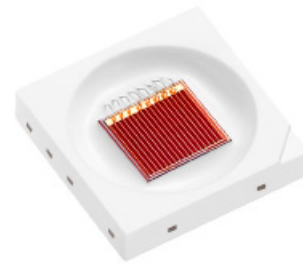


# SFT-20-RA

## Projection LED



### Features

- 2.0 mm<sup>2</sup> LED emitting area
- Drive current up to 8 A
- Standard 3535 SMT package
- Low thermal resistance  $R_{th\_Junction\ to\ Case} = 1.03^{\circ}C/W$
- Dominant wavelength: Red Amber 613nm
- Flat surface emission for high collection efficiency



### Applications

- Entertainment / Stage Lighting
- 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. . . . .	7
Soldering Profile. . . . .	8
Mechanical Dimensions. . . . .	9
Tape and Reel Outline . . . . .	11
Shipping Label . . . . .	13
Notes . . . . .	14
Revision History . . . . .	15



## Ordering Information

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

Color	Luminous Flux		Wavelength bin	Ordering Part Number
	Min. Flux Bin	Min. Flux		
RA	1A	180 lm	R1, R2	SFT-20-RA-F35-MPA
	1A	180 lm	R1, R2	SFT-20-RA-F35-MPA200
	1B	200 lm	R1, R2	SFT-20-RA-F35-MPB200

### Part Number Nomenclature

SFT	20	RA	###	<Bin kit>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
SFT: Surface-Mount Flat-Top	20: 2 mm <sup>2</sup>	RA: Red Amber	F35: 3535 EMC SMD R35: 3535 EMC mounted on Star-Board <sup>2</sup>	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.
2. Starboard Configuration R35 are available for small sample quantity only. For additional quantity, contact Luminus representative.



## Binning Structure

All SFT-20 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 monochromatic color of the SFT-20 product line.

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

Color	Luminous Flux Bin <sup>3</sup>	Binning @ 1.4 A, T <sub>c</sub> = 25°C <sup>4</sup>	
		Minimum Flux (lm)	Maximum Flux (lm)
Red Amber	1A	180	200
	1B	200	220
	1C	220	240
	1D	240	260
	1E	260	285

### Dominant Wavelength Bins<sup>2</sup>

Color	Wavelength Bin <sup>3,5</sup>	Binning @ 1.4 A, T <sub>c</sub> = 25°C <sup>4</sup>	
		Minimum Wavelength (nm)	Maximum Wavelength (nm)
Red Amber	R1	609	615
	R2	615	621

**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.
5. The wavelength bin as marked on the product label may be followed by a letter which is for internal use only.



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

	Symbol	Values	Unit
Forward Current (Single pulse 20 ms or Pulsed) <sup>2,3,4</sup>	$I_{f \min}$	0.4	A
	$I_{f \max}$	6.0	
Forward Current (Pulsed) <sup>2,3,4</sup> Frequency >240Hz, duty cycle <70%	$I_{fp \min}$	0.4	A
	$I_{fp \max}$	8.0	
Forward Surge Current (Pulsed) <sup>2,3,4</sup> Frequency >240Hz, duty cycle <10%, t=1ms	$I_{surge \max}$	9	A
Storage Temperature	$T_{s \min}$	-40	°C
	$T_{s \max}$	100	
Junction Temperature <sup>3</sup>	$T_{j \max}$	110	°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 1.4 A, 20ms 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	Value	Unit
Emitting Area	$A_E$	2.0	mm <sup>2</sup>
Emitting Area Dimension		1.31 x 1.55	mm x mm
Reference Duty Cycle		100	%
Test Peak Drive Current	$I_f$	1.4	A
Peak Luminous Flux <sup>2</sup>	$\Phi_V$	250	lm
Peak Radiometric Flux <sup>2</sup>	$\Phi_E$	0.83	W
Forward Voltage	$V_{f\ min}$	2.0	V
	$V_f$	2.3	
	$V_{f\ max}$	3.0	
Dominant Wavelength	$\lambda_{d\ min}$	609	nm
	$\lambda_{d\ typ}$	613	
	$\lambda_{d\ max}$	621	
Peak Wavelength	$\lambda_p$	620	nm
FWHM- Spectral bandwidth at 50% of $\Phi_V$	$\Delta\lambda_{1/2}$	16	nm
Chromaticity Coordinates <sup>2,3</sup>	CIE x	0.66	
	CIE y	0.32	
<b>Thermal Characteristics</b>			
Electrical Thermal Resistance (junction to case) <sup>4,5</sup>	$R_{th(j-c)\ electrical}$	1.03	°C/W
Real Thermal Resistance (junction to case) <sup>4,5</sup>	$R_{th(j-c)\ real}$	1.45	°C/W

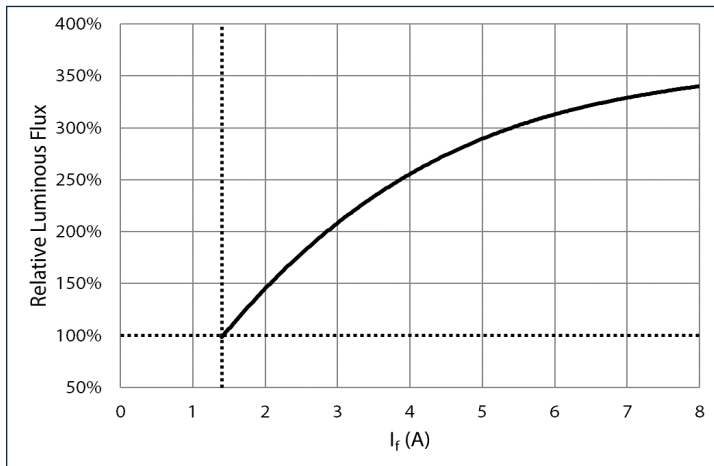
**Note:**

1. Product test condition: 1.4 A, 25°C case temperature.
2. Typical flux at typical dominant wavelength.
3. In CIE 1931 chromaticity diagram coordinates, normalized to X+Y+Z=1.
4. 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.
5. For optimal results, Luminus recommends customer PCB Design per guidelines from Luminus application note, "Design Guidelines for SFT Chipset Assembly".

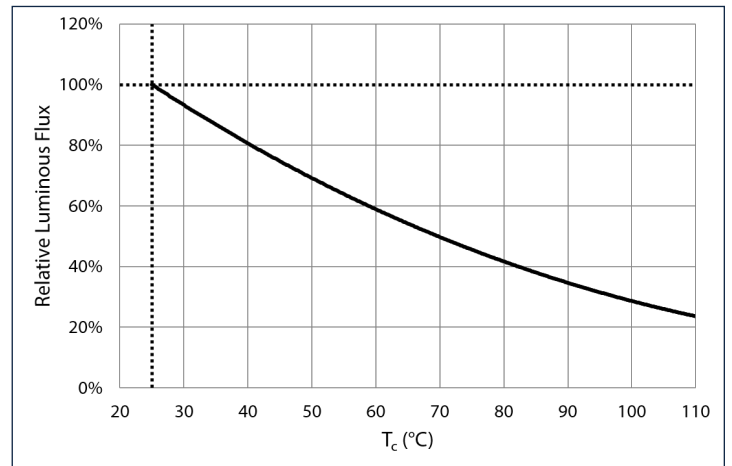


### Relative Luminous Flux

Forward current:  $\phi_v/\phi_v(1.4\text{ A}), T_c = 25^\circ\text{C}$

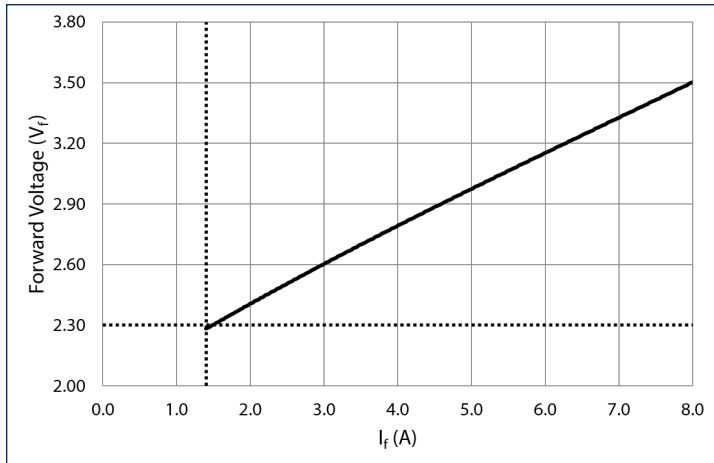


Temperature:  $\phi_v/\phi_v(25^\circ\text{C}), I_f = 1.4\text{ A}$

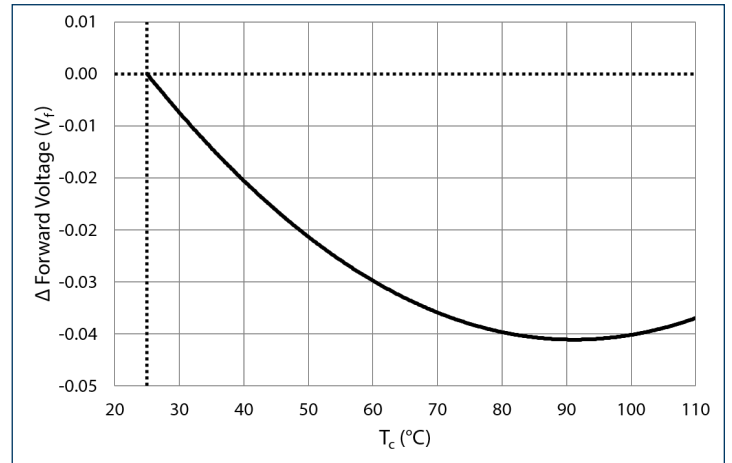


### Forward Voltage

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

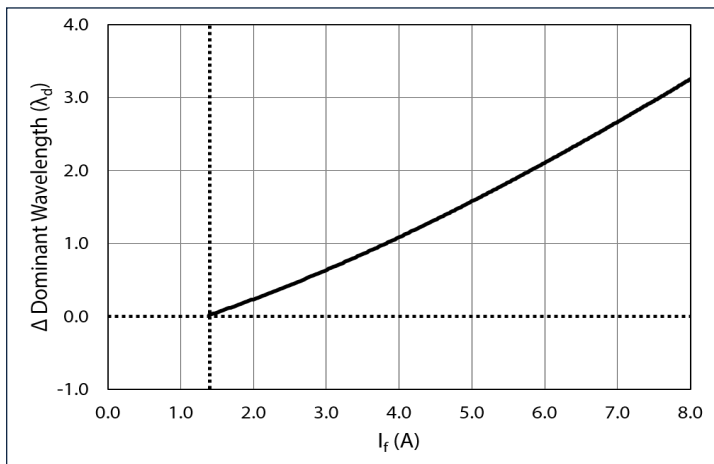


Temperature:  $\Delta V_f = V(T_c) - V(25^\circ\text{C}), I_f = 1.4\text{ A}$

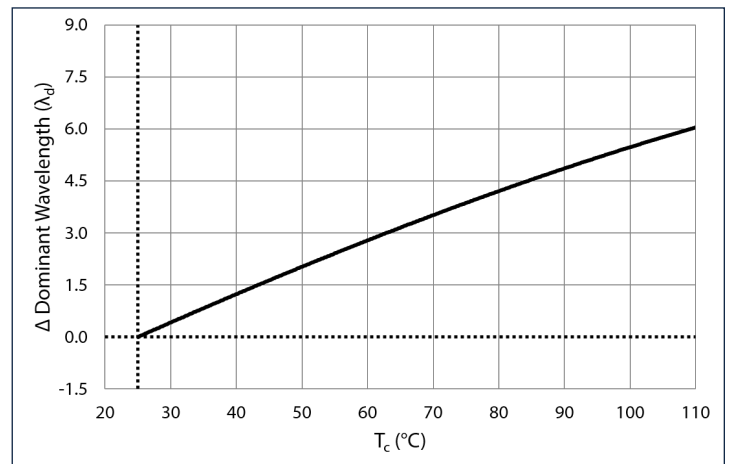


### Dominant Wavelength Shift

Forward current:  $\Delta\lambda_d = \lambda_d(I_f) - \lambda_d(1.4\text{ A}), T_c = 25^\circ\text{C}$



Temperature:  $\Delta\lambda_d = \lambda_d(T_c) - \lambda_d(25^\circ\text{C}), I_f = 1.4\text{ A}$

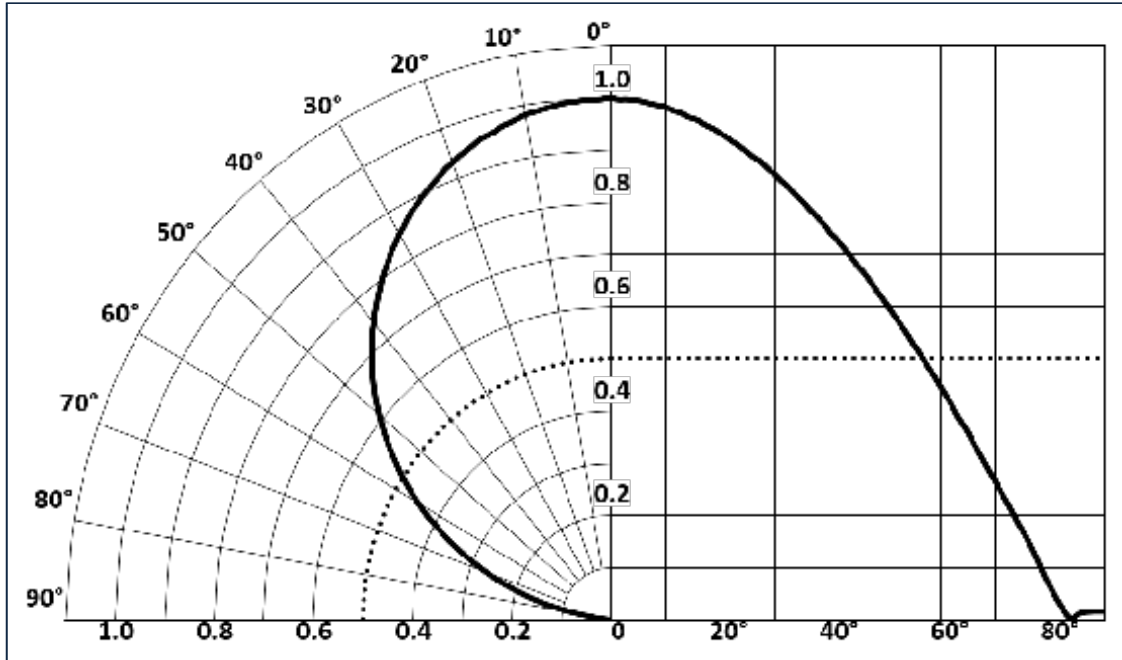




## Angular Distribution and Typical Spectrum

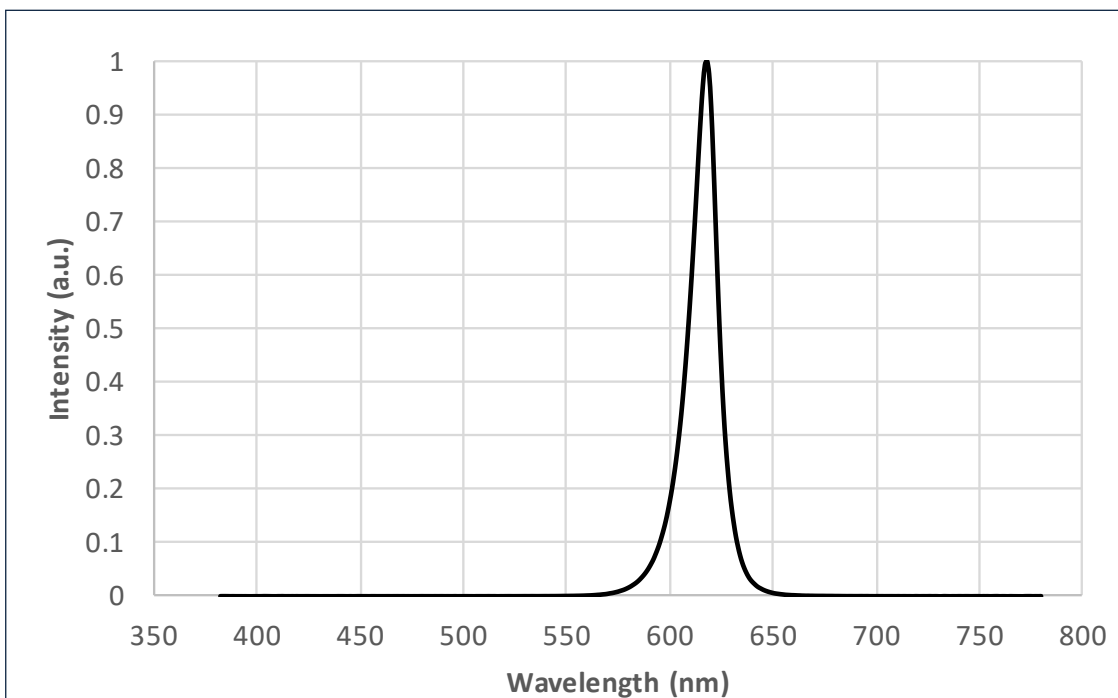
### Angular Intensity Distribution

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



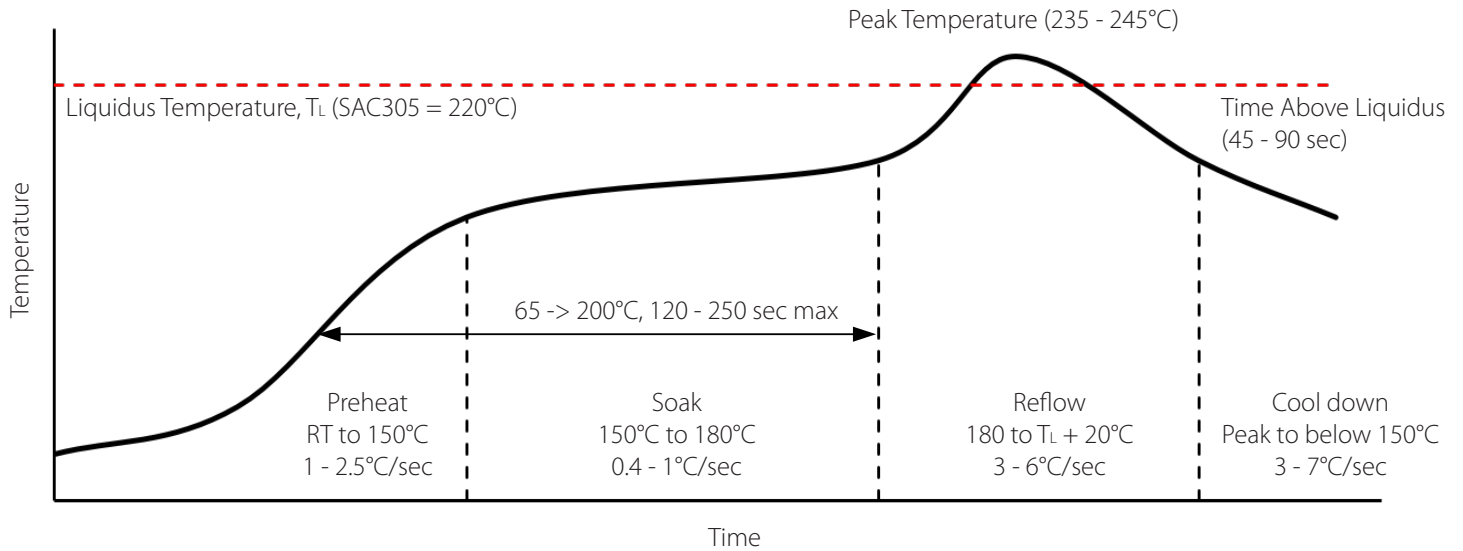
### Typical Spectrum

$$\Phi_{\text{ref}} = f(\lambda); I_f = 1.4 \text{ A}; T_c = 25^\circ\text{C}$$





## 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:

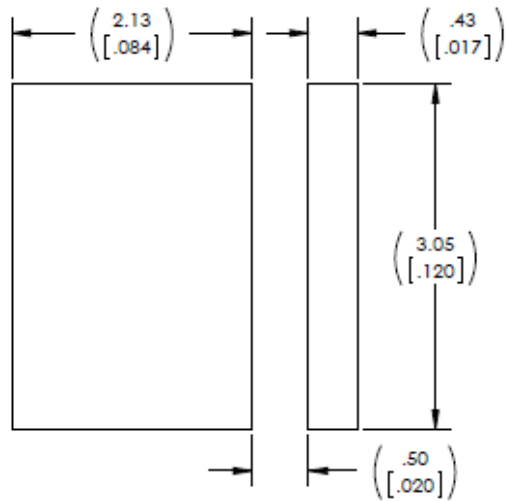
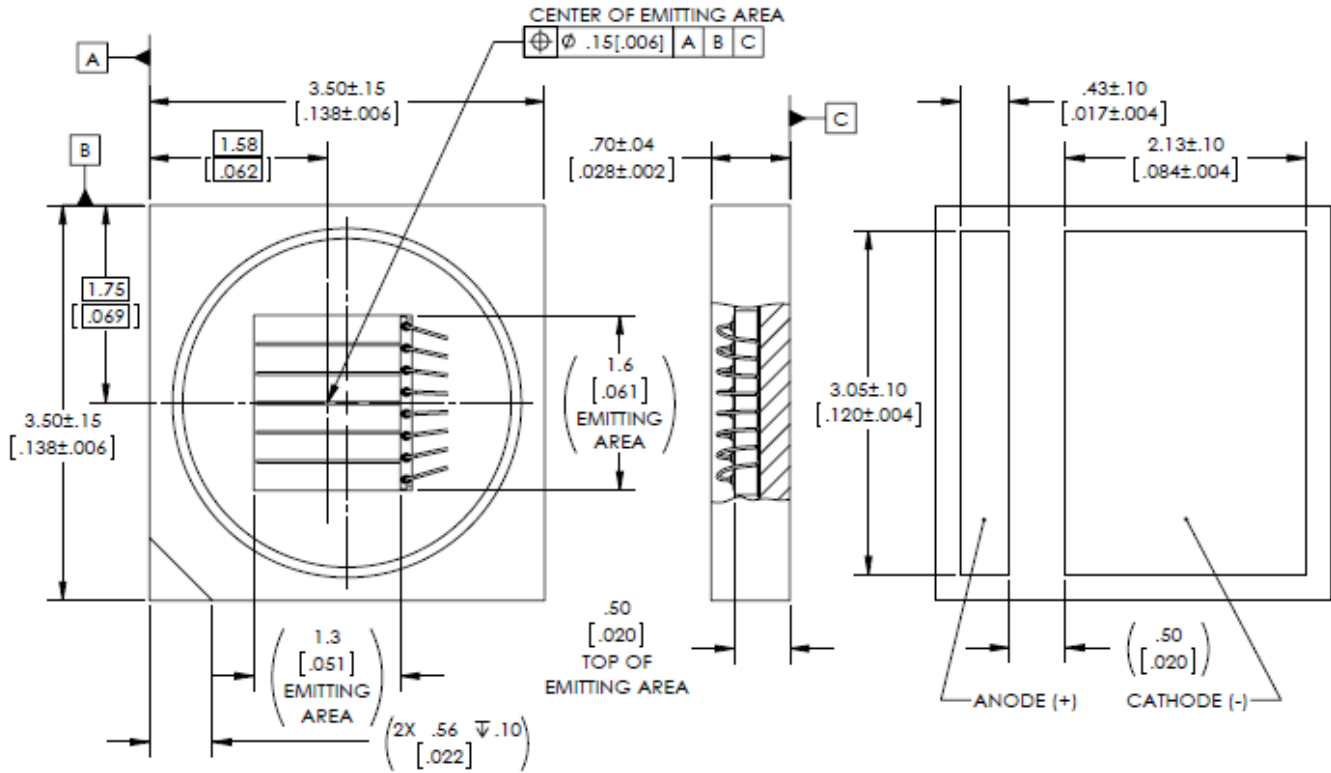
<https://luminusdevices.zendesk.com/hc/en-us/articles/360060306692-How-do-I-Reflow-Solder-Luminus-SMD-Components->

- For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.





## Mechanical Dimensions

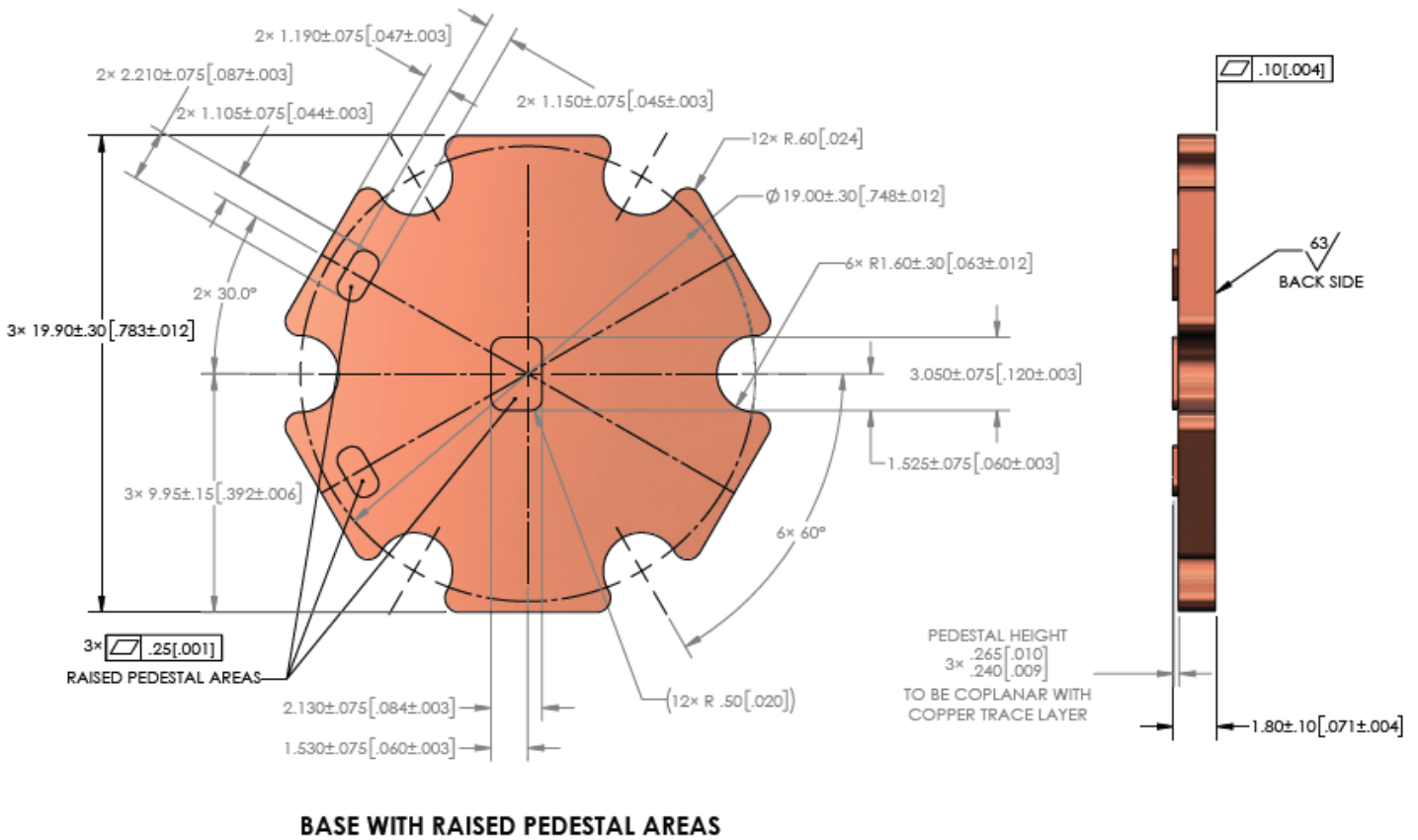
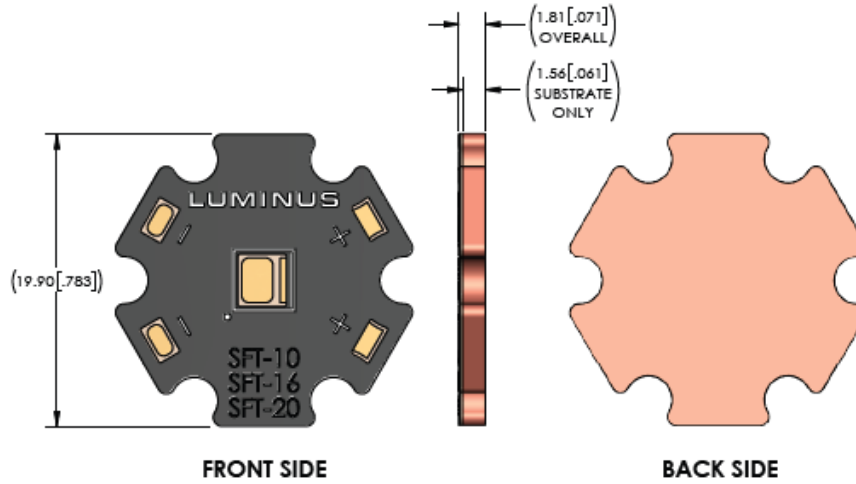


RECOMMENDED SOLDER PAD LAYOUT



## Mechanical Dimensions

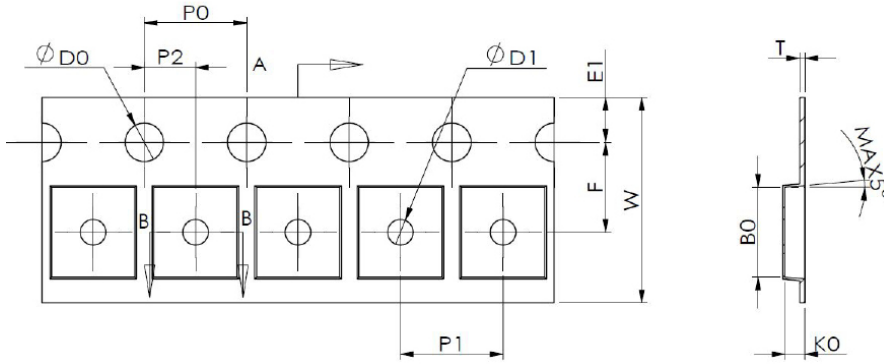
### Starboard dimensions



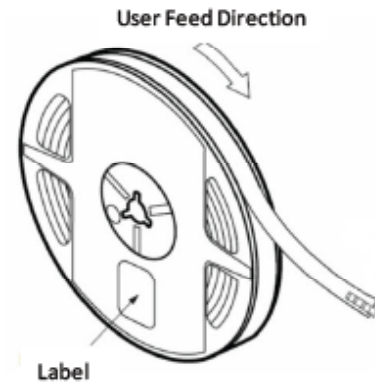
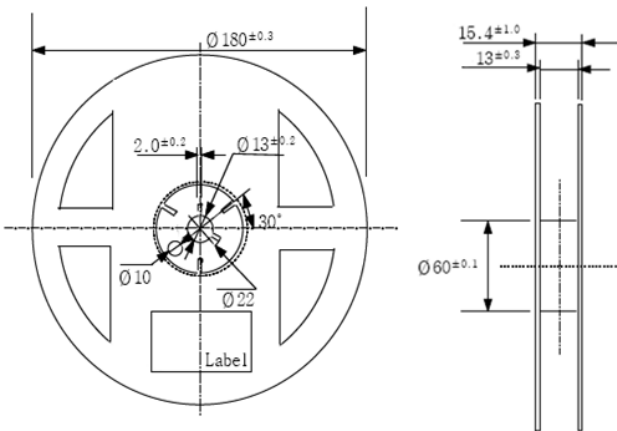


## Tape and Reel Outline

### 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



**Note:**

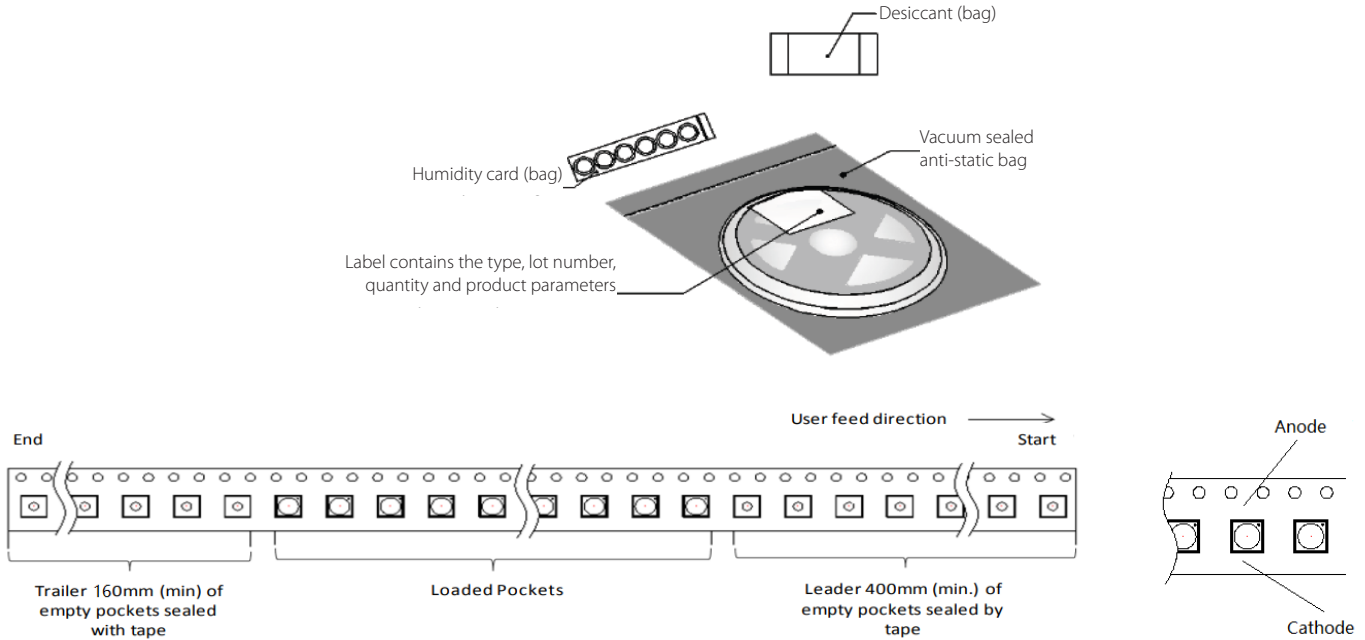
1. The quantity per reel is not orderable.
2. Minimum order quantity: 500 pcs.

Parameter	Quantity (pcs)
Pieces per reel	250
	500

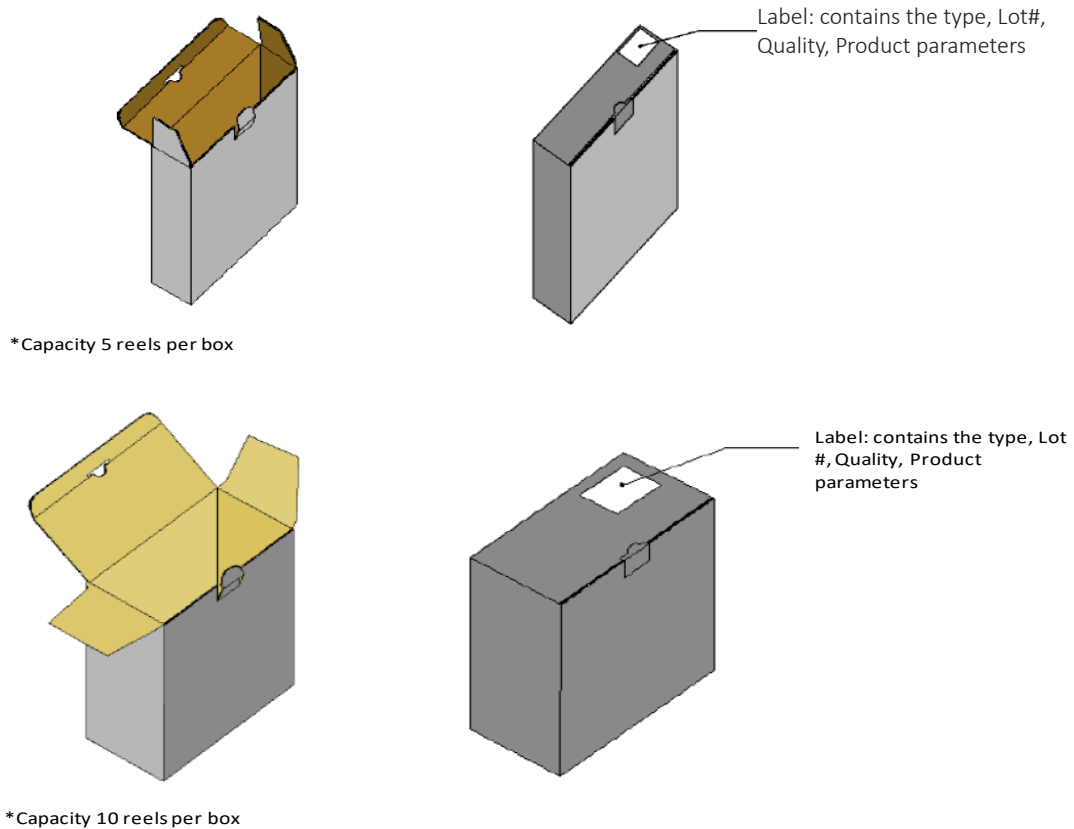


## Tape and Reel Outline

### Reel Package

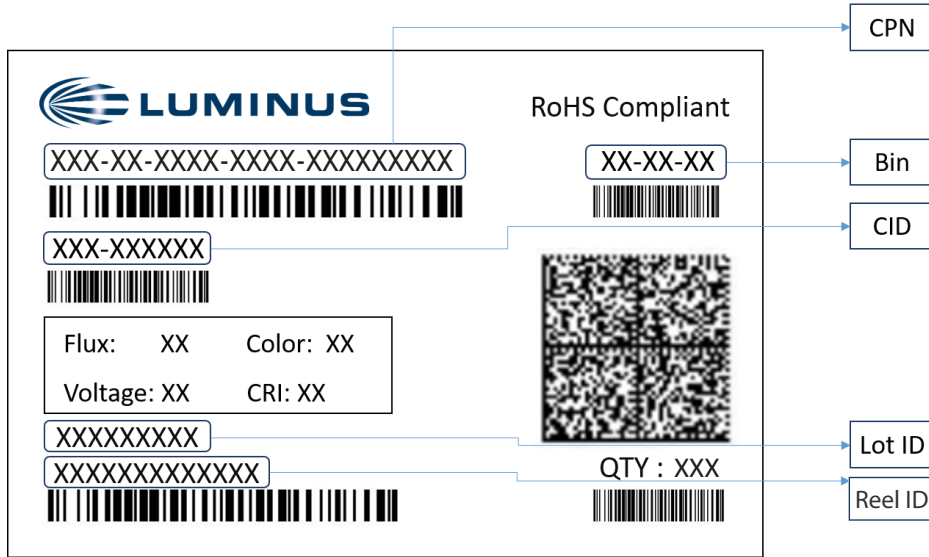


### Box Packaging Information





## 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

### 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: 2006-Non-GLS under 1.4 A, this product complies to Risk group 0 (RG0) Exempt.

No photo biological hazard under foreseeable conditions.

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



## Revision History

Rev	Date	Description of Change
01	12/13/2023	Initial release as single color SFT-20. Replacing SFT-20 RGB datasheet PDS-002824