

Cisco's QSFP-100G-ZR4-S

The Cisco QSFP-100G-ZR4-S supports link lengths of up to 80 km over a standard pair of G.652 single-mode fiber with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. The QSFP-100G-ZR4-S requires host-based RS-FEC.



- Q** **What's so special about the QSFP-100G-ZR4-S?**
- A It operates in QSFP28 port and provides up to 80 km reach, which previously was only possible with larger coherent modules or external chassis-based solutions.
- Q** **Why does the QSFP-100G-ZR4-S operate in the O-band?**
- A The O-band is where dispersion is minimal and direct-detect technology can be used to recover the signal.
- Q** **Why is having direct-detect technology in the QSFP-100G-ZR4 important?**
- A Direct detect technology is low cost, mature, and low power.

- Q** **Why do the wavelengths of the QSFP-100G-ZR4-S seem familiar?**
- A The QSFP-100G-ZR4-S operates on the same LAN WDM grid with center wavelengths of approximately 1295, 1300, 1304, and 1309 nm as other transceivers.
- Q** **Can the QSFP-100G-ZR4-S be used in breakout mode (i.e., 4x25G channels)?**
- A The transceiver only operates in 100G mode.
- Q** **Can the QSFP-100G-ZR4-S interoperate with other transceivers from other manufactures?**
- A The QSFP-100G-ZR4-S should interoperate with other manufacturers' 100G-ZR4 transceivers, however Cisco generally does not perform any interoperability testing with other manufacturers' transceivers.
- Q** **Can the QSFP-100G-ZR4-S interoperate with other Cisco transceivers?**
- A Yes, please see the "Cisco Optics to Optics Interoperability" matrix: <https://tmgmatrix.cisco.com/iop?si=QSFP-100G-ZR4-S>. Please note different attenuators may be needed in both the transmit and receive paths.

- Q Can the QSFP-100G-ZR4-S interoperate with 100G coherent transceivers?**
- A No, the QSFP-100G-ZR4-S uses direct-detect transmitters and receivers and doesn't interoperate with 100G coherent transceivers.
- Q Does the QSFP-100G-ZR4-S generate or decode FEC like some other transceivers?**
- A No, the QSFP-28 port of the host platform must generate and decode FEC.
- Q Is RS-FEC needed to operate the QSFP-100G-ZR4-S?**
- A Yes, RS-FEC (528,514) is always needed on the host port.
- Q Can the QSFP-100G-ZR4 interoperate with transceivers that don't use RS-FEC (i.e., 100G-LR4)?**
- A No, the QSFP-100G-ZR4 always needs RS-FEC on the host port.
- Q What are the power requirements for the QSFP-100G-ZR4-S?**
- A The maximum power consumption of the QSFP-100G-ZR4-S is 5.5W, and this occurs when the transceiver is at its maximum operating temperature.
- Q What are the cooling requirements for the QSFP-100G-ZR4-S?**
- A The platform must be able to cool the transceiver to a maximum of 70°C. Often this requires "front to back" airflow as cooler ambient air may be needed to reduce the temperature of the transceiver.

- Q What is the maximum operating temperature of the QSFP-100G-ZR4-S?**
- A The operating temperature range is 0 to 70°C. The ambient operating temperature range of the platform will probably be lower because of heating caused by the platform. For example, the maximum ambient temperature range of platform could be only 0 to 40°C.
- Q How many QSFP-100G-ZR4-S transceivers can operate in a Cisco platform?**
- A Please see the Cisco platform operating guidelines. This information may also be available in the "Cisco Optics to Device Interoperability Matrix" at <https://tmgmatrix.cisco.com/>.
- Q What is the reach of the QSFP-100G-ZR4-S?**
- A The maximum reach of 80 km (engineered link) is based upon a 29dB link loss with a fiber attenuation of 0.35dB/km (instead of 0.43dB/km worst case) with 1dB of total connector loss (instead of 1.6dB).
- Q What is the minimum reach for the QSFP-100G-ZR-S?**
- A The minimum attenuation on a link QSFP-100G-ZR-S on both ends is approximately 11dB. So this would correspond to a minimum reach of approximately 20 km.
- Q Is the QSFP-100G-ZR4-S like the QSFP-100G-ER4L-S or the QSFP-100G-4W40-I?**
- A Yes, there are many similarities to both the QSFP-100G-ER4L-S and QSFP-100G-4W40-I, however the QSFP-100G-ZR4-S has an SOA and always needs platform-based RS-FEC.

Q **What is an SOA?**
A The QSFP-100G-ZR4-S uses a Semiconductor Optical Amplifier (SOA) to amplify low-level receiver signal levels up to the amount needed for the detectors to operate properly.

Q **Does the QSFP-100G-ZR4-S transmitter use an SOA?**
A The QSFP-100G-ZR4-S uses high-powered lasers to safely launch the signals into the fiber and doesn't need an SOA on the output.

Q **What kind of cables are needed to connect to the QSFP-100G-ZR4-S?**
A Single-mode fiber cables with dual UPC (Ultra-Physical Connector) LC connectors are needed.

Q **Does the QSFP-100G-ZR4-S have DOM?**
A Yes, it supports Digital Optical Monitoring (DOM) of many of the transceiver's parameters, including optic levels, voltage, and temperature.

Q **Should the QSFP-100G-ZR4-S be able to operate in systems with IEEE-1588 Class C timing requirements?**
A Yes, the QSFP-100G-ZR4-S has minimal and predictable delay performance.

Q **Is 100G-ZR4 a standard?**
A There isn't yet a standard or MSA (Multi-Source Agreement), although many of the QSFP-100G-ZR4-S transceivers from other suppliers have similar operating specifications; however, without testing with other vendors' transceivers, Cisco can't commit to interoperability.

Q **Where can more information be found about the QSFP-100G-ZR4?**
A See the Cisco 100GBASE QSFP-100G Modules Data Sheet: www.cisco.com/c/en/us/products/collateral/interfaces-modules/transceiver-modules/datasheet-c78-736282.html.