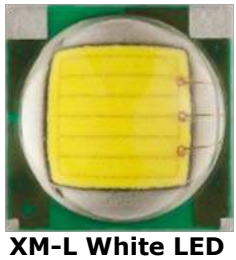
CREE® XLAMP® XM-L WIDE AREA LIGHT DEMO

Demo objective: Provide an easy-to-view depiction of a solid-state lighting system enabling users the opportunity to view multiple illuminance patterns utilizing Cree's revolutionary XLamp XM-L LED. In addition, this demonstration shows first-hand the benefits of utilizing the XM-L at higher than its binning current and closer to its maximum rated current, thus using more of the operating capacity of the LED.

How to use the demo: Lenses can be changed by removing the screw at the center of the optic. This demo is most effective when in a darkened room and the demo is on the floor shining up against the ceiling. If this isn't feasible, shining the demo against a bare wall with the demo 10-15 ft away from the wall best replicates how the system will look in an application and the different light patterns of the various optics.

WARNING: This demo heats up very quickly. Please be careful when handling the demo and don't leave the demo on for more than 5 minutes or it will become very hot to the touch.

The Cree XLamp XM-L White LED is the industry's highest flux and efficacy single-die component, delivering up to 160 lumens per watt at 1 W and 350 mA and up to 1000 lumens at 3 A and 10 W, or 100 lumens per watt. The XM-L is available in color temperatures ranging from 2700K to 8300K and Standard- and High-CRI options. The XM-L is ideally suited for outdoor and high-bay lighting applications and indoor directional fixtures.



XM-L White LED

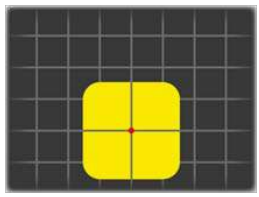
DETAILS ON LEDIL OPTICS

C12361_HB 2X2 High-Bay Module

Optimized to create a square, asymmetric light pattern meeting Design Lights Consortium™ (DLC) high-bay requirements with 70% lm in the 0° - 60° zone and 35% lm in the 20° - 50° zone.

Optic Diagram

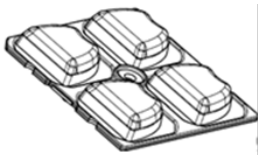
Optic Beam Pattern



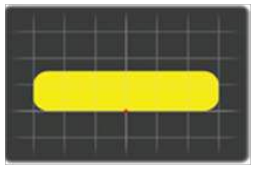
C12419-STRADA-2X2-A-T Street Lighting Type II Pattern

Designed to work on roads that are narrower than the height of the pole and when the spacing is four times the height of the pole. This optic has an asymmetric design so it can used without tilting the lamp head.

Optic Diagram



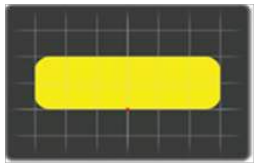
Optic Beam Pattern



C12360_STRADA-2X2-DNW Street Lighting Type III Pattern
Designed for roads where the pole height and the roadway width are similar. This optic has an asymmetric design which often negates the need for tilting the head of the lamp.

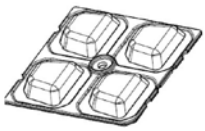
Optic Diagram

Optic Beam Pattern

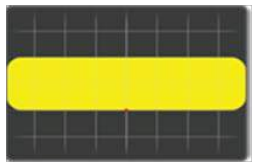


C12362_STRADA-2X2-DWC Street Lighting Type III Pattern
Designed for roads with longer pole distances. This optic can be used in street lighting setups where the pole distance is six times the pole height. This optic also has an asymmetric design that often negates the need to tilt the lamp head.

Optic Diagram

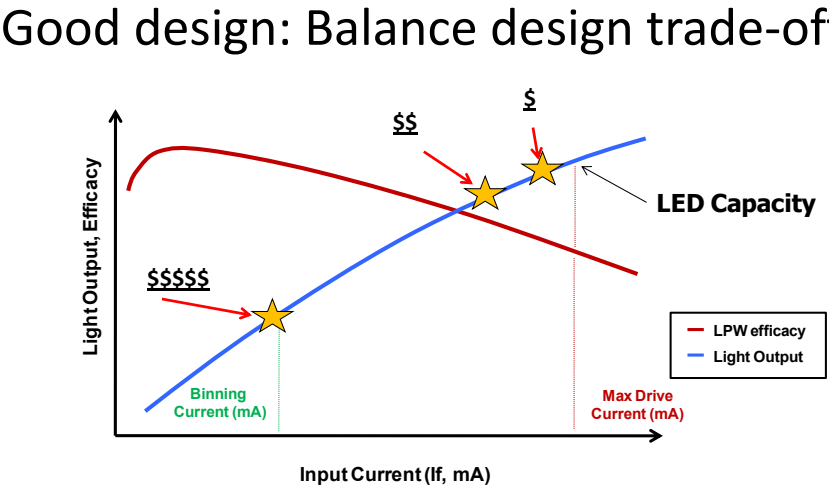


Optic Beam Pattern



Find out more about these optics at www.ledil.com.

There is a common misconception that the current at which the LED is binned is the "optimal" or "recommended" current for operating the LED. That is not the case at all. In fact, if you are operating the LED at the binning current you are more than likely not getting the full potential of the LED and more importantly, out of your system overall. The graph below illustrates this very well. In this example, using the LED at the binning current results in much lower light output per LED and thus requires more LEDs, and higher LED costs, for the system compared to a system utilizing less LEDs driven at higher currents and producing more light output per LED. There are other things to consider in your design in terms of system efficacy, thermal dissipation and other trade-offs. It is important to know that the binning current does not limit how hard you drive an LED.

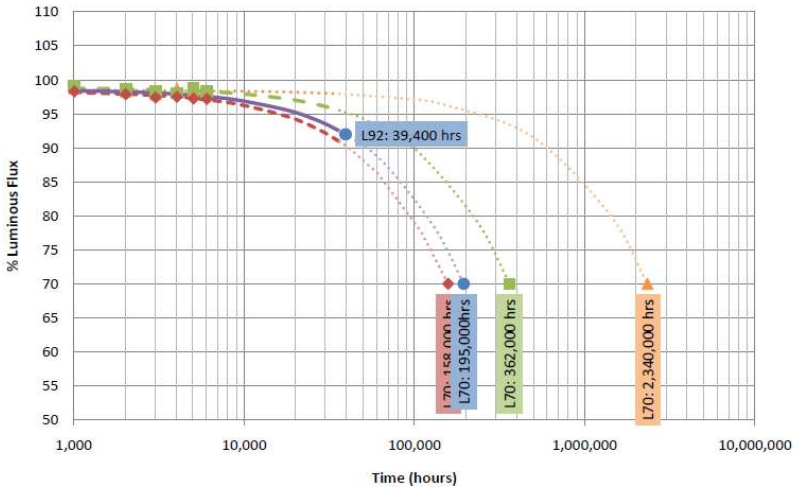


Below is an example of a TM-21 Lifetime Report for the Cree XM-L LED. As you can see from the chart, at 2 amps we have data at a Tsp of 55 °C as well as 85 °C. The calculated LED lifetime at these temperatures is well over

300,000 hours at 55 °C and well over 150,000 at 85 °C. The TM-21 process also allows interpolation of a lifetime estimate for a temperature between the two measured temperatures. So in the example below the calculated lifetime at 77 °C is 195,000 hours. The TM-21 process also allows calculation of a lumen maintenance percentage other than the standard L70 level. In the below example we chose 92% lumen maintenance, i.e., L92. This level was chosen because a large percentage of the population doesn't perceive a less-than-10% change in light level. The calculated L92 lifetime is close to 4.5 years of continuous operation.

TM-21 Lifetime Report

LED	XLamp XM-L White		
I	2000 mA		
	Ts1	Tsi (Interpolated)	Ts2
Tsp	**55°C**	**77°C**	**85°C**
Tsp	328.15 K	350.15 K	358.15 K
Ea/kB		3191.23	
A		1.5965E-02	
α	9.543E-07	1.758E-06	2.155E-06
β	9.887E-01	9.861E-01	9.834E-01
Calculated L70	L70(6k) = 362,000 hours	L70(6k) = 195,000 hours	L70(6k) = 158,000 hours
Reported L70	L70(6k) > 36,300 hours	**L70(6k) > 36,300 hours**	L70(6k) > 36,300 hours
Calculated Lifetime		L92(6k) = 39,400 hours	
Reported Lifetime		**L92(6k) > 36,300 hours**	



INFORMATION ON THE DRIVER FROM XENERQI

The XEL-A025CB is a 25-W constant current LED driver designed for the needs of today's lighting fixtures: multi-country, universal input, high efficiency, PFC, 5-year warranty, lighting suppression, wide output range and no flicker, among others.

Follow the QR code for product, series and contact information or email us at Sales@Xenerqi.com