RoHS Single Fiber Bidirectional QSFP



Overview

It uses single-fibre bi-directional technology to transmit different wavelengths over a single fiber. Multiplexing and demultiplexing of the eight wavelengths are managed within the device.

Key Takeaways

Single-fiber bidirectional QSFP transceivers provide 100G full-duplex connectivity over a single strand of single-mode fiber, enabling high-speed, space-efficient network deployments. OverviewSingle-fiber bidirectional (BiDi) QSFP modules are designed to transmit and receive data over a single strand of single-mode fiber (SMF), effectively halving the fiber count compared to traditional dual-fiber solutions. These modules are commonly used in data centers, metro networks, and carrier aggregation networks where fiber availability or cost is a constraint.

Key Features

Data Rate: Typically 100Gbps full-duplex, often using 4x25Gbps NRZ lanes in QSFP28 form factor. Fiber Type: Single-mode fiber (SMF) is standard, with reach ranging from 20 km to 80 km depending on the module and FEC support. Wavelengths: BiDi modules use LAN WDM or O-band wavelengths to separate transmit and receive signals on the same fiber.

For example, EdgeOptic 100G BiDi QSFP28 Side B transmits on 1295–1309 nm and receives on 1273–1286 nm. Modulation: Low-power NRZ modulation is common for short to medium distances, while coherent optics with dual tunable lasers are used for longer-reach ZR applications. RoHS Compliance: Most modern QSFP BiDi modules, including Cisco and EdgeOptic models, are RoHS-compliant, ensuring they meet environmental and safety standards.

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Use Cases

Data Center Interconnect (DCI): Reduces fiber usage while maintaining 100G connectivity between racks or sites. Metro and Regional Networks: Supports long-reach single-fiber links up to 80 km with FEC-enabled modules. Network Upgrades: Enables operators to expand capacity on existing fiber infrastructure without laying additional fiber.

Examples of Modules

Cisco QSFP-100G-B20U4-I / B20D4-I: 100G full-duplex over single SMF up to 20 km, O-band operation, low-power NRZ, operates in pairs.

Edge

Optic BIDI-100G-QSFP28-80B: 100G over single SMF up to 80 km with RS FEC, 4x25Gbps NRZ lanes, LC/UPC simplex interface. Coherent 100G ZR QSFP28: Dual-laser coherent optics for single-fiber 100G ZR applications, IP-over-DWDM, optimized for long-reach aggregation networks.

Advantages

Fiber Efficiency: Halves the number of fibers required for full-duplex links. Cost Savings: Reduces fiber and duct infrastructure costs. Flexibility: Compatible with standard QSFP28 ports and supports both short and long-reach deployments.

Scalability: Supports high-density 100G links in data centers and metro networks. Single-fiber bidirectional QSFP modules are a practical solution for operators seeking high-speed, RoHS-compliant, and fiber-efficient network expansion, offering both short-reach and long-reach options depending on network requirements.

Article Content

100G QSFP28 Cable and Transceiver Modules Data Sheet | FS

It uses single-fibre bi-directional technology to transmit different wavelengths over a single fiber. Multiplexing and demultiplexing of the eight wavelengths are managed within the device.

100G Over Single Fiber, Simplified | ProLabs

Our QSFP28 Bidirectional (Bidi) transceivers delivers high-speed 100G connectivity over a single strand of fiber, with reach options up to 70km and support for both standard and industrial

Industry''s First 100G ZR QSFP28 for Bi-Directional Application

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The Coherent 100G ZR QSFP-DCO is the industry''s first dual laser QSFP28 digital coherent optics (DCO) module for single fiber, bi-directional applications – a breakthrough for

Cisco 100GBASE QSFP-100G Modules Data Sheet

Cisco QSFP-100G-SR1.2 The Cisco QSFP 100-Gb SR1.2 Bi-Directional (BiDi) transceiver is a pluggable optical transceiver with a duplex LC connector interface for short-reach data communication and

100G QSFP28 BiDi : Optical Transceiver Module | NEC

NEC''s 100G QSFP28 BiDi optical transceiver enables the transmission and reception of 100Gb/s high-speed data over a single optical fiber. By enabling bidirectional transmission over a single fiber, this

Dual to Single Fiber Solutions | RAD BiDi QSFP28 DD Adaptor

RAD offers dual to single fiber solutions for high-speed, reliable networks. Explore our Bidi QSFP28 adaptors for seamless connectivity.

QSFP, QSFP+, zQSFP, QSFP28 and QSFP56, QSFP

Each channel is capable of transferring data from 10 to 112 Gbps and supports a total of up to 400 Gbps per port. Our QSFP product portfolio includes cages in

100G QSFP28 Single Fiber (BiDi) Modules: Technology, Benefits ...

100G QSFP28 single fiber (BiDi) modules are a practical, proven method to increase the effective capacity of existing fiber plants, reduce cabling complexity, and optimize total cost of

SFP SFP Plus QSFP Modules: Practical Network Cabling Guide

QSFP-40G-LR4 means QSFP+ (40 GbE), Long Reach, 4 wavelengths (CWDM, single-mode, 10 km). Always check the datasheet for the specific wavelength, fiber type requirement, and maximum

40G QSFP+ SR BiDi VCSEL 850nm/900nm 150m

This product converts XLPPI 4x10G signals into two 20G signals and achieves 40G total bandwidth transmission over two single-fiber bidirectional channels. Each

100G QSFP28 Cable and Transceiver Modules Data Sheet

The QSFP-BX10-100G Module provides 100GBase-BX throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1271nm-TX/1331nm-RX or 1331nm-TX/1271nm-RX

Introduction About BiDi SFP and BiDi Fiber

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How Does BiDi SFP Work? As the above-mentioned introduction about BiDi SFP, we have learned the modules separate different transmission wavelengths over a single fiber to achieve

40G BiDi QSFP+ 150m MMF | Two-Fiber | EDGEOPTIC

EDGEOPTIC 40G BiDi QSFP+ transceiver: 150m OM4 multimode fiber, 850/900nm wavelengths, 2dB link budget, 41.25 Gbps. Two-fiber 40G solution, 0-70°C.

40G BiDi QSFP+: Single-fiber Bidirectional Transmission

The interfaces of optical modules are mainly divided into single-fiber bidirectional BiDi and dual-fiber bidirectional (Deplux). In the wavelength division multiplexing system, the line transmission

100GBASE QSFP-100G Modules Data Sheet

The Cisco® 100GBASE Quad Small Form-Factor Pluggable (QSFP) portfolio offers customers a wide variety of high-density and low-power 100

QSFP-100G-SR1.2 QSFP28 100GBASE-SR BiDi 850nm 100m DOM

QSFP-100G-SR1.2 BiDi is a parallel Quad Small Form-factor Pluggable (QSFP28) Bi-Direction optical module that supports 100 Gbps bit rates. The module integrates four host electrical data into two

100G QSFP28 Cable and Transceiver Modules Data Sheet | FS

The QSFP-ER-100G Module is designed for use in100GBASE Ethernet throughput up to 30k mover single mode fiber (SMF) using a wavelength of 1310nm via duplex LC connectors.

Palo Alto Networks PAN-QSFP-40GBASE-BIDI Compatible 40Gbps QSFP+ ...

Palo Alto Networks PAN-QSFP-40GBASE-BIDI compatible optical transceiver is a parallel 40Gbps Quad Small Form-factor Pluggable QSFP+ BIDI module for use in 40GBASE Ethernet network.

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