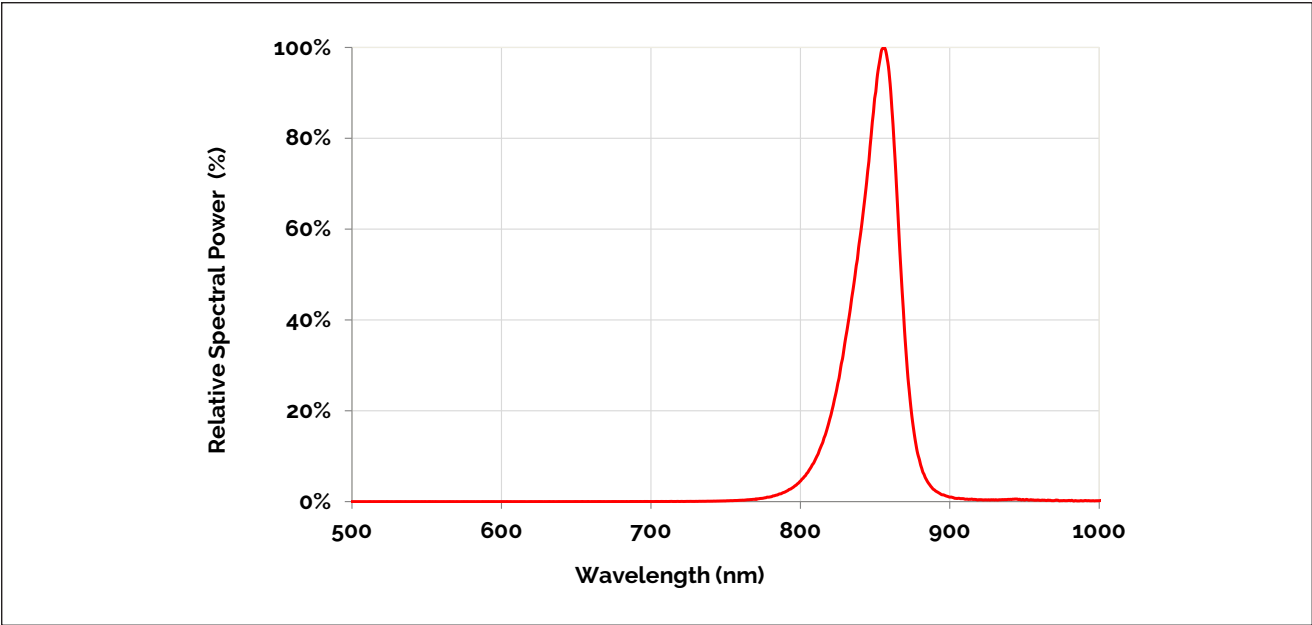
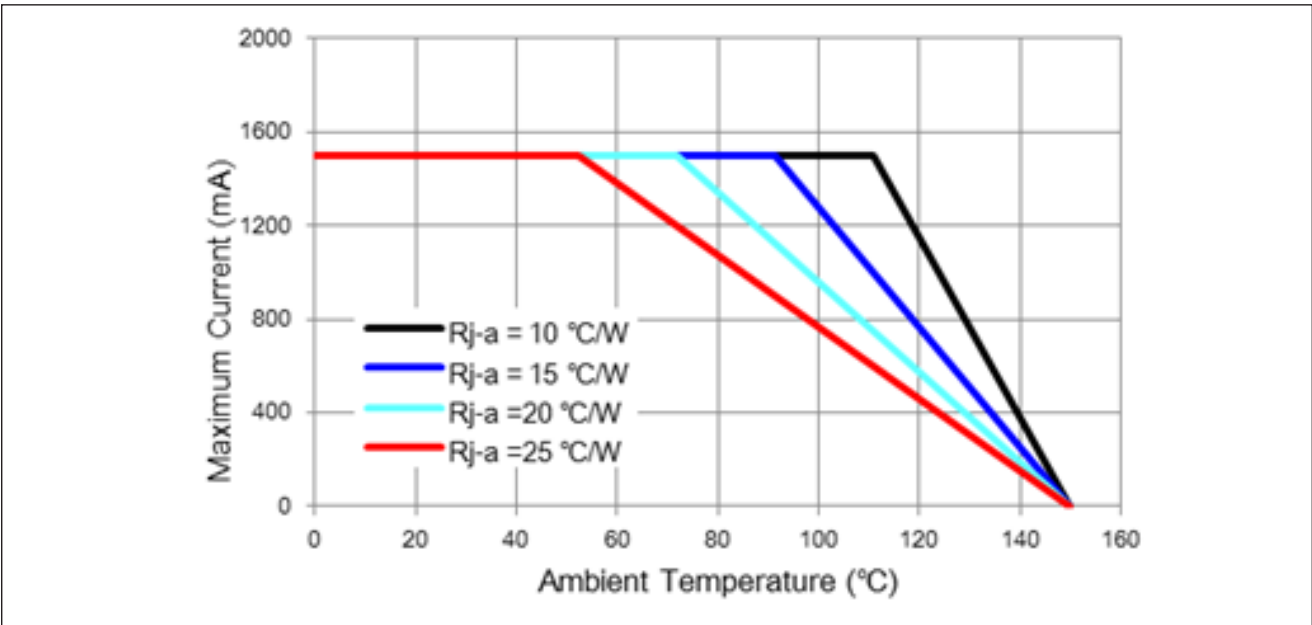


Figure 2: Derating Curve



Notes for Figure 2:

1. The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

Performance Curves

Figure 3: Forward Current vs. Forward Voltage

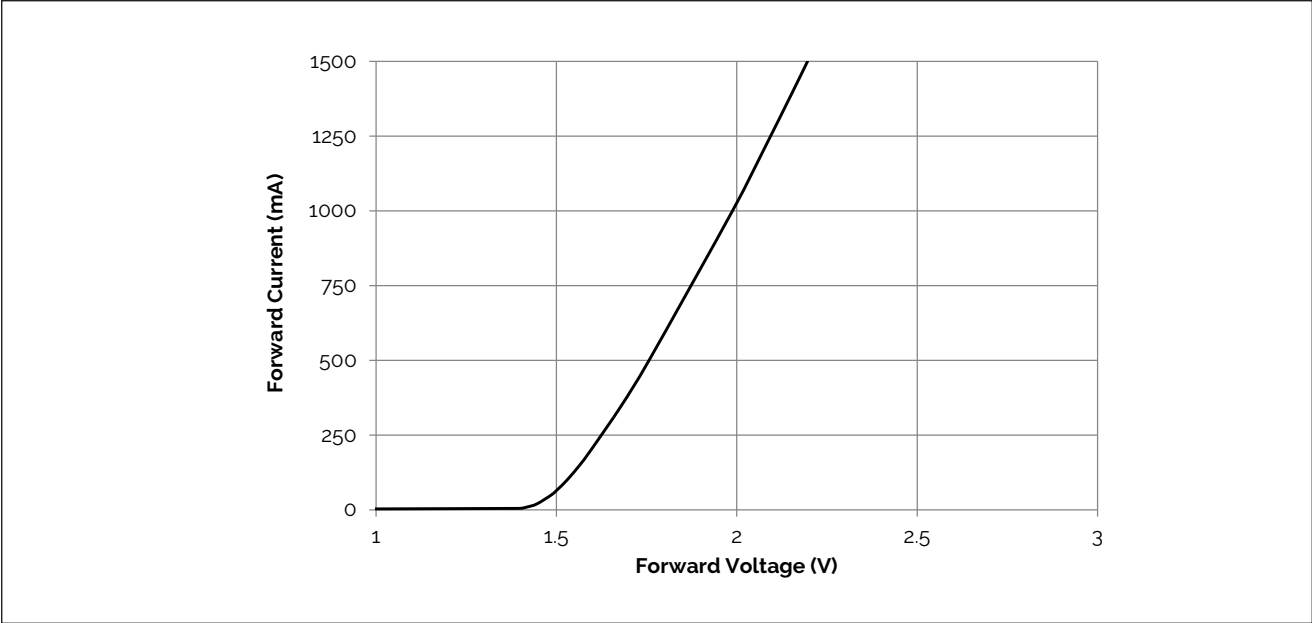
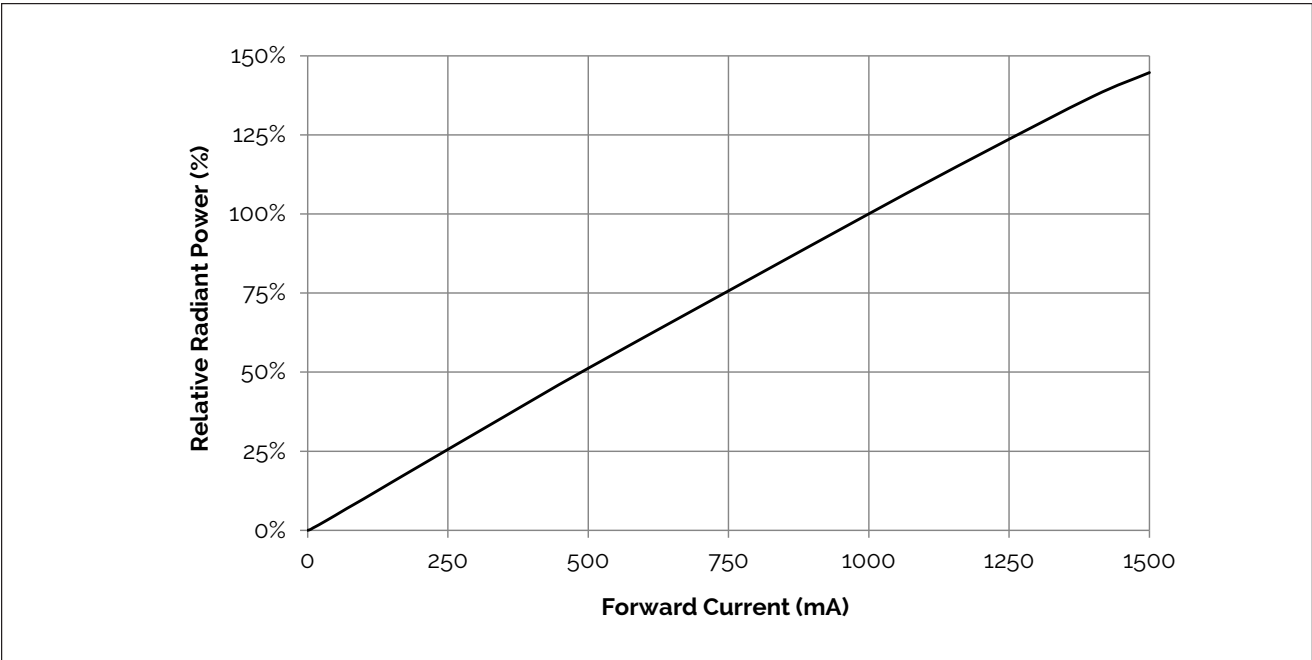


Figure 4: Relative Radiant Power vs. Forward Current



Typical Radiation Pattern

Figure 5: Radiation Characteristics 90°

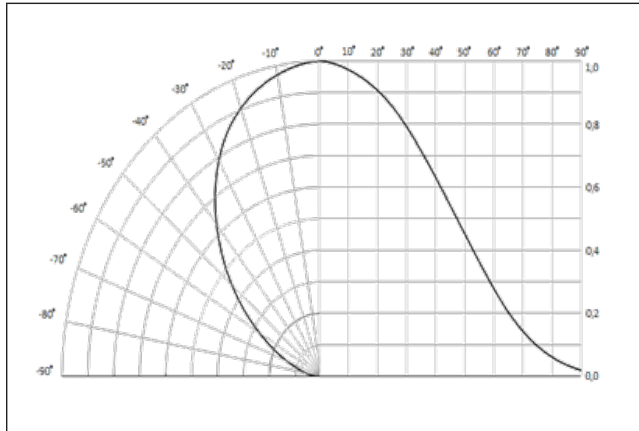
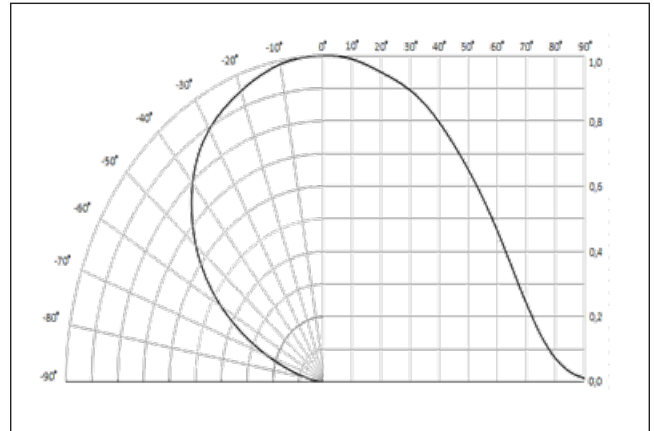
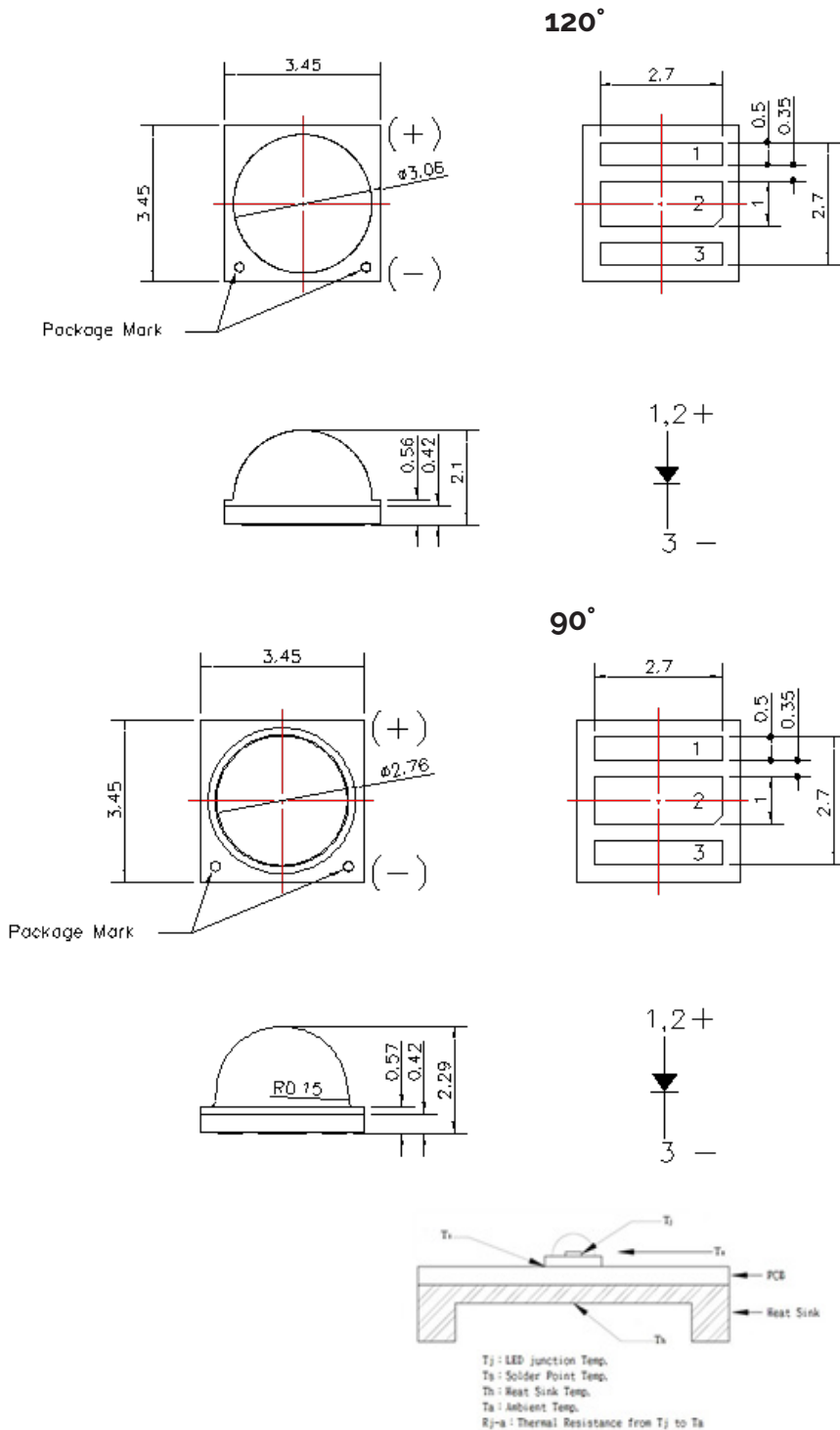


Figure 6: Radiation Characteristics 120°



Mechanical Dimensions

Figure 7: Drawing for IR 3535

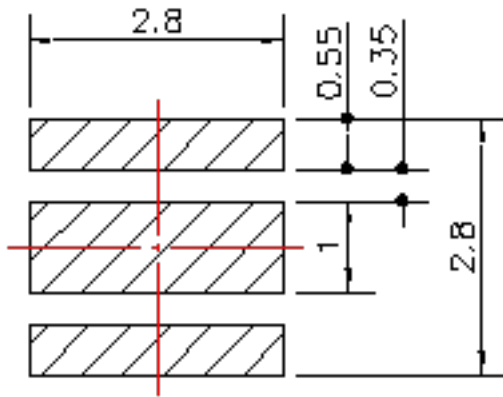


Notes for Figure 7:

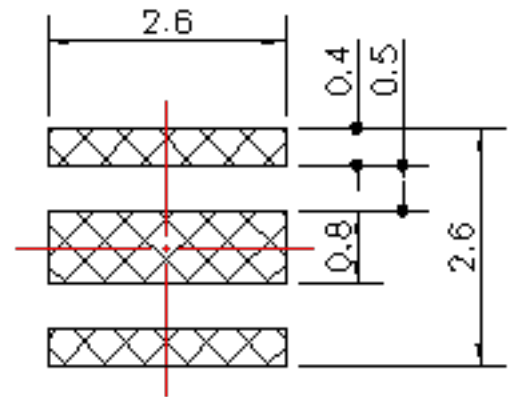
1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.

Mechanical Dimensions

Figure 8: Suggested Stencil Pattern



Recommended PCB Soldering Pad Pattern



Recommended Stencil Pattern
(Hatched Area Is Opening)

Note for Figure 8:

1. Drawing dimensions are in millimeters.

Reflowing Characteristics

Figure 9 : Reflow Profile

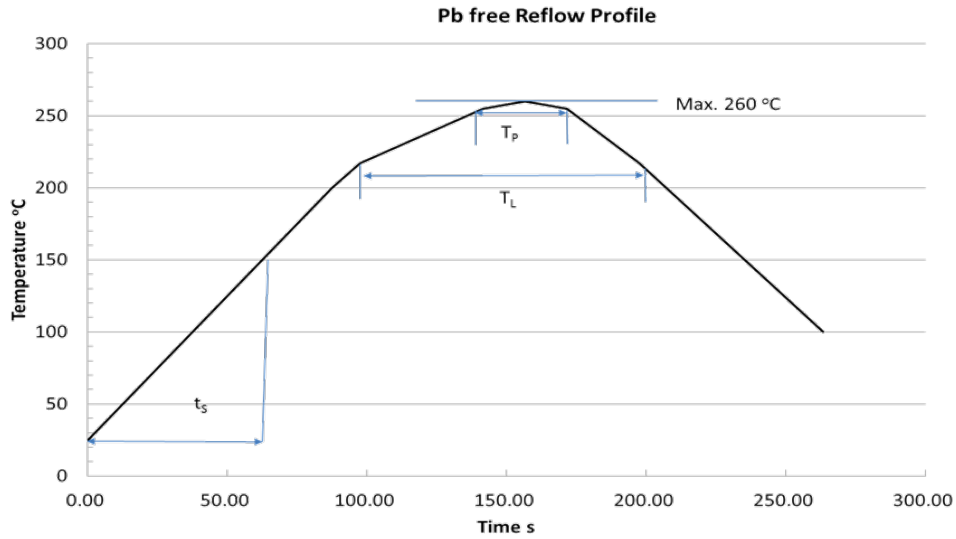


Table 4 : Reflow Profile Table for Pb-Free (SnAgCu) Assembly

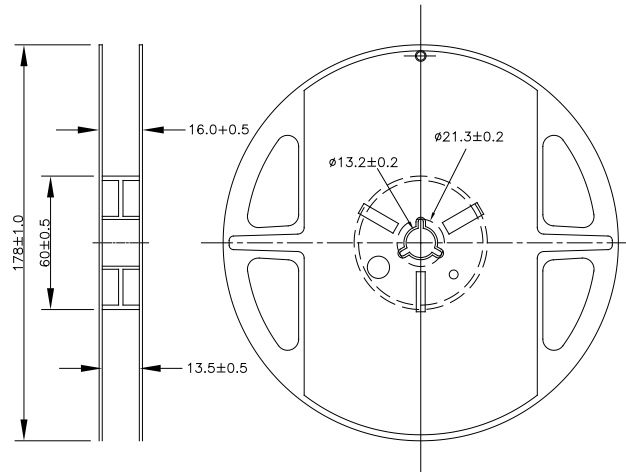
| Profile Feature | Minimum | Recommendation | Maximum |
|---------------------------------------------------------------------------|---------|----------------|---------|
| Ramp-up Rate to Preheat 25°C to 150°C (°C/s) | - | 2 | 3 |
| Time $t_{smin} : T_{smax}$ (s) | 60 | 100 | 120 |
| Ramp-up Rate to Peak: T_{smax} to T_p (°C/s) ² | - | 2 | 3 |
| Liquidus Temperature T_L (°C) | - | 217 | - |
| Time above Liquidus Temperature t_L (s) | - | 80 | 100 |
| Peak Temperature T_p (°C) ¹ | - | 245 | 260 |
| Time within 5°C of Specified Peak Temperature $T_p - 5^\circ\text{C}$ (s) | 10 | 20 | 30 |
| Ramp-down Rate: T_p to 100°C (°C/s) | - | 3 | 4 |
| Time 25°C to T_p (s) | - | - | 480 |

Notes for Table 4:

1. Do not expose the silicone dome lens to high temperature.
2. The maximum number of reflow cycles should not exceed 3 times.

Packaging

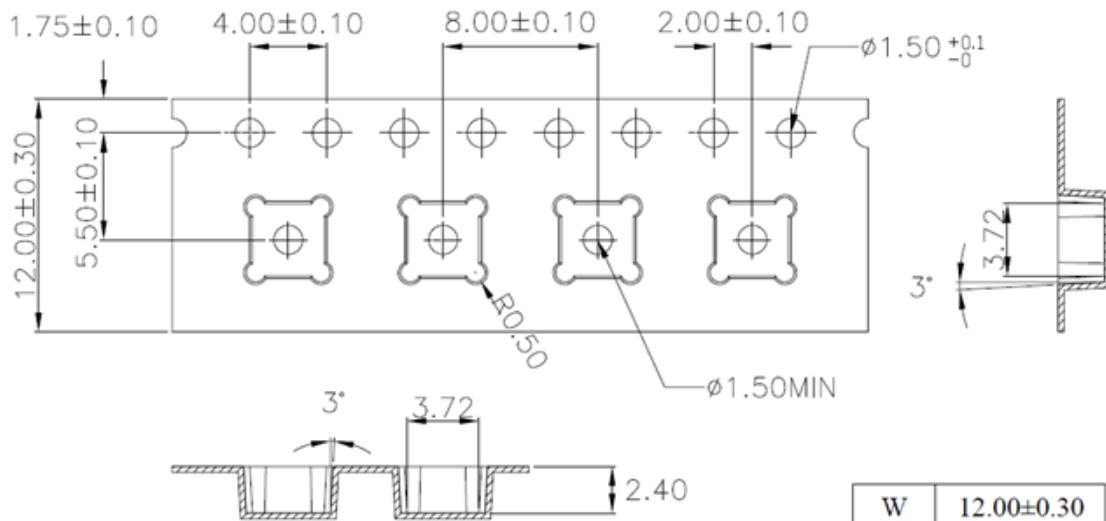
Figure 10: Emitter Reel Drawings



Note for Figure 10:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Figure 11: Emitter Tape Drawings



1. 10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30 ± 0.05 mm.

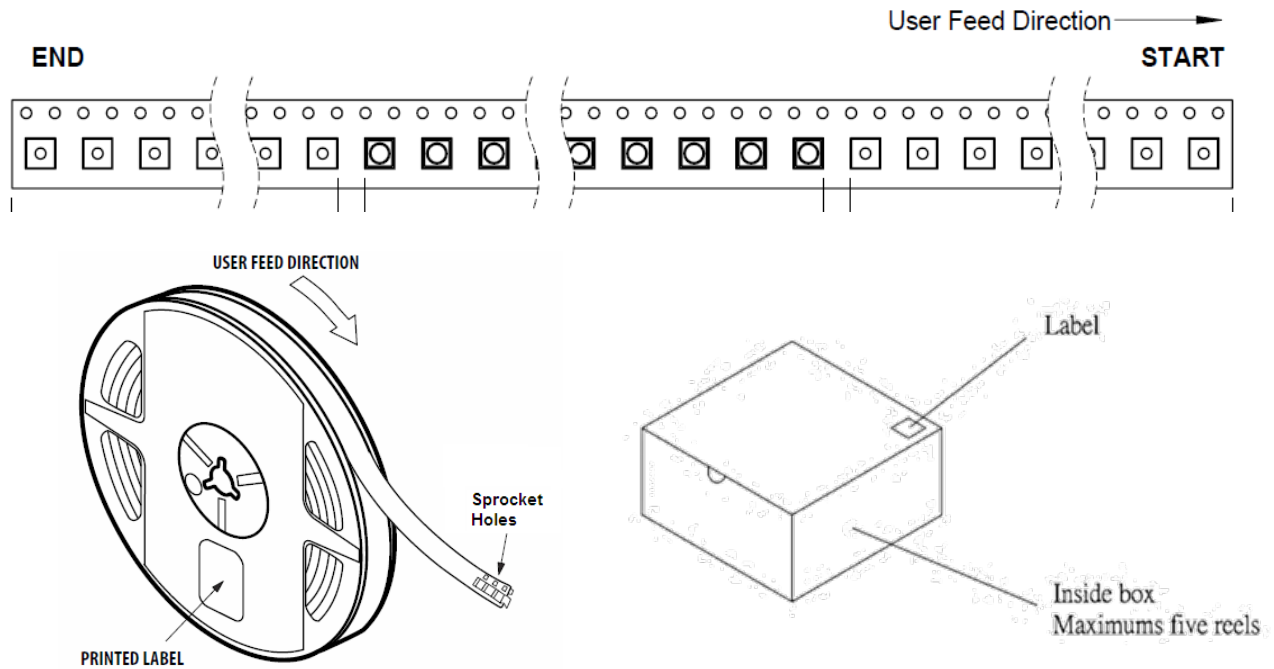
| | |
|----|------------|
| W | 12.00±0.30 |
| A0 | 3.72±0.10 |
| B0 | 3.72±0.10 |
| K0 | 2.40±0.10 |

Note for Figure 11:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Packaging

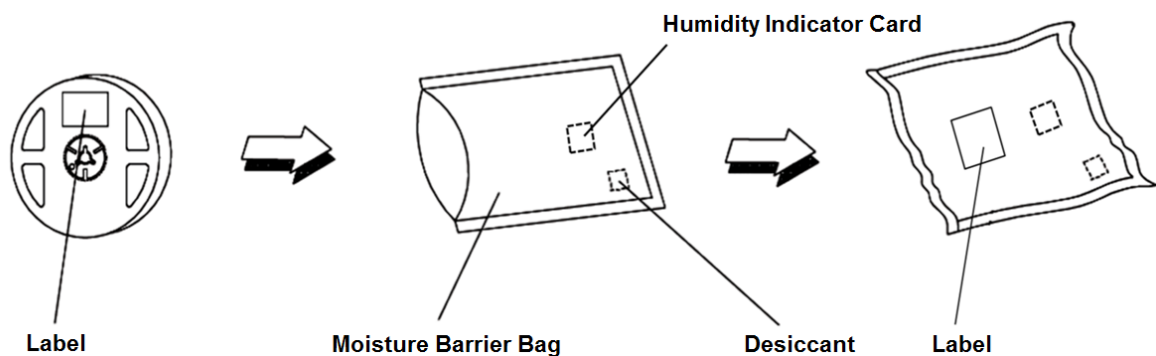
Figure 12: Emitter Tape Drawings



Notes for Figure 12:

1. Each reel (maximum number of pieces is 1000 for 120°/90° product) is packed in a moisture-proof bag along with a pack of desiccant and 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 number, lot number and quantity should be indicated on the label of the moisture-proof bag and cardboard box.

Figure 13: Emitter Reel Packaging Drawings



Note for Figure 13:

1. Drawings are not to scale.

Design Resources

Optical Source Models

Optical source models and ray set files are available for all Bridgelux products. For a list of available formats, visit www.bridgelux.com.

Please contact your Bridgelux sales representative for assistance.

Precautions

CAUTION: CHEMICAL EXPOSURE HAZARD

Exposure to some chemicals commonly used in manufacturing and assembly can cause damage to the LED emitter. Please consult Bridgelux Application Note AN51 for additional information.

CAUTION: RISK OF BURN

Do not touch the IR LED emitter during operation. Allow the emitter to cool for a sufficient period of time before handling. The IR LED emitter may reach elevated temperatures that could burn skin when touched.

CAUTION

CONTACT WITH SILICONE DOME LENS

Avoid any contact with the silicone dome lens. Do not touch the silicone dome lens of the emitter or apply stress to the silicone dome lens. Contact may cause damage to the emitter.

Optics and reflectors must not be mounted in contact with the silicone dome lens.

Disclaimers

MINOR PRODUCT CHANGE POLICY

The rigorous qualification testing on products offered by Bridgelux provides performance assurance. Slight cosmetic changes that do not affect form, fit, or function may occur as Bridgelux continues product optimization.

STANDARD TEST CONDITIONS

Unless otherwise stated, LED emitter testing is performed at the nominal drive current.

ENVIRONMENTAL COMPLIANCE

Bridgelux is committed to providing environmentally friendly products. This product complies with the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS directive. Bridgelux does not intentionally add the following restricted materials to any LED product: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

About Bridgelux: We Build Light That Transforms

At Bridgelux, we help companies, industries and people experience the power and possibility of light. Since 2002, we've designed LED solutions that are high performing, energy efficient, cost effective and easy to integrate. Our focus is on light's impact on human behavior, delivering products that create better environments, experiences and returns—both experiential and financial. And our patented technology drives new platforms for commercial and industrial luminaires.

For more information about the company, please visit
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