

Thailand s low-loss silicon photonics technology



Overview

TSMC unveils a breakthrough silicon photonics platform at OFC 2025, integrating low-loss, high-uniformity SiN photonic devices to meet next-gen data center demands in speed, bandwidth, and power. Market Forecast By Product (Switches, Cables, Sensors, Variable Optical Attenuators, Transceivers), By Component (Lasers, Modular, Photo Sensors), By Applications (Data Centers and High-performance Computing, Telecommunication, Military, Defense, and Aerospace, Medical and Life Science, Sensing). LIGENTEC process offers a state of the art, cost-effective platform with very high geometric accuracy. The process is accompanied by a complete PDK (available in L-edit, Calibre, Luceda and Synopsys). The PDK includes DRC rules files, and validated simulation film for our reference designs. Example. Imec offers SiN integrated photonics in diferent flavors: low-loss SiN (based on LPCVD technology) and CMOS-compatible SiN (based on PECVD technology). Our mission is to commercialize ultra-low loss photonic integrated circuits and provide access to this highly specialized technology.



Article Content

OFC2025|Integration of TSMC's Low-Loss and High

TSMC unveils a breakthrough silicon photonics platform at OFC 2025, integrating low-loss, high-uniformity SiN photonic devices to meet next-gen data center

Latest Progress and Challenges in 300 mm Monolithic Silicon

In this paper we discuss the latest developments in the GlobalFoundries Fotonix™ program, including enhancements in device performance, packaging, PDK compact models, and in-house test capabilities.

Innovative Technology for Building Ultralow-Loss

A Breakthrough in Low-Loss Photonic Circuits Now, scientists in the group of Professor Tobias J. Kippenberg at EPFL's School of Basic Sciences

High-yield, wafer-scale fabrication of ultralow-loss, dispersion ...

For widespread technological application of nonlinear photonic integrated circuits, ultralow optical losses and high fabrication throughput are required. Here, the authors present a CMOS ...

Low-loss integrated silicon nitride photonics platform

Photonic Integrated Circuits (PICs) are expected to disrupt the industry similar to what Integrated Circuits did in the electronics industry by shrinking size, weight and cost while increasing

Anneal-free ultra-low loss silicon nitride integrated

We demonstrate for the first time, a uniform low temperature (<250 °C) process for fabricating both high-confinement thick and low-confinement thin

Engineering Low-Loss Silicon Quantum Photonics in the Mid-Infrared

Quantum silicon photonics must overcome considerable loss engineering challenges before it can scale to the millions of physical qubits required for fault tolerant quantum computation . The first such

Deta Developing next generation photonic integrated circuits Silicon ...

Figure 1: History of silicon nitride thin films in microelectronics and evolution of the photonic circuit technology based on ultra low loss silicon nitride waveguides as developed by the Kippenberg group

Thailand Silicon Photonics Market (2021

The silicon photonics market in Thailand has been witnessing steady growth, driven by the increasing adoption of advanced optical communication technologies and

3D integration enables ultralow-noise isolator-free

Three-dimensional integration of distributed-feedback lasers and ultralow-loss silicon nitride waveguides results in ultralow-noise lasers without

Review of Silicon Photonics Technology and Platform Development

This article reviews advancements in silicon photonics technology and platform development, highlighting its impact on engineering and technology innovation.

Ultra-low loss quantum photonic circuits integrated with ...

Applications of ultra-low-loss photonic circuitry in quantum photonics, in particular including triggered single photon sources, are rare. Here, the authors show how InAs quantum dot

Progress in Passive Silicon Photonic Devices: A

We survey the state of the art in fundamental building blocks, including strip, rib, and silicon nitride waveguides, with a focus on achieving ultra

Review of Silicon Photonics Technology and Platform Development

We will document the early works in silicon photonics, as well as its commercial status. We will provide a comprehensive review of the development of silicon photonics and the foundry services which enable

Technology

LIGENTEC offers its proprietary silicon nitride (Si₃N₄) platform targeted at photonic applications using integrated photonic chips from visible to mid-IR. Silicon nitride as a material strikes a balance

Ultra-Low-Loss Silicon Nitride Photonics Based on

Abstract The fabrication processes of silicon nitride (Si₃N₄) photonic devices used in foundries require low temperature deposition, which

300-nm-thick, ultralow-loss silicon nitride photonic

Silicon nitride (Si₃N₄) photonic integrated circuits are rapidly developing in recent decades. The low loss of Si₃N₄ attracts significant

A high-speed heterogeneous lithium tantalate silicon

Lithium tantalate is heterogeneously integrated with silicon photonic integrated circuits via a micro-transfer printing process in a manner fully

Ultra-Low-Loss Silicon Nitride Photonics Based on

Low threshold parametric oscillation, broadband frequency combs, and narrow-linewidth laser are demonstrated. This work demonstrates the

Lighting the way forward: The bright future of photonic integrated ...

The ongoing trend towards elevated levels of integration favours the widespread embrace of silicon (Si) photonics, particularly in utilizations such as LiDAR. The integration of PICs with other

Silicon nitride photonics platforms with extremely low propagation loss

Imec's low autofluorescence and stable SiN platform enables the development of extremely sensitive, low-cost and disposable solutions for sensing and bio-photonics applications in industries such as

Anneal-free ultra-low loss silicon nitride integrated photonics

The silicon nitride integration platform has enabled a wide range of waveguide and device designs, from thin nitride waveguides that support ultra-low loss dilute optical modes to thick nitride ...

A manufacturable platform for photonic quantum computing

A manufacturable platform for quantum computing with photons is introduced and a set of monolithically integrated silicon-photonics-based modules is benchmarked, demonstrating dual-rail

Ultra-low loss silicon nitride becomes even cooler

Ultra-low loss silicon nitride realized using deuterated precursors and low thermal budgets well within backend-of-line CMOS processing may accelerate widespread proliferation of their use.

Ultra-low Loss Technologies

Our mission is to commercialize ultra-low loss photonic integrated circuits and provide access to this highly specialized technology. Our disruptive technology

Contact Us

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