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Semiconductors

Optical interconnect: The new value layer in AI infrastructure

AI optical interconnect is moving from a transceiver upgrade cycle into a system-level infrastructure bottleneck. As AI clusters scale from tray-level systems into rack, row and campus-scale fabrics, compute performance increasingly depends not only on GPU/ASIC availability, but also on whether data can move efficiently across larger accelerator domains. Copper remains cost-effective for short links, but higher lane speeds, rising insertion loss and tighter power budgets are forcing optics deeper into scale-up, scale-out and scale-across architectures. **We believe this expands the industry opportunity beyond optical modules toward higher-value components, integrated optical platforms and system-level interconnect architectures.**

- **The near-term monetization layer remains in high-speed pluggable modules, but value capture is shifting upstream.** Module demand should grow rapidly as AI clusters require higher bandwidth and lower latency, yet module assembly itself is becoming more competitive. The more defensible profit pools sit in components that are scarce, qualification-heavy and difficult to second-source, including **high-speed InP (indium phosphide) lasers, DSP (digital signal processor) /analog ICs, optical engines and precision packaging.** This is why we expect the optical supply chain to polarize: Leading module suppliers with hyperscaler qualifications and supply-chain access should consolidate share, while second-tier vendors face red-sea pricing pressure as manufacturing-led entrants ramp.
- **Technology roadmaps are also becoming more fragmented, which favors suppliers with architecture-neutral exposure.** EML (electro-absorption modulated laser) remains the proven performance path for 400G/800G and early 1.6T pluggables, while SiPh (silicon photonics) gains momentum as bandwidth density, power and EML supply tightness become more pressing. CPO (co-packaged optics) should be viewed as the endpoint of a broader migration away from DSP-retimed front-panel pluggables, not an immediate replacement. Pluggables remain the volume engine, but LPO (linear pluggable optics)/LRO (linear receiver optics), NPO (near-packaged optics) and CPO increasingly shift value toward optical engines, CW (continuous wave) /UHP (ultra-high power) lasers, ELS (external laser source), coupling/packaging and system-level reliability.
- **Against this backdrop, we prefer companies positioned in scarce upstream and architecture-enabling layers of the optical value chain.** Laser and photonics platforms such as Lumentum (LITE US, BUY, TP: US$1,070) and Coherent (COHR US, BUY, TP: US$465) benefit from InP lasers, CW/UHP light sources, ELS and OCS/CPO exposure; module leaders such as Innolight (300308 CH, BUY) and Eoptolink (300520 CH, NR) should retain share through hyperscaler qualification, execution and delivery scale; while manufacturing-led entrants such as Luxshare Precision (002475 CH, covered by our technology analyst Hanqing Li) and Dongshan Precision (002384 CH, NR) may intensify competition in less differentiated modules. The key industry conclusion is that AI optics is not a simple TAM expansion story but a value reallocation one, with profit pools migrating from final assembly toward bottleneck components, optical engines and system-level optical architectures.

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Sector reports:

1. Semiconductors - Nvidia 1QFY27 earnings: AI factory economics extends growth runway (link)
2. Semiconductors - DeepSeek V4 pricing offer extended, signaling China's LLM inference cost advantage (link)
3. Semiconductors - Google Cloud Next: TPU v8 and rising of AI Hypercomputer (link)
4. Semiconductors - Key takeaways for OFC 2026 (link)
5. Iluvatar CoreX (9903 HK) - A system-level challenger in China's evolving AI compute stack space; Initiate at BUY (link)

Company reports:

1. Innolight (300308 CH) - 1Q26 earnings: Brighter than a shooting star (link)
2. Innolight (300308 CH) - Stronger into 2026 on 1.6T ramp and SiPh mix (link)
3. Innolight (300308 CH) - Pluggables first, new architecture later (link)
4. Innolight (300308 CH) - A clear beneficiary of global AI infrastructure capex; remains our top pick in 2026 (link)
5. Innolight (300308 CH) - Record-high quarter driven by AI demand; Robust cloud capex underpins outlook (link)

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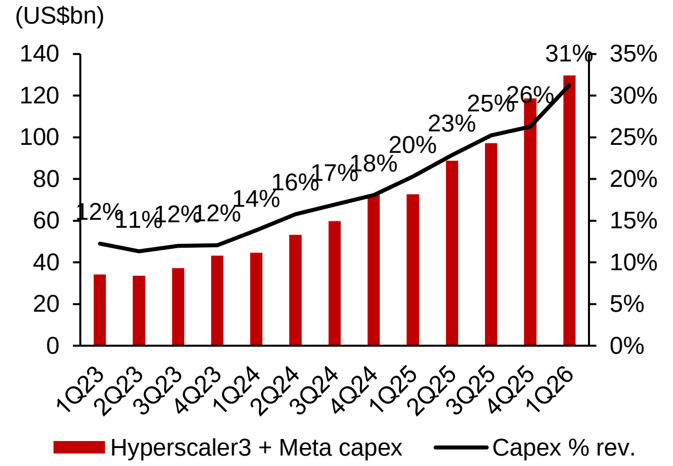
Industry Overview

Datacom optical interconnect: Capturing a bigger share of the total AI infrastructure capex

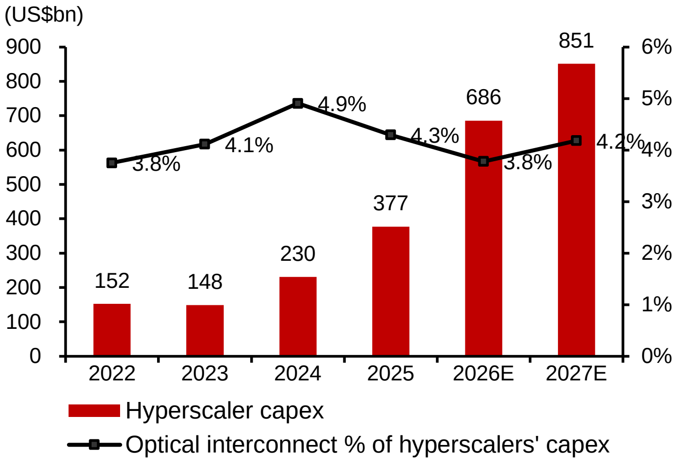
Overseas hyperscalers collectively spent more than **US$370bn** on capex in 2025, and Bloomberg consensus expects this to approach **US$700bn in 2026E**. We expect datacenter optical interconnect to capture a growing share of this capex as AI infrastructure scales from individual racks into larger rack, row and campus-level fabrics. The reason is simple: as AI clusters grow, compute performance increasingly depends not only on GPU/ASIC availability, but also on how efficiently those accelerators exchange data within and across data centers.

Figure 1: Amazon, Microsoft, Meta, and Google's capex and capex intensity



Source: Bloomberg, CMBIGM

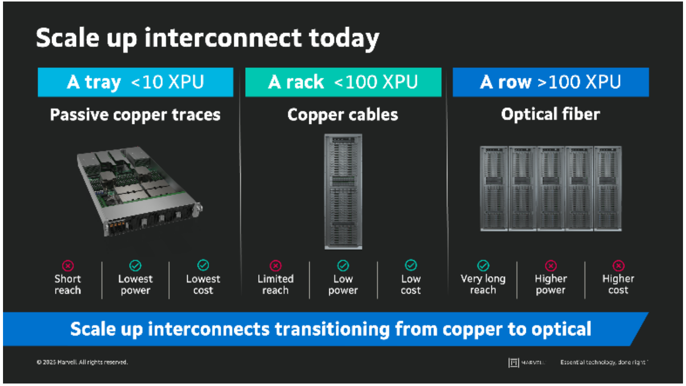
Figure 2: Datacenter optical interconnect spend as % of AMZN/META/GOOG/MSFT capex



Source: Frost & Sullivan, Bloomberg consensus, CMBIGM

Optical interconnect is becoming a structural bottleneck in AI infrastructure. Copper remains cost- and power-efficient for very short links, but its advantage erodes rapidly at higher lane speeds. As signal rates approach **224 Gbps per lane**, copper reach shortens, insertion loss rises and more retiming becomes necessary. This confines passive copper to near-chassis or very short in-rack links, making optics increasingly necessary once traffic moves beyond the immediate compute tray.

Figure 3: Datacenter interconnect under different scenarios



Scale up interconnect today

A tray <10 XPU
Passive copper traces
Short reach | Lowest power | Lowest cost

A rack <100 XPU
Copper cables
Limited reach | Low power | Low cost

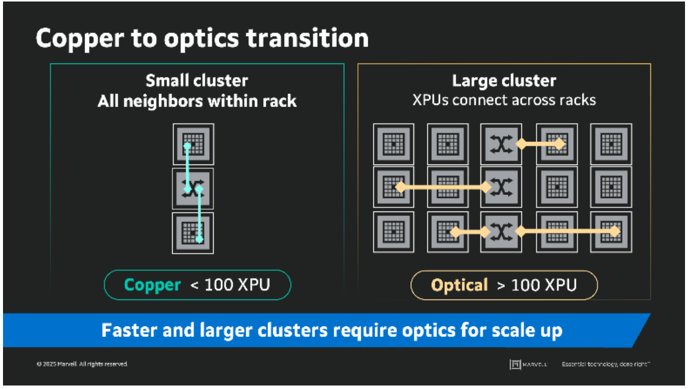
A row >100 XPU
Optical fiber
Very long reach | Higher power | Higher cost

Scale up interconnects transitioning from copper to optical

MARVELL Essential technology, done right™

Source: Marvell, CMBIGM

Figure 4: Copper is no longer sufficient in larger AI clusters



Copper to optics transition

Small cluster
All neighbors within rack
Copper < 100 XPU

Large cluster
XPUs connect across racks
Optical > 100 XPU

Faster and larger clusters require optics for scale up

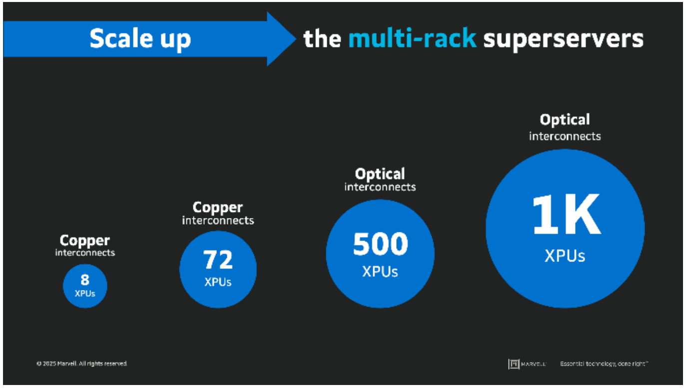
MARVELL Essential technology, done right™

Source: Marvell, CMBIGM

We frame the optical opportunity across three connectivity domains. **Scale-up** is where optics moves closer to compute, as larger accelerator domains require LPO, NPO, XPO and eventually CPO to reduce electrical loss and preserve bandwidth density. **Scale-out** remains the near-term volume driver, with 800G and 1.6T pluggables supporting high-bandwidth east-west traffic across AI clusters. **Scale-across** becomes more relevant as hyperscalers connect AI compute across buildings, campuses and regions, driving demand for coherent DCI (data center interconnect), narrow-linewidth lasers and higher-capacity optical transport.

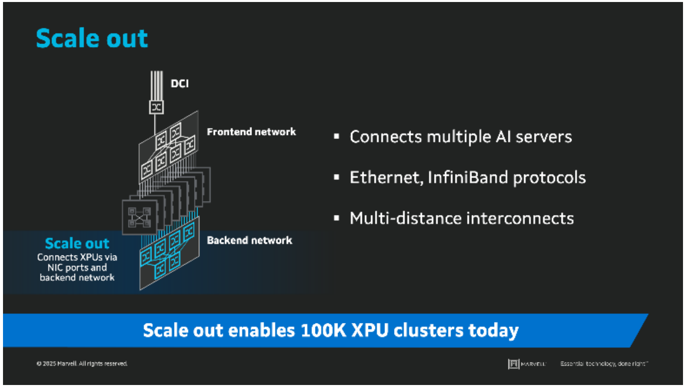
The key industry shift is from **module speed upgrades to architecture-driven optical adoption**. Prior datacom cycles were largely about moving from one transceiver generation to the next. This current cycle is broader: **optics is being pulled closer to ASICs, deeper into switching fabrics and farther across AI campuses**. As a result, the value pool is expanding beyond transceiver modules into EML lasers, CW/UHP lasers, silicon photonics, DSPs, coherent optics, optical engines and optical circuit switching.

Figure 5: Scale up interconnect


Scale up the multi-rack superservers

Source: Marvell, CMBIGM

Figure 6: Scale out interconnect


Scale out

- Connects multiple AI servers
- Ethernet, InfiniBand protocols
- Multi-distance interconnects

Scale out enables 100K XPU clusters today

Source: Marvell, CMBIGM

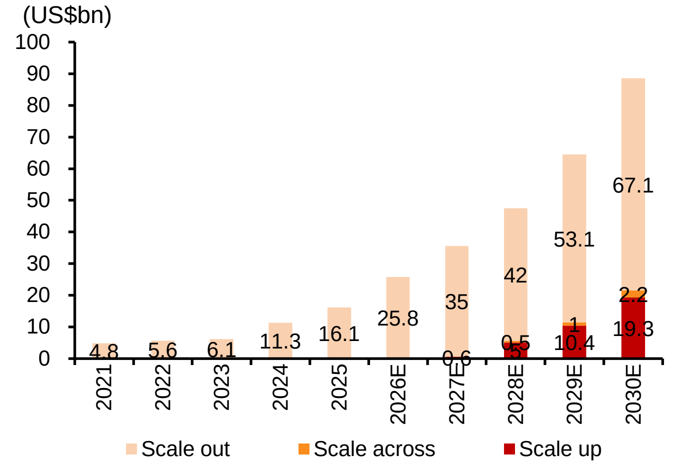
Optical modules are the first volume layer of AI interconnect monetization

Optical modules are the most direct monetization layer of AI scale-out. As AI clusters expand, high-speed modules are critical for moving traffic across accelerator racks and preventing compute underutilization. **800G** has become the mainstream workhorse for leading AI networks, while **1.6T** represents the next bandwidth-density upgrade as switch platforms migrate toward 51.2T and 102.4T.

Unlike prior datacom cycles, the current upgrade is not driven only by generic cloud traffic growth. It is driven by the need to match network bandwidth with GPU and ASIC cluster scaling. As accelerator count rises, insufficient interconnect bandwidth directly reduces cluster utilization and lengthens training or inference completion time. Optical modules are therefore shifting from replaceable networking components into core enablers of AI infrastructure efficiency.

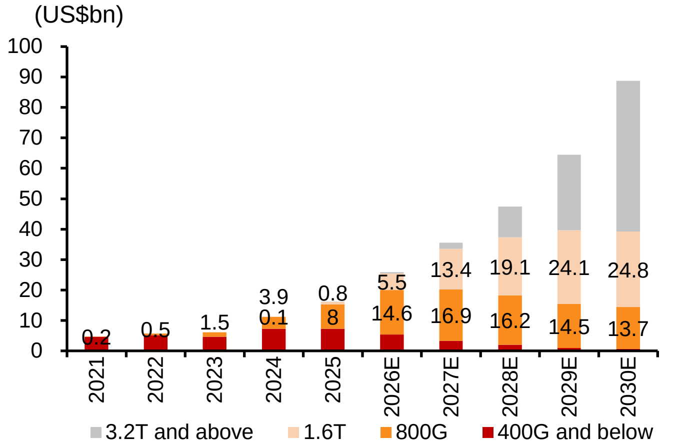
We believe this supports a faster and more durable module upgrade cycle, but also raises the execution bar. Future share gains will increasingly depend on high-speed EML and SiPh capability, thermal design, packaging yield, firmware stability and hyperscaler qualification. According to Frost & Sullivan, the datacom optical interconnect market is expected to grow **60.2%/38.0% YoY in 2026E/27E**, with a **40.6% revenue CAGR over 2025–30E**, primarily driven by scale-out demand for 800G and 1.6T optical modules.

Figure 7: Datacom optical interconnect TAM, by network layer



Source: F&S, CMBIGM

Figure 8: Datacom optical interconnect TAM, by optical module bandwidth

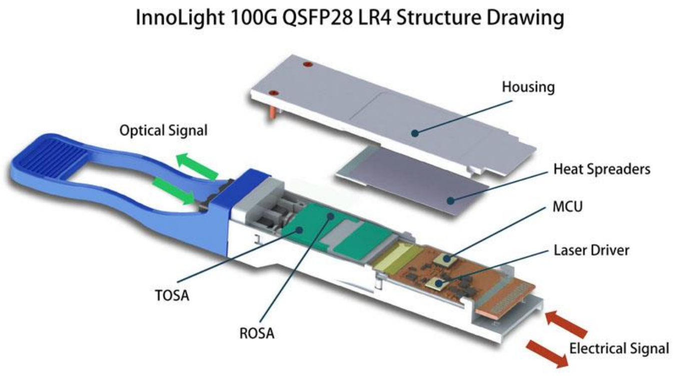


Source: F&S, CMBIGM

Component value shifts from module assembly to lasers and optical engines

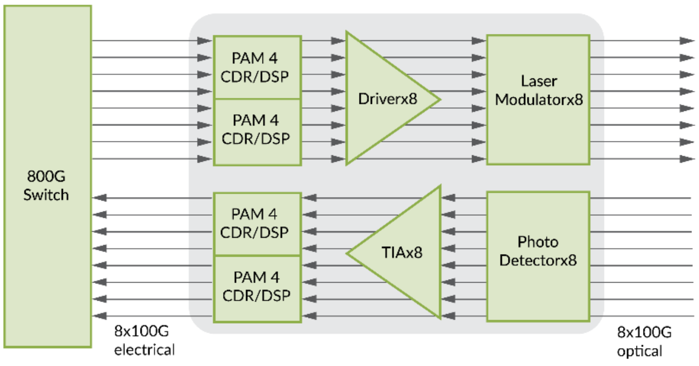
To size the opportunity more precisely, we decompose optical interconnects across three dimensions: **speed generation, reach/application and component content**. Speed generation captures the migration from 800G to 1.6T and eventually 2.4T/3.2T. Reach and application determine whether the module is used for intra-data-center scale-out, future scale-up opticalization or scale-across DCI. Component content determines where value is captured, including EML lasers, CW/UHP lasers, SiPh engines, DSPs, drivers/TIAs (transimpedance amplifier), coherent components and packaging.

Figure 9: A typical 100G QSFP LR4 optical module



Source: QSFPTEK.com, CMBIGM

Figure 10: Juniper 800G X8 transceiver architecture

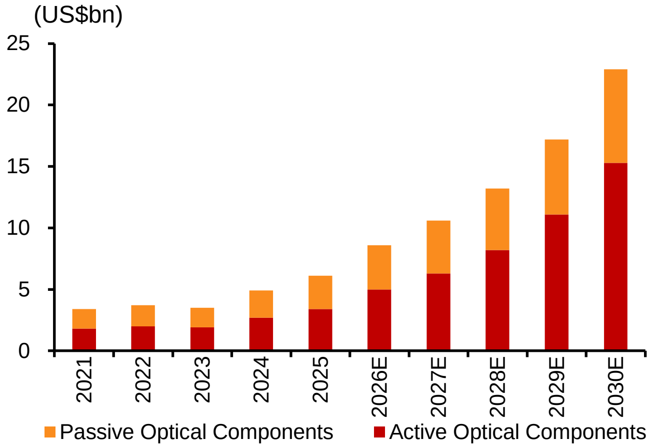


Source: Juniper, CMBIGM

A high-speed optical module should be analyzed as a bundle of value pools, not a single hardware product. The electronic stack determines signal integrity, power consumption and host compatibility, while the optical stack determines reach, bandwidth density, coupling efficiency and manufacturability. This distinction becomes more important as the industry moves from 800G to 1.6T, because the bottleneck shifts from basic module assembly toward high-speed signal processing, laser performance, optical-engine integration and packaging yield.

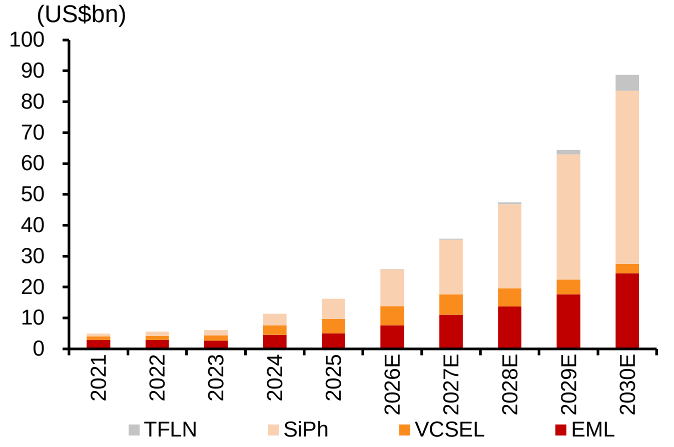
In our view, the most defensible value sits in components that are technically scarce, customer-qualified and difficult to second-source, including DSPs, drivers/TIAs, EML lasers, CW lasers, SiPh engines and precision optical packaging. A component-level breakdown therefore provides a clearer market-sizing framework than module TAM alone.

Figure 11: Datacom optical interconnect TAM, by component type



Source: F&S, CMBIGM

Figure 12: Datacom optical interconnect TAM, by platform



Source: F&S, CMBIGM

Note: TFLN - thin-film lithium niobate; VCSEL - vertical-cavity surface-emitting laser.

According to F&S, the optical component market is entering a strong upcycle, led by faster growth in **active optical components**, which are expected to grow **47%/26% YoY in 2026E/27E**, compared with **33%/19% YoY** for passive optical components. We believe this divergence reflects the shift toward higher-speed 800G/1.6T modules, where demand for high-speed laser sources, photodiodes and optical engines rises disproportionately with bandwidth requirements.

Passive optical components should also benefit from volume growth and greater packaging complexity, including FAU (fiber array unit), lenses, mux/demux and precision coupling optics, but the larger incremental value pool should accrue to active components given higher technical barriers and tighter qualification requirements.

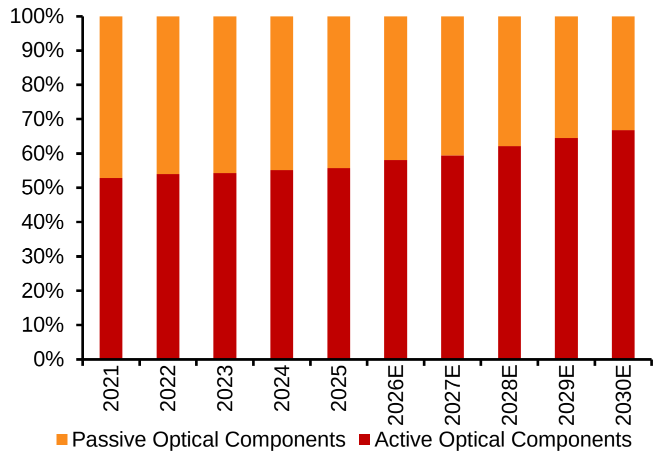
Figure 13: Key active and passive optical components in an optical module

Category	Component	Active/passive	Function	Example
Active components				
Light source	Laser	Active optical	Generates optical light	EML laser, CW laser, VCSEL
Optical modulation	Modulator / optical engine	Active optical platform	Encodes electrical data onto light	EML modulator, SiPh modulator / SiPh PIC (photonic IC)
Optical detection	Detector	Active optoelectronic	Converts received light back into electrical current	Photodiode / PD array
Passive components				
Wavelength management	Passive optical component	Passive optical	Combines or separates wavelengths	Mux / demux, AWG (arrayed waveguide grating)
Optical coupling / packaging	Passive optical packaging	Passive optical	Aligns and couples light between chip, lens and fiber	Lens, FAU, fiber coupling optics

Source: F&S, CMBIGM

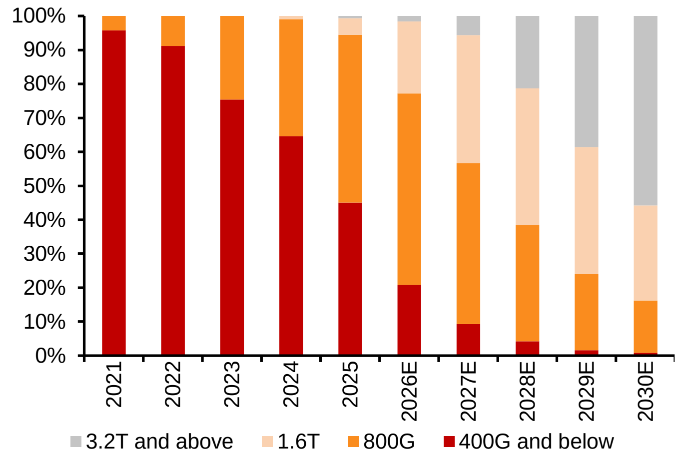
We expect active optical components to outgrow passive components over the long term. As modules migrate toward 800G/1.6T and eventually higher-speed generations, component requirements become more demanding, with greater need for high-speed lasers, optical engines and integrated photonic platforms such as SiPh, alongside longer-term architecture shifts toward CPO. According to F&S, active optical components are expected to account for **67%** of the total optical components market by 2030E, up from **56% in 2025**, as module shipments shift toward higher-speed products that carry more sophisticated active optical content.

Figure 14: Active optical components value share vs. passive optical components



Source: F&S, CMBIGM

Figure 15: Value share of optical modules by speed

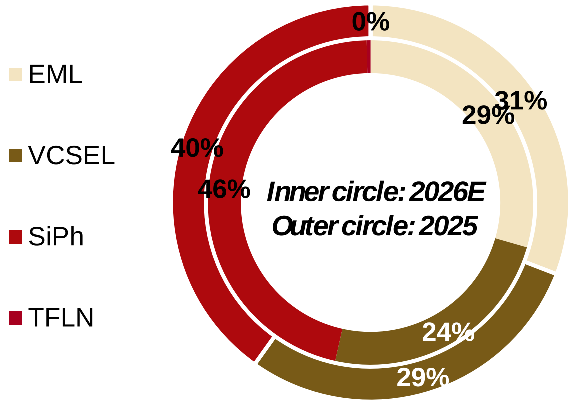


Source: F&S, CMBIGM

EML remains the mainstream solution in 400G/800G single-mode optical modules because it offers a proven combination of output power, signal quality, reach and manufacturability. By integrating the laser and electro-absorption modulator in one device, EML provides a strong optical link budget, making it well suited for DR (direct reach)/FR (far reach)/LR (long range) applications where reach and performance matter.

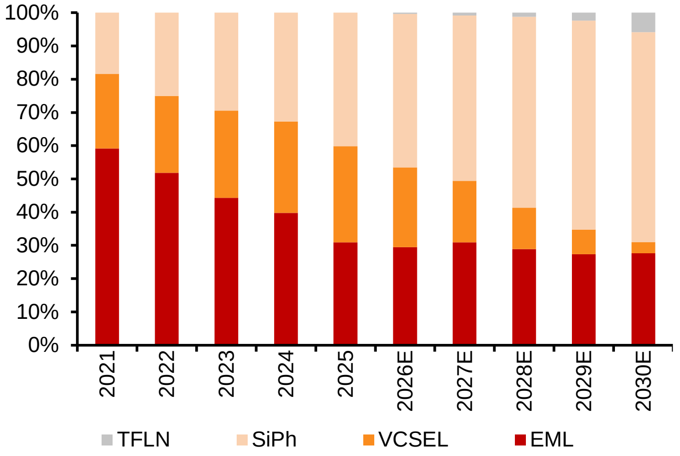
However, as the industry moves toward 1.6T and 200G/lane, the bottleneck shifts from speed alone to bandwidth density, power, thermal control and supply availability. We estimate the InP laser shortage will remain elevated at **above 50% in 2026E**, prompting module vendors and hyperscalers to diversify technology roadmaps rather than rely solely on one constrained laser supply chain. This increases the appeal of SiPh, which separates light generation from modulation, uses CW lasers as the light source, and integrates more optical functions onto a silicon photonics platform. In this sense, SiPh adoption is driven not only by technical scalability, but also by the need to mitigate EML supply tightness and improve manufacturing flexibility at higher module volumes.

Figure 16: Optical interconnect market share by technology: EML remains a near-term mainstream solution



Source: F&S, CMBIGM

Figure 17: Optical interconnect value share from 2021 to 2030E, with SiPh solution gradually gaining momentum

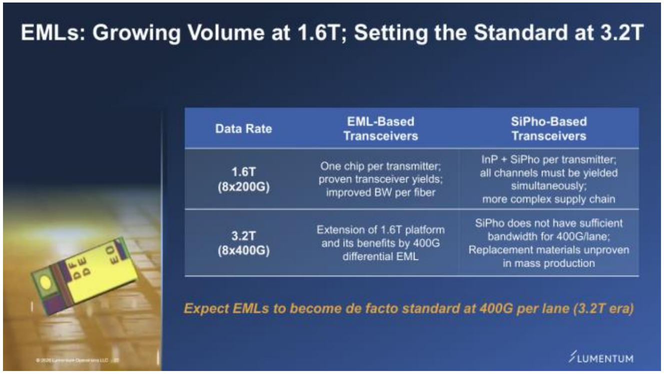


Source: F&S, CMBIGM

In our view, the laser roadmap should be framed as coexistence plus value migration, rather than a binary EML-to-SiPh substitution. EML remains the proven performance path for 800G and early 1.6T pluggables, supported by mature qualification, strong optical budget and cleaner supply-chain ownership.

- **Lumentum's roadmap** at OFC 2026 argues that 1.6T EML-based transceivers use one chip per transmitter with proven yields, while SiPh-based designs require InP plus SiPh per transmitter and simultaneous yield across all channels; it also suggests 400G differential EML could extend the platform into the 3.2T era. At the same time, SiPh becomes more relevant as bandwidth density, power and integration become the key bottlenecks.
- **Coherent's** roadmap at OFC 2026 reflects this bifurcation, with both 400G differential EML for higher-speed pluggables and InP CW laser plus 200G/lane SiPh PIC for high-density form factors

Figure 18: Lumentum's pluggable module roadmap at OFC 2026



EMLs: Growing Volume at 1.6T; Setting the Standard at 3.2T

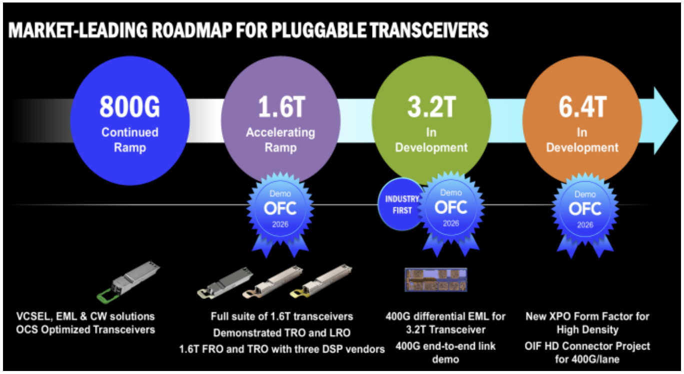
Data Rate	EML-Based Transceivers	SiPho-Based Transceivers
1.6T (8x200G)	One chip per transmitter; proven transceiver yields; improved BW per fiber	InP + SiPho per transmitter; all channels must be yielded simultaneously; more complex supply chain
3.2T (8x400G)	Extension of 1.6T platform and its benefits by 400G differential EML	SiPho does not have sufficient bandwidth for 400G/lane; Replacement materials unproven in mass production

Expect EMLs to become de facto standard at 400G per lane (3.2T era)

LUMENTUM

Source: Lumentum, CMBIGM

Figure 19: Coherent's pluggable module roadmap at OFC 2026



MARKET-LEADING ROADMAP FOR PLUGGABLE TRANSCEIVERS

800G Continued Ramp

1.6T Accelerating Ramp

3.2T In Development

6.4T In Development

VCSEL, EML & CW solutions
OCS Optimized Transceivers

Full suite of 1.6T transceivers
Demonstrated TRO and LRO
1.6T FRO and TRO with three DSP vendors

400G differential EML for 3.2T Transceiver
400G end-to-end link demo

New XPO Form Factor for High Density
OIF HD Connector Project for 400G/lane

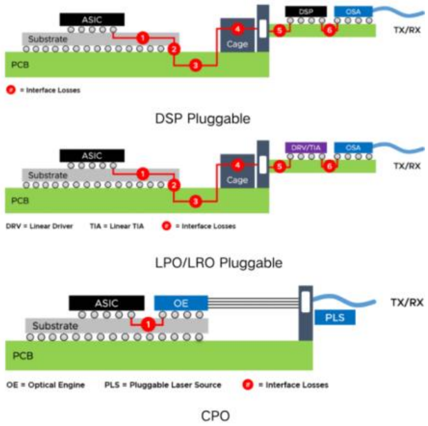
Source: Coherent, CMBIGM

CPO as the next generational architectural extension, but not as an immediate replacement for pluggables

We view CPO (co-packaged optics) as the end point of a broader migration away from DSP-retimed front-panel pluggables, rather than a standalone technology jump. Traditional pluggables remain dominant because they are standardized, serviceable and multi-vendor. The trade-off is structural: electrical signals must travel from the ASIC to the module cage before optical conversion, creating power and signal-integrity penalties. LRO and LPO reduce DSP content while retaining the pluggable form factor. NPO moves the optical engine closer to the ASIC as an intermediate step. CPO goes furthest by placing optics directly next to the ASIC to maximize bandwidth density and reduce electrical reach. According to SemiAnalysis, this migration addresses the inefficiency of sending signals across **15–30cm** electrical paths before optical conversion.

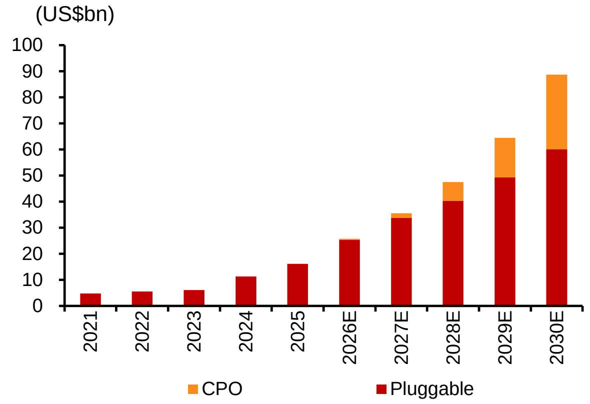
According to F&S, the CPO market is expected to grow at a **219% revenue CAGR over 2025–30E**, with **300%/350% YoY growth in 2026E/27E**, driven by a small group of early adopters. By contrast, pluggable optical modules should continue to see volume expansion and technology upgrades, with a **30% CAGR over 2025–30E** and **58%/33% YoY growth in 2026E/27E**. This means CPO should not be viewed as an immediate replacement for pluggables. **Pluggables remain the near-term volume engine, while CPO/NPO represent faster-growing architectural extensions as AI networks hit power, density and copper-reach constraints.**

Figure 20: Pluggable vs. CPO/NPO



Source: Broadcom, CMBIGM

Figure 21: CPO vs. pluggable modules market size



Source: F&S, CMBIGM

For laser suppliers, the key point is that both paths are positive, but the value pool shifts. In traditional EML pluggables, laser value is embedded inside the module. In SiPh/CPO, light generation is separated from modulation: the optical engine moves closer to the ASIC, while CW/UHP lasers and ELS remain serviceable and supply the light. **SemiAnalysis notes that many CPO implementations keep lasers as pluggable external laser sources because lasers are a key failure-sensitive component, improving serviceability and replaceability.** As a result, CPO does not reduce optical component value; it reallocates value away from front-panel pluggable assembly toward light sources, optical engines, coupling/packaging and system-level reliability.

We see two leading CPO commercialization tracks currently: **Nvidia's (NVDA US, NR) system-led CPO roadmap and Broadcom's (AVGO US, NR) merchant/custom ASIC-led roadmap, with TSMC's (TSM US, NR) COUPE serving as the packaging platform behind Broadcom's next-generation CPO endpoints.**

Figure 22: Nvidia's CPO roadmap vs. Broadcom's

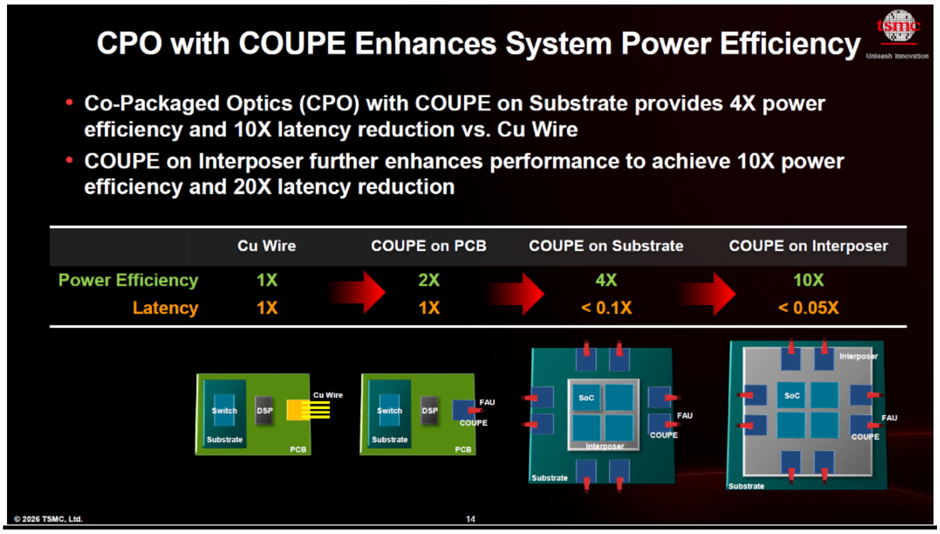
	Nvidia			**Broadcom**		
Product	**Quantum 3450 CPO**	**Spectrum 6810 CPO**	**Spectrum 6800 CPO**	**Humboldt**	**Bailly**	**Davisson**
Launch Date	2H 2025	2H 2026	2H 2026	2022	2024	2026
Networking Standard	InfiniBand	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
Scale-out or Scale-up	Scale-up	Scale-out	Scale-out	Scale-out	Scale-out	Scale-out
Switch ASIC	Quantum-3	Spectrum-6	Spectrum-6	Tomahawk 4	Tomahawk 5	Tomahawk 6
Throughput per Package	28.8 Tbps	102.4 Tbps	102.4 Tbps	25.6 Tbps	51.2 Tbps	102.4 Tbps
Number of Switch Packages	4	1	4	1	1	1
Switch Aggregate Bandwidth	115.2 Tbps (not all-to-all)	102.4 Tbps	409.6 Tbps (not all-to-all)	25.6 Tbps (half-electrical)	51.2 Tbps	102.4 Tbps
SerDes speed (Gb/s uni-di)	200 Gbps	200 Gbps	200 Gbps	100G	100G	200G
Optical Connectivity	DR Optics	DR Optics	DR Optics	DR Optics	FR4 Optics	DR4 Optics
Physical MPO Ports	144	128	512	-	-	-
Bandwidth and Logical Port Configurations Available	144 Ports of 800G	512 Ports of 200G 256 Ports of 400G 128 Ports of 800G	512 Ports of 800G	256 Ports of 100G 128 Ports of 200G 64 Ports of 400G	128 Ports of 400G 64 Ports of 800G	128 Ports of 800G 64 Ports of 1.6T
Bandwidth per Optical Engine (OE)	1.6 Tbps	3.2 Tbps	3.2 Tbps	3.2 Tbps	6.4 Tbps	6.4 Tbps
# of OEs	72	32	128	4	8	16
External Light Sources (ELSs)	18	16	64	-	-	-

Source: SemiAnalysis, CMBIGM

Nvidia's CPO roadmap is system-led and deployment-oriented. Its first CPO products are tied to back-end scale-out switches, starting with Quantum 3450 CPO for InfiniBand in 2H25 and Spectrum CPO for Ethernet in 2H26. The roadmap emphasizes high-radix switch systems, large physical MPO (multi-fiber push-on) port counts, and meaningful use of optical engines and external light sources. **Spectrum 6800, for example, reaches 512 physical MPO ports and 512 logical 800G ports, with 128 optical engines and 64 external light sources.** This suggests Nvidia is using CPO not only to reduce pluggable transceiver power, but also to simplify cabling, raise bandwidth density and prepare the supply chain for larger scale-up optical deployments later.

Broadcom's CPO roadmap is more platform-led and merchant-silicon-oriented. The progression from Humbolt to Bailly to Davisson tracks the Tomahawk ASIC roadmap, moving from 25.6T to 51.2T and then 102.4T switch bandwidth. Compared with Nvidia's system-level approach, **Broadcom appears to focus more on scalable CPO building blocks around Ethernet switch silicon**, with optical engine bandwidth rising from 3.2T to 6.4T and logical port configurations moving toward 128 ports of 800G or 64 ports of 1.6T. This makes Broadcom's roadmap more relevant to merchant switch platforms and hyperscaler custom ASIC ecosystems, where optical engine integration, SiPh, packaging and TSMC COUPE-style manufacturability become key differentiators.

Figure 23: TSMC's CPO packaging solution



CPO with COUPE Enhances System Power Efficiency

- Co-Packaged Optics (CPO) with COUPE on Substrate provides 4X power efficiency and 10X latency reduction vs. Cu Wire
- COUPE on Interposer further enhances performance to achieve 10X power efficiency and 20X latency reduction

	Cu Wire	COUPE on PCB	COUPE on Substrate	COUPE on Interposer
Power Efficiency	1X	2X	4X	10X
Latency	1X	1X	< 0.1X	< 0.05X

Source: TSMC, CMBIGM

Overall, we believe both roadmaps are positive for optical component suppliers. Nvidia creates strong pull for ELS, UHP/CW lasers and high-volume optical engines, while Broadcom creates demand for SiPh optical engines, advanced packaging and scalable CPO integration. **The key takeaway is that CPO is not a near-term replacement for pluggables, but it expands the optical value pool into more strategic and less commoditized layers of the AI interconnect stack.**

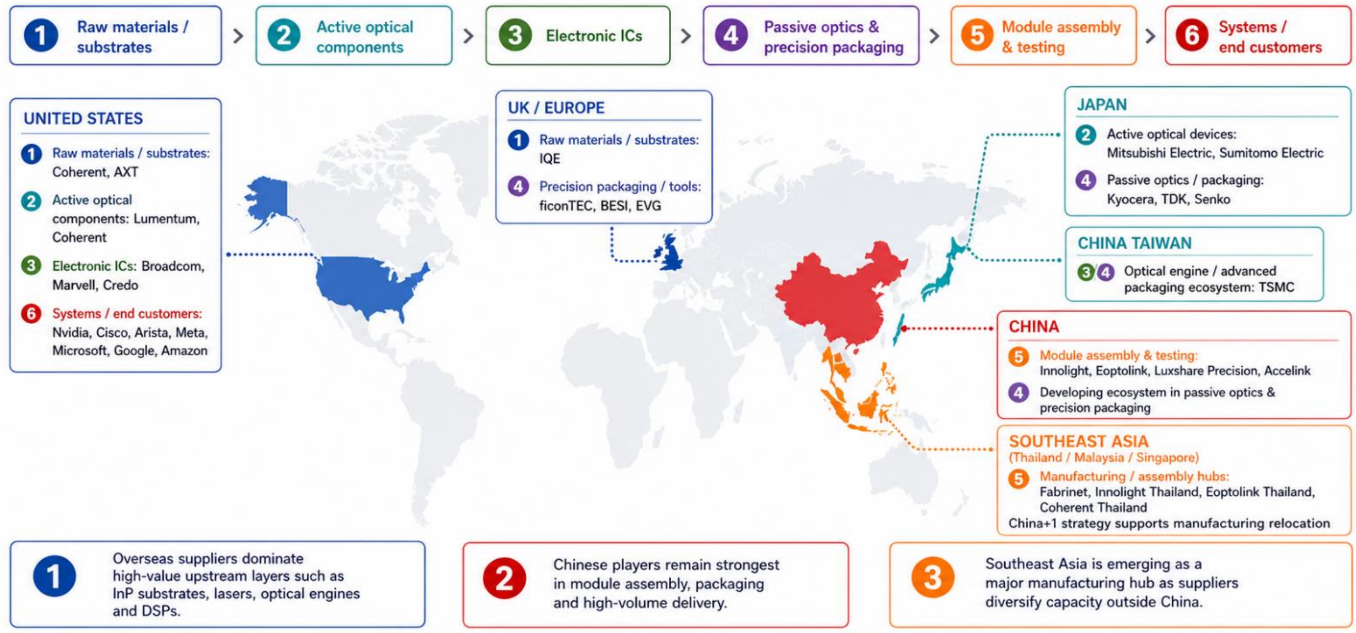
Competitive Landscape

Value capture remains concentrated upstream

The datacom optical interconnect supply chain is increasingly split between **upstream technology ownership** and **downstream manufacturing execution**. Overseas suppliers continue to dominate the higher-value layers of the chain, including EML/CW/UHP lasers, SiPh platforms, DSPs, drivers/TIAs, coherent optics, optical engines, OCS (optical circuit switch) and CPO-related subsystems. These products require deep photonics know-how, proprietary process platforms, long qualification cycles and close customer validation, which create higher entry barriers and more defensible margins. By contrast, China's domestic players have built strong positions in module assembly, packaging, testing and high-volume delivery, supported by cost efficiency, fast iteration and strong participation in hyperscaler supply chains.

This value-chain divide should become more visible as the industry moves from 400G/800G toward 1.6T, 3.2T and CPO/NPO architectures. In prior cycles, module assembly and speed migration were sufficient to capture meaningful growth. In the current AI cycle, however, bottlenecks are shifting toward high-speed lasers, InP capacity, SiPh optical engines, DSP/analog ICs, advanced coupling, thermal design and system-level reliability. **For example, in 800G and 1.6T EML modules, lasers and DSPs together represent more than half of total cost, per our estimate**. As technical complexity rises, we expect profit share to become increasingly concentrated among suppliers that control scarce upstream technologies, rather than those exposed only to final module shipments.

Figure 24: Global optical interconnect value chain



Source: CMBIGM

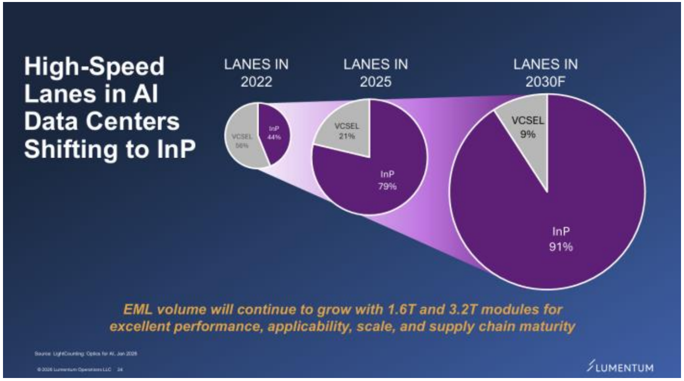
Upstream materials and equipment are the first true bottlenecks in the AI optical supply chain. InP substrate and epiwafer supply is concentrated among a small group of qualified suppliers such as Sumitomo Electric (5802 JT, NR), AXT (AXTI US, NR) and its China-based subsidiary Tongmei, IQE (IQEPF US, NR) and vertically integrated Coherent. The constraint is not nominal capacity, but qualified wafer quality, defect control and consistency, which directly determine downstream EML/CW laser yield and reliability. As 800G/1.6T demand scales, this gives upstream InP suppliers stronger pricing and allocation power than downstream assemblers.

Figure 25: Global optical interconnect upstream material value chain

Segment	Major players	Earnings call comments
InP substrate / epitaxy	Sumitomo Elec., AXT/Tongmei, JX adv. Metals, IQE	**AXT (AXTI US, NR):** Increased InP wafer capacity by 25% since 3Q25 and planned to double capacity by end-2026; InP wafer backlog reached a new high of U$60mn driven by AIDC buildouts **IQE (IQEPF US, NR):** Strong organic growth in InP products for DC and optical markets, plus tier-1 design wins for next-gen AI DC
Vertically integrated / active optical component suppliers	Coherent, Lumentum, Mitsubishi Elec., Sumitomo Elec.	**Coherent (COHR US, BUY):** Pushing 6-inch InP wafer capacity which can produce more than 4x as many at less than half the costs vs. 3-inch. 2Q DC book-to-bill was above 4x, with visibility into 2027 and LT supply agreements **Lumentum (LITE US, BUY):** Expect 50%+ EML unit capacity growth by end-CY26 vs end-CY25 and is ramping internally-sourced CW lasers because external CW supply is constrained. It also secured a multi-hundred-million-dollar UHP laser purchase order, supporting the CPO/ELS ramp **Sumitomo Elec. (5802 JT, NR):** Capacity expansion for optical devices used for intra-DC and InP substrate production; emphasize on large-diameter 4-6 inch substrates
Equipment suppliers	Veeco, Aixtron, Terdyne/FiconTEC	**Veeco (VECO US, NR):** Received US250mn+ orders from multiple customers for MOCVD (metal-organic chemical vapor deposition), wet processing and ion beam deposition tools to support InP laser manufacturing, with deliveries in 2026-2027 **Aixtron (AIXR GR, NR):** New orders driven by optoelectronics with new Malaysia greenfield site ready for production by mid-2027 **Teradyne (TER US, NR)/FiconTEC:** SiPh represents a US$100mn opportunity this year, per mgmt., with production of testing equipment still at ramp-up phase

Source: Company data, CMBIGM

Figure 26: InP demand will remain strong throughout the decade

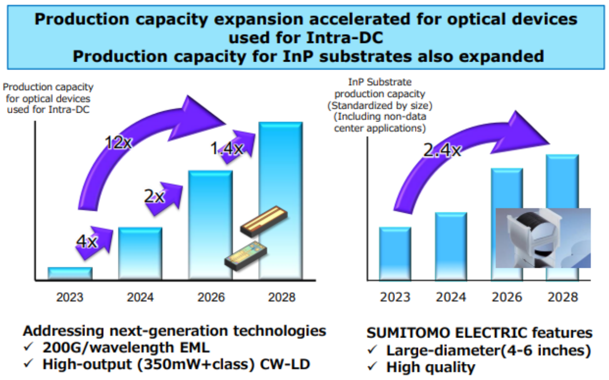


High-Speed Lanes in AI Data Centers Shifting to InP

EML volume will continue to grow with 1.6T and 3.2T modules for excellent performance, applicability, scale, and supply chain maturity

Source: Lumentum, CMBIGM

Figure 27: Accelerating InP capacity expansion with higher-margin product



Production capacity expansion accelerated for optical devices used for Intra-DC
Production capacity for InP substrates also expanded

Addressing next-generation technologies
- ✓ 200G/wavelength EML
- ✓ High-output (350mW+class) CW-LD

SUMITOMO ELECTRIC features
- ✓ Large-diameter(4-6 inches)
- ✓ High quality

Source: Sumitomo Electric, CMBIGM

Optical transceiver market: Leaders consolidate, challengers squeeze the middle

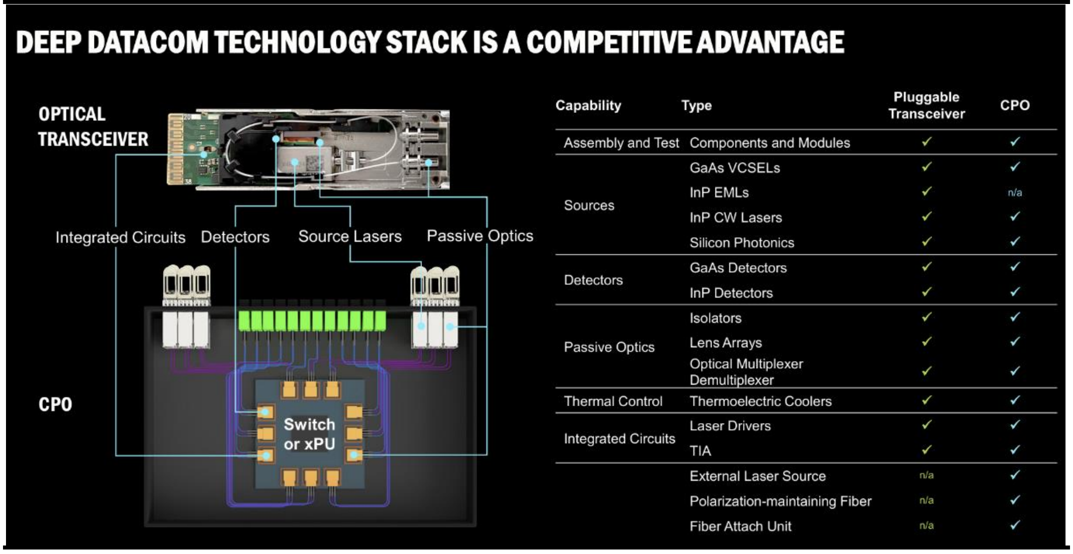
Upstream materials and equipment define the supply ceiling for optical components, but optical transceivers are where that capacity is converted into deployable AI infrastructure. An 800G/1.6T module is no longer a simple assembly product; it is a customer-qualified optoelectronic system integrating scarce EML/CW lasers, photodiodes, DSPs, drivers/TIAs, passive coupling optics and thermal packaging. This makes module vendors the first downstream layer where upstream component access, optical-engine design, yield control, firmware stability and hyperscaler qualification all converge. Demand growth alone will not guarantee share gains. Winners will be those able to secure critical components, maintain delivery certainty and execute consistently at the leading speed node.

We expect the optical transceiver market to polarize rather than fragment. Tier-one suppliers such as Innolight, Eoptolink and Coherent should remain structurally advantaged, supported by hyperscaler design wins, proven 800G/1.6T execution, supply-chain resilience and established quality assurance. New entrants may still gain volume, but we believe they are more likely to pressure weaker incumbents and runner-up vendors that lack component access, qualification history or pricing power, rather than displace the leading platforms. The 800G/1.6T cycle should therefore evolve into a two-speed market: share concentration at the top and red-sea pricing in the middle.

We see three competitive groups emerging:

- The first is **pure-play optical module leaders**, such as Innolight and Eoptolink, whose strength lies in speed of execution, hyperscaler qualification, product iteration and high-volume module delivery.
- The second is **vertically integrated photonics platforms**, such as Coherent and, in selected products, Lumentum, which combine lasers, optical components, packaging know-how and modules or subsystems, giving them stronger control over scarce upstream supply and product margins.
- The third is **manufacturing-led new entrants**, such as Luxshare Precision (002475 CH, covered by our technology team) and Dongshan Precision (002384 CH, NR) through its recent Source Photonics acquisition. These players may not have the deepest optical heritage, but they bring customer relationships, capex capability, precision manufacturing, electronics assembly and rapid ramp-up execution. Their entry is important because once product specifications mature, they can accelerate commoditization and intensify pricing pressure.

Figure 28: Vertically integrated players like Coherent set to gain traction over the longer term

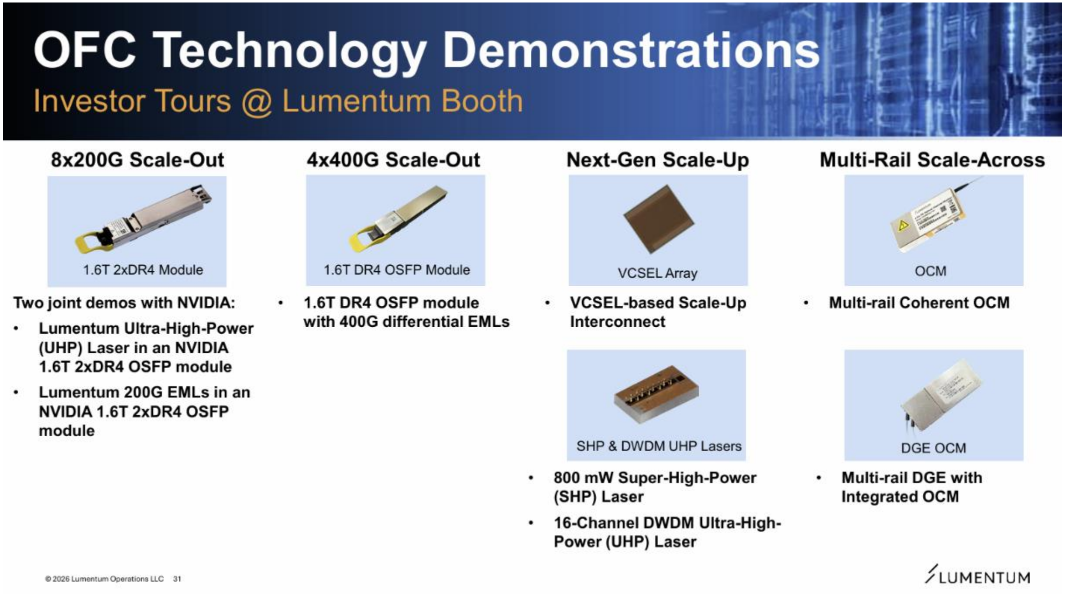


DEEP DATACOM TECHNOLOGY STACK IS A COMPETITIVE ADVANTAGE

Capability	Type	Pluggable Transceiver	CPO
Assembly and Test	Components and Modules	✓	✓
Sources	GaAs VCSELs	✓	✓
	InP EMLs	✓	n/a
	InP CW Lasers	✓	✓
	Silicon Photonics	✓	✓
Detectors	GaAs Detectors	✓	✓
	InP Detectors	✓	✓
Passive Optics	Isolators	✓	✓
	Lens Arrays	✓	✓
	Optical Multiplexer Demultiplexer	✓	✓
Thermal Control	Thermoelectric Coolers	✓	✓
Integrated Circuits	Laser Drivers	✓	✓
	TIA	✓	✓
	External Laser Source	n/a	✓
	Polarization-maintaining Fiber	n/a	✓
	Fiber Attach Unit	n/a	✓

Source: Coherent, CMBIGM

Figure 29: Robust product lineup from Lumentum covering scale up, out, and across



OFC Technology Demonstrations

Investor Tours @ Lumentum Booth

8x200G Scale-Out

1.6T 2xDR4 Module

Two joint demos with NVIDIA:

- Lumentum Ultra-High-Power (UHP) Laser in an NVIDIA 1.6T 2xDR4 OSFP module
- Lumentum 200G EMLs in an NVIDIA 1.6T 2xDR4 OSFP module

4x400G Scale-Out

1.6T DR4 OSFP Module

- 1.6T DR4 OSFP module with 400G differential EMLs

Next-Gen Scale-Up

VCSEL Array

- VCSEL-based Scale-Up Interconnect

SHP & DWDM UHP Lasers

- 800 mW Super-High-Power (SHP) Laser
- 16-Channel DWDM Ultra-High-Power (UHP) Laser

Multi-Rail Scale-Across

OCM

- Multi-rail Coherent OCM

DGE OCM

- Multi-rail DGE with Integrated OCM

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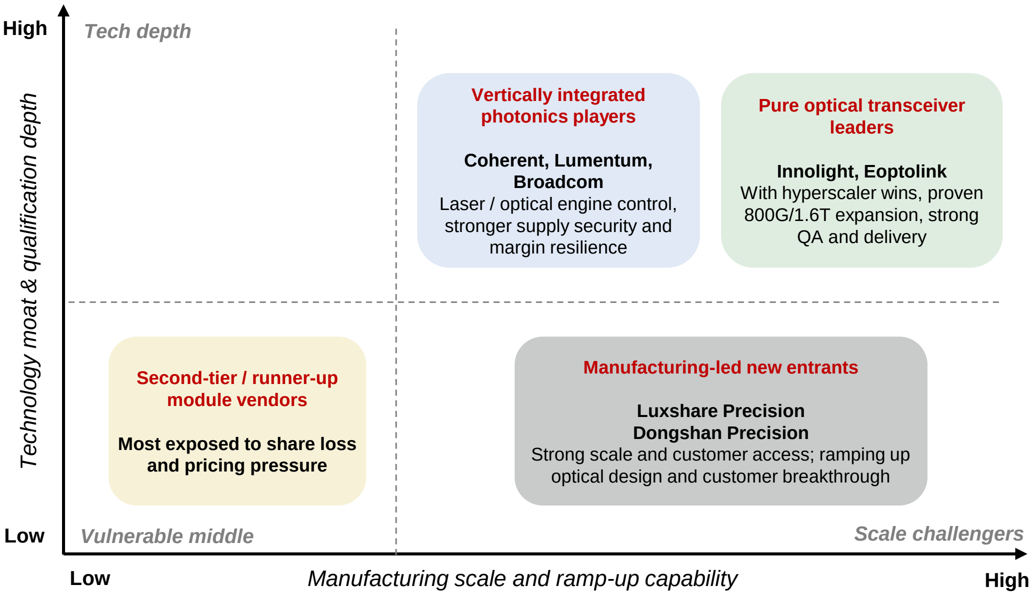
LUMENTUM

Source: Lumentum, CMBIGM

Figure 30: Optical interconnect landscape: Technology moat vs. capacity scale



Source: CMBIGM

We believe vertically integrated suppliers across the optical value chain are better positioned than pure transceiver module vendors, as value remains concentrated in scarce, qualification-heavy components such as EML/CW/UHP lasers, SiPh optical engines, DSPs, advanced packaging and optical switching. This gives players such as Lumentum and Coherent a different exposure from module-focused suppliers that they can benefit from AI optical growth through upstream bottleneck ownership, even if downstream module assembly becomes increasingly competitive and price-driven.

Peers table

Figure 31: Peers table

		Mkt Cap	P/E (x)		EPS (US$)		Revenue YoY%		GPM%	
Company	**Ticker**	**(US$mn)**	**CY26E**	**CY27E**	**CY26E**	**CY27E**	**CY26E**	**CY27E**	**CY26E**	**CY27E**
Domestic peers										
Innolight	**300308 CH**	184,992	48.2	29.3	3.44	5.67	144.6	53.6	43.9	44.5
Eoptolink	**300502 CH**	108,230	41.7	28.8	1.86	2.69	113.1	48.7	48.3	48.1
Suzhou TFC	**300394 CH**	47,409	90.7	67.0	0.67	0.91	92.2	33.7	52.2	52.0
CIG	**603083 CH**	9,179	34.1	18.2	0.72	1.35	135.1	64.4	29.7	31.2
Accelink	**002281 CH**	24,452	106.8	71.9	0.28	0.42	46.8	19.2	25.0	25.3
HG Tech	**000988 CH**	22,333	67.0	51.1	0.33	0.43	56.5	21.9	22.0	22.1
Yuanjie Semi	**688498 CH**	26,678	313.5	185.2	0.68	1.15	143.6	63.8	68.1	69.4
Overseas peers										
Applied Opto.	**AAOI US**	14,053	137.2	30.6	1.28	5.73	125.4	161.7	31.7	35.0
Fabrinet	**FN US**	20,790	36.9	30.8	15.71	18.83	33.6	18.6	12.3	12.4
Lumentum	**LITE US**	66,384	65.2	36.3	13.09	23.53	103.4	66.0	47.5	50.6
Coherent	**COHR US**	69,407	52.6	36.7	6.74	9.66	31.1	33.0	39.9	40.9
Marvell	**MRVL US**	220,966	65.0	40.7	3.89	6.20	38.0	46.5	58.7	57.6
Broadcom	**AVGO US**	1,770,296	28.8	18.2	12.92	20.48	75.6	56.8	74.5	72.4

Source: Bloomberg consensus as of 10 Jun, 2026, CMBIGM

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