

Article Overview

High-speed optical module chips, such as those for 400G to 1.6T modules, have seen significant price declines over the past five years, with current market prices influenced by technology type, data rate, and supply chain constraints.

Market Pricing Trends

The average selling price (ASP) for 100G optical modules has dropped approximately 70% over the past five years, reflecting aggressive cost reductions by chip vendors while maintaining performance standards . For higher-speed modules, such as 400G, 800G, and 1.6T, prices vary depending on whether the module uses traditional EML (Electro-Absorption Modulated Laser) chips or silicon photonics (SiPh) chips. Silicon photonics modules typically require fewer chips and integrate multiple optical components, which can reduce assembly costs and improve efficiency .

Factors Affecting Prices

- o Data Rate and Chip Complexity: Higher-speed modules (800G, 1.6T) require more advanced DSPs, driver chips, and photodetector arrays. For example, an 800G silicon photonics module may use two SiPh chips with four CW light sources, whereas traditional 800G modules require eight EML chips, increasing component costs .
- o Supply Chain Constraints: Specialized semiconductor manufacturing, particularly for III-V compound semiconductors like indium phosphide lasers, has led to extended lead times (over 52 weeks for some components), which can temporarily increase prices .
- o Technological Advancements: Integration of coherent optical transmission and silicon photonics reduces the number of discrete components, lowering production costs and enabling more competitive pricing .
- o Market Demand: Rapid growth in data centers, 5G infrastructure, and AI workloads has increased demand for high-speed optical modules, which can influence pricing depending on supply availability .

Estimated Price Ranges

While exact per-chip prices are proprietary, industry reports suggest the following approximate ranges:

- o 100G modules: Prices have fallen significantly, often below \$100 per module in high-volume production .
- o 400G modules: Typically range from \$200 to \$500 per module, depending on form factor and technology.
- o 800G silicon photonics modules: Estimated at \$1,000-\$1,500 per module, reflecting integration efficiencies and fewer chips required .
- o 1.6T modules: Not yet in mass production; projected prices are higher due to limited supply and advanced technology requirements, potentially \$3,000+ per module .

Conclusion

High-speed optical module chip prices are declining overall due to technological integration and economies of scale, but higher-speed modules remain costly due to complexity and supply chain limitations. Silicon photonics is increasingly cost-effective compared to traditional EML-based modules, particularly for 800G and future 1.6T deployments. Market dynamics, including 5G expansion and AI-driven data center growth, continue to influence pricing trends .

With strong in-house capabilities in optical chip design and packaging, the company delivers 100G to 800G modules and coherent

Major benefits of SFP+ transceivers include compact size, lower cost, and high speed. SFP+ offers higher speed than

In this dynamic environment, the optical module chip spot market has gradually become an important segment of the

The high-speed DSP market is dominated by a few international vendors such as Marvell, Broadcom, and MaxLinear,

In 2024, the global market average selling price of high-speed data communication optical modules was approximately

The proposed optical computing chip enables the high-speed, parallel processing for quantitative trading with

Fabrication and assembly costs generally account for 25-35% of total chip cost, with high-speed chips being more

MCU chips powering optical modules have emerged as a critical semiconductor segment driven by the AI data center

In general, the price increase of optical modules is the inevitable result of strong demand (the AI computing power race)

Complete guide to 800G optical module costs and TCO optimization for AI data centers. Includes pricing analysis,

Explore the evolution of optical modules in speed and form factors from 400G to 1.6T, stressing key enhancement

High-speed optical module chip price

Introduction Electro-Absorption Modulated Laser (EML) chips are critical components in modern optical communication

We demonstrate chip-on-board (COB) packaged optical module operating at data rate of 25 Gb/s based on silicon

Average selling prices for 100G optical modules have declined approximately 70% over the past five years, forcing chip vendors to

In terms of pricing, 800G LPO modules have been sold at around \$600 this year, which is cheaper than single-mode

Shop high-speed optical transceivers from Unitekfiber. We offer 100% compatible 40G, 100G, and 400G QSFP-DD modules for data

Web: <https://supremeacademicresearch.co.za>

