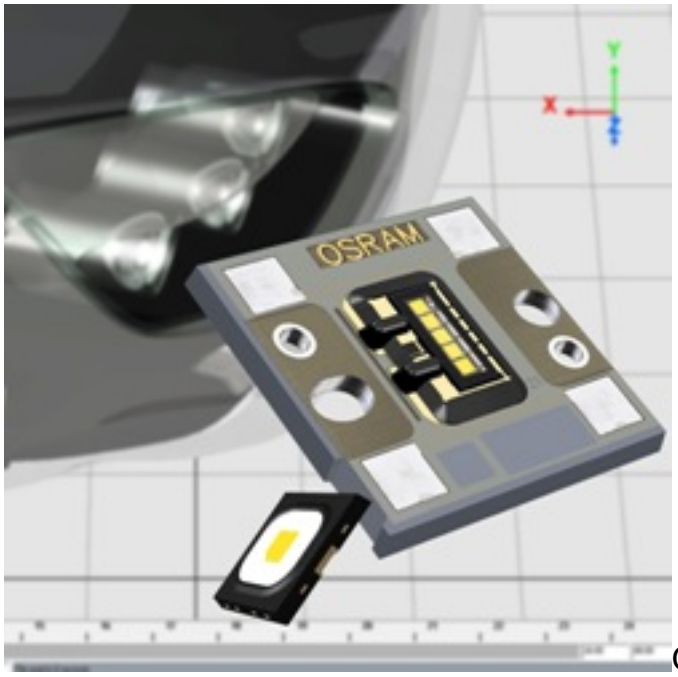
LED Prototypes Enhance Headlight Performance



OSRAM Opto Semiconductors has developed two LED prototypes that combine new chip and package technologies to provide high light output at high currents, a uniform light pattern, thermal stability, and a good contrast ratio to address the requirements of headlight systems. The OSLON Black Flat and OSRAM OSTAR Headlamp Pro prototypes will be showcased at the International Symposium on Automotive Lighting (ISAL) in Darmstadt, Germany, from September 26 to 28, 2011.

More and more flexibility is needed for the light sources used in headlights, the “eyes” of any vehicle. Not only do they have to be reliable and provide the appropriate amount of light in all visibility and driving conditions, they have to perform various functions and adjust to changing ambient conditions, including high temperatures in the headlight itself. OSRAM has developed these new LEDs to meet all of these requirements and more.

OSLON Black Flat is the latest addition to the OSLON Black Series and is equipped with a ceramic converter and a QFN package (Quad Flat No Leads). With a typical thermal resistance of 5 K/W, it is 20% better than the traditional OSLON Black Series. The black package represents high stability because the coefficient of thermal expansion of the LED matches the coefficient of expansion of the metal core board. The flat top, lens free design is ideal for the close coupling needed for light guide designs and maximizes the incoupling of light. The solder pad is identical to the other members of the OSLON family (OSLON Black, OSLON MX & OSLON SX), which enables a wide range of light output from a largely identical board design. With a power draw of 2.3 W and an operating current of 700 mA, the new OSLON Black Flat achieves a typical luminous flux of 190 lm.

The OSRAM OSTAR Headlamp Pro is able to meet a wide range of requirements in terms of output and adaptability to ambient conditions. It offers a more uniform light pattern, better thermal stability (more useable warm lumens) and greater brightness than its OSTAR Headlamp predecessor. The new 20 x 20 mm high-flux LED is available in two to five chip configurations.

The new OSTAR LED offers headlight manufacturers better performance at lower costs. AFS (Adaptive Frontlighting System) functionality can now be achieved with chips that can be controlled individually or in series, allowing for chip matrix solutions. Typical luminous flux values are around 250 lm for a single chip (1A operating current), equating to 1250 lm for the 5-chip version. The thermal resistance of the 5-chip version has been reduced to 2.1 K/W, which represents a 20% improvement over its predecessor.

“The two new prototypes combine new technologies with new functionality and are perfectly matched to the demanding automotive requirements of headlight systems,” said Peter Knittl, OSRAM’s Director of Automotive LED. “This makes them particularly attractive for widespread use in all vehicle classes.” The design utilizes OSRAM’s new UX:3 chip technology, which excels at producing high light output even at high currents, and a ceramic converter, which provides a uniform light pattern. Additionally, the advanced package technology of the device produces a defined light/dark boundary in the light pattern, thereby providing a particularly good contrast ratio for simpler and improved optical designs. All these properties make the LEDs ideal for efficient use in headlights. Initial samples are now available. Market launch is scheduled for the 3rd quarter of 2012.

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