

# AI optical module PCB



## Overview

This article presents a waveguide embedded system (WES) based on optical printed circuit board technology for AI and HPC data centers, intended to address challenges in co-packaged optics (CPO) integration. Optical modules are the core components for the conversion of optical signals to electrical signals in optical communication systems. On the. Optical PCIe and Optical PCBs (oPCBs) are addressing this bottleneck, with the PCIe 7.0 Specification natively integrating optical support and doubling speeds to 128 GT/s per lane. Optical interconnects realized in oPCBs offer ~10x lower channel loss, 5x higher lane density, and 10x higher. As transmission speeds move from 56G PAM4 to 112G PAM4 and beyond, PCB technology has become one of the most critical factors determining optical module performance, reliability, and thermal stability. For manufacturers and network equipment providers, choosing the right high-speed PCB solution is. Optical PCBs [^1] integrate light-based data transmission with electrical circuits using polymer waveguides and photonic chips, enabling 400Gbps+ speeds for 5G networks and AI servers while reducing power consumption by 40% compared to conventional boards.



## Article Content

What is Optical PCB?

This article delves into the intricacies of PCB optical modules, discussing their applications, technical requirements, distinct characteristics, and

High-Speed PCB Solutions for 400G and 800G Optical Modules

The rapid expansion of AI computing, hyperscale data centers, cloud networking, and 5G infrastructure is accelerating the deployment of 400G and 800G optical modules worldwide. As

Optical Module PCB: The Ultimate Guide to Design, Fabrication, and ...

Rigid-flex PCBs offer elegant solutions for creating compact, reliable 3D interconnects in optical modules, but their design and fabrication present a unique set of challenges that demand specialized

The Application of Optical Modules in AI Technology

Optical modules convert electrical signals into light to move data quickly and reliably in AI systems, enabling fast and smooth data processing.

AI Data Center Optical Transceiver Module Market 2025–2030

AI Data Center Optical Transceiver Module Market 2025–2030 Posted on Apr-03-2026  
The AI data center optical transceiver market has entered a historic growth phase, driven by the exponential

Optical Module PCB | APTPCB

A comprehensive guide to Optical Module PCB design and manufacturing. Learn definitions, key metrics, selection trade-offs, and validation steps for high-speed transceivers.

Optical Modules: 400G, 800G, 1.6T, and PCB Selection in Manufacturing

When designing PCBs for optical module manufacturing, several key factors must be considered to ensure optimal performance. The PCB plays a critical role in maintaining signal

GF Overseas Electronics & Communications   Zhen Ding 4Q25

On the earnings call, management expressed strong confidence in AI-driven growth, targeting 6–7x revenue growth in optical modules and AI server PCB businesses. In addition,

Five Key Trends of Co-Packaged Optics (CPO) in 2026

These pressures are driving renewed momentum behind co-packaged optics (CPO). According to LightCounting, sales of lasers and photonic integrated

## XPO-LPO Optical Transceiver | Optical Interconnect

Leveraging LPO technology, the module provides ultra-low-latency, power-efficient optical links tailored for AI, high-performance computing, and

## Optical Communication Industry Trends 2026: AI, 800G/1.6T Optical ...

Explore optical communication industry trends in 2026, driven by AI infrastructure, 800G and 1.6T optical modules, silicon photonics, and next-generation data center connectivity solutions.

## Nvidia's 1.6T optical module hits production snag, mass manufacturing ...

Major international cloud service providers have reportedly slowed data center expansion, raising concerns over a potential slowdown in demand for optical communications

## AT& S Empowers High-Speed Optical Module PCB

Here you can download current logos and images from various departments in high quality. Together with globally renowned optical module

## Global AI Optical Transceiver Market to Reach US\$26 Billion in 2026 ...

TrendForce's latest research indicates that the global market for AI-focused optical transceivers has entered a phase of rapid growth, with market size projected to expand from

## AI Computing Accelerating Optical Modules

Optical modules are the core components for the conversion of optical signals to electrical signals in optical communication systems. They are primarily composed of optical devices, control chips, PCBs

## LPO vs NPO vs CPO: The Evolution of Optical Interconnects in AI

Each architecture emphasizes different design priorities, and together they form the technological framework for optical interconnects in next-generation AI data centers. Frequently

## Optical PCB Waveguide Embedded System Overview

This article presents a waveguide embedded system (WES) based on optical printed circuit board technology for AI and HPC data centers, intended to

## Samsung Foundry Reportedly Wins Optical Module Order,

Samsung Foundry is reportedly stepping up its silicon photonics efforts. According to ZDNet, the company said in its 1Q26 earnings release that its foundry has secured orders from a

## OFC 2026 Special: Arista Leads XPO Launch as Three

Discover the major industry shift at OFC 2026 as Arista Networks and global leaders unveil the XPO MSA, Open CPX, and OCI MSA to solve AI data

Samsung QLED TV Teardown Reveals Technology That

The PCB, which is attached to the panel, precisely controls each pixel, fine-tuning the image. 2) Optical Sheet The optical sheet concentrates light from the backlight to enhance brightness. The optical sheet concentrates light from the backlight, ensuring a brighter and more uniform image across the

GlobalFoundries accelerates adoption of co-packaged optics for

SCALE CPO solution is the industry's first OCI MSA capable platform and built with GF's proven silicon photonics technology MALTA, N.Y., May 4, 2026 - GlobalFoundries (Nasdaq: GFS)

Ano ang NPO, CPO at XPO: Nangunguna sa Kinabukasan ng AI Data

Iniyon para sa mga pangangailangan ng ultra-high bandwidth at high-density ng mga susunod na henerasyon ng AI GPU cluster, ang XPO ay isang bagong pamantayan ng pluggable

GIGALIGHT Launches Dual-Density 100G SFP56-DD SR2 Optical Module

May 11, 2026, Shenzhen, China. - With the rapid acceleration of AI clusters, data center switching architectures, and 200G/400G network deployments, demand for higher port density and

Optical PCBs

The demands of AI and cloud computing are fundamentally reshaping data centre architectures, creating a critical need for optical interconnects since copper cannot sustain beyond 100 Gbps per lane.

LightCounting :: Scale-up networks in AI Clusters is a

A surge in AI development created a new wave in demand for optical connectivity in 2023-2025 and it will sustain the market's growth through 2030. The Figure below

Lightmatter Expands Photonic Interconnect Roadmap with Passage™



Near-Packaged Optics (NPO): The L20 module integrates directly next to the ASIC on the PCB or a mezzanine board, delivering exceptional configuration flexibility.

Optical Modules Market Research Report 2034

Optical Modules Market Outlook 2025-2034 The global optical modules market was valued at \$14.8 billion in 2025 and is projected to reach \$39.6 billion by 2034,

Credo Technology Group Holding Ltd

Highly Integrated, High-Performance and Power-Efficient Devices Bring Flexible Deployment Options to Accelerate AI Infrastructure Build-Out

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March 16 GTC 2026 Keynote + Silicon Valley Channel Check Call Summary \* Key

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