

Actual operating distance of 80km optical module



Overview

80km SFP Modules: Core Applications & Technical Essentials The 80km SFP is a compact, hot-pluggable optical transceiver module standardized for long-distance.

Key Takeaways

80km optical modules are designed to transmit data reliably over distances up to 80 kilometers using high-power lasers and sensitive receivers, typically operating in the 1550nm wavelength range.

Overview

An 80km optical module is a long-reach fiber optic transceiver capable of maintaining stable data transmission over single-mode fiber for distances up to 80 kilometers. These modules are commonly used in metropolitan area networks, carrier-grade backbone networks, enterprise private lines, and data center interconnects where network nodes are geographically distant. They convert electrical signals from networking equipment into optical signals for transmission and then back into electrical signals at the receiving end, ensuring low error rates and high signal integrity.

Key Technical Features

- **Wavelength:** Most 80km modules operate at 1550nm, where fiber attenuation is lower, allowing longer transmission without repeaters.
- **Optical Power:** High-power lasers, such as DFB lasers, provide sufficient output (often above +5dBm) to overcome fiber losses.

- **Receiver Sensitivity:** Advanced receivers, including low-noise APD detectors, can detect weak signals down to -28dBm, ensuring reliable reception over long distances .

- **Dispersion Compensation:** Modules often include integrated dispersion compensation to prevent intersymbol interference over long fiber spans .

- **Form Factor:** Standard SFP, SFP+, QSFP28, or CFP2 form factors allow compatibility with a wide range of switches, routers, and transmission equipment .

- **Hot-Pluggable:** Most modules support hot-swapping without powering down the device, simplifying maintenance and upgrades .

Applications

- **Long-Haul Ethernet Links:** 1Gbps to 100Gbps connections across cities or between data centers .

- **Backbone Networks:** Connecting aggregation layers or regional nodes without intermediate repeaters .

- **5G and DCI Networks:** Supporting high-bandwidth, low-latency links for base station backhaul and inter-city disaster recovery .

- **Fiber Resource Optimization:** BIDI modules allow bidirectional transmission over a single fiber, reducing fiber usage by 50% compared to traditional dual-fiber solutions .

Practical Considerations

When deploying 80km optical modules, network engineers must consider fiber type (G.652 or G.655), link budget, connector quality, and environmental conditions. Coherent optics, such as Cisco QSFP28 100G ZR modules, can extend 100GbE links up to 80km over dark fiber and even further over amplified DWDM networks, providing flexibility for high-speed, long-distance deployments . In summary, 80km optical modules provide a cost-effective, high-performance solution for long-distance fiber connectivity, balancing transmission distance, equipment compatibility, and operational stability for modern network infrastructures .

Article Content

80km SFP Modules: Core Applications & Technical Essentials

The 80km SFP is a compact, hot-pluggable optical transceiver module standardized for long-distance fiber optical

SFP 80km Modules: Performance Analysis of Premium Optics

Explore how SFP 80km optical modules deliver reliable long-distance fiber connectivity. Learn key specifications, performance

25G SFP28

Eoptolink's 25G SFP28 transceivers are suitable for 25G Ethernet and CPRI (option 10) applications, like in 5G mobile networks. The

10G SFP+ 80 km DWDM Optical Transceiver Datasheet

10G SFP+ 80 km DWDM Optical Transceiver Datasheet Overview The T1-SFP-10G-DWDM80-Cxx is a high performance, cost

SFP Distance Explained: Real-World Range, Limits, and Optics

Understand SFP distance, fiber optic range, and real-world limits of SR/LR modules. Learn how wavelength, fiber

OC-48/STM-16 SFP 80km | Ultra Long-Haul | EDGEOPTIC

Transceiver ensures a 26 dB guaranteed optical link budget, which determines the maximum transmission distance. Over single

QSFP28 100 Gbps 80km Transceiver

Product Description QSFP28 Plug-in, compatible with QSFP-100G-ZR4 (with FEC), 80km Optical Transceiver, Duplex LC, DOM

Wavelength and Transmission Distance of Optical Transceiver Modules

The price of the optical sources and signal converters that are paired with 850nm optical transceiver modules is far lower than the

SFP Optical Transceiver Modules for Long Distance: A Complete

Discover everything you need to know about SFP optical transceiver modules for long-distance fiber transmission.

QSFP 40G 80km: Complete Guide to 40G Long-Distance Optics

These modules multiplex four optical lanes internally and transmit over a duplex LC interface, making them physically similar to LR4

10G SFP+ 80 km DWDM Optical Transceiver Datasheet

Overview The T1-SFP-10G-DWDM80-Cxx is a high performance, cost effective module supporting data rate of 10Gbps and 80km

How to Use 10G SFP+ Long-distance SFP Module?

The actual transmission distance depends on the output power of the optical transceiver, the transmission attenuation

Basic Knowledge Of Optical Module Transmission Distance

Generally, short-range modules can reach up to 2 km, medium-range modules range from 10 km to 20 km, and long-range modules

25G SFP28 BIDI ZR 80km Optical Module: The New Benchmark for

As an optoelectronic device with high performance and long-distance transmission capability,optical modules play a

QSFP28 100 Gbps 80km Transceiver

d for comfort of identification. Actual distance should be calculated by taking into account minimal optical budget and average

10Gbps 80KM SFP+ Optical Transceiver module

The 10Gbps 80KM SFP+ Optical Transceiver Module is designed for high-speed, long-distance fiber optic connections. It supports 10

Analysis of Device Damage Caused by Direct Installation of Long ...

In fiber-optic communication systems,long-distance optical modules,due to their high transmit optical power,are highly

What are the detailed parameters of the optical module

Optical modules generally have the following specifications: multi-mode 550m, single-mode 15km, 40km, 80km and

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