

# BROCADE 10 GBPS FIBRE CHANNEL SWL OPTICAL TRANSCEIVER

## STORAGE AREA NETWORK

### HIGHLIGHTS

- Provides high system reliability through rigorous qualification and certification processes
- Leverages unique design parameters to provide the highest performance with industry-leading Brocade switch, director, and backbone 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
- Extends connectivity of 10 Gbps devices to 16 Gbps Fibre Channel fabrics

The Brocade One™ strategy helps simplify networking infrastructures through innovative technologies and solutions. The Brocade optics family supports this strategy by delivering thoroughly tested and standards-compliant optics that enable simple, non-stop connectivity across diverse storage resources.

Today's enterprise data centers are undergoing an infrastructure transformation, requiring higher speeds, greater scalability, and higher levels of performance and reliability to better meet the demands of business. As speed and performance needs increase, optical transceivers—once considered a generic component of Fibre Channel switching technologies—have become an integral part of overall system design. However, optical transceiver design margins and parameters vary widely, and can be the difference between an optimized, highly reliable fabric and incompatibility issues that drive up support costs.

The Brocade® 10 Gbps Fibre Channel Short Wavelength (SWL) optical transceiver, part of the Brocade family of Small Form-Factor Pluggable (SFP) optical transceivers, is optimized to fully leverage Brocade 16 Gbps backbone, 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.

## Optimized, Certified Optical Transceivers for the Highest- Performance Data Center Fabrics

### END-TO-END COMPATIBILITY AND RELIABILITY

The Brocade 10 Gbps Fibre Channel SWL optical transceivers support highly reliable operations in data center fabrics and are optimized for Brocade 16 Gbps 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 supporting mission-critical applications.

### KEY FEATURES

The Brocade 10 Gbps Fibre Channel SWL SFPs are hot-swappable, low-voltage (3.3 V) digital diagnostic optical transceivers that support high-speed serial links over multimode optical fiber at signaling rates up to 10.5 Gbps. They comply with SFP+ mechanical (SFF-8432), optical, and electrical specifications (FC-P1-5) for LC duplex transceivers.

The Brocade 10 Gbps Fibre Channel SWL optical transceiver is a multi-rated 850 nm SFP that complies with 10.5 Gbps Fibre Channel specifications. Product highlights include:

- 850 nm multimode VCSEL transmitter
- FC-P1-5 compliance for 10.5 Gbps operation

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- Diagnostic features per SFF-8472 “Diagnostic Monitoring Interface for Optical Transceivers,” providing real-time monitoring of:
  - Transmitted optical power
  - Received optical power
  - Laser bias current
  - Temperature
  - Supply voltage
- Industry-standard LC duplex connector
- 300 m link lengths at 10.5 Gbps on OM3 fiber
- IEC 60825-1 Class 1/CDRH Class 1 laser eye safe
- Compliance with Restriction on Hazardous Substances (RoHS) directive

### FAMILY OF OPTICAL TRANSCEIVERS

Brocade offers a comprehensive family of 4 Gbps, 8 Gbps, 10 Gbps, and 16 Gbps SFPs to provide highly compatible, high-performance connectivity to Brocade backbone, director, and switch products.

For additional ordering information, contact a Brocade representative or visit [www.brocade.com/howtobuy](http://www.brocade.com/howtobuy).

### BROCADE GLOBAL SERVICES

Brocade Global Services delivers world-class professional services and technical support to enable the transition to virtualized data centers and cloud-optimized architectures. Brocade Professional Services offers assessment, design, and implementation services to help organizations optimize their SAN architectures in cloud-optimized data centers. Brocade Premier Support and onsite residencies help organizations maximize availability of mission-critical data in SAN environments through personalized, preferential, and proactive technical support.

### MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include education, support,

and services. For more information, contact a Brocade sales partner or visit [www.brocade.com](http://www.brocade.com).

### BROCADE 10 GBPS FIBRE CHANNEL SWL SPECIFICATIONS

| Systems              |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Performance          | Fibre Channel: 10.51875 Gbps line speed, full duplex; auto-sensing of 10.5 Gbps port speeds                                                                                                                                                                                                                                                                                                                                                       |
| Media                | Hot-pluggable, industry-standard Small Form-Factor Pluggable (SFP+), LC connector; Short Wavelength (SWL)                                                                                                                                                                                                                                                                                                                                         |
| Operating parameters | Transmit (Tx):<br>Wavelength: 840 to 860 nm<br>Spectral width: Complies to IEEE triple trade-off curve<br>Average power: -1 dBm max<br>RIN: -128 dB/Hz max<br>Optical return loss: 12 dB max<br>OMA: 372 µW, -4.3 dBm<br>Receive (Rx):<br>Wavelength: 840 to 860 nm<br>Average power: -9.9 to -1 dBm<br>Optical return loss: -12 dB min<br>Unstressed sensitivity: 77 µW, -11.1 dBm<br>SRS OMA: 180 µW, -7.5 dBm<br>3 dB cutoff maximum: 12.3 GHz |
| Operating distances  | 300 m on OM3 multimode fiber                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Mechanicals          |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Size                 | Width: 13.60 mm (0.54 inches)<br>Height: 12.827 mm (0.48 inches)<br>Depth: 57.20 mm (2.25 inches)                                                                                                                                                                                                                                                                                                                                                 |
| Environmental        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Storage temperature  | -40°C to 100°C                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Power                |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Power dissipation    | 1.00 W                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Regulatory and Standards Compliance

- North America: UL/CSA 60950, CDRH Class 1
- European Union: EN 60590, EN 60825 Class 1

### Caution:

- Do not look through the optical ports, as it is a potential eye hazard.*
- SFP is an ESD sensitivity class-2 device. It should be handled accordingly.*

For information related to SFF Committee documentation, visit [www.sffcommittee.org](http://www.sffcommittee.org).  
 For information about supported SAN standards, visit [www.brocade.com/sanstandards](http://www.brocade.com/sanstandards).  
 For information about switch and device interoperability, visit [www.brocade.com/interoperability](http://www.brocade.com/interoperability).

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