Monaco Long Distance Optical Transceiver 100G Selection Guide

Article Overview

For long-distance 100G applications, QSFP28 LR4, ER4, and ZR4 transceivers are the primary options, each optimized for specific distances, fiber types, and network requirements.

Key Considerations for Selection

1. Transmission Distance:

o LR4 (Long Reach 4): Supports up to 10 km over single-mode fiber (SMF) using four wavelengths (1295, 1300, 1304, 1309 nm) with duplex LC connectors, ideal for metro networks and data center interconnects .
o ER4 (Extended Reach 4): Extends up to 40 km, suitable for regional networks where LR4 may be insufficient .
o ZR4/ZR4+: Designed for ultra-long distances up to 80-100 km, incorporating Semiconductor Optical Amplifiers (SOA) and Forward Error Correction (FEC) to maintain signal integrity over very long links . 2. Fiber Type and Connectors:
o Single-mode fiber (SMF) is standard for long-distance links.
o Duplex LC connectors are common for LR4 and ER4, while MPO/MTP connectors may be used in parallel transmission modules like PSM4 for shorter distances . 3. Modulation and Wavelength Multiplexing:
o LR4 and ER4 use four discrete wavelengths with EML lasers and Wavelength Division Multiplexing (WDM) to achieve 100G throughput.
o CWDM4 is optimized for medium distances (~2 km) using DML lasers and coarse WDM, while PSM4 is for short-range parallel transmission . 4. Power Consumption and Efficiency:
o QSFP28 modules typically consume less than 3.5W, reducing operational costs and heat generation, which is critical for high-density deployments . 5. Network Compatibility and Upgrade Path:
o QSFP28 modules support 100G to 4x25G applications, enabling cost-effective upgrades from 25G networks.
o They also support 400G to 4x100G scalability, ensuring future-proofing for enterprise or telecom networks . 6. Signal Integrity and Reliability:
o Long-distance modules like ER4 and ZR4 include optimized optical materials and FEC to minimize bit error rates and maintain signal quality over tens of kilometers . 7. Cost and Deployment Strategy:
o LR4 offers a balance of cost and distance for most long-distance links.
o ER4 and ZR4 are more expensive due to amplification and error correction features but are necessary for extended reach applications .

Practical Selection Framework
o Determine required link distance and select LR4, ER4, or ZR4 accordingly.
o Verify fiber type and connector compatibility with existing infrastructure.

o Assess power and cooling constraints in high-density environments.
o Consider future scalability to 400G or higher to avoid frequent upgrades.
o Evaluate cost-effectiveness by balancing module price, operational costs, and network performance. By following these criteria, network engineers can confidently select the appropriate Monaco long-distance 100G QSFP28 transceiver to meet performance, reliability, and budget requirements .

There are a variety of 100G QSFP28 optical transceivers for applications of different transmission distances. How to select from

Compare SFP, SFP+, SFP28, QSFP+ and QSFP28 in this 2026 selection guide. Learn where each form factor fits,

Long-range QSFP28 100G transceivers from Smartoptics filled this reach gap perfectly. Smartoptics also collaborated in testing

They are widely used in leaf-spine architectures and also in data center interconnect (DCI) links over metro distances. The growing

Transceiver form factor selection table Use the table to select the right form factor for your required protocol, bit rate, aggregation

Systematic classification of optical modules by data rate, form factor, transmission distance, and fiber type.

3 Future-proof your optics with scalable deployment e transceivers gives you long-term flexibility. For instance, some QSFP-DD

Choosing the proper transceiver for your network to rely upon is no easy feat. With our expert guide, you can easily

How should the correct 100G optical transceiver module be selected? This blog will introduce 100G optical transceiver

40G optical transceivers use fiber optic cables and offer longer reach (up to 40km) and higher flexibility in routing and distance. In

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Learn how to choose QSFP modules for 40G, 100G, QSFP28, QSFP56, and 400G QSFP-DD networks. Compare speed, distance,

QSFP28 transceiver guide covering module types, pricing, compatibility, and deployment.

This article tells you how to choose 100G QSFP28 modules for medium and long transmission distances, as well as

Optimize your data center upgrade with this expert guide on the qsfp28 optical transceiver. Compare SR4, LR4, and

ZR 100G transceivers represent coherent optical technology designed for ultra-long-distance transmission up to 80 km

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