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Global Optical Chip for Data Center Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Optical Chip for Data Center market size is expected to reach $ 3007 million by 2032, rising at a market growth of 10.4% CAGR during the forecast period (2026-2032).

Optical Chip for Data Center generates, modulates, transmits, receives, or processes optical signals within high-speed fiber optic communication systems used in cloud, AI, hyperscale, and enterprise data centers, enabling ultra-high bandwidth, low latency, and energy-efficient data transmission for 100G, 200G, 400G, 800G, and emerging 1.6T interconnect architectures.

The Optical Chip for Data Center industry chain begins upstream with compound semiconductor wafers, silicon wafers, epitaxial growth materials, photoresists, specialty gases, DSP chips, and advanced packaging substrates, continues midstream with photonic chip design firms, silicon photonics foundries, InP device manufacturers, wafer fabrication and advanced optical packaging providers, and extends downstream to optical module integrators, switch and router manufacturers, system OEMs, hyperscale cloud operators, telecom carriers, and AI infrastructure providers that deploy high-speed optical interconnect solutions in large-scale data center and interconnection networks worldwide.

Multiple global projects are under construction or planned, including new 300mm silicon photonics fabrication lines in North America and Asia, capacity expansions for indium phosphide wafer production, advanced co-packaged optics assembly facilities, AI-focused optical engine manufacturing plants, DSP-photonics integration centers, high-speed 800G and 1.6T module pilot lines, and government-supported semiconductor photonics clusters aimed at strengthening domestic supply chains, increasing wafer

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throughput, enhancing advanced packaging capabilities, and meeting rapidly growing demand from hyperscale cloud providers and AI data center deployments through 2027–2030.
2025 Global Market Average Gross Profit Margin: 34%.

The Optical Chip for Data Center market is in a rapid expansion phase driven primarily by AI model training, cloud computing growth, and bandwidth-intensive applications such as generative AI and distributed computing. The transition from 400G to 800G and the early commercialization of 1.6T architectures are accelerating technology upgrades across hyperscale infrastructure. Power efficiency per bit and bandwidth density have become the most critical performance metrics, pushing adoption of silicon photonics and co-packaged optics solutions. The market has shifted from traditional telecom-driven growth to AI-cluster-driven demand, significantly increasing shipment volumes for short-reach and mid-reach optical chips.

Regionally, North America leads in demand due to hyperscale cloud concentration and AI infrastructure investment, while Asia-Pacific dominates manufacturing capacity, particularly in silicon photonics packaging and compound semiconductor fabrication. China is expanding domestic photonic chip capacity to reduce reliance on imports, while the United States and Europe are strengthening local semiconductor ecosystems through industrial policy support. Taiwan and Southeast Asia play key roles in advanced packaging and module assembly.

Market development opportunities are strongest in AI cluster interconnects, co-packaged optics integration, and 1.6T migration cycles. Increasing rack power density and copper interconnect limitations create structural demand for optical solutions. However, risks include cyclical capital expenditure from hyperscalers, technology substitution risks between pluggable and co-packaged architectures, supply chain constraints in InP materials, and price erosion from rapid capacity expansion. Technical risks also include thermal management challenges and integration complexity at higher speeds.

Key trends include deeper photonic-electronic integration, increasing adoption of 300mm silicon photonics wafers, DSP-photonics co-optimization, and standardization of 800ZR and 1.6T coherent solutions. Energy efficiency targets are driving innovation toward lower pJ/bit performance and improved laser efficiency. Competitive characteristics show a mix of vertically integrated IDMs, fabless silicon photonics designers, and specialized InP manufacturers, with increasing strategic partnerships between chip suppliers and hyperscale customers. Barriers to entry remain high due to

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capital intensity, yield optimization requirements, and advanced packaging know-how, reinforcing industry consolidation and long-term supply agreements.

This report studies the global Optical Chip for Data Center demand, key companies, and key regions.

This report is a detailed and comprehensive analysis of the world market for Optical Chip 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 Optical Chip for Data Center that contribute to its increasing demand across many markets.

Highlights and key features of the study
Global Optical Chip for Data Center total market, 2021-2032, (USD Million)
Global Optical Chip for Data Center total market by region & country, CAGR, 2021-2032, (USD Million)
U.S. VS China: Optical Chip for Data Center total market, key domestic companies, and share, (USD Million)
Global Optical Chip for Data Center revenue by player, revenue and market share 2021-2026, (USD Million)
Global Optical Chip for Data Center total market by Type, CAGR, 2021-2032, (USD Million)
Global Optical Chip for Data Center total market by Application, CAGR, 2021-2032, (USD Million)

This report profiles major players in the global Optical Chip for Data Center market based on the following parameters - company overview, revenue, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Lumentum, Coherent, Mitsubishi Electric, Source Photonics, Broadcom, Sumitomo Electric, Applied Optoelectronics, NTT Electronics, Yuanjie Semiconductor Technology, Eliteoptronics, 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 Optical Chip for Data Center market

Detailed Segmentation:

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Each section contains quantitative market data including market by value (US$ Millions), by player, by regions, 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 Optical Chip for Data Center Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Optical Chip for Data Center Market, Segmentation by Type:

DFB

EML

VCSEL

Others

Global Optical Chip for Data Center Market, Segmentation by Speed:

?25G

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50G

100G

200G

Global Optical Chip for Data Center Market, Segmentation by Data Center Scale:

Small and Medium-Sized Data Centers

Large Data Centers

Global Optical Chip for Data Center Market, Segmentation by Application:

Intra-Data Center Interconnect

Data Center Interconnect (DCI)

Companies Profiled:

Lumentum

Coherent

Mitsubishi Electric

Source Photonics

Broadcom

Sumitomo Electric

Applied Optoelectronics

NTT Electronics

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Yuanjie Semiconductor Technology

Eliteoptronics

TRUMPF

Vertilite

Key Questions Answered

1. How big is the global Optical Chip for Data Center market?
2. What is the demand of the global Optical Chip for Data Center market?
3. What is the year over year growth of the global Optical Chip for Data Center market?
4. What is the total value of the global Optical Chip for Data Center market?
5. Who are the Major Players in the global Optical Chip for Data Center market?
6. What are the growth factors driving the market demand?

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