

Detailed Explanation of Optical Module Packaging Types



Article Overview

Optical module packaging types define the form factor, performance, and application of optical transceivers, ranging from GBIC and SFP to QSFP-DD and co-packaged optics (CPO).

Standard Form Factor Packages

Optical modules are commonly categorized by their physical form factor, which affects port density, transmission rate, and compatibility:

- GBIC (Gigabit Interface Converter): Early standard in the 1990s, hot-swappable, uses SC interface, supports ~1 Gbps, now largely obsolete .
- SFP (Small Form Factor Pluggable): Miniaturized GBIC, LC interface, supports Gigabit Ethernet and SONET/SDH networks, widely used in data centers .
- SFP+ / SFP28: Enhanced versions of SFP for 10G and 25G transmission rates, maintaining compact size for high port density .
- XFP / X2 / XPAK / XENPAK: Larger modules designed for 10G and higher speeds, used in telecom and enterprise networks .
- QSFP / QSFP+ / QSFP28 / QSFP-DD: Quad Small Form Factor Pluggable modules supporting 40G, 100G, and 400G, enabling high-speed interconnects in data centers .
- CFP / CFP2 / CFP4 / OSFP: High-performance modules for 100G to 400G applications, often used in cloud computing and high-speed networking .
- COBO / CPO (Co-Packaged Optics): Advanced packaging integrating optics with switch ASICs for ultra-high-speed, low-latency data center applications

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Common in such a discussion are mentions of 2 .5D or 3D packaging, with those descriptions referring to the ways in which internal

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In the field of high-speed data transmission, optical modules, as the core components enabling optoelectronic signal conversion,

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A complete list of common optical module types-ETU-LINK

Many partners do not know much about the packaging types of optical modules,so in this article,ETU-LINK introduces

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