



Press Release

TRUMPF expands its portfolio of polarization stable VCSELs for optimal illumination performance

Release new multimode VCSEL with polarization stable light for higher performance // Surface gratings enable stable polarization for better illumination quality // Dual polarization, high-power multimode VCSEL and high-power single-mode polarization-controlled VCSEL planned for 2023

Ulm, January 17, 2023 – TRUMPF Photonic Components, a global leader in VCSEL and photodiode solutions, releases a new multimode VCSEL with stable polarization to support the increasing demand for advanced VCSEL sources. By integrating additional functionalities such as linear polarization, the VCSEL technology is becoming smarter and the illumination quality is increasing. “It’s great to see the VCSEL technology evolving and to tap into new application fields for VCSELs by integrating additional features. With the market release of our new multimode VCSEL with stable polarization, we serve application demands with optimal illumination quality, like in smartphones”, says Ralph Gudde, Vice President Marketing and Sales at TRUMPF Photonic Components. The new 940nm multimode VCSEL with controllable polarization is entering mass production and comes with high yield. The proprietary surface grating is directly etched into the Gallium arsenide (GaAs). With the two emission zones, the new VCSEL generates an optical power of 8 mW. Applications in consumer electronic devices and smartphones benefit from this optimum efficiency in optical power, as the VCSEL technology combines high laser efficiency and slope efficiency of 1 W/A with full polarization control. Measurements confirm that the electro-optical properties of VCSELs with integrated grating and stabilizing linear polarization are the same as VCSELs without grating. “Thanks to the polarization feature, controlled laser light improves the quality of the overall sensing system, enabling a positive user experience and power savings”, says Gudde.

Better illumination quality for smartphones, AR and VR applications

The smartphone and consumer electronics industries are constantly looking for smarter components for their devices, all the while increasing illumination quality. VCSELs with polarization-controlled light address these demanding 3D



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illumination applications not only in smartphones, but also in OLED screens or in virtual and augmented reality applications. The illumination quality is severely increased, as polarized light helps to eliminate optical losses. VCSELs with stable polarization also avoid disturbing reflections and enable innovative optical concepts like a collinear arrangement of transceiver and receiver optics. This is supported by TRUMPF's own designs and processes, which enable high quality and perform without any losses.

Two in one: switchable polarization on its way

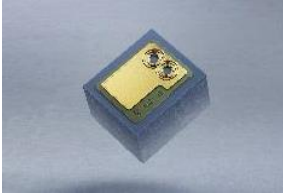
TRUMPF also announces its next products with polarization features, that will be released later in 2023. One is a multimode VCSEL with dual polarization that is now ready for customer sampling. Here, one single VCSEL chip can individually address two polarization directions, which significantly reduces the form factor and the optical system complexity. This supports further miniaturization demands in smartphone applications and consumer electronics. In the actual concept, two VCSEL arrays at 0° and 90° linear polarization, are combined and interlaced on one VCSEL chip, using orthogonal surface gratings. The two polarization directions are individually addressable, each yielding about 1.35 W of output power. Combined with polarization-selective optics this results in a reduction of components, as only one VCSEL chip is needed to create both flood illumination and dot patterns. "Dual polarization VCSELs will revolutionize the consumer electronics business", says Gudde. "Device manufacturers will get one component that functions as a dual-pattern projector", Gudde adds. The second release will be a large polarization controlled single emitter, single-mode VCSEL component with 2 mW output power. This serves industrial sensing applications like industrial optical encoders and spectroscopy. Evaluation samples will be available from June onwards and mass production is scheduled for the end of 2023.

Visit TRUMPF Photonic Components at Photonics West 2023 at Booth 539

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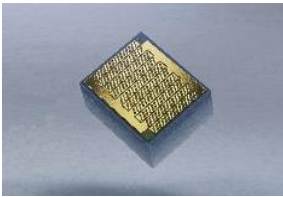


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New multimode VCSEL with stable polarization

TRUMPF releases a polarization-stable multimode VCSEL to improve the illumination quality in demanding 3D-illumination applications.



One VCSEL two polarization directions

VCSELs with dual polarization will support miniaturization demands in smartphone applications and consumer electronics.



Two illumination patterns by one VCSEL

VCSEL with dual polarization can serve both flood-illumination and dot-pattern applications at the same time.



TRUMPF designs and manufactures VCSELs and photodiodes

In the state-of-the-art clean room facility high quality VCSELs are manufactured.

About TRUMPF Photonic Components

TRUMPF Photonic Components is a global technology leader, supplying VCSEL and photodiode solutions for consumer electronics, datacom, automotive, industrial sensing and heating markets. So far, more than two billion VCSEL chips and photodiodes have been shipped worldwide. The staff continues to drive its technological know-how, that has been established for over 20 years now in order to maintain its leadership position. The long-established technology was acquired by TRUMPF in 2019. The company has its headquarters in Ulm, Germany, with further sales locations in the Netherlands, China, Korea and the US.

TRUMPF Photonic Components belongs to the TRUMPF Group, a high-technology company that offers production solutions in the machine tool and laser sectors. TRUMPF is one of the global technological and market leaders for machine tools used in flexible sheet metal processing, and also for industrial lasers and metal 3D printing. In the 2021/22 fiscal year, the company employed some 16,500 people and generated sales of about 4.2 billion euros. With over 80 subsidiaries, the TRUMPF Group is represented in nearly every European country, in North America, South America and Asia. The company has production facilities in Germany, France, the United Kingdom, Italy, Austria, Switzerland, Poland, the Czech Republic, the United States, Mexico and China.



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For more information about TRUMPF Photonic Components visit:

www.trumpf.com/s/VCSEL-solutions

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