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PRESS RELEASE

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World's first integrated value chain platform initiative for heterogeneous integration in photonics

Three leaders in photonic integrated circuits announce collaboration to offer a seamless path for heterogeneous integration with micro-Transfer Printing (MTP).

Lausanne, Cork, Erfurt, September 20th, 2024 – In a bold move to revolutionise photonic integrated circuits (PICs), three of the industry's foremost leaders, X-Celeprint, Ligentec, and X-FAB, are aligning their efforts to simplify and enhance heterogeneous integration through Micro Transfer Printing (MTP). This collaboration is set to close existing gaps in the value chain and offer a seamless journey from R&D to mass production.

In response to the global need for reducing power consumption, emissions, and material waste, innovation in advanced photonic integration and packaging technologies is paving the way for a greener future while delivering scalable, high-performance solutions for the industry.

Photonic Integrated Circuits (PICs) are at the forefront of technological innovation, poised to enable breakthrough applications and overcome current technological barriers. The future of PICs is moving toward chiplets, where the best materials and components are combined to create hybrid solutions.

Today, achieving these hybrid chiplets is a complex and cumbersome process for customers, as no integrated supply chain exists to streamline the path from development to production.

To address this challenge, three industry leaders are partnering to create a fully integrated supply chain that simplifies the development of and industrialisatin hybrid PICs:

- **Ligentec:** A leader in low-loss Silicon Nitride (SiN) PICs, enabling next-generation optical systems.
- **X-Celeprint:** A leader in micro-Transfer Printing (MTP), bringing the capability to integrate diverse active materials on PIC platforms.
- **X-FAB:** A leading specialty foundry for feature-rich analog mixed-signal ASICs, MEMS, Microsystems and Photonics, providing scaling-up and volume production capabilities.

Together, these companies will be working towards offering customers a complete, seamless solution, covering all stages from early technology assessment and R&D, through design support, prototyping, and piloting, to full-scale production.

As the first step in this collaboration, Ligentec will integrate photodetectors (PDs) onto their low-loss SiN platform using MTP technology. This will be offered as an additional module to their regular multi-project wafer (MPW) runs, providing an easy, low-barrier entry point for customers. X-Celeprint will contribute its vast expertise in process development, with X-FAB ensuring a smooth scale-up from prototyping to volume production.

"After years of intensive R&D, we are seeing significant uptake and interest in Micro Transfer Printing. The technology readiness level in photonics integration has reached the stage to bring it to the market, offering customers a powerful solution to overcome the challenges of hybrid PICs." states Kyle Benkendorfer – CEO of X-Celeprint.

"No single material system can meet the diverse requirements of photonics. Heterogeneous integration is essential, and with Micro Transfer Printing, we have the ideal technology to combine the best active materials with our high- performance SiN platform," adds Thomas Hessler, CEO of LIGENTEC, "This not

only enhances functionality but also opens the door to new applications and innovations."

"We see MTP as a very promising technology with tremendous future potential. X-FAB is committed to supporting this collaboration, ensuring a smooth and efficient transition from prototyping to high-volume production." says Volker Herbig, VP BU Microsystems of X-FAB.

This combined offering covers the entire customer journey, providing clear and accessible pathways from R&D to high-volume production. Future functionalities, such as light generation and modulation, will be integrated in the next stages, further expanding the potential of this technology.

About LIGENTEC

LIGENTEC provides application-specific Photonic Integrated Circuits (PICs) to clients in high-tech industries such as quantum computing, advanced computing, communication, autonomous driving, space, and biosensors. LIGENTEC's technology, which was originally developed at the Federal Institute of Technology in Lausanne (EPFL), is patented and fully compatible with CMOS. This technology allows for the production of PICs with better performance than today's state-of-the-art technology. Additionally, active components can be integrated to enable even more functionality on- chip. By combining the benefits of the low-loss silicon nitride material with wafer level fabrication and integration, LIGENTEC addresses the main challenges of integrated photonics today, including low loss and short production cycles. LIGENTEC offers a smooth transition from research and development to volume production, supported by its low entry barrier MPW services, custom PIC developments, and high-volume production in a 200mm, IATF 16949 certified CMOS foundry. LIGENTEC is based in Lausanne, Switzerland, and Corbeil-Essonnes, Île-de-France, France, and is ISO 9001:2015 certified.
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About X-CELEPRINT

X-Celeprint is a pioneering technology company specialising in Micro Transfer Printing, an advanced heterogeneous integration process that enables the assembly of ultra-thin, ultra-small, and high-performance semiconductor devices onto a wide range of substrates. This innovative approach facilitates the creation of the next generation electronic systems with an efficient, scalable and environmental production approach, catering to applications in datacom, sensing, LIDAR, quantum computing, medtech, and more. X-Celeprint's cutting-edge solutions are designed to meet the evolving demands of the tech industry, driving for smaller, faster and lower power electronic systems. X-Celeprint is co-located with the Tyndall National Institute in Cork, Ireland and with Micross, which has a Trusted/ITAR-compliant 200mm wafer fab with extensive heterogeneous capabilities, in Research Triangle Park, North Carolina. Both facilities have MTP technology in their R&D advanced packaging lines, supporting customers with rapid prototyping. X-Celeprint licences MTP technology, which consists of more than 750 worldwide patents and 190 pending applications.
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About X-FAB

X-FAB is a global foundry group providing a comprehensive set of specialty technologies and design IP to enable its customers to develop world-leading semiconductor products that are manufactured at X-FAB's six wafer fabs located in Malaysia, Germany, France, and the United States. With its expertise in analog/mixed-signal technologies, microsystems/ MEMS and silicon carbide (SiC), X-FAB is the development and manufacturing partner for its customers, primarily serving the automotive, industrial and medical end markets. X-FAB has approximately 4,500 employees and has been listed on Euronext Paris since April 2017 (XFAB).
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