EXALOS Achieves a New Milestone for Next Generation Display Technologies with its First Cyan-Green Superluminescent Light Emitting Diode (SLED)

Schlieren, Switzerland, January 22nd, 2018. EXALOS, the world’s leading developer of visible Superluminescent Light Emitting Diodes (SLEDs), has successfully produced its first cyan-green SLED. With an output wavelength of 495 nm in between the company’s existing red (640 nm, GaAs) and blue (450 nm, GaN) devices, this SLED represents a major step toward a complete red-green-blue (RGB) SLED illumination source for micro-displays in augmented reality applications, head-up display architectures, etc.

SLEDs are broadband semiconductor devices that are closely related to their more commonly known relatives, laser diodes (LDs) and light-emitting diodes (LEDs). Following the successful demonstration of blue SLEDs, Exalos embarked upon a comprehensive program last year to develop green devices. The effort leveraged a number of the advances that had successfully yielded 450 nm GaN-based SLEDs and required increasing the indium concentration in the quantum well (QW) structures to attain the longer wavelengths. After just six months, a major milestone has been achieved through the demonstration of the company’s first cyan-green device at an optical output power of > 5 mW. The breakthrough resulted from extensive modeling/simulation, iterative epitaxial designs, and improvements in the modal gain of the semiconductor structure. Efforts are now underway to increase the power, improve the wall plug efficiency, and extend operation to wavelengths beyond 500 nm.

With the current wave of excitement surrounding the potential of augmented and virtual reality (AR/VR) applications, there is significant interest in high luminance displays for near-to-eye and pico-projector systems that are compact and offer a wide color gamut with high overall efficiency. While LDs and LEDs have been the preferred illumination sources for such displays, their shortcomings have been well documented. LDs have a narrowband output which can comprise image quality through unwanted coherent artifacts and speckle. LEDs, on the other hand, are broad area emitters which result in low efficiency when coupling into waveguide architectures. SLEDs, however, are directional light sources offering efficient coupling to micro-optical elements with a broader spectral bandwidth that leads to strongly reduced speckle noise and improved image quality when used as illumination sources in holographic and MEMS-based scanning micro-displays. In addition, visible SLEDs can also provide benefits in applications such as broad area illumination, sensing, microscopy, spectroscopy, or machine vision.

Exalos will be exhibiting its cyan-green SLEDs for the first time, along with its latest red and blue devices, at BIOS and PW in San Francisco from January 27th to February 1st. Please stop by our booth at either BioS (8335) or Photonics West (1941) to discuss how these sources can benefit your application and learn more about our latest developments.

For more information about our SLEDs please visit our website at www.exalos.com or email us at sales@exalos.com.

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About EXALOS
EXALOS AG, an ISO 9001:2015 certified company, is developing and selling near-IR SLEDs and Swept Source, with wavelengths ranging from 650 nm to 1650 nm, for the medical imaging, fiber optic gyroscope, test equipment and sensor industries and visible SLEDs and Laser Diodes, with wavelengths ranging from 405 nm to 650 nm, novel displays, machine vision, broad area illumination. Etc. EXALOS has its headquarters in Schlieren, Switzerland.