How to separate transmission and reception in Huawei SFP optical modules



Overview

They can substitute for each other as long as they have the same optical power, sensitivity, and transmission distance.

Key Takeaways

Transmission (Tx) and reception (Rx) in Huawei SFP modules are separated either by using distinct fibers for each direction or by employing bidirectional single-fiber modules with integrated Tx and Rx components.

Physical Separation of Tx and Rx

Huawei SF

P modules can operate in two main configurations: Dual-fiber SFP modules: These use two separate fibers, one for transmitting (Tx) and one for receiving (Rx). This is the most straightforward method to separate transmission and reception, as each fiber carries signals in only one direction. Single-fiber bidirectional SFP modules (BiDi): These modules use wavelength-division multiplexing (WDM) to transmit and receive signals over a single fiber.

The module contains a TOSA (transmitter optical sub-assembly) and a ROSA (receiver optical sub-assembly), each operating at different wavelengths (e.g., 1310 nm for Tx and 1550 nm for Rx), effectively separating the directions internally.

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Internal Components

Inside a Huawei SFP module: TOSA: Converts electrical signals into optical signals for transmission.

ROS

A: Converts incoming optical signals back into electrical signals for reception. Laser driver and limiting amplifier: Ensure proper signal strength and integrity. Controller: Manages module operation and supports monitoring via Digital Diagnostic Monitoring (DDM) in eSFP modules.

This internal architecture ensures that even in single-fiber modules, Tx and Rx signals remain isolated and do not interfere with each other.

Practical Deployment Tips

Check module type: Ensure you are using the correct SFP type (dual-fiber or BiDi) for your network topology. Port assignment: For dual-fiber modules, connect the Tx port of one device to the Rx port of the other, and vice versa. Monitoring: Use Huawei's CLI or network management tools to monitor Tx/Rx power levels and ensure proper operation.

Compatibility: Only replace or mix modules with the same optical power, sensitivity, and wavelength specifications to maintain signal integrity. By understanding the module type and internal structure, you can effectively separate transmission and reception in Huawei SFP optical modules, whether using dual fibers or bidirectional single-fiber solutions.

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They can substitute for each other as long as they have the same optical power, sensitivity, and transmission distance. The eSFP and SFP optical modules are classified into single-fiber

Understanding Optical Modules

If an optical module is installed in a running device, you can run the display transceiver command to view parameters of the optical module, including the center wavelength, transmission distance, fiber

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This comprehensive guide breaks down the internal structure, core components (TOSA, ROSA, lasers), and operational mechanisms of SFP optical modules, enriched with technical insights

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Use the command display transceiver to view the optical module information of all optical ports, and use the command display transceiver interface interface-type interface-number to view the

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Optical transceivers are widely applied in switches, network cards, routers and other communication devices. Checking transceiver parameters allows users to monitor real-time

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Confused by SFP vs SFP+? Read the definitive 2026 guide on SFP modules. We explain Single Mode vs Multimode, DDM diagnostics, and how to choose the right transceiver for Cisco, Juniper, and more.

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If an optical module is installed in a running device, you can run the display transceiver command to view parameters of the optical module, including the center wavelength, transmission distance, fiber

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Types of Optical Modules

Optical modules are available in various types to meet diversified requirements. Classified by transmission rates Depending on transmission rates, optical modules are classified into FE, GE,

Displaying Optical Module Information

When certifying an optical module, Huawei comprehensively verifies the functions of the optical module to ensure the optical module quality. The functions include the installation and removal, transmit and

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