

SST-20-B

Blue LED

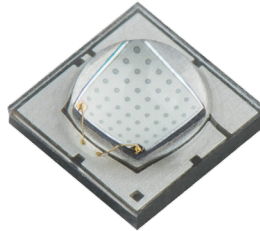


Table of Contents

SST-20 Binning Structure . . . 2

Part Numbering and Bin Kit Information 3

Optical and Electrical Characteristics 4

A120 - Mech. Dimensions . . . 6

B120 - Mech. Dimensions . . . 7

A120/B120 - Tape and Reel . . 8

Reel Packaging 9

Box Packaging Info 10

Soldering Profile 11

Precautions for Use 12

History of Changes 13

Features:

- High Power Blue LED with Peak Wavelength of 450nm
- Typical Wall-Plug Efficiency of 72% at 350 mA
- Maximum drive current: 3 A
- Available with 2 industry standard soldering footprint configurations
- High thermal conductivity package - junction thermal resistance of only 3.5°C/W
- Available with 120° viewing angle
- 8000V HBM ESD rating per MIL STD-883D
- Electrically isolated thermal path
- RoHS and REACH compliant

Applications

- Horticulture / Growlights
- Accent and effect lighting
- Architectural lighting
- Remote-phosphor fixtures
- Stage lighting

SST-20 Binning Structure

SST-20 Blue LEDs are tested for luminous flux and chromaticity at a drive current of 350mA - 20ms single pulse and placed into one of the following luminous flux (FF) and chromaticity (WW) bins:

Flux Bins - Test condition=350mA, 25°C, 20ms pulse

| Flux Bin (FF) | Minimum Flux (mW) | Maximum Flux (mW) |
|---------------|-------------------|-------------------|
| R | 630 | 670 |
| S | 670 | 710 |
| T | 710 | 750 |
| U | 750 | 790 |
| V | 790 | 830 |

Wavelength Bins - Test condition=350mA, 25°C, 20ms pulse

| Chromaticity Bin (WW) | Minimum Wavelength (nm) | Maximum Wavelength (nm) |
|-----------------------|-------------------------|-------------------------|
| B2 | 440 | 445 |
| B3 | 445 | 450 |
| B4 | 450 | 455 |
| B5 | 455 | 460 |

*Note: Luminus maintains a +/- 6% tolerance on flux measurements.

Ordering Information

| Products | Ordering Part Number | Description |
|---------------|----------------------|---|
| SST-20-B-A120 | SST-20-B-A120-xx123 | High Power 2-mm ² Blue LED in a 3535 surface mount package and a 120-degree viewing angle - Type A soldering pad configuration |
| SST-20-B-B120 | SST-20-B-B120-xx123 | High Power 2-mm ² Blue LED in a 3535 surface mount package and a 120-degree viewing angle - Type B soldering pad configuration |

Part Number Nomenclature

SST — 20 — <A> — <PAA(A)> — <FCCC>

| Product Family | LED Emission Area | Color | Package Configuration | Bin kit |
|----------------------------|-------------------------|------------------------|---|--|
| SST: Surface Mount Package | 20: 2.0 mm ² | <A>: Color B = Blue | P: Soldering pad configuration A type - see page 6 B type - see page 7 AA(A): Viewing angle 120° | See Tables F =minimum flux bin CCC: Chromaticity bin kit |

SST-20 Bin Kit Order Codes

The following table describes the bin kit ordering codes available for the SST-20 Blue LEDs. Each bin kit specifies a minimum flux as well as specific chromaticity bins allowed. Please note that within each kit a maximum flux is not specified and as a result Luminus may ship any part meeting or exceeding the minimum flux specification. Shipments will always meet the listed chromaticity bins. For information on ordering bin kits not listed below, please contact Luminus.

SST-20 Blue Bin Kit Order Codes

| Color | Luminous Flux | | Chromaticity Bins | Kit Number |
|-------|-------------------|-----------|-------------------|------------|
| | Bin Kit Flux Code | Min. Flux | | |
| Blue | R | 630 | B2,B3,B4,B5 | R450 |
| | S | 670 | B2,B3,B4,B5 | S450 |
| | T | 710 | B2,B3,B4,B5 | T450 |

Product Shipping & Labeling Information

All SST-20 products are packaged and labeled with their respective bin as outlined in the tables on pages 2 & 3. Each reel will only contain one bin.

SST-20 Blue

SST — 20 — B — P120 — FCCC

| Product Family | LED Emission Area | Color | Package Configuration | Bin kit |
|----------------------------|-------------------------|-------|--|--|
| SST: Surface Mount Package | 20: 2.0 mm ² | Color | P: Soldering pad configuration A type - see page 6 B type - see page 7 | Flux and Chromaticity bin kit code as outlined above |

Optical and Electrical Characteristics¹⁻³

Optical and Electrical Characteristics at 350mA¹

| Parameter | Symbol | Minimum | Typical | Maximum | Unit |
|---|------------------------------|---------|---------|---------|---------|
| Forward Current at test ² | I_f | 350 | | | mA |
| Output Radiometric Power | Φ_r | | 710 | | mW |
| Forward Voltage | V_f | 2.5 | 2.80 | 3.2 | V |
| Wall-Plug Efficiency | WPE | | 72 | | % |
| Photosynthetic Photon Flux (PPF) ⁴ | $\mu\text{mol/s}$ | | 2.68 | | |
| PPF Efficacy (PPF/W) | $\mu\text{mol/J}$ | | 2.73 | | |
| Viewing Angle (A120 / B120) | $2 \text{ } \emptyset_{1/2}$ | | 120 | | degrees |
| Peak Wavelength | λ_p | 440 | 450 | 460 | nm |
| FWHM | $\Delta\lambda_{1/2}$ | 20 | 22 | 24 | nm |
| Forward Current (CW) ² | I_{fmin}, I_{fmax} | 0.2 | | 3 | A |
| Maximum Surge Current | I_{fsmax} | | | 4 | A |
| Maximum Reverse Current ³ | I_{rev} | | | N.A. | |
| LED Junction Temperature | T_j | | | 150 | °C |
| ESD withstand Voltage HBM Per JEDEC/ESDA STANDARD JS-001 | V_{HBM} | 8000 | | | V |
| ESD withstand Voltage CDM Per JEDEC/ESDA STANDARD JS-002 | V_{CDM} | 1000 | | | V |
| Operating Temperature | T_{OPR} | -40 | | 80 | °C |
| Storage Temperature | T_{STG} | -40 | | 100 | °C |
| Thermal resistance junction to case (electrical) | $R_{\theta JC-EL}$ | | 3.5 | | °C/W |

Note 1: Ratings are based on operation at a constant junction temperature of $T_j = 25^\circ\text{C}$.

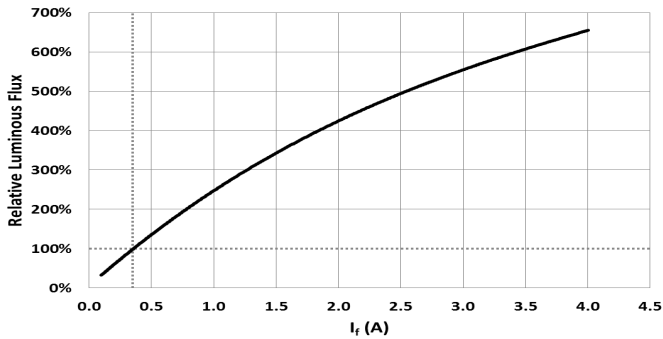
Note 2: Sustained operation at maximum current will result in shortened lifetime.

Note 3: Not designed for reverse voltage operation.

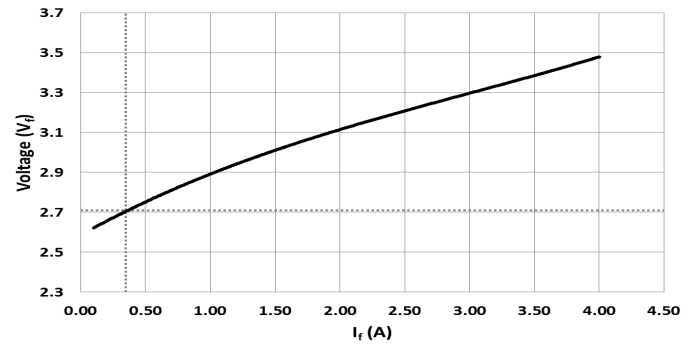
Note 4: Values at 350mA, $T_j = 25^\circ\text{C}$ and computed in the 400nm to 700nm range.

Optical and Electrical Characteristics

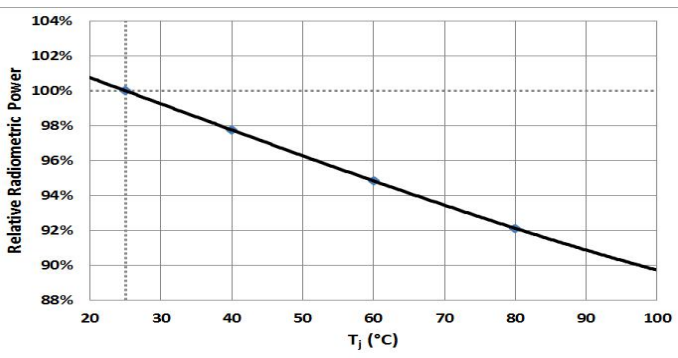
Relative Output Flux vs. Forward Current



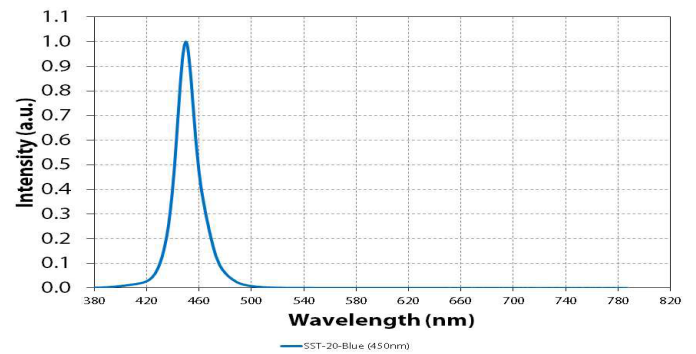
Forward Voltage vs. Forward Current



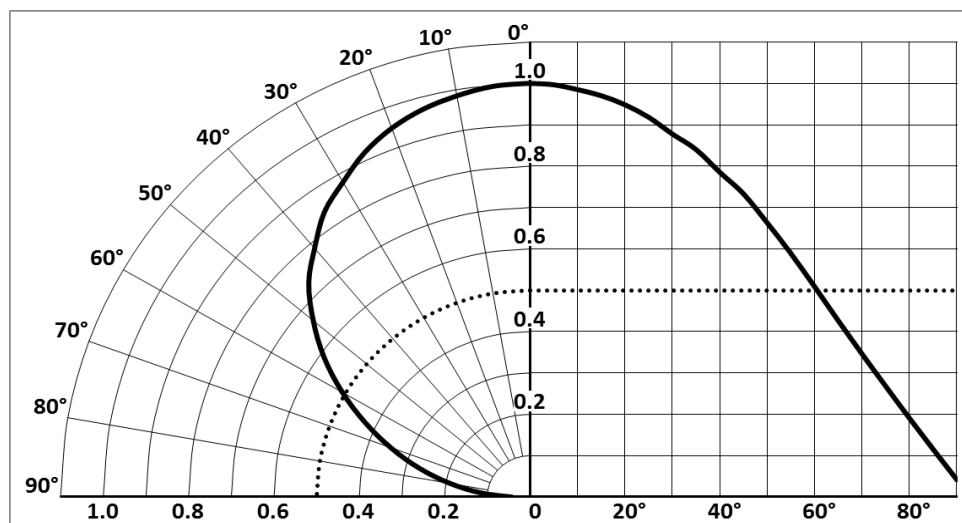
Relative Output Flux vs. Junction Temperature



Typical Spectra



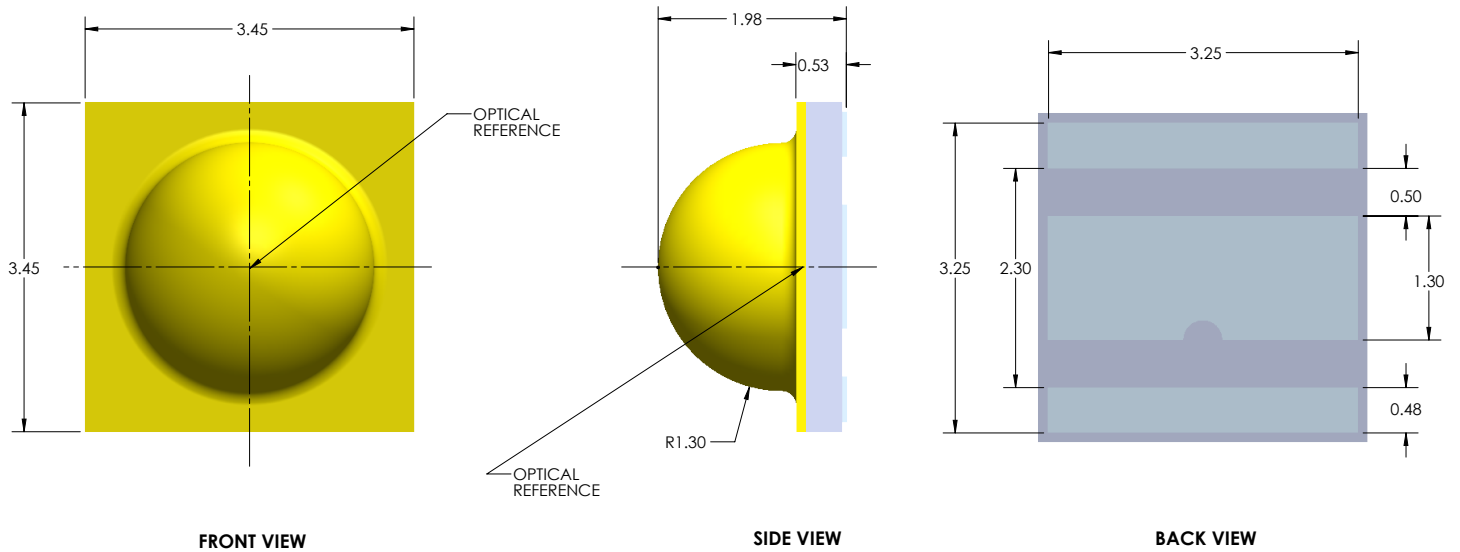
Typical Angular Pattern of Radiant Power - Types A120 and B120⁴



Note 4: Angular pattern measurements were made at 350mA, 25°C.

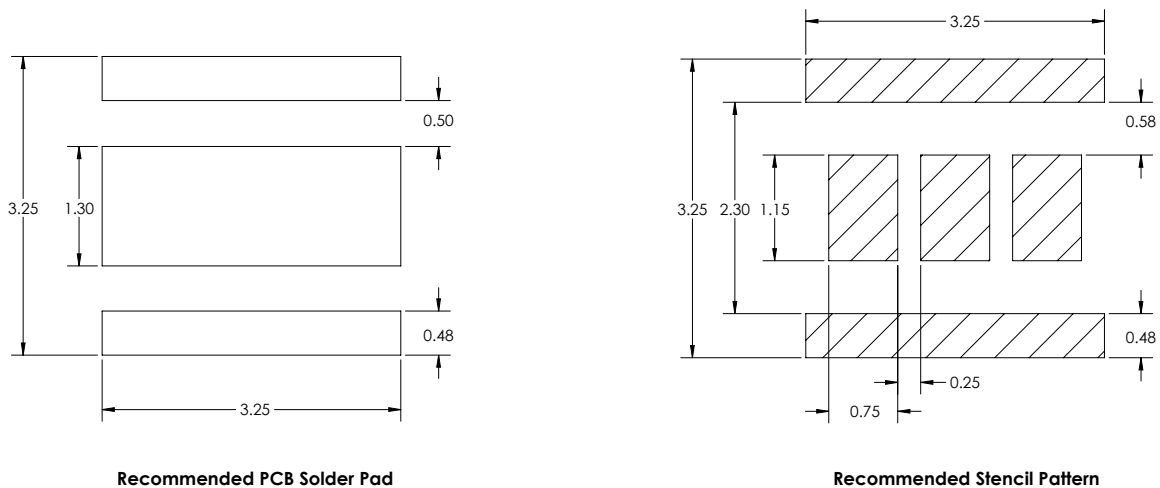
Mechanical Dimensions⁵

A120 Package Configuration



Recommended PCB Solder Pad and Stencil Pattern⁵

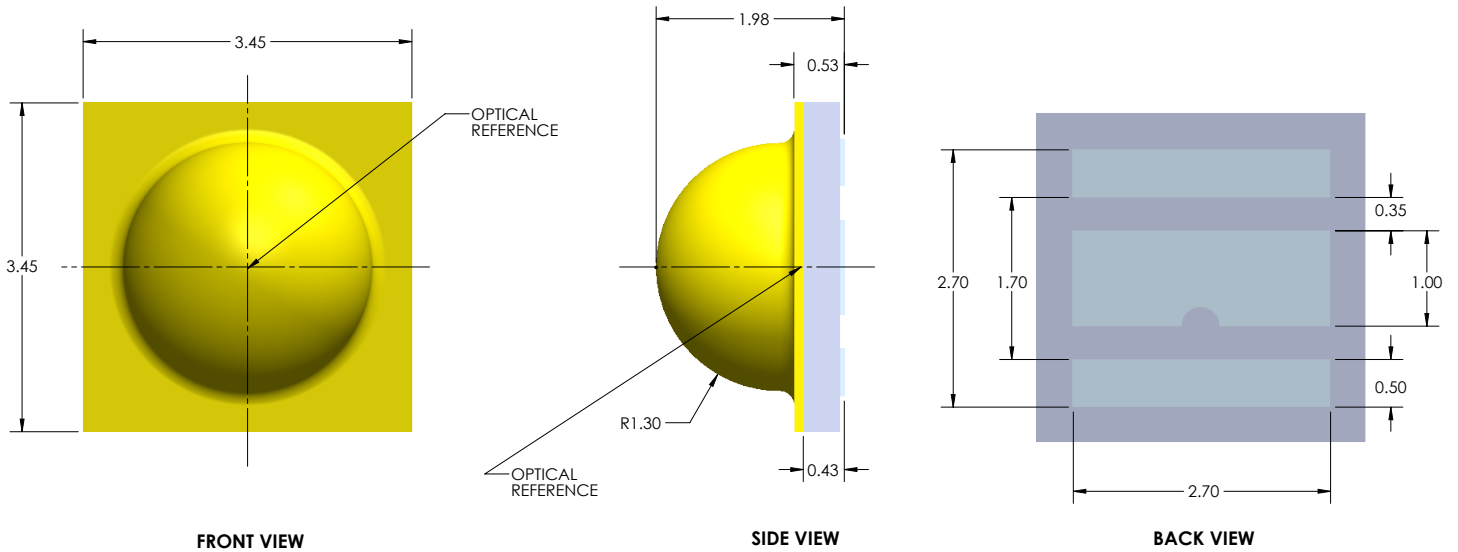
A120 Package Configuration



Note 5: Dimensions are in millimeters +/- 0.13 mm

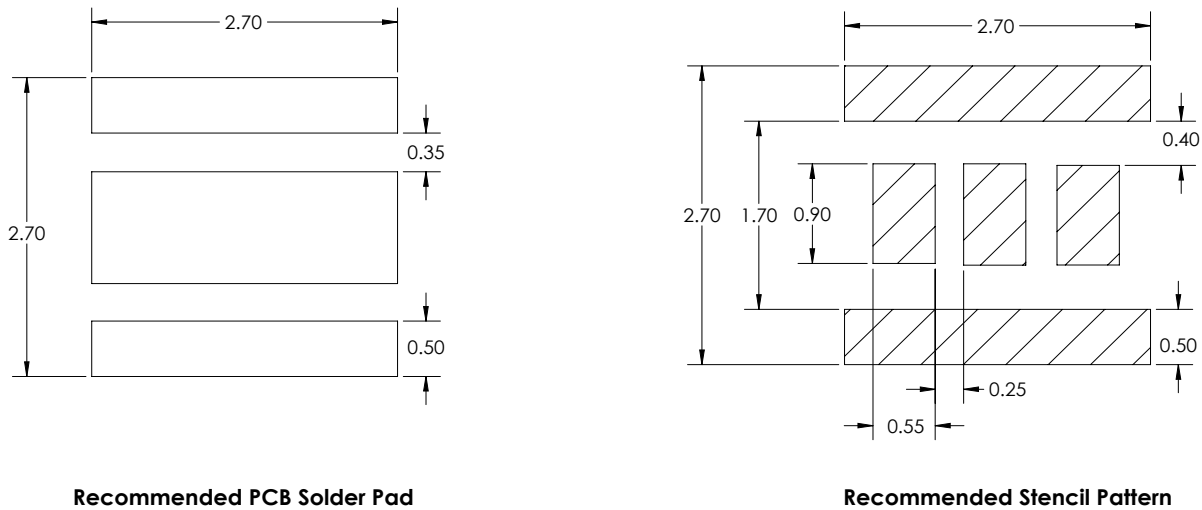
Mechanical Dimensions⁶

B120 Package Configuration



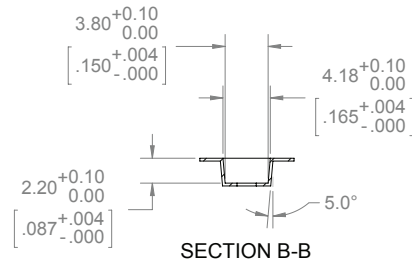
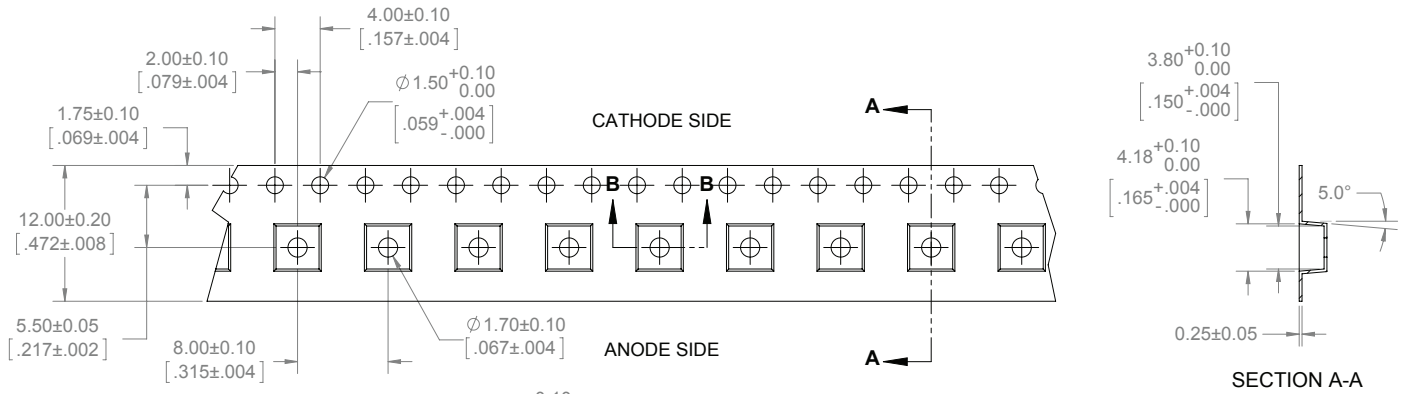
Recommended PCB Solder Pad and Stencil Pattern⁶

B120 Package Configuration



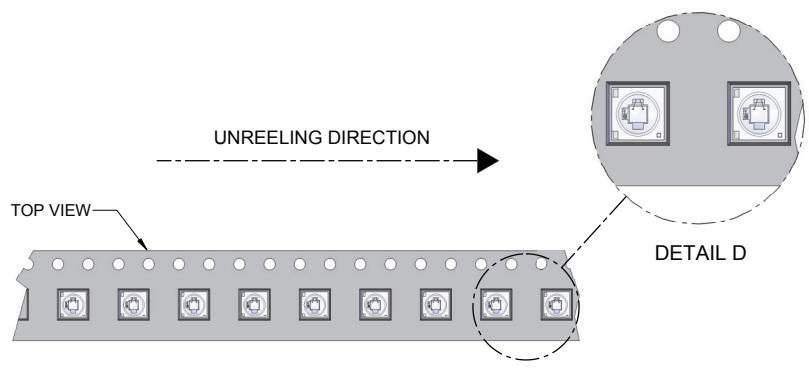
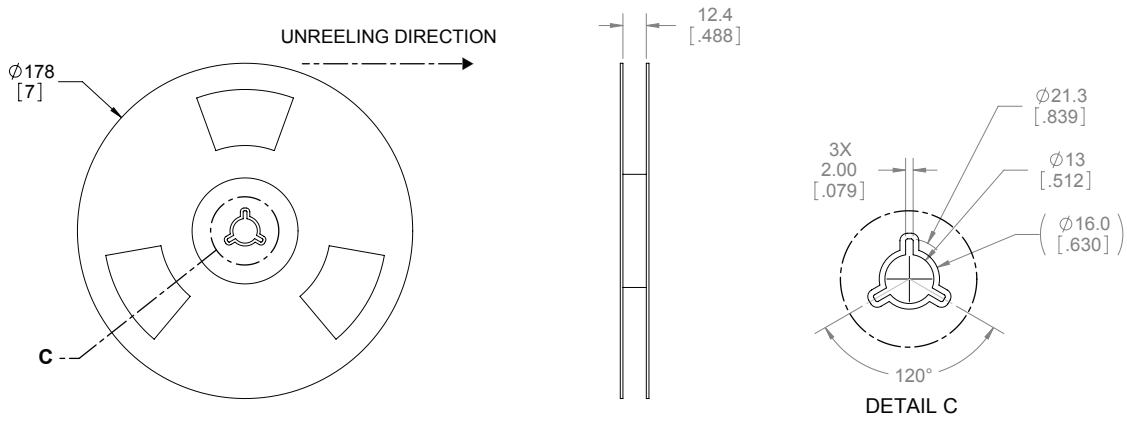
Note 6: Dimensions are in millimeters +/- 0.13 mm

Tape and Reel - A120 and B120 Package Configurations^{7,8}



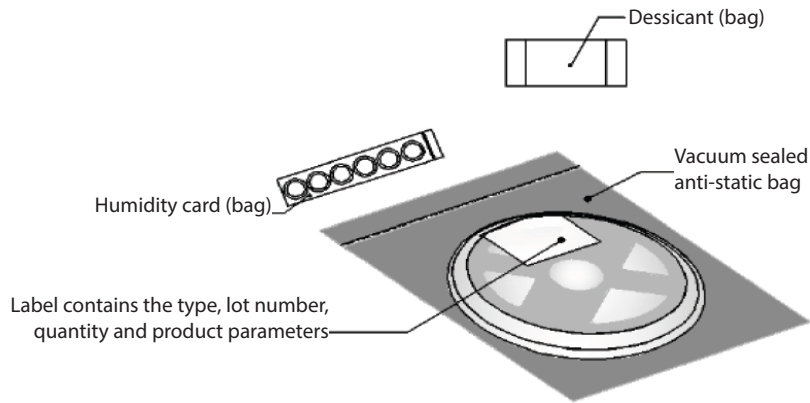
NOTES:

1. FINAL TAPE AND REEL PACKAGING MUST MEET THE REQUIREMENTS OF JEDEC-STD-033, LEVEL 2A.
2. LEAVE 304.8mm [12.00 in] OF TAPE EMPTY FOR LEAD IN (38 EMPTY POCKETS).
3. LEAVE 457.2mm [18.00 in] OF TAPE EMPTY FOR TRAILER (57 EMPTY POCKETS).
4. MUST COMPLY TO EIA-481-C-2003



Note 7: Dimensions are in millimeters
 Note 8: Quantity per reel: 1,000 pcs

Reel Packaging



Reel Label

Label Fields:

- CPN: Luminus ordering part number
- MPN: For Luminus internal use
- Qty on reel
- 2D Bar codes
- Flux: FF as defined on page 3
- Voltage: VV as defined on page 3
- Color: CC as defined on page 6
- Mfg Info: For Luminus internal use



CPN: SST-20-WCS-B120

MPN: xxxxxx

QTY: 1000 pcs

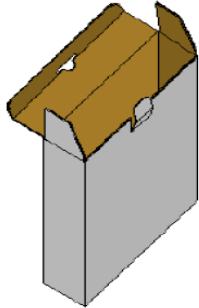


| BIN INFO | |
|-----------------|----|
| Flux: | K5 |
| Voltage: | VJ |
| Color: | BC |

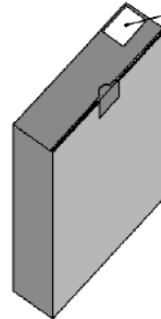
| MFG INFO |
|-----------------------------|
| Rev: 01 |
| Lot#: xxx-xxxxxxxxxx |

RoHS Compliant

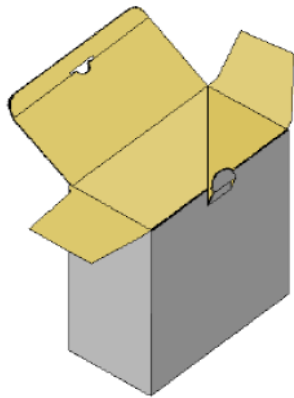
Box Packaging Information



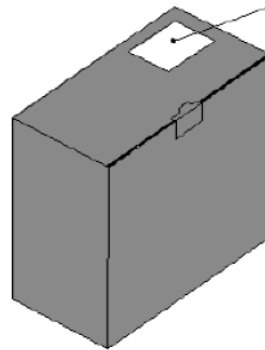
*Capacity 5 reels per box



Label: contains the type,
Lot #, Quality, Product
parameters



*Capacity 10 reels per box



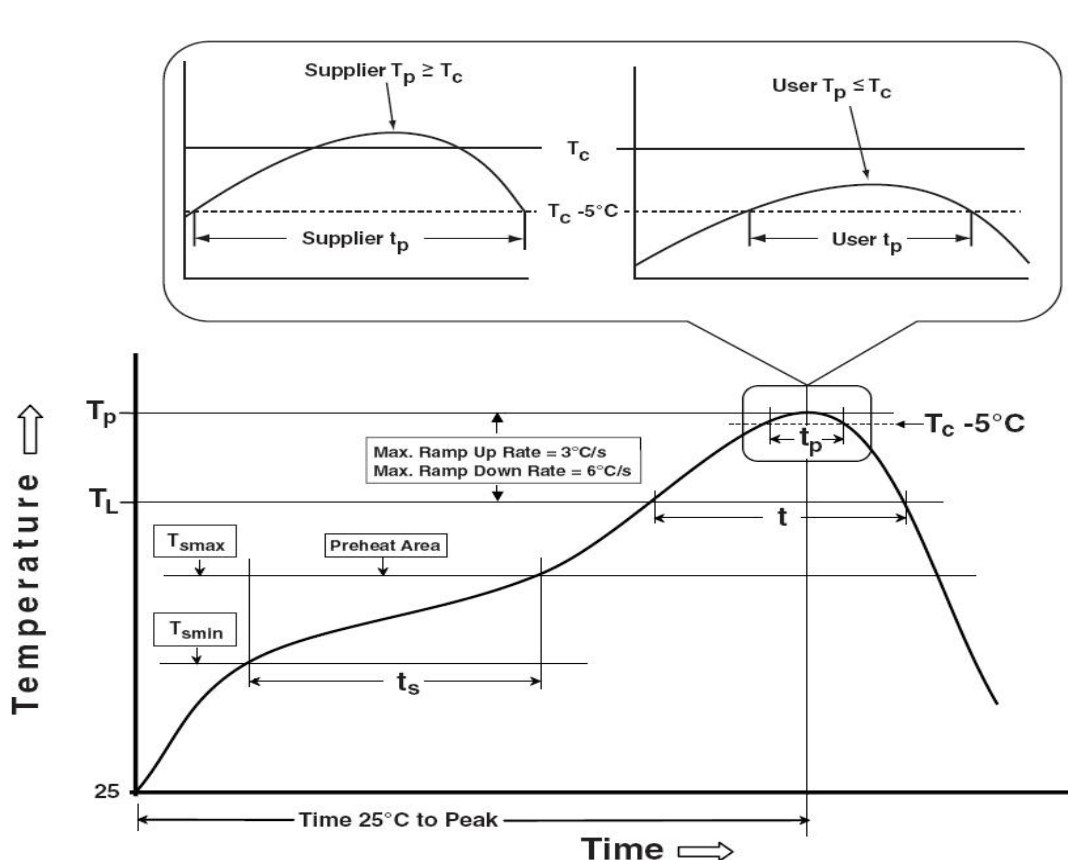
Label: contains the type, Lot
#, Quality, Product
parameters

Soldering Profile

| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|--|-------------------------|------------------|
| Preheat & Soak | 100 °C | 150 °C |
| Temperature min (T _{smin}) | 150 °C | 200 °C |
| Temperature max (T _{smax}) | 60-120 seconds | 60-120 seconds |
| Time (T _{smin} to T _{smax}) (t _s) | | |
| Average ramp-up rate (T _{smax} to T _p) | 3 °C/second max | 3 °C/second max |
| Liquidous temperature (T _L) | 183 °C | 217 °C |
| Time at liquidous (t _L) | 60-150 seconds | 60-150 seconds |
| Peak package body temperature (T _p)* | 230 °C ~235 °C | 255 °C ~260 °C |
| Classification temperature (T _c) | 235 °C | 260 °C |
| Time (t _p) within 5 °C of the specified classification temperature (T _c) | 20 seconds | 30 seconds |
| Average ramp-down rate (T _p to T _{smax}) | 6 °C/second max | 6 °C/second max |
| Time 25 °C to peak temperature | 6 minutes max | 8 minutes max |

* Tolerance for peak profile temperature(T_p) is defined as a supplier minimum and a user maximum.

** Tolerance for time at peak profile temperature(t_p) is defined as a supplier minimum and a user maximum.



Precautions for Use

Storage:

1. Before opening the package

The LEDs should be kept at a temperature lower than 40° C and relative humidity lower than 90%. The LEDs should be used within a year. When storing the LEDs, moisture proof package with absorbent material (silica gel) is recommended.

2. After opening the package

The LEDs should be kept at temperature lower than 30° C and relative humidity lower than 60%. The LEDs should be soldered within 168 hours (7days) after opening the moisture proof package.

If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with moisture proof package within absorbent material (silica gel). It is also recommended to return the unused LEDs to the original moisture proof package and to seal the moisture proof package again.

If the moisture absorbent material (silica gel) vapors or expires the expiration date, baking treatment should be performed by using the following conditions : 60 °C for 20 hours.

The LEDs electrode and leadframe comprise a silver plated copper alloy. The silver surface may be affected by environments. Please avoid conditions which may cause the LEDs to corrode or discolor. The corrosion or discoloration might lower solderability or affect optical characteristics.

Please avoid rapid transition in ambient temperature, especially in high humidity environments where condensation can occur.

Static Electricity:

1. The products are sensitive to static electricity, and care should be taken when handling them.

2. Static electricity or surge voltage will damage the LEDs. It is recommended to wear a anti-electrostatic wristband or anti-electrostatic gloves when handling the LEDs.

3. All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.

History of Changes

| Rev | | Description of Change |
|-----|------------|--|
| 01 | 09/25/2017 | Initial Release - Preliminary Specifications |
| 02 | 07/07/2018 | Update picture on front page. Remove preliminary wording. Add PPF & PPF/W values |

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