

Global Silicon Photonics Wafer Foundry Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Silicon Photonics Wafer Foundry market size is expected to reach \$ 3715 million by 2032, rising at a market growth of 31.4% CAGR during the forecast period (2026-2032).

Silicon Photonics Wafer Foundry refers to wafer-level foundry services that provide process platforms, wafer fabrication, MPW shuttle runs, dedicated engineering runs, low-volume manufacturing and volume production for silicon photonic integrated circuits. The major process platforms include SOI-based silicon photonics, silicon/germanium-on-silicon photonic-electronic integration, silicon nitride photonics and heterogeneous integration platforms. These foundries fabricate photonic components such as optical waveguides, couplers, modulators, photodetectors, splitters, ring resonators and thermal tuners on semiconductor wafers, while supporting customers with PDKs, process libraries and design rules. The market scope should mainly cover wafer fabrication foundry revenue, excluding downstream optical modules, CPO systems, standalone packaging and testing services, pure design services and end-system revenue. In 2025, global silicon photonics wafer foundry shipments reached approximately 63.73 thousand equivalent 8-inch wafers, with an average ex-factory price of about USD 7,620 per wafer.

Silicon photonics wafer foundry is a specialized foundry business formed by the integration of semiconductor wafer manufacturing and photonic integration technologies. It mainly provides PDK support, MPW shuttle runs, dedicated engineering runs, low-volume manufacturing and volume production services for silicon photonic integrated circuits. Its major process platforms include SOI or silicon-based silicon photonics platforms, silicon nitride photonics platforms, and heterogeneous integration and other silicon-based photonics platforms. The fabricated photonic devices include

optical waveguides, couplers, modulators, photodetectors, splitters, ring resonators and thermal tuners. Compared with traditional CMOS electronic IC foundry services, silicon photonics wafer foundry requires not only wafer-level uniformity and yield control, but also precise management of optical loss, coupling efficiency, polarization stability, thermal drift, photonic-electronic co-design, and packaging and testing compatibility.

At present, silicon photonics wafer foundry is still transitioning from R&D validation to commercial volume production, and its overall scale remains much smaller than that of CMOS logic foundry. Therefore, industry capacity should be described in terms of ?effective commercial silicon photonics output capability? rather than the nominal capacity of semiconductor fabs. GlobalFoundries and Tower Semiconductor are currently among the most representative commercial silicon photonics foundry platforms, while imec, LioniX, SilTerra, VTT and IHP mainly play roles in MPW, prototyping, pilot production or specialty process platforms. With rising demand from AI data centers, high-speed optical modules, CPO and photonic-electronic integration, large semiconductor foundries such as TSMC, Samsung and UMC are also accelerating their silicon photonics platform development. Samsung further disclosed its progress in a 300mm silicon photonics foundry platform in 2026, while UMC is building a 12-inch silicon photonics platform by introducing imec?s iSiPP300 technology. As a result, the competitive landscape is shifting from specialized platforms toward broader participation by large-scale wafer foundries.

From the perspective of downstream demand, data center optical interconnects represent the most important growth area for silicon photonics wafer foundry. AI clusters, cloud computing and high-speed switching systems require higher bandwidth, lower power consumption and greater interconnect density, driving the adoption of silicon photonics in pluggable optical modules, CPO, OCS, scale-out and scale-up networks, and board-level optical interconnects. Non-data-center applications include telecom communication, coherent optical communication, LiDAR, industrial sensing, biosensing, quantum photonics and research projects. Although these orders are more fragmented and customized, they offer relatively high technical value. Since silicon photonics wafer foundry requires close coordination across process platforms, PDKs, packaging and testing, optical validation and customer qualification, its average gross margin is generally higher than that of conventional mature-node foundry services, typically in the range of approximately 25% to 40%. In the future, as 300mm platforms mature, customer orders ramp up and packaging and testing standardization improves, silicon photonics wafer foundry is expected to become a high-growth segment in photonic-electronic integrated semiconductor manufacturing.

This report studies the global Silicon Photonics Wafer Foundry production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Silicon Photonics Wafer Foundry 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 Photonics Wafer Foundry that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Silicon Photonics Wafer Foundry total production and demand, 2021-2032, (Units)

Global Silicon Photonics Wafer Foundry total production value, 2021-2032, (USD Million)

Global Silicon Photonics Wafer Foundry production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Units), (based on production site)

Global Silicon Photonics Wafer Foundry consumption by region & country, CAGR, 2021-2032 & (Units)

U.S. VS China: Silicon Photonics Wafer Foundry domestic production, consumption, key domestic manufacturers and share

Global Silicon Photonics Wafer Foundry production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Units)

Global Silicon Photonics Wafer Foundry production by Type, production, value, CAGR, 2021-2032, (USD Million) & (Units)

Global Silicon Photonics Wafer Foundry production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Units)

This report profiles key players in the global Silicon Photonics Wafer Foundry 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 GlobalFoundries, Tower Semiconductor, TSMC, Silex Microsystems, VTT, SilTerra, IHP Microelectronics, Imec, LioniX International, Samsung, 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 Photonics Wafer Foundry market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (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 Photonics Wafer Foundry Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Silicon Photonics Wafer Foundry Market, Segmentation by Type:

300 mm Wafer

200 mm Wafer

Others

Global Silicon Photonics Wafer Foundry Market, Segmentation by Process Platform:

SOI/Si-Based Silicon Photonics Platform

Silicon Nitride Photonics Platform

Heterogeneous and Other Silicon-Based Photonics Platform

Global Silicon Photonics Wafer Foundry Market, Segmentation by End Users:

Optical Communication and Transceiver Vendors

AI, Cloud and Data Center Customers

Fabless Silicon Photonics IC Companies

Research Institutes, Government Programs and Others

Global Silicon Photonics Wafer Foundry Market, Segmentation by Application:

Data Center

Non-Data Center

Companies Profiled:

GlobalFoundries

Tower Semiconductor

TSMC

Silex Microsystems

VTT

SilTerra

IHP Microelectronics

Imec

LioniX International

Samsung

UMC

Key Questions Answered:

1. How big is the global Silicon Photonics Wafer Foundry market?
2. What is the demand of the global Silicon Photonics Wafer Foundry market?
3. What is the year over year growth of the global Silicon Photonics Wafer Foundry market?
4. What is the production and production value of the global Silicon Photonics Wafer Foundry market?
5. Who are the key producers in the global Silicon Photonics Wafer Foundry market?
6. What are the growth factors driving the market demand?

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