

400G optical module with DSP



AI Overview

A DSP is used in 400G optical modules to manage high-speed signal processing, compensate for transmission impairments, and enable advanced modulation for reliable 400G data transmission.

Core Functions of a DSP

In a 400G optical module, the Digital Signal Processor (DSP) acts as the “brain” of the system, performing critical tasks at both the transmitter and receiver ends. At the transmitter, the DSP converts input electrical signals into PAM4 (four-level pulse amplitude modulation) signals and distributes them to the optical transmitter assembly for conversion into optical signals. At the receiver, the DSP samples and digitizes incoming signals, compensates for impairments such as chromatic dispersion (CD) and polarization mode dispersion (PMD), and performs carrier recovery and clock synchronization to restore the original data.

Advanced Signal Processing

DSPs enable advanced modulation formats like DP-QPSK, DP-16QAM, and DP-64QAM, which allow more bits per symbol and higher data rates within the same bandwidth. They also implement forward error correction (FEC) to detect and correct errors caused by noise, improving link reliability and tolerance to lower optical signal-to-noise ratios (OSNR). Additionally, DSPs perform linearization to correct distortions from laser drivers and modulators, and channel equalization to counteract amplitude fading and phase shifts

Article Content

Aug 05, 2025

400G Optical Transceiver Module Types

The 400G optical transceiver refers to an optical module product with a transmission rate of up to 400Gbps, which is

Aug 23, 2025

Cisco 400G QSFP-DD Ultra Long Haul Coherent Optics

The Cisco 400G QSFP-DD Ultra Long-Haul Coherent Optics Module enables 400G traffic

May 02, 2026

400G ZR Optics Pluggable Coherent Modules | Acacia

Today, Acacia, now part of Cisco, is adding to its award-winning, comprehensive portfolio of 400G coherent pluggable

Nov 09, 2025

QSFP-DD Product Family » Acacia

Key Features High optical transmitter output power greater than +1dBm for 400G transmission over ROADM line systems including

Jul 15, 2026

Broadcom Launches Taurus BCM83640 A 3nm 400G Per Lane

Enter Broadcom Taurus BCM83640, a 3nm 400G per lane optical PAM4 DSP, designed specifically to enable 1.6T

Jun 07, 2026

BCM87840 | 7 nm 400GbE PAM-4 PHY (4:4)

The BCM87840 leverages Broadcom's market-leading 7-nm PAM-4 PHY transceiver technology platform already proven with

Apr 25, 2026

Hybrid-Integrated 400G TROSA Module and Its Performance Evaluation ...

We report on performance evaluation of a hybrid-integrated 4×100G TROSA module using a PAM4 DSP chip. Stable transmission

Dec 13, 2025

400G OSFP Transceiver Optics Types and Connections

The following table shows the 400G OSFP optical modules provided by FS. Engineered for Ethernet and InfiniBand

Apr 03, 2026

MaxLinear PAM4 DSP Enables Delta to Develop 400G Optical Module

MaxLinear's Telluride PAM4 DSP enables sub-10W, 400G optical module solutions and will be on display at

Jan 11, 2026

400Gb/s QSFP-DD ZR+ Coherent Optical Transceiver

The 400G QSFP-DD ZR+ is a C-Band optical frequency tunable coherent optical module, combines 7nm coherent

Apr 11, 2026

Marvell 400G Multi-rate Coherent DSP Product Brief

Canopus is a 400G Multi-rate Coherent DSP enabling Small Form Factor pluggable optical modules for high-density / low-power

Feb 09, 2026

Broadcom Delivers Industry's First 400G/lane Optical DSP for Next ...

The device features 400G/lane serial optical interfaces, which enable optical transceiver manufacturers to cost

Aug 06, 2025

PAM4 Optical DSPs | Enabling high-bandwidth optical

The Perseus 400G/800G PAM4 DSP with integrated TIAs and laser drivers, enables 400G/800G optical

Sep 16, 2025

FS 800G& 400G Transceiver Acceptance Testing Guide | FS

In building a high-performance InfiniBand network, OSFP-800G-SR8 and OSFP-SR4-400G-FL InfiniBand optical modules serve as

Mar 25, 2026

Know Your 400G Transceiver | Juniper Networks

For 400G optics with a 400GAUI-8 electrical interface, a gearbox Digital Signal Processor (DSP) is employed to manage the

Sep 06, 2025

Broadcom's 400G/lane Optical Solutions Pave the Path Toward 200T ...

Building upon its first-to-market 400G EML and PD debuted at OFC 2025, Broadcom is launching the Taurus BCM83640, the

Jan 19, 2026

PAM4 Optical DSPs | Enabling high-bandwidth optical

The Marvell® PAM4 optical DSP portfolio addresses the critical the need for high-bandwidth optical

Jul 28, 2025

400G Coherent Optical Devices: Architecture, Applications & Trends

400G Coherent Optics is a complex system that integrates key photonic and electronic components to enable high

Aug 26, 2025

PAM4 DSPs

MaxLinear's highly integrated PAM4 DSPs offer superior link-margin performance and low power to enable 100G, 400G, 800G, and

Mar 17, 2026

Broadcom Delivers Industry's First 400G/lane Optical DSP for Next ...

Further, the adoption of 400G/lane optical interfaces lays the foundation for the eventual deployment of 3.2T module

Apr 29, 2026

Broadcom Delivers Industry's First 400G/lane Optical DSP for

“Taurus, the industry's first 1.6T DSP based on 400G/lane I/O, doubles the throughput per lane to enable the next

Mar 05, 2026

Cisco 400G QSFP-DD High-Power (Bright) Optical

Learn how Cisco 400G QSFP-DD High-Power (Bright) Optical module's small size and low

Contact Us

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