

# Brocade 10 Gbps LR Optical Transceiver

## HIGHLIGHTS

- Provides high system reliability based on rigorous qualification and certification testing
- Leverages unique design parameters to provide the highest performance with industry-leading Brocade solutions, supporting business continuity
- 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

## Optimized, Certified Optical Transceivers for Extending Data Center Networks

Today's enterprise data centers and networking environments 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 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 Long Range (LR) Ethernet optical transceiver, part of the Brocade family of Small Form-Factor Pluggable (SFP) optical transceivers, is optimized to fully leverage Brocade 10 Gbps Fibre Channel over Ethernet (FCoE)/Converged Enhanced Ethernet (CEE) switches, Converged Network Adapter (CNA) products, and 10 Gigabit Ethernet (GbE) switches and routers. 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

Brocade 10 Gbps LR Ethernet optical transceivers support highly reliable operations in data center networks and

are optimized for Brocade switching platforms. They undergo rigorous qualification and certification testing to provide an end-to-end solution that is easier to maintain—helping improve the availability of data center networks supporting mission-critical applications.

### Key Features

Brocade 10 Gbps LRSFPs are hot-swappable, low-voltage (3.3 V) digital diagnostic Ethernet optical transceivers that support high-speed serial links over single-mode optical fiber at signaling rates up to 10.5 Gbps. They comply with SFP mechanical (SFF-8432), optical, and electrical specifications (FC-PI-4) for LC duplex transceivers.

The Brocade 10 Gbps LR Ethernet optical transceiver is a 1310 nm SFP

# Brocade 10 Gbps LR Specifications

## Systems

Performance	FCoE: 10.5 Gbps line speed, full duplex	
Media	Hot-pluggable, industry-standard Small Form-Factor Pluggable (SFP+), LC connector; Long Range (LR)	
Operating parameters	Transmit (Tx): Wavelength: 1260 to 1355 nm Average power: -8.2 to +0.5 dBm RIN: -128 dB/Hz max Optical return loss: -12 dB max OMA: -5.2 dBm min	Receive (Rx): Wavelength: 1260 to 1355 nm Average power: -14.2 dBm to +0.5 dBm Optical return loss: -12 dB Unstressed sensitivity: 55 µW, -12.6 dBm SRS OMA: 93 µW, -10.3 dBm 3 dB cutoff maximum: 12.3 GHz

## Mechanicals

Size	Width: 14.80 mm (0.58 inches) Height: 12.40 mm (0.49 inches) Depth: 56.70 mm (2.23 inches)
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## Environmentals

Storage temperature	-40°C to 85°C
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## Power

Power dissipation	1.25 W
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## 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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that complies with 10GBASE-LR specifications. Highlights include:

- 1310 nm DFB laser
- Optical interface specifications per IEEE 802.3ae 10GBASE-LR
- 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 LCduplex connector
- 10 km link lengths on 9 µm single-mode fiber
- IEC60825-1 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 reliable 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).

## 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).

