

Press

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Osram increases luminous efficacy of white and blue high-power LEDs by 7.5 percent

Improved epitaxial processes reduce droop

Osram Opto Semiconductors' research lab has considerably improved the luminous efficacy of its high-power LEDs by reducing the unwanted droop effect at high currents. This development was made possible by optimized epitaxial growth processes. At a current density of 3 A/mm², the quantum efficiency of the LEDs is now a full 7.5 percent above the previous level.

The unwanted drop in efficiency as the current density increases, commonly referred to as “droop”, limits the maximum luminous efficacy of indium gallium nitride based light emitting diodes (LEDs) and is, therefore, the subject of intense research and development activities worldwide. Engineers at Osram Opto Semiconductors have now been able to reduce this effect considerably and achieve a significant increase in the efficiency of the LEDs. Under laboratory conditions and at a current density of 3 A/mm², a typical luminous flux of 740 lm was verified in a QFN LED package (Quad Flat No Lead) – an improvement of around 7.5 percent compared with previous typical values (6200 K, Cx 0.319, Cy 0.323, single-chip version). Even at low current densities of 0.35 A/mm², the benefit of the optimized LEDs is still around 4 percent. “We have been able to reduce the droop effect considerably by extensively revising and improving the epitaxy,” said Dr. Alexander Frey, Project Manager at the Regensburg company.

The new processes are being used in all LEDs from Osram Opto Semiconductors based on UX:3 chip technology and will also have a positive impact on other high-power products. The results will be integrated step by step in the company's existing product portfolio.

Press Contact:

Kate Cleveland

Tel. 248-277-8018

Fax 248-596-0395

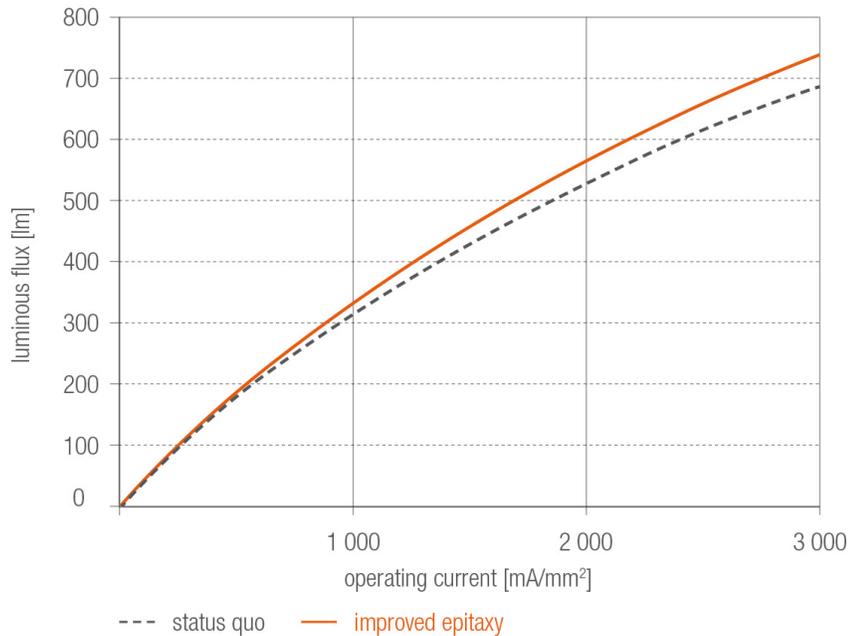
Email kate.cleveland@osram-os.com

Technical Information:

Tel. 866-993-5211

Email: support@osram-os.com

Sales contact: www.osram-os.com/sales-contacts



By making improvements to the epitaxy, Osram has achieved a considerable increase in the luminous efficacy of white LEDs compared to existing products. At 3000 mA/mm² the benefit is a full 7.5 percent.

Picture: Osram

ABOUT OSRAM

OSRAM, based in Munich, is a globally leading lighting manufacturer with a history dating back more than 100 years. The portfolio ranges from high-tech applications based on semiconductor technology, such as infrared or laser lighting, to smart and connected lighting solutions in buildings and cities. OSRAM had around 33,000 employees worldwide at the end of fiscal 2015 (September 30) and generated revenue of almost €5.6 billion in that fiscal year. The company is listed on the stock exchanges in Frankfurt and Munich (ISIN: DE000LED4000; WKN: LED 400; trading symbol: OSR). Additional information can be found at www.osram.com