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EVG and Teramount collaborate on packaging technologies for photonic integrated circuits – March 31, 2022

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Wafer-level optics helps solve challenge of connecting fibers to silicon chips for datacom and telecom applications

EV Group of St Florian, Austria — a supplier of wafer bonding and lithography equipment for semiconductor, micro-electro-mechanical systems (MEMS) and nanotechnology applications — and Teramount of Jerusalem, Israel (which provides scalable solutions for connecting optical fibers to silicon chips for data center, advanced computing, sensors and other datacom and telecom applications) are collaborating on implementing wafer-level optics to solve a major obstacle of silicon photonics, namely fiber chip packaging. The collaboration will leverage EVG's nanoimprint lithography (NIL) technology, expertise and services with Teramount's PhotonicPlug technology.

Under this collaboration, standard CMOS wafers that implement silicon photonics chips will be post processed using EVG's NIL technology to implement optical elements such as mirrors and lenses for Teramount's unique 'self-aligning optics'. This enables flexible beam extraction from the chips and easy connection to a large number of optical fibers. Furthermore, it enables wafer-level optical inspection capabilities for enhancing silicon photonics wafer manufacturing.

The collaboration is being carried out within EVG's NILPhotonics Competence Center, which provides an open access innovation incubator for customers and partners across the NIL supply chain to collaborate to shorten development cycles and time to market for innovative photonic devices and applications. Through the collaboration with Teramount, EVG provides process development and production services, as well as expertise in both CMOS and photonics manufacturing, accelerating the commercialization of Teramount's PhotonicPlug technology.

The need for high-speed data transfers in data centers, telecom networks, sensors and emerging applications in advanced computing for artificial intelligence (AI) is growing exponentially. This in turn is driving the importance of developing solutions that can cost-effectively scale up production of silicon photonics, which enable ultra-high bandwidth performance. The collaboration between EVG and Teramount aims to solve this problem.

"Our joint work with EVG has been very successful in producing this innovative synergy between wafer-level optics and silicon photonics wafer manufacturing," says Hesham Taha, CEO of Teramount. "By offering this capability to the industry, Teramount solves one of the major hurdles to further adoption of optical connectivity, which is critical for so many applications that require high-speed data transfers and low power consumption," he adds.

"Teramount's PhotonicPlug silicon photonics packaging technology is a truly novel approach to improving optical performance," comments Markus Wimplinger, corporate technology development and IP director at EVG. "This is just the latest example of innovative technology developed with the support of EVG's process and equipment know-how through our NILPhotonics Competence Center, where we help our partners and customers turn new ideas into innovative products."

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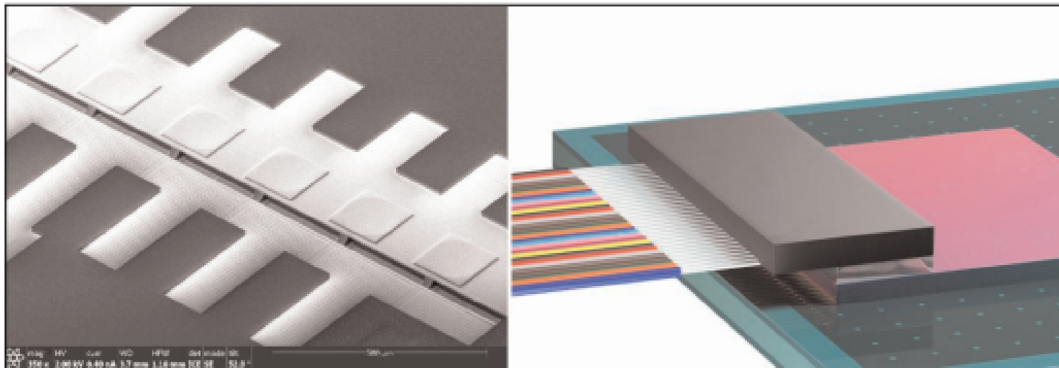

Nanoimprint of wafer-level optics on silicon photonics wafer (left) for Teramount PhotonicPlug's scalable fiber connectivity (right).