

LUXEON® SkyBlue™

LUXEON SkyBlue is a complete LED circadian lighting solution that delivers superior melanopic ratios at comfortable CCTs

The LUXEON SkyBlue solution is comprised of LUXEON SkyBlue and white LUXEON 3030 HE Plus LEDs that are factory matched to provide optimal melanopic ratio, superior efficacy, and light output with exceptional uniformity. Available in CCTs of 3000K, 3500K, and 4000K, each kit simplifies the analysis and engineering necessary to produce a circadian illumination system.



FEATURES AND BENEFITS

Superior melanopic ratio, high-efficacy circadian lighting

Unmatched ease of use and time to market

Industry standard 3030 packaging allows simple design-in

Seamless connection between lighting specification, fixture performance and LED selection

Very high CRI, R9, low cyanosis observation index

Lighting uniformity within a 3 MacAdam ellipse color space

PRIMARY APPLICATIONS

Healthcare Settings

Schools

Factories

Offices

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General Product Information

Characterization Conditions

LUXEON SkyBlue Kit LEDs are tested and binned with a 20ms monopulse of 50mA at a junction temperature, T_j , of 55°C.

Part Number Nomenclature

Part numbers for LUXEON SkyBlue Kit LEDs follow the convention below:

L 1 3 0 – **C C D D** H A 3 0 S B B 3 0

Where:

C C – designates nominal CCT (30=3000K, 35=3500K, 40=4000K)

D D – designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)

Therefore, the following part number is used for a LUXEON SkyBlue Kit 3000K 80CRI LED:

L 1 3 0 – **3 0 8 0** H A 3 0 S B B 3 0

Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON SkyBlue is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Performance Characteristics

Product Selection Guide

Table 1. Product performance of LUXEON SkyBlue Kit at 50mA, T_j= 55°C.

NOMINAL CCT	TYPICAL M/P RATIO		CRI/R9	TYPICAL LUMINOUS EFFICACY	TYPICAL LUMINOUS FLUX	LUXEON SKYBLUE KIT PART NUMBER ^[3]
	MDER ^[1]	MEER ^[2]				
3000K	0.67	0.74	83/90	148	58	L130-3080HA30SBB30
3500K	0.76	0.84	85/90	158	62	L130-3580HA30SBB30
4000K	0.85	0.94	85/90	160	64	L130-4080HA30SBB30

Notes for Table 1:

1. Melanopic daylight (D65) efficacy ratio, as defined in CIE S026/E:2018 clause 3.10. Melanopic equivalent daylight (D65) illuminance = photopic illuminance (Ev) * melanopic DER.
2. Melanopic equi-energy (E) efficacy ratio. Not standardized but derived from the informative annex A.3. of CIE S 026/E:2018, using the equi-energy spectrum.
3. Additional Kits are available to serve legacy designs. Please contact sales for more information.

Electrical and Thermal Characteristics

Table 2. Electrical and thermal characteristics for LUXEON SkyBlue Kit at 50mA, T_j= 55°C.

PART NUMBER	FORWARD VOLTAGE ^[1] (V _f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE ^[2] (mV/°C)
	MINIMUM	TYPICAL	MAXIMUM	
L130-xxxxHA30SBB30	7.64	7.84	8.04	-2.5 to -3.5

Notes for Table 2:

1. Lumileds maintains a tolerance of ±0.1V on forward voltage measurements.
2. Measured between 25°C and 85°C.

Absolute Maximum Ratings

Table 3. Absolute maximum ratings for LUXEON SkyBlue.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current ^[1]	300mA
Peak Pulsed Forward Current ^[2]	700mA
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
LED Junction Temperature (DC & Pulse)	125°C
Operating Case Temperature	-40°C to 105°C
LED Storage Temperature	-40°C to 105°C
Soldering Temperature	JEDEC 020D 260°C
Allowable Reflow Cycles	3
Reverse Voltage (V _{reverse}) ^[3]	-5V

Notes for Table 3:

1. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple", are acceptable if the following conditions are met:
 - The frequency of the ripple current is 100Hz or higher
 - The average current for each cycle does not exceed the maximum allowable DC forward current
 - The maximum amplitude of the ripple does not exceed 25% of the maximum allowable DC forward current
2. Pulse operation with the maximum peak pulse forward current is acceptable if the pulse on time is ≤5ms per cycle and the duty cycle is ≤50%
3. At a maximum reverse current of 10µA. LUXEON SkyBlue is not designed to be driven in reverse bias.

Characteristic Curves

Spectral Power Distribution Characteristics

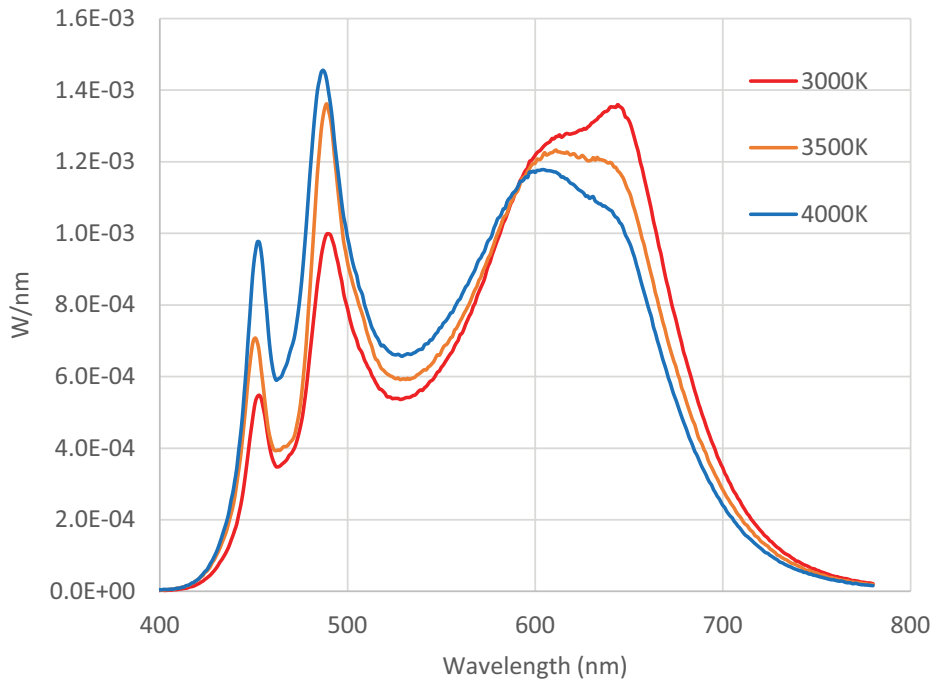


Figure 1. Typical normalized power vs. wavelength for L130-xx80HA30SBB30 at 50mA, $T_j=55^\circ\text{C}$.

Light Output Characteristics

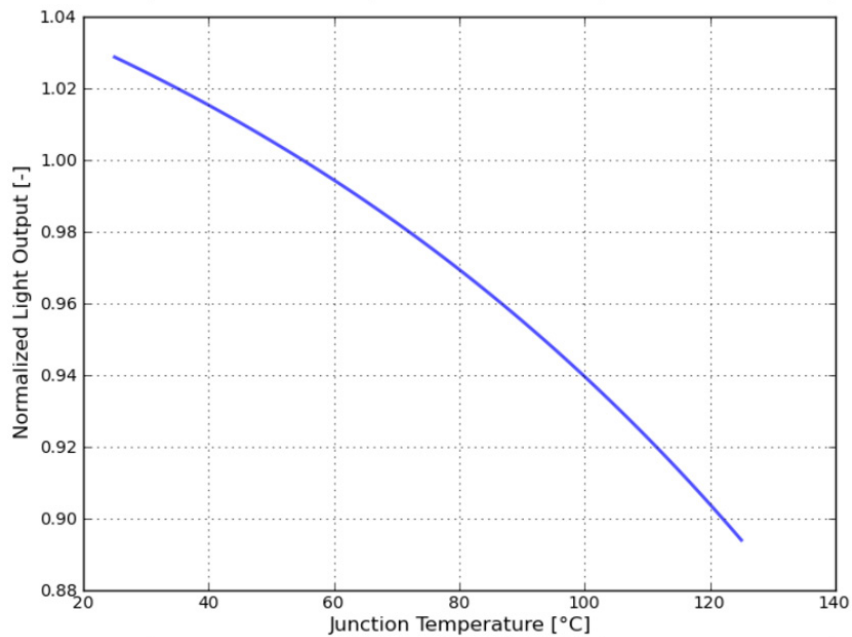


Figure 2. Typical normalized light output vs. junction temperature for L130-xxxxHA30SBB30 at 50mA.

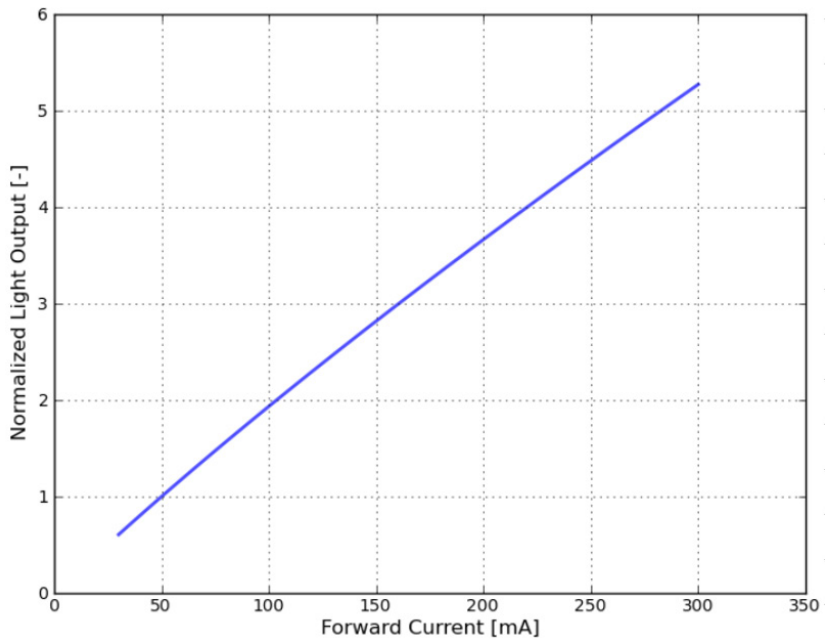


Figure 3. Typical normalized light output vs. forward current for L130-xxxxHA30SBB30 at $T_j=55^\circ\text{C}$.

Forward Current Characteristics

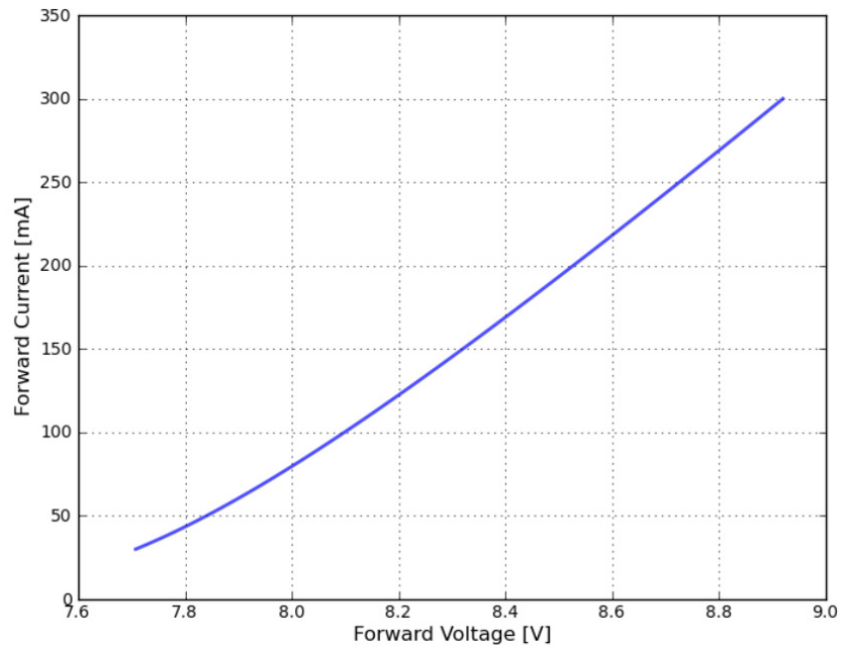


Figure 4. Typical forward current vs. forward voltage for L130-xxxxHA30SBB30 at $T_j=55^\circ\text{C}$.

Radiation Pattern Characteristics

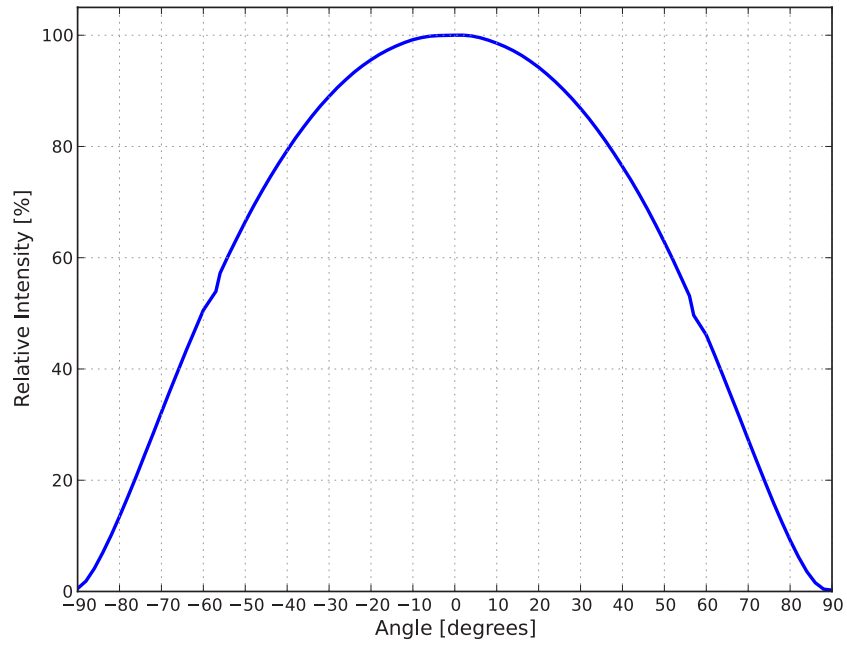


Figure 5. Typical radiation pattern for L130-xxxxHA30SBB30 at 50mA, $T_j=55^\circ\text{C}$.

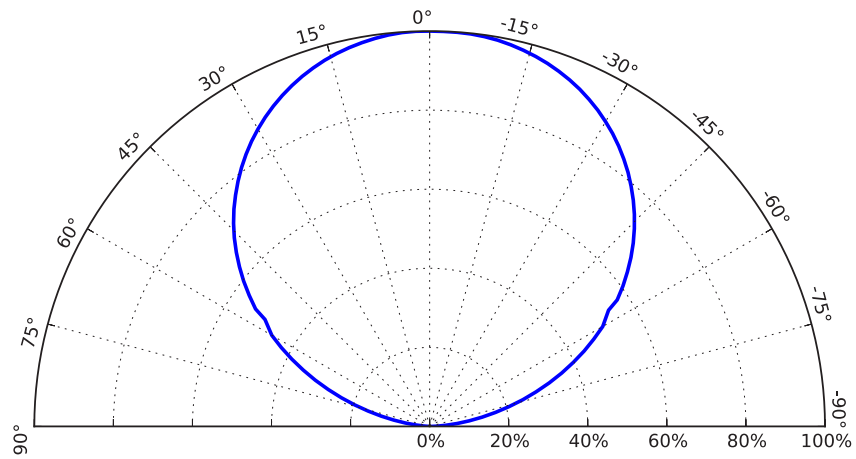


Figure 6. Typical polar radiation pattern for L130-xxxxHA30SBB30 at 50mA, $T_j=55^\circ\text{C}$.

Product Bin and Labeling Definitions

Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON SkyBlue Kit LEDs are labeled using a 4- or 5-digit alphanumeric CAT code following the format below:

C D E F or **C x D E F**

- C** – designates luminous flux bin (example: Q=13-14.5lm)
- x** – designates Lumileds internal code
- D E** – designates color bin (example: 7A,7B for 3000K ^[1] parts)
- F** – designates forward voltage bin (example: J=2.56 to 2.66V, K=2.66 to 2.76V)

Therefore, a LUXEON SkyBlue Kit with a lumen range of 13-14.5lm, color bin of 7A, and a forward voltage range of 2.56 to 2.76V has the following CAT code:

Q 7 A J

Note:

1. Means L2 CCT combined with white LEDs.
2. LUXEON SkyBlue Kits contain matched LED components that meet Bios Lighting specifications. Please contact your local Sales Representative or Lumileds Technical Solutions Manger for details on kit contents.

Mechanical Dimensions

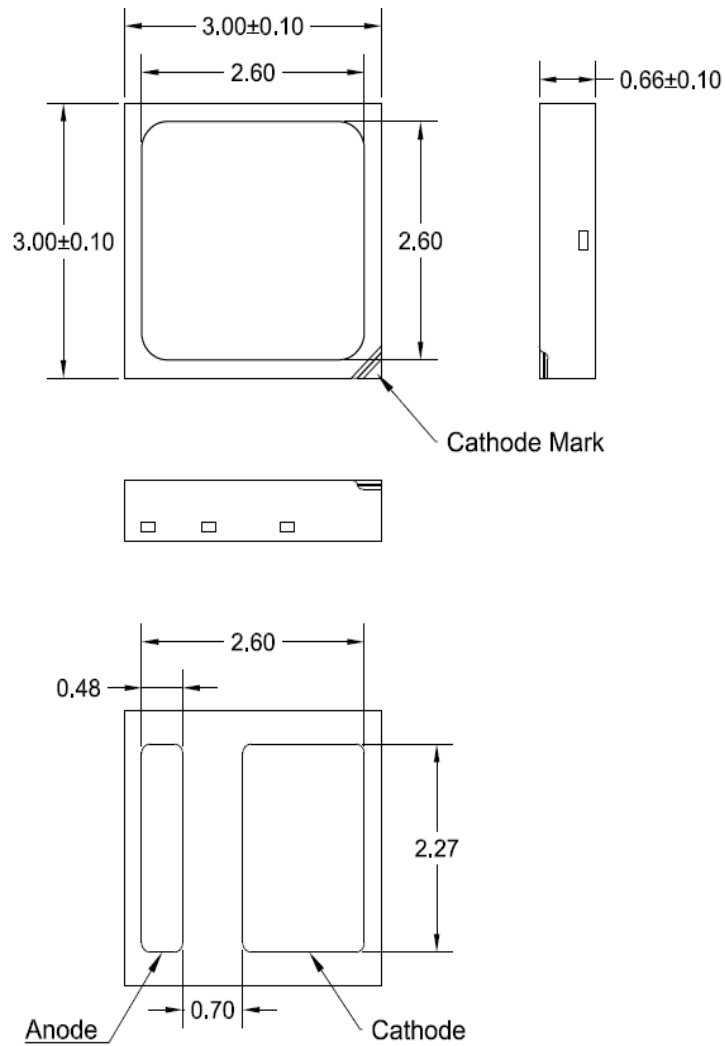


Figure 7. Mechanical dimensions for LUXEON SkyBlue and LUXEON 3030 HE Plus.

Notes for Figure 7:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Tolerance: ± 0.10 mm.

Reflow Soldering Guidelines

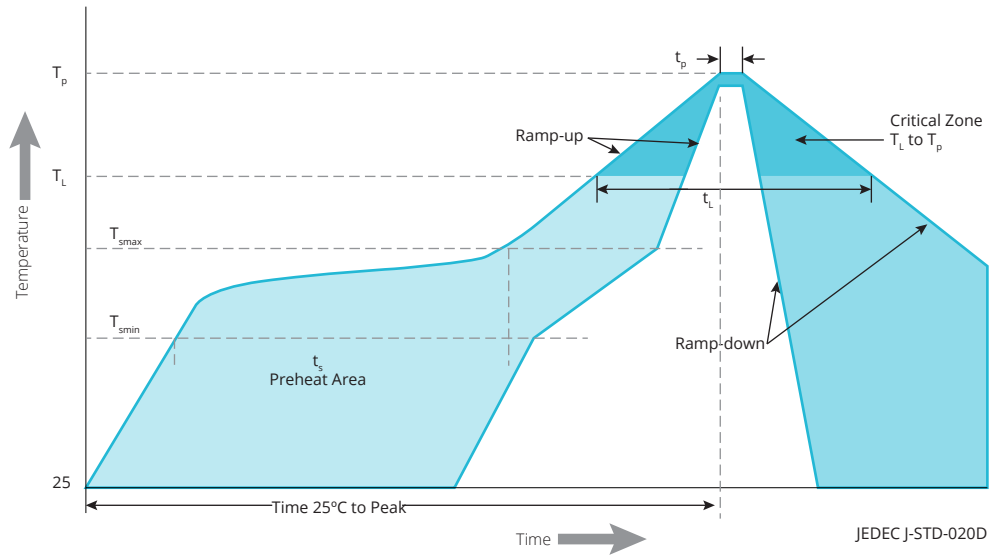


Figure 8. Visualization of the acceptable reflow temperature profile as specified in Table 4.

Table 4. Reflow profile characteristics for LUXEON SkyBlue and LUXEON 3030 HE Plus.

PROFILE FEATURE	LEAD FREE ASSEMBLY
Preheat Minimum Temperature (T_{smin})	150°C
Preheat Maximum Temperature (T_{smax})	200°C
Preheat Time (t_{smin} to t_{smax})	60 to 120 seconds
Ramp-Up Rate (T_L to T_p)	3°C / second maximum
Liquidous Temperature (T_L)	217°C
Time Maintained Above Temperature T_L (t_L)	60 to 150 seconds
Peak / Classification Temperature (T_p)	260°C
Time Within 5°C of Actual Peak Temperature (t_p)	20 to 40 seconds
Ramp-Down Rate (T_p to T_L)	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

Notes for Table 4:

1. All temperatures refer to the application Printed Circuit Board (PCB), measured on the surface adjacent to the package body.

JEDEC Moisture Sensitivity

Table 5. Moisture sensitivity levels for LUXEON SkyBlue and LUXEON 3030 HE Plus.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

Solder Pad Design

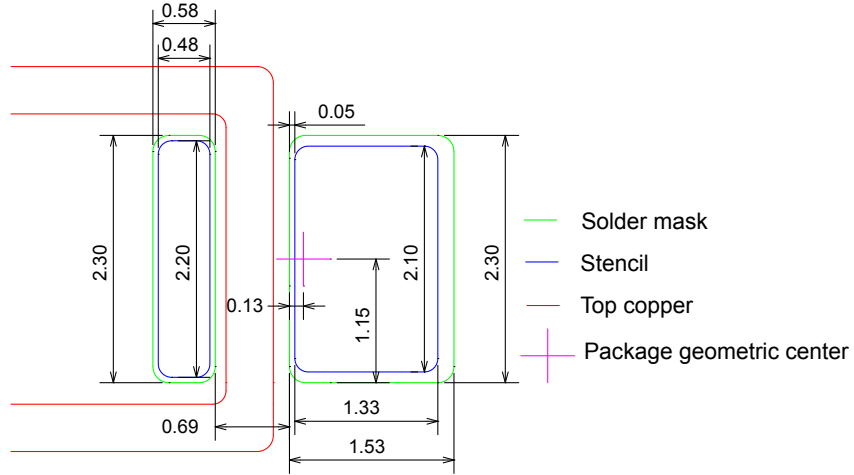


Figure 9. Recommended PCB solder pad layout for LUXEON SkyBlue.

Notes for Figure 9:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

Packaging Information

Pocket Tape Dimensions

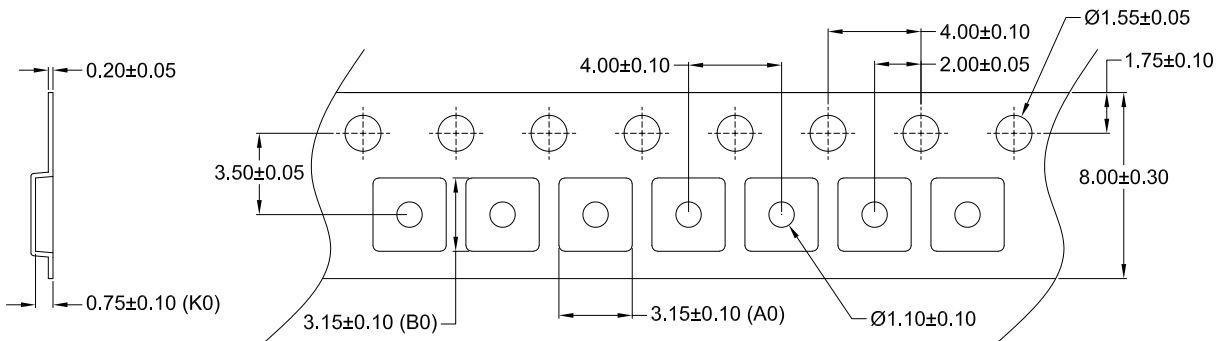


Figure 10. Pocket tape dimensions for LUXEON SkyBlue.

Notes for Figure 10:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

Reel Dimensions

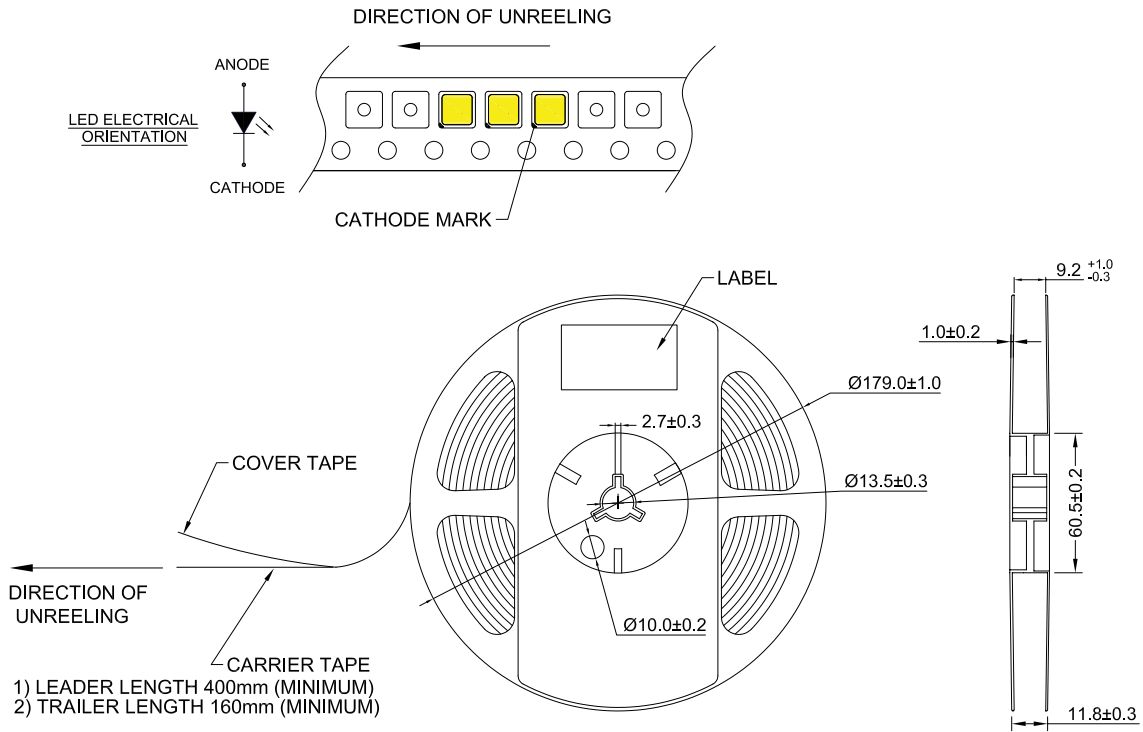


Figure 11. Reel dimensions for LUXEON SkyBlue.

- Notes for Figure 11:
1. Drawings are not to scale.
 2. All dimensions are in millimeters.

About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit lumileds.com.



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