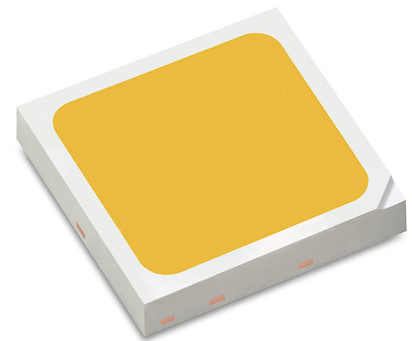


LUXEON SunPlus 3030

Industry leading efficacy, 3V 3030 package

LUXEON SunPlus 3030 is a superior high efficacy, mid power package built on the legacy of the LUXEON 3030 product line. It serves as a go-to solution for horticulture applications that require top notch $\mu\text{mol/J}$ performance and long lifetime. Luxeon SunPlus 3030 adopt quadrant bin structure within 3 SDCM, which enables 2 SDCM by kitting.



FEATURES AND BENEFITS

Superior high efficacy at rated current enables outstanding $\mu\text{mol/J}$ at system level

Reliable package design from a proven product line affirms application long lifetime

Quadrant bin structure within 3 SDCM enables 2 SDCM by kitting

Industry standard package allows drop-in replacement for existing 3030 packages

Robust coating design for enhanced sulfurprotection capability ^[1]

[1] Refer to reliability datasheet for more details.

PRIMARY APPLICATIONS

Horticulture

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General Product Information

Product Test Conditions

LUXEON SunPlus 3030 LEDs are tested and binned with a 20ms monopulse of 65mA at a junction temperature, T_j , of 25°C.

Part Number Nomenclature

Part numbers for LUXEON SunPlus 3030 follows the convention below:

L 1 3 0 – **A A A A B B** 3 0 C C C C C

Where:

- A A A A** – designates nominal CCT and CRI (2780=2700K, 80CRI; 3090 =3000K, 90CRI, etc., and NSC1 = Nightscape)
- B B** – designates product code (HA= LUXEON 3030 HE Plus, HB = LUXEON 3030 HE)
- C C** – designates options for product specification (000B1 = base part number of performance proliferation B1, 000C1 = base part number of performance proliferation C1. Besides, there would be custom part numbers that are derived from base part number for kitting purpose etc., and those would take the last five digits to differentiate from base part number. For examples, 000B4 = 3SDCM kitting by opposite bin of proliferation B1, 000B5 = pure 3SDCM of proliferation B1, 000B7 = 2SDCM by opposite bin kitting from four 3SDCM inner bins of proliferation B1)

Therefore, the following part number is used for a LUXEON SunPlus 3030, 3000K 80CRI LED with pure 3SDCM of proliferation:

L 1 3 0 – **3 0 8 0** H A 3 0 0 0 0 C 5

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 SunPlus 3030 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 SunPlus 3030 at 65mA, T_j= 25°C

NOMINAL CCT ^[1]	MINIMUM CRI ^[2, 3]	PPF (μmol/s) ^[2, 3, 4] in PAR (400 to 700nm)		PPF/W TYPICAL (μmol/J)	PART NUMBER
		MINIMUM	TYPICAL		
2200K	70	0.422	0.464	2.634	L130-2270HA30000B1
3000K	70	0.443	0.487	2.762	L130-3070HA30000B1
3500K	70	0.455	0.500	2.839	L130-3570HA30000B1
4000K	70	0.458	0.503	2.858	L130-4070HA30000B1
5000K	70	0.466	0.512	2.906	L130-5070HA30000B1
5700K	70	0.466	0.512	2.904	L130-5770HA30000B1
6500K	70	0.468	0.514	2.919	L130-6570HA30000B1
2700K	80	0.438	0.481	2.732	L130-2780HA30000B1
3000K	80	0.448	0.492	2.793	L130-3080HA30000B1
3500K	80	0.45	0.494	2.806	L130-3580HA30000B1
4000K	80	0.459	0.505	2.865	L130-4080HA30000B1
5000K	80	0.46	0.506	2.871	L130-5080HA30000B1
5700K	80	0.453	0.498	2.826	L130-5780HA30000B1
6500K	80	0.463	0.509	2.889	L130-6580HA30000B1
2700K	90	0.42	0.462	2.622	L130-2790HA30000B1
3000K	90	0.426	0.469	2.660	L130-3090HA30000B1
3500K	90	0.429	0.472	2.679	L130-3590HA30000B1
4000K	90	0.437	0.481	2.729	L130-4090HA30000B1
5000K	90	0.435	0.478	2.714	L130-5090HA30000B1
5700K	90	0.441	0.485	2.753	L130-5790HA30000B1
6500K	90	0.446	0.490	2.783	L130-6590HA30000B1
2200K	70	0.422	0.478	2.721	L130-2270HA30000C1
3000K	70	0.443	0.497	2.830	L130-3070HA30000C1
3500K	70	0.455	0.505	2.877	L130-3570HA30000C1
4000K	70	0.458	0.507	2.888	L130-4070HA30000C1
5000K	70	0.466	0.514	2.929	L130-5070HA30000C1
5700K	70	0.466	0.515	2.934	L130-5770HA30000C1
6500K	70	0.468	0.515	2.934	L130-6570HA30000C1
2700K	80	0.438	0.485	2.763	L130-2780HA30000C1
3000K	80	0.448	0.494	2.815	L130-3080HA30000C1
3500K	80	0.45	0.501	2.855	L130-3580HA30000C1
4000K	80	0.459	0.512	2.916	L130-4080HA30000C1
5000K	80	0.46	0.512	2.916	L130-5080HA30000C1
5700K	80	0.453	0.504	2.872	L130-5780HA30000C1
6500K	80	0.463	0.518	2.952	L130-6580HA30000C1
2700K	90	0.42	0.463	2.638	L130-2790HA30000C1
3000K	90	0.426	0.476	2.712	L130-3090HA30000C1
3500K	90	0.429	0.472	2.687	L130-3590HA30000C1
4000K	90	0.437	0.484	2.758	L130-4090HA30000C1
5000K	90	0.435	0.486	2.769	L130-5090HA30000C1
5700K	90	0.441	0.491	2.798	L130-5790HA30000C1
6500K	90	0.446	0.497	2.832	L130-6590HA30000C1

Notes for Table 1:

1. Correlated color temperature is not targeted at T_j=25°C.
2. Luminous flux and CRI are specified at T_j=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7.5% on PPF.
4. PPF data is calculated from luminous flux measurements.

Optical Characteristics

Table 2. Optical characteristics for LUXEON SunPlus 3030 at 65mA, T_j= 25°C

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE ^[1]	TYPICAL VIEWING ANGLE ^[2]
L130-xxxxHx30000x1	160°	110°

Notes for Table 2:

1. Total angle at which 90% of total luminous flux is captured.
2. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON SunPlus 3030 at 65mA, T_j= 25°C

PART NUMBER	FORWARD VOLTAGE ^[1] (V _f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE ^[2] (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L130-xxxxHA30000x1	2.66	2.70	2.76	-1.0 to -2.0	10.0

Notes for Table 3:

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

Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON SunPlus 3030

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current ^[1]	240mA/480mA
Peak Pulsed Forward Current ^[2]	350mA/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 4:

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 SunPlus 3030 LEDs are not designed to be driven in reverse bias.

Characteristics Curves

Spectral Power Distribution Characteristics

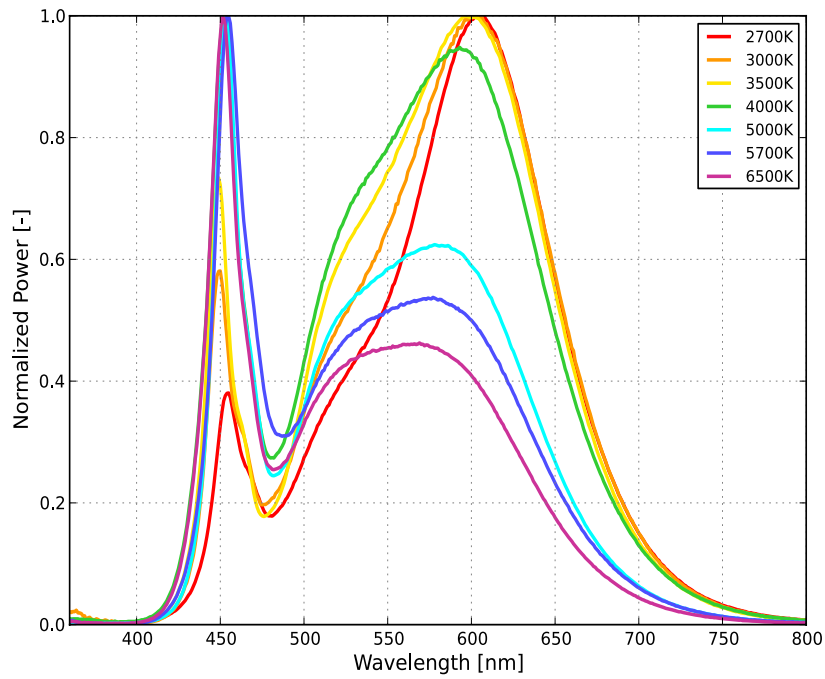


Figure 1a. Typical normalized power vs. wavelength for L130-xx80HA30000x1 at 65mA, $T_j=25^\circ\text{C}$

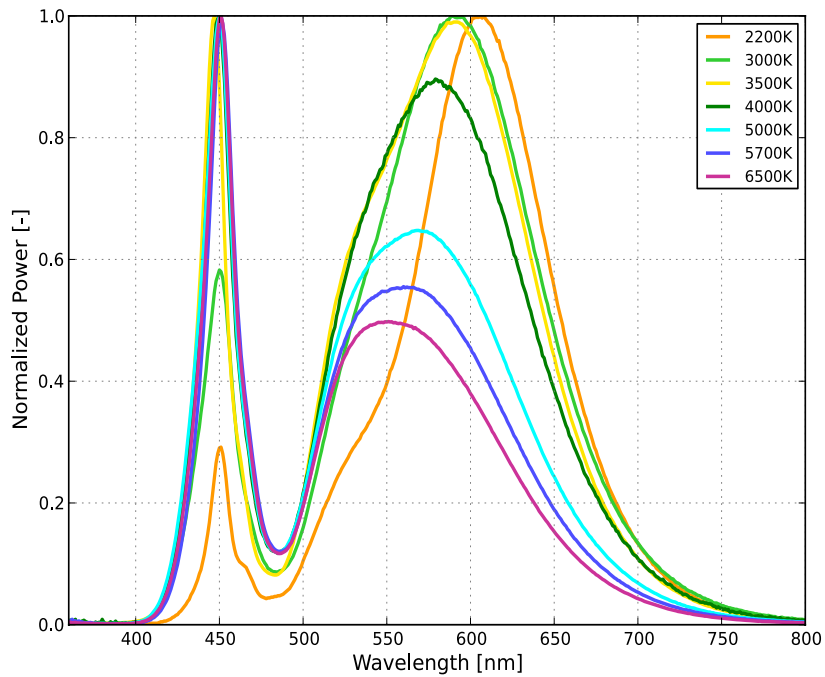


Figure 1b. Typical normalized power vs. wavelength for L130-xx70HA30000x1 at 65mA, $T_j=25^\circ\text{C}$

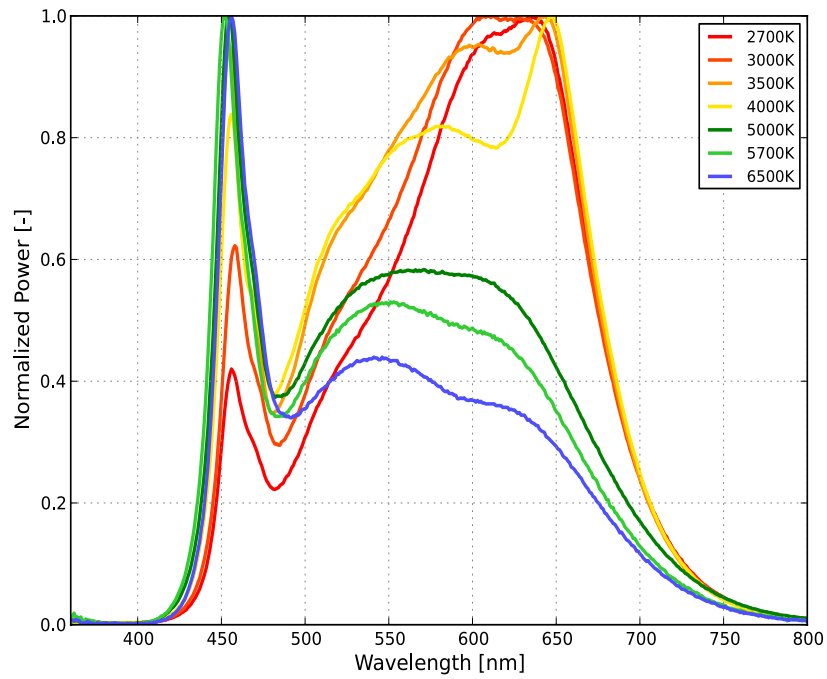


Figure 1c. Typical normalized power vs. wavelength for L130-xx90HA30000x1 at 65mA, $T_j=25^\circ\text{C}$

Light Output Characteristics

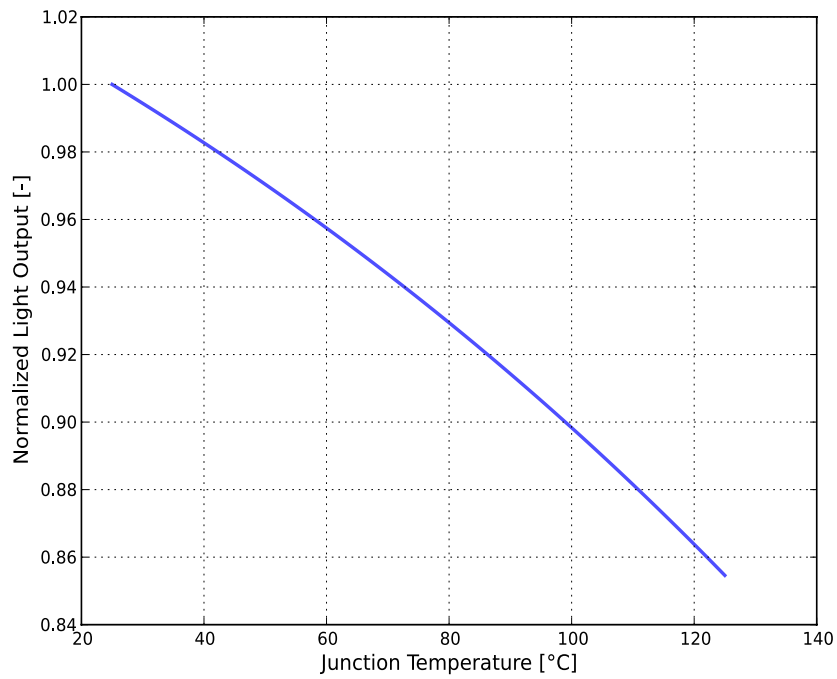
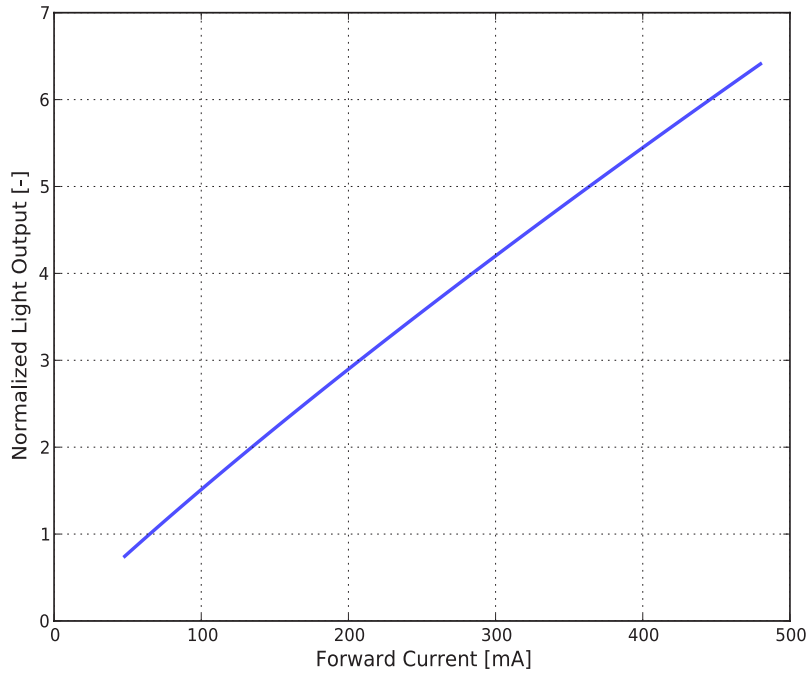


Figure 2. Typical normalized light output vs. junction temperature for L130-xxxxHA30000x1 at 65mA



ESTIMATED TYPICAL RATIO COMPARED TO FLUX AT RATED CONDITION 65mA, $T_j=25^\circ\text{C}$.

60mA	65mA	120mA	150mA	480mA
93%	100%	180%	222%	641%

Figure 3. Typical normalized light output vs. forward current for L130-xxxxHA30000x1 at $T_j=25^\circ\text{C}$

Forward Current Characteristics

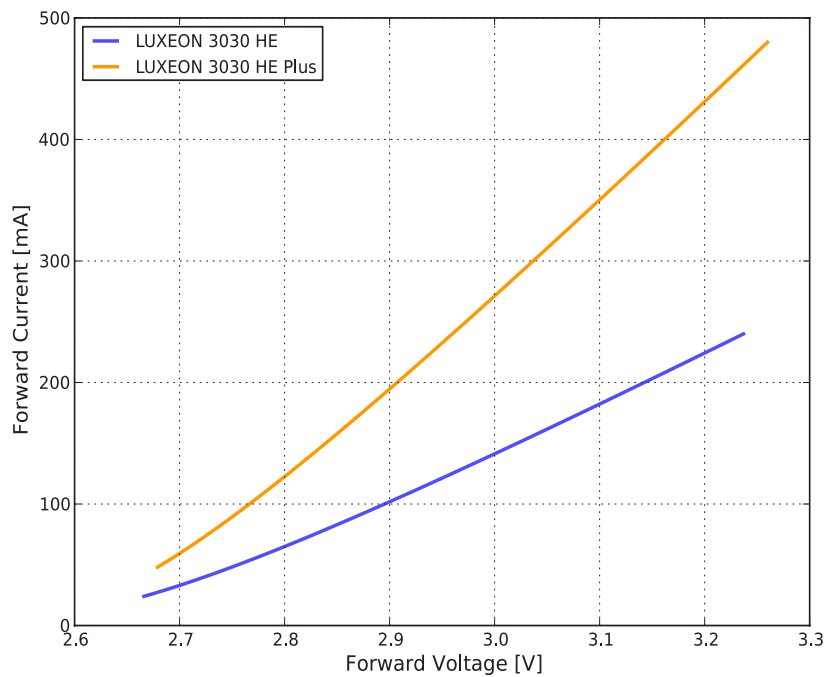


Figure 4. Typical forward current vs. forward voltage for L130-xxxxHA30000x1 at $T_j=25^\circ\text{C}$

Radiation Pattern Characteristics

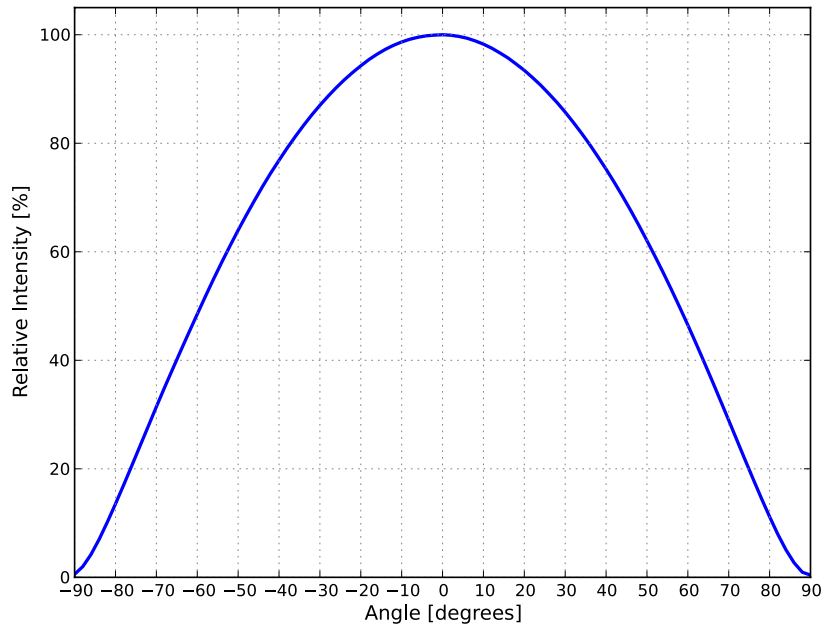


Figure 5. Typical radiation pattern for L130-xxxxHA30000x1 at 65mA, $T_j=25^\circ\text{C}$

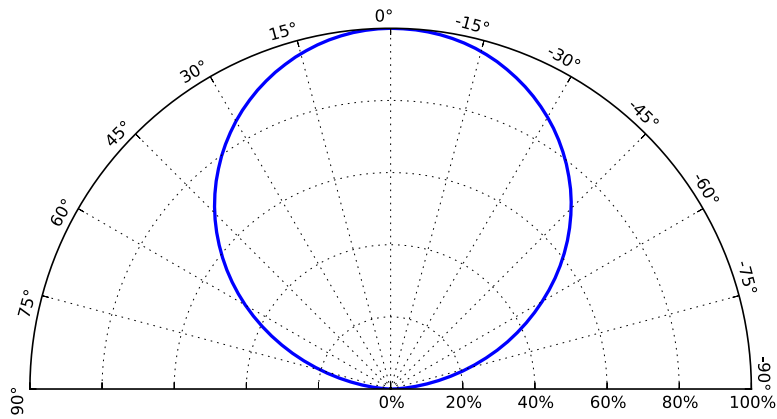


Figure 6. Typical polar radiation pattern for L130-xxxxHA30000x1 at 65mA, $T_j=25^\circ\text{C}$

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 SunPlus 3030 LEDs are labeled using a 4- or 5-digit alphanumeric CAT code following the format below:

A B C D or A x B C D

- A** – designates luminous flux bin (example: F=35.5 to 37.0 lm, G=37.0 to 38.5 lm)
- x** – designates Lumileds internal code
- B C** – designates color bin (example: 5E, 5H, 5F, 5G for 4000K parts)
- D** – designates forward voltage bin (K = 2.65 to 2.75V)

Therefore, a LUXEON SunPlus 3030 with a lumen range of 35.5 to 37.0 lm, color bin of 5E, and a forward voltage range of 2.65 to 2.75V has the following CAT code:

F 5 E K

Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON SunPlus 3030 emitters. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

Table 5. Luminous flux bin definitions for LUXEON SunPlus 3030 at 65mA, $T_j=25^\circ\text{C}$

BIN	LUMINOUS FLUX ⁽¹⁾ (lm)	
	MINIMUM	MAXIMUM
Y	25.0	26.5
Z	26.5	28.0
A	28.0	29.5
B	29.5	31.0
C	31.0	32.5
D	32.5	34.0
E	34.0	35.5
F	35.5	37.0
G	37.0	38.5
H	38.5	40.0
J	40.0	41.5

Notes for Table 5:

1. Lumileds maintains a tolerance of $\pm 7.5\%$ on luminous flux measurements.

Color Bin Definitions

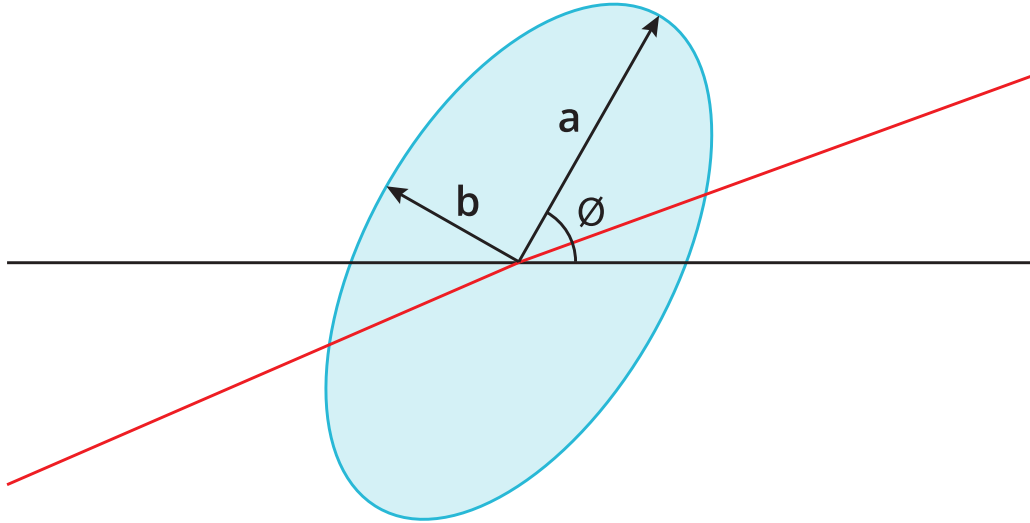


Figure 7. 3- and 5-step MacAdam ellipse illustration for Tables 6a-6g

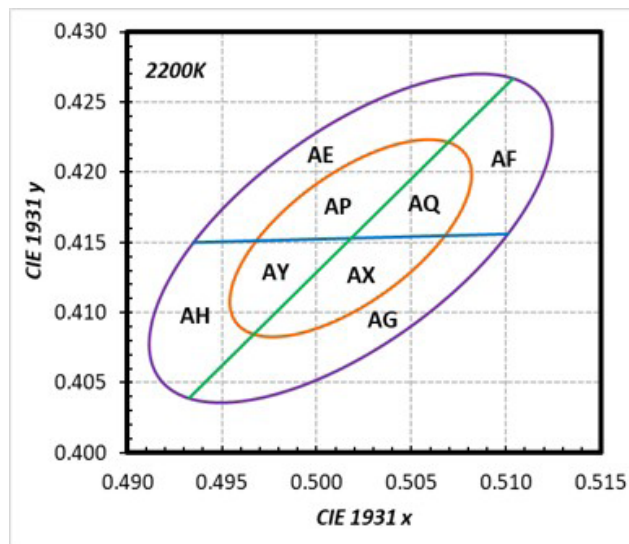


Figure 8a. 1/8th color bin structure for LUXEON 3030 HE and LUXEON 3030 HE Plus 2200K, at 65mA, $T_j=25^\circ\text{C}$

Table 6a. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 3030 HE and LUXEON 3030 HE Plus 2200K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
2200K	Single 3-Step MacAdam ellipse	(0.5018, 0.4153)	0.00860	0.00400	49.27°
2200K	Single 5-Step MacAdam ellipse	(0.5018, 0.4153)	0.01440	0.00660	49.27°

Notes for Table 6a:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

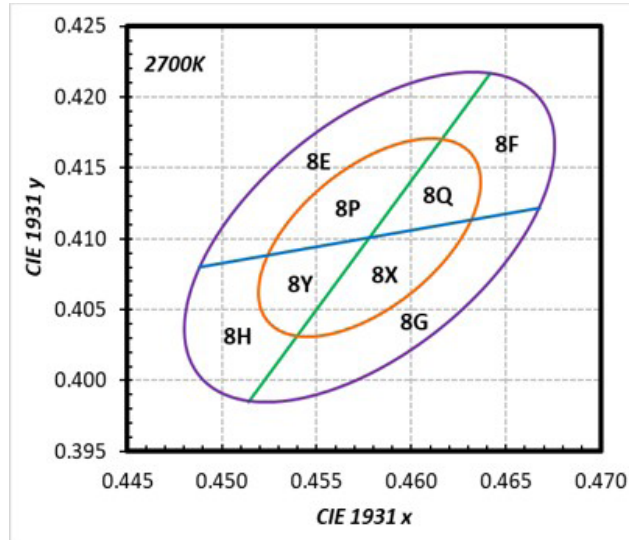


Figure 8b. 1/8th color bin structure for LUXEON SunPlus 3030 2700K, at 65mA, $T_j=25^\circ\text{C}$

Table 6b. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 2700K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
2700K	Single 3-Step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°
2700K	Single 5-Step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°

Notes for Table 6b:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

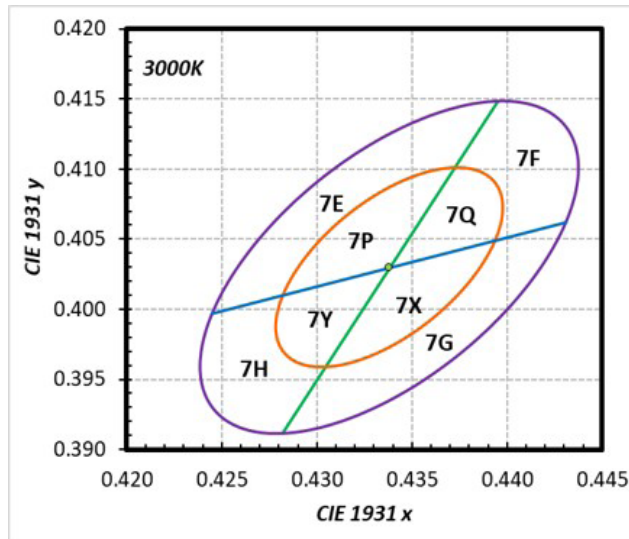


Figure 8c. 1/8th color bin structure for LUXEON SunPlus 3030 3000K, at 65mA, $T_j=25^\circ\text{C}$

Table 6c. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 3000K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
3000K	Single 3-Step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°
3000K	Single 5-Step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°

Notes for Table 6c:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

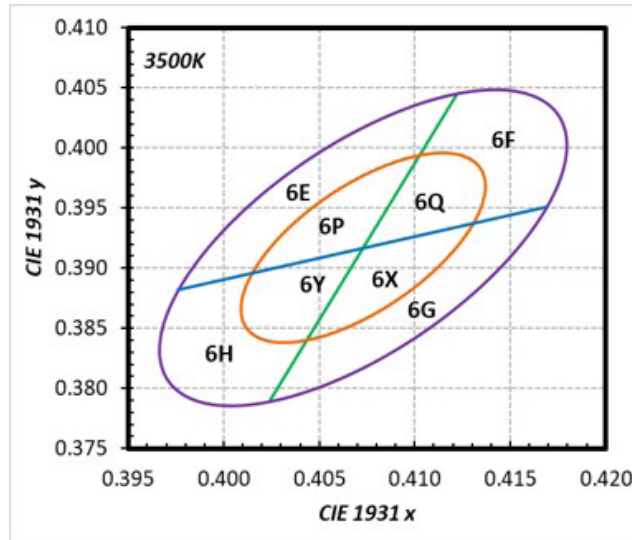


Figure 8d. 1/8th color bin structure for LUXEON SunPlus 3030 3500K, at 65mA, $T_j=25^\circ\text{C}$

Table 6d. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 3500K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
3500K	Single 3-Step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°
3500K	Single 5-Step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°

Notes for Table 6d:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

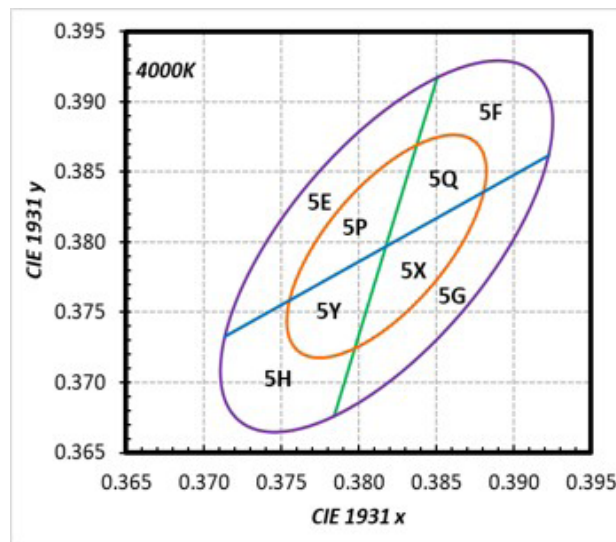


Figure 8e. 1/8th color bin structure for LUXEON SunPlus 3030 4000K, at 65mA, $T_j=25^\circ\text{C}$

Table 6e. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 4000K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
4000K	Single 3-Step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°
4000K	Single 5-Step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°

Notes for Table 6e:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

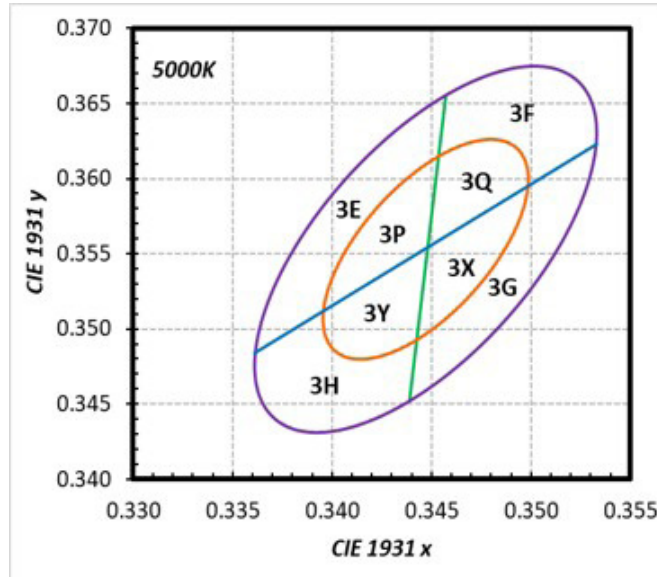


Figure 8f. 1/8th color bin structure for LUXEON SunPlus 3030 5000K, at 65mA, $T_j=25^\circ\text{C}$

Table 6f. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 5000K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
5000K	Single 3-Step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°
5000K	Single 5-Step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°

Notes for Table 6f:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

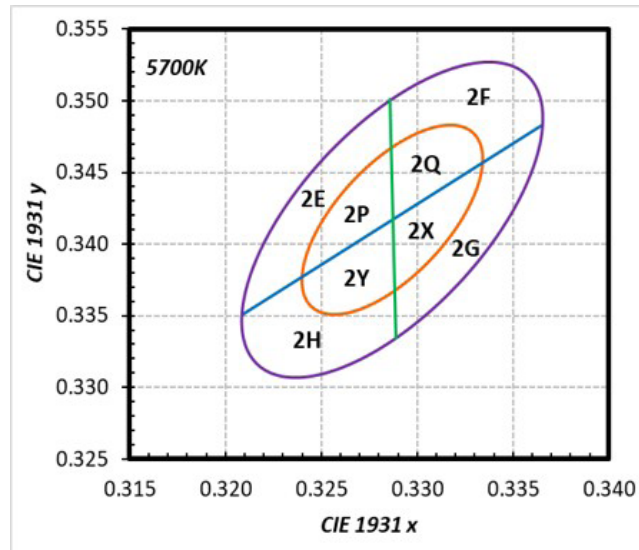


Figure 8g. 1/8th color bin structure for LUXEON SunPlus 3030 5700K, at 65mA, $T_j=25^\circ\text{C}$

Table 6g. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 5700K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
5700K	Single 3-Step MacAdam ellipse	(0.3287, 0.3417)	0.00746	0.00320	59.09°
5700K	Single 5-Step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°

Notes for Table 6g:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

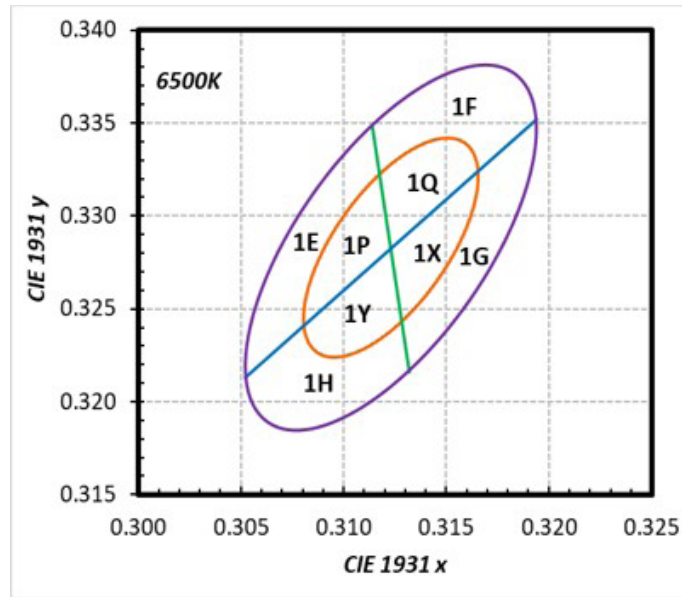


Figure 8h. 1/8th color bin structure for LUXEON SunPlus 3030 6500K, at 65mA, $T_j=25^\circ\text{C}$

Table 6h. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON SunPlus 3030 6500K, at 65mA, $T_j=25^\circ\text{C}$

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
6500K	Single 3-Step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°
6500K	Single 5-Step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°

Notes for Table 6h:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

Forward Voltage Bins

Table 7. Forward voltage bin definitions for L130-xxxxHA30000x1, $T_j=25^\circ\text{C}$

BIN	FORWARD VOLTAGE ⁽¹⁾ (V _f)	
	MINIMUM	MAXIMUM
K	2.66	2.76

Notes for Table 7:

1. Lumileds maintains a tolerance of $\pm 0.1\text{V}$ on forward voltage measurements.

Mechanical Dimensions

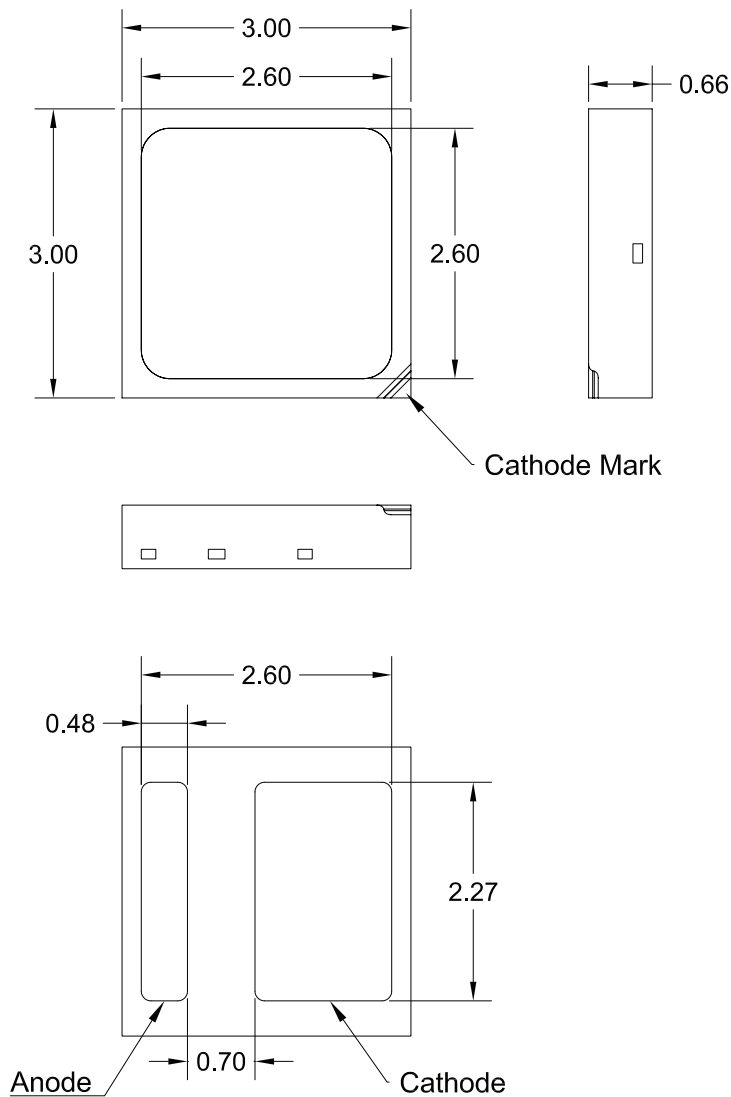


Figure 9. Mechanical dimensions for LUXEON SunPlus 3030

Notes for Figure 9:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Tolerance: $\pm 0.10\text{mm}$.

Reflow Soldering Guidelines

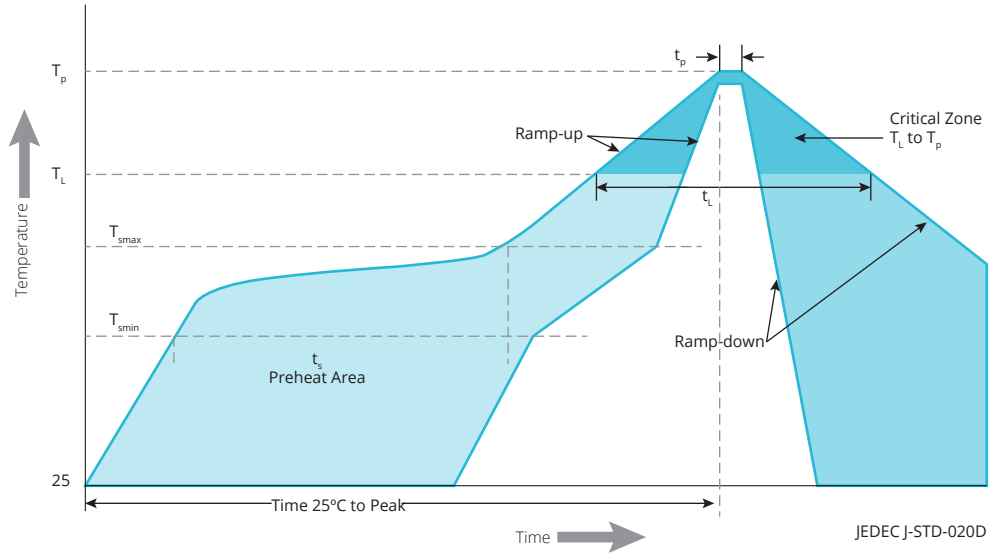


Figure 10. Visualization of the acceptable reflow temperature profile as specified in Table 8

Table 8. Reflow profile characteristics for LUXEON SunPlus 3030

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 8:

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

JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON SunPlus 3030

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

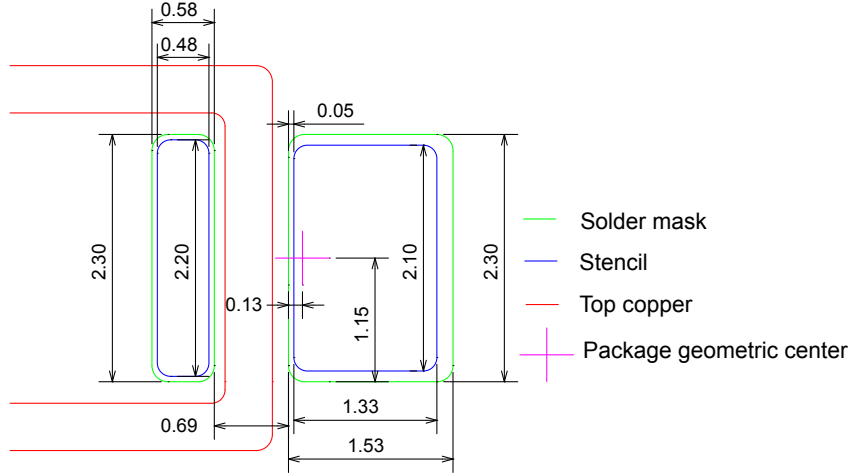


Figure 11. Recommended PCB solder pad layout for LUXEON SunPlus 3030

Notes for Figure 11:

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

Packaging Information

Pocket Tape Dimensions

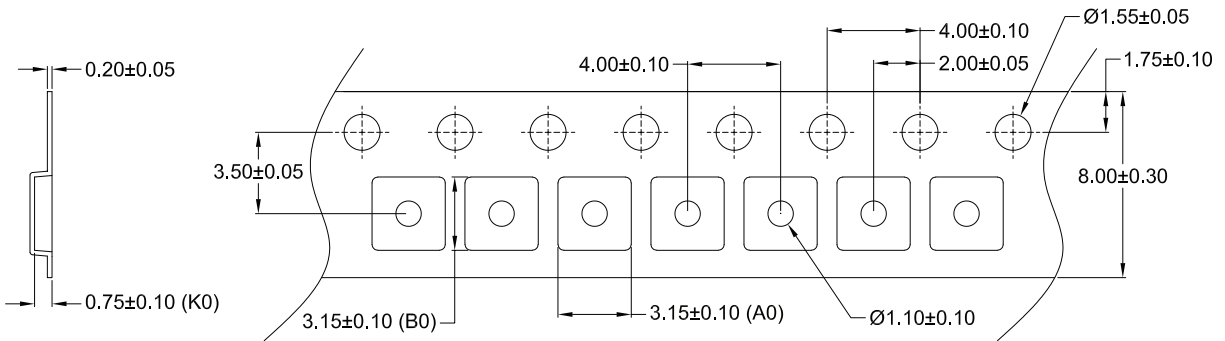


Figure 12. Pocket tape dimensions for LUXEON SunPlus 3030

Notes for Figure 12:

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

Reel Dimensions

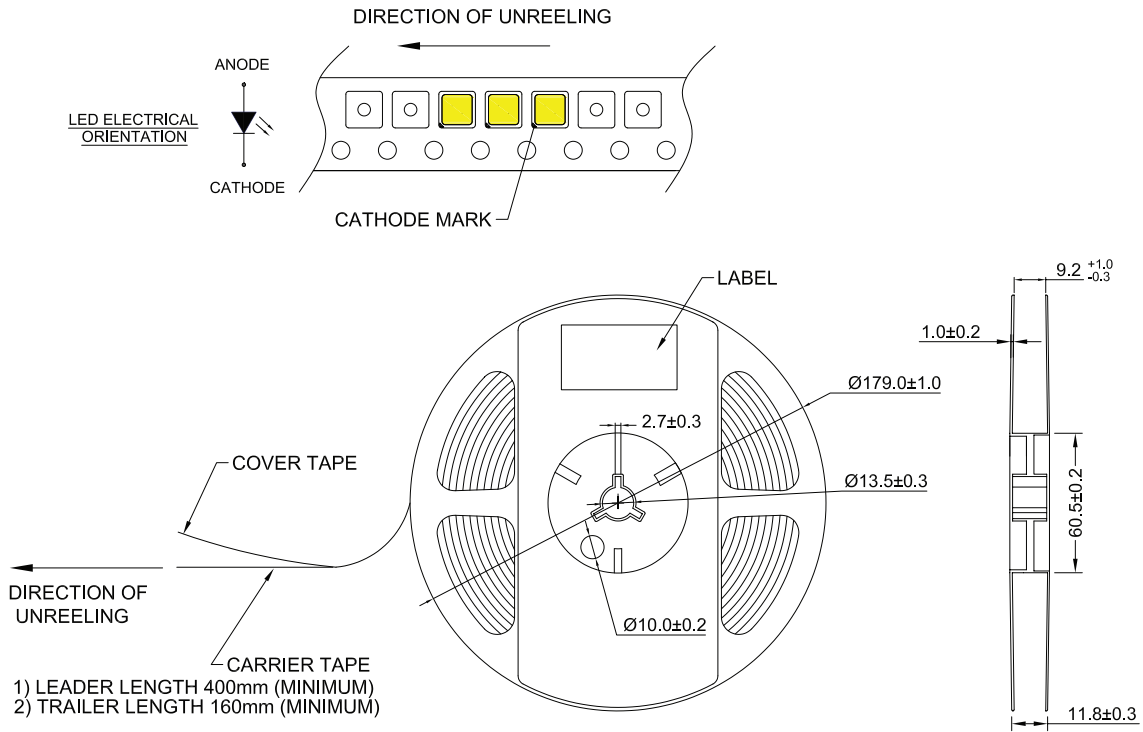


Figure 13. Reel dimensions for LUXEON SunPlus 3030

Notes for Figure 13:

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

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