

# SFT-14-B

# SFT-14-BP

## Projection LED



### Features

- 1.4 mm<sup>2</sup> emitting area
- Complement to SFT-14 Red Amber (RA) and Converted Green (CG) for best projection brightness and color gamut
- Matched to 0.2" / 0.3" Pico projection applications
- Drive current up to 8.4 A
- Standard 3535 SMT package
- Low thermal resistance: 1.6°C/W
- Dominant wavelength: Blue 459 nm
- Flat surface emission for high collection efficiency



### Applications

- Suitable for micro-display sizes 0.3x" and 0.2x"
- Medical / Life Science
- Industrial
- Transportation / Beacons
- High performance illumination
- Specifically engineered for stand alone, embedded, or battery-assisted projection display applications

### Table of Contents

Ordering Information. . . . .	2
Binning Structure. . . . .	3
Absolute Maximum Ratings . . . . .	4
Device Characteristics . . . . .	5
Angular Distribution and Typical Spectrum. . . . .	8
Soldering Profile. . . . .	10
Mechanical Dimensions. . . . .	11
Tape and Reel Outline . . . . .	12
Shipping Label . . . . .	14
Notes . . . . .	15
Revision History . . . . .	16



## Ordering Information

### Ordering Part Numbers<sup>1</sup>

Color	Radiometric Flux		Wavelength Bin	Bin Kit Ordering Code	Ordering Part Number
	Min. Flux Bin	Min. Power			
Blue	4D	1.15 W	B2, B6, B7	EPD	SFT-14-B-F35-EPD300
	4E	1.30 W	B2, B6, B7	EPE	SFT-14-B-F35-EPE300
Blue Pump	4E	1.30 W	B0, B1	EPE	SFT-14-BP-F35-EPE300
	4F	1.45 W	B0, B1	EPF	SFT-14-BP-F35-EPF300

### Part Number Nomenclature

SFT	14	##	F35	<Bin kit>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
SFT: Surface-Mount Flat-Top	14: 1.4 mm <sup>2</sup>	B: Blue BP: Blue Pump	F35: 3535 EMC SMD See Mechanical Drawing section	Refer to ordering part numbers in this document

**Note:**

1. Flux Bin listed is minimum bin shipped, higher bins may be included at Luminus' discretion.



## Binning Structure

All SFT-14 LEDs are tested for luminous flux/dominant wavelength and placed into one of the following flux/wavelength bins. The binning structure is universally applied across each color of the SFT-14 product line.

### Flux Bins<sup>1,2</sup>

Radiometric Flux Bin <sup>3</sup>	Binning @ 0.98 A, T <sub>c</sub> = 25°C <sup>4</sup>	
	Minimum Power (W)	Maximum Power (W)
4C	1.05	1.15
4D	1.15	1.30
4E	1.30	1.45
4F	1.45	1.60
4G	1.60	1.75
4H	1.75	1.90

### Wavelength Bins<sup>1,2</sup>

Color	Wavelength Bin <sup>3</sup>	Binning @ 0.98 A, T <sub>c</sub> = 25°C <sup>4</sup>	
		Minimum Wavelength (nm)	Maximum Wavelength (nm)
Blue Pump	B0	444	449
	B1	449	455
Blue	B2 (under EOL)	455	465
	B6	454	462
	B7	462	465

**Note:**

1. Luminus maintains a +/- 6% tolerance on flux measurements.
2. Products are production tested then sorted and packed by bin.
3. Individual bins are not orderable. Please refer to the Product Ordering information page for a list of orderable bin kits.
4. T<sub>c</sub> = Case temperature.



## Absolute Maximum Ratings<sup>1</sup>

	Symbol	Values	Unit
Forward Current (Single pulse 20 ms or Pulsed) <sup>2,3,4</sup>	$I_{f \min}$	0.2	A
	$I_{f \max}$	7.0	
Forward Current Pulsed <sup>2,3,4</sup> Frequency >240Hz, Duty <70%	$I_{fp \max}$	8.4	A
Forward Surge Current (Pulsed) <sup>2,3,4</sup> Frequency >240Hz, duty cycle <10% or t=1ms)	$I_{surge \max}$	9.0	A
Storage Temperature	$T_{s \min}$	-40	°C
	$T_{s \max}$	100	
Junction Temperature	$T_{j \max}$	150	°C
ESD sensitivity ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$	2000	V

**Note:**

1. All ratings are based on standard testing conditions at drive current 0.98 A, 20 ms single pulse at  $T_c = 25^\circ\text{C}$ .
2. In pulsed operation, rise time from 10% to 90% of forward current should be larger than 0.5 microseconds.
3. Product performance and lifetime data is specified at recommended forward drive current. Sustained operation at or near absolute minimum current may result in a reduction of device performance and device lifetime compared to recommended forward drive current.
4. Sustained operation above maximum current is not recommended and will result in a reduction of device lifetime.



## Device Characteristics<sup>1</sup>

Optical and Electrical Characteristics	Symbol	Blue	Blue Pump	Unit
Emitting Area	$A_E$	1.4	1.4	mm <sup>2</sup>
Peak Luminous Flux <sup>2</sup>	$\Phi_V$	45	40	lm
Peak Radiometric Flux <sup>2</sup>	$\Phi_E$	1.50	1.75	W
Forward Voltage	$V_{f\ min}$	2.5	2.5	V
	$V_f$	3.0	3.0	
	$V_{f\ max}$	3.6	3.6	
Dominant Wavelength	$\lambda_{d\ min}$	454	444	nm
	$\lambda_d$	459	448	
	$\lambda_{d\ max}$	465	455	
FWHM- Spectral bandwidth at 50% of $\Phi_V$	$\Delta\lambda_{1/2}$	19	19	nm
Chromaticity Coordinates <sup>3</sup>	CIE x	0.15	0.15	---
	CIE y	0.04	0.04	
<b>Thermal Characteristics</b>				
Real thermal resistance (junction-case)	$R_{th\ real\ (j-c)}$	1.60		°C/W
Electrical thermal resistance <sup>4,5</sup> (junction-case)	$R_{th\ elec.\ (j-c)}$	0.72		°C/W

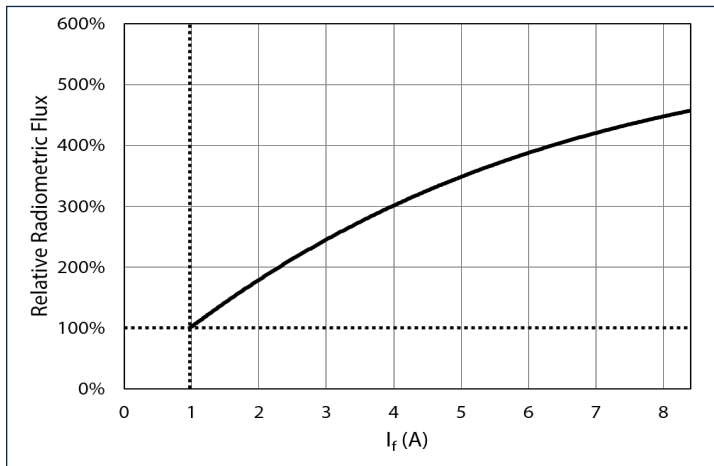
**Note:**

- Product test condition: 0.98 A, 25°C case temperature.
- Typical flux at typical dominant wavelength.
- CIE 1931 chromaticity diagram coordinates, normalized to X+Y+Z=1.
- Thermal resistance values are based on modeled results correlated to measured  $R_{th(j-c)}$  data using Forward Voltage sensitivity parametric method, compliant with JEDEC Standards JESD51-14.
- For optimal results, Luminus recommends customer PCB Design per guidelines from Luminus application note, "Design Guidelines for SFT Chipset Assembly".

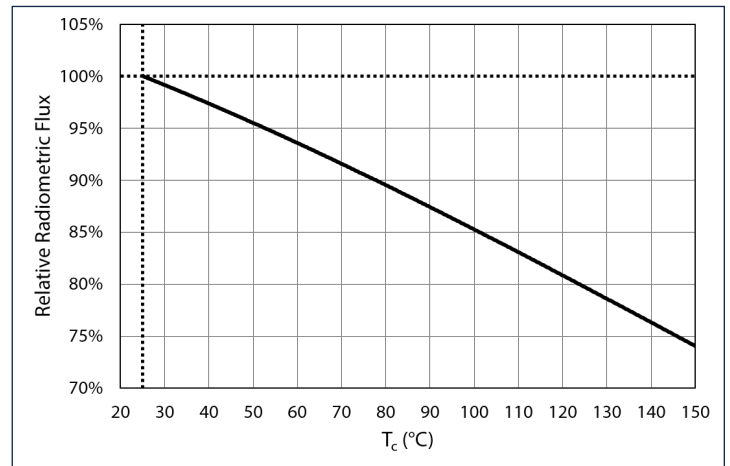


### Relative Radiometric Flux - Blue

Forward current:  $\phi_v/\phi_v(0.98\text{ A})$  Single pulse 20 ms,  $T_c = 25^\circ\text{C}$

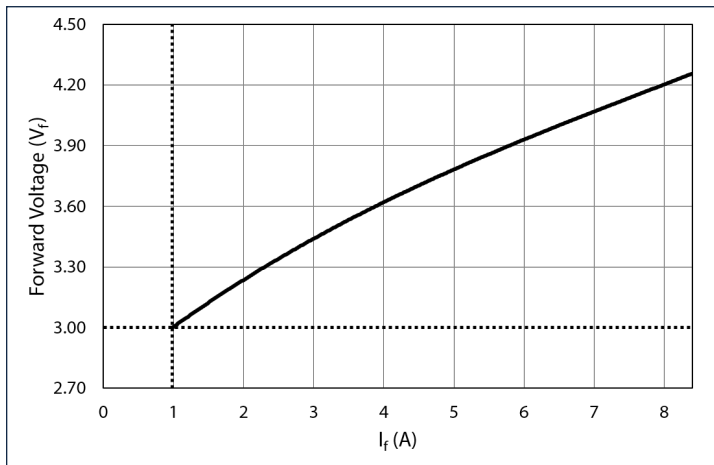


Temperature:  $\phi_v/\phi_v(25^\circ\text{C})$  Single pulse 20 ms,  $I_f = 0.98\text{ A}$

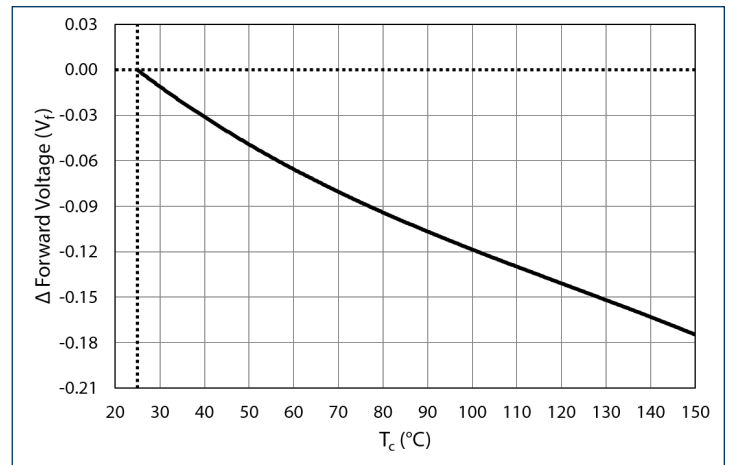


### Forward Voltage - Blue

Forward current:  $V_f = V(I_f)$  Single pulse 20 ms,  $T_c = 25^\circ\text{C}$

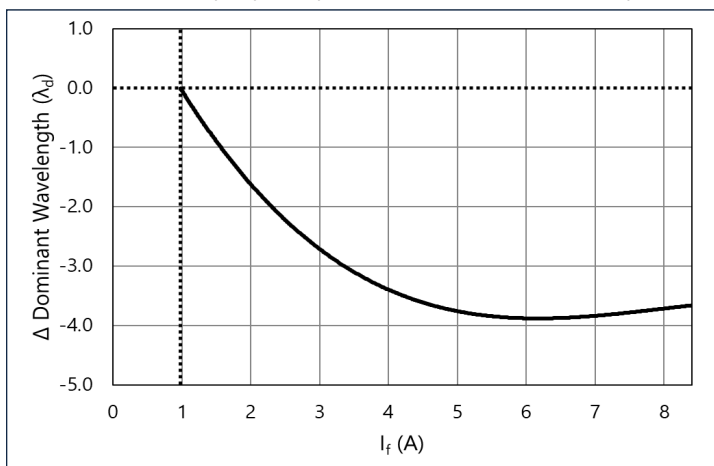


Temperature:  $\Delta V_f = V(T_c) - V(25^\circ\text{C})$  Single pulse 20 ms,  $I_f = 0.98\text{ A}$

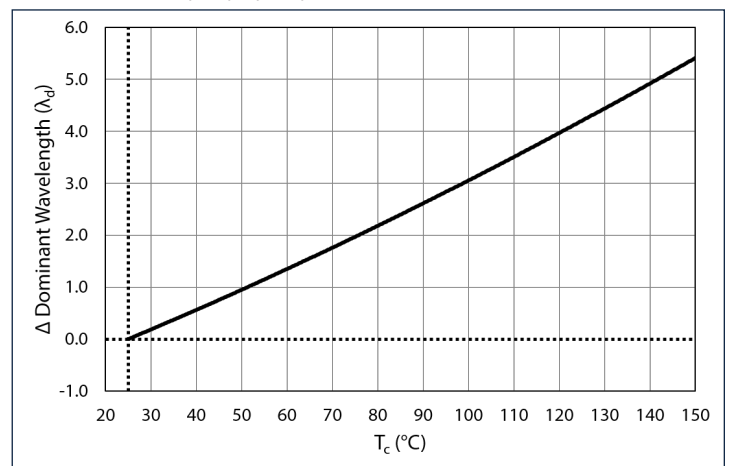


### Dominant Wavelength Shift - Blue

Forward current:  $\Delta\lambda_d = \lambda_d(I_f) - \lambda_d(0.98\text{ A})$  Single pulse 20 ms,  $T_c = 25^\circ\text{C}$



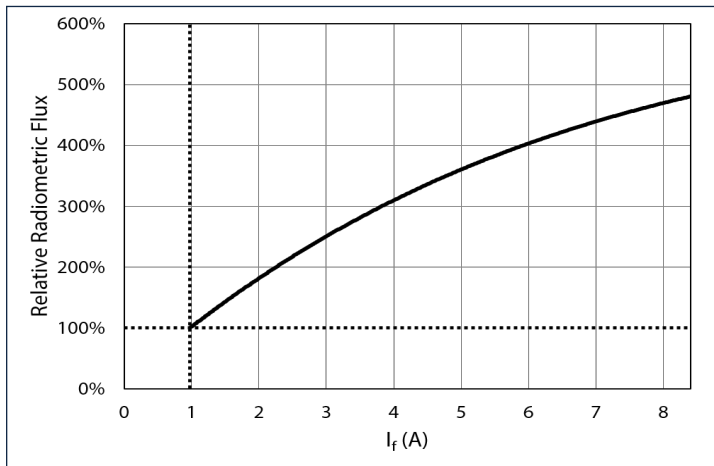
Temperature:  $\Delta\lambda_d = \lambda_d(T_c) - \lambda_d(25^\circ\text{C})$  Single pulse 20 ms,  $I_f = 0.98\text{ A}$



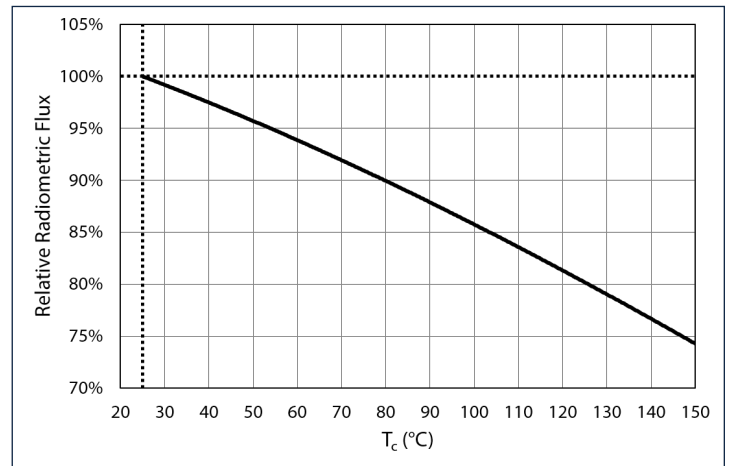


### Relative Radiometric Flux - Blue Pump

Forward current:  $\phi_v/\phi_v(0.98\text{ A})$  Single pulse 20 ms,  $T_c = 25^\circ\text{C}$

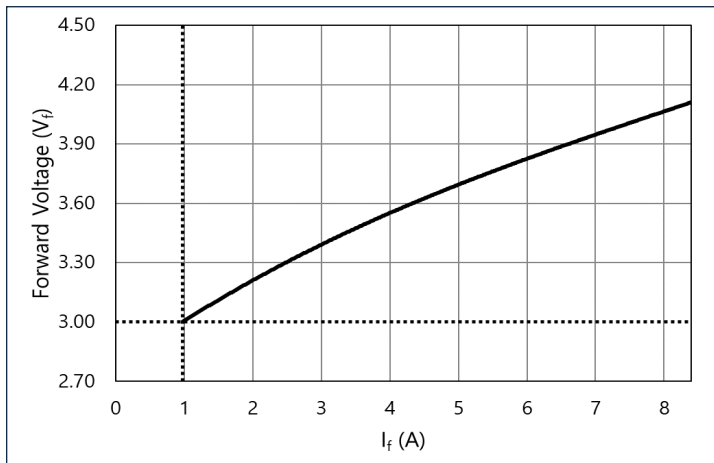


Temperature:  $\phi_v/\phi_v(25^\circ\text{C})$  Single pulse 20 ms,  $I_f = 0.98\text{ A}$

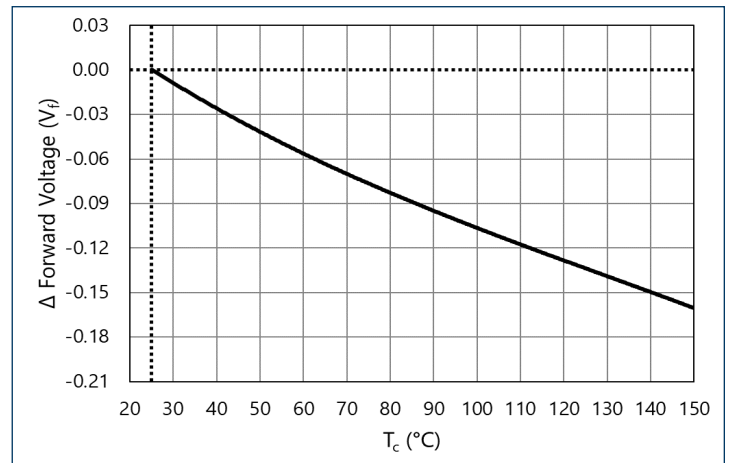


### Forward Voltage - Blue Pump

Forward current:  $V_f = V(I_f)$  Single pulse 20 ms,  $T_c = 25^\circ\text{C}$

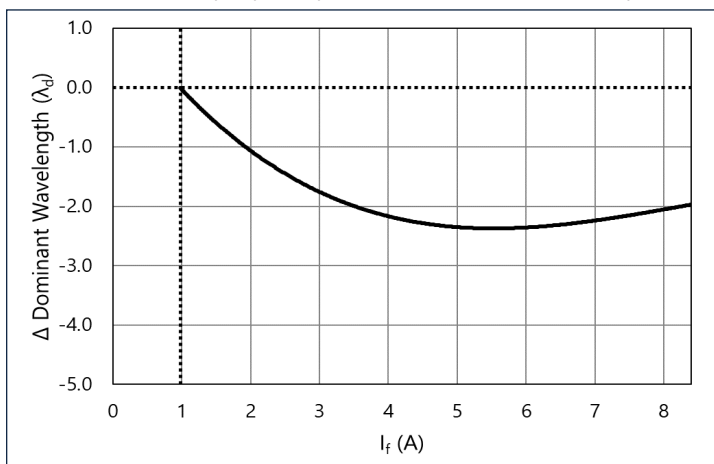


Temperature:  $\Delta V_f = V(T_c) - V(25^\circ\text{C})$  Single pulse 20 ms,  $I_f = 0.98\text{ A}$

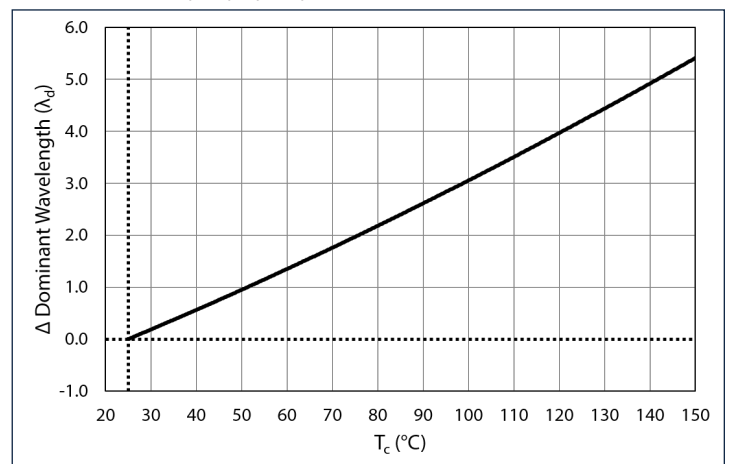


### Dominant Wavelength Shift - Blue Pump

Forward current:  $\Delta\lambda_d = \lambda_d(I_f) - \lambda_d(0.98\text{ A})$  Single pulse 20 ms,  $T_c = 25^\circ\text{C}$



Temperature:  $\Delta\lambda_d = \lambda_d(T_c) - \lambda_d(25^\circ\text{C})$  Single pulse 20 ms,  $I_f = 0.98\text{ A}$

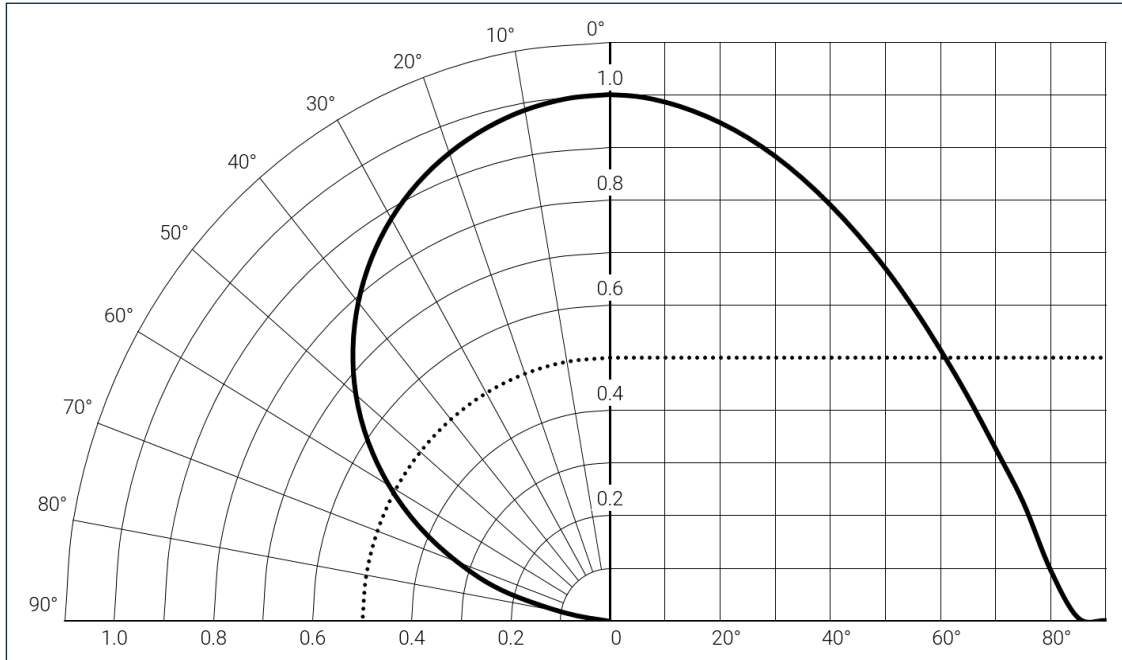




## Angular Distribution and Typical Spectrum

### Angular Intensity Distribution

$$I_{\text{ref}} = f(\Phi); T_c = 25^\circ\text{C}$$



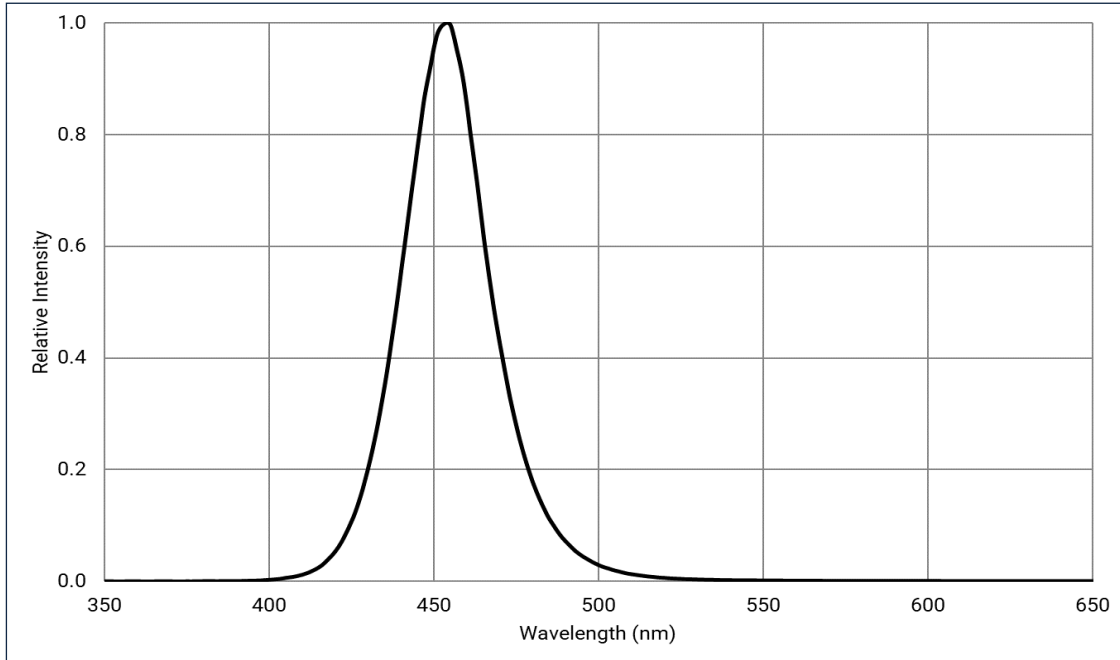




## Angular Distribution and Typical Spectrum

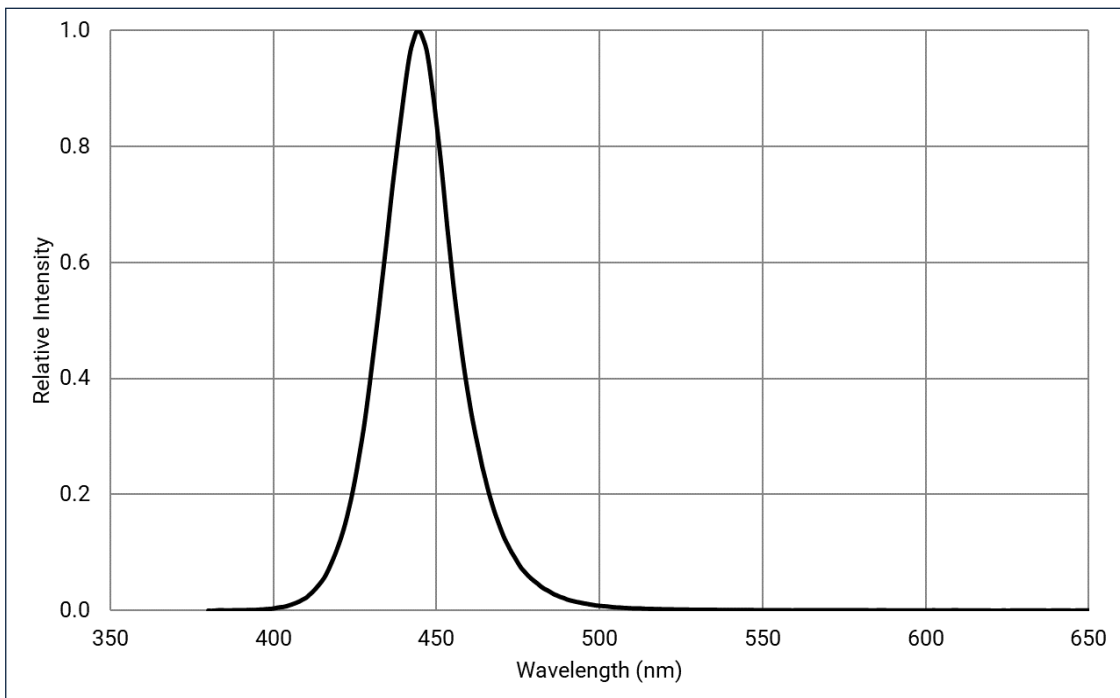
### Typical Spectrum - Blue

$\Phi_{\text{ref}} = f(\lambda); I_f = 0.98 \text{ A}; T_c = 25^\circ\text{C}$



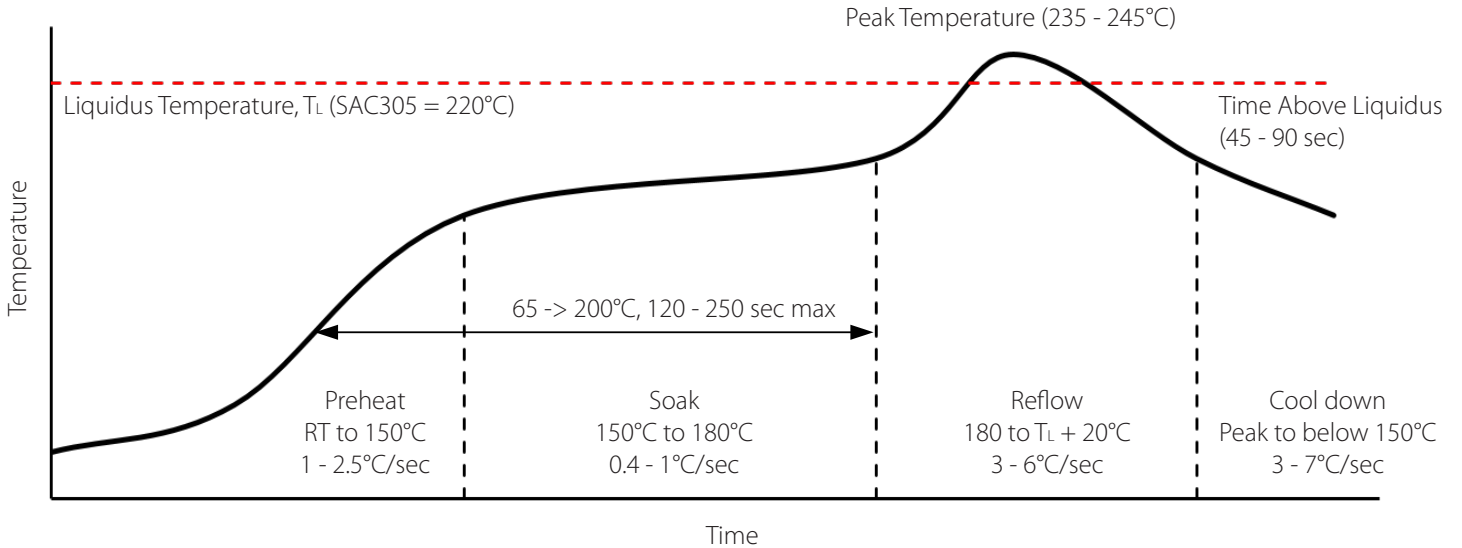
### Typical Spectrum - Blue Pump

$\Phi_{\text{ref}} = f(\lambda); I_f = 0.98 \text{ A}; T_c = 25^\circ\text{C}$





## Soldering Profile



SMT Rework Guideline	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

**Note:**

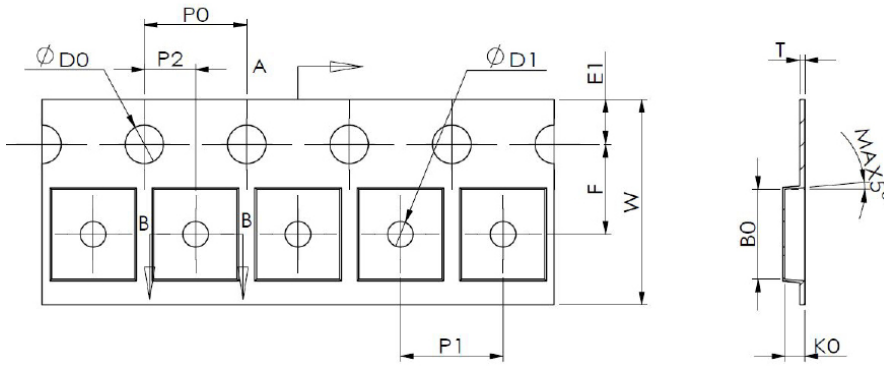
- Product complies to Moisture Sensitivity Level 3 (MSL 3).
- The numbers in the table are specific to SAC305. Luminus recommends using an SAC305 solder paste with a no-clean flux for RoHS compliant products.
- During the pick and place process, ensure the pick-up tool does not touch any die components.
- Use of a multi-zone IR reflow oven with a nitrogen blanket is recommended.
- Time-temperature profile of the reflow process showing the four functional profile zones are defined in IPC-7801. Temperature is referenced to the center of the PCB.
- Luminus recommends to use the solder paste data sheet information as a starting point in time-temperature process development.
- These are general guidelines. Consult the solder paste manufacturer's datasheet for guidelines specific to the alloy and flux combination used in your application.  
For more information, please refer to:  
<https://luminusdevices.zendesk.com/hc/en-us/articles/360060306692-How-do-I-Reflow-Solder-Luminus-SMD-Components->
- For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.



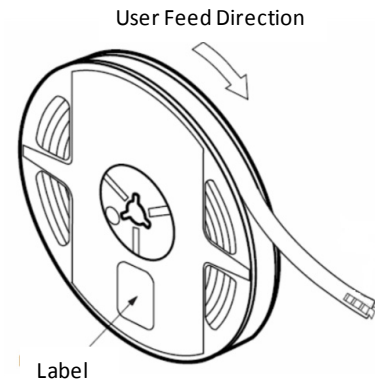
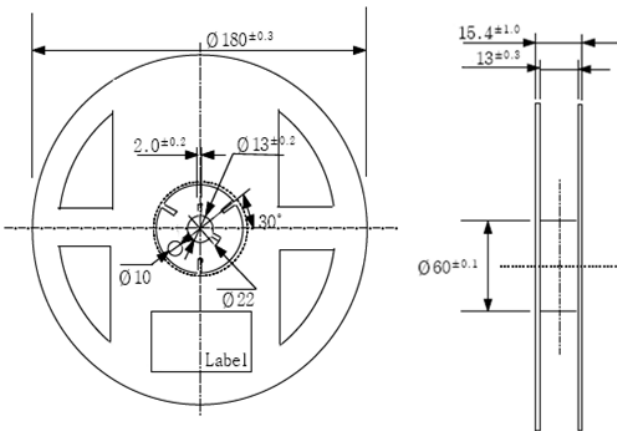


## Tape and Reel Outline

### Shipping Reel Outline



Parameter	Dimension (mm)
B0	4.00 +/- 0.10
K0	1.20 +/- 0.10
P0	4.00 +/- 0.10
P1	8.00 +/- 0.10
P2	2.00 +/- 0.05
T	0.30 +/- 0.05
E1	1.75 +/- 0.10
F	5.50 +/- 0.05
D0	1.55 +/- 0.05
D1	1.55 +/- 0.05
W	12.00 +/- 0.10



Parameter	Quantity (pcs)
Pieces per reel	250
	500

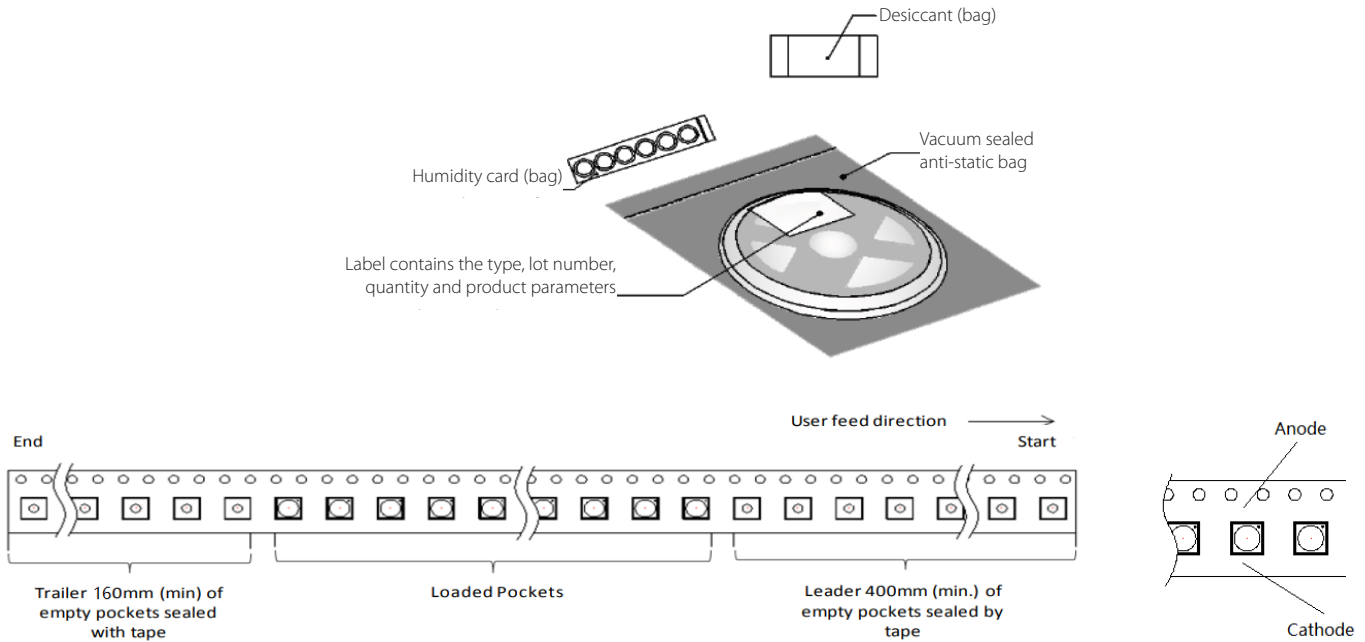
### Note

1. The quantity per reel is not orderable.
2. Minimum order quantity: 500 pcs.

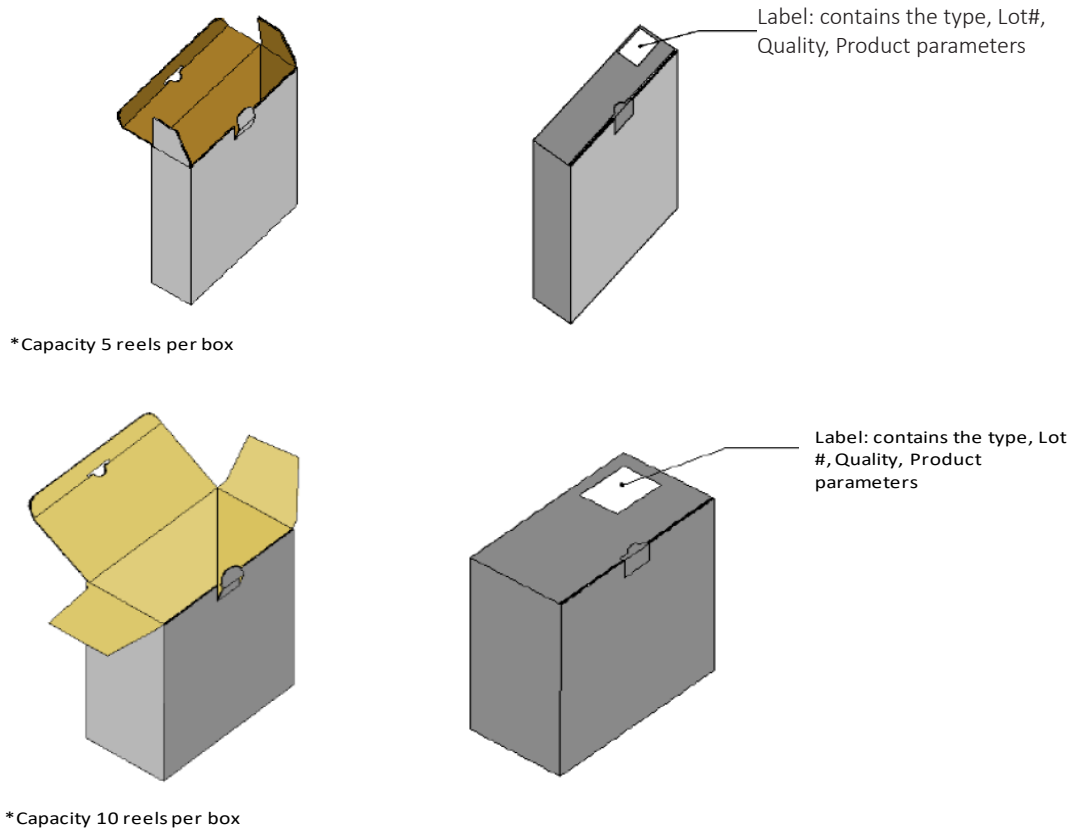


## Tape and Reel Outline

### Reel Package

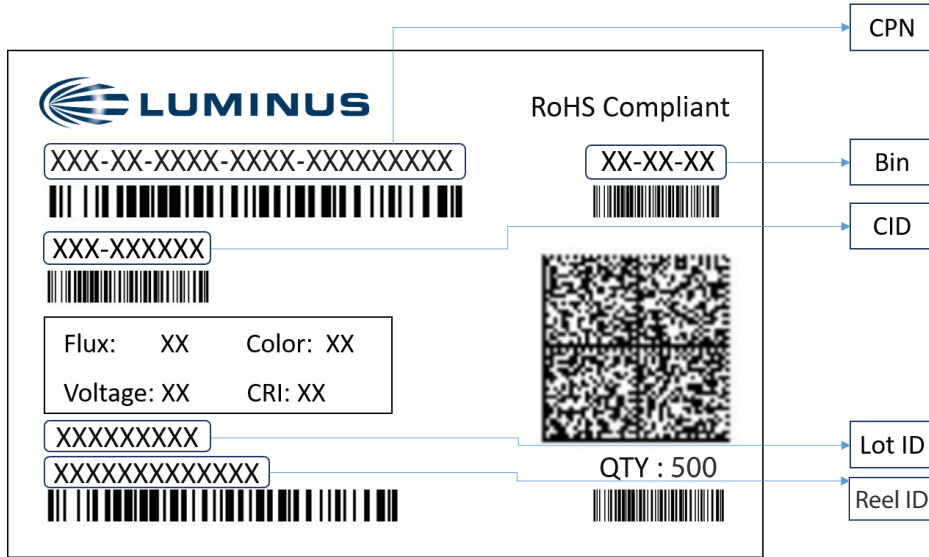


### Box Packaging Information





## Shipping Label



### Label Fields:

- CPN: Luminus ordering part number
- CID: Customer's part number
- QTY: Quantity of devices in pack
- Flux: Bin as defined on page 3
- Voltage: NA
- Color: Bin as defined on page 3
- CRI: NA
- Lot ID: For Luminus internal use
- Reel ID: For Luminus internal use

### Packing Configuration:

- Maximum of 500 devices per reel
- Partial reel may be shipped
- Each pack is enclosed in anti-static bag
- Shipping label is placed on top of each pack



## Notes

### Static Electricity

This product is sensitive to static electricity, and care should be taken when handling them. Static electricity or surge voltage will damage the LEDs. It is recommended to wear an anti-electrostatic wristband or anti-electrostatic gloves when handling the LEDs. All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken to isolate LED processing equipment from potential sources of voltage surges.

Reference: APN-002815 Electrical Stress Damage to LEDs and How to Prevent It

### Eye Safety

According to the test specification risk group IEC 62471-Non-GLS under 0.98 A, this product complies to Risk group 2 (RG2) Moderate risk.

Do not stare at operating lamp, may be harmful to the eyes.

For more information, please refer to: <https://luminusdevices.zendesk.com/hc/en-us/articles/10532958752397>.



## Revision History

Rev	Date	Description of Change
A	05/30/2022	Initial draft
B	01/29/2024	Update template, ordering part numbers, and bin-kit codes