

Product Brief

Highlights

- Provides high system reliability through a rigorous qualification and certification process
- Leverages unique design parameters to provide the highest performance with industry-leading Brocade switch and director platforms
- Helps eliminate issues related to SFP incompatibility, reducing downtime and support costs
- Helps eliminate issues resulting from unexpected design changes, providing ongoing end-to-end compatibility
- Optimizes connectivity with Brocade platforms to enable maximum cable distance

Key Features

The Brocade 16Gb/s SWL SFPs are hot-swappable, low-voltage (3.3V) digital diagnostic optical transceivers that support high-speed serial links over multimode optical fiber at signaling rates up to 14.025Gb/s. The transceivers comply with SFP+ mechanical (SFF-8432), optical, and electrical (FC-P1-5) specifications. The Brocade 16Gb/s SWL optical transceiver is a multirate 850-nm SFP that complies with 14.025/8.5/4.25Gb/s Fibre Channel specifications.

Product highlights include the following:

- 850-nm multimode VCSEL transmitter
- FC-P1-5 compliance for 14.025/8.5/4.25Gb/s operation

Brocade[®] 16Gb/s SWL SFP+

Optimized, Certified Optical Transceivers for High-Performance Data Center Fabrics

Overview

Today's enterprise data centers are undergoing an infrastructure transformation, requiring higher speeds, greater scalability, and higher levels of performance and reliability to meet the increasing demands of business. As speed and performance needs increase, optical transceivers are an integral part of an optimized, highly reliable fabric.

The Brocade[®] 16Gb/s Short Wavelength (SWL) optical transceiver, part of the Brocade family of Small Form-Factor Pluggable (SFP) optical transceivers, is optimized to fully leverage Brocade 16Gb/s director and switch products. Together, these optical transceivers provide state-of-the-art performance, helping IT organizations achieve new levels of infrastructure consolidation while expanding the capabilities of their applications and services.

End-to-End Compatibility and Reliability

The Brocade 16Gb/s SWL optical transceivers support highly reliable operations in data center fabrics and are optimized for Brocade 16Gb/s switching platforms. They undergo rigorous qualification and certification testing that results in an end-to-end solution that is easier to maintain—helping improve the availability of data center fabrics that support mission-critical applications.

Family of Optical Transceivers

Brocade offers a comprehensive family of reliable optical transceivers to provide highly compatible, high-performance connectivity to Brocade director and switch products. For additional ordering information, contact a Brocade representative or visit <https://www.broadcom.com/products/fibre-channel-networking/transceiver-modules>.

Brocade Global Support

Global Support has the expertise to help organizations build resilient, efficient SAN infrastructures. Leveraging 20+ years of expertise in storage networking, Global Support delivers world-class technical support, implementation, and migration services to enable organizations to maximize their hardware and software investments, accelerate new technology deployments, and optimize the performance of their overall network.

Maximizing Investments

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit www.broadcom.com.

Key Features (cont.)

- Diagnostic features per SFF-8472, *Diagnostic Monitoring Interface for Optical Transceivers*, providing real-time monitoring of the following:
 - Transmitter average optical power
 - Receiver average optical power
 - Laser bias current
 - Temperature
 - Supply voltage
- Industry-standard LC duplex connector
- 100m link lengths at 14.025Gb/s on OM3 fiber
- IEC 60825-1 Class 1/CDRH Class 1 laser eye safe
- Compliance with the Restriction on Hazardous Substances (RoHS) directive

Caution

- Do not look through the optical ports because doing so is a potential eye hazard.
- The SFP is an ESD sensitivity Class 2 device. It should be handled accordingly.

Ordering Part Numbers

- XBR-000192 (1-pack)
- XBR-000193 (8-pack)
- XBR-000492 (1-pack)
- XBR-000493 (8-pack)

Regulatory and Standards Compliance

North America: UL/CSA 60950, CDRH Class 1

European Union: EN 60950, EN 60825 Class 1

For information related to SFF Committee documentation, visit www.snia.org/sff.

For information about supported SAN standards, visit www.broadcom.com/sanstandards.

For information about switch and device interoperability, visit <https://www.broadcom.com/products/fibre-channel-networking/transceiver-modules>.

Brocade 16Gb/s SWL SFP+ Specifications

System	
Performance	Fibre Channel: 4.25, 8.5, and 14.025Gb/s line speed, full duplex; auto-sensing of 4, 8, and 14Gb/s port speeds
Media	Hot-pluggable, industry-standard Small Form-Factor Pluggable (SFP+), LC connector; Short Wavelength (SWL)
Operating Parameters	Transmit (Tx): Wavelength: 830 nm to 860 nm Spectral width: 0.59 nm Average power: -8 dBm to -1 dBm RIN: -128 dB/Hz max Optical return loss: 12 dB max OMA: 331 µW, -4.8 dBm Receive (Rx): Wavelength: 770 nm to 860 nm Average power: 0 dBm max Optical return loss: -12 dB min Unstressed sensitivity: 95 µW, -10.2 dBm SRS OMA: 170 µW, -7.7 dBm 3 dB cutoff maximum: 18 GHz
Operating Distances	OM1 62.5 µm (200-500 MHz*km) • 4Gb/s Fibre Channel. Distance: 0.5m to 70m • 8Gb/s Fibre Channel. Distance: 0.5m to 21m • 16Gb/s Fibre Channel. Distance: 0.5m to 15m OM2 50 µm (500 MHz*km) • 4Gb/s Fibre Channel. Distance: 0.5m to 150m • 8Gb/s Fibre Channel. Distance: 0.5m to 50m • 16Gb/s Fibre Channel. Distance: 0.5m to 35m OM3 50 µm (1500 MHz*km) • 4Gb/s Fibre Channel. Distance: 0.5m to 380m • 8Gb/s Fibre Channel. Distance: 0.5m to 150m • 16Gb/s Fibre Channel. Distance: 0.5m to 100m OM4 50 µm (3500 MHz*km) • 4Gb/s Fibre Channel. Distance: 0.5m to 400m • 8Gb/s Fibre Channel. Distance: 0.5m to 190m • 16Gb/s Fibre Channel. Distance: 0.5m to 125m
Mechanical	
Size	Width: 14.80 mm (0.58 inches) Height: 11.85 mm (0.47 inches) Depth: 56.50 mm (2.22 inches)
Environment	
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Power	
Power Dissipation	0.8W