SFT-14-CG

Projection LED

Features

- 1.4 mm^2 emitting area
- Complement to SFT-14 Red Amber (RA), Blue Pump (BP) and Blue (B) 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: Phosphor Converted Green 555 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

Ordering Part Numbers[1]

Color	Luminous Flux		Bin Kit Ordering Code	Ordering Part Number
	Min. Flux Bin	Min. Flux		
Converted Green	2G	455 lm	MPG300	SFT-14-CG-F35-MPG300
	2H	490 lm	MPH300	SFT-14-CG-F35-MPH300
	2J	530 lm	MPJ300	SFT-14-CG-F35-MPJ300

Part Number Nomenclature

SFT **14** **CG** **F35** **<Bin kit>**

Product Family	Chip Area	Color	Package Configuration	Bin Kit
SFT: Surface-Mount Flat-Top	14: 1.4 mm^2	CG: Converted Green	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 monochromatic color of the SFT-14 product line.

Flux Bins[1,2]

Color	Luminous Flux Bin[3]	Binning @ 0.98 A, T_c= 25°C[4]	
		Minimum Flux (lm)	Maximum Flux (lm)
Converted Green	2D	360	395
	2E	395	425
	2F	425	455
	2G	455	490
	2H	490	530
	2J	530	580
	2K	580	625

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.

Absolute Maximum Ratings[1]

	Symbol	Values	Unit
Forward Current (Single pulse 20 ms or Pulsed)[2,3,4]	$I_{f\,min}$	0.2	A
	$I_{f\,max}$	7.0	
Forward Current Pulsed [2,3,4] Frequency >240Hz, Duty <70%	$I_{fp\,max}$	8.4	A
Forward Surge Current (Pulsed) [2,3,4] 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°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[1]

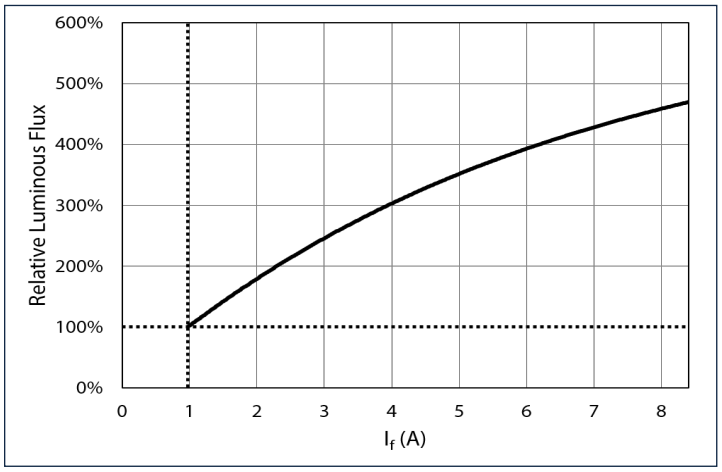
Optical and Electrical Characteristics	Symbol	Value	Unit
Emitting Area	A_E	1.4	mm^2
Peak Luminous Flux[2]	Φ_V	490	lm
Peak Radiometric Flux[2]	Φ_E	1.06	W
Forward Voltage	$V_{f\ min}$	2.50	V
	V_f	2.95	
	$V_{f\ max}$	3.60	
Dominant Wavelength	$\lambda_{d\ min}$	545	nm
	λ_d	555	
	$\lambda_{d\ max}$	565	
FWHM- Spectral bandwidth at 50% of Φ_V	$\Delta\lambda_{1/2}$	100	nm
Chromaticity Coordinates (Full spectrum)[3]	CIE x	0.33	
	CIE y	0.56	
Chromaticity Coordinates (Filtered spectrum)[3,4]	CIE x	0.31	
	CIE y	0.63	
Thermal Characteristics			
Real thermal resistance (junction-case)	$R_{th\ real\ (j\text{-}c)}$	1.60	°C/W
Electrical thermal resistance[4,5](junction-case)	$R_{th\ elec.(j\text{-}c)}$	0.92	°C/W

Note:

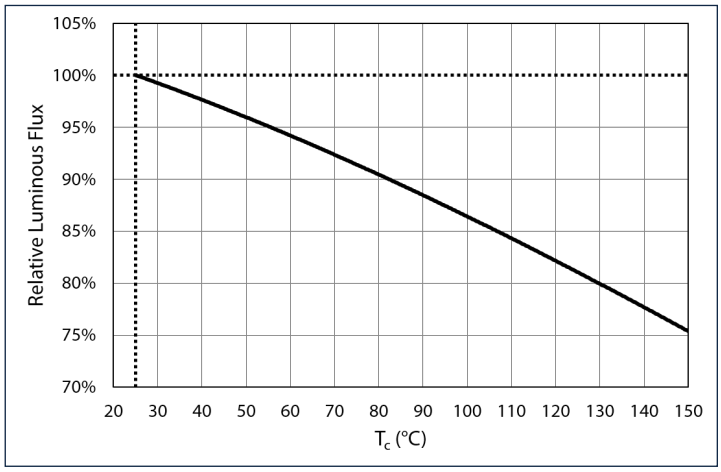
1. Product test condition: 0.98 A, 25°C case temperature.
2. Typical flux at typical dominant wavelength.
3. CIE 1931 chromaticity diagram coordinates, normalized to X+Y+Z=1.
4. Optical filter of 50% cut off range between 580 nm and 600 nm applied in typical projection display engine.
5. Thermal resistance values are based on modeled results correlated to measured $R_{th(j\text{-}c)}$ data using Forward Voltage sensitivity parametric method, compliant with JEDEC Standards JESD51-14.
6. 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: φ_v/φ_v(0.98 A) Single pulse 20 ms, T_c = 25°C

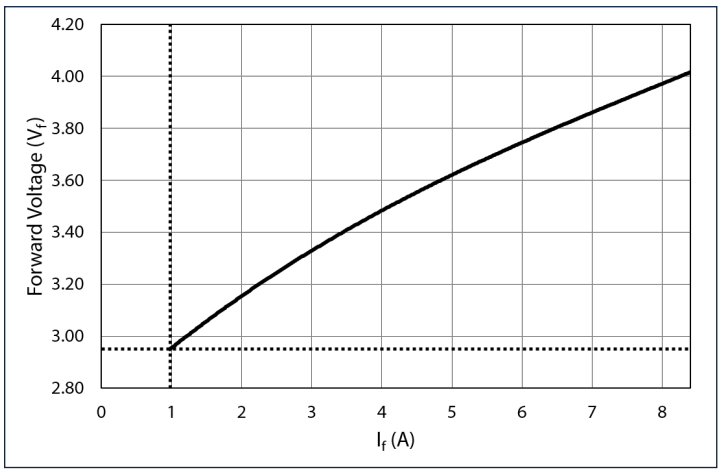


Temperature: φ_v/φ_v(25°C) Single pulse 20 ms, I_f = 0.98 A

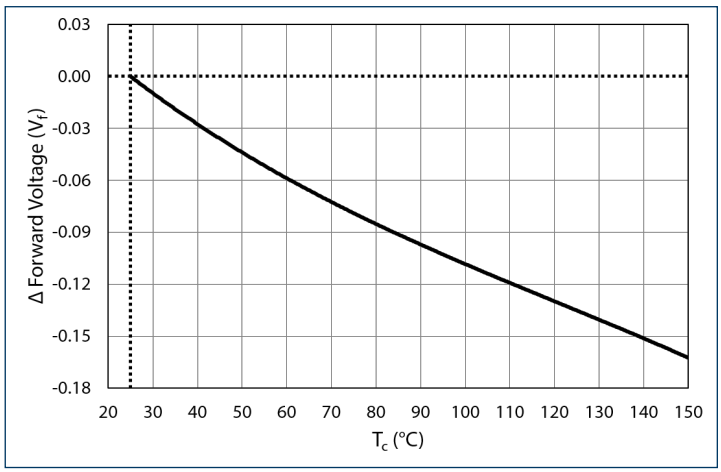


Forward Voltage

Forward current: $V_f = V(I_f)$ Single pulse 20 ms, T_c = 25°C

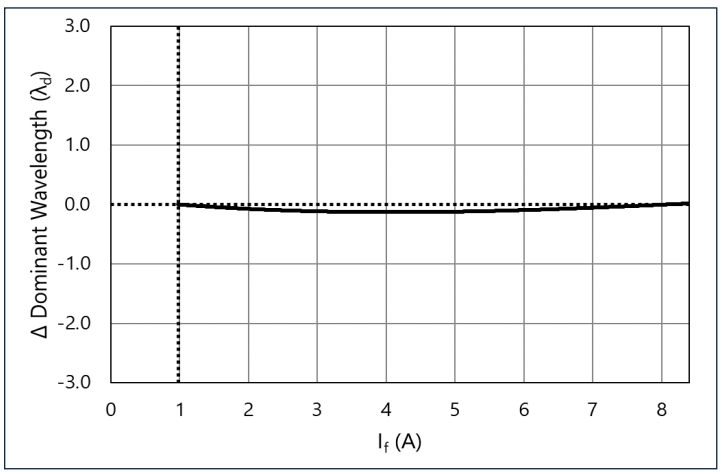


Temperature: $\Delta V_f = V(T_c) - V(25°C)$ Single pulse 20 ms, I_f = 0.98 A

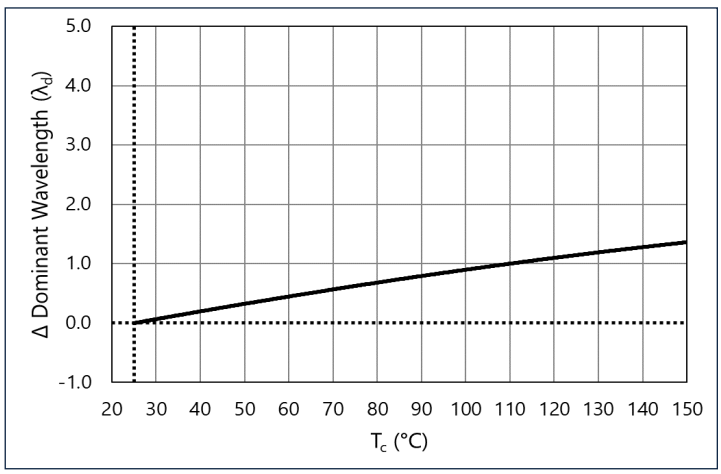


Dominant Wavelength Shift

Forward current: $\Delta\lambda_d = \lambda_d(I_f) - \lambda_d$(0.98 A) Single pulse 20 ms, T_c = 25°C



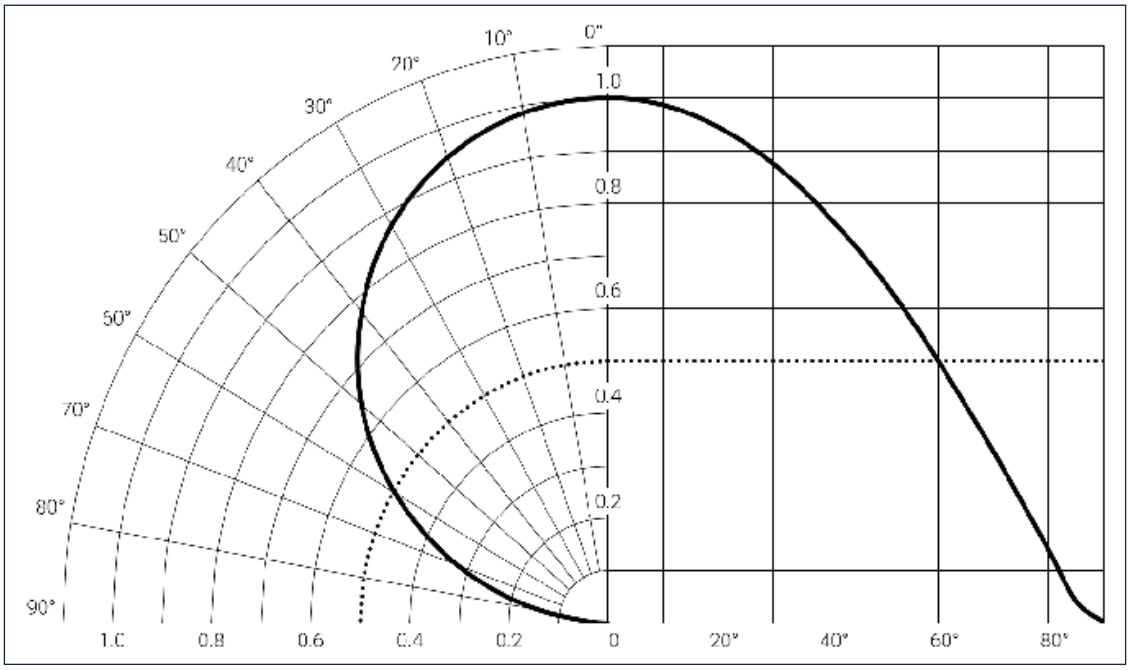
Temperature: $\Delta\lambda_d = \lambda_d(T_c) - \lambda_d$(25°C) Single pulse 20 ms, I_f = 0.98 A



Angular Distribution and Typical Spectrum

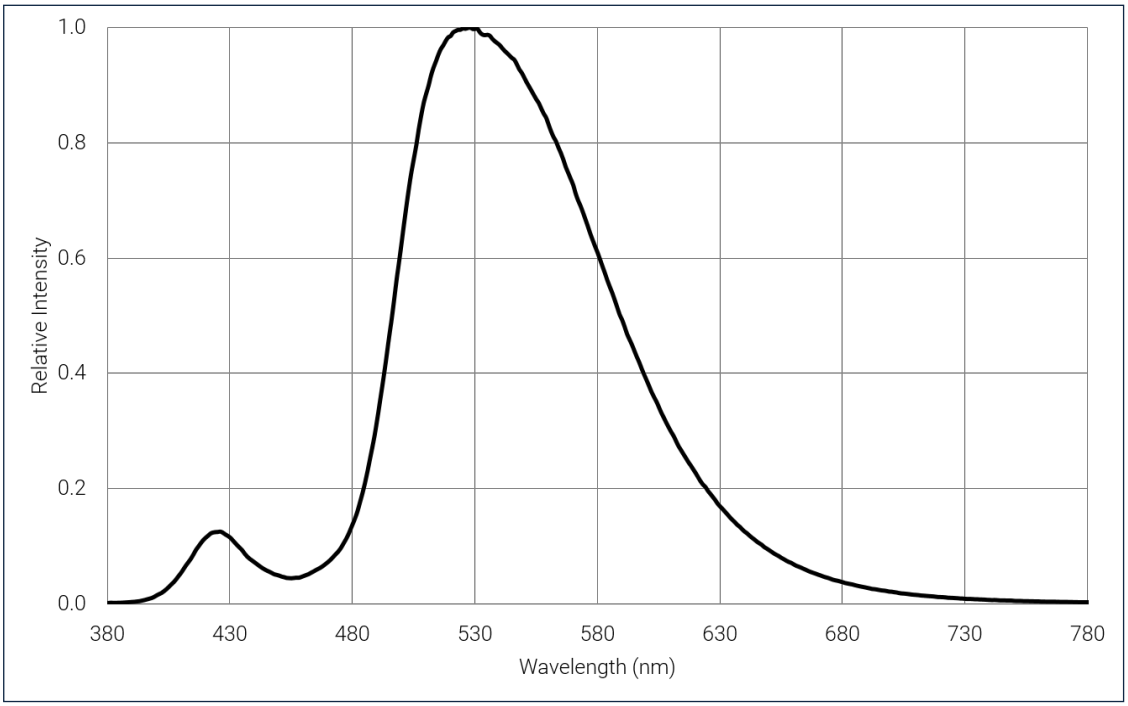
Angular Intensity Distribution

$I_{ref} = f(\Phi)$; $T_c = 25°C$

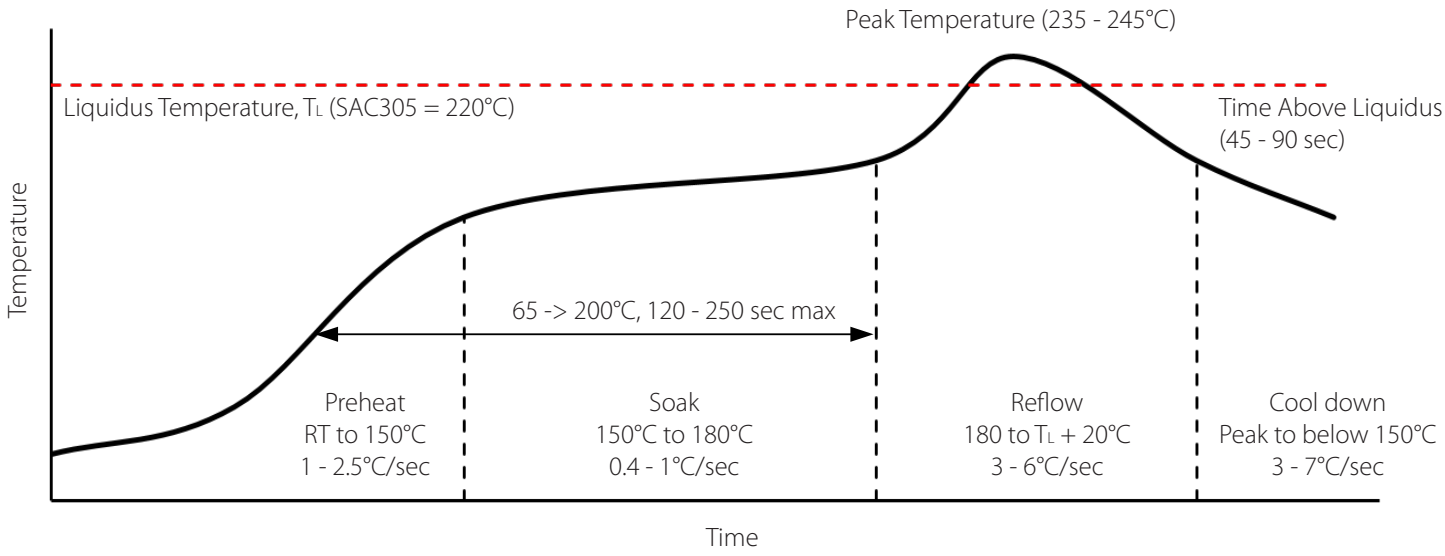


Typical Spectrum

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



Soldering Profile



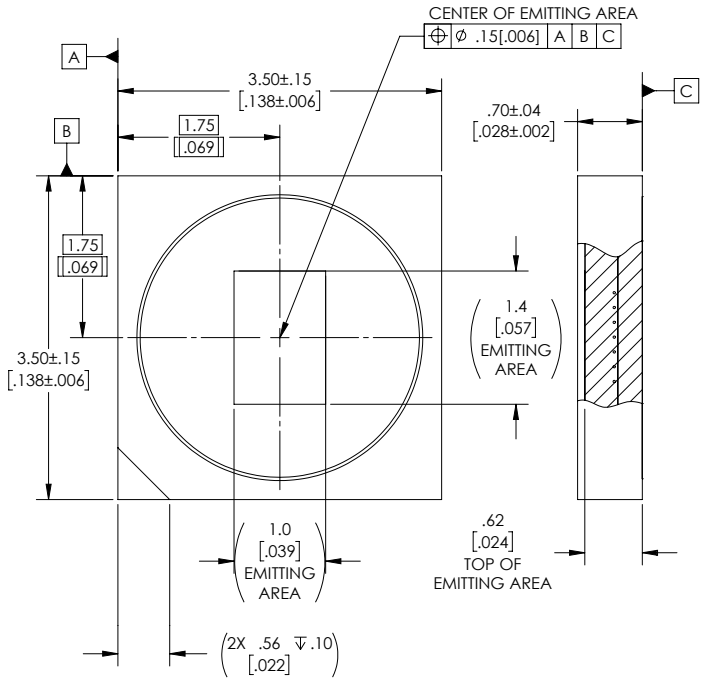
SMT Rework Guideline	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

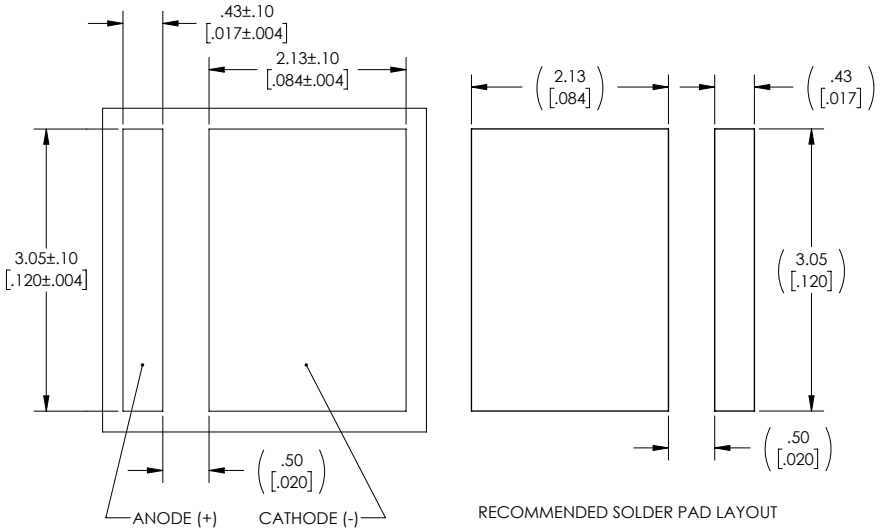
Note:

1. Product complies to Moisture Sensitivity Level 3 (MSL 3).
2. 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.
3. During the pick and place process, ensure the pick-up tool does not touch any die components.
4. Use of a multi-zone IR reflow oven with a nitrogen blanket is recommended.
5. 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.
6. Luminus recommends to use the solder paste data sheet information as a starting point in time-temperature process development.
7. 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-
8. For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.

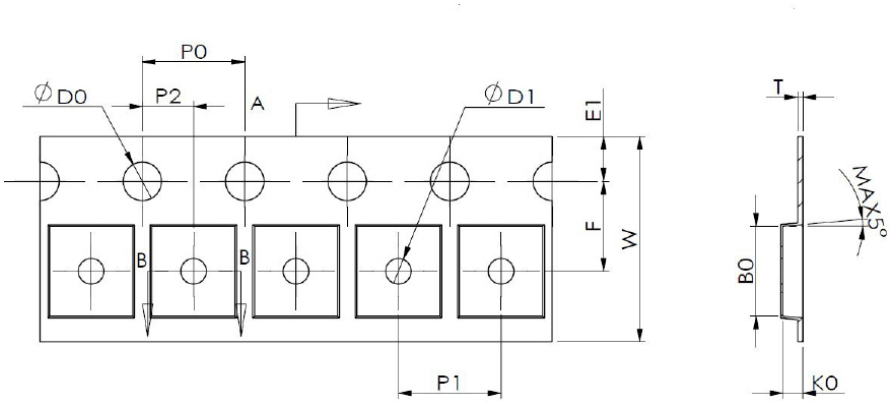
Mechanical Dimensions



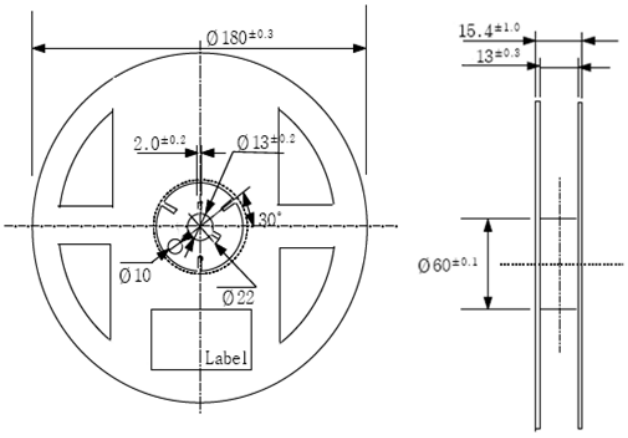


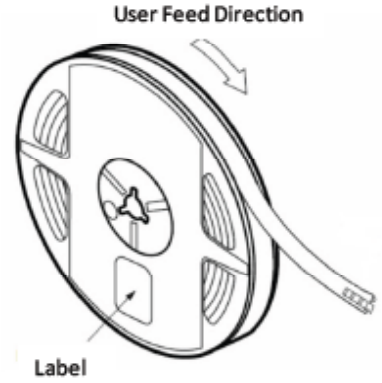
Tape and Reel Outline

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





Parameter	Quantity (pcs)
Pieces per reel	250
	500

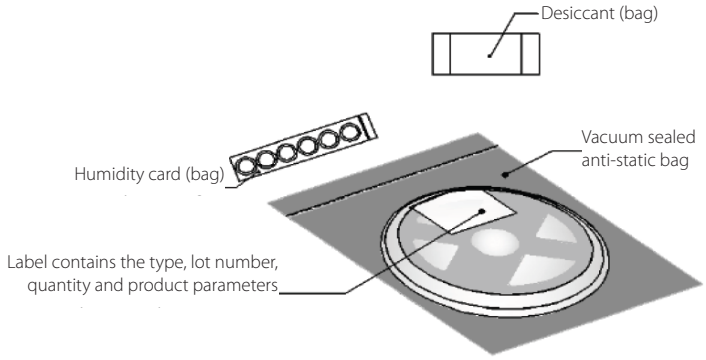
Note

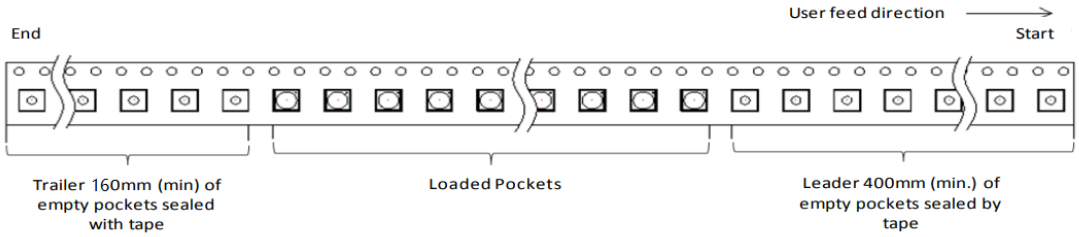
1. The quantity per reel is not orderable.

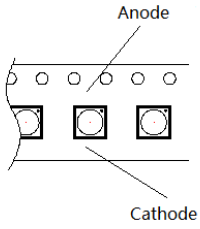
2. Minimum order quantity: 500 pcs.

Tape and Reel Outline

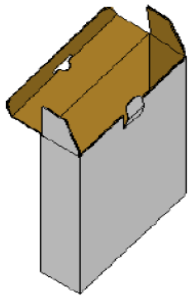
Reel Package

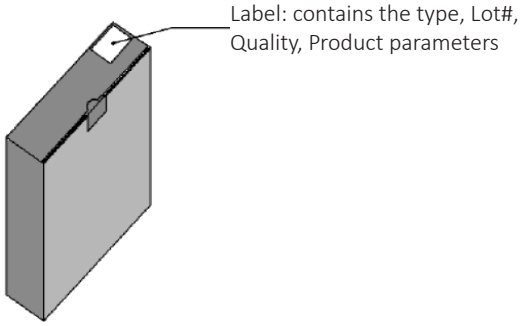




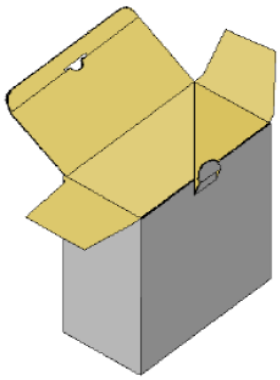


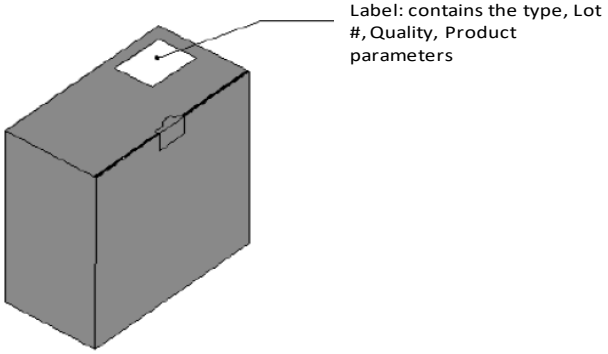
Box Packaging Information





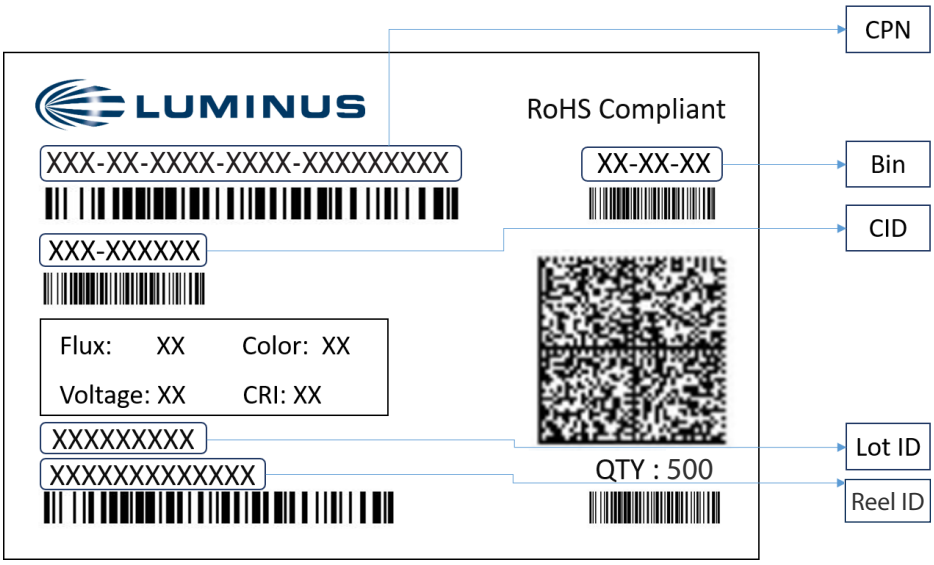
*Capacity 5 reels per box





*Capacity 10 reels per box

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: NA
- 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	01/25/2024	Update template, ordering part numbers, and bin-kit codes