

# Silicon Photonics 400G Optical Module Test Report



## Overview

**Abstract:** 400G-FR4 silicon photonics transmit-receive chipsets, compatible with co-packaged-optics, on-board-optics, and pluggable form factors, were demonstrated with a combined bandwidth density of 94Gb/s/mm, energy efficiency of <math><10\text{pJ/bit}</math>, and -5.4 dBm OMA. The purpose of this report is to characterize the electrical and optical performance of transceiver. This document is for the 400G QSFP-DD DR4 design review. DDMI. **ABSTRACT:** The Optical Internetworking Forum (OIF) has been instrumental in standardizing coherent optics at the physical layer, with the 400ZR implementation agreement (IA) being a significant achievement. This white paper reports on the performance evaluation of 400ZR and OpenZR+ pluggable modules. The InnoLight's 400G QSFP-DD is one of the first 400G optical transceivers on the market and it allows to communicate up to 2km in PSM4. The InnoLight solution is based on the INPHI chipset, the IN010C50 PAM4 DSP, the four GaAs laser driver dies, and a TIA die, all designed by INPHI. 4dBm OMA sensitivity at the KP4. Silicon Photonics (SiPh) transceivers have emerged not as a theoretical alternative, but as a production-proven platform reshaping how high-speed optical modules are designed, built, and deployed. What began as an academic experiment has evolved into a commercially viable technology powering 100G. ations — IEEE, ITU, and OIF — have already released 400G standards.

## Article Content

Hot

### InnoLight's 400G QSFP-DD Optical Transceiver

This report is an exhaustive analysis of the InnoLight 400G QSFP-DD optical transceiver, including a full analysis of the laser die, photodiode die, the TIA circuit, GaAs laser driver circuit, the PAM4 DSP

Jul 18, 2025 Hot

### Silicon Photonics Transceivers: 400G & 800G Data Center Guide

This article provides a comprehensive, engineering-level examination of Silicon Photonics transceivers—how they work, how they differ fundamentally from traditional optical modules, and why

Jun 28, 2026 Hot

### Broadcom CEO Hock Tan cautious on silicon photonics,

Broadcom continues to push development of its silicon photonics and co-packaged optics (CPO) roadmap, but CEO Hock Tan said that market need is

Sep 11, 2025 Hot

### Optical Transceiver Modules Driving AI & Telecom Upgrades

Optical Transceiver Module Demand Surge in AI Data Center Networks Silicon Photonics Market Growth Dynamics: This report description reviews commercialization progress, product

Aug 17, 2025 Hot

### (PDF) 400G Silicon Photonics Integrated Circuit

400G-FR4 silicon photonics transmit-receive chipsets, compatible with co-packaged-optics, on-board-optics, and pluggable form factors, were

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### Co-packaged Optics Market 2026-2034 Analysis:

Co-packaged Optics Market 2026-2034 Analysis: Trends, Competitor Dynamics, and Growth Opportunities Co-packaged Optics Market by Component (Optical

May 03, 2026 Hot

### Silicon Photonics-Based Optical I& O Modules Market Size ...

The Silicon Photonics-Based Optical I& O Modules Market is witnessing a transformative phase driven by the relentless surge in data traffic, fueled by cloud computing, AI, and IoT proliferation.

Aug 08, 2025 Hot

#### Silicon Photonics Transceivers - GIGALIGHT

The optical amplifier module developed by GIGALIGHT is designed for long-distance transmission systems in digital optical fiber communication. It is specifically designed to work in conjunction with

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#### 400G Silicon Photonics Integrated Circuit Transceiver Chipsets for

We have designed and developed 400G-FR4 Silicon Photonics transmit and receive chipsets, compliant with IEEE 802.3bs and 100G Lambda MSA standards. To the best of our knowledge, we

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#### Top 10 Opportunities in Optical Transceivers Post

From MEMS and silicon photonics to regional production and direct-to-hyperscaler sales, the post-tariff landscape is rich with strategic potential.

Oct 16, 2025 Hot

#### Optical Transceiver Market Price Trends 2026: TCO & Risks

There is a massive production vs. lab gap when evaluating Silicon Photonics against traditional EML (Electro-absorption Modulated Laser) designs. In a pristine lab environment, a SiPh

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#### Understanding Optics Module Trends and Growth Dynamics

The valuation surge is directly correlated with advancements in material science, particularly in silicon photonics integration and indium phosphide (InP) based components, which

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#### Global EML Laser Chip Market Size, Industry Share

In this context, EML technology stands at the nexus of innovation and infrastructure evolution, enabling next-generation optical networking solutions.

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#### Active Optical Module Market 2025

Silicon Line and Accelink have emerged as significant challengers, particularly in the Asia-Pacific region where demand for high-speed data transmission continues to surge. Their competitive advantage

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400G Optical Transceiver Market Size, Share and

In the 400G Optical Transceiver Market, silicon photonics enhances module integration and miniaturization, allowing for greater data throughput per unit area.

Sep 19, 2025 Hot

QDD-DR4-400G-Si Performance Test Report | FS

Features and Purpose The purpose of this report is to characterize the electrical and optical performance of transceiver. This document is for the 400G QSFP-DD DR4 design review. Table 1:

Aug 07, 2025 Hot

Co-Packaged Optics Market Growth, Size, Share & Industry Trends

AI and HPC clusters exceeding 25 exaflops require high-efficiency optical engines, supported by silicon photonics-based modulator bandwidths above 224 Gbps. More than 30

Jan 10, 2026 Hot

White Paper HiSilicon Optoelectronics 400G All

Based on an oDSP and optical components with the highest performance, the 400G MSA module delivers the optimal performance for 400G long-haul transmissions, and a flexible 200-800G DWDM

Feb 11, 2026 Hot

Investor Presentation

- Industry first: 400G link with internally designed Silicon Photonics Increasing Density Transceiver Demo in new XPO form factor

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OFC 2025 400ZR White Paper 4\_17

In this white paper, we will report the demonstration results of interoperability testing using our products for testing and measuring optical signals which meet such industry needs.

Oct 28, 2025 Hot

Industry insight: photonics to scale AI data centers

From co-packaged optics at the board level to silicon photonics and optical circuit switches at the rack and network levels, photonics enables significant advances in bandwidth,

Sep 10, 2025 Hot

Breaking the Memory Wall: Tower Semiconductor and NVIDIA Unveil

By successfully scaling its 1.6T silicon photonics (SiPho) platform, Tower Semiconductor is providing the "optical plumbing" necessary to keep pace with increasingly massive AI models.

Jun 26, 2026 Hot

400G Optics – Technologies, Timing, and Transceivers

This presentation is an investigation into three potential solutions for 400G optical transceivers given the current objectives – Solutions perceived by the author to have a high probability of technical

Nov 15, 2025 Hot

Qsfp-dd Module Market Size, Trends, 2026-2033 Forecast, and

In June 2025, Sumitomo Electric expanded its manufacturing capacity for silicon photonics-based optical modules, supporting the rising demand for compact, high-performance

Nov 29, 2025 Hot

Optical Modules Market Size, Growth Trends & Forecast

Access detailed insights on the Optical Modules Market, forecasted to rise from USD 3.5 billion in 2024 to USD 8.2 billion by 2033, at a CAGR of 10.3%.

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FS 800G& 400G Transceiver Acceptance Testing Guide

These modules play a crucial role in establishing high-quality links that are zero-packet-loss, non-blocking, and low-error. The installation, removal, replacement, and maintenance of optical modules

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Deep Dive

The AI optical/photonics complex has become the cleanest picks-and-shovels exposure to the hyperscaler capex supercycle, and remains supply-constrained rather than demand

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## Best Silicon Photonics Stocks 2026: Top 7 AI Picks

Discover the best silicon photonics stocks 2026 powering NVIDIA's AI boom. Compare top picks, CPO leaders & breakout plays before Wall Street catches on.

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## 5G Drive Telecom Optical Module: Market Trends & 2033 Outlook

The 5G Drive Telecom Optical Module market expands, fueled by escalating data demands and network upgrades. Analyze growth drivers, forecasts, and strategic imperatives for 2033.

Sep 01, 2025

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