

Breakthrough in Silicon Photonics Interconnect Technology



Overview

Intel has achieved a breakthrough in the photonics segment, unveiling the world's first fully integrated optical compute interconnect for emerging AI markets. Silicon (Si) photonics is a groundbreaking technology that merges the fields of Si microelectronics and photonics to enable the manipulation and transmission of light on a Si chip. When we talk about the world of interconnects and how vital they have been for the AI markets, the prospects of photonics are discussed. On-chip interconnect today is based on copper/low-k wiring – in today's chips, there can be more than 100 km of copper wires. Newly-developed materials and processes allow. STMicroelectronics of Geneva, Switzerland says that it is helping hyperscalers, and the leading optical module provider, to overcome these challenges by unveiling its next generation of proprietary technologies for higher-performing optical interconnect in data centers and AI clusters. Revitalized interest in silicon photonics.



Article Content

Sep 07, 2025

Silicon Photonics Platform for Next Generation Data

Beyond copper interconnect, explorations of single metallic elements, binary and ternary alloys, and 2D materials for future interconnect materials are underway

Jun 24, 2026

TSMC says COUPE platform set for production as Samsung outlines

TSMC said its COUPE silicon photonics platform is set to enter volume production this year, as rising demand for high-speed interconnects in AI data centers pushes optical technologies

Jun 02, 2026

Marvell Announces Breakthrough Co-Packaged Optics

Marvell silicon photonics devices have logged over 10 billion field hours. Marvell has been a pioneer in transforming interconnect technology to

Mar 14, 2026

Silicon Photonics – the Backbone of HPC and AI | TechInsights

An overview of silicon photonics integration, key device structures, and technologies like co-packaged optics shaping next-gen datacenter interconnects. Integrating photonics with silicon

May 07, 2026

Photonic Interconnects

In 2006, Luxtera, one of the world leaders in silicon photonics, introduced the first research breakthrough in the field by releasing the first commercial products featuring electronics and photonics integrated

Jun 27, 2025

How Industry Collaboration Fosters NVIDIA Co

NVIDIA is developing a co-packaged optics (CPO) platform that integrates optical and electrical components to improve data-center connectivity,

Nov 24, 2025

ST launches SiPho and next-gen BiCMOS technologies for higher ...

STMicroelectronics of Geneva, Switzerland says that it is helping hyperscalers, and the leading optical module provider, to overcome these challenges by unveiling its next generation of

Sep 04, 2025

TSMC's Silicon Photonics Architecture: Why Couplers

Driven by the growing demand for high-speed, low-latency data transmission in AI and high-performance computing (HPC) applications, silicon

Oct 10, 2025

Lightmatter Unveils Passage M1000 Photonic Superchip, World's

The company's groundbreaking Passage™ platform—the world's first 3D-stacked silicon photonics engine—connects thousands to millions of processors at the speed of light.

Mar 26, 2026

3D Photonics for AI Applications | Passage™

3D photonic interconnect chips designed to accelerate AI training and inference with breakthrough performance and efficiency, powering the future of computing.

Mar 18, 2026

Ultracompact and large-bandwidth silicon modulator in a CMOS

This breakthrough represents an important advance in photonic interconnect technology, as it overcomes the critical trade-off between bandwidth and footprint while achieving an ultra-high...

Jun 09, 2026

Intel Unveils World's First Optical Interconnect

Intel has achieved a breakthrough in silicon photonics, unveiling world's first fully integrated optical compute interconnect for AI markets.

Dec 21, 2025

Lumentum debuts AI optical scale-up demo at OFC | LITE Stock News

As a VCSEL-based scale-up solution, the platform also provides an independent supply chain alternative to silicon photonics and InP laser-based architectures. "AI infrastructure is pushing

Jul 22, 2025

OFC 2025: Marvell Interconnecting the AI Era

In essence, this breakthrough marks a turning point in PAM4-based connectivity, setting a new standard for what high-speed networks can achieve.

Jun 08, 2026

FinancialContent

In the long term, the applications of silicon photonics could extend beyond the data center. While currently too expensive for consumer electronics, the maturation of the technology

Jan 20, 2026

GlobalFoundries accelerates adoption of co-packaged optics for

Built with GF's advanced silicon photonics technology, the SCALE CPO solution utilizes both coarse and dense wavelength-division multiplexing (CWDM, DWDM) for bi-directional data

May 25, 2026

Lumentum

Lumentum Holdings Inc. ("Lumentum"), a global leader in photonic solutions, today announced a breakthrough optical interconnect solution designed to support next-generation AI

Dec 29, 2025

Coherent to Unveil Breakthrough AI-Scale Optical Innovations and ...

Coherent will unveil AI-scale optical innovations at OFC 2026, showcasing technologies that advance bandwidth, scalability, and energy efficiency.

Jun 14, 2026

ST silicon photonics and BiCMOS technologies: the winning portfolio

This whitepaper describes STMicroelectronics' advancements in silicon photonics and BiCMOS technologies, essential for addressing the energy efficiency and performance demands of AI optical

May 30, 2026

The advent of co-packaged optics (CPO) in 2025

Co-packaged optics (CPO)—the silicon photonics technology promising to transform modern data centers and high-performance networks by

May 03, 2026

Lumentum Showcases Breakthrough Optical Scale-Up

SAN JOSE, Calif., March 17, 2026--Lumentum Holdings Inc. ("Lumentum"), a global leader in photonic solutions, today announced a breakthrough optical

Apr 22, 2026

Marvell Announces Breakthrough Co-Packaged Optics Architecture for ...

Marvell silicon photonics devices have logged over 10 billion field hours. Marvell has been a pioneer in transforming interconnect technology to improve the performance, scalability, and

Apr 06, 2026

Distributed Quantum Computing at Scale | Photonic Inc.

Distributed Quantum Computing for Breakthrough Applications at Scale Photonic is building the world's first commercial-scale, fault-tolerant quantum computer,

Oct 04, 2025

Lightmatter unveils M1000 and L200 Passage photonic

Lightmatter has unveiled two new photonic interconnect solutions designed to tackle the bandwidth challenges associated with increasingly dense

Dec 01, 2025

Lightmatter's photonic breakthrough: A leap forward in

Lightmatter unveiled its Envisi photonic computing chip on April 8, using light instead of electrons to drastically reduce energy consumption and

Feb 06, 2026

Nvidia turns to silicon photonics to supercharge next

Nvidia is responding by moving away from traditional electrical signaling and adopting silicon photonics, a shift the company argues is now

Sep 09, 2025

Silicon Photonics in AI Interconnects

Abstract: Silicon photonics enables compact, scalable, and energy-efficient interconnects that address the growing bandwidth and power challenges of AI systems.

Oct 20, 2025

FinancialContent

Future-Proof: Building today's innovations with tomorrow's technology – keep your infrastructure ahead of the curve with standards-compliant solutions. With decades of experience in

Dec 27, 2025

Breakthrough in Silicon Photonics Technology in ...

In this review, we aim to provide a brief overview of the recent advancements in silicon photonic devices employed for telecommunication and sensing (biosensing and gas sensing)

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