

CompoundTek Successfully Demonstrates One of the World's First Hybrid Si O+C+L-Band Wavelength-Tunable Laser Module For Stealth Mode Product Company

Singapore, 11 Apr 2022 – At the recent LUX-Enterprise Singapore Co-packaged Photonics/ASICS & Heterogeneous Integration Workshop, CompoundTek Pte Ltd, a global foundry services provider in emerging Silicon Photonics (SiPh) solutions, shared ground-breaking results on hybrid Silicon O+C+L-band wavelength tunable laser module that a stealth mode product company ran with CompoundTek.

Through the development of the hybrid silicon laser technology, CompoundTek's team led by Chief Operating Officer, KS Ang and Principal Engineer, Dr Brian Sia together with key personnel from the stealth mode product company are one of the first in the world to realise laser engines that operate simultaneously in the O-, C-, and L-wavebands. The laser engines have a wavelength tuning range of 175 nm across the three wavebands, with an output power and side-mode suppression ratio as high as 40 mW and 50 dB, respectively.

As a corollary to highly advanced silicon manufacturing, silicon photonics has emerged as one of the fastest growing technologies. However, due to the material properties of silicon, the realisation of laser sources has represented one of the final frontiers in the area. "Lighting up Silicon" is thus a strategically imperative initiative that needs to be urgently addressed.

The primary advantage of wavelength-tunable laser lies in its ability to reduce the complexity of optical systems; a single wavelength-tunable laser can be used to replace an array of single-wavelength lasers, thereby, simplifying system architecture as well as lowering inventory cost.

While distributed feedback (DFB) laser arrays and microelectromechanical systems (MEMS) vertical cavity surface emitting lasers (VCSEL) have been shown to demonstrate wavelength-tuning functionality, there are limitations in terms of DFB array coupler loss and mechanical instability, respectively. Littman/Littrow-configured external cavity lasers (ECL) have also indicated wide operating wavelength range; however, the application-space of these class of lasers are limited by their bulk, as well as higher vulnerability to environmental vibrations.

KS Ang said, "The challenge is for the development of a solid state-based laser diode with compact footprint, good performance that can be manufactured in a scalable, high-yield and low-cost process. CompoundTek's silicon photonics platform poses an attractive proposition for the realisation of the technology."

"While there are many ways to build a tunable laser, what sets CompoundTek's technology apart is our ability to integrate with Silicon Photonics devices which offer low propagation loss and high integration densities. Kudos to Dr. Brian Sia and the team, we are indeed very proud of this latest achievement," he added.

Since its inception in 2017, Singapore-based CompoundTek has over 20 global commercial customers alongside more than 20 research institutes and universities in various applications such as telecommunications, automotive radar, data communications, bio-sensing, artificial intelligence, quantum computing and smart sensors.

For more information, please contact enquiries@compoundtek.com

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About CompoundTek Pte Ltd

Founded and supported by industry veterans and technologists, Singapore-based CompoundTek combines world-class commercial foundry with leading silicon photonics (SiPh) research institutes to provide cutting-edge SiPh technologies that enhance foundry services capabilities. As one of the elites offering SiPh solutions internationally, CompoundTek brings to the marketplace revolutionary semiconductor applications designed to meet critical requirements in high bandwidth and high data transfer solutions particularly in emerging connectivity driving Industry 4.0. The company's in-depth know-how includes end-to-end technologies - from proprietary fabrication process expertise to product design support with strategic partners and extended services for end-product manufacturing. CompoundTek's global customers span FORTUNE 500 companies in high-growth industries including artificial intelligence, automotive, bio-medical diagnostics, data centre, lidar, smart sensor, telecommunication and quantum optical computing.

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