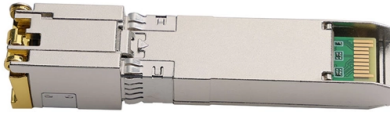


Optical Module Highlights



Overview

Explore the key highlights of OFC 2025 in San Francisco—the world's leading optical communications event.

Key Takeaways

Optical modules in 2026 are defined by high-speed 800G/1.6T deployments, co-packaged optics, silicon photonics, and AI-driven infrastructure demands. Key Technological Trends

- High-Speed Modules: 800G modules dominate the market with 35–40 million units, while 1.6T modules are entering commercial deployment, particularly for AI and hyperscale data centers. Legacy 400G modules are gradually retreating to specialized scenarios .

- Technical Routes: Silicon photonics and LPO (low-power optics) reduce energy consumption by up to 50% for short-reach AI links. EML (electro-absorption modulated lasers) are used for long-haul transmission, while NPO and CPO (co-packaged optics) support high-density AI clusters .

- Mainstream Packages: SFP/SFP+ remain for 10G/25G, QSFP-DD for 800G/1.6T, and OSFP for 1.6T+ applications, offering improved heat dissipation and scalability .

Scenario-Based Applications

- AI Data Centers & Intelligent Computing: High-density, low-latency interconnects using CPO and silicon photonics.

- 5G-Advanced / 6G-Ready Networks: Optical modules for front-haul and back-haul with high reliability and power efficiency.

- Enterprise Campuses & SME Networks: 10G/25G SFP modules for access layers.

- Telecom Backbone / DCI / Metro Networks: Coherent optics and long-reach EML modules for distances >40 km.

- Industrial / Medical / Special Environments: Modules optimized for temperature resilience and reliability .

Notable Innovations and Announcements

- Co-Packaged Optics (CPO): Demonstrated by Broadcom and Meta, achieving highly reliable links with 50 million hours of link flap-free operation, supporting AI scale-up networks .

- Next-Generation Coherent Pluggables: Ciena introduced WaveLogic 6 Nano modes and Vesta 200 6.4T CPX optical engines for GPU cluster interconnects .

- Detachable Fiber Interfaces: Lightmatter and Molex presented modular, serviceable fiber-to-chip solutions for improved manufacturability and field serviceability .

- Laser Innovations: Lumentum and Scintil showcased multi-channel DWDM lasers and 800 mW SHP lasers for CPO and silicon photonics architectures .

- Scale-Up Networking Standards: Broadcom's OCI MSA standard reduces latency, power, and cost using wavelength division with four colors per direction instead of high-speed PAM4 lanes .

Market Dynamics

- Growth: The global optical module market is projected to reach USD 42 billion by 2033, with a CAGR of 12%, driven by hyperscale data centers, 5G deployment, and AI infrastructure .

- Optical Module Chips: The market for laser, detector, and amplifier chips is expanding rapidly, with 800G and 1.6T solutions driving adoption in cloud and AI applications .

- Regional Trends: The U.S. and China are leading markets, with China expected to reach USD 4.2 billion by 2032 .

Selection Guidelines

- Speed Matching: 1.6T for AI clusters, 800G for data centers, 10G/25G for access layers.

- Distance Accuracy: SR multimode 40 km.

- Power Priority: Silicon photonics/LPO for AI clusters, NPO for high-density racks .

These highlights reflect a convergence of high-speed performance, energy efficiency, modularity, and AI-driven demand, positioning optical modules as a critical enabler for next-generation networking and computing infrastructure.

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