

Why does a 100g optical module have four light receivers

Article Overview

A 100G optical module uses four light receivers because it splits the 100 Gbps data rate into four parallel 25 Gbps channels, each detected independently to achieve the total 100 Gbps throughput.

Parallel Channel Design

100G optical modules, such as QSFP28, often implement a 4x25 Gbps architecture, meaning the total 100 Gbps data stream is divided into four separate channels. Each channel has its own transmitter and receiver, allowing the module to handle high-speed data efficiently without requiring a single extremely fast laser or photodetector. This design reduces complexity, power consumption, and cost compared to a single-lambda 100 Gbps solution.

Types of 100G Modules Using Four Receivers

- o 100GBASE-SR4: Uses four independent transmit and receive channels over multimode fiber, each at 25 Gbps, typically for short-reach data center links.
- o 100GBASE-PSM4: Uses four single-mode fibers for transmit and four for receive, each at 25 Gbps, supporting distances up to 500 meters in data centers.
- o 100GBASE-CWDM4 / LR4: Uses wavelength division multiplexing to combine four 25 Gbps channels onto a single fiber pair, with each channel at a distinct wavelength, reducing fiber count while maintaining 100 Gbps throughput.

Advantages of Four Receivers

- o Signal Integrity: Lower per-channel speed (25 Gbps) reduces signal degradation and allows simpler photodetector design.
- o Scalability: Modules can be upgraded to higher speeds (e.g., 400G uses 4x100G channels) using the same multi-lane principle.
- o Cost Efficiency: Multi-lane modules are cheaper to manufacture and easier to integrate into existing fiber infrastructure.
- o Flexibility: Supports both short-reach multimode and longer-reach single-mode applications depending on the module type. In summary, four light receivers in a 100G optical module enable parallel detection of four 25 Gbps channels, balancing high-speed performance, cost, and reliability across different network distances and fiber types. This multi-lane approach is a standard design choice in modern data center and metro optical networks.



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Complete guide to 100G QSFP28 transceivers including SR4, LR4, and other variants. Learn specifications,

This comprehensive guide dives deep into the technology, specifications, applications, and best practices for deploying

Then this post will have a comprehensive introduction to 100G optic fiber modules. CXP Optical Transceiver CXP is

In short, the 25G chip acts as the building block, and 100G optical modules are composed of four such chips working

Building a 25G/100G data center requires a large number of 100G optical modules, which account for a high proportion

A complete guide to 100G QSFP28 transceivers covering types, specs, reach, compatibility, and how to choose the right module for

An "Optical Receiver" is a device that detects and converts the light received from a transmitter into an electrical signal. It consists of

Time for a new generation of 100G optics Back when 10G SFP+ pluggable optical modules were state of the art,

Modern data centers rely on high-speed optical links, and 100G optical transceiver modules (especially the QSFP28 form factor) are

100G optical transceivers are core components of high-speed networks, with ER4 and LR4 being two mainstream long-distance

The QSFP28 100G LR4 optical module converts four 25Gbps electrical signals into four LAN WDM optical signals

100G optical modules have revolutionized modern networking by enabling faster data transmission, higher bandwidth,

A 100G PSM4 transceiver is a pluggable optical module designed for 1 00G Ethernet transmission over single-mode

Nowadays, the trend for 100G Ethernet network is bullish and inevitable. Thus, the demands for 100G modules are becoming

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As a leading player in this transformation, the QSFP28 optical transceiver delivers exceptional performance to meet

100G LR4 Optical Module, How does it work? The 100G LR4 transceiver works by converting electrical signals to

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