



## Press Release

# TRUMPF multi-junction VCSEL technology drives system efficiency and miniaturization

**Multi-junction option supports miniaturization trends in consumer electronics and automotive // Up to triple-junction high-performance VCSEL arrays available // Increase in output power and higher efficiency // Up to 3 times more output power at same current level**

*Ulm, October 11, 2022* – TRUMPF Photonic Components, a global leader in VCSEL and photodiode solutions, supports the request for miniaturization in consumer electronics and automotive, and expands its VCSEL array portfolio with the multi-junction feature. The tunnel junction technology offers a highly efficient solution for the demanding trend towards miniaturization. With tunnel junctions, the performance of a single VCSEL is increased, as multiple active zones are put into series in the same VCSEL component. Up to three times the output can be generated out of the same VCSEL device. Most illumination applications benefit from higher efficiency and increase in output power with the same VCSEL light source. “Our customers also benefit from an increase in flexibility. Based on their application needs, they can configure their VCSEL components with a single, double, or triple junction”, says Alexander Weigl, Head of Product Management at TRUMPF Photonic Components.

### **Application in automotive industry**

The multi-junction technology supports applications such as LiDAR, as this application in the automotive branch requires high-output power within limited space for the short and long-range identification of objects. “We even combine the multi-junction technology with our ViBO technology platform. Due to our integration approach to make our VCSELs smarter, this unique VCSEL comes with integrated backside optics and is already up to five to ten times smaller compared to other VCSELs”, explains Weigl. “This is a big step towards miniaturization, while increasing output power and reliability of the VCSEL components”, Weigl adds.

### **Customer benefit from a VCSEL toolbox**



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The VCSEL technology will remain a main light source for applications in smartphones, consumer electronics and automotive applications, as they are highly efficient and boast a long service life. Based on the application requirements, TRUMPF offers options with highly integrated optical structures for the best fit. Therefore, along with the multi-junction option and monolithically integrated optics, VCSELs can offer polarization control for improved illumination quality, or integrated photodiodes to enable the further processing of light signals. To offer robust VCSEL devices with high performance, TRUMPF covers the whole process chain, from the developing and designing right to its manufacturing of their VCSELs solutions.

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### **VCSELs with multi-junction support LiDAR applications**

LiDAR applications require high-output power within limited space, this is addressed by VCSELs with multi-junction.



### **TRUMPF Photonic Components clean room facility**

TRUMPF designs and manufactures its VCSEL solutions with state-of-the-art technology.



### **Alexander Weigl, Head of Product Management at TRUMPF Photonic Components**

### **About TRUMPF Photonic Components**

TRUMPF Photonic Components is a global technology leader, supplying VCSEL and photodiode solutions for the consumer electronics, datacom, automotive, industrial sensing and heating markets. So far, more than two billion VCSEL chips and photodiodes



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have been shipped worldwide. With over twenty years of experience, the company maintains its leadership position by continuing to drive its technological know. This 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 the 2021/22 fiscal year, the company employed some 16,500 people and generated sales of about 4.2 billion euros (preliminary figures). 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.

For more information about TRUMPF Photonic Components visit:

[www.trumpf.com/s/VCSEL-solutions](http://www.trumpf.com/s/VCSEL-solutions)

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