

Photonic Integrated Circuit Market Size, Share & Trends Analysis Report By Material (III-V Material, Lithium Niobate, Silica-on-silicon), By Integration Process (Hybrid), By Application, By Region, And Segment Forecasts, 2025 - 2030

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Abstracts

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Photonic Integrated Circuit Market Growth & Trends

The global photonic integrated circuit market size is expected to reach USD 25.80 billion by 2030, registering a CAGR of 10.8% from 2025 to 2030, according to a new report by Grand View Research, Inc. Photonic IC is an integrated circuit that uses optical wavelength as an information signal and provides multiple integrated photonic functions. Photonic IC, as such, is similar to an electronic IC and can be a viable replacement for it as well as for the copper-based wired transmission. Photonic IC forms an integral part of lasers, optical amplifiers, modulators, and MUX/DEMUX components, which are extensively used in the optical signal processing, optical communication, biophotonics, and sensing applications. The growing demand for sensing and optical devices are expected to fuel the growth of the photonic IC market.

There is an increasing need for cost effective, power efficient, and compact PICs which would further propel the photonic IC market over the forecast period across the mobile broadband Internet access, high-performance computing, datacenter, and enterprise networking, along with metro and long haul data communications, among many others. The increasing adoption of the high-level integrated PICs and application-specific PICs would boost the photonic IC market to strive for greater functionality and new product development across a number of verticals.

The photonic IC market is anticipated to grow substantially due to the continuous technological advancements and the evolving end-user demands. The laser, optical amplifier, and MUX/DEMUX component segments possess enormous growing opportunities, owing to the ability of photonic ICs to incorporate new optical functionalities that can be embedded on a single chip to achieve high efficiency and compactness.

The increasing demand for the optical communication and sensing applications is driving the growth of photonic ICs around the globe with an efficient management of datacenters and long haul networks providing a thriving market for them. Moreover, with the advancements in quantum computing, the adoption of photonic ICs are increasing as they allow multitasking that quantum computing readily requires. Also, the growing adoption of the biophotonic application in medical devices also holds considerable growth opportunities for the photonic ICs market. On the other hand, the high bandwidth and optimum performance requirements of the telecommunication industry, data storage, cloud service providers, and large business enterprises are expected to boost the optical communication and signal processing segments. This market will create many new opportunities culminating in an increased adoption of photonic ICs over the forecasted period.

Photonic Integrated Circuit Market Report Highlights

Based on materials, the III-V Material segment dominated the global photonic integrated circuit market industry with a revenue share of 33.2% in 2024.

Based on integration process, the hybrid integration segment dominated the global market for photonic integrated circuits in 2024. Some of the common techniques for hybrid integration include selective area growth, die-to-wafer bonding, flip-chip bonding, and others.

Based on application, the data centers segment accounted for the largest revenue share of the global market in 2024. This is attributed to the performance improvement capabilities of photonic integrated circuits (PICs).

North America photonic integrated circuit market held the largest revenue share of 38.5% in 2024. This is attributed to factors such as growing 5G networks in the region, the large number of data centers operating in North America, the growing demand for the biomedical

sector, and the presence of multiple semiconductor market participants in the region.

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