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Selection Guide for Bestselling Active Optical Modules for IDC Data Centers



Overview

Intelligent Selection Guide for Active Optical Devices Used in IDC Data centers are entering one of the most intensive and demanding eras where many small.

Key Takeaways

Choosing the right active optical module for data centers depends on speed, form factor, transmission reach, and vendor reliability, with SFP+, QSFP28, QSFP-DD, and OSFP modules leading the market.Key Considerations for Selection
• Speed and Bandwidth Requirements
• 10G SFP+: Suitable for legacy or low-density deployments.

• 25G SFP28: Ideal for server uplinks and TOR switches.

• 40G QSFP+ and 100G QSFP28: Common in aggregation and spine layers.

• 200G/400G QSFP-DD and 400G OSFP: Future-proof high-density deployments for AI clusters and hyperscale data centers .

• Form Factor and Compatibility
• Ensure the module matches the switch or router port type (SFP, QSFP, QSFP-DD, OSFP).

• Consider backward compatibility for incremental upgrades .

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• Transmission Reach
• Short Reach (SR): Up to 100 meters over multimode fiber, suitable for intra-rack or TOR connections.

• Long Reach (LR): Up to 10 km over single-mode fiber, suitable for inter-rack or inter-building links.

• Extended Reach / Coherent Optics: For DCI (Data Center Interconnect) spanning 40 km to over 1,000 km, coherent pluggable optics reduce power and space requirements .

• Active Optical Cables (AOCs) and Embedded Interconnects
• AOCs integrate transceivers and fiber in a single cable, reducing installation complexity and improving signal integrity for short to medium distances.

• Embedded interconnect solutions with VCSELs, PDs, and PMD ICs optimize thermal and RF performance for high-speed links .

• Vendor Reliability and Market Trends
• Leading suppliers include II-VI, InnoLight, Lumentum, Accelink, FOT, Sumitomo, NeoPhotonics, Fujitsu, and Avago/Broadcom .

• Market trends indicate rapid adoption of 200G, 400G, and 800G modules, especially in AI clusters and hyperscale cloud data centers .

• Consider vendors with proven reliability, low failure rates (

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