PRESS RELEASE

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# Imec demonstrates the co-integration of its high-quality SiN waveguide technology with its active silicon photonics platform

**LEUVEN (Belgium), January 31, 2022**— Today, at an invited talk at SPIE Photonics West (San Francisco), imec, a world-leading research and innovation hub in nanoelectronics and digital technologies, announced that it demonstrated co-integration of its high-quality silicon nitride waveguide technology with its silicon photonics platform—without performance degradation of the high-bandwidth active devices. An important upgrade for imec's silicon photonics platform, the result enables the synthesis of high-quality wavelength-selective devices and other optical passive functions that benefit from accurate optical phase control, meeting market demands for optical transceivers for datacom, LiDAR, and other applications.

Low propagation loss, accurate phase control, low-loss light coupling, lower thermal variation, and high power handling are some of the reasons why adding a high-quality silicon nitride (SiN) boosts silicon photonics integrated circuits (PIC). High-quality SiN layers achieving low optical losses and excellent control over the material properties, such as thickness and refractive index variability, are crucial for improving the energy efficiency of Si-based optical transceivers. Since such high-quality SiN layers are deposited by the low-pressure chemical vapor deposition (LPCVD) method at elevated temperatures, it is vital to avoid degrading the performance of the co-integrated baseline Si and Ge devices.

Imec has tackled those integration challenges within its silicon photonics platform "iSiPP," which is available for industrial partners. Thanks to various engineering updates and changes in the process flow, imec has, for example, shown a more than four times reduction of the variability of the resonant wavelength of SiN-based micro-rings compared to the same device made with lower quality PECVD silicon nitride, currently used in the imec platform, without degrading the co-integrated active devices.

Philippe Absil, vice president at imec: "We are excited to have achieved this major upgrade of our silicon photonics platform. The ability to co-integrate high-quality SiN devices with our baseline technology is important to broaden our offering to our partners who can now consider system simplification with single PIC solutions to combine active and SiN passive functions."

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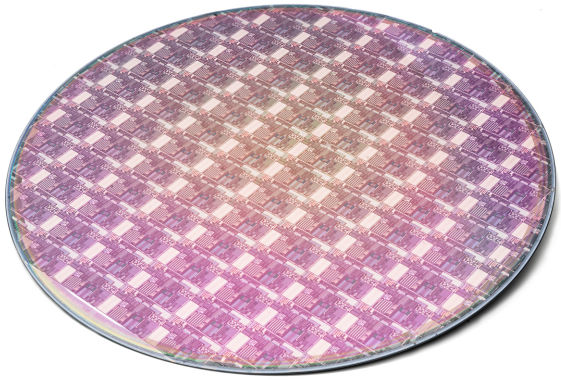

*A 300mm wafer processed on imec's iSiPP platform*

**About imec**
Imec is a world-leading research and innovation center in nanoelectronics and digital technologies. Imec leverages its state-of-the-art R&D infrastructure and its team of more than 5,500 employees and top researchers, for R&D in advanced semiconductor and system scaling, silicon photonics, artificial intelligence, beyond 5G communications and sensing technologies, and in application domains such as health and life sciences, mobility, industry 4.0, agrofood, smart cities, sustainable energy, education, … Imec unites world-industry leaders across the semiconductor value chain, Flanders-based and international tech, pharma, medical and ICT companies, start-ups, and academia and knowledge centers. Imec is headquartered in Leuven (Belgium), and has research sites across Belgium, in the Netherlands and the USA, and representation in 3 continents. In 2021, imec's revenue (P&L) totaled 732 million euro.

Further information on imec can be found at www.imec-int.com.



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