



CompoundTek and STAR Technologies collaborate to establish strategies for high-volume Silicon Photonics Wafer Test

Partnership aims to spearhead innovations and development of standard processes from design through to test and inspection

Singapore, 18 August 2020 – CompoundTek Pte Ltd (CompoundTek), a global foundry services provider in emerging silicon photonics (SiPh) solutions, and STAR Technologies Inc (STAR), architects with leading technologies for semiconductor test solutions – have formed a strategic collaboration to develop standards and solutions for cost-effective high-volume SiPh Wafer Test. Addressing the growing need for consistency and reliability across all applications of SiPh technology, the SiPh Wafer Test aims to spearhead the development of more standard processes and facilitate wider industry adoption and innovations from design through to test and inspection.

SiPh is a technology that is not only being used to displace traditional electrical interconnects, but also for a broad range of applications, including lidar, quantum computing, and bio-sensing. Today, however, the integration of optical components on a chip creates a host of new challenges in wafer-level probing of SiPh devices as large volumes of device-performance data are required to carry a design from concept to qualification and subsequently into production.

“To accelerate the market wider adoption of wafer-level Silicon Photonics tests - cost and efficiencies must be improved. To do so, we believe it is necessary to take a holistic approach by establishing partnerships that leverage expertise within the test technology value chain and that of the fabrication process. It is this synergy of measurement instrumentation, positioning and commercialisation technologies that will further standardise the way testing is done, the way the chip is laid out for ease of tests - that both CompoundTek and STAR effectively brings to the marketplace,” explained Raj Kumar, CompoundTek’s chief executive officer, on the collaboration.

Currently, SiPh testing is fragmented with no recognised standards. Most of the companies have homegrown SiPh bench solution which is good for small scale engineering characterisation during the design verification phase, but inefficient for the high-throughput and low-cost test required for testing during the mass production phase. There is no independent SiPh wafer test service provider with a cost-efficient solution to address this market gap. Availing these capabilities helps the industry to drive down associated product costs from prototyping to mass manufacturing, and accelerate their time to market.



Dr Jeffrey Lam, general manager and vice president of engineering of STAR Technologies adds, "When you think of working in a lab on an initial prototype, and spending a few hours to set up and align a single device for measurements, it seems feasible. It is not the case however, in high-volume SiPh manufacturing where time- and effort-intensive methods are not practical, and time-to-market is a critical factor. This has inhibited the rapid adoption of SiPh, a challenge we aim to effectively address with methods and strategies that have a unique relative emphasis on accuracy, throughput, and test flexibility, through our combined SiPh Wafer Test approach."

The technology shift in the form of SiPh demonstrates the potential for measurable gains in speed, power efficiency and density. The first wave of the SiPh revolution is poised to roll over to data centres around the world with optical interconnects that break the barriers set by copper wire.

Yole's Silicon Photonics Market and Technology 2020, shows that in 2019, shipments of SiPh transceivers for datacenters reached almost 3.5 million units, generating revenues worth approximately US\$364 million from the development of transceivers for telecom/datacom applications. Led by the demand from global network traffic such as applications in cloud, video streaming, and Internet of Things (IoT), the SiPh transceiver market itself is expected to be worth US\$3.6 billion in 2025 with 24 million units shipped.

In parallel, the development of SiPh transceivers has resulted in increased demand of cost-effective wafer test solutions, enabling the industry to improve their quality control coverage at wafer-level, potentially driving down product costs due to failures after packaging.

Since its launch in 2017, Singapore-based CompoundTek has 20 global commercial customers and over 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 leading brands and FORTUNE 500 companies in high-growth industries including artificial intelligence, automotive, bio-medical diagnostics, data centre, lidar, smart sensor, telecommunication and quantum optical computing.

Visit <https://compoundtek.com/> for more information.

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About STAR Technologies

Founded in 2000, and headquartered in HsinChu, Taiwan, STAR Technologies Inc is a leader in semiconductor and test solutions; providing intellectual property, software, hardware, consumables, service and expertise to meet the requirements and challenges within the semiconductor industries. STAR's global customers span leading foundries, IDMs, fabless companies in various market sectors across semiconductor industries including telecommunications, industrial, automotive, CMOS imaging, data computing, smart sensors.

Visit <https://www.star-quest.com/> for more information.

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