

Coherent Optical Module 10G



Overview

10GBASE-LR 10km CWDM SFP+ Optical Transceiver Digital diagnostics functions are available via a 2-wire serial interface, as Coherent 1-10G Optical Transceiver.

Key Takeaways

10G coherent optical modules are advanced pluggable transceivers designed for high-speed, long-distance optical communication, offering improved signal integrity and dispersion compensation for data center and metro networks.

10G coherent optical modules are pluggable transceivers that use coherent detection technology to transmit and receive optical signals over long distances with high fidelity. Unlike traditional direct-detection 10G SFP+ modules, coherent modules can compensate for chromatic dispersion and polarization mode dispersion, enabling reliable transmission over tens of kilometers without additional dispersion compensation equipment. They are increasingly used in Data Center Interconnection (DCI), metro, and long-haul networks, supporting distances typically ranging from 10 km to over 100 km.

Key Features

- **Pluggable Form Factors:** Commonly available in SFP+, XFP, and QSFP+ packages, allowing easy integration into existing network equipment.
- **Digital Signal Processing (DSP):** Integrated DSP chips enhance signal quality, reduce power consumption, and enable smaller module sizes compared to traditional line-card coherent solutions.

- **High Reliability:** Coherent modules are designed for industrial and data center environments, offering stable performance and compatibility with standard optical interfaces .
- **Wavelength and Dispersion Management:** Many modules include tunable lasers and dispersion compensation features to optimize performance over standard single-mode fibers .
- **Digital Diagnostics:** Modules support monitoring of optical power, temperature, and other parameters via standard interfaces like SFF-8472 .

Applications

- **Data Center Interconnect (DCI):** Coherent 10G modules enable high-speed links between data centers, supporting bandwidth-intensive applications and cloud services .
- **Metro and Long-Haul Networks:** They are suitable for distances of 40–120 km, providing cost-effective alternatives to embedded line-card coherent solutions .
- **Industrial and Enterprise Networks:** 1–10G coherent modules are still widely used in industrial equipment and legacy network upgrades where high reliability is required .

Advantages Over Traditional 10G Modules

- **Longer Reach:** Coherent detection allows for extended transmission distances without signal degradation.
- **Improved Signal Integrity:** DSP and coherent detection reduce jitter and compensate for fiber impairments.
- **Standardization and Pluggability:** Modern coherent modules are moving toward standardized pluggable formats, similar to SFP+ for 10G networks, enabling higher port density and lower power consumption .

Leading Providers

Companies like Coherent and GIGALIGHT offer a wide range of 10G coherent optical modules, including tunable SFP+ and XFP transceivers, as well as integrated solutions for DCI and long-haul networks . These modules are compatible with standard optical transport platforms and can be used with muxponder/OTU cards for flexible deployment. In summary, 10G coherent optical modules provide a compact, pluggable solution for high-speed optical communication, combining long-distance capability, signal integrity, and ease of integration, making them essential for modern data center and metro network infrastructures .

Article Content

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Coherent optical module refers to a typically hot-pluggable coherent optical transceiver that uses coherent modulation (BPSK / QPSK

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WP-100G Coherent

The innovative 100G coherent solutions enable transport of 100G data rate capacity over a single wavelength across long distances

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FTLX8574D3BCV

FTLX8574D3BCV 1G/10G Dual-Rate SFP+ transceivers are designed for use in 1-Gigabit and 10-Gigabit Ethernet links over

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