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.

Cisco 100BASE-T Copper SFP
The 100BASE-T SFP operates on standard Category 5 unshielded twisted-pair copper cabling of link lengths up to 100 m (328 ft). It supports Industrial temperature range of -40 to 85°C.
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>
<thead>
<tr>
<th>SFP</th>
<th>Wavelength (nm)</th>
<th>Fiber Type</th>
<th>Cable Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLC-FE-100FX</td>
<td>1300</td>
<td>MMF</td>
<td>2 km (6,562 ft)</td>
</tr>
<tr>
<td>GLC-FE-100FX-RGD</td>
<td>1300</td>
<td>MMF</td>
<td>2 km (6,562 ft)</td>
</tr>
<tr>
<td>GLC-GE-100FX</td>
<td>1310</td>
<td>SMF</td>
<td>10 km (32,810 ft)</td>
</tr>
<tr>
<td>GLC-FE-100LX-RGD</td>
<td>1310</td>
<td>SMF</td>
<td>10 km (32,810 ft)</td>
</tr>
<tr>
<td>GLC-FE-100BX-U</td>
<td>1550</td>
<td>SMF</td>
<td>10 km (32,810 ft)</td>
</tr>
<tr>
<td>GLC-FE-100BX-D</td>
<td>1550</td>
<td>SMF</td>
<td>10 km (32,810 ft)</td>
</tr>
<tr>
<td>GLC-FE-100EX</td>
<td>1310</td>
<td>SMF</td>
<td>40 km (131,240 ft)</td>
</tr>
<tr>
<td>GLC-FE-100ZX</td>
<td>1550</td>
<td>SMF</td>
<td>80 km (262,480 ft)</td>
</tr>
</tbody>
</table>

Table 2 gives information about fiber loss.

<table>
<thead>
<tr>
<th>SFP</th>
<th>Type</th>
<th>Transmit (dBm)</th>
<th>Receive (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>GLC-FE-100FX</td>
<td>100BASE-FX</td>
<td>-14</td>
<td>-20</td>
</tr>
<tr>
<td>GLC-FE-100FX-RGD</td>
<td>100BASE-FX</td>
<td>-8</td>
<td>-15</td>
</tr>
<tr>
<td>GLC-GE-100FX</td>
<td>100BASE-LX10</td>
<td>-8</td>
<td>-15</td>
</tr>
<tr>
<td>GLC-FE-100LX-RGD</td>
<td>100BASE-BX10-U</td>
<td>-8</td>
<td>-14</td>
</tr>
<tr>
<td>GLC-FE-100BX-U</td>
<td>100BASE-BX10-U</td>
<td>-8</td>
<td>-14</td>
</tr>
<tr>
<td>GLC-FE-100BX-D</td>
<td>100BASE-BX10-D</td>
<td>0</td>
<td>-5</td>
</tr>
<tr>
<td>GLC-FE-100EX</td>
<td>100BASE-ZX</td>
<td>2</td>
<td>-3</td>
</tr>
</tbody>
</table>
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-GE-100FX, GLC-FE-100BX-D, GLC-FE-100BX-U, and GLC-FE-100ZX
  - **Extended temperature range (EXT):** -5 to 85°C (23 to 185°F) applicable to GLC-FE-100FX, GLC-FE-100LX and GLC-FE-100-EX
  - **Industrial temperature range (IND):** -40 to 85°C (-40 to 185°F), applicable to GLC-FE-100FX-RGD, GLC-FE-100LX-RGD and GLC-FE-T-I

- 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)
  - GLC-FE-T-I modules typically consume 1W per port

Warranty

- Standard warranty: 1 year
- Extended warranty (option): Available under a Cisco SMARTnet® 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**

<table>
<thead>
<tr>
<th>Product Number</th>
<th>SFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLC-FE-100FX</td>
<td>100BASE-FX SFP for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100FX-RGD</td>
<td>100BASE-FX Rugged SFP for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-GE-100FX</td>
<td>100BASE-FX SFP for Gigabit Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100LX</td>
<td>100BASE-LX10 SFP for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100LX-RGD</td>
<td>100BASE-LX10 Rugged SFP for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100BX-U</td>
<td>100BASE-BX10-U SFP for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100BX-D</td>
<td>100BASE-BX10-D SFP for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100EX</td>
<td>100BASE-EX for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-100ZX</td>
<td>100BASE-ZX for Fast Ethernet SFP Ports</td>
</tr>
<tr>
<td>GLC-FE-T-I</td>
<td>100BASE-T for Fast Ethernet SFP Ports</td>
</tr>
</tbody>
</table>
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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