

# LUXEON CS Pro CoB

High efficacy, superior quality of light and commonly used square footprints for easy design-in

Retail and hospitality lighting needs are crystal clear: very high efficacy and excellent quality of light that make colors pop and encourage customers to engage with displays and products. LUXEON CS Pro CoBs deliver light, efficacy, long-life, and color stability for high-value installations.



## FEATURES AND BENEFITS

- Widely used square footprints for easy design-in
- High performance with superior color stability
- Low thermal resistance enables smaller heatsinks and extends the operating life span
- Supported by a comprehensive optical, mechanical, and electrical ecosystem

## PRIMARY APPLICATIONS

- Track Lights
- Downlights
- Spotlights
- High Bay
- Low Bay
- More...

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# General Product Information

## Product Test Conditions

LUXEON CS Pro CoB LEDs are tested and binned with a DC drive current specified below at a junction temperature,  $T_j$ , of 85°C. Part numbers for LUXEON CS Pro CoB LEDs follow the convention below:

- 720mA – L2C6-AABBCL08A15X0
- 900mA – L2C6-AABBCL10A15X0
- 990mA – L2C6-AABBCL11A22X0

## Part Number Nomenclature

Part numbers for LUXEON CS Pro CoB follow the convention below:

L 2 C 6 – **A A B B C D D D E F F G G**

Where:

- A A** – designates nominal CCT (30=3000K)
- B B** – designates minimum CRI (90=90CRI)
- C** – designates SDCM (2=2-step MacAdam)
- D D D** – designates product configuration (example: L08=1208)
- E** – designates options for product specification
- F F** – designates light emitting surface (LES) size (15=14.5mm, 22=22mm)
- G G** – designates options for product specification

Therefore, the following part number is used for a LUXEON CS Pro CoB 1208, 3000K 90CRI, 2 SDCM with a 14.5mm LES:

L 2 C 6 – **3 0 9 0 2 L 0 8 A 1 5 X 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 CS Pro CoB 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).

## Use Limitations

LUXEON CS Pro CoB is for use in commercial illumination products and cannot be use for medical equipment, airfields, runways, aircraft, stage and studio applications, or for consumer products sold through retailers, e-commerce or DIY and homebuilder channels. LUXEON CS Pro CoB is recommended for use in dry environments (not for use in wet environments).

## Performance Characteristics

### Product Selection Guide

Table 1. Product performance of LLUXEON CS Pro CoB at specified test current,  $T_j=85^\circ\text{C}$ .

LES <sup>[4]</sup> (mm)	NOMINAL CCT	MINIMUM CRI <sup>[1, 2, 3]</sup>	LUMINOUS FLUX <sup>[1]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	ENERGY EFFICIENCY CLASS <sup>[5]</sup>	PART NUMBER
			MINIMUM	TYPICAL				
15	3000K	90	3355	3728	153	720	D	L2C6-30902L08A15X0
15	3000K	90	4214	4682	153	900	D	L2C6-30902L10A15X0
22	3000K	90	4657	5174	154	990	D	L2C6-30902L11A22X0

**Notes for Table 1:**

- Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 6.5\%$  on luminous flux measurements.
- Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
- R9 value of 90CRI products is  $>50$ .
- Light Emitting Surface (LES) is the inner diameter (phosphor area) inside the dam.
- Energy efficiency class as specified in Commission Delegated Regulation (EU) 2019/2015. The available range of energy efficiency classes is A-G.

## Optical Characteristics

Table 2. Optical characteristics for LUXEON CS Pro CoB at specified test current,  $T_j=85^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L2C6-xxxxxxxAxxX0	135°	115°

**Notes for Table 2:**

- Total angle at which 90% of total luminous flux is captured.
- Viewing angle is the off axis angle from the LED centerline where the luminous intensity is  $\frac{1}{2}$  of the peak value.

## Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON CS Pro CoB at specified test current,  $T_j=85^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/ $^\circ\text{C}$ )	TYPICAL THERMAL RESISTANCE—JUNCTION TO CASE <sup>[3]</sup> ( $^\circ\text{C}/\text{W}$ )
	MINIMUM	TYPICAL	MAXIMUM		
L2C6-xxxxxL08A15X0	32.5	33.9	35.5	10	0.20
L2C6-xxxxxL10A15X0	32.5	33.9	35.5	10	0.18
L2C6-xxxxxL11A22X0	32.5	33.9	35.5	10	0.16

**Notes for Table 3:**

- Lumileds maintains a tolerance of  $\pm 0.06\text{V}$  on forward voltage measurements.
- Measured between  $25^\circ\text{C}$  and  $85^\circ\text{C}$ .
- Thermal resistance is measured between junction and the bottom of the LUXEON CoB substrate.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON CS Pro CoB.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	2.5x test current
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 3B
Operating Case Temperature <sup>[1]</sup>	-40°C to 105°C
LED Storage Temperature	-40°C to 120°C
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

**Notes for Table 4:**

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- 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 20% of the maximum allowable DC forward current

## Characteristic Curves

### Spectral Power Distribution Characteristics

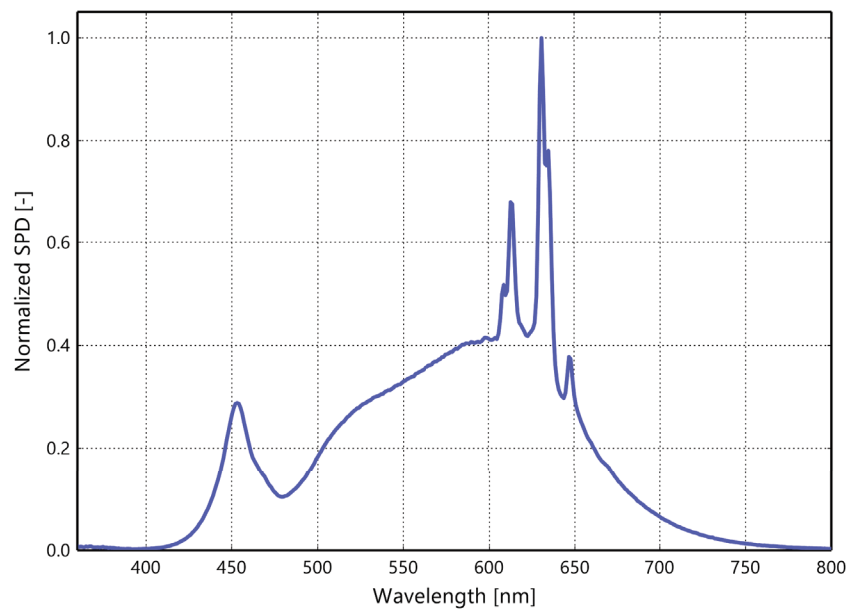


Figure 1a. Typical normalized power vs. wavelength for L2C6-xx90xxxxAxxX0 at specified test current,  $T_j=85^\circ\text{C}$ .

# Light Output Characteristics

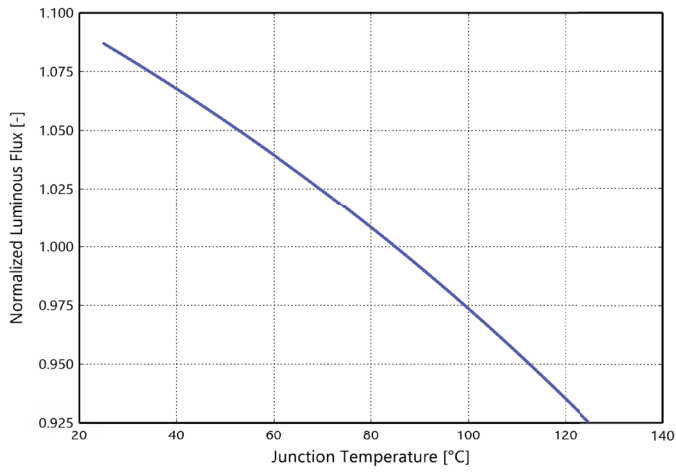


Figure 2. Typical normalized light output vs. junction temperature for L2C6-xxxxLxxAxxX0 at specified test current.

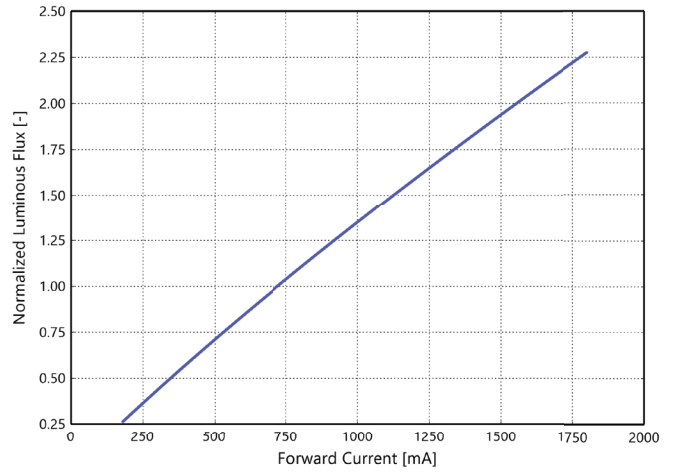


Figure 3a. Typical normalized light output vs. forward current for L2C6-xxxxL08A15X0 at  $T_j=85^\circ\text{C}$ .

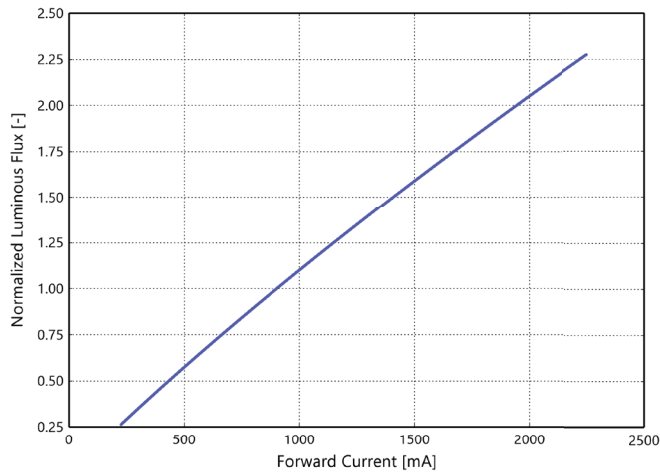


Figure 3b. Typical normalized light output vs. forward current for L2C6-xxxxL10A15X0 at  $T_j=85^\circ\text{C}$ .

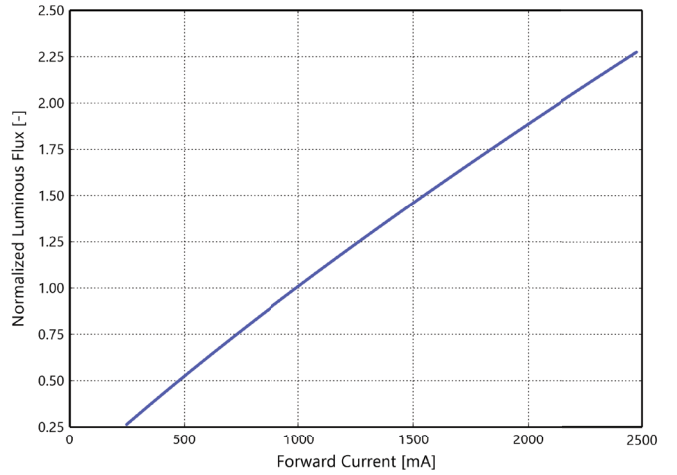


Figure 3c. Typical normalized light output vs. forward current for L2C6-xxxxL11A22X0 at  $T_j=85^\circ\text{C}$ .

# Forward Current Characteristics

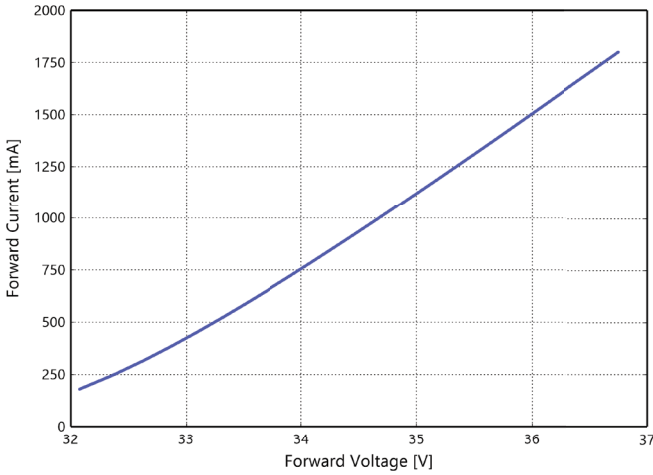


Figure 4a. Typical forward current vs. forward voltage for L2C6-xxxxL08A15X0 at  $T_j=85^\circ\text{C}$ .

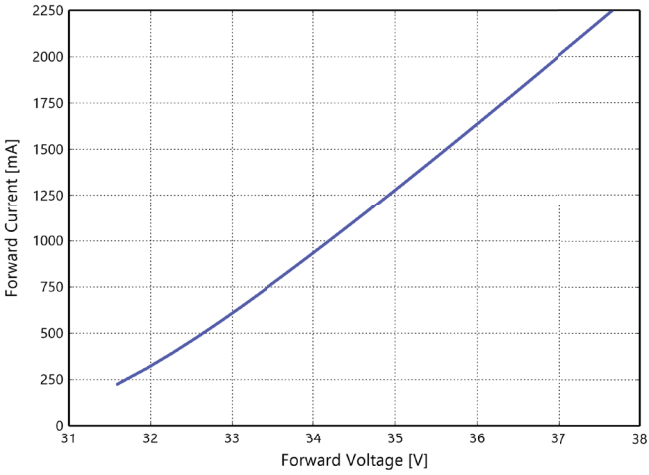


Figure 4b. Typical forward current vs. forward voltage for L2C6-xxxxL10A15X0 at  $T_j=85^\circ\text{C}$ .

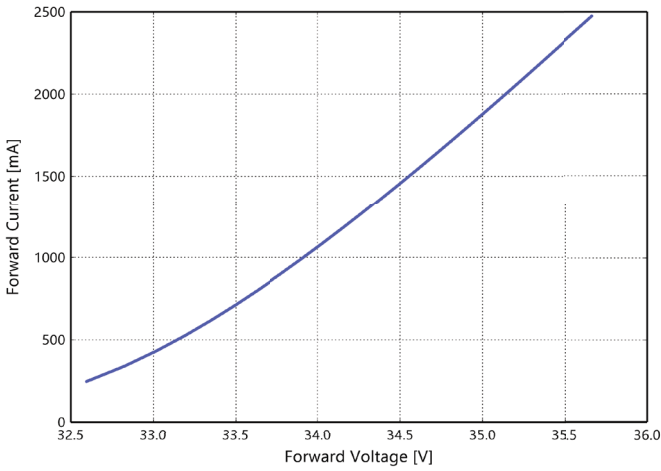


Figure 4c. Typical forward current vs. forward voltage for L2C6-xxxxL11A22X0 at  $T_j=85^\circ\text{C}$ .

# Radiation Pattern Characteristics

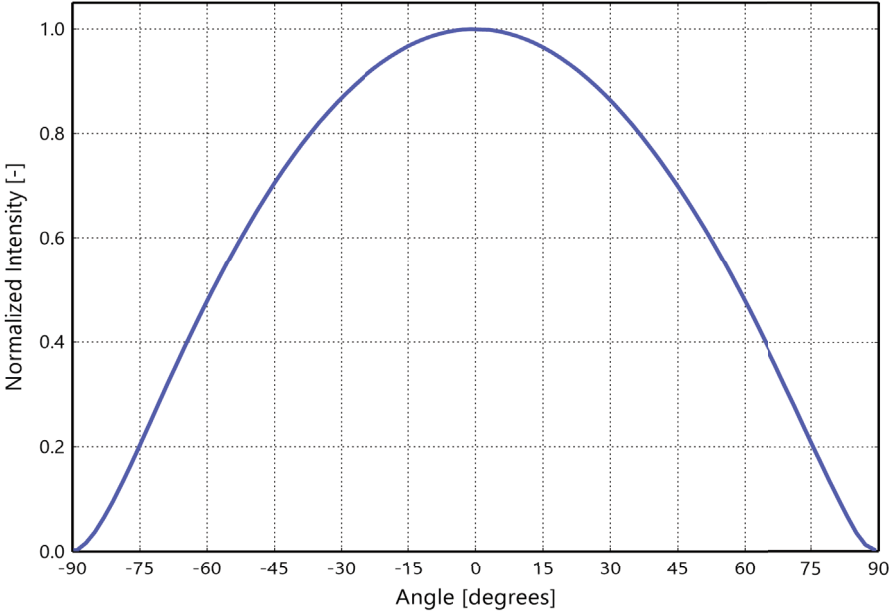


Figure 5. Typical radiation pattern for LUXEON CS Pro CoB at specified test current,  $T_j=85^{\circ}\text{C}$ .

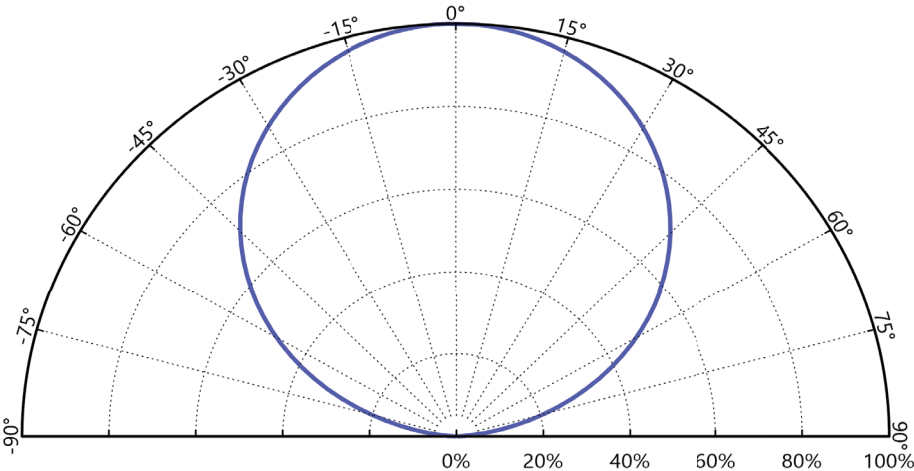


Figure 6. Typical polar radiation pattern for LUXEON CS Pro CoB at specified test current,  $T_j=85^{\circ}\text{C}$ .

# Color Bin Definitions

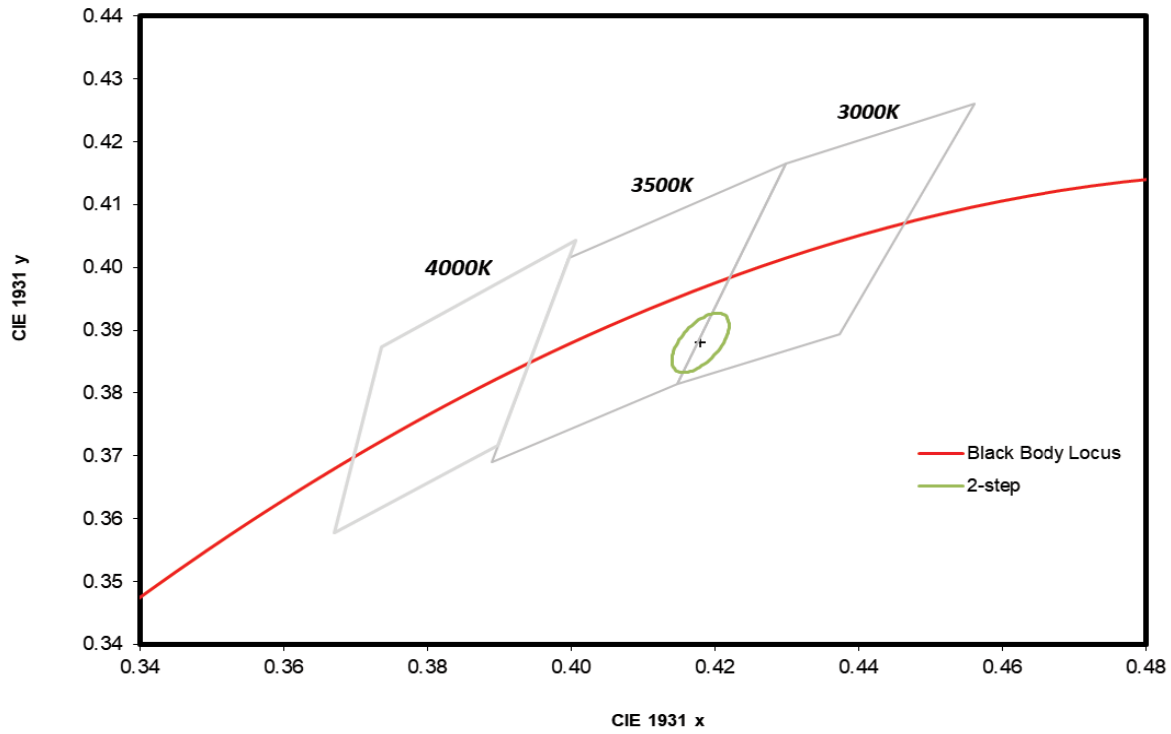


Figure 7. 2-step MacAdam ellipse illustration for Table 5.

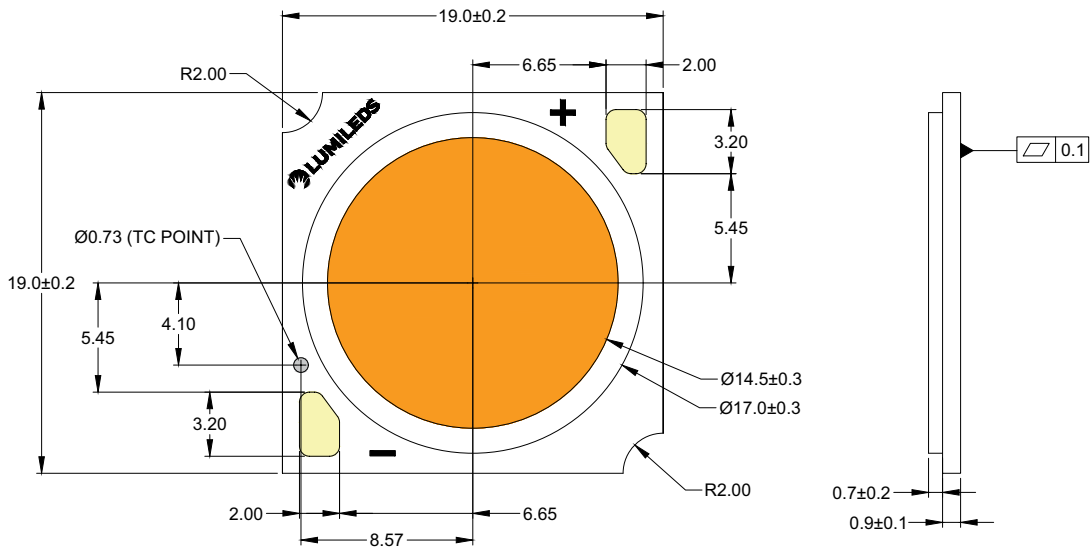
Table 5. 2-step MacAdam ellipse color bin definitions for LUXEON CS Pro CoB.

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$
3000K	Single 2-step MacAdam ellipse	(0.4180, 0.3880)	0.00556	0.00272	53.20°

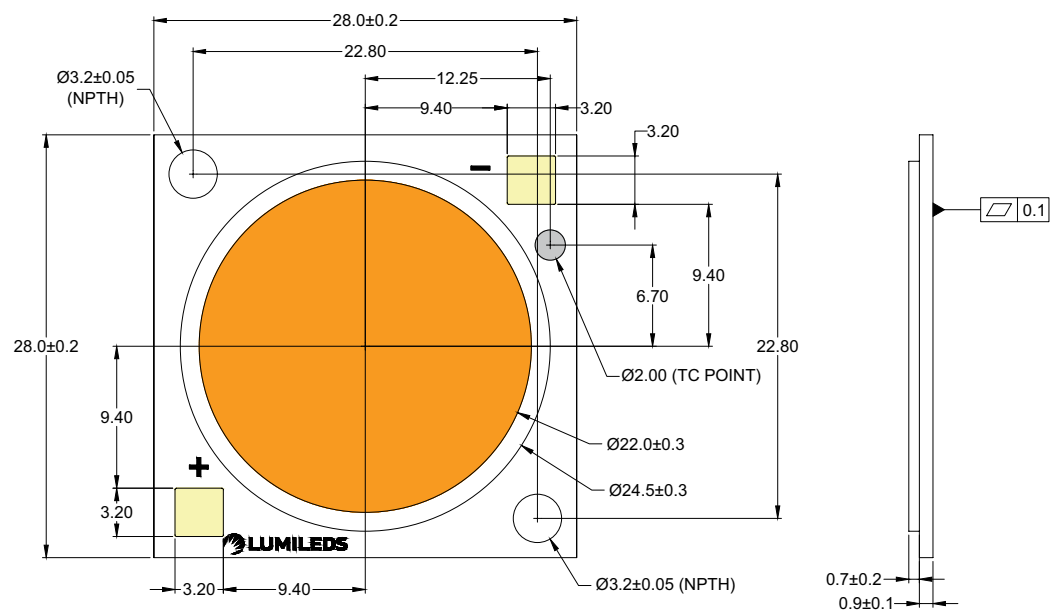
**Notes for Table 5:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

# Mechanical Dimensions



L2C6-xx90xL08x15X0, L2C6-xx90xL10x15X0



L2C6-xx90xL11x22X0

Figure 8. Mechanical dimensions for LUXEON CS Pro CoB.

- Notes for Figure 8:
1. Drawings are not to scale.
  2. All dimensions are in millimeters.

# Packaging Information

LUXEON CS Pro CoB LEDs are packaged in trays then in a carton box. Each tray contains a specified number of LEDs. The LEDs in each tray come from a single category code, ensuring they are all well-matched for light output, color, and forward voltage. Each tray contains a rubber stopper at one end. The tray label has both alphanumeric and bar code information. The carton boxes have printed information providing part numbers with CAT codes that indicate luminous flux, color and forward voltage bins.

## Total Units per Tray

Table 6. Number of LEDs per tray for LUXEON CS Pro CoB.

PART NUMBER	TOTAL UNITS PER TRAY	TOTAL TRAYS PER INNER BOX	TOTAL UNITS PER INNER BOX
L2C6-xxxxxL08x15X0	36	2	72
L2C6-xxxxxL10x15X0	36	2	72
L2C6-xxxxxL11x22X0	30	2	60

## Tray Dimensions

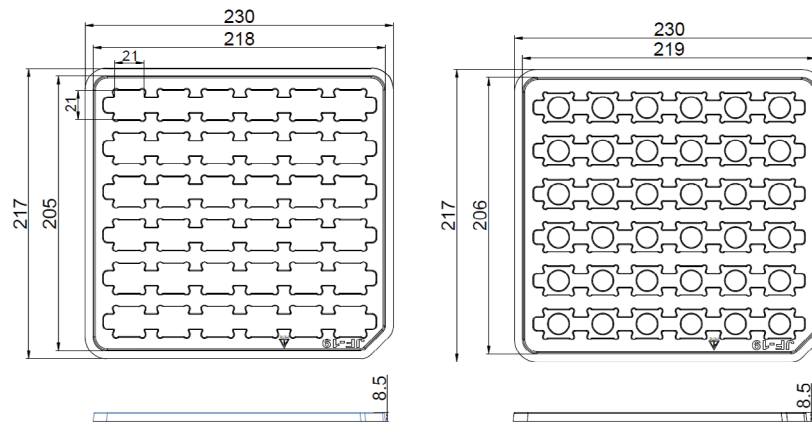


Figure 9a. Tray dimensions for L2C6-xxxxxL08x15X0, L2C6-xxxxxL10x15X0.

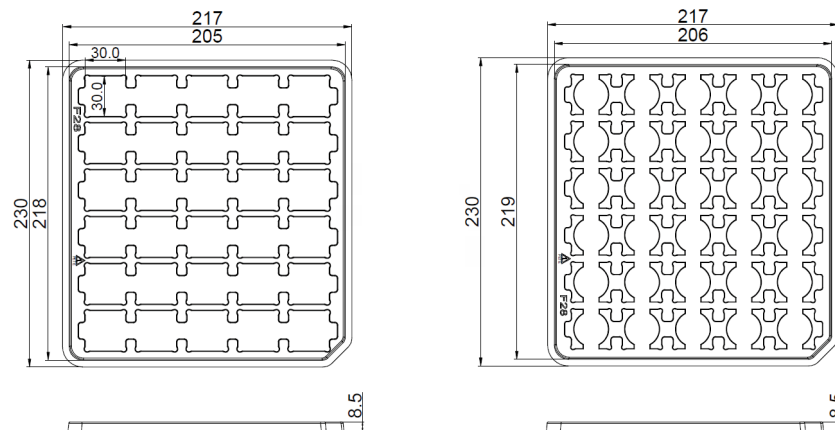


Figure 9b. Tray dimensions for L2C6-xxxxxL11x22X0.

Notes for Figures 9a and 9b:

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

# Inner Box

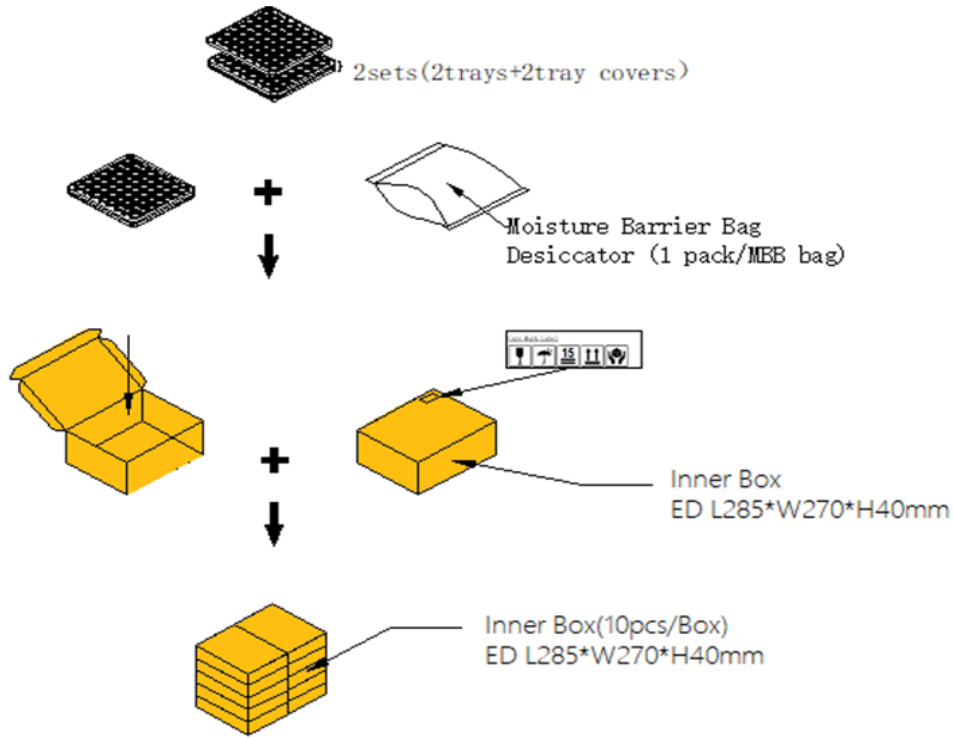


Figure 10. Dimensions for inner box and outer box packaging for LUXEON CS Pro CoB.

Table 7. Inner box information for LUXEON CS Pro CoB.

BOX TYPE	DIMENSIONS (mm)			AVERAGE WEIGHT (160pcs/box)
	H	L	W	
Inner Box	40	285	270	0.376Kg



Figure 11. Example of inner box label and tray label for LUXEON CS Pro CoB.

Notes for Figure 11 – Inner Box Label descriptions for customer use:

Field labels not described are for Lumileds internal use only.

1. Lumileds part number.
2. Number of LED emitters in a box.
3. LED test date in YYWW format.
4. Customer part number for custom requests only.
5. Unique production lot identification number. This number is required for traceability purpose.
6. Product category code.
7. EU regulatory address.

# Outer Box

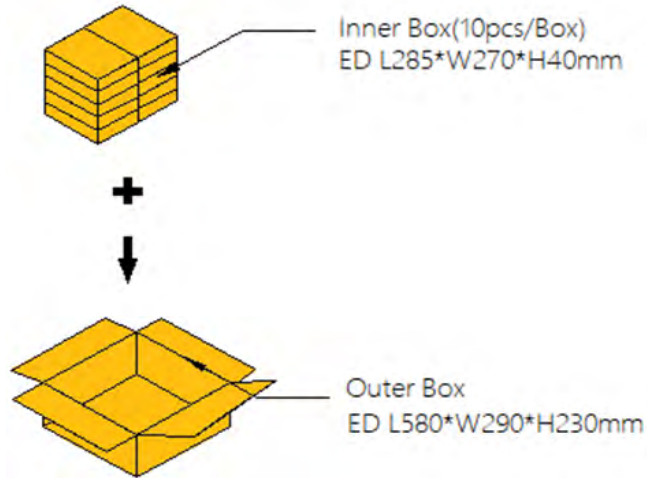


Figure 12. Dimensions for outer box packaging for LUXEON CS Pro CoB.

Table 8. Outer box information for LUXEON CS Pro CoB.

BOX TYPE	DIMENSIONS (mm)			MAXIMUM INNER BOXES PER OUTER BOX	MAXIMUM QUANTITY PER OUTER BOX	AVERAGE WEIGHT (50pcs/box)
	H	L	W			
Outer Box	230	580	290	10	1600	4.412Kg

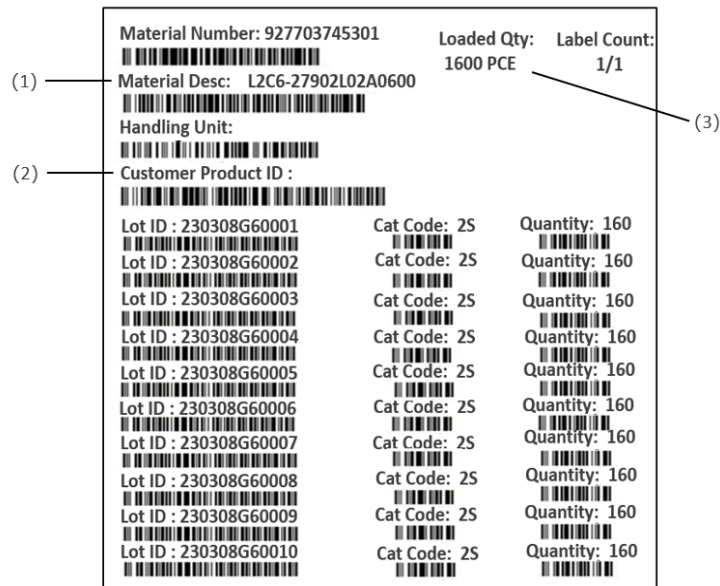


Figure 13. Example of outer box label for LUXEON CS Pro CoB.

Notes for Figure 13 – Outer Box Label descriptions for customer use:  
 Field labels not described are for Lumileds internal use only.

1. Lumileds part number.
2. Customer part number for custom requests only.
3. Total number of LED emitters in a shipment box.

# About Lumileds

Lumileds is a global leader in LED and microLED technology, innovation, and solutions for the automotive, display, illumination, mobile, and other markets where light sources are essential. Our approximately 3,500 employees operate in over 15 countries and partner with our customers to deliver never before possible solutions for lighting, safety, and well-being..

To learn more about our lighting solutions, visit [lumileds.com](https://lumileds.com).



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