

Introduction

Purpose

- Provide an Overview of Cree's XLamp XP-E High Efficiency White (HEW)

Objective

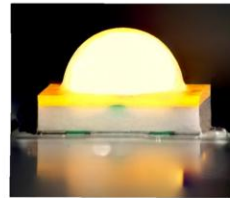
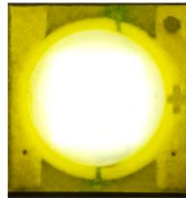
- Give a brief summary of XP-E HEW's performance
- Detail the Features & Characteristics of XP-E HEW
- Highlight Target Applications for XP-E HEW
- Review XP-E HEW order codes
- Review XP-E HEW L70 Lifetime Performance

Content

- 10 slides

Content

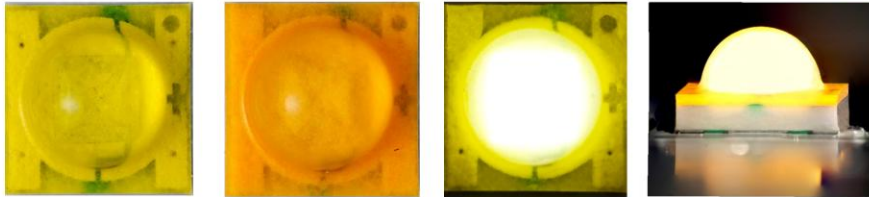
- 5 Minutes



Welcome to the Cree XLamp XP-E High Efficiency White product training. This product training module will introduce the Cree XLamp XP-E H.E.W., give a brief summary of XP-E H.E.W.'s performance, detail XP-E H.E.W.'s characteristics, highlight targeted applications, review XP-E H.E.W. Order codes and XP-E H.E.W. L70 Lifetime performance.

(Note to presenter: Please say H.E.W as the letters, now as a word.)

XLamp XP-E High Efficiency White



Optimized to lower initial system cost for diffused lighting applications

- **Flux & efficacy improvement over standard XP-E White**
 - Similar to XP-G: Up to 148 lm, 3.0V typ @ 350 mA (141 LPW)
- **New Direct Attach die technology**
 - Improved thermal performance; excellent performance & reliability
- **Extension of existing XLamp XP family**
 - Available in standard white, outdoor white & high CRI white

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Cree XP-E HEW is a product utilizing Cree's new Direct Attach die technology. The results of this technology is a flux and efficacy improvement over standard XP-E White to performance levels comparable to XP-G. This new technology is also optimized to lower initial system cost for diffused lighting applications.

Specifically, XP-E HEW provides up to 148 Lumens, at 3.0 Volts typical at 350 MilliAmp or 141 Lumens Per Watt.


This is an extension of the XLamp XP Family, and available in standard white, outdoor white, and high CRI white.

XLamp XP-E HEW Characteristics

XP-E HEW		<ul style="list-style-type: none"> - ANSI-compatible chromaticity bins - Electrically neutral thermal path - Symmetric design: matching optical & mechanical centers - Unlimited floor life at $\leq 30^{\circ}\text{C}$ / 85% RH - Reflow solderable JEDEC J-STD-020C compatible - RoHS- & REACH-compliant
Max Current	1000 mA	
Thermal Resistance	6 $^{\circ}\text{C}/\text{W}$	
Viewing Angle	120 $^{\circ}$	
Typ. Vf @ 350 mA	3.0 V	

Standard White	Cool White	Neutral White	Warm White
CCT (K)	10,000K – 5,000K	5,000K – 3,700K	3,700K – 2,600K
CRI (typ)	75	75	80

Outdoor White	Neutral White	High CRI White	Warm White
CCT (K)	5,300K – 4,000K	CCT (K)	3,200K – 2,600K
CRI (typ)	70	CRI (min)	80, 85 or 90



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The XP-E HEW provides the characteristics that are typical of XLamp components. This includes ANSI – compatible bins, and electrically neutral thermal path, and a symmetric design with matching optical and mechanical centers. XP-E HEW has an unlimited floor life if the room is less than 30 Degrees Celsius and has an RH less than 85%. XP-E HEW is also RoHS and Reach compliant.

In terms of performance, the max current on the XP-E HEW is 1000 mA, the thermal resistance is 6 Degrees Celsius Per Watt, the viewing angle is 120 degrees and the typical VF at 350 MilliAmps is 3.0 Volts.

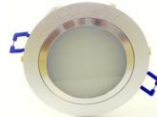
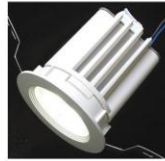
XP-E HEW is available in Standard Cool White, Neutral White and Warm White along with Outdoor White, optimized for outdoor applications. It is also available in High CRI Warm White, ideal for demanding indoor applications such as replacement lamps and downlights.

Target Applications

1. A- or E- replacement lamps



2. Downlights



NOT ideal for applications that require tight optical control:

- Roadway lights
- Flash lights
- PAR/MR replacement lamps

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Two ideal applications for the XP-E HEW are A-Style and E-Style replacement lamps. As mentioned previously, the XP-E HEW is optimized to lower initial system cost for diffused lighting applications. As you can see from the photos on the right of XP-E HEW being used in these applications, the component provides an extremely bright diffused light.

It should also be noted. XP-E HEW is NOT ideal for applications that require tight optical control such as roadway lights, flash lights, and PAR/MAP Replacement lamps. For Roadway lights and Flashlights the XLamp XP-G and XM-L are ideally suited. And for PAR & MR Replacement lamps, the XLamp MT-G EasyWhite and XM-L EasyWhite are ideally suited for those applications.

XLamp XP-E HEW Application: 450 lm A19



- Target: 450 lumens
- Optical: 85% efficiency
- Electrical: 85% efficiency
- Tsp = 70°C

LED	Current	# of LEDs	System Flux	System Efficacy	System Power
XLamp XP-E	350 mA	7	455 lm	52 LPW	8.73 W
XLamp XP-E HEW	600 mA	4	468 lm	55 LPW	8.42 W

XLamp XP-E HEW cuts LED count while still maintaining the same system performance!

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This slide provides a clear example of how XP-E HEW is ideally suited for bulb replacement designs. For an A19 replacement requiring 450 lumens, assuming 85% optical efficiency and 85% electrical efficiency, and a solder point temperature of 70 Degrees Celsius, one could use 4 XP-E HEW LEDs instead of 7 standard XP-E LEDs.

Using standard XP-E to reach these specifications requires 7 LEDs driven at 350 MilliAmps to get to a total system flux of 455 Lumens, for a system efficacy of 52 Lumens Per Watt, for a total system power of 8.73 Watts. Now with XP-E HEW, you'll only need 4 LEDs driven at 500 MilliAmps for a total of 468 lumens, for a system efficacy of 55 Lumens per watt, and a total system power of 8.42 Watts. To say in another way XP-E HEW enables a design that uses 3 fewer LEDs, while getting better system flux and efficacy and using less power.

XLamp XP-E HEW Application: 600 lm Downlight



- Target: 600 lumens
- Optical: 85% efficiency
- Electrical: 85% efficiency
- Tsp = 80°C

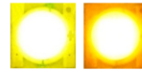
LED	Current	# of LEDs	System Flux	System Efficacy	System Power
XLamp XP-E	350 mA	10	630 lm	51 LPW	12.3 W
XLamp XP-E HEW	700 mA	5	645 lm	52 LPW	12.3 W

XLamp XP-E HEW cuts LED count while still maintaining the same system performance!

For a 600 Lumen downlight the benefits of XP-E HEW are even more dramatic. Assuming 85% optical efficiency and 85% electrical efficiency, and a Solder Point Temperature of 80 Degrees Celsius one could use 5 XP-E HEW LEDs instead of previously using 10 standard XP-E LEDs.

Using standard XP-E to reach these specifications requires 10 LEDs driven at 350 MilliAmps to get to a total system flux of 630 Lumens, for a system efficacy of 51 Lumens Per Watt, for a total system power of 12.3 Watts. Now with XP-E HEW, you'll only need 5 LEDs driven at 700 MilliAmps for a total of 645 lumens, for a system efficacy of 52 Lumens per watt, and a total system power of 12.3 Watts. To say in another way XP-E HEW enables a design that used half as many LEDs, while getting better system flux and efficacy while using the same amount of power.

XLamp XP-E High Efficiency White Standard Order Codes



Min. Flux Bin	Cool	Neutral			Warm		
	51	E3	E4	E5	E6	E7	E8
R5 (H)	139						
R4 (G)	130	130	130	130			
R3 (F)	122	122	122	122			
R2 (E)		114	114	114	114	114	
Q5 (D)		107	107	107	107	107	107
Q4 (C)					100	100	100
Q3 (B)						93.9	93.9
Q2 (A)							87.4

(minimum luminous flux @ 350mA)

Outdoor XPEHEW-**0**1-0000-xxxxx
 Standard XPEHEW-**L**1-0000-xxxxx
 80 CRI XPEHEW-**H**1-0000-xxxxx

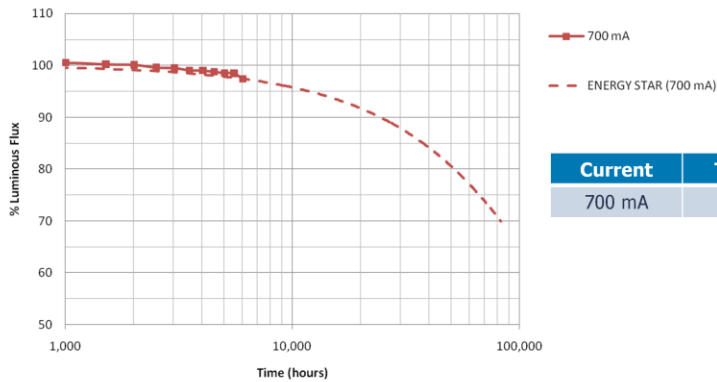
Outdoor
 Standard
 80 CRI



This slide outlines the standard order codes for XP-E HEW, all flux values are the minimum luminous flux at 350 MilliAmps.

As you can see at the bottom of the page, highlighted in Red the first letter after the dash indicates if the product is outdoor, standard and or has a minimum of 80 CRI

XLamp XP-E HEW L70 Lifetime (Ta=55°C)



Notes:

- These extrapolations are for informational purposes only and are not a warranty or a specification.
- Extrapolated lifetimes are subject to change without notice.
- Extrapolation uses ENERGY STAR exponential method (fit to last data point).
- Notice: Cree will revise L70 lifetimes to those calculated by IES TM-21 methods once TM-21 is finalized.

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XP-E HEW performs very well using the Energy Star Standard for measuring lumen maintenance. Using the Energy Star exponential method of extrapolation and 6,000 hours of collected data at 700 MilliAmps and 55 Degrees Celsius, XP-E HEW is projected to maintain 70 per cent of its rated luminous flux at nearly 83,000 hours. That's almost 9 and a half years. This speaks to the robust construction of the LED using the Direct Attach method.

XLamp XP-E HEW – Summary

- **XP-E HEW delivers a new level of flux and efficacy for XP-E utilizing Cree's new direct attach die technology with up to 141 Lumens Per Watt from a single component.**
- **XP-E HEW is optimized for LED replacement bulbs and Downlights and can dramatically reduce the number of LEDs used in a system**
- **XP-E HEW has the features and characteristics you have come to expect from the Cree XLamp Family of LEDs**
- **XP-E HEW performs very well using the Energy Star Method for measuring lumen maintenance, projecting to maintain 70% of its rated lumens for over 80,000 hours.**

In summary:

XP-E HEW delivers a new level of flux and efficacy for XP-E utilizing Cree's new direct attach die technology

XP-E HEW is optimized for LED replacement bulbs and Downlights and can dramatically reduce the number of LEDs used in a system

XP-E HEW has the features and characteristics you have come to expect from the Cree XLamp Family of LEDs

XP-E HEW performs very well using the Energy Star Method for measuring lumen maintenance, projecting to maintain 70% of its rated lumens for over 80,000 hours



PORTABLE

RESIDENTIAL

OFFICE

RETAIL

ARCHITECTURAL

OUTDOOR

LED lighting: Energy efficient & planet friendly.

Cree. Leading the LED lighting revolution.

Join Cree's LED lighting revolution. We invite you to see how our high-performance, high-efficiency LEDs are lighting up the world.

