Introduction to 100g Optical Module Packaging

Article Overview

The main packaging types for 100G optical modules are CFP, CFP2, CFP4, and QSFP28, with QSFP28 being the current mainstream standard in data centers.

Overview of 100G Module Packaging

100G optical modules are high-speed transceivers that convert electrical signals into optical signals for data transmission at 100 Gbps. Their packaging type determines size, power consumption, port density, and application suitability .

CFP Series (CFP, CFP2, CFP4)

o CFP: The original 100G form factor, large in size (144.75 mm x 82 mm x 13.6 mm), high power consumption (10-24W), suitable for long-distance transmission like 100GBASE-LR4 and ER4 . Requires a built-in gearbox for signal conversion.
o CFP2: Reduced size by ~50% (41.5 mm x 107.8 mm x 12.35 mm), lower power consumption (6-12W), supports 4x25 Gbps or 10x10 Gbps lanes, suitable for medium- to long-distance links .
o CFP4: Further miniaturized, more energy-efficient, supports 4x25 Gbps lanes, designed for higher port density while maintaining long-distance capabilities .

QSFP28 (Quad Small Form-Factor Pluggable 28)

o Size: Compact (18.3 mm x 56.5 mm x 8.5 mm), about 1/5 the size of CFP, enabling high port density in 1U racks .
o Architecture: Quad-channel design with 4 independent 25 Gbps channels aggregated to 100 Gbps .
o Power Consumption: Low, typically <=3.5W, with some low-power models at 2.5W .
o Applications: Ideal for short- to medium-distance data center interconnections, cloud computing, and high-performance computing networks .
o Advantages: Hot-swappable, IEEE-compliant, supports high-density deployment, and integrates I2C management for monitoring module status .

Evolution and Current Trends

o CFP modules were the first widely adopted 100G packaging but are gradually replaced due to large size and high power consumption .
o CFP2 and CFP4 improved port density and energy efficiency, but QSFP28 has become the mainstream choice in modern data centers due to its compact size, low power, and high-density deployment capability .

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Summary

For 100G optical modules:

o CFP: Large, high-power, long-distance applications.
o CFP2/CFP4: Smaller, more efficient, medium- to long-distance.
o QSFP28: Compact, low-power, high-density, mainstream for data centers. Choosing the right packaging depends on distance requirements, port density, power constraints, and network architecture .

In 100G networks, various form factors provide us with diversity and flexibility, enabling us to adapt more effectively to

The basic design methodology and criteria required for packaging of optical components are reviewed, and the state-of

A 100G optical module is a high-speed communication device designed for data centers and telecommunication

However, selecting the right form factor for your 100G optical transceiver modules can be challenging due to the

Discover everything about 800G optical modules--standards, packaging, types & applications. Learn how they power

It is compliant with IEEE 802.3cd, and QSFP28 MSA standards. The transceiver

Explore the QSFP28 100G optical module, a vital component for high-speed network connections. Discover its unique

In-depth Understanding of 100G Optical Modules: Definition, Transmission Principle, and Influencing Factors Abstract: In today"s fast

What are the 100G optical module standards and how should we choose? Today, we will briefly sort out the 100G

Dive into the technological revolution of data centers transitioning from 10G to 25G/100G network architectures to

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Background: With the rise of high-bandwidth applications such as AI and 8K video, optical module speeds are

Wholesale various Optical Transceivers,if you want to select high quality 100G QSFP28 optical

Explore FS"s comprehensive guide to 100G QSFP28 LR4/LR transceivers. Learn how to choose the right module for

In this article, we delve into the introduction of 100G single-mode and multi-mode optical modules, exploring their classifications,

The 100G Lambda MSA (Multi-Source Agreement),which uses a single-wavelength 100Gbps PAM4 (Pulse Amplitude

The 100G SFP112 form factor represents an innovation in the field of optical modules, aimed at meeting the demands

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