

Global Silicon Photonic Transceiver for Data Center Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Silicon Photonic Transceiver for Data Center market size is expected to reach \$ 13464 million by 2032, rising at a market growth of 25.6% CAGR during the forecast period (2026-2032).

Silicon Photonic Transceiver for Data Center refers to high-speed optical communication transceiver products designed for intra-data-center and data center interconnect applications. These products use silicon photonic PICs or silicon photonic optical engines as the core optoelectronic conversion unit and are packaged in form factors such as QSFP, QSFP-DD, OSFP, OSFP-XD and NPO. By integrating optical waveguides, modulators, photodetectors, couplers, splitters and related passive or active photonic components on silicon-based chips, they enable high-speed electrical-to-optical and optical-to-electrical conversion among servers, switches, routers and AI computing clusters. They are mainly used in hyperscale cloud data centers, AI training and inference clusters, enterprise data centers, colocation data centers and data center interconnect applications. Compared with traditional discrete optical device solutions such as EML and InP, silicon photonic transceivers for data centers feature higher integration, lower power consumption, higher channel density, better compatibility with large-scale wafer manufacturing and faster product iteration, making them particularly suitable for 400G, 800G, 1.6T and higher-speed data center optical interconnect requirements. The scope of this report only covers finished optical transceiver revenue based on silicon photonics solutions and used in data center applications, excluding silicon photonic chips, DSP chips, wafer foundry services, standalone optical engines, CPO switch systems, telecom backbone transceivers and traditional EML/InP optical transceivers. In 2025, global Silicon Photonic Transceiver for Data Center shipments reached approximately 15.41 million units, with an average ex-factory price of about USD 173.15 per unit.

Silicon Photonic Transceivers for Data Centers represent an important upgrade direction for high-speed optical communication transceivers in AI computing and cloud data center applications. They are mainly used for high-speed optoelectronic conversion among servers, GPU clusters, switches, routers and data center interconnect systems. As AI training and inference clusters continue to expand, east-west traffic inside data centers is growing rapidly. Traditional electrical interconnects and some discrete optical device solutions are facing increasing pressure in terms of power consumption, bandwidth density, thermal management and cost, which is accelerating the penetration of silicon photonic transceivers in 400G, 800G, 1.6T and higher-speed optical interconnect applications.

In terms of product form, silicon photonic transceivers for data centers mainly include pluggable optical transceivers such as QSFP-DD, OSFP, OSFP-XD and QSFP, as well as near-packaged optical transceivers such as NPO. QSFP-DD and OSFP are currently the mainstream form factors for 400G and 800G data center applications, covering switch-to-switch, switch-to-server and intra-AI-cluster interconnect scenarios. OSFP-XD and NPO are more oriented toward 1.6T and future higher-speed applications. By transmission distance, DR, FR and certain LR products are the main directions, among which DR/FR short- and medium-reach single-mode transceivers are the most widely used in hyperscale cloud data centers and AI data centers.

From the downstream user perspective, these products mainly serve hyperscale cloud and AI computing operators, enterprise data centers, colocation data centers and data center interconnect customers. Hyperscale cloud and AI computing operators are the core source of demand, with the highest requirements for port speed, power consumption per port, mass delivery capability and product iteration speed. Enterprise and colocation data centers place greater emphasis on system compatibility, stability and total procurement cost. Data center interconnect applications require longer transmission distance, high reliability and flexible network deployment. Therefore, silicon photonic transceivers for data centers have both the characteristics of standardized high-speed modules and strong customer qualification and customization attributes.

From the supply chain perspective, the upstream segment mainly includes silicon photonic PICs, lasers, DSPs, drivers, TIAs, fiber arrays, PCBs, ceramic substrates, thermal management materials, mechanical components and high-speed testing equipment. Midstream companies are responsible for silicon photonic optical engine integration, optoelectronic packaging, module assembly, firmware tuning, burn-in testing

and system compatibility verification. Downstream customers include cloud service providers, AI infrastructure operators, data center operators, switch equipment vendors and system integrators. Since product performance depends not only on the silicon photonic chip itself, but also heavily on fiber coupling, thermal management, high-speed electrical signal integrity and module-level reliability, companies with strong capabilities in silicon photonic platforms, packaging processes, high-speed testing and customer collaboration are more competitive.

In terms of manufacturing, the key production steps of silicon photonic transceivers for data centers include optical engine mounting, chip bonding, fiber array coupling, module assembly, firmware programming, burn-in testing, temperature cycling, eye diagram testing and system compatibility verification. Compared with ordinary low- and mid-speed optical transceivers, 800G and 1.6T silicon photonic transceivers impose higher requirements on automatic coupling accuracy, thermal design, testing efficiency and yield control. The annual effective capacity of a mature high-speed silicon photonic transceiver production line is usually in the range of tens of thousands to several hundred thousand units, while actual output is significantly affected by product data rate, testing duration, automation level, customer qualification progress and yield ramp-up.

In terms of competitive landscape, suppliers of silicon photonic transceivers for data centers are mainly concentrated in the United States and China. U.S. companies have strong foundations in silicon photonic platforms, optical engines, DSP collaboration and leading cloud customer resources, with representative companies including Cisco Systems, Jabil, Coherent, Lumentum and Source Photonics. Chinese companies have clear advantages in high-speed optical module manufacturing, large-scale delivery and cost control, with representative companies including InnoLight Technology, Eoptolink, Accelink Technologies, Broadex Technologies and HG Genuine. Japan and Europe still participate in lasers, optical devices, coherent communication, silicon photonic chips and R&D platforms, but their share in the mass production market for finished data center silicon photonic transceivers is relatively small.

In terms of profitability, the gross margin of silicon photonic transceivers for data centers is generally higher than that of ordinary low- and mid-speed optical transceivers, but it varies by product generation and competition stage. Mature 400G products have experienced faster price declines, with gross margins gradually stabilizing. 800G and 1.6T products usually have higher gross margins due to higher technical barriers, stricter customer qualification requirements and limited supply capacity. The industry's average gross margin is generally around 25%-35%. Companies with silicon photonic

optical engine design, automated packaging, high-speed testing capabilities and qualification experience with leading customers tend to have stronger profitability. However, as capacity expands and competition in standardized products intensifies, the gross margin of some products may face downward pressure.

Overall, silicon photonic transceivers for data centers are accelerating their penetration from a high-speed optical module sub-segment into a mainstream interconnect solution for AI data centers. Short-term growth is mainly driven by the transition from 400G to 800G, the introduction of 1.6T products and rising demand for optical interconnects within AI clusters. In the medium to long term, as silicon photonic PIC yields improve, packaging automation advances, the NPO/CPO ecosystem matures and cloud service providers expand procurement scale, the application share of these products in data center optical interconnects is expected to continue increasing. However, the industry still faces challenges such as high customer concentration, rapid product iteration, long qualification cycles, price declines and bottlenecks in advanced packaging and testing. Competition among companies will gradually shift from simple module delivery capability to comprehensive strength in silicon photonic platforms, packaging processes, scalable manufacturing and leading customer resources.

This report studies the global Silicon Photonic Transceiver for Data Center production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Silicon Photonic Transceiver for Data Center and provides market size (US\$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Silicon Photonic Transceiver for Data Center that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Silicon Photonic Transceiver for Data Center total production and demand, 2021-2032, (K Units)

Global Silicon Photonic Transceiver for Data Center total production value, 2021-2032, (USD Million)

Global Silicon Photonic Transceiver for Data Center production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global Silicon Photonic Transceiver for Data Center consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: Silicon Photonic Transceiver for Data Center domestic production, consumption, key domestic manufacturers and share

Global Silicon Photonic Transceiver for Data Center production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)

Global Silicon Photonic Transceiver for Data Center production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

Global Silicon Photonic Transceiver for Data Center production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

This report profiles key players in the global Silicon Photonic Transceiver for Data Center market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Cisco Systems, Jabil, Coherent, Source Photonics, Lumentum, InnoLight Technology, Eoptolink, Accelink Technologies, Broadex Technologies, HG Genuine, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Silicon Photonic Transceiver for Data Center market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (K Units) and average price (US\$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Silicon Photonic Transceiver for Data Center Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Silicon Photonic Transceiver for Data Center Market, Segmentation by Type:

100G???

200G

400G

800G

1.6T???

Global Silicon Photonic Transceiver for Data Center Market, Segmentation by
Transmission Distance:

DR/DR4/DR8

FR/FR4/2xFR4

LR/LR4

ZR/ZR+

Others

Global Silicon Photonic Transceiver for Data Center Market, Segmentation by Sales
Channel:

Direct Sales

Distribution

Global Silicon Photonic Transceiver for Data Center Market, Segmentation by Application:

Internet

Government

Telecommunications

Finance

Manufacturing

Transportation

Others

Companies Profiled:

Cisco Systems

Jabil

Coherent

Source Photonics

Lumentum

InnoLight Technology

Eoptolink

Accelink Technologies

Broadex Technologies

HG Genuine

Key Questions Answered:

1. How big is the global Silicon Photonic Transceiver for Data Center market?
2. What is the demand of the global Silicon Photonic Transceiver for Data Center market?
3. What is the year over year growth of the global Silicon Photonic Transceiver for Data Center market?
4. What is the production and production value of the global Silicon Photonic Transceiver for Data Center market?
5. Who are the key producers in the global Silicon Photonic Transceiver for Data Center market?
6. What are the growth factors driving the market demand?

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