Emergency Vehicle Lighting

Photos courtesy of Federal Signal Corp.

A current trend in the emergency vehicle lighting industry is the move to LED light sources for takedown lights and light bars. LEDs offer many advantages when compared to traditional halogen light sources, such as reduced power consumption, resistance to failure due to shock and vibration, and directional light output with no need for reflectors. XLamp® LEDs provide these benefits as well as a maximum junction temperature of 145 °C and the most stringent reliability testing in the industry!

Features & Benefits

ISOLATED THERMAL PATH

For emergency vehicle lighting, one of the most important features of XLamp LEDs is the electrically neutral thermal path. This feature allows the light fixture to make use of FR4 PCB with thermal vias, which is 8 to 10 times less expensive than metal core PCB (MCPCB).

HIGH BRIGHTNESS & EFFICACY

Using XLamp LEDs is the easy way to design a light that meets the optical requirements of the emergency vehicle lighting industry, while also offering a significant reduction in power consumption.

STRINGENT RELIABILITY TESTING

Cree qualifies the entire XLamp product line with JEDEC-standard procedures using the highest acceptance criteria in the LED industry. Cree is committed to making high-quality power LEDs and it shows in our testing criteria.

STANDARD SMT PARTS

All XLamp LEDs are leadless, surface-mount components designed for standard reflow soldering. Unlike conventional halogen lamps, XLamp LEDs do not require less-reliable hand-soldered wire connections. Using XLamp LEDs, emergency vehicle lights are much more resistant to failure from shock or vibration — from both bulb failure and connection failure.

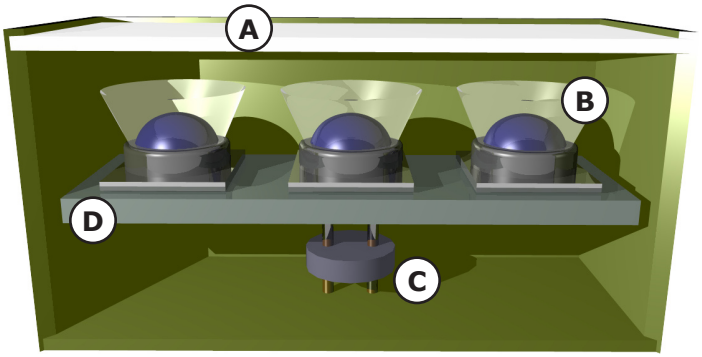
XLamp XR LEDs for Color

XLamp XR LEDs are the best XLamp LEDs yet for this demanding application. The XR series has a very high maximum junction temperature of 145 °C — higher than the previous XLamp XL LEDs and most of the competition. A light based on XR LEDs has a high-enough thermal margin to be used in the hottest of climates and next to existing halogen lights. In addition, XR LEDs have the lowest thermal resistivity

(8 °C/W) in the 1-watt power LED market, meaning that keeping the LED cool is very easy. Finally, XR LEDs are available in a wide array of colors to meet the needs of emergency services in any part of the world. Only Cree XLamp LEDs offer this much quality and flexibility in emergency vehicle light design!

XLamp XR-E LEDs for Halogen Replacement

At 80 lumens typical luminous flux per LED, the XLamp XR-E LEDs are bright enough to replace halogen in applications such as takedown lights. With typical efficacy of 70 lumens per watt, XR-E LEDs use less power and generate less heat than conventional halogen light sources. XR-E LEDs also have all the same thermal and quality advantages of XR LEDs, so there is no compromise in choosing XR-E LEDs to replace halogen in any emergency vehicle lighting application.



A: Diffuser, **B**: Optic, **C**: Driver, **D**: PCB/Thermal

Cost Comparison	PCB		Electrical Connections	Light Source Lifetime
	Type	Cost		
Halogen Lightbar	MCPCB	$80–$100	Hand-soldered wire	Up to 4,000 hrs
Cree XLamp Lightbar	FR4	$15–$20	Reflow soldered SMT	50,000 hrs

Characteristic	Unit	XLamp XR			XLamp XR-E
		Red-Orange	Amber	Blue	Cool White
Typical Luminous Flux @ 350 mA	lm	49	42	15	80
Typical Efficacy @ 350 mA	lm/W	62	53	13	70
Maximum LED Junction Temperature	°C	145	145	145	145
Thermal Resistance, junction to solder point	°C/W	15	15	8	8
Viewing Angle	degrees	100	100	100	90

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