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Photonics Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Product Type (LED, Lasers Sensors Detectors & Imaging Devices, Consumer Electronics & Devices, Others), By Application (Displays, Information & Communication Technology, Photovoltaic, Production Technology, Lighting, Medical Technology & Biophotonics, Others), By End User (Building & Construction, Media Broadcasting & Telecommunication, Consumer & Business Automation, Medical, Industrial, Safety & Defense, Others), By Region & Competition, 2021-2031F

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Abstracts

The Global Photonics Market is projected to expand from USD 1.21 Billion in 2025 to USD 1.93 Billion by 2031, registering a CAGR of 8.09%. This field encompasses the physical science responsible for generating, detecting, and manipulating light waves, serving essential applications in telecommunications, healthcare, and manufacturing. Key factors propelling this growth include the urgent need for high-bandwidth data transmission infrastructure and the mandatory integration of optical sensors into automated industrial workflows. These fundamental necessities drive a consistent demand for imaging components, lasers, and sensors, operating independently of temporary fluctuations in consumer electronics preferences.

However, the industry faces a significant obstacle regarding the reliability of global

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supply chains for specialized raw materials, which can critically delay production schedules. According to the 'SPIE 2025 Optics and Photonics Global Industry Report', annual global revenues from the manufacturing of core optics and photonics components hit USD 345 billion in 2023. This figure underscores the sector's substantial economic impact, even as it navigates logistical challenges that threaten the continuity of manufacturing operations.

Market Driver

Innovations in Silicon Photonics for High-Performance Computing and AI are resolving critical energy efficiency and bandwidth bottlenecks in contemporary data centers. As artificial intelligence models become increasingly complex, the physical constraints of legacy copper interconnects require a shift to optical I/O solutions that embed modulators and lasers directly onto silicon substrates. This transition facilitates faster data transfer rates with significantly lower power consumption, which is essential for hyperscale computing clusters. The financial scale of this development is highlighted by recent investments; according to EE Times in October 2024, the 'Lightmatter Raises $400 Million Series D' report noted that the company secured major funding at a USD 4.4 billion valuation to expand its photonic computing solutions, emphasizing the intense industry focus on optical interconnects for AI infrastructure.

Concurrent with this, the rising demand for High-Speed Data Transmission and 5G Connectivity is driving the expansion of optical fiber networks to accommodate surging global internet traffic. Telecommunication operators are actively upgrading backhaul infrastructure with advanced optical cabling and transceivers to sustain network quality amidst increasing user loads. According to the 'Ericsson Mobility Report' from June 2024, mobile network data traffic increased by 25 percent year-on-year between March 2023 and March 2024, necessitating continued investment in high-capacity photonic components. Furthermore, GSMA Intelligence's 'The State of 5G 2024' report from February 2024 indicates that global 5G connections exceeded 1.5 billion by the end of 2023, demonstrating the vast addressable market for photonics-enabled telecommunication hardware.

Market Challenge

The volatility of global supply chains for specialized raw materials creates a distinct barrier to the growth of the photonics market. Unlike general electronics production, manufacturing optical sensors and lasers requires high-purity substrates and rare earth elements that are typically sourced from geographically concentrated areas. When

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these specific logistical channels suffer disruptions due to transport bottlenecks or geopolitical shifts, manufacturers encounter immediate delays in producing core components. This vulnerability hinders the industry's ability to meet the rigid delivery schedules essential for sectors such as industrial automation and telecommunications, resulting in direct project slowdowns and delayed revenue recognition.

Furthermore, persistent uncertainty regarding material availability compels companies to operate below their maximum production capacity, effectively capping growth despite increasing demand. This operational instability complicates inventory planning and discourages the capital investment necessary for long-term facility expansion. The widespread impact of this logistical friction is evident in recent industry assessments; according to 'Photonics21' in '2024', supply chain issues affected 66% of companies within the sector. This statistic illustrates how the fragility of raw material procurement channels actively restricts the market from achieving its full economic potential.

Market Trends

The standardization of LiDAR technology for mass-market automotive Advanced Driver Assistance Systems (ADAS) is fundamentally transforming the photonics sensor landscape. Automakers are increasingly moving beyond the use of LiDAR in experimental robotaxi fleets to integrate these sensors into consumer passenger vehicles, thereby enhancing safety features like highway autonomy and automatic emergency braking. This shift is enabled by the successful miniaturization of solid-state components and reduction in sensor costs, allowing for seamless integration into vehicle designs without affecting aesthetics or aerodynamics. According to Hesai Group's 'Third Quarter 2024 Unaudited Financial Results' from November 2024, the company delivered 129,913 ADAS-specific LiDAR units in a single quarter, marking a 220 percent increase compared to the same period in the previous year.

Simultaneously, the adoption of High-Numerical Aperture (High-NA) Extreme Ultraviolet (EUV) lithography represents a critical evolution in semiconductor fabrication. As chip manufacturers target process nodes below 2 nanometers, traditional optical lithography becomes insufficient, necessitating advanced photonics systems with superior resolution to define microscopic circuit patterns. This transition requires significant capital investment in next-generation optical systems that employ high-power laser sources and complex mirror assemblies. The industry's commitment to this technology remains strong; according to ASML's 'Q3 2024 financial results' from October 2024, the company reported quarterly net bookings of 2.6 billion EUR, with Extreme Ultraviolet (EUV) systems accounting for 1.4 billion EUR of this total, confirming the sustained

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demand for advanced optical fabrication tools.

Key Market Players

IBM Hamamatsu Photonics KK

Intel Corporation

NEC Corporation

AMS OSRAM AG

IPG Photonics

Polatis Photonics Inc.

Alcatel-Lucent SA

Koch Industries

Infinera Corporation

Innolume GmbH

Report Scope

In this report, the Global Photonics Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Photonics Market, By Product Type

LED

Lasers Sensors Detectors & Imaging Devices

Consumer Electronics & Devices

Others

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Europe

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- United Kingdom
- Italy
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- Spain

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- India
- Japan
- Australia
- South Korea

South America

- Brazil
- Argentina
- Colombia

Middle East & Africa

- South Africa

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Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Photonics Market.

Available Customizations:

Global Photonics Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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