

Silicon Photonics for Access Switches



Overview

In the last decade, silicon photonic switches are increasingly believed to be potential candidates for replacing the electrical switches in the applications of telecommunication networks, data center and high-throughput computing, due to their low power consumption (Picojoules). In the last decade, silicon photonic switches are increasingly believed to be potential candidates for replacing the electrical switches in the applications of telecommunication networks, data center and high-throughput computing, due to their low power consumption (Picojoules). In the last decade, silicon photonic switches are increasingly believed to be potential candidates for replacing the electrical switches in the applications of telecommunication networks, data center and high-throughput computing, due to their low power consumption (Picojoules per bit), large. Silicon photonic switches received much attention because of their compatibility with the complementary metal-oxide-semiconductor (CMOS) process and are anticipated to be potential candidates to replace electrical switches in many applications such as data center and telecommunication networks. 2 ×. Silicon photonics is an attractive technology for Photonic Integrated Circuits (PICs) because it builds directly on the extreme maturity of the silicon nano-electronics world. Thereby it opens a route towards very advanced PICs with very high yield and low cost. The envisaged converged network is presented and an experimental test-bed which demonstrates flexible Cloud Radio Access Network-.

Article Content

A comprehensive analysis of silicon photonic switching chips

This study, in contrast to prior assessment studies, discusses both plain silicon-embedded photonic switches as well as silicon-embedded optoelectronic devices utilising PCMs in a structured manner.

Silicon Photonics Optical Circuit Switch for Access Applications ...

Recent advances in silicon photonics have made it possible to implement compact, cost-effective, and programmable OCS architectures suitable for deployment at the network edge.

Quantum InfiniBand Switches for AI and HPC Networks | NVIDIA

Powering on NVIDIA Quantum-X InfiniBand Photonics Switch When the NVIDIA Quantum-X CPO Q3450 switch and ConnectX®-8 SuperNIC™ connect GB300 racks, they demonstrate NVIDIA

Nvidia marks Marvell for AI-RAN, silicon photonics work ... with a \$2B ...

Nvidia and Marvell Technology tightened work on AI efforts geared at the ongoing AI-infused betterment of telecommunication radio access network (RAN) systems, developing new

Non-Hermitian hybrid silicon photonic switching

An on-chip, high-bandwidth-density non-Hermitian hybrid switching network based on the integration of III-V and silicon materials is demonstrated,

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The company gains a dedicated manufacturing line for the packaging, assembly, testing, and qualification of its ONE Series silicon photonic optical circuit switch, enabling volume production

NVIDIA Corporation

NVIDIA silicon photonics networking switches are available as part of the NVIDIA Spectrum-X Photonics Ethernet and NVIDIA Quantum-X Photonics InfiniBand platforms.

A Silicon Photonic Switching Platform for Flexible Converged ...

In this work, we propose the use of a Silicon Photonic (SiP) space-and-wavelength selective switch fabric as a flexible wavelength provisioning platform for converged optical networks.

NVIDIA Unveils Silicon Photonics CPO Technology Transforming AI

Conclusion NVIDIA's introduction of 1.6Tb/s silicon photonics CPO switches marks a pivotal step in data center networking evolution. CPO technology promises to reduce power

Nvidia's new silicon photonics-based 400 Tb/s switch platforms enable ...

At GTC 2025, Nvidia introduced its Spectrum-X Photonics and Quantum-X Photonics networking switch platforms for exascale datacenters that use silicon photonics. The new networking

LightIN: a versatile silicon-integrated photonic field ...

We demonstrate a programmable silicon photonic chip with an intelligent configuration framework, enabling on-chip computing, signal processing, switching, and encryption.

STMicro's Silicon Photonics Hits Mass Production:

STMicroelectronics enters high-volume PIC100 silicon photonics production for AI data centers. Here's what 800G/1.6T co-packaged optics mean

A comprehensive analysis of silicon photonic switching chips

In this study, we categorised silicon-integrated optical switches by their internal mechanisms and discussed the most advanced literature on the subject. We additionally take a look

Silicon Photonics for Optical Circuit Switch

Optical circuit switches enable scalable, low-latency, and energy-efficient architectures for next-generation AI data center networks. This paper explores silicon photonic switches as a

Industry insight: photonics to scale AI data centers

This paper explores the adoption of photonic technologies, including co-packaged optics (CPO), optical circuit switches (OCS), and silicon photonics in general, to address critical challenges

News Archive

As AI moves from model development to production inference, compute demand is accelerating and shifting toward continuously operating AI factories that generate tokens at scale.

Nvidia turns to silicon photonics to supercharge next-gen AI

All Quantum-X switches will feature liquid cooling. Later in 2026, Nvidia will debut Spectrum-X Photonics, extending CPO to Ethernet.

SILICON PHOTONICS

As architects further evolve AI networks, silicon photonics, alongside heterogeneous integration, will transform the switching layer, replacing traditional packet switching, and enable lower latency and

Silicon Photonics & Co-Packaged Optics: 2026 Analysis

Why co-packaged optics and silicon photonics are reshaping AI data centers in 2026 — the bandwidth wall, power math, incumbents, and what it means.

Review of 2 × 2 Silicon Photonic Switches

This review article mainly introduces and summarizes the principle and state of the art of several types of 2 × 2 silicon photonic switches, including silicon-based electro-optic switches, silicon

Nvidia Unveils Silicon Photonics Cpo Technology For Ai Data Centers ...

Discover NVIDIA's groundbreaking silicon photonics CPO technology, transforming AI data center networks. Learn about the Spectrum-X and Quantum-X switches that enhance

Nvidia outlines plans for using light for communication

Earlier this year, Nvidia outlined that its next-generation rack-scale AI platforms will use silicon photonics interconnects with co-packaged optics

NVIDIA Invests \$2B into Marvell | Industry News | Jun 2026 | Photonics ...

NVIDIA and Marvell have established a strategic partnership to connect Marvell to the AI factory and AI-Radio Access Network (RAN) ecosystem through NVIDIA NVLink Fusion, a rack-scale AI

State of the Art and Perspectives on Silicon Photonic

In this paper, we systematically discuss the state of art of the silicon photonic switch engine, for example, MZI, MRR and MEMS waveguide coupler.

NVIDIA and Coherent Announce Strategic Partnership to Develop

“With Coherent, NVIDIA is pioneering next-generation silicon photonics to enable AI infrastructure at unprecedented scale, speed and energy efficiency.” “This strategic relationship

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