



# FES 10GBASE SFP+ Modules

## Product overview

The FES 10GBASE SFP+ modules (Figure 1) give you a wide variety of 10 Gigabit Ethernet connectivity options for data center, enterprise wiring closet, and service provider transport applications.

**Figure 1.** FES 10GBASE SFP+ modules



## Features and benefits

FES SFP+ modules offer the following features and benefits.

- Industry's smallest 10G form factor for greatest density per chassis
- Hot-swappable input/output device that plugs into an Ethernet SFP+ port of a FES switch (no need to power down if installing or replacing)
- Supports “pay-as-you-populate” model for investment protection and ease of technology migration
- Digital optical monitoring capability for strong diagnostic capabilities
- Optical interoperability with 10GBASE XENPAK, 10GBASE X2, and 10GBASE XFP interfaces on the same link

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### **FES SFP-10G-SR-S module (S-Class)**

The FES 10GBASE-SR module supports a link length of 26 meters on standard Fiber Distributed Data Interface (FDDI)- grade Multimode Fiber (MMF). Using 2000 MHz\*km MMF (OM3), up to 300-meter link lengths are possible. Using 4700 MHz\*km MMF (OM4), up to 400 meter link lengths are possible. SFP-10G-SR-S does not support FCoE.

### **FES SFP-10G-SR module**

The FES 10GBASE-SR Module supports a link length of 26m on standard Fiber Distributed Data Interface (FDDI)-grade Multimode Fiber (MMF). Using 2000MHz\*km MMF (OM3), up to 300m link lengths are possible. Using 4700MHz\*km MMF (OM4), up to 400m link lengths are possible.

### **FES SFP-10G-SR-X module**

The FES SFP-10G-SR-X is a multirate\* 10GBASE-SR, 10GBASE-SW and OTU2/OTU2e module for extended operating temperature range. It supports a link length of 26m on standard Fiber Distributed Data Interface (FDDI)-grade Multimode Fiber (MMF). Using 2000MHz\*km MMF (OM3), up to 300m link lengths are possible. Using 4700MHz\*km MMF (OM4), up to 400m link lengths are possible.

### **FES SFP-10G-LRM module**

The FES 10GBASE-LRM Module supports link lengths of 220m on standard Fiber Distributed Data Interface (FDDI) grade Multimode Fiber (MMF). To make sure that specifications are met over FDDI-grade, OM1 and OM2 fibers, the transmitter should be coupled through a mode conditioning patch cord. No mode conditioning patch cord is required for applications over OM3 or OM4. For additional information on mode conditioning patch cord requirements please see:

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### **FES SFP-10G-LR-S module (S-Class)**

The FES 10GBASE-LR module supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF) (G.652). SFP- 10G-LR-S does not support FCoE.

### **FES SFP-10G-LR module**

The FES 10GBASE-LR Module supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF, G.652).

### **FES SFP-10G-LR-X module**

The FES SFP-10G-LR-X is a multirate 10GBASE-LR, 10GBASE-LW, and OTU2/OTU2e module for extended operating temperature range. It supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF, G.652).

### **FES SFP-10G-ZR-S module (S-Class)**

The FES 10GBASE-ZR module supports link lengths of up to about 80 kilometers on standard SMF (G.652). This interface is not specified as part of the 10 Gigabit Ethernet standards and is, instead, built according to FES specifications. SFP- 10G-ZR-S does not support FCoE.

### **FES SFP-10G-ZR module**

The FES SFP-10G-ZR is a multirate 10GBASE-ZR, 10GBASE-ZW, and OTU2/OTU2e module. It supports link lengths of up to about 80 kilometers on standard Single-Mode Fiber (SMF, G.652). This interface is not specified as part of the 10 Gigabit Ethernet standard and is instead built according to FES specifications.



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