New technology gives the green light to compact laser projectors

Osram Opto Semiconductors now offers its first direct green laser diodes. With optical outputs of 30 and 50 milliwatts and a particularly high beam quality, the two new compact laser diodes represent a milestone in the development of miniature projectors for mobile devices such as smartphones and cameras. Projection units for laser shows, point lasers and line lasers will also benefit from this new technology.

Direct green laser diodes are an important step toward the development of powerful pico projectors. It means that the old labor-intensive method of producing green light by doubling the frequency of an infrared laser is no longer necessary. More importantly, the new technology enables high color rendering and excellent contrast.

The new laser diodes are available in two versions. The PL 520 provides wavelengths of 515-530 nm, producing precisely the right green beam for projection applications. Its optical output power is 50 mW and the efficiency is 5-6%. The PL 515 offers an output of 30 mW in a wavelength range of 510 to 530 nm, with the same efficiency. Both laser diodes have a package diameter of only 3.8 mm, which enables the dimensions of projection units to be reduced considerably. “The commercial breakthrough for compact laser projectors is closer than ever before,” said Sevugan Nagappan, Product Marketing Manager at Osram Opto Semiconductors.

Single-mode lasers with high beam quality
The new laser diodes have a very high beam quality, emitting an extremely narrow beam that spreads out only slightly, thanks to its small divergence angle. In the case of pico projectors, which project the laser light with a MEMS mirror (micro-electromechanical system) without any other optics, the size of the light point determines the image resolution. So, the beam quality is particularly important here. Both laser diodes operate in single mode, which means they emit only a single transverse oscillation mode.

Direct emitting lasers can be better modulated than other laser types, such as frequency-doubled infrared lasers. This is an important property for MEMS-based projectors, in which the color components per pixel result from the emission time of the laser diode. There is also no need to adjust the focus of the projection image because the image is always sharp, even on curved surfaces.

Laser shows, point lasers and line lasers
These single mode lasers open up new possibilities as light sources for laser shows. Their high beam quality enables extremely fine structures to be displayed, even over large distances. The projectors also benefit from the high thermal stability and small size of the lasers.

Green diode lasers are also ideal as point or line lasers for measuring distances, as the human eye is most sensitive in the green spectrum, providing another important advantage over red laser light. For the same laser output, and therefore the same laser safety class, green light is more easily perceived by the human eye than red light that is typically used. This means that distance meters, such as those used by builders, can be used over longer distances.

By launching one of the first direct emitting green laser diodes, Osram Opto Semiconductors is solidifying its leading position in lasers based on indium gallium nitride (InGaN). The green laser is the result of years of intensive development work at OSRAM’s laboratories in Regensburg, Germany. It has been developed as part of the MOLAS project sponsored by the German Ministry for Education and Research for technologies involving ultra-compact and mobile laser projection systems. In 2010, researchers at the company received the Karl-Heinz-Beckurts Award for development work on the green laser.

www.osram-os.com/pr-greenlaser [1]

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