



Press Release ViBO

Smaller, safer, smarter: TRUMPF presents new VCSEL laser platform ViBO

TRUMPF drives VCSEL array technology further and presents new VCSEL platform with monolithically integrated micro-optical elements // 3D sensing applications benefit from tailored illumination profiles from smart glasses over face recognition towards LiDAR

Ulm, September 15, 2021 - TRUMPF Photonic Components, a global leader in VCSEL (Vertical Cavity Surface Emitting Lasers) and photodiode solutions for the consumer electronics, data communications, industrial sensing and heating markets, has revealed the new product platform **ViBO** (VCSEL with integrated Backside Optics). This revolutionary VCSEL array technology supports a new generation of illumination devices that are inherently eye-safe over the whole product lifetime as the diffusor optics are monolithically incorporated into the laser array. This allows easy interfacing with the new platform and enhances reliability. Also, the form factor is significantly reduced compared to present hybrid VCSEL package solutions. ViBO can be directly SMD mounted onto a board or driver IC without additional wire bonding. This supports for instance easier integration under smartphone displays.

"ViBO has superior properties as well as cost advantages compared to standard top-emitting devices that are combined with external optics. Using ViBO as light source for 3D sensing applications offers more flexibility and freedom in design for its integration, as the footprint and the height are significantly smaller than hybrid solutions. This is especially interesting for consumer electronics such as smartphones or AR glasses", says Ralph Gudde, VP of Marketing and Sales. "The smart combination of our high-performance VCSELs with unique, patented lens forms directly etched into the GaAs-substrate, gives our customers unprecedented benefits in creating tailored illumination profiles needed in advanced 3D sensing applications," adds Ralph Gudde. Addressable zones allow to create not only flood or spot illumination, but also linear or individual illumination profiles as the emitting zones can be flexibly turned on and off.

In the first generation products, TRUMPF focuses on the realization of illumination devices incorporating various diffusor designs for a wide range of emission angles to support various flood illumination applications for consumer and automotive. Ralph Gudde motivates that approach, "after having shipped millions of hybrid packaged products containing separate VCSEL arrays and diffusors, these widely used flood illuminators are the logical candidates for our ViBO technology." With coplanar contact designs, the devices can be flip-chip mounted yielding the most compact integration with the shortest electrical path and thus minimum electrical inductance. This design setup allows short pulses, high modulation speed and the flexibility of addressing multiple channels or even selected segments on the chip.

ViBO lays the foundation of a new platform which can be tailored to various customer requirements and optical system designs. Conceivable fields of application could be all areas of proximity sensing – from smart glasses over face recognition towards LiDAR applications.



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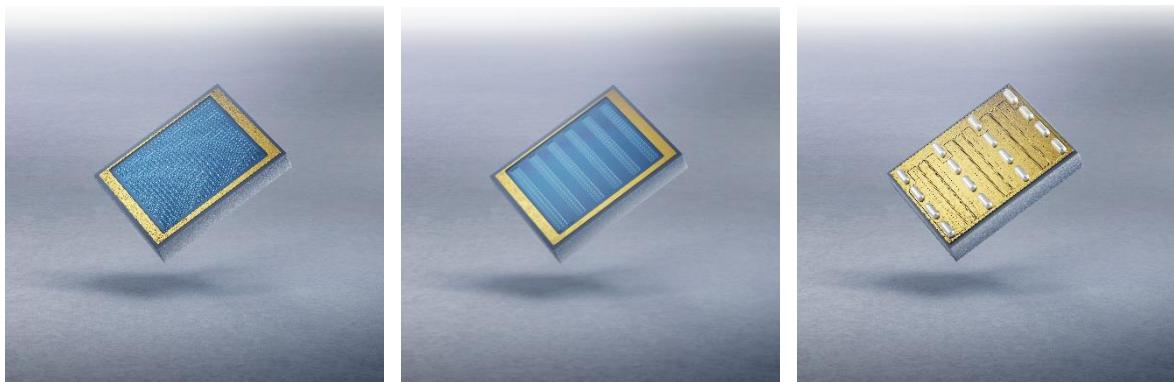
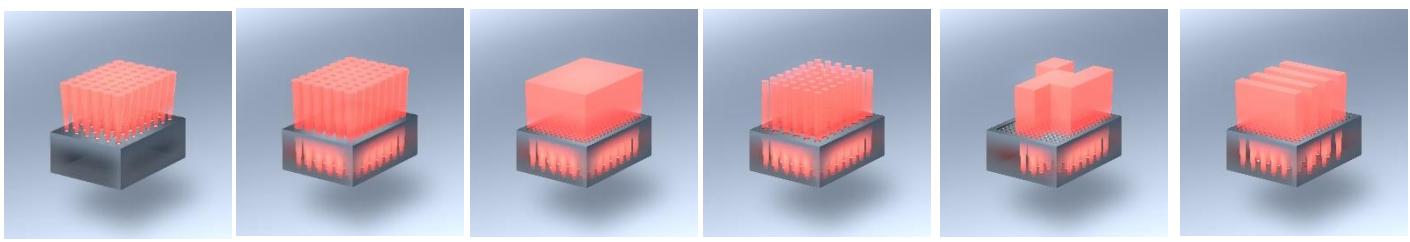


Figure 1: **ViBO** product with uniform lens array to support flood illumination (left) and addressable lens zones to support scanning illumination (middle). ViBO products can be SMD mounted to the board or driver IC using preformed contacts



(right). © TRUMPF

Figure 2: Technological description - Standard VCSEL top emitter - the light is generated in the top layer where it exits the GaAs substrate (1). Standard bottom emitter - the light is generated at the bottom layer and travels through the GaAs substrate where it leaves the substrate at the top (2). In case of **ViBO**, custom lens structures are etched into the top of the GaAs substrate to create the desired illumination profile like diffusing (3) or (4) collimating. By addressing different zones, more advanced illumination profiles can be generated (5, 6). © TRUMPF



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About TRUMPF Photonic Components

TRUMPF Photonic Components is a global technology leader, supplying VCSEL and photodiode solutions for consumer electronics, datacom, industrial sensing and heating markets. More than two billion VCSEL chips and photodiodes have been shipped worldwide so far. The employees continue to drive the 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 the world technological and market leader for machine tools used in flexible sheet metal processing, and also for industrial lasers and metal 3D printing. In 2019/20 the company – which has about 14,300 employees – achieved sales of 3.5 billion euros. With over 70 subsidiaries, the TRUMPF Group is represented in nearly all the countries of Europe, North and South America, and Asia. It has production facilities in Germany, France, Great Britain, Italy, Austria, Switzerland, Poland, the Czech Republic, the USA, Mexico, China and Japan.

For more information about TRUMPF Photonic Components visit: www.trumpf.com/VCSEL-solutions

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