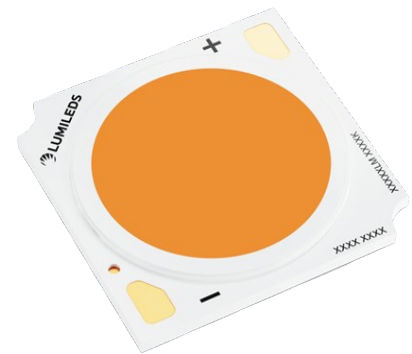


# LUXEON CS CoB with CrispWhite Technology

Fashion retail lighting that makes an impact, revealing the whitest whites

The LUXEON CoB with CrispWhite Technology creates the most impactful retail lighting ever available by revealing the whitest whites. LUXEON CoB with CrispWhite Technology delivers a natural crisp whiteness by activating Fluorescent Whitening Agents (FWAs) in paints and fabrics to attractively display merchandise in retail shops; ideal for CDM/CMH replacement.



## FEATURES AND BENEFITS

- Spectral wavelength distribution that excites whitening agents
- Enhanced white and color rendering
- 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
- [More...](#)



This light source is intended only for use in retail lighting and other lighting applications that require excitation of optical brighteners with UV or violet light.

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# General Product Information

## Product Test Conditions

LUXEON CS CoB with CrispWhite Technology LEDs are tested and binned with a DC drive current specified below at a junction temperature,  $T_j$ , of 85°C.

180mA	-	L2C6-AABBCL02A06C0
270mA	-	L2C6-AABBCL03A09C0
360mA	-	L2C6-AABBCL04A09C0
450mA	-	L2C6-AABBCL05A13C0
720mA	-	L2C6-AABBCL08A15C0
990mA	-	L2C6-AABBCL11A22C0

## Part Number Nomenclature

Part numbers for LUXEON CS CoB with CrispWhite Technology follow the convention below:

L 2 C 6 – **A A B B C D D D E E F F**

Where:

- A A** – designates nominal CCT (30=3000K)
- B B** – designates minimum CRI (90=90CRI, 95=95 CRI))
- C** – designates SDCM (2=2 step Macadam, 3=3 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 (06=6.3mm, 09=9.8mm, 13=13mm, 15=14.5mm, 22=22mm)
- G G** – designates options for product specification

Therefore, the following part number is used for a LUXEON CS CoB with CrispWhite Technology 1208, 3000K 90CRI, 3 SDCM with a 14.5mm LES:

L 2 C 6 – **3 0 9 0 3 L 0 8 A 1 5 C 0**

## Lumen Maintenance

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

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON CS CoB with CrispWhite Technology 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 CS CoB with CrispWhite Technology 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)	PART NUMBER
			MINIMUM	TYPICAL			
6.3	3000K	90	633	703	114	180	L2C6-30903L02A06C0
9.8	3000K	90	971	1079	116	270	L2C6-30903L03A09C0
9.8	3000K	90	1282	1424	115	360	L2C6-30903L04A09C0
13	3000K	90	1618	1798	116	450	L2C6-30903L05A13C0
14.5	3000K	90	2578	2864	116	720	L2C6-30903L08A15C0
22	3000K	90	3608	4009	118	990	L2C6-30903L11A22C0
6.3	3000K	95	624	693	112	180	L2C6-30953L02A06C0
9.8	3000K	95	957	1063	114	270	L2C6-30953L03A09C0
9.8	3000K	95	1263	1403	113	360	L2C6-30953L04A09C0
13	3000K	95	1596	1773	115	450	L2C6-30953L05A13C0
14.5	3000K	95	2525	2806	113	720	L2C6-30953L08A15C0
22	3000K	95	3554	3949	116	990	L2C6-30953L11A22C0

**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 CoB with CrispWhite Technology 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-xxxxxxxAxx00	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 CoB with CrispWhite Technology 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/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO CASE <sup>[3]</sup> (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L2C6-xxxxxL02A0600	32.7	34.4	36.1	-12	0.72
L2C6-xxxxxL03A0900	32.7	34.4	36.1	-12	0.44
L2C6-xxxxxL04A0900	32.7	34.4	36.1	-12	0.35
L2C6-xxxxxL05A1300	32.7	34.4	36.1	-12	0.26
L2C6-xxxxxL08A1500	32.7	34.4	36.1	-12	0.20
L2C6-xxxxxL11A2200	32.7	34.4	36.1	-12	0.14

**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 CoB with CrispWhite Technology

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:**

1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. 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

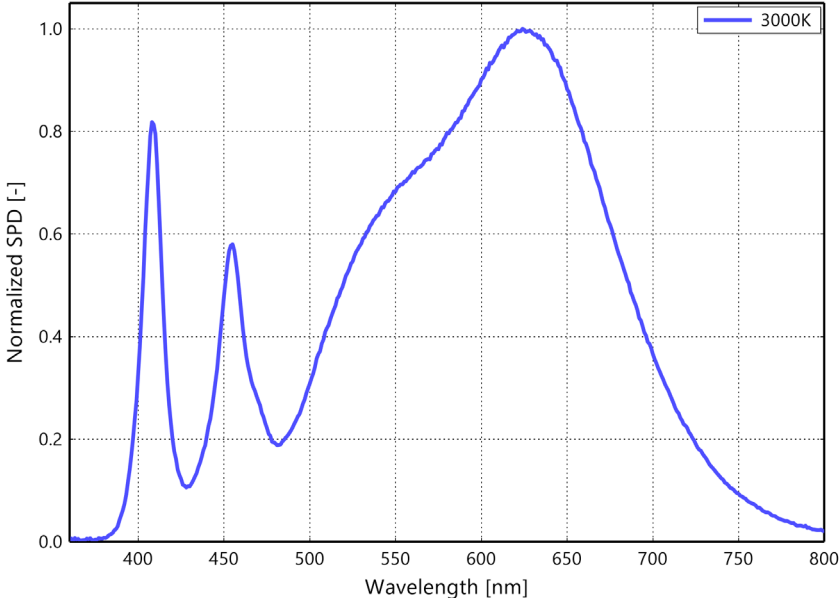


Figure 1a. Typical normalized power vs. wavelength for L2C6-3090xxxxAxxC0 at specified test current,  $T_j=85^{\circ}\text{C}$

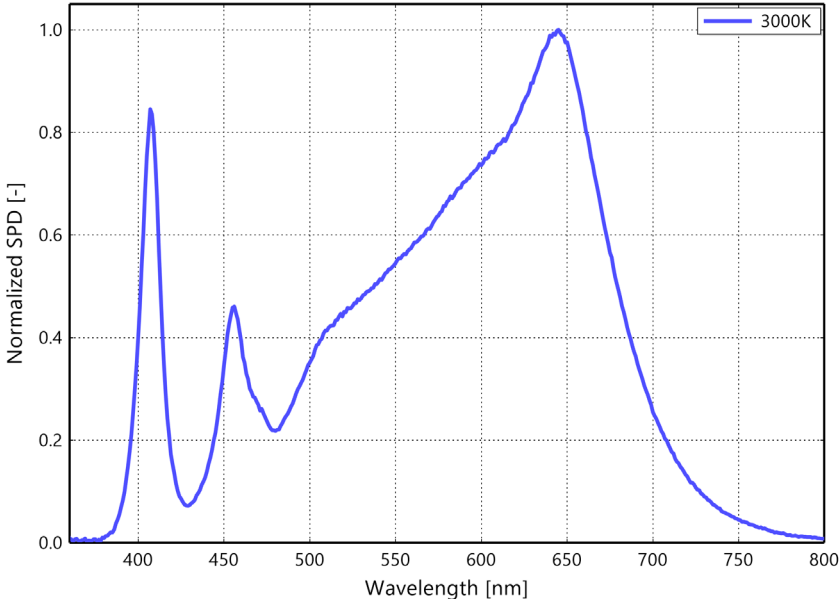


Figure 1b. Typical normalized power vs. wavelength for L2C6-3095xxxxAxxC0 at specified test current,  $T_j=85^{\circ}\text{C}$

# Light Output Characteristics

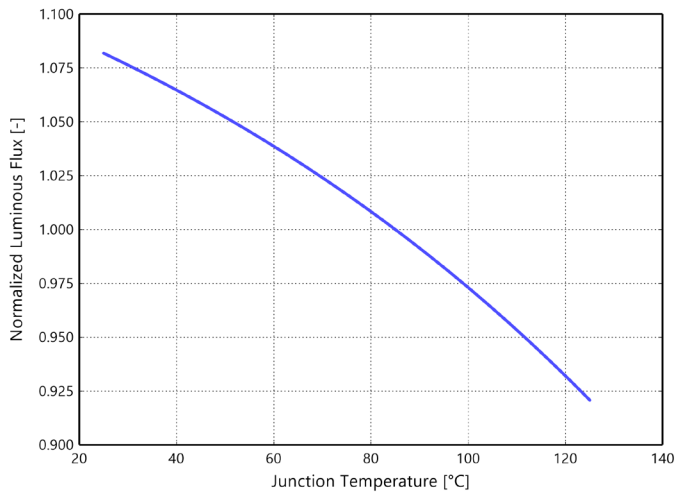


Figure 2. Typical normalized light output vs. junction temperature for L2C6-30xxxxAxxC0 at specified test current

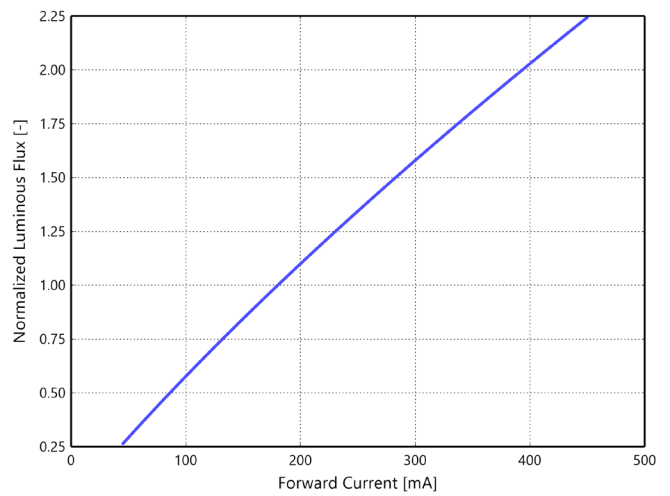


Figure 3a. Typical normalized light output vs. forward current for L2C6-30xxxL02A06C0 at  $T_j=85^\circ\text{C}$

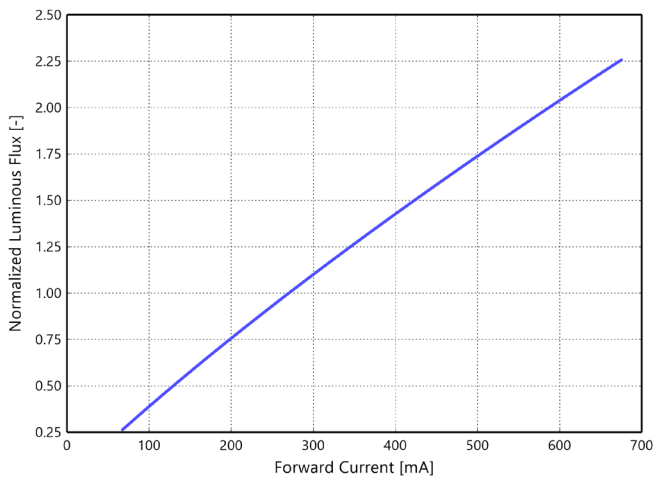


Figure 3b. Typical normalized light output vs. forward current for L2C6-30xxxL03A09C0 at  $T_j=85^\circ\text{C}$

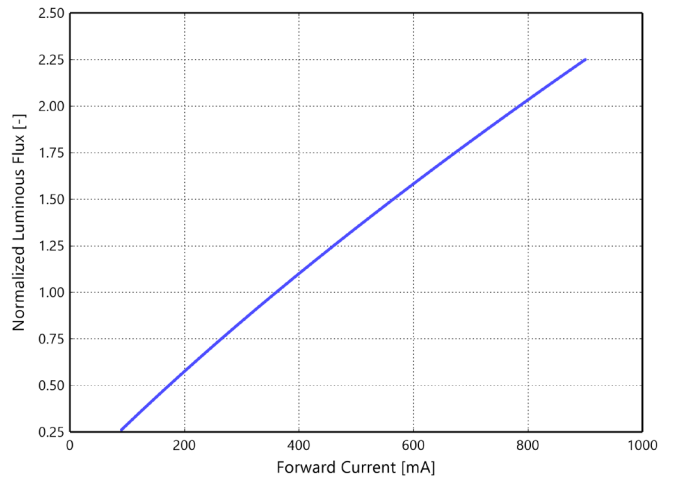


Figure 3c. Typical normalized light output vs. forward current for L2C6-30xxxL04A09C0 at  $T_j=85^\circ\text{C}$

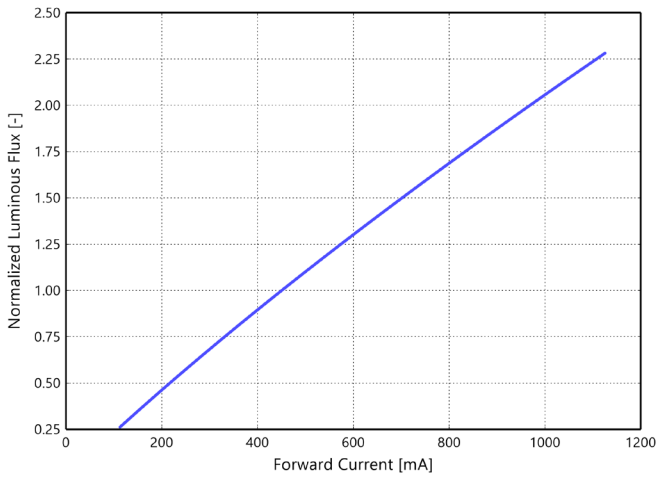


Figure 3d. Typical normalized light output vs. forward current for L2C6-30xxxL05A13C0 at  $T_j=85^\circ\text{C}$

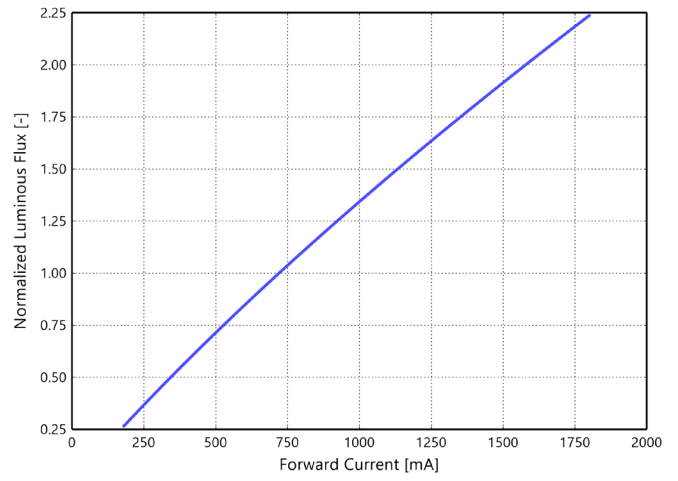


Figure 3e. Typical normalized light output vs. forward current for L2C6-30xxxL08A15C0 at  $T_j=85^\circ\text{C}$

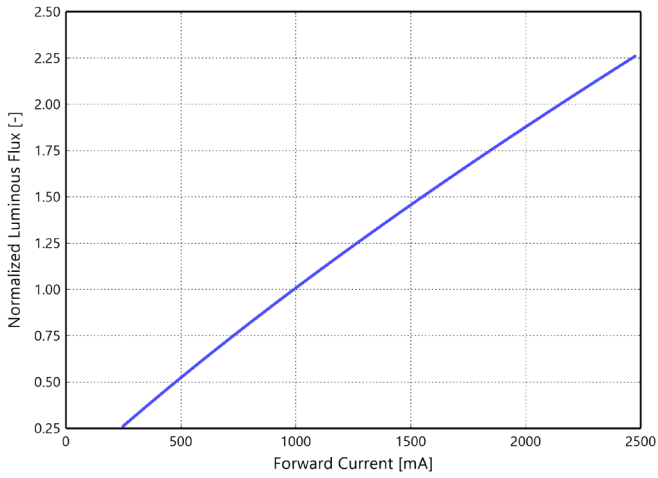


Figure 3f. Typical normalized light output vs. forward current for L2C6-30xxxL11A22C0 at  $T_j=85^\circ\text{C}$

# Forward Current Characteristics

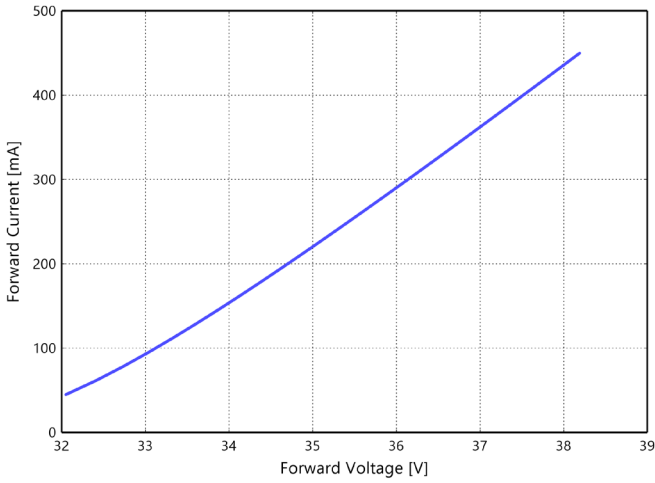


Figure 4a. Typical forward current vs. forward voltage for L2C6-30xxxL02A06C0 at  $T_j=85^\circ\text{C}$

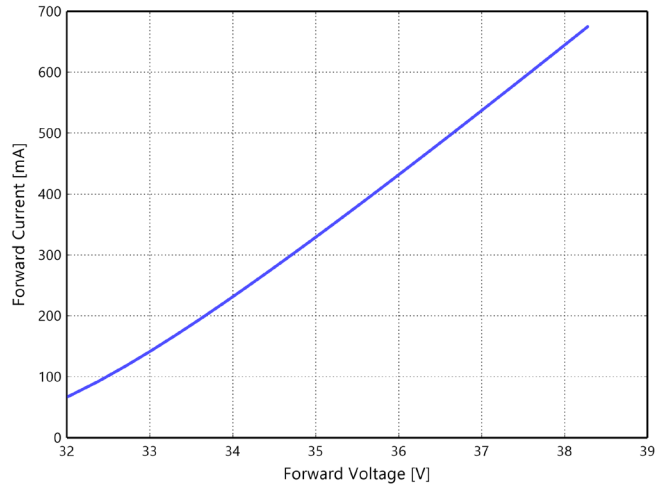


Figure 4b. Typical forward current vs. forward voltage for L2C6-30xxxL03A09C0 at  $T_j=85^\circ\text{C}$

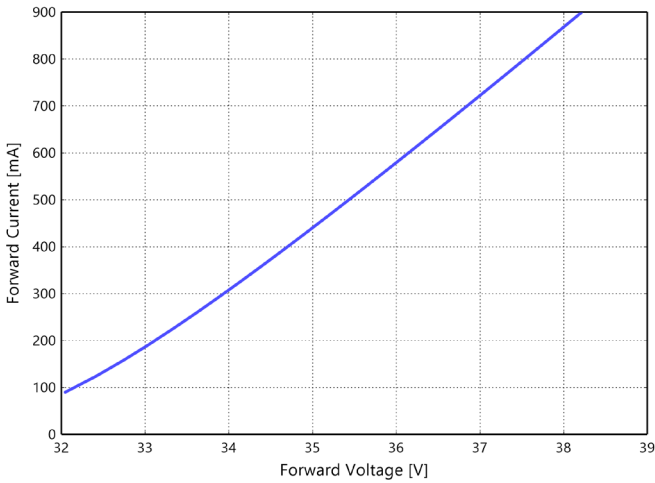


Figure 4c. Typical forward current vs. forward voltage for L2C6-30xxxL04A09C0 at  $T_j=85^\circ\text{C}$

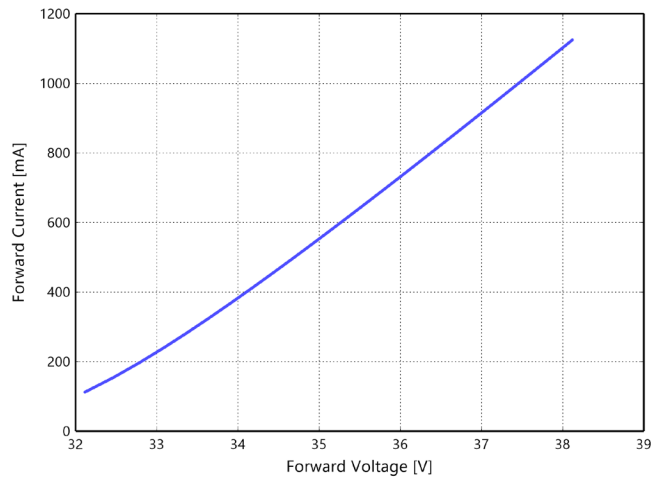


Figure 4d. Typical forward current vs. forward voltage for L2C6-30xxxL05A13C0 at  $T_j=85^\circ\text{C}$

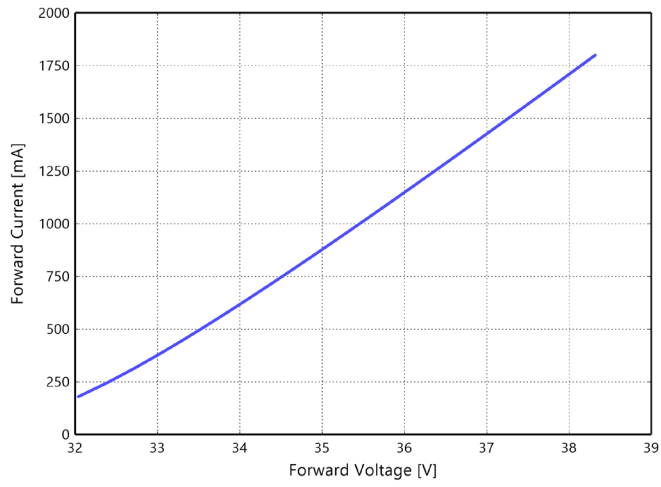


Figure 4e. Typical forward current vs. forward voltage for L2C6-30xxxL08A15C0 at T<sub>j</sub>=85°C

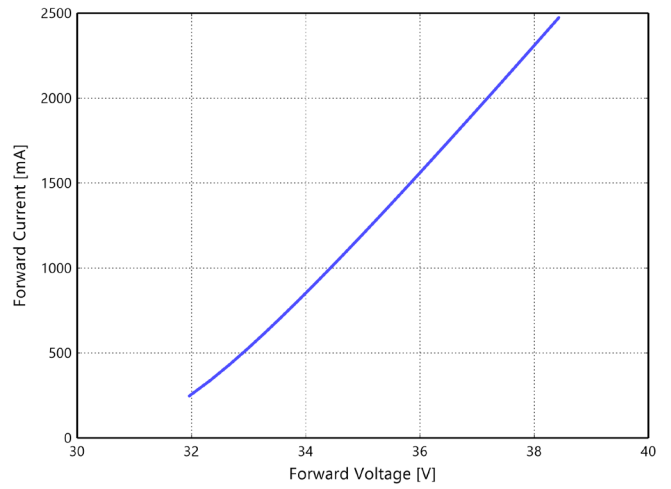


Figure 4f. Typical forward current vs. forward voltage for L2C6-30xxxL11A22C0 at T<sub>j</sub>=85°C

# Radiation Pattern Characteristics

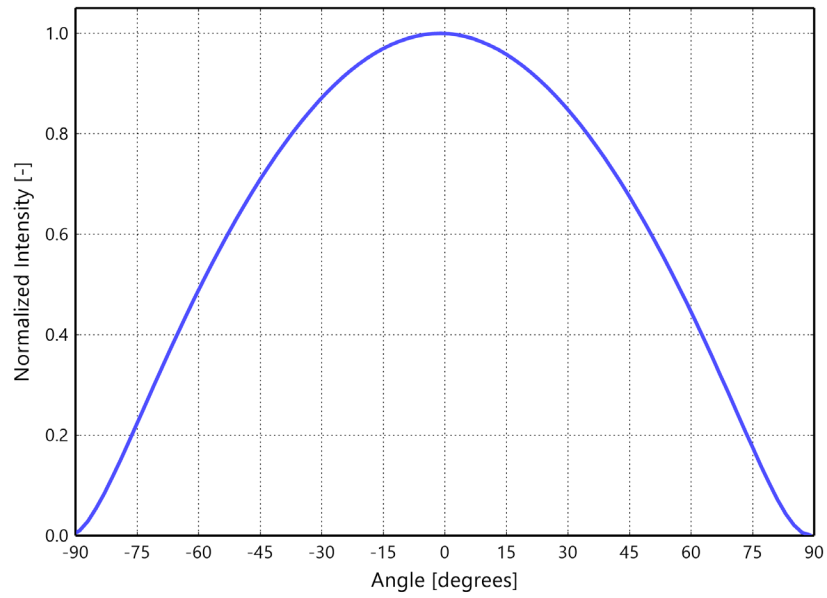


Figure 5. Typical radiation pattern for LUXEON CS CoB with CrispWhite Technology at specified test current,  $T_j=85^{\circ}\text{C}$

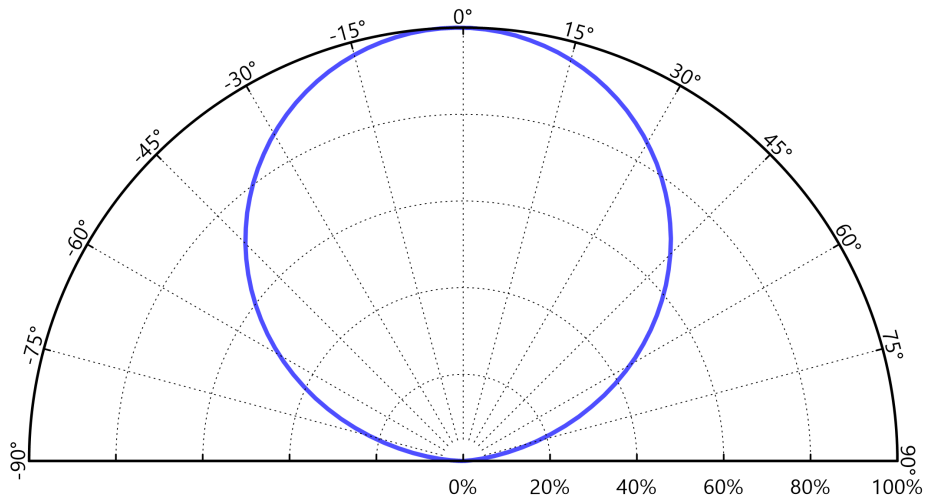


Figure 6. Typical polar radiation pattern for LUXEON CS CoB with CrispWhite Technology at specified test current,  $T_j=85^{\circ}\text{C}$

# Color Bin Definitions

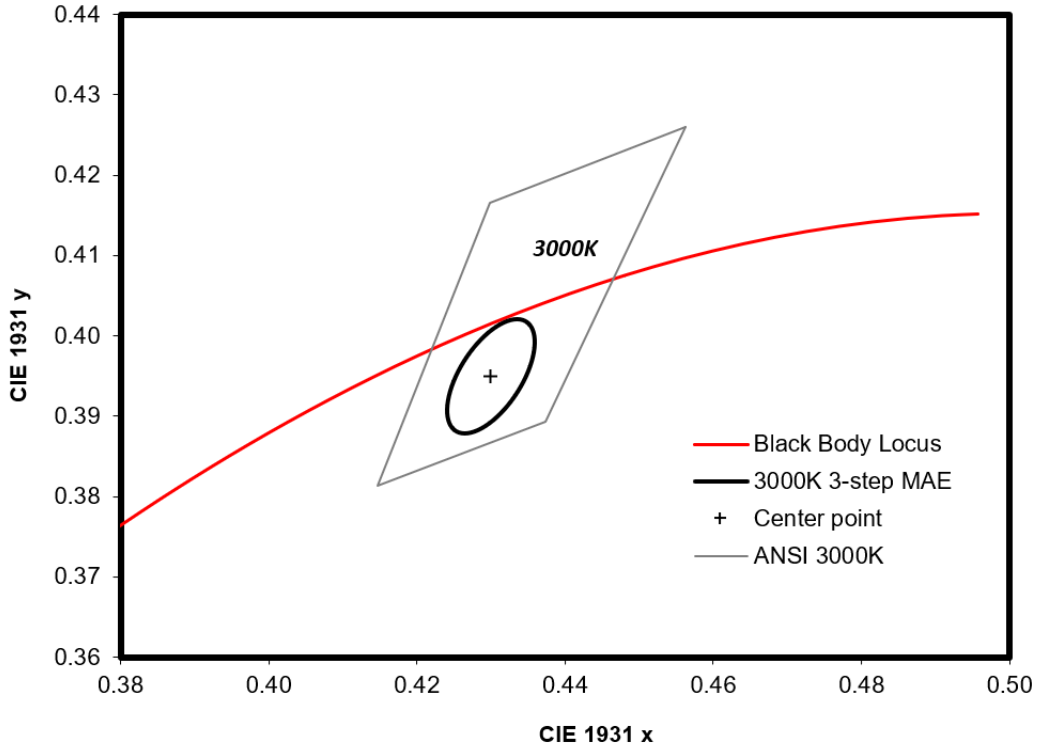


Figure 7. 3-step MacAdam ellipse illustration for Table 5

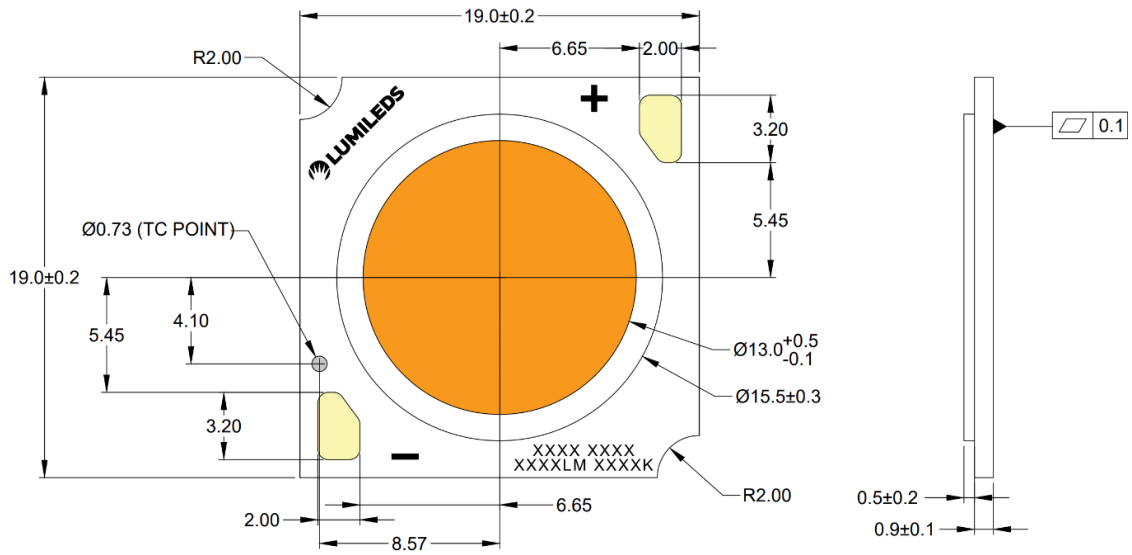
Table 5. 3-step MacAdam ellipse color bin definitions for LUXEON CS CoB with CrispWhite Technology

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$
3000K	3-step MacAdam ellipse	(0.430, 0.395)	0.00834	0.00408	53.20°

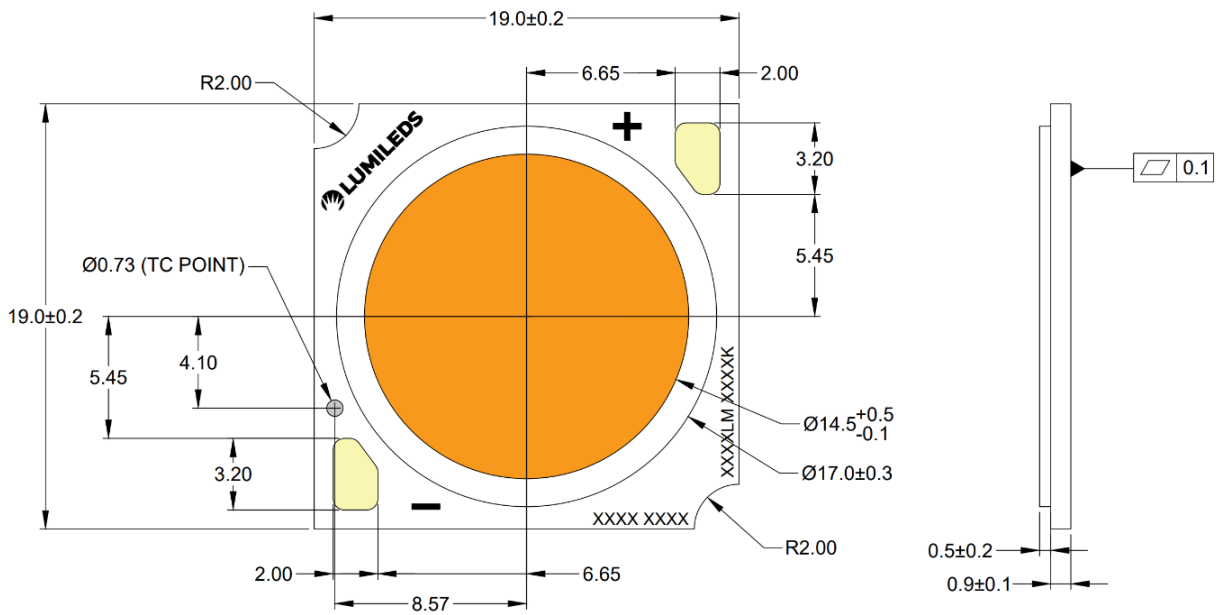
**Notes for Table 5:**

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

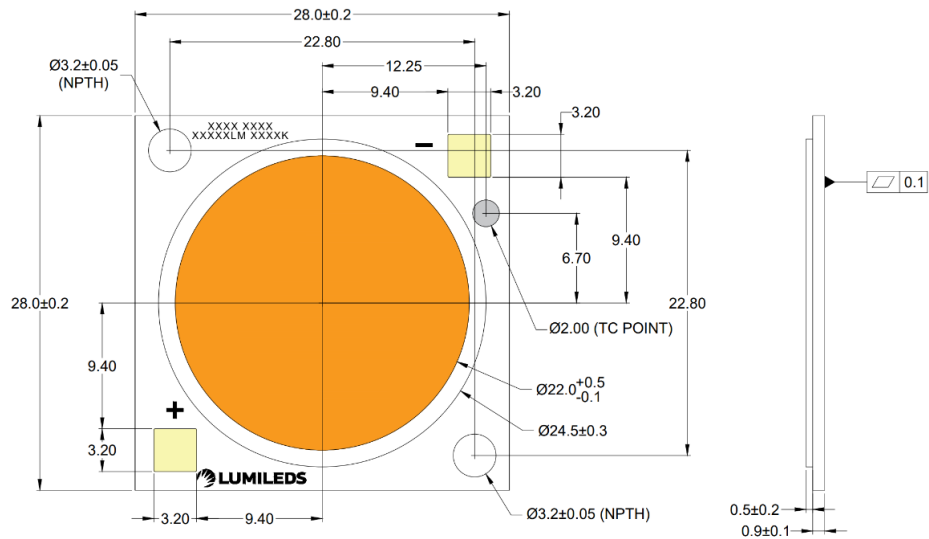




L2C6-30xxxL05x13C0



L2C6-30xxxL08x15C0



L2C6-30xxxL11x22C0

Figure 8. Mechanical dimensions for LUXEON CS CoB with CrispWhite Technology

Notes for Figure 8:

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

# Packaging Information

LLUXEON CS CoB with CrispWhite Technology 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.

**Table 6. Packing information Number of LEDs per tray for LUXEON CS CoB with CrispWhite Technology**

PART NUMBER	TOTAL UNITS PER TRAY	TOTAL TRAYS PER INNER BOX	TOTAL UNITS PER INNER BOX
L2C6-30xxxL02x06C0	80	2	160
L2C6-30xxxL03x09C0	80	2	160
L2C6-30xxxL04x09C0	80	2	160
L2C6-30xxxL05x13C0	36	2	72
L2C6-30xxxL08x15C0	36	2	72
L2C6-30xxxL11x22C0	30	2	60

# Tray Dimensions

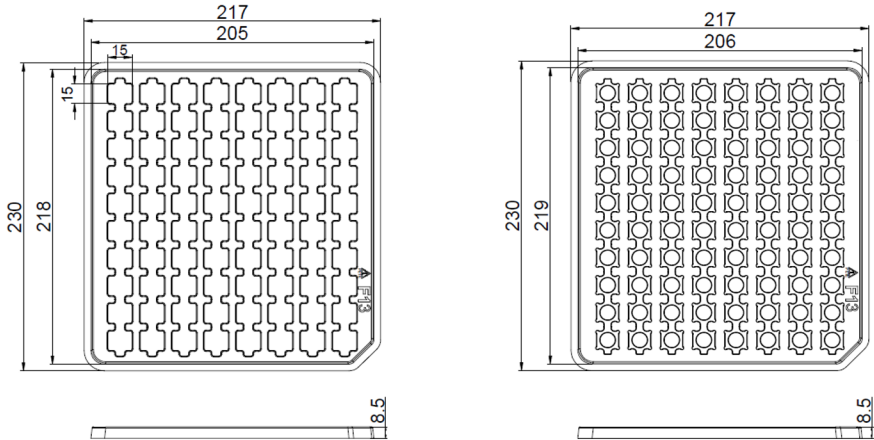


Figure 9a. Tray dimensions for L2C6-30xxxL02x06C0, L2C6-30xxxL02x09C0, L2C6-30xxxL04x09C0

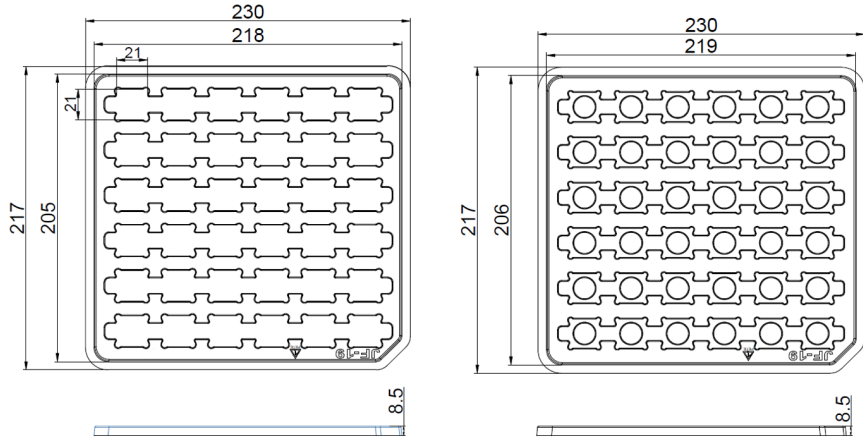


Figure 9b. Tray dimensions for L2C6-30xxxL06x13C0, L2C6-30xxxL08x15C0

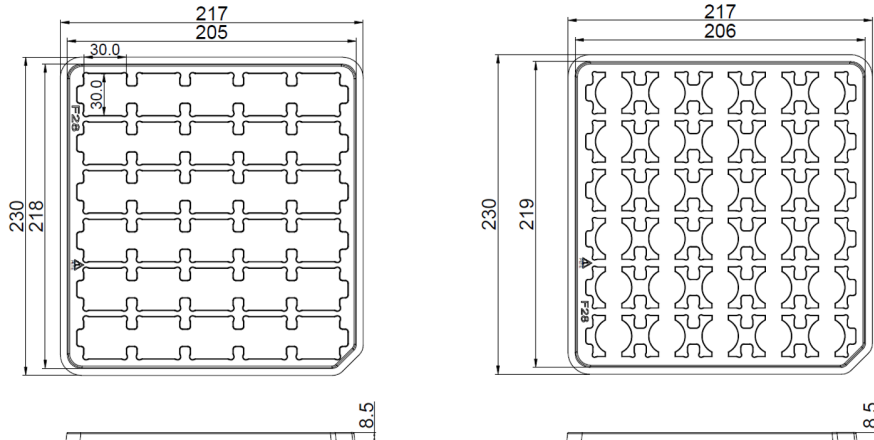


Figure 9c. Tray dimensions for L2C6-30xxxL11x22C0

Notes for Figures 9a, 9b and 9c:  
 1. Drawings not to scale.  
 2. All dimensions are in millimeters.

# Inner Box

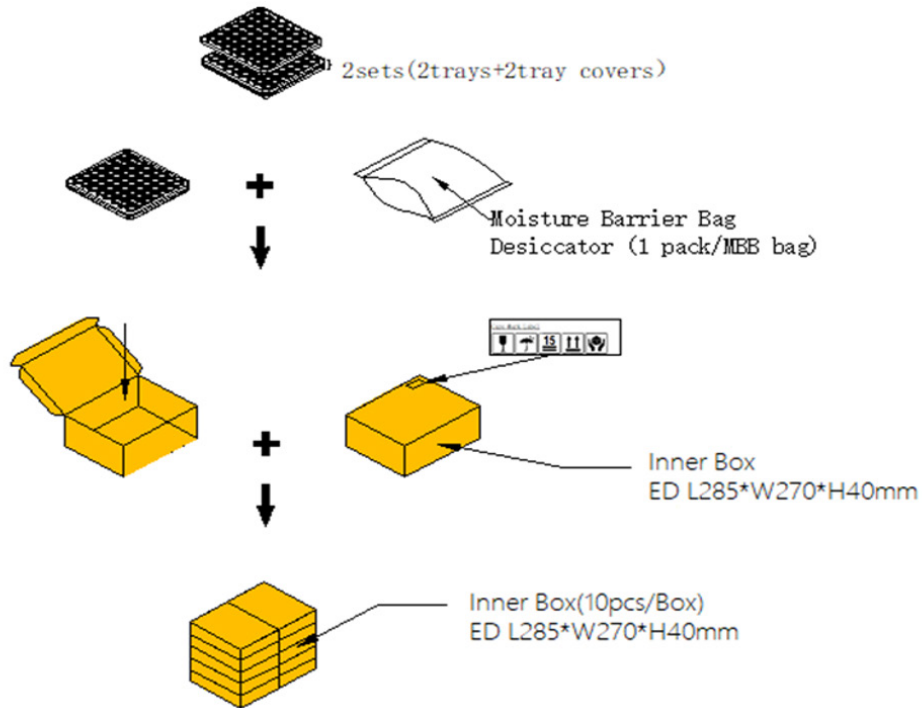


Figure 10. Dimensions for inner box and outer box packaging for LUXEON CS CoB with CrispWhite Technology

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 CoB with CrispWhite Technology

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

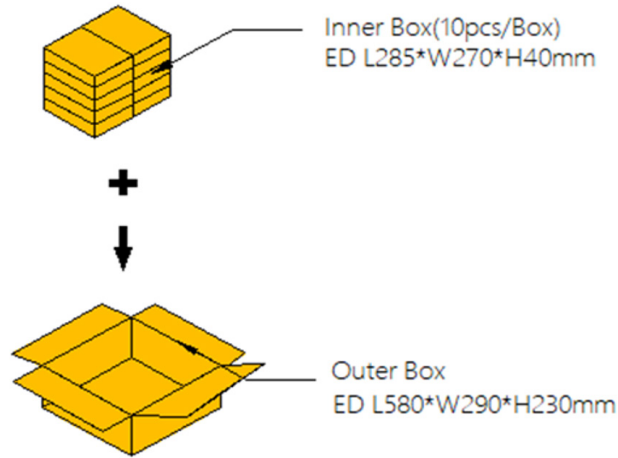


Figure 12. Dimensions for outer box packaging for LUXEON CS CoB with CrispWhite Technology

Table 8. Outer box information for LUXEON CS CoB with CrispWhite Technology

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

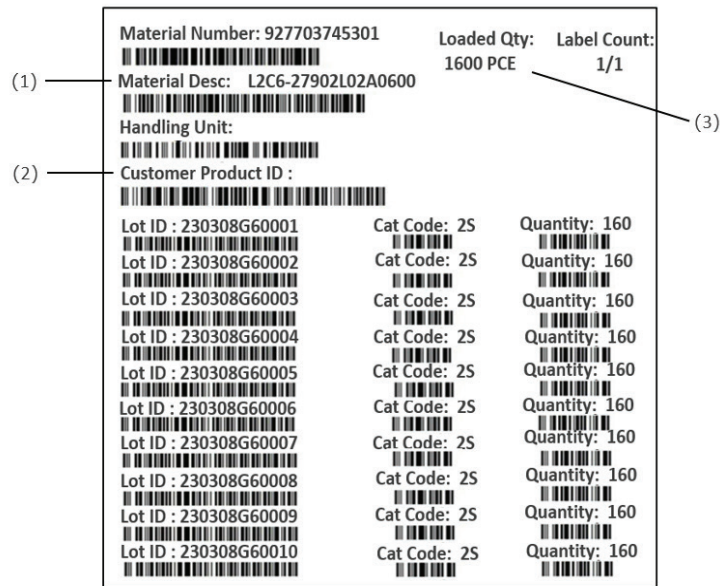


Figure 13. Example of outer box label for LUXEON CS CoB with CrispWhite Technology

- 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](http://lumileds.com).



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