

# Cisco 100BASE-X Small Form-Factor Pluggable Modules for Fast Ethernet Applications

## Product Overview

The Cisco® 100BASE-X Small Form-Factor Pluggable (SFP) device (Figure 1) is a hot-swappable input/output device that plugs into Fast Ethernet ports, dual-rate Fast/Gigabit Ethernet ports, or Gigabit Ethernet ports of a Cisco switch or router, linking the port with the fiber cabling network.

Main features include the following:

- Hot-swappable when deployed, the switch or router does not have to reboot
- Supports the “pay-as-you-populate” model
- Interchangeable with other 100BASE-X SFPs on the same line card
- Supports the Cisco quality ID feature that enables the switch or router to identify whether or not the SFP is a Cisco qualified SFP
- Optically interoperable with respective 100BASE-X Ethernet interfaces on the same link

**Figure 1.** Cisco 100M Ethernet SFP



## Cisco 100BASE-FX SFP

The Cisco 100BASE-FX SFP operates on ordinary multimode fiber-optic (MMF) link spans up to 2 kilometers (km) long.

GLC-FE-100FX modules operate in Fast Ethernet or dual-rate Fast/Gigabit Ethernet ports of Cisco switches and routers.

GLC-FE-100FX-RGD modules operate in Fast Ethernet or dual-rate Fast/Gigabit Ethernet ports of Cisco Industrial Ethernet and SmartGrid switches and routers.

GLC-GE-100FX modules operate in Gigabit Ethernet ports of Cisco switches and routers.

All these modules are interoperable with industrywide interfaces compliant to the IEEE 100BASE-FX standard.

## Cisco 100BASE-LX10 SFP

The Cisco 100BASE-LX10 SFP operates on ordinary single-mode fiber-optic (SMF) link spans up to 10 km long.

GLC-FE-100LX modules operate in Fast Ethernet or dual-rate Fast/Gigabit Ethernet ports of Cisco switches and routers.

GLC-FE-100LX-RGD modules operate in Fast Ethernet or dual-rate Fast/Gigabit Ethernet ports of Cisco Industrial Ethernet and SmartGrid switches and routers.

These modules are interoperable with industrywide interfaces compliant to the IEEE 100BASE-LX10 standard.

## Cisco 100BASE-BX10 SFP

The Cisco 100BASE-BX10 (part numbers GLC-FE-100BX-D and GLC-FE-100BX-U) SFPs operate on ordinary SMF single-strand link spans up to 10 km long. A 100BASE-BX10-D device is always connected a 100BASE-BX10-U device with a single strand of standard SMF with an operating transmission range up to 10 km. The communication over a single strand of fiber is achieved by separating the transmission wavelength of the two devices as depicted in Figure 2. 100BASE-BX10-D transmits a 1550-nm channel and receives a 1310-nm signal, whereas a 100BASE-BX10-U transmits a 1310-nm wavelength and receives a 1550-nm signal. Note in Figure 2 the presence of a wavelength-division multiplexing (WDM) splitter integrated into the SFP to split the 1310-nm and 1550-nm light paths.

**Figure 2.** Bidirectional Transmission on a Single Strand of SMF



## Cisco 100BASE-EX SFP

The Cisco 100BASE-EX SFP operates on ordinary SMF link spans up to 40 km long.

GLC-FE-100EX modules operate in Fast Ethernet or dual-rate Fast/Gigabit Ethernet ports of Cisco switches and routers.

## Cisco 100BASE-ZX SFP

The Cisco 100BASE-ZX SFP operates on ordinary SMF link spans up to 80 km long.

GLC-FE-100ZX modules operate in Fast Ethernet or dual-rate Fast/Gigabit Ethernet ports of Cisco switches and routers.

## Technical Specifications

### Platform Support

The Cisco SFPs are supported across a variety of Cisco switches, routers, and optical transport devices. For more details, refer to the document [Cisco 100M Ethernet SFP Compatibility Matrix](#).

### Connectors and Cabling

**Connectors:** Dual LC connector (GLC-FE-100FX, GLC-FE-100FX-RGD, GLC-GE-100FX, GLC-FE-100LX, GLC-FE-100LX-RGD, GLC-FE-100EX, and GLC-FE-100ZX) or single LC connector (GLC-FE-100BX-D and GLC-FE-100BX-U)

Table 1 provides cabling specifications for the SFPs for installation in a Fast Ethernet SFP port. Note that all SFP ports have LC-type connectors, and the minimum cable distance for all SFPs listed (MMF and SMF [G.652]) is 2 meters (6.5 feet).

**Table 1.** SFP Port Cabling Specifications

| SFP  | Wavelength (nm) | Fiber Type | Cable Distance     |
|--|-----------------|------------|--------------------|
| GLC-FE-100FX<br>GLC-FE-100FX-RGD<br>GLC-GE-100FX | 1310            | MMF        | 2 km (6,562 ft)    |
| GLC-FE-100LX<br>GLC-FE-100LX-RGD                 | 1310            | SMF        | 10 km (32,810 ft)  |
| GLC-FE-100BX-U                                   | 1310            | SMF        | 10 km (32,810 ft)  |
| GLC-FE-100BX-D                                   | 1550            | SMF        | 10 km (32,810 ft)  |
| GLC-FE-100EX                                     | 1310            | SMF        | 40 km (131,240 ft) |
| GLC-FE-100ZX                                     | 1550            | SMF        | 80 km (262,480 ft) |

Table 2 gives information about fiber loss.

**Table 2.** Fiber-Loss Budgets

| SFP  | Type           | Transmit (dBm) |         | Receive (dBm) |         |
|--|----------------|----------------|---------|---------------|---------|
|  |                | Maximum        | Minimum | Maximum       | Minimum |
| GLC-FE-100FX<br>GLC-FE-100FX-RGD<br>GLC-GE-100FX | 100BASE-FX     | -14            | -20     | -14           | -31     |
| GLC-FE-100LX<br>GLC-FE-100LX-RGD                 | 100BASE-LX10   | -8             | -15     | -8            | -28     |
| GLC-FE-100BX-U                                   | 100BASE-BX10-U | -8             | -14     | -3            | -28.2   |
| GLC-FE-100BX-D                                   | 100BASE-BX10-D | -8             | -14     | -3            | -28.2   |
| GLC-FE-100EX                                     | 100BASE-EX     | 0              | -5      | -8            | -28     |
| GLC-FE-100ZX                                     | 100BASE-ZX     | 2              | -3      | -8            | -30     |

## Dimensions

**Dimensions (H x W x D):** 8.5 x 13.4 x 56.5 mm

## Environmental Conditions and Power Requirements

- **Operating temperature range:**
  - **Commercial temperature range (COM):** 0 to 70°C (32 to 158°F), applicable to GLC-FE-100F X, GLC-FE-100LX, GLC-GE-100FX, GLC-FE-100BX-D, GLC-FE-100BX-U, GLC-FE-100EX, and GLC-FE-100ZX
  - **Industrial temperature range (IND):** -40 to 85°C (-40 to 185°F), applicable to GLC-FE-100FX-RGD and GLC-FE-100LX-RGD
- **Storage temperature range:** -40 to 85°C (-40 to 185°F)
- **Power consumption:**
  - GLC-FE-100FX, GLC-FE-100FX-RGD, GLC-FE-100BX-D, GLC-FE-100BX-U, GLC-FE-100EX, and GLC-FE-100ZX modules consume up to 1W per port
  - GLC-GE-100FX modules typically consume 1.5W per port (up to 1.7W)

## Warranty

- Standard warranty: 90 days
- Extended warranty (option): Available under a Cisco SMARTnet<sup>®</sup> Support contract for the Cisco switch or router chassis

## Ordering Information

Table 3 gives ordering information for the Cisco SFP.

**Table 3.** Ordering Cisco SFP

| Product Number          | SFP   |
|-------------------------|---|
| <b>GLC-FE-100FX</b>     | 100BASE-FX SFP for Fast Ethernet SFP Ports          |
| <b>GLC-FE-100FX-RGD</b> | 100BASE-FX Rugged SFP for Fast Ethernet SFP Ports   |
| <b>GLC-GE-100FX</b>     | 100BASE-FX SFP for Gigabit Ethernet SFP Ports       |
| <b>GLC-FE-100LX</b>     | 100BASE-LX10 SFP for Fast Ethernet SFP Ports        |
| <b>GLC-FE-100LX-RGD</b> | 100BASE-LX10 Rugged SFP for Fast Ethernet SFP Ports |
| <b>GLC-FE-100BX-U</b>   | 100BASE-BX10-U SFP for Fast Ethernet SFP Ports      |
| <b>GLC-FE-100BX-D</b>   | 100BASE-BX10-D SFP for Fast Ethernet SFP Ports      |
| <b>GLC-FE-100EX</b>     | 100BASE-EX for Fast Ethernet SFP Ports              |
| <b>GLC-FE-100ZX</b>     | 100BASE-ZX for Fast Ethernet SFP Ports              |

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## Regulatory and Standards Compliance

### Safety

- Laser Class 1 21CFR1040 LN#50 7/2001
- Laser Class I IEC 60825

### Standards

- IEEE 802.3u
- IEEE 802.3z
- IEEE 802.3ah
- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- RoHS 5

## Additional Information

For more information about Cisco 100BASE-X SFPs for Fast Ethernet SFP ports, contact:

- United States and Canada: 800 553-6387
- Europe: 32 2 778 4242
- Australia: 61 2 9935 4107
- Other: 408 526-7209
- <http://www.cisco.com>



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