Polariton Implements Plasmonic Modulators on 200 mm Silicon Photonics, Reaching >110 GHz Electro-optic Bandwidth

December 03, 2025
Zurich, Switzerland and Brussels, Belgium

Polariton, a technology leader in optical connectivity for next-generation data infrastructure, announces the industry's first plasmonic electro-optic modulator platform integrated on 200 mm silicon photonics. It was confirmed delivering an electro-optic bandwidth exceeding 110 GHz. This milestone combines ultra-high-speed performance with a scalable platform designed for high-volume production, significantly reducing wafer area and enabling integration through established global semiconductor supply chains. Advancements at the platform level eliminate data bottlenecks and deliver a future-proof architecture optimized for lower power consumption, enabling customers to scale efficiently while meeting the demands of AI infrastructure.

This achievement was made possible through collaboration with imec in the framework of PhotonHub, the pan-European one-stop-shop photonics innovation hub funded by the European Union. The silicon photonics chips were fabricated on the iSiPP200 platform, made available via imec's IC-Link division and compatible with manufacturing foundry processing. Polariton integrated its plasmonic devices in the back-end following the silicon photonics process flow, ensuring compatibility with existing foundry infrastructure.

Polariton's plasmonic technology builds on silicon photonics and extends its capabilities with a portfolio of high-performance modulators, including Mach-Zehnder and IQ modulators, as well as ring-resonator modulators. These resonant devices are ideally suited for 400G and 800G per lane IM/DD applications. The technology enables high-speed electro-optic modulation across both O and C bands, supporting future scalability across wavelength ranges. Measurements confirmed that the plasmonic modulators integrated on imec's iSiPP200 platform achieve an electro-optic bandwidth exceeding 110 GHz, underscoring the platform's capability for ultra-high-speed applications.

"Integrating plasmonics into imec's silicon photonics platform is a major step toward volume production of ultra-fast modulators. This achievement addresses the scalability demands of next-generation data centers and demonstrates that our plasmonic technology is compatible with established silicon photonics platforms, so customers can confidently build on their trusted manufacturing partners," said Wolfgang Heni, co-Founder and COO of Polariton.

"PhotonHub is proud to empower companies with direct access to leading photonics expertise and infrastructure in Europe. This collaboration demonstrates how connecting the right partners drives innovation and creates value for the industry. It's a clear example of how to deliver competitive advantage and inspire new opportunities across data and AI markets." said Hugo Thienpont, Director of VUB Brussels Photonics and coordinator of PhotonHub.

About Polariton Technologies

Polariton is a Swiss designer and manufacturer of high-performance photonic integrated circuits (PICs) for ultra-high-bandwidth and low-power applications in communication, computing, test & measurement, space and quantum technologies markets. Exceptional performance is achieved by combining the established silicon photonics platform with plasmonic active devices enabling operation in sub-THz and THz regimes, in particular with Mach-Zehnder and ring resonator modulators.

Follow Polariton on LinkedIn @polariton-technologies and visit the website.

About PhotonHub

PhotonHub is a pan-European photonics innovation hub that aims to accelerate the uptake, integration, and deployment of photonics technologies by European industry. It serves as a one-stop-shop for companies, particularly SMEs and non-photonics companies, providing access to a broad range of services and expertise to support photonics-led innovation across diverse industry sectors. PhotonHub has received funding from the European Union's Horizon Europe program under the Grant Agreement n° 101189537 in Public Private Partnership with Photonics21. For further details on the various supports offered and how to apply, visit PhotonHub.eu

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