

Photonics Market Size, Share and Growth Analysis Report - Forecast Trends and Outlook (2025-2034)

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Report description:

The global photonics market size reached around USD 741.65 Billion in 2024. The market is projected to grow at a CAGR of 7.50% between 2025 and 2034 to reach nearly USD 1528.56 Billion by 2034.

Photonics refers to the science of light as it controls, detects, and produces photons and light waves or light particles. It encompasses the study of the application of light across various spectrums, from infrared to visible and ultraviolet regions. Photonics also involves the use of light (photons) to perform functions that traditional electronics (electrons) do, including communications, information processing, lighting, and sensing, among others.

The rising demand for energy-efficient products and the increasing use of photonic products in different applications are the major drivers propelling the photonics market growth. Another major driving force for the market is its rising application in silicone-based photonics. For telecommunications and data centre applications, hybrid silicon lasers (silicon and group III-V semiconductor) are used, which benefit from the luminous properties of III-V semiconductor materials. The technological progress of light-based technologies has driven a new wave of innovation by offering sustainable solutions to various challenges.

Key Trends and Developments

Photonic integrated circuits (PICs) for next-gen applications; trend of sustainability and green photonics; the pivotal role of photonics in quantum technologies; and technological advancements in laser technology are the major trends in the photonics market

Photonics Market Trends

The emphasis on sustainability within the photonics sector is a reflection of the broader global movement towards environmental

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responsibility and the reduction of carbon footprints across various end-use sectors. Photonics technologies enable the development of intelligent lighting systems that adjust based on natural light availability, occupancy, and other factors, further reducing energy consumption. Photonics is critical in the development and optimisation of photovoltaic cells for solar energy, and advances in materials science and photonic designs have led to higher efficiency solar panels, capable of converting more sunlight into electricity.

In December 2023, ORCA Computing, a London-based startup, made a significant announcement regarding its expansion into quantum computing infrastructure. The company revealed that it has been chosen to install two of its PT-1 quantum photonic systems at the Poznan Supercomputing and Networking Center (PSNC) in Poland. Quantum photonic systems, like the PT-1 developed by ORCA Computing, use light (photons) to perform quantum computations and this approach is distinct from other quantum computing technologies that might rely on superconducting circuits or trapped ions.

Market Segmentation

"Photonics Market Report and Forecast 2025-2034" offers a detailed analysis of the market based on the following segments:

Breakup by Type

- LED
- Laser, Detectors, and Sensors and Imaging Devices
- Optical Communication Systems and Components
- Consumer Electronics and Devices
- Others

Breakup by Application

- Surveying and Detection
- Production Technology
- Data Communication
- Image Capture and Display
- Medical Technology
- Lighting
- Others

Breakup by End Use

- Building and Construction
- Media, Broadcasting and Telecommunication
- Consumer and Business Automation
- Medical
- Security and Defence
- Industrial
- Others

Breakup by Region

- North America

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- Europe
- Asia Pacific
- Latin America
- Middle East and Africa

LEDs account for a major photonics market share owing to their growing adoption across the lighting sector

LEDs hold the highest share in the market due to their widespread application in lighting, displays, automotive, and consumer electronics. Their energy efficiency, long lifespan, and decreasing cost have driven their adoption across various sectors, making them a dominant technology in general lighting, automotive lighting, and backlighting for TVs, smartphones, and other devices.

The optical communication systems and components segment is also expected to witness a robust growth in the forecast period due to the critical role of optical communication in modern telecommunications infrastructure. The increasing demand for high-speed internet and data services has propelled the growth of optical communication technologies, including fibre optic cables, transceivers, amplifiers, and switches. These components are essential as the backbone of the internet, data centres, and cloud computing, supporting the massive data flow across global networks.

Data communication applications are expected to maintain their dominance in the photonics market

There is a surge in usage of photonics in data communication to enable high-speed, high-bandwidth communication systems, supporting the photonics market growth. Optical fibre technology, which relies on photonics, is the backbone of the Internet and global telecommunications, supporting the massive increase in data traffic.

Medical technology is another major application that holds a significant share of the photonics market. Photonics plays a crucial role in various medical and healthcare technologies, including diagnostic imaging systems (such as MRI, CT scans, and X-rays), laser surgeries, phototherapy, and endoscopy. The increasing adoption of advanced medical technologies for diagnosis, treatment, and patient care, combined with an ageing global population and rising healthcare standards, drives the demand for photonics in this segment.

Photonics Market Analysis by Region

The demand for photonics in North America is strong and growing, driven by several key factors and applications across various end-use sectors. The internet and telecommunications heavily rely on optical fibre technologies, which are a cornerstone of photonics. The demand for higher bandwidth and faster data transmission rates in North America has led to increased investments in upgrading and expanding fibre optic networks. The ongoing rollout of 5G technology and the expansion of data centre capacities further fuel this demand. Moreover, the defence and security sector in North America, particularly in the United States, invests heavily in photonics for applications ranging from night vision systems and laser-based communication to surveillance and guidance systems.

The Europe photonics market is robust, driven by a strong emphasis on innovation and sustainable development. The healthcare sector in Europe is a major driver of photonics demand, with applications ranging from medical diagnostics and imaging to therapeutic devices and minimally invasive surgeries. Europe's focus on advanced healthcare solutions and personalised medicine has spurred the development and adoption of photonic technologies in biophotonics, including lab-on-a-chip devices and optical biosensors.

Competitive Landscape

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The market players are increasing their research and development activities and are increasingly focusing on cross-industry collaborations to develop strategic partnerships and gain a competitive edge

Other major players in the photonics market include Intel Corporation, Ohara Corporation, and Hamamatsu Photonics K.K., among others. These companies operate in various segments, including optical components, lasers, imaging systems, photovoltaic cells, and fibre optics, among others.

More Insights On

Silicon Photonics Market

Table of Contents:

- 1 Executive Summary
 - 1.1 Market Size 2024-2025
 - 1.2 Market Growth 2025(F)-2034(F)
 - 1.3 Key Demand Drivers
 - 1.4 Key Players and Competitive Structure
 - 1.5 Industry Best Practices
 - 1.6 Recent Trends and Developments
 - 1.7 Industry Outlook
- 2 Market Overview and Stakeholder Insights
 - 2.1 Market Trends
 - 2.2 Key Verticals
 - 2.3 Key Regions
 - 2.4 Supplier Power
 - 2.5 Buyer Power
 - 2.6 Key Market Opportunities and Risks
 - 2.7 Key Initiatives by Stakeholders
- 3 Economic Summary
 - 3.1 GDP Outlook
 - 3.2 GDP Per Capita Growth
 - 3.3 Inflation Trends
 - 3.4 Democracy Index
 - 3.5 Gross Public Debt Ratios
 - 3.6 Balance of Payment (BoP) Position
 - 3.7 Population Outlook
 - 3.8 Urbanisation Trends
- 4 Country Risk Profiles
 - 4.1 Country Risk
 - 4.2 Business Climate
- 5 Global Photonics Market Analysis
 - 5.1 Key Industry Highlights
 - 5.2 Global Photonics Historical Market (2018-2024)
 - 5.3 Global Photonics Market Forecast (2025-2034)
 - 5.4 Global Photonics Market by Type

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- 5.4.1 LED
 - 5.4.1.1 Historical Trend (2018-2024)
 - 5.4.1.2 Forecast Trend (2025-2034)
- 5.4.2 Laser, Detectors, and Sensors and Imaging Devices
 - 5.4.2.1 Historical Trend (2018-2024)
 - 5.4.2.2 Forecast Trend (2025-2034)
- 5.4.3 Optical Communication Systems and Components
 - 5.4.3.1 Historical Trend (2018-2024)
 - 5.4.3.2 Forecast Trend (2025-2034)
- 5.4.4 Consumer Electronics and Devices
 - 5.4.4.1 Historical Trend (2018-2024)
 - 5.4.4.2 Forecast Trend (2025-2034)
- 5.4.5 Others
- 5.5 Global Photonics Market by Application
 - 5.5.1 Surveying and Detection
 - 5.5.1.1 Historical Trend (2018-2024)
 - 5.5.1.2 Forecast Trend (2025-2034)
 - 5.5.2 Production Technology
 - 5.5.2.1 Historical Trend (2018-2024)
 - 5.5.2.2 Forecast Trend (2025-2034)
 - 5.5.3 Data Communication
 - 5.5.3.1 Historical Trend (2018-2024)
 - 5.5.3.2 Forecast Trend (2025-2034)
 - 5.5.4 Image Capture and Display
 - 5.5.4.1 Historical Trend (2018-2024)
 - 5.5.4.2 Forecast Trend (2025-2034)
 - 5.5.5 Medical Technology
 - 5.5.5.1 Historical Trend (2018-2024)
 - 5.5.5.2 Forecast Trend (2025-2034)
 - 5.5.6 Lighting
 - 5.5.6.1 Historical Trend (2018-2024)
 - 5.5.6.2 Forecast Trend (2025-2034)
 - 5.5.7 Others
- 5.6 Global Photonics Market by End Use
 - 5.6.1 Building and Construction
 - 5.6.1.1 Historical Trend (2018-2024)
 - 5.6.1.2 Forecast Trend (2025-2034)
 - 5.6.2 Media, Broadcasting and Telecommunication
 - 5.6.2.1 Historical Trend (2018-2024)
 - 5.6.2.2 Forecast Trend (2025-2034)
 - 5.6.3 Consumer and Business Automation
 - 5.6.3.1 Historical Trend (2018-2024)
 - 5.6.3.2 Forecast Trend (2025-2034)
 - 5.6.4 Medical
 - 5.6.4.1 Historical Trend (2018-2024)
 - 5.6.4.2 Forecast Trend (2025-2034)
 - 5.6.5 Security and Defense

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- 5.6.5.1 Historical Trend (2018-2024)
- 5.6.5.2 Forecast Trend (2025-2034)
- 5.6.6 Industrial
 - 5.6.6.1 Historical Trend (2018-2024)
 - 5.6.6.2 Forecast Trend (2025-2034)
- 5.6.7 Others
- 5.7 Global Photonics Market by Region
 - 5.7.1 North America
 - 5.7.1.1 Historical Trend (2018-2024)
 - 5.7.1.2 Forecast Trend (2025-2034)
 - 5.7.2 Europe
 - 5.7.2.1 Historical Trend (2018-2024)
 - 5.7.2.2 Forecast Trend (2025-2034)
 - 5.7.3 Asia Pacific
 - 5.7.3.1 Historical Trend (2018-2024)
 - 5.7.3.2 Forecast Trend (2025-2034)
 - 5.7.4 Latin America
 - 5.7.4.1 Historical Trend (2018-2024)
 - 5.7.4.2 Forecast Trend (2025-2034)
 - 5.7.5 Middle East and Africa
 - 5.7.5.1 Historical Trend (2018-2024)
 - 5.7.5.2 Forecast Trend (2025-2034)
- 6 North America Photonics Market Analysis
 - 6.1 United States of America
 - 6.1.1 Historical Trend (2018-2024)
 - 6.1.2 Forecast Trend (2025-2034)
 - 6.2 Canada
 - 6.2.1 Historical Trend (2018-2024)
 - 6.2.2 Forecast Trend (2025-2034)
- 7 Europe Photonics Market Analysis
 - 7.1 United Kingdom
 - 7.1.1 Historical Trend (2018-2024)
 - 7.1.2 Forecast Trend (2025-2034)
 - 7.2 Germany
 - 7.2.1 Historical Trend (2018-2024)
 - 7.2.2 Forecast Trend (2025-2034)
 - 7.3 France
 - 7.3.1 Historical Trend (2018-2024)
 - 7.3.2 Forecast Trend (2025-2034)
 - 7.4 Italy
 - 7.4.1 Historical Trend (2018-2024)
 - 7.4.2 Forecast Trend (2025-2034)
 - 7.5 Others
- 8 Asia Pacific Photonics Market Analysis
 - 8.1 China
 - 8.1.1 Historical Trend (2018-2024)
 - 8.1.2 Forecast Trend (2025-2034)

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- 8.2 Japan
 - 8.2.1 Historical Trend (2018-2024)
 - 8.2.2 Forecast Trend (2025-2034)
- 8.3 India
 - 8.3.1 Historical Trend (2018-2024)
 - 8.3.2 Forecast Trend (2025-2034)
- 8.4 ASEAN
 - 8.4.1 Historical Trend (2018-2024)
 - 8.4.2 Forecast Trend (2025-2034)
- 8.5 Australia
 - 8.5.1 Historical Trend (2018-2024)
 - 8.5.2 Forecast Trend (2025-2034)
- 8.6 Others
- 9 Latin America Photonics Market Analysis
 - 9.1 Brazil
 - 9.1.1 Historical Trend (2018-2024)
 - 9.1.2 Forecast Trend (2025-2034)
 - 9.2 Argentina
 - 9.2.1 Historical Trend (2018-2024)
 - 9.2.2 Forecast Trend (2025-2034)
 - 9.3 Mexico
 - 9.3.1 Historical Trend (2018-2024)
 - 9.3.2 Forecast Trend (2025-2034)
 - 9.4 Others
- 10 Middle East and Africa Photonics Market Analysis
 - 10.1 Saudi Arabia
 - 10.1.1 Historical Trend (2018-2024)
 - 10.1.2 Forecast Trend (2025-2034)
 - 10.2 United Arab Emirates
 - 10.2.1 Historical Trend (2018-2024)
 - 10.2.2 Forecast Trend (2025-2034)
 - 10.3 Nigeria
 - 10.3.1 Historical Trend (2018-2024)
 - 10.3.2 Forecast Trend (2025-2034)
 - 10.4 South Africa
 - 10.4.1 Historical Trend (2018-2024)
 - 10.4.2 Forecast Trend (2025-2034)
 - 10.5 Others
- 11 Market Dynamics
 - 11.1 SWOT Analysis
 - 11.1.1 Strengths
 - 11.1.2 Weaknesses
 - 11.1.3 Opportunities
 - 11.1.4 Threats
 - 11.2 Porter's Five Forces Analysis
 - 11.2.1 Supplier's Power
 - 11.2.2 Buyer's Power

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- 11.2.3 Threat of New Entrants
- 11.2.4 Degree of Rivalry
- 11.2.5 Threat of Substitutes
- 11.3 Key Indicators for Demand
- 11.4 Key Indicators for Price
- 12 Value Chain Analysis
- 13 Competitive Landscape
- 13.1 Supplier Selection
- 13.2 Key Global Players
- 13.3 Key Regional Players
- 13.4 Key Player Strategies
- 13.5 Company Profiles
- 13.5.1 Schott AG
 - 13.5.1.1 Company Overview
 - 13.5.1.2 Product Portfolio
 - 13.5.1.3 Demographic Reach and Achievements
 - 13.5.1.4 Certifications
- 13.5.2 Nikon Corporation
 - 13.5.2.1 Company Overview
 - 13.5.2.2 Product Portfolio
 - 13.5.2.3 Demographic Reach and Achievements
 - 13.5.2.4 Certifications
- 13.5.3 Hoya Corporation
 - 13.5.3.1 Company Overview
 - 13.5.3.2 Product Portfolio
 - 13.5.3.3 Demographic Reach and Achievements
 - 13.5.3.4 Certifications
- 13.5.4 Corning Incorporated
 - 13.5.4.1 Company Overview
 - 13.5.4.2 Product Portfolio
 - 13.5.4.3 Demographic Reach and Achievements
 - 13.5.4.4 Certifications
- 13.5.5 Intel Corporation
 - 13.5.5.1 Company Overview
 - 13.5.5.2 Product Portfolio
 - 13.5.5.3 Demographic Reach and Achievements
 - 13.5.5.4 Certifications
- 13.5.6 Ohara Corporation
 - 13.5.6.1 Company Overview
 - 13.5.6.2 Product Portfolio
 - 13.5.6.3 Demographic Reach and Achievements
 - 13.5.6.4 Certifications
- 13.5.7 Hamamatsu Photonics K.K.
 - 13.5.7.1 Company Overview
 - 13.5.7.2 Product Portfolio
 - 13.5.7.3 Demographic Reach and Achievements
 - 13.5.7.4 Certifications

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