LED for automotive front lighting offers low thermal resistance and high light output at high currents

The new Oslon Black Flat LED from Osram Opto Semiconductors is a high-performance light source for automotive front lighting systems that offers high light output at high currents, uniform light distribution, thermal stability and exceptionally good contrast for seeing and being seen. Equipped with state-of-the-art chip and packaging technology and a ceramic converter (part of Osram's new C2 Ceramic Conversion Technology), this new LED is the latest addition to Osram's Oslon Black series of compact, robust LEDs for automotive and industrial applications. It was introduced as a prototype in September 2011 at the International Symposium on Automotive Lighting and is now commercially available.

Today's light sources for front lighting have to be multitasking components. Not only do they have to reliably illuminate the road in rain, fog and darkness, they need to perform various functions such as low and high beam headlights, daytime running lights, cornering lights, fog lights and other auxiliary lighting. At the same time, the LEDs have to withstand the high temperatures in the headlight. More and more automobile manufacturers are opting for the flexibility, efficiency and power that LED technology offers, and Oslon Black Flat has been designed to meet all of today's front lighting requirements.

High luminous flux at high temperatures
The Oslon Black Flat LED contains new "UX:3" chip technology that delivers high

light output even at high currents. With a power draw of 2.3 W and an operating current of 700 mA, it achieves a typical luminous flux of 200 lumens (at 25°C). If operated at 1.2 A, it can achieve up to 270 lm, even with an application temperature of 100°C in the chip.

Thermal management is much simpler with this new LED due to the greater thermal stability of the luminous flux, even under “hot” application conditions, and also to a new temperature-optimized packaging process. This means that the typical thermal resistance has been reduced to a very low 4 kW. The thermal coefficient of expansion of the LED’s black QFN (Quad Flat No Leads) package is ideally matched to the coefficient of expansion of the metal core board. All these properties make the Oslon Black Flat fully AECQ101 automotive qualified, particularly stable and extremely durable (more than 100,000 hours at 700 mA and a chip temperature of 60°C).

High quality of light for better visibility
The Oslon Black Flat is designed without a lens and a low profile and flat design that maximizes optical incoupling by allowing minimal distance between a light guide or lens. This means more light enters the light guide which is critical to making the implementation successful. Its luminance, what the human eye perceives as the brightness of a particular surface, is 2 to 5 times higher than comparable LEDs in its class at 70-100 Mcd/m² (million candelas per square meter). “This is particularly important in automotive front lighting solutions based on projection systems,” said Michael Martens, product marketing manager for automotive LEDs at Osram Opto Semiconductors. “The greater the luminance of the LED, the smaller the external lens and the smaller the space needed. Headlights can therefore be made much more compact, giving designers much more freedom.”

Encapsulation of the chips directly in the package produces a defined light/dark boundary in the light pattern and, in conjunction with advanced package technology and the ceramic converter, a uniform distribution of light and particularly good contrast ratio on the road.

“The benefits of Oslon Black Flat, especially its low thermal resistance and impressive performance under extreme conditions, have really struck a chord in the industry,” added Martens. “Before the end of 2012, we will be seeing automobiles and motorcycles on the road in which these small LEDs will be performing the key front lighting functions.”

Oslon Black Flat will be showcased at SIA-Vision, October 9 - 10, 2012, in Versailles, France.

For more information go to www.osram-os.com [1]

Links:
[1] http://www.osram-os.com