



# LUXEON CoB with CrispWhite Technology Line

Retail lighting that makes an impact

The LUXEON CoB with CrispWhite Technology Line creates the most impactful retail lighting ever available, by revealing the richest whites, vibrant reds and colors that pop. LUXEON CoB with CrispWhite Technology delivers the warm saturated colors of high 90CRI solutions while creating a natural crisp whiteness by activating fluorescent whitening agents in paints and fabrics to properly display merchandise in retail shops; ideal for CDM/CMH replacements.



## FEATURES AND BENEFITS

- Lumen packages from 500 to 5,000 lumens for a range of options
- Industry's smallest light emitting surface (LES) for highest flux densities
- Up to 4x lower thermal resistance than competitors enabling smaller heat sinks and higher lumens
- Contains violet LEDs and does NOT contain UV LEDs for minimal amount of damage, much lower than that from traditional CDM shop lighting
- Mouse bites for M2 and M3 make it easy to work with

## PRIMARY APPLICATIONS

- Downlights
- High Bay & Low Bay
- Lamps
- Spotlights

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# General Product Information

## Product Test Conditions

LUXEON 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.

200mA	-	LUXEON CoB 1202s and 1202
250mA	-	LUXEON CoB 109
300mA	-	LUXEON CoB 1203
450mA	-	LUXEON CoB 1204
600mA	-	LUXEON CoB 1205
900mA	-	LUXEON CoB 1208
1200mA	-	LUXEON CoB 1211

## Part Number Nomenclature

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

L H C 1 – **A A B B** – **D D D D** C R S P (Traditional Part Number Scheme)

L 2 C 1 – **A A B B** 1 2 0 2 0 6 A C 0 (New Part Number Scheme)

L 2 C 3 – **A A B B** 1 0 9 E 0 6 C 0 0

Where:

- A A** – designates nominal CCT (30=3000K)
- B B** – designates minimum CRI (90=90CRI)
- D D D D** – designates product configuration (1202=1202, 1203=1203, 1204=1204, 1205=1205, 1208=1208, 1211=1211)

Therefore, the following part numbers are used for LUXEON CoB 1203 with CrispWhite Technology 3000K CCT 90CRI:

L H C 1 – **3 0 9 0** – **1 2 0 3** C R S P

## 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 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 CoB with CrispWhite Technology at test current,  $T_j=85^{\circ}\text{C}$ .

NOMINAL CCT	MINIMUM CRI <sup>[1]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	LES <sup>[4]</sup> (mm)	PART NUMBER
		MINIMUM	TYPICAL				
3000K	90	585	650	75	250	6.5	L2C3-3090109E06C00
3000K	90	550	600	85	200	6.5	L2C1-3090120206ACO
3000K	90	550	625	90	200	9.0	LHC1-3090-1202CRSP
3000K	90	850	950	90	300	9.0	LHC1-3090-1203CRSP
3000K	90	1250	1400	90	450	13.0	LHC1-3090-1204CRSP
3000K	90	1700	1900	90	600	13.0	LHC1-3090-1205CRSP
3000K	90	2500	2800	90	900	15.0	LHC1-3090-1208CRSP
3000K	90	3400	3750	90	1200	19.0	LHC1-3090-1211CRSP

**Notes for Table 1:**

1. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 6.5\%$  on luminous flux measurements.
2. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Maximum luminous flux is 10% above typical luminous flux.
4. Light emitting surface (LES) is the inner diameter (phosphor area) inside the dam.

## Optical Characteristics

Table 2. Optical characteristics for LUXEON CoB with CrispWhite Technology at test current,  $T_j=85^{\circ}\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L2C3-3090109E06C00	135°	115°
L2C1-3090120206ACO	135°	115°
LHC1-3090-xxxxCRSP	135°	115°

**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  $\frac{1}{2}$  of the peak value.

## Electrical and Thermal Characteristics

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

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> (V)			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		
L2C3-3090109E06C00	33	35	38	-16	1.5
L2C1-3090120206AC0	33	35.5	38	-16	0.98
LHC1-3090-1202CRSP	33	35.5	38	-16	0.91
LHC1-3090-1203CRSP	33	35.5	38	-16	0.70
LHC1-3090-1204CRSP	33	35.5	38	-16	0.53
LHC1-3090-1205CRSP	33	35.5	38	-16	0.45
LHC1-3090-1208CRSP	33	35.5	38	-16	0.29
LHC1-3090-1211CRSP	33	35.5	38	-16	0.23

**Notes for Table 3:**

1. Lumileds maintains a tolerance of  $\pm 2\%$  on forward voltage measurements.
2. Measured between  $25^\circ\text{C}$  and  $85^\circ\text{C}$ .
3. Junction temperature to back of the PCB and measurement tolerance of  $\sim 10\%$ .

## Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON CoB with CrispWhite Technology.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	400mA for L2C3-3090109E06C00 2x test current for LHC1-xxxx-xxxxCRSP and L2C1-xxxx120206AC0
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
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{\text{reverse}}$ )	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

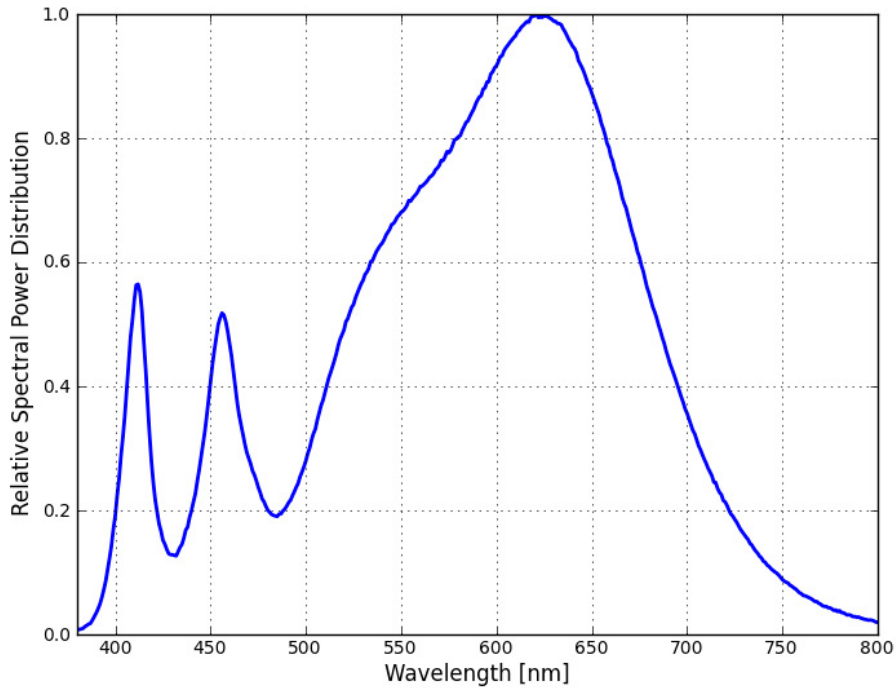


Figure 1: Typical normalized power vs. wavelength for L2C3-3090109E06C00, L2C1-3090120206AC0 and LH1C1-3090-xxxxCRSP at test current,  $T_j=85^\circ\text{C}$ .

## Light Output Characteristics

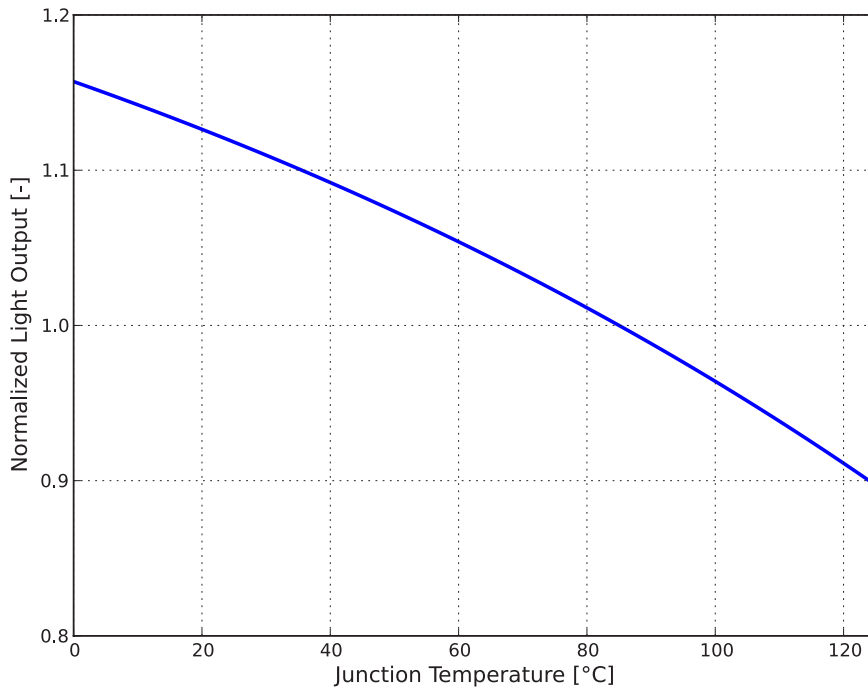


Figure 2: Typical normalized light output vs. junction temperature for L2C3-3090109E06C00, L2C1-3090120206AC0 and LH1C1-3090-xxxxCRSP at test current.

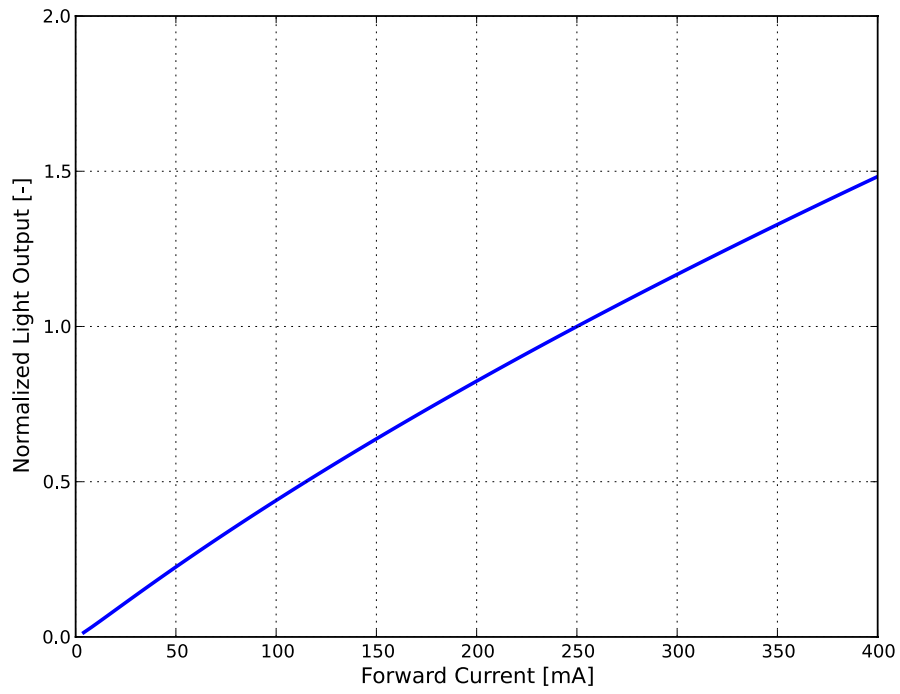
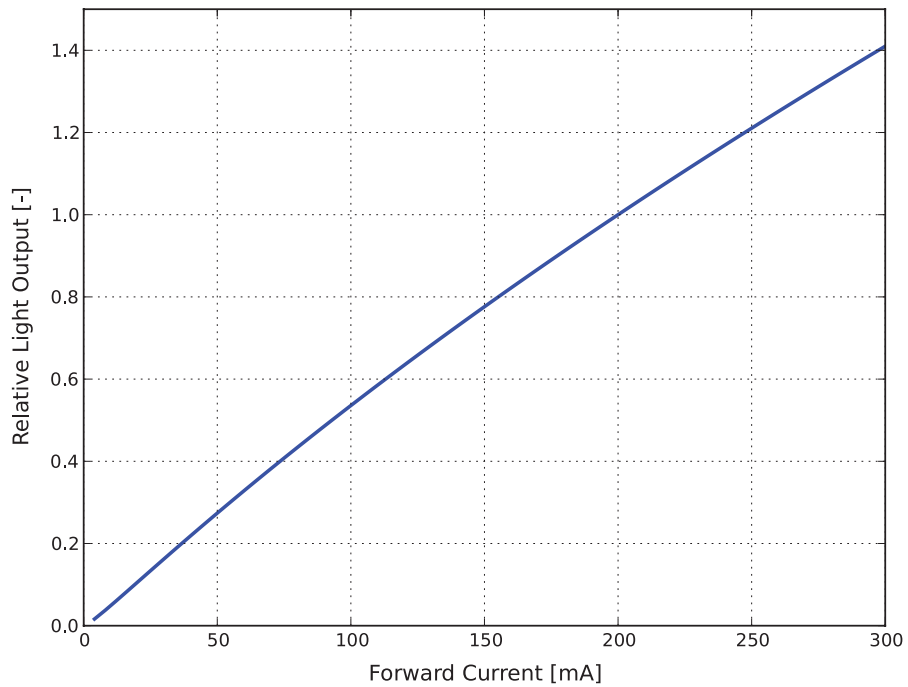


Figure 3a: Typical normalized light output vs. forward current for L2C3-3090109E06C00 at  $T_j=85^\circ\text{C}$ .



3b: Typical normalized light output vs. forward current for L2C1-3090120206AC0 and LHC1-3090-1202CRSP at  $T_j=85^\circ\text{C}$ .

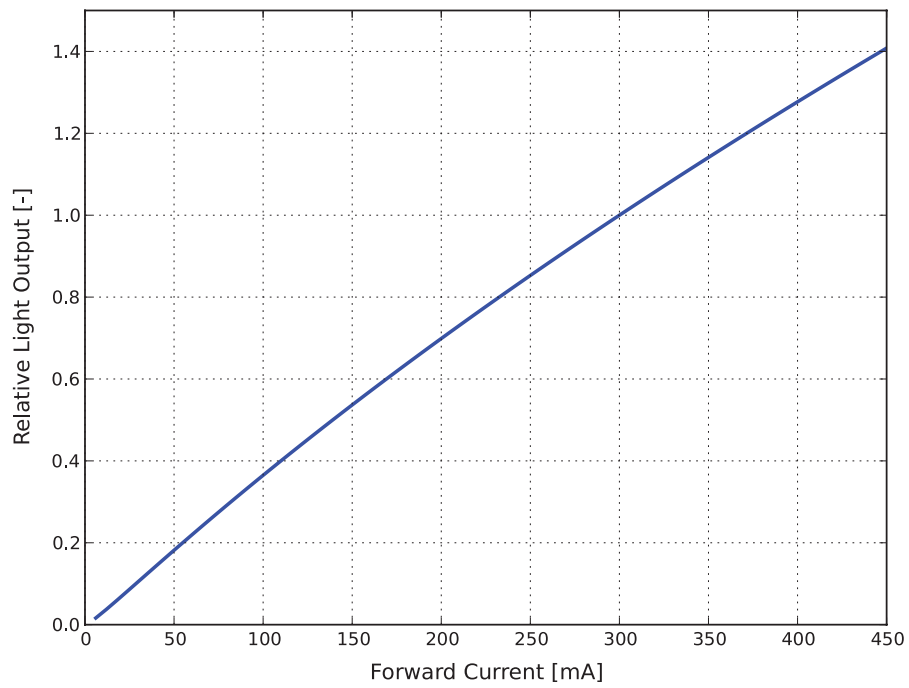
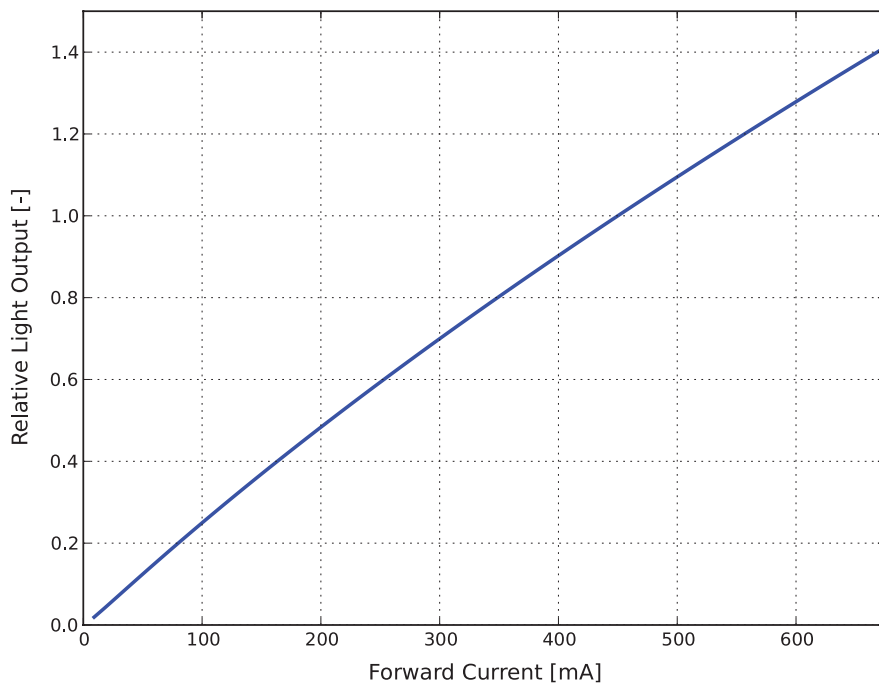


Figure 3c: Typical normalized light output vs. forward current for LHC1-3090-1203CRSP at  $T_j=85^\circ\text{C}$ .



3d: Typical normalized light output vs. forward current for LHC1-3090-1204CRSP at  $T_j=85^\circ\text{C}$ .



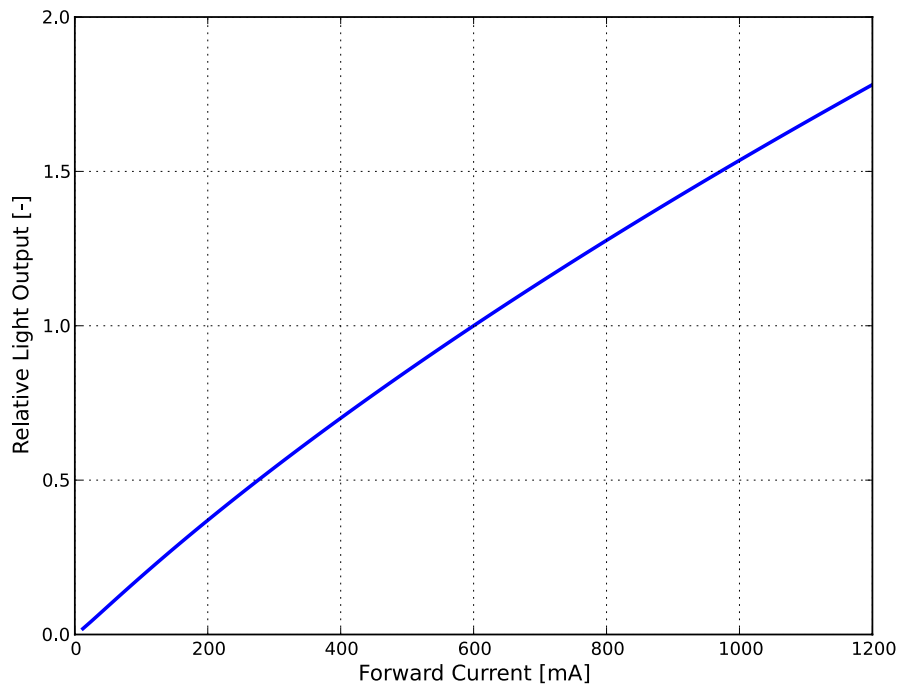
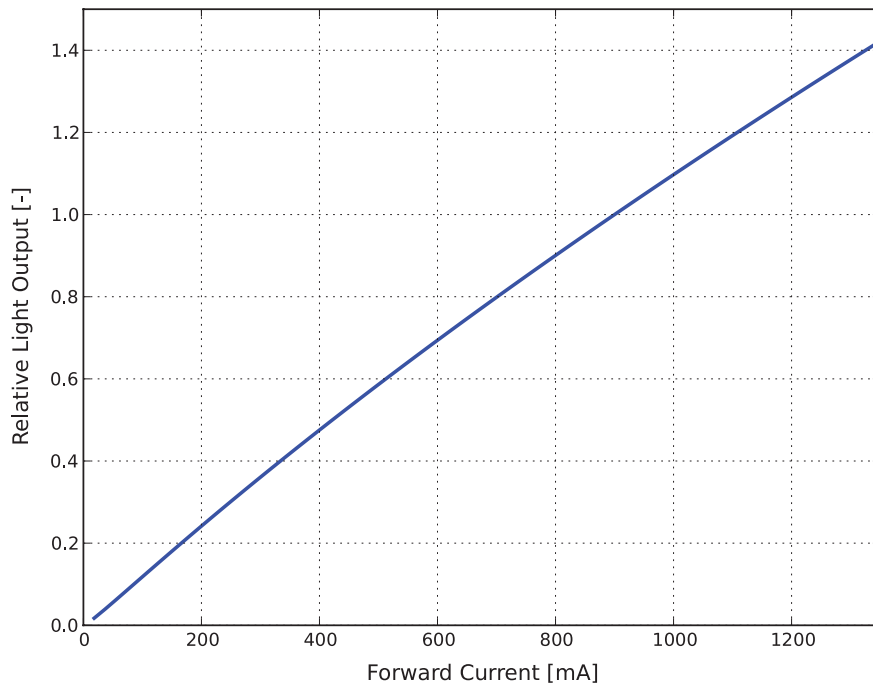
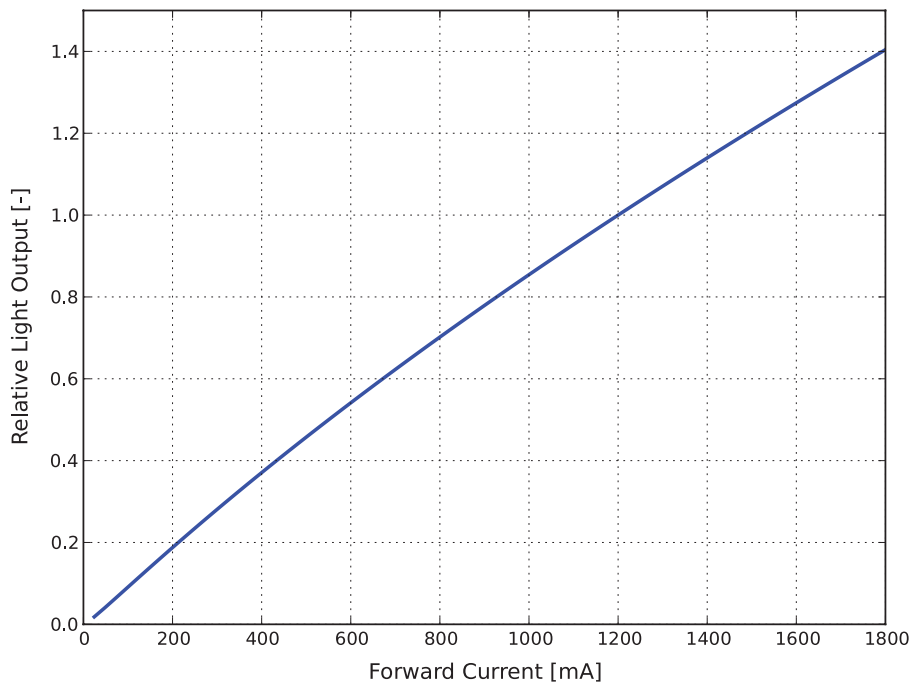


Figure 3e: Typical normalized light output vs. forward current for LHC1-3090-1205CRSP at  $T_j=85^\circ\text{C}$ .

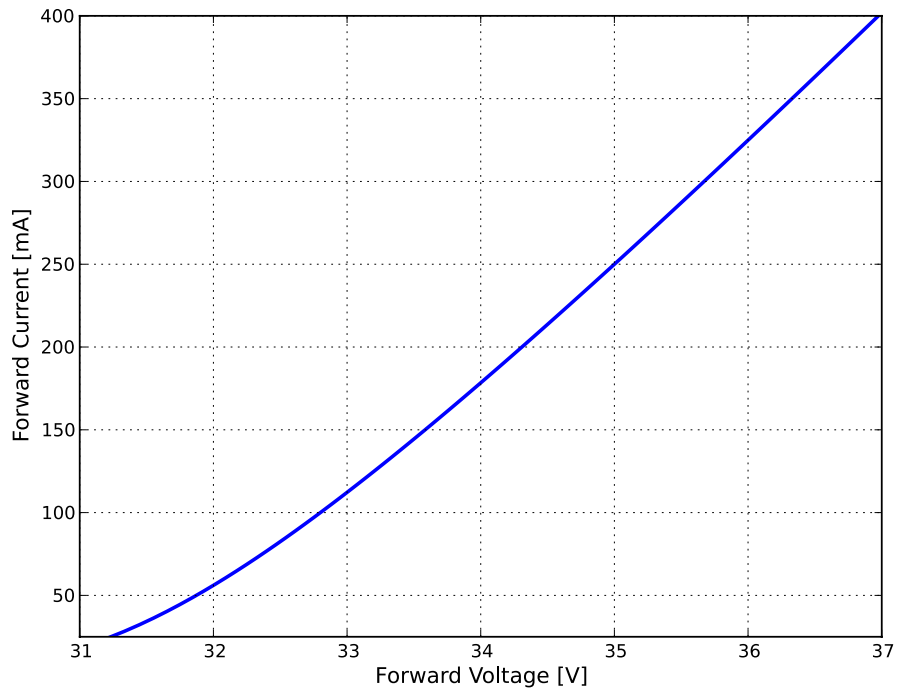


3f: Typical normalized light output vs. forward current for LHC1-3090-1208CRSP at  $T_j=85^\circ\text{C}$ .

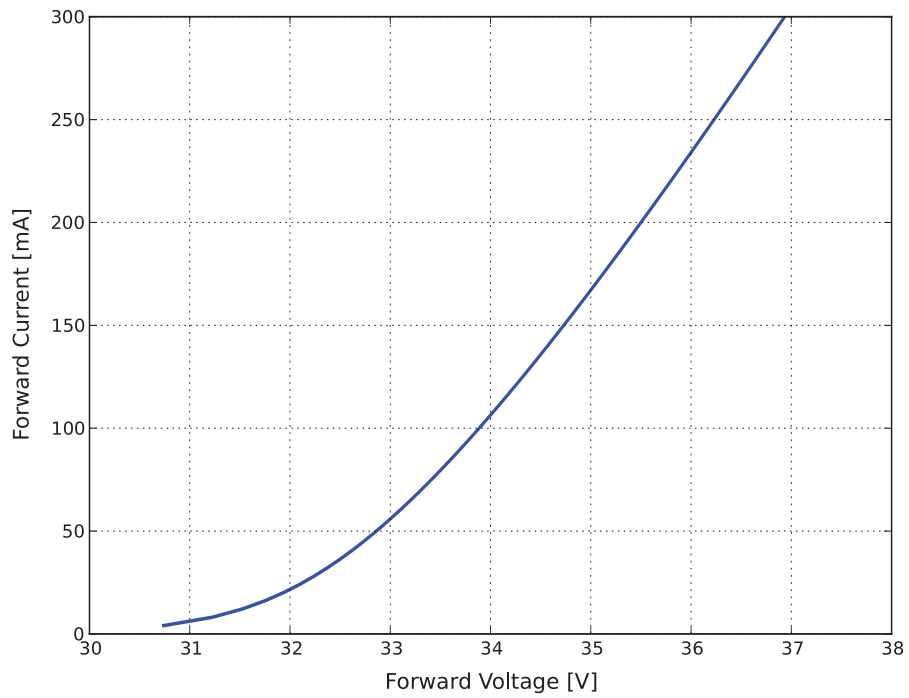


3g: Typical normalized light output vs. forward current for LHC1-3090-1211CRSP at  $T_j=85^\circ\text{C}$ .

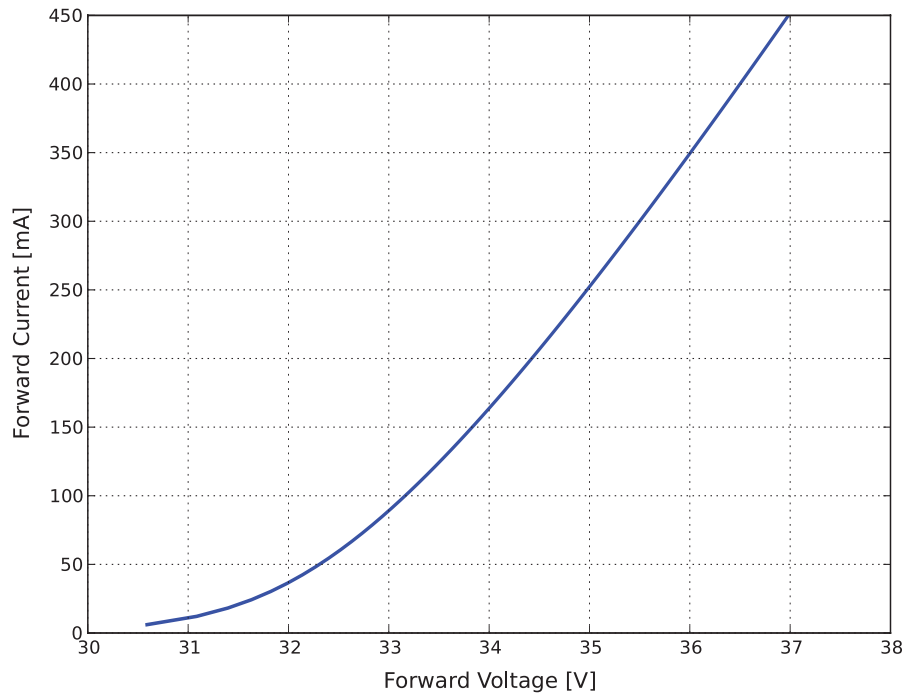
## Forward Current Characteristics



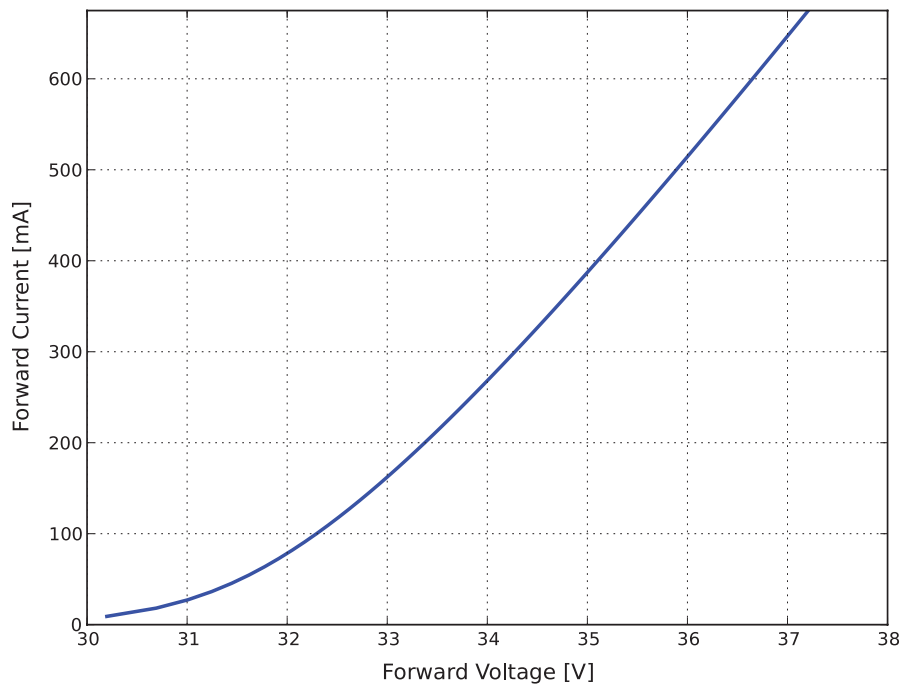
4a: Typical forward current vs. forward voltage for L2C3-3090109E06C00 at  $T_j=85^\circ\text{C}$ .



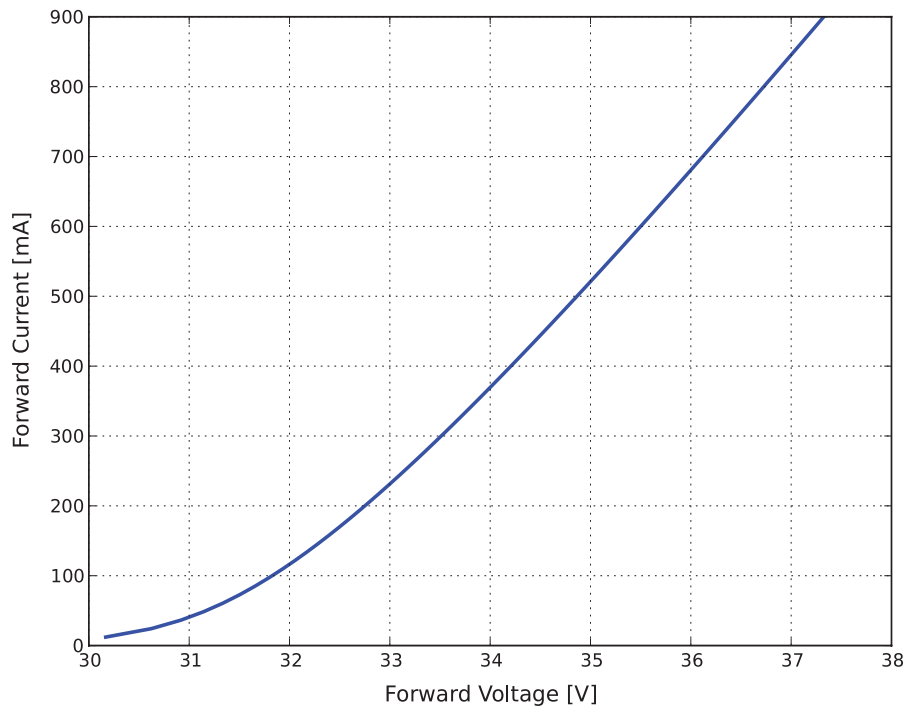
4b. Typical forward current vs. forward voltage for L2C1-3090120206AC0 and LHC1-3090-1202CRSP at  $T_j=85^\circ\text{C}$ .



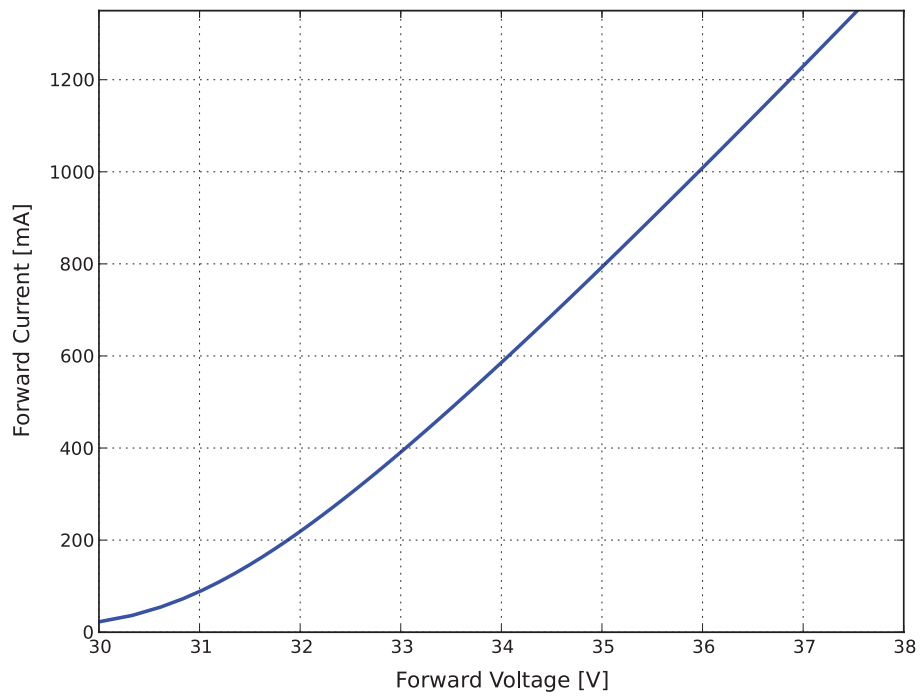
4c. Typical forward current vs. forward voltage for LHC1-3090-1203CRSP at  $T_j=85^\circ\text{C}$ .



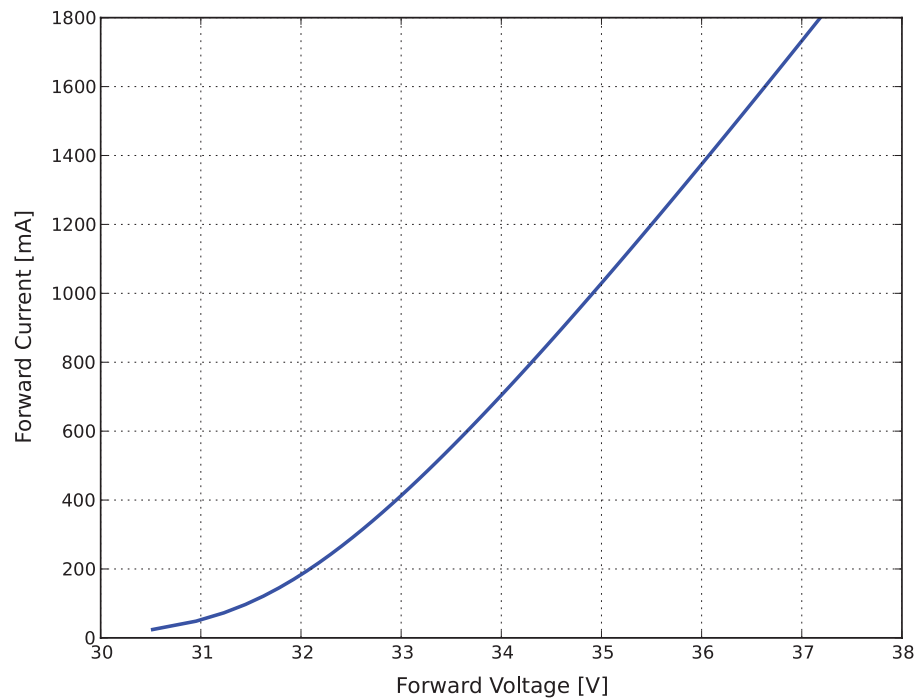
4d. Typical forward current vs. forward voltage for LHC1-3090-1204CRSP at  $T_j=85^\circ\text{C}$ .



4e. Typical forward current vs. forward voltage for LHC1-3090-1205CRSP at  $T_j=85^\circ\text{C}$ .



4f. Typical forward current vs. forward voltage for LHC1-3090-1208CRSP at  $T_j=85^\circ\text{C}$ .



4g. Typical forward current vs. forward voltage for LHC1-3090-1211CRSP at  $T_j=85^\circ\text{C}$ .

## Radiation Pattern Characteristics

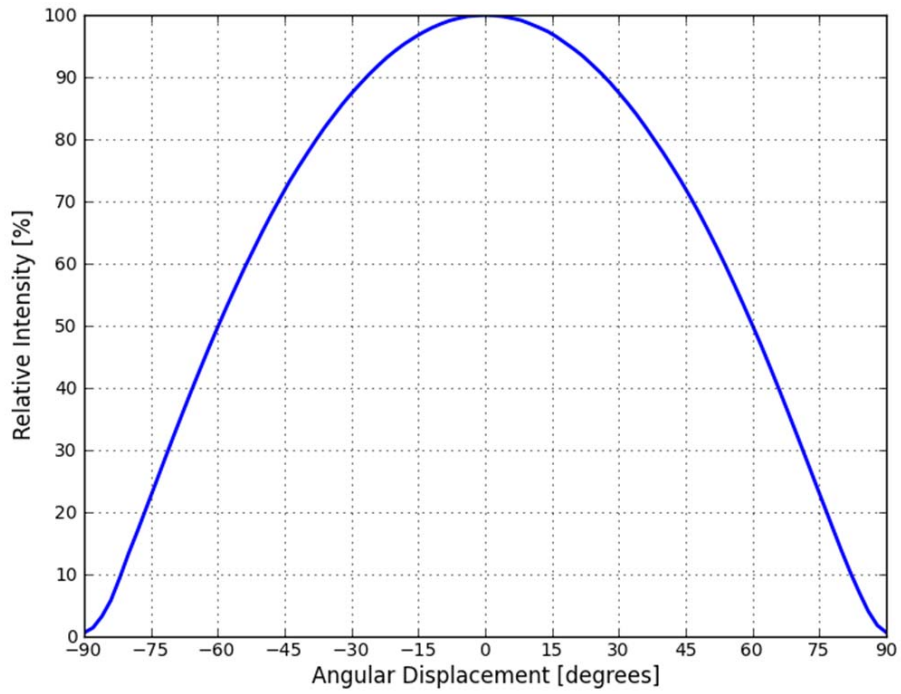


Figure 5: Typical radiation pattern for L2C3-3090109E06C00, L2C1-3090120206AC0 and LH1C1-3090-xxxxCRSP at test current,  $T_j=85^\circ\text{C}$ .

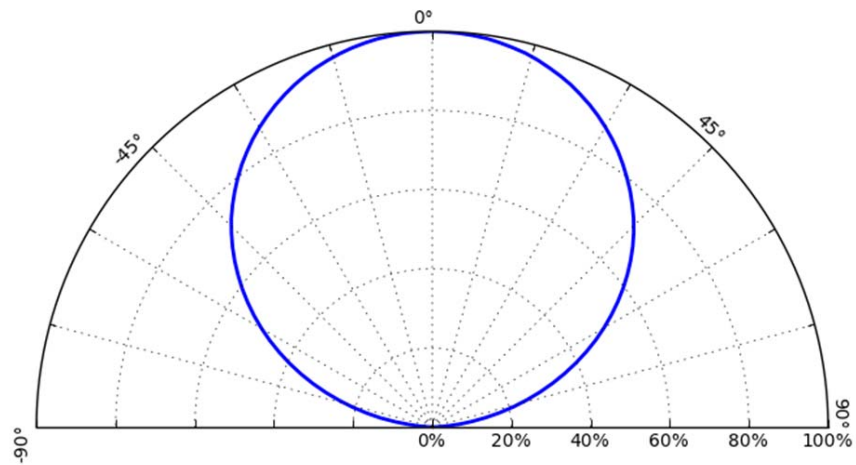


Figure 6: Typical polar radiation pattern for L2C3-3090109E06C00, L2C1-3090120206AC0 and LH1C1-3090-xxxxCRSP at test current,  $T_j=85^\circ\text{C}$ .

## Color Bin Definition

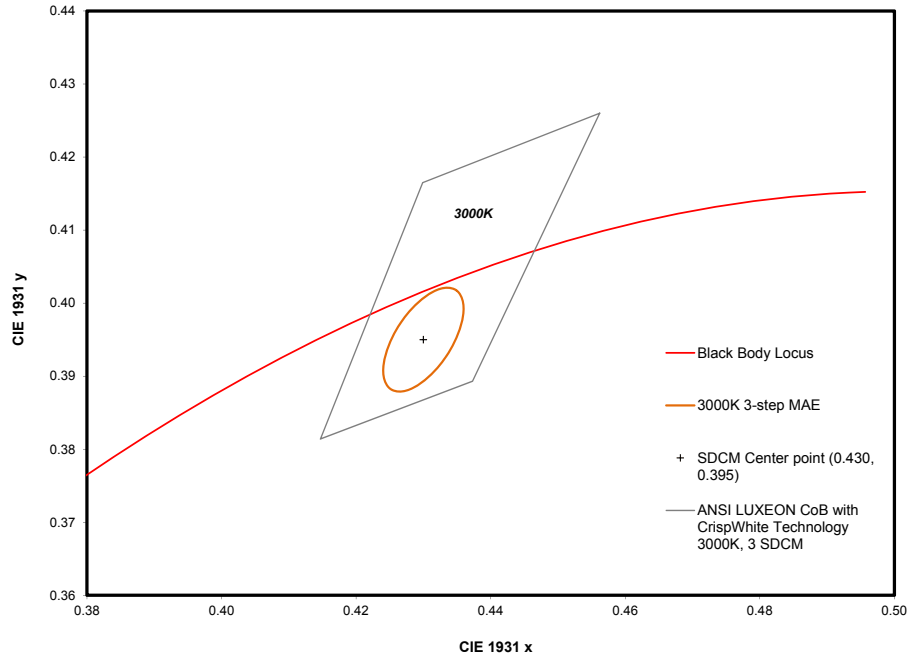


Figure 7: 3000K 3-step MacAdam ellipse color bin.

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

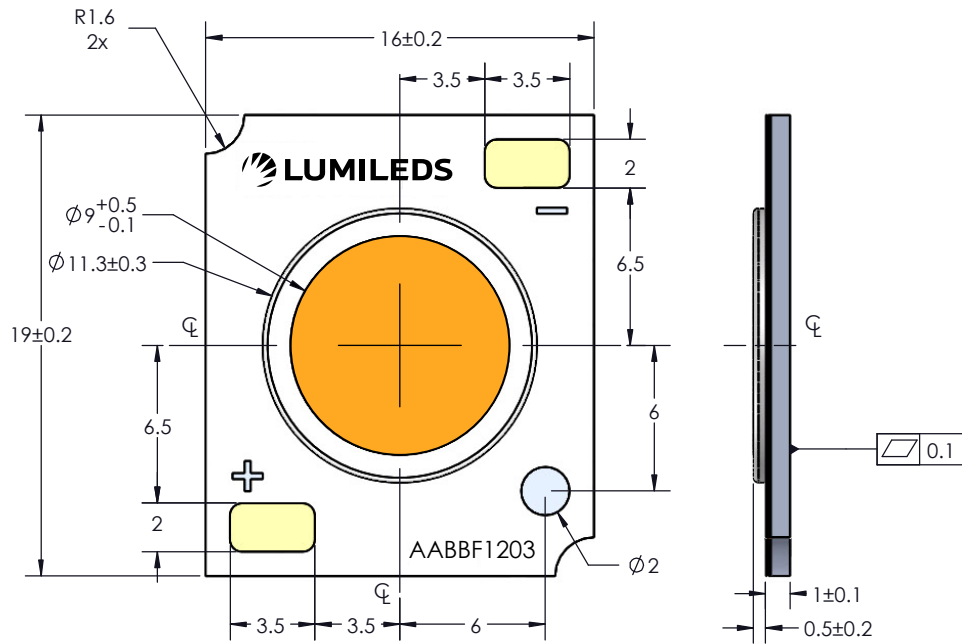
NOMINAL CCT	COLOR SPACE	CENTER POINT (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$
3000K	Single 3-Step MacAdam ellipse	(0.430, 0.395)	0.00834	0.00408	53.2°

**Notes for Table 5:**

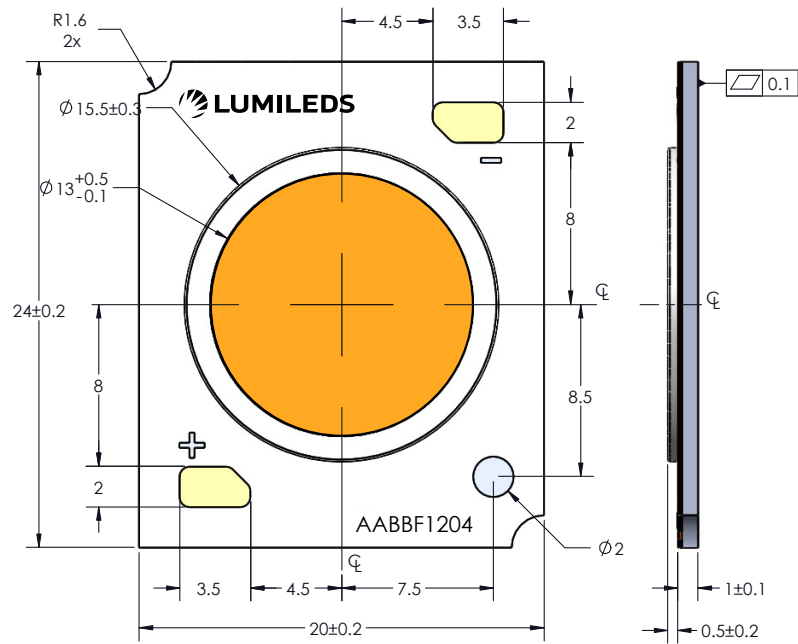
1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.





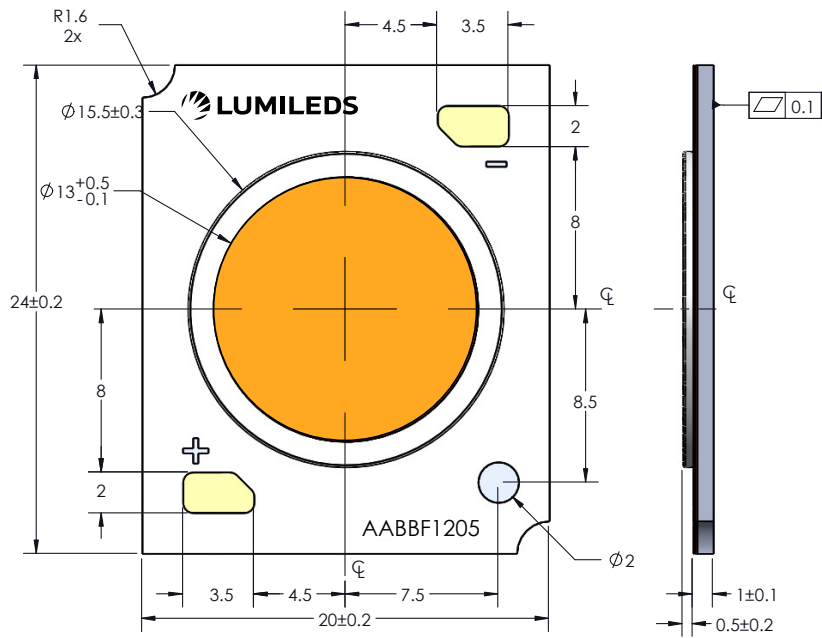


8c. Mechanical dimensions for LHC1-3090-1202CRSP and LHC1-3090-1203CRS.

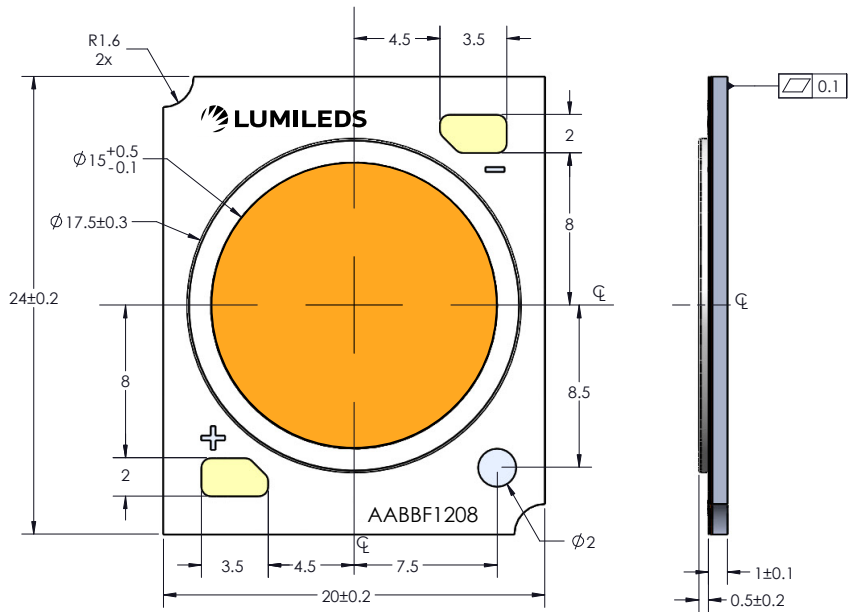


8d. Mechanical dimensions for LHC1-3090-1204CRSP.

Notes for Figures 8c and 8d:  
 1. Drawings are not to scale.  
 2. All dimensions are in millimeters.

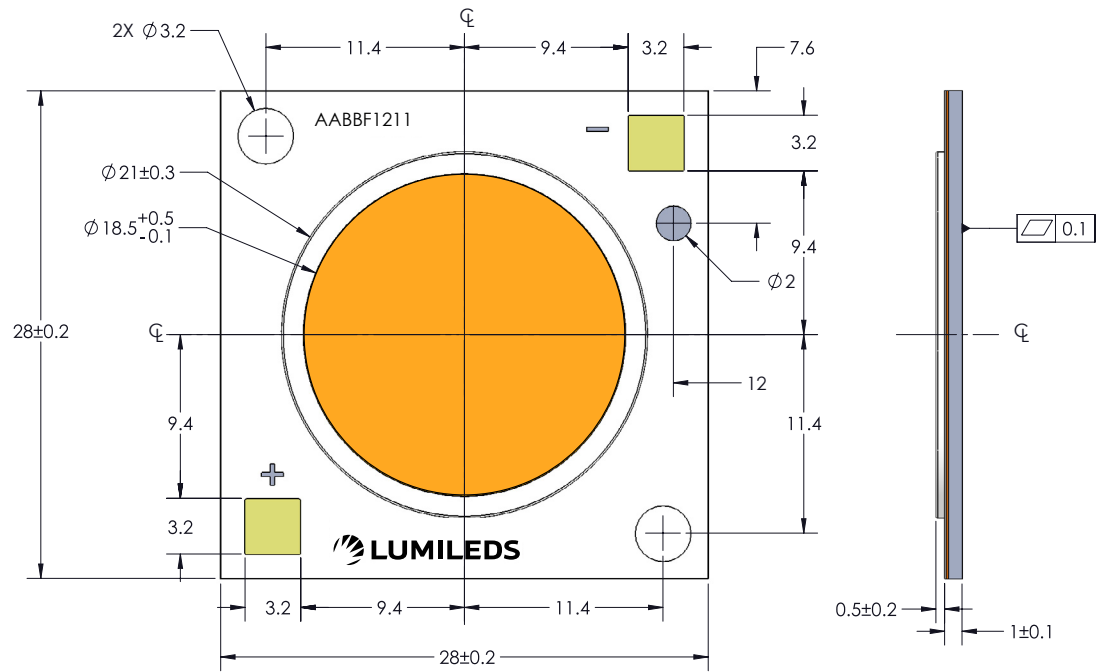


8e. Mechanical dimensions for LHC1-3090-1205CRSP.



8f. Mechanical dimensions for LHC1-3090-1208CRSP.

Notes for Figures 8e and 8f:  
 1. Drawings are not to scale.  
 2. All dimensions are in millimeters.



8g. Mechanical dimensions for LHC1-3090-1211CRSP.

Notes for Figure 8g:

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

# Packaging Information

LUXEON CoB LEDs are packaged in tubes. Each tube contains a specified number of LEDs. The LEDs in each tube come from a single category code, ensuring they are all well-matched for light output, color, and forward voltage. Each tube contains a rubber stopper at one end. The tube label has both alphanumeric and bar code information.

## Total Units per Box

Table 6. Number of LEDs per box for LUXEON CoB with CrispWhite Technology.

TOTAL	L2C3-3090109E06C00 and L2C1-3090120206AC0	LH1C1-3090-1202CRSP	LH1C1-3090-1203CRSP	LH1C1-3090-1204CRSP	LH1C1-3090-1205CRSP	LH1C1-3090-1208CRSP	LH1C1-3090-1211CRSP
Units per Tube	20	20	20	20	20	20	10
Tubes per Box	5	5	5	5	5	5	5
Units per Box	100	100	100	100	100	100	50

## Tube Dimensions

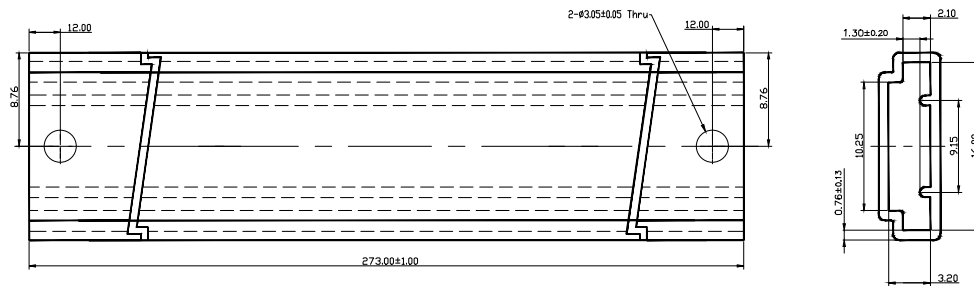


Figure 9a: Tube dimensions for LUXEON CoB with CrispWhite Technology L2C3-3090109E06C00 and L2C1-3090120206AC0.

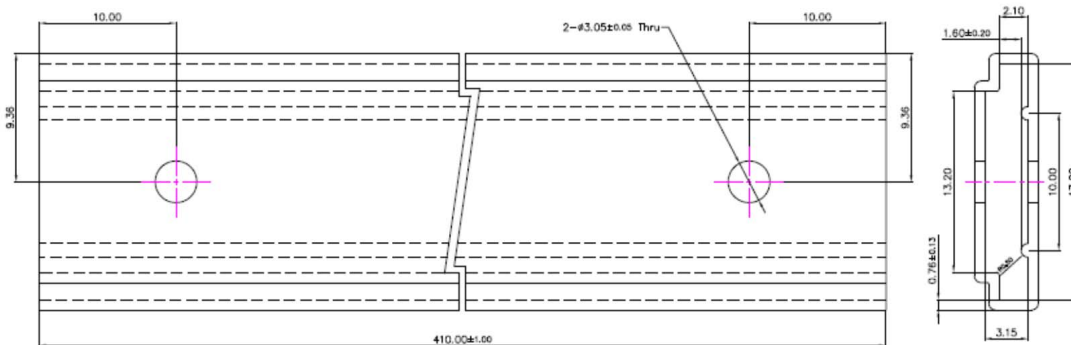


Figure 9b: Tube dimensions for LUXEON CoB with CrispWhite Technology LHC1-xxxx-1202CRSP and LHC1-xxxx-1203CRSP.

### Notes for Figures 9a and 9b:

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

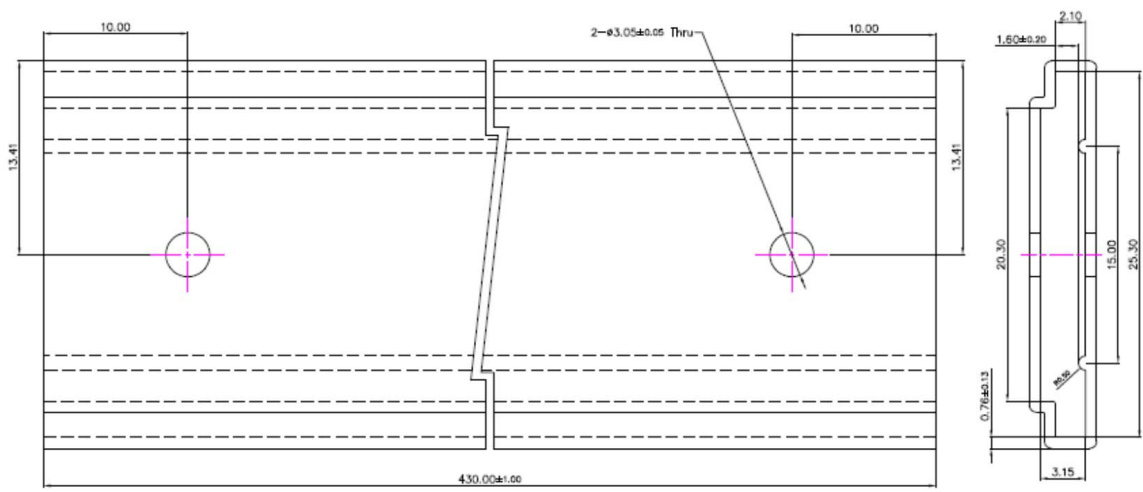


Figure 9c: Tube dimensions for LUXEON CoB with CrispWhite Technology LHC1-xxxx-1204CRSP, LHC1-xxxx-1205CRSP and LHC1-xxxx-1208CRSP.

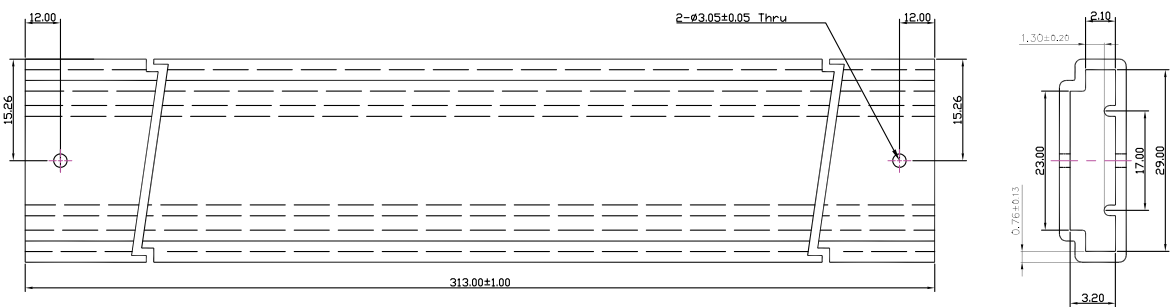


Figure 9d: Tube dimensions for LUXEON CoB with CrispWhite Technology LHC1-xxxx-1211CRSP.

- Notes for Figures 9c and 9d:
1. Drawings are not to scale.
  2. All dimensions are in millimeters.

## About Lumileds

Lumileds is the global leader in light engine technology. The company develops, manufactures and distributes groundbreaking LEDs and automotive lighting products that shatter the status quo and help customers gain and maintain a competitive edge. With a rich history of industry “firsts,” Lumileds is uniquely positioned to deliver lighting advancements well into the future by maintaining an unwavering focus on quality, innovation and reliability.

To learn more about our portfolio of light engines, visit [lumileds.com](http://lumileds.com).



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## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

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*Click to view products by [Lumileds manufacturer](#):*

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[ASMT-MW06-NMNZ1](#)