

SFT-10-RA

Projection LED



Features

- 1.0 mm² LED emitting area
- Complement to SFT-10 Converted Green (CG), Blue Pump (BP) and Blue (B) for best projection brightness and color gamut
- Drive current up to 4 A
- Standard 3535 SMT package
- Low thermal resistance $R_{th_Junction\ to\ Case} = 3.0^{\circ}C/W$
- Dominant wavelength: Red Amber 613nm
- Flat surface emission for high collection efficiency



Applications

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

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Ordering Information

Ordering Part Numbers¹

Color	Luminous Flux		Wavelength bin	Ordering Part Number
	Min. Flux Bin	Min. Flux		
RA	1A	90 lm	R1, R2	SFT-10-RA-F35-MPA
	1A	90 lm	R1, R2	SFT-10-RA-F35-MPA200
	1B	100 lm	R1, R2	SFT-10-RA-F35-MPB200

Part Number Nomenclature

SFT	10	RA	###	<Bin kit>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
SFT: Surface-Mount Flat-Top	10: 1 mm ²	RA: Red Amber	F35: 3535 EMC SMD R35: 3535 EMC mounted on Star-Board ²	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-10 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-10 product line.

Flux Bins^{1,2}

Color	Luminous Flux Bin ³	Binning @ 0.7 A, T _c = 25°C ⁴	
		Minimum Flux (lm)	Maximum Flux (lm)
Red Amber	1A	90	100
	1B	100	110
	1C	110	120
	1D	120	130
	1E	130	145
	1F	145	155
	1G	155	170
	1H	170	185

Dominant Wavelength Bins²

Color	Wavelength Bin ^{3,5}	Binning @ 0.7 A, T _c = 25°C ⁴	
		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_c = 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 Ratings¹

	Symbol	Values	Unit
Forward Current (Single pulse 20 ms or Pulsed) ^{2,3,4}	$I_{f \text{ min}}$	0.2	A
	$I_{f \text{ max}}$	3.0	
Forward Current Pulsed ^{2,3,4} Frequency >240Hz, Duty <70%	$I_{fp \text{ min}}$	0.2	A
	$I_{fp \text{ max}}$	4.0	
Forward Surge Current (Pulsed) ^{2,3,4} Frequency >240Hz, duty cycle <10%, t=1ms	$I_{\text{surge max}}$	4.4	A
Storage Temperature	$T_{s \text{ min}}$	-40	°C
	$T_{s \text{ max}}$	100	
Junction Temperature	$T_{j \text{ max}}$	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 0.7 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 Characteristics¹

Optical and Electrical Characteristics	Symbol	Value	Unit
Emitting Area	A_E	1.0	mm ²
Emitting Area Dimension		1.0 x 1.0	mm x mm
Reference Duty Cycle		100	%
Test Peak Drive Current	I_f	0.7	A
Peak Luminous Flux ²	Φ_V	130	lm
Peak Radiometric Flux ²	Φ_E	0.46	W
Forward Voltage	$V_{f\ min}$	2.0	V
	V_f	2.4	
	$V_{f\ max}$	3.0	
Dominant Wavelength	$\lambda_{d\ min}$	609	nm
	$\lambda_{d\ typ}$	613	
	$\lambda_{d\ max}$	621	
Peak Wavelength	λ_p	620	nm
FWHM- Spectral bandwidth at 50% of Φ_V	$\Delta\lambda_{1/2}$	16	nm
Chromaticity Coordinates ³	CIE x	0.66	
	CIE y	0.32	
Thermal Characteristics			
Thermal Resistance (junction to case) ^{4,5}	$R_{th(j-c)}$	3.0	°C/W

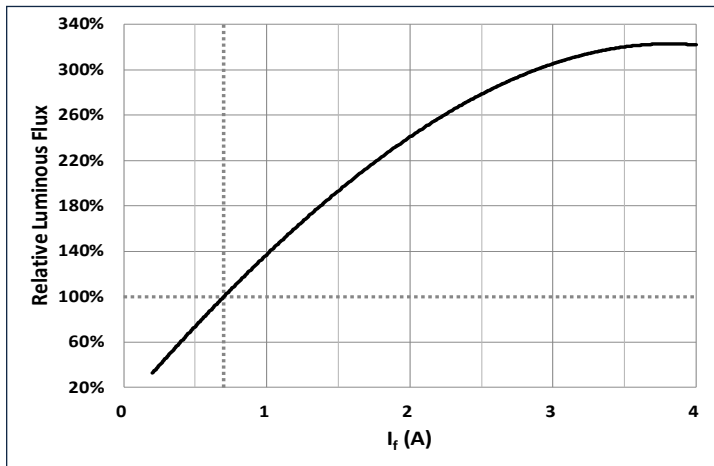
Note:

- Product test condition: 0.7 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".

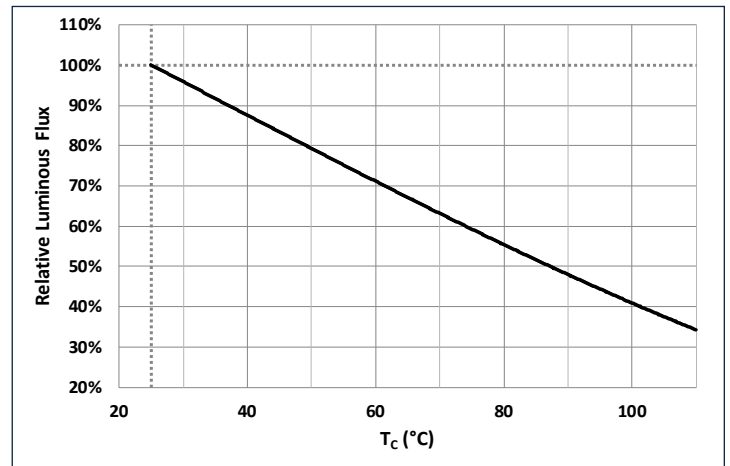


Relative Luminous Flux

Forward current: $\phi_v/\phi_v(0.7\text{ A}), T_c = 25^\circ\text{C}$

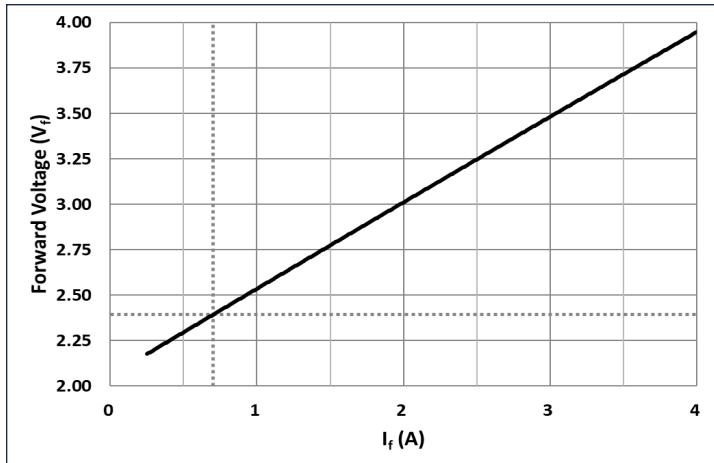


Temperature: $\phi_v/\phi_v(25^\circ\text{C}), I_f = 0.7\text{ A}$

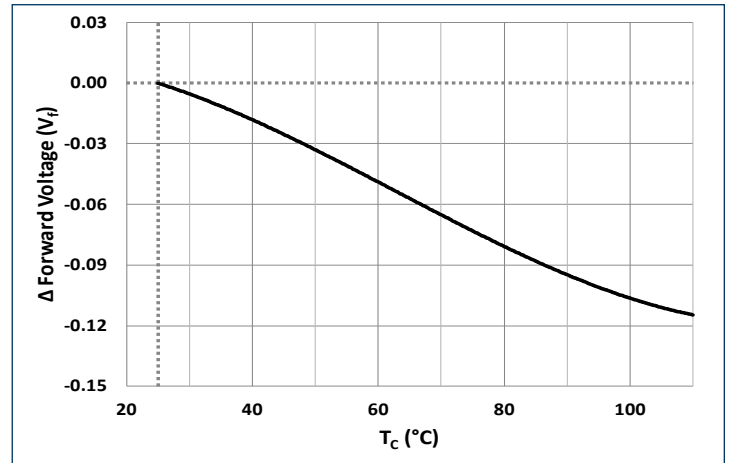


Forward Voltage

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

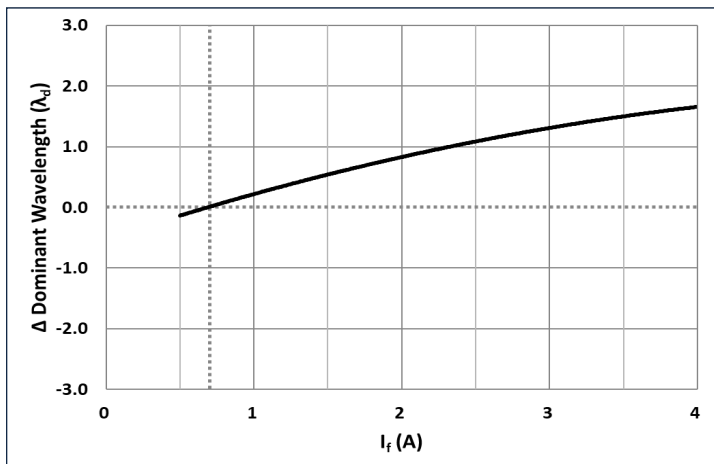


Temperature: $\Delta V_f = V(T_c) - V(25^\circ\text{C}), I_f = 0.7\text{ A}$

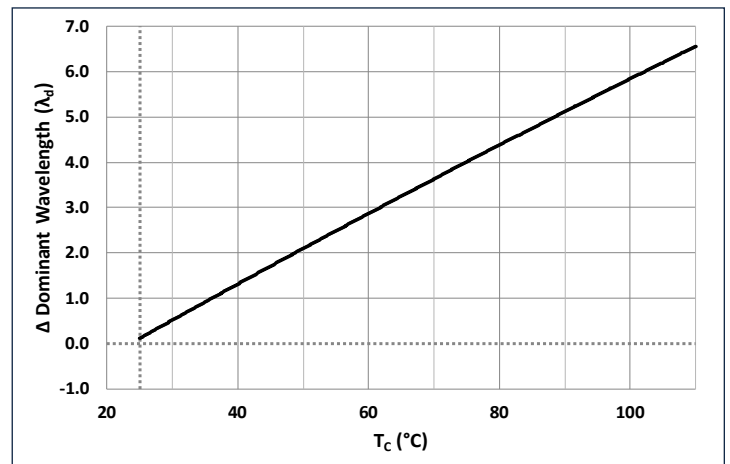


Dominant Wavelength Shift

Forward current: $\Delta\lambda_d = \lambda_d(I_f) - \lambda_d(0.7\text{ A}), T_c = 25^\circ\text{C}$



Temperature: $\Delta\lambda_d = \lambda_d(T_c) - \lambda_d(25^\circ\text{C}), I_f = 0.7\text{ A}$

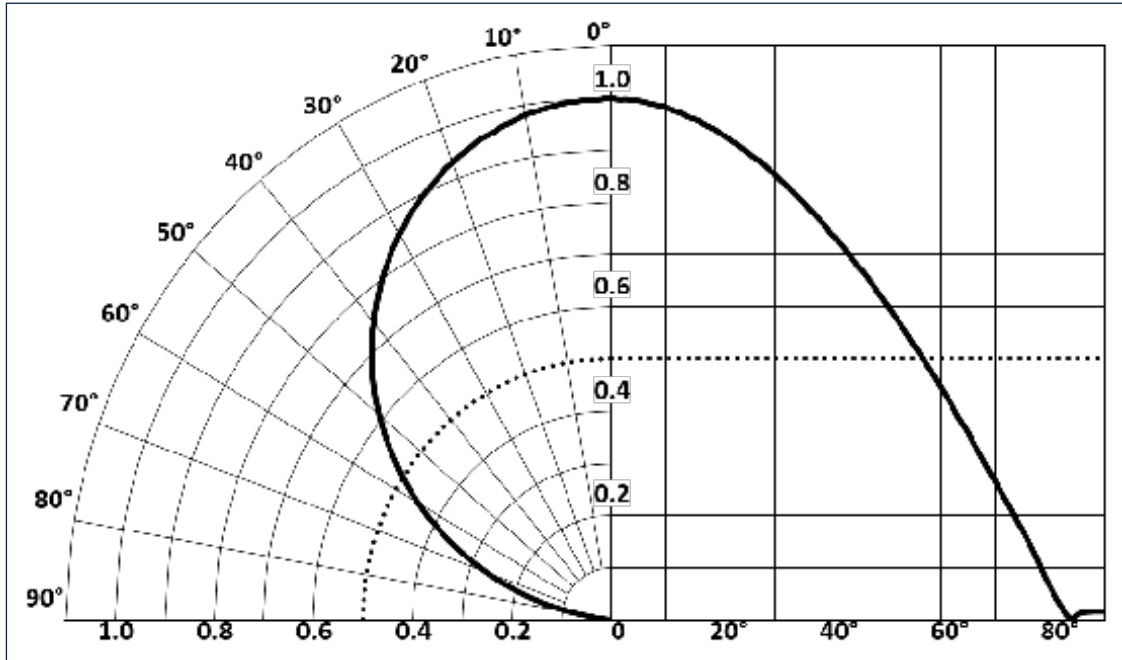




Angular Distribution and Typical Spectrum

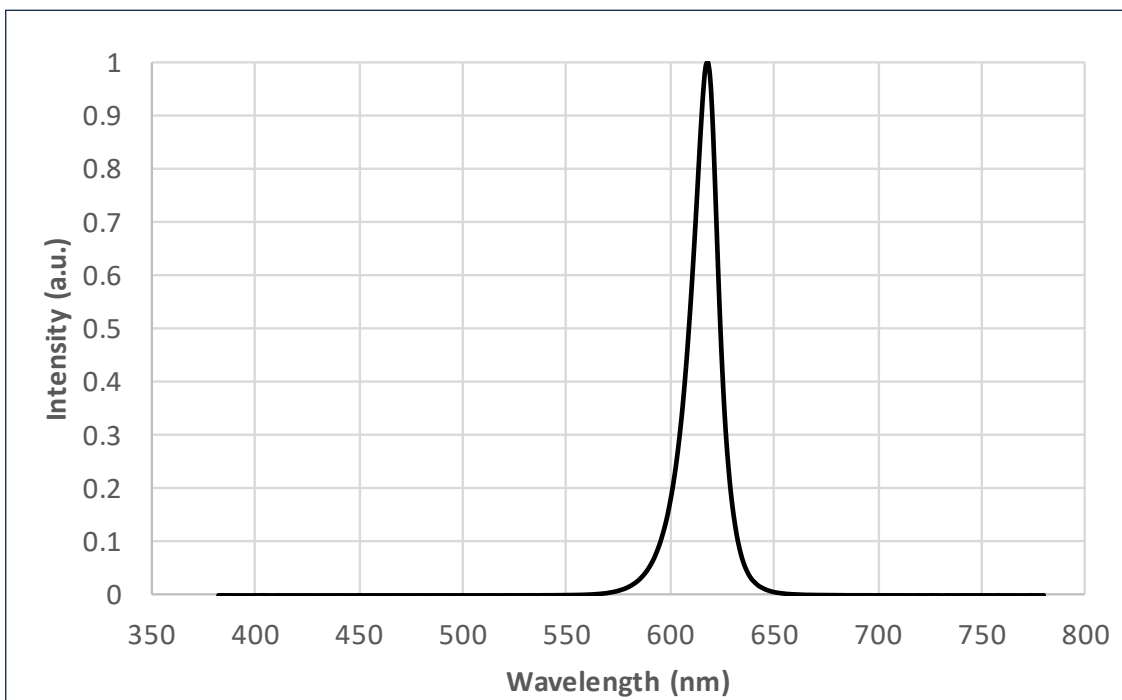
Angular Intensity Distribution

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



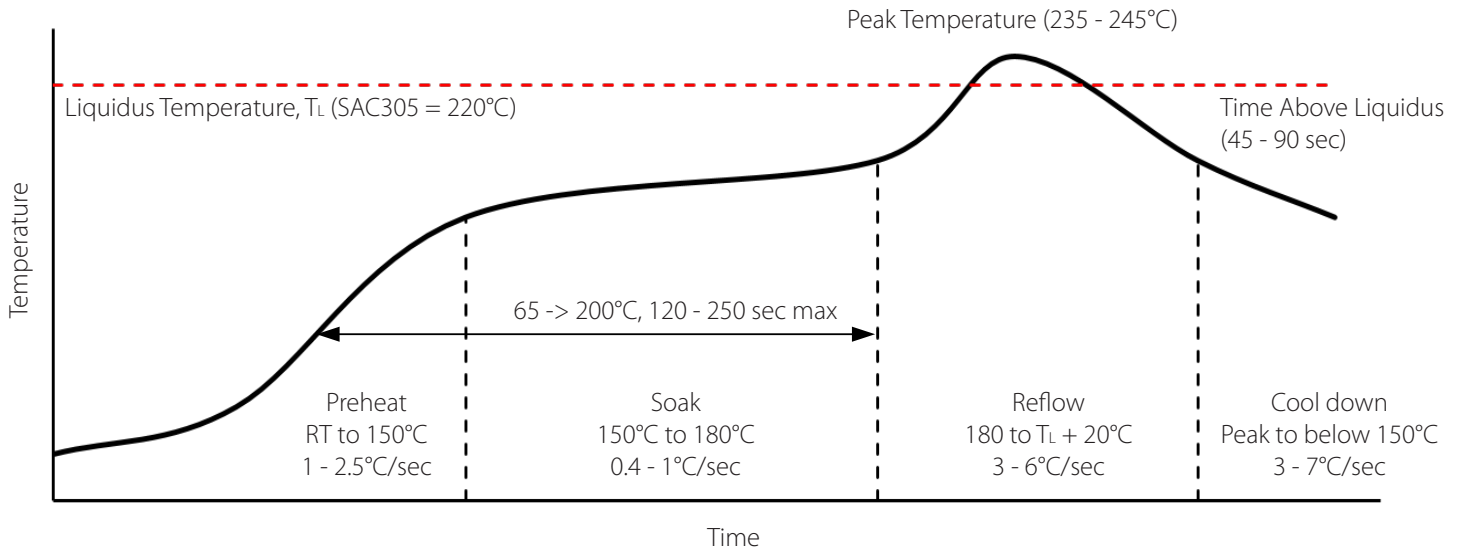
Typical Spectrum

$$\Phi_{\text{ref}} = f(\lambda); I_f = 0.7 \text{ A}; T_c = 25^\circ\text{C}$$





Soldering Profile



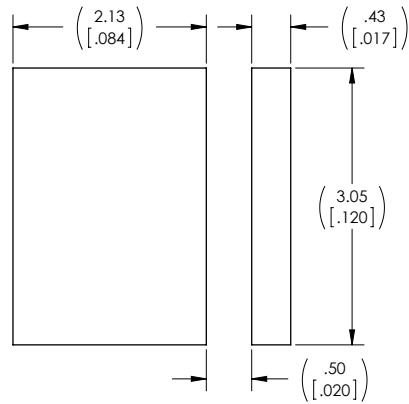
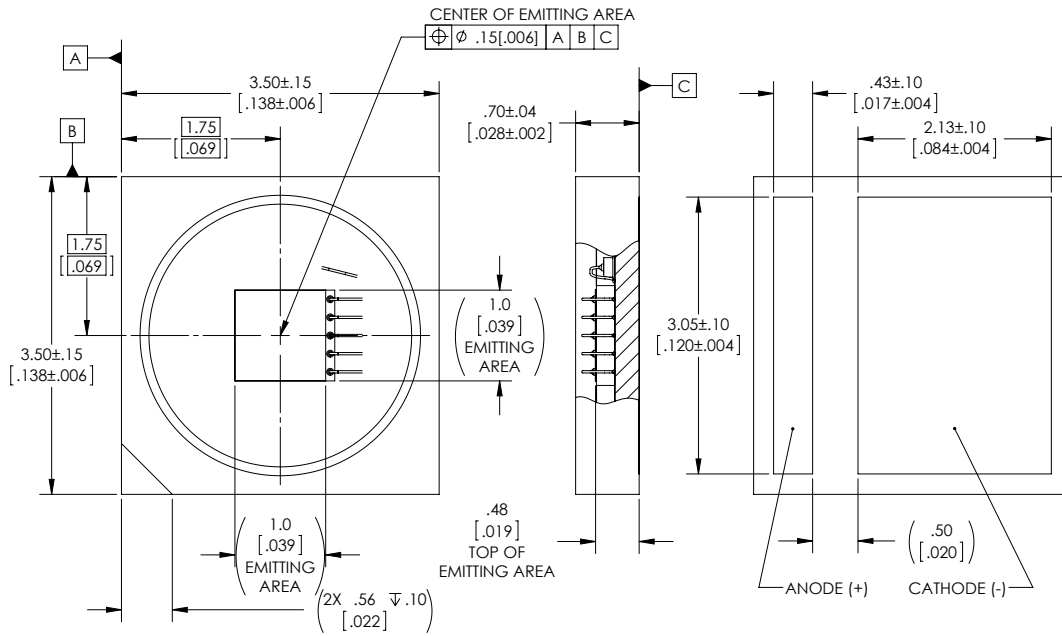
SMT Rework Guideline	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

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

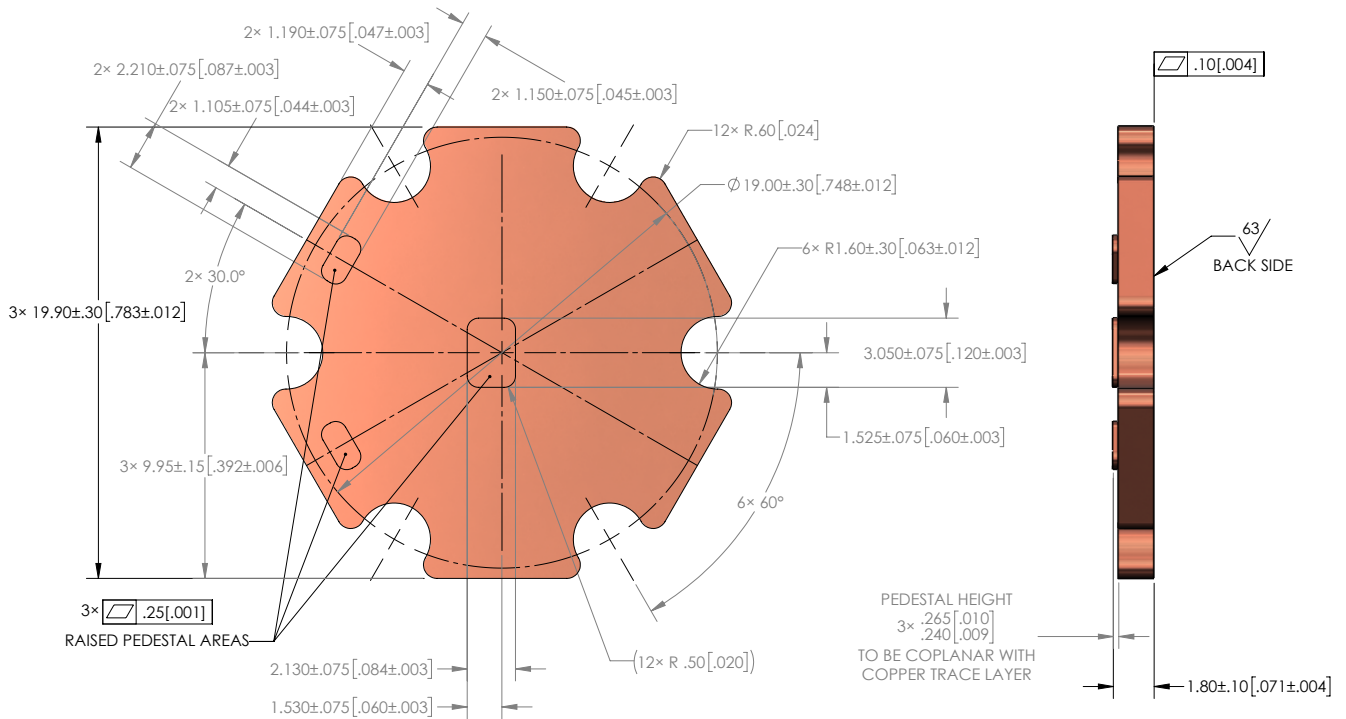
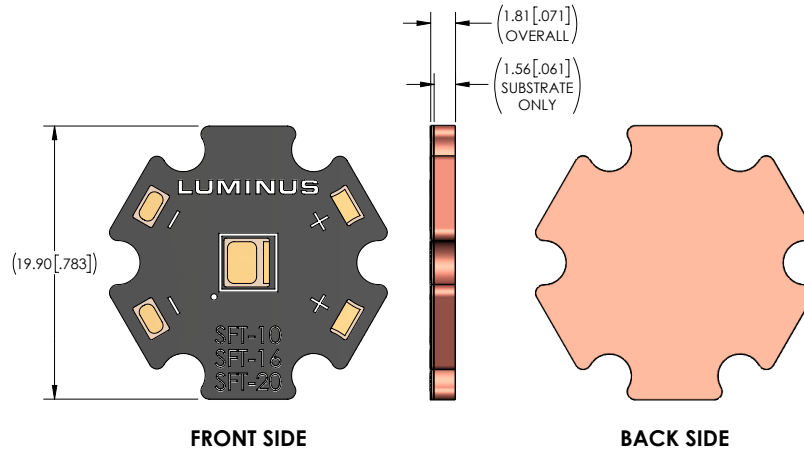


RECOMMENDED SOLDER PAD LAYOUT



Mechanical Dimensions

Starboard dimensions

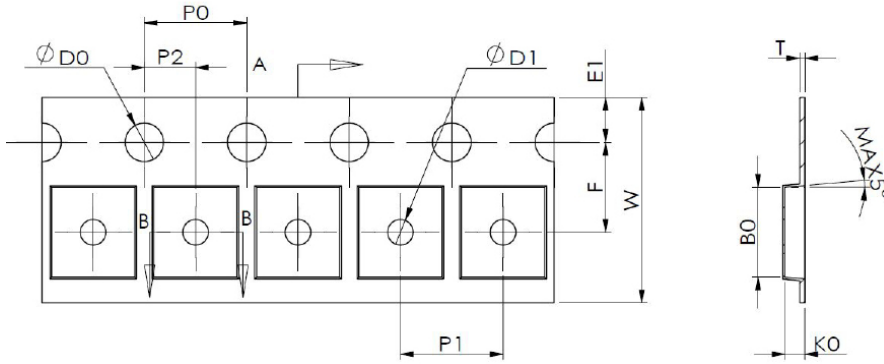


BASE WITH RAISED PEDESTAL AREAS

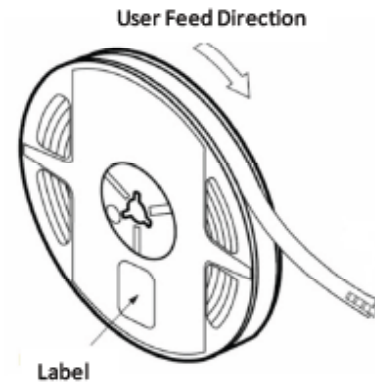
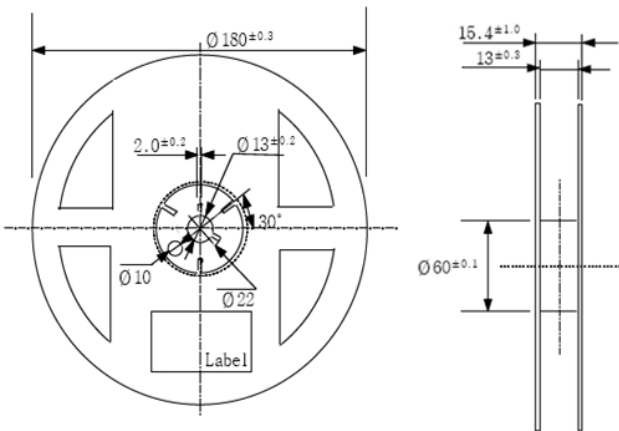


Tape and Reel Outline

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:

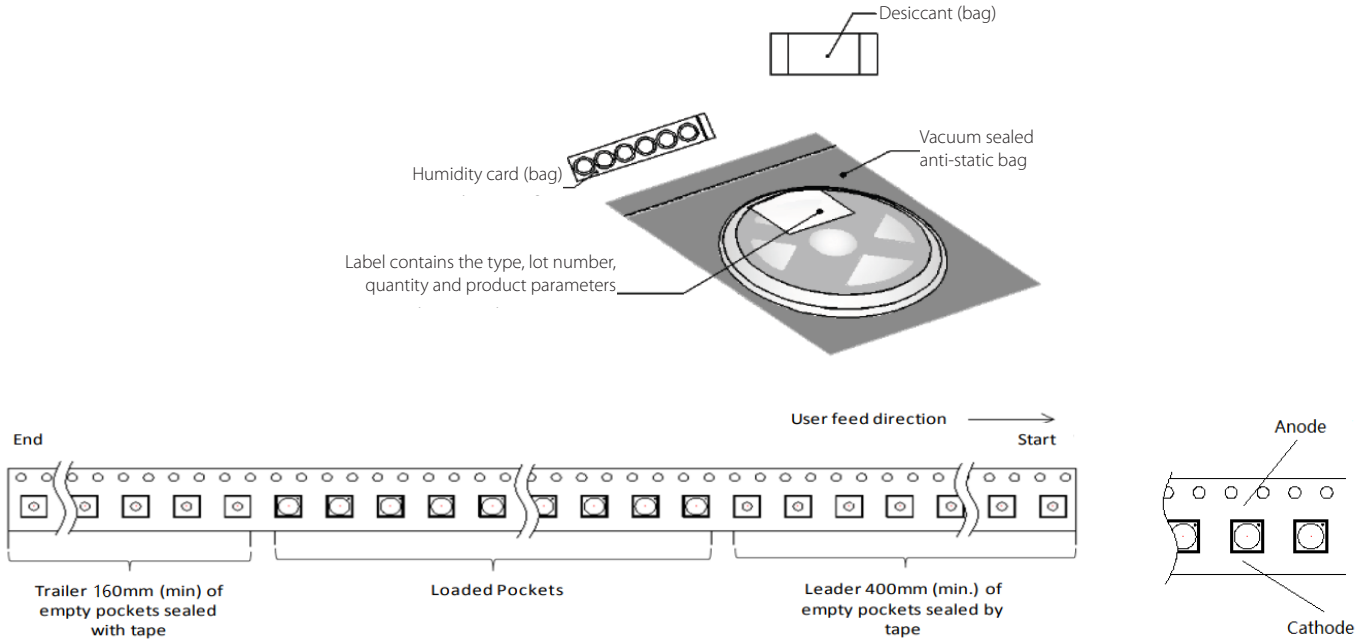
1. The quantity per reel is not orderable.
2. Minimum order quantity: 500 pcs.

Parameter	Quantity (pcs)
Pieces per reel	250
	500

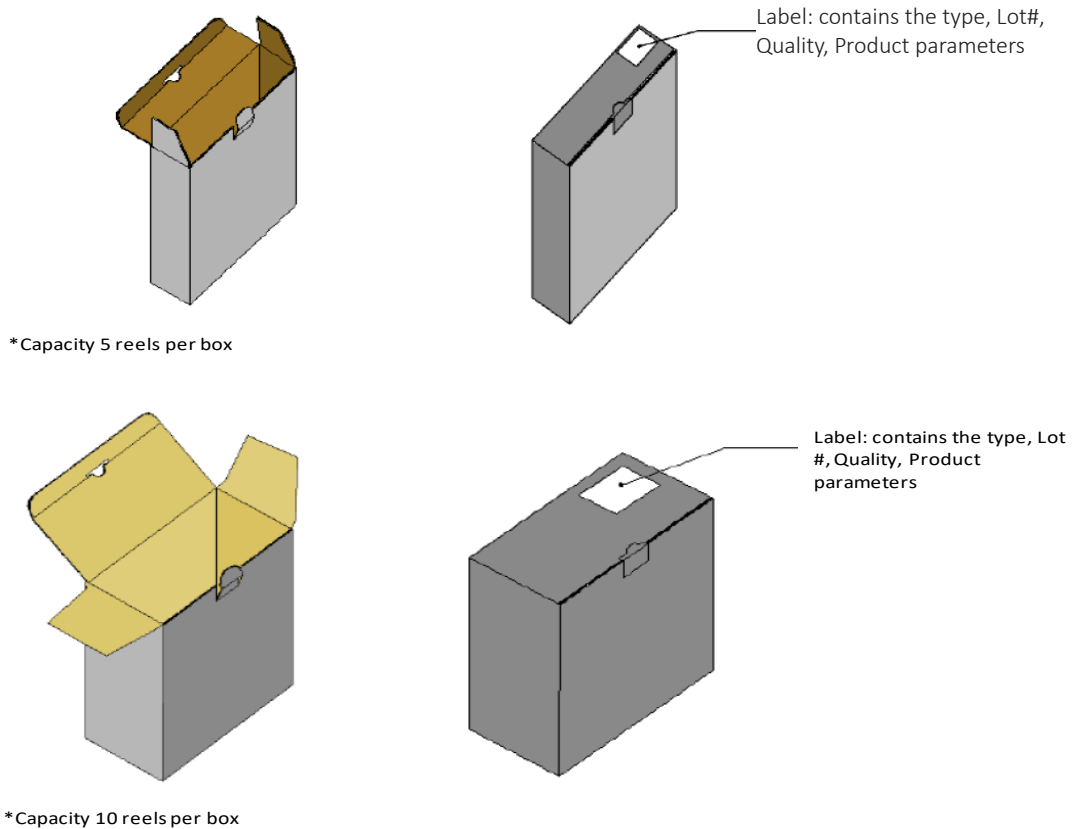


Tape and Reel Outline

Reel Package

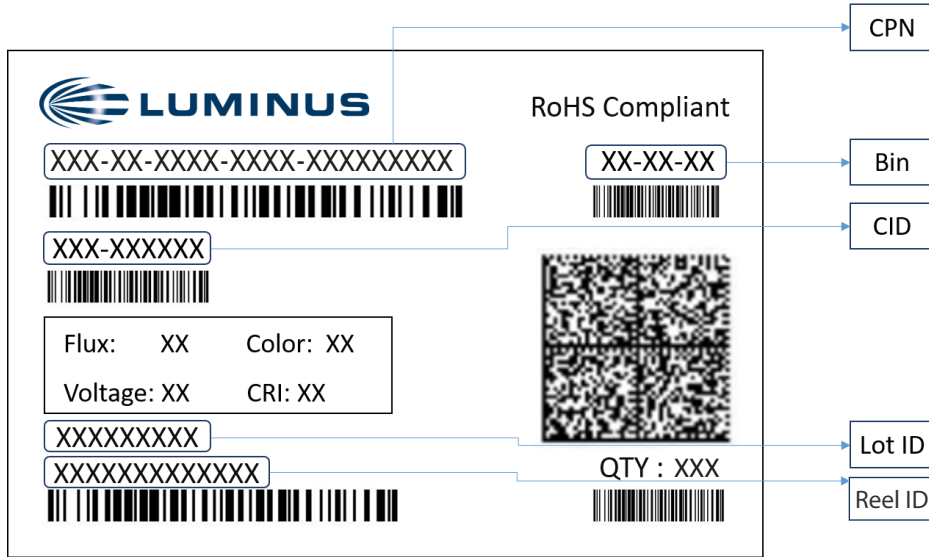


Box Packaging Information





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 0.7 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	11/20/2023	Initial release as single color SFT-10. Replacing SFT-10 RGB datasheet PDS-002823.