



Overview: Cisco 7600 Series Ethernet Services 20G Line Cards

This chapter describes the Cisco 7600 Series Ethernet Services 20G (ES20) line cards that are supported on the Cisco 7600 Series Routers and contains the following sections:

- [Cisco 7600 Series Ethernet Services 20G Line Card Summary, page 2-1](#)
- [Identifying Slots and Subslots for the Cisco 7600 Series Ethernet Services 20G Line Cards, page 2-2](#)
- [Cisco 7600-ES20-10G Line Card Overview, page 2-3](#)
- [Cisco 7600-ES20-GE Line Card Overview, page 2-6](#)

Cisco 7600 Series Ethernet Services 20G Line Card Summary

Summary descriptions of the Cisco 7600 Series Ethernet Services 20G line cards that are supported on the Cisco 7600 Series Routers are shown in [Table 2-1](#).

Table 2-1 Supported ES20G Line cards

Cisco ES20 Line Card	Product Numbers	Description	Maximum Number of SFPs or XFPs	Minimum Cisco IOS Release
7600-ES20-10G	7600-ES20-10G3C, 7600-ES20-10G3CX L	2-port 10 Gigabit Ethernet line card providing core-facing redundant 10 Gigabit Ethernet uplinks with H-VPLS support.	2	Cisco IOS Release 12.2SRB
7600-ES20-GE	7600-ES20-GE3C, 7600-ES20-GE3CX L	20-port 1 Gigabit Ethernet line card providing core-facing redundant Ethernet uplinks with H-VPLS support.	20	Cisco IOS Release 12.2SRB

Checking Hardware and Software Compatibility

To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the Software Advisor tool on Cisco.com. This tool does not verify whether the Cisco 7600 ES20 line cards within a system are compatible, but it does provide the minimum Cisco IOS requirements for individual hardware modules or components.



Note

Access to this tool is limited to users with Cisco.com login accounts.

To access Software Advisor, click **Login** at Cisco.com, type “Software Advisor” in the SEARCH box, and click **GO**. Click the link for the Software Advisor tool.

Choose a product family or enter a specific product number to search for the minimum supported software release needed for your hardware.

Identifying Slots and Subslots for the Cisco 7600 Series Ethernet Services 20G Line Cards

This section describes how to specify the physical location of a Cisco 7600 Series Ethernet Services 20G line cards on the Cisco 7600 series routers within the command-line interface (CLI) to configure or monitor those devices.

Specifying the Slot Location for a Cisco 7600 Series Ethernet Services 20G Line Cards

The Cisco 7600 series routers support different chassis models, each of which supports a certain number of chassis slots.



Note

The Cisco 7600 ES20 line cards are not supported with a Supervisor Engine 1, Supervisor Engine 1A, Supervisor Engine 2, or Supervisor Engine 720-3A.

For information about the chassis slots available in different Cisco 7600 series router models, see http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/hardware/cis_76xx/osr_over.htm.

Some commands allow you to display information about the Cisco 7600 ES20 line card itself, such as **show module**, **show idprom module**, **show hw-module slot**, and **show diagbus**. These commands require you to specify the chassis slot location where the Cisco 7600 ES20 line card that you want information about is installed.

For example, to display status and information about the Cisco 7600 ES20 line card installed in slot 6 of a Cisco 7609 router, enter the following command:

```
Router# show module 6
```

For more information about Cisco 7600 ES20 line card commands, see the “Command Summary for the Cisco 7600 Series Ethernet Services 20G Line Card” and the “Cisco 7600 Series Ethernet Services 20G Line Card Commands” chapters in the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide .

**Note**

The Cisco 7600 ES20 line card must be in a slot that provides two primary serial channels. Dual serial channels are not available in all slots of a 13-slot chassis. Dual fabric connectivity is supported in slots 9 to 13.

Cisco 7600-ES20-10G Line Card Slot, Bay, and Port Locations

The Cisco 7600-ES20-10G line card uses a *slot/bay/port* numbering scheme. The slot refers to whichever slot the line card occupies in the router. The bay number is always 0. The port number is either 0 or 1.

Executing the **show interface** command for a Cisco 7600-ES20-10G line card located in slot 4 of a Cisco 7600 series router chassis produces the following:

```
show interface TenGigabitEthernet4/0/0 (first interface)
show interface TenGigabitEthernet4/0/1 (second interface)
```

Cisco 7600-ES20-GE Line Card Slot, Bay, and Port Locations

The Cisco 7600-ES20-GE line card uses a <slot, bay, port> numbering scheme. The slot refers to whichever slot the line card occupies in the router. The bay number is always zero. The port number is zero through 19.

Executing the **show interface** command for a Cisco 7600-ES20-GE line card located in slot 6 of a Cisco 7600 series router chassis produces the following (only first six interfaces are shown):

```
show interface TenGigabitEthernet6/0/0 (first interface)
show interface TenGigabitEthernet6/0/1 (second interface)
show interface TenGigabitEthernet6/0/2 (third interface)
show interface TenGigabitEthernet6/0/3 (fourth interface)
show interface TenGigabitEthernet6/0/4 (fift interface)
show interface TenGigabitEthernet6/0/5 (sixth interface)
```

For more information about Cisco 7600 ES20 line card commands, see the “Command Summary for the Cisco 7600 ES20 Line Cards” and the “Cisco 7600 ES20 Line Card Commands” chapters in the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide .

Cisco 7600-ES20-10G Line Card Overview

The following sections describe the Cisco 7600-ES20-10G line card:

- [Cisco 7600-ES20-10G Line Card Processor, page 2-4](#)
- [Cisco 7600-ES20-10G Line Card LEDs, page 2-4](#)
- [Cisco 7600 SIP-200 Physical Specifications, page 2-5](#)
- [Cisco 7600 SIP-200 Line Card Memory Options, page 2-5](#)
- [Cisco 7600-ES20-10G Cables and Connectors, page 2-5](#)

Cisco 7600-ES20-10G Line Card Processor

The processor on a Cisco 7600-ES20-GE line card is described in [Table 2-2](#).

Table 2-2 Cisco 7600-ES20-10G Line Card Processor

Type	Speed	Description
CPU	400 megahertz (MHz) internal operating frequency	Broadcom 1125 MIPS-based design

Cisco 7600-ES20-10G Line Card LEDs

The Cisco 7600-ES20-10G line card has three LEDs, as shown in [Figure 2-1](#). There is one Status LED and two A/L (Active Loopback) LEDs. [Table 2-3](#) provides LED descriptions.

Figure 2-1 Cisco 7600-ES20-10G Faceplate

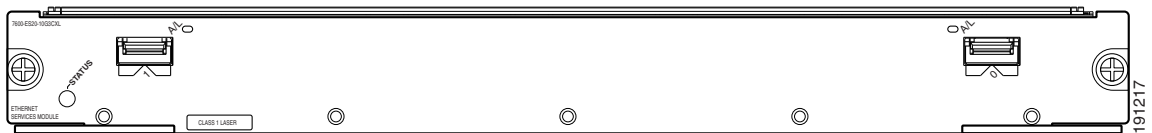


Table 2-3 Cisco 7600-ES20-10G LEDs

LED Label	Color	State	Meaning
STATUS	Red	On	The line card has encountered an error.
	Green	On	The line card is online.
	Yellow	On	The line card is loading.
	Off	Off	The line card is powered off.
A/L	Amber	On	The port is enabled but there is not a valid Ethernet link.
	Green	On	The port is enabled and a valid Ethernet link has been established.
	Green and Amber	On	Undefined condition.
	Off	Off	The port is not enabled by software.

Cisco 7600 SIP-200 Physical Specifications

The Cisco 7600-ES20-10G physical specifications are shown in [Table 2-4](#).

Table 2-4 7600-ES20-10G Physical Specifications

Description	Specifications
Physical dimensions	The Cisco 7600-ES20-10G line card occupies one module slot and can be operated in all Cisco 7600 Series Routers.
Shipping weight	8 lb (3.64 kg)
Operating temperature	32 to 104°F (0 to 40°C)
Relative humidity	10 to 90 percent, noncondensing
Storage temperature	−4 to 149°F (−20 to 65°C)

Cisco 7600 SIP-200 Line Card Memory Options

[Table 2-5](#) lists the memory options available for the Cisco 7600-ES20-10G line card:

Table 2-5 Cisco 7600-ES20-10G Line Card Memory Options

Line Card	Memory Options
Cisco 7600-ES20-10G	1 GB

Cisco 7600-ES20-10G Cables and Connectors

The Cisco 7600-ES20-10G line card supports the XFP-10GLR-OC192SR and XFP-10GER-OC192IR XFP modules.

The XFP-10GLR-OC192SR and XFP-10GER-OC192IR XFPs modules include an optical transmitter and receiver pair integrated with Clock and Data Recovery (CDR) integrated circuits.

The XFP modules provide high-speed serial links at the following rates: 9.95 Gbps (OC-192) and 10.3125 Gbps (10 Gigabit Ethernet) on single-mode fiber (SMF). The transmit side recovers and retimes the 10-Gbps serial data and passes it to a laser driver. The laser driver biases and modulates a 1310-nm or 1550-nm laser, enabling data transmission over SMF through an LC connector. The receive side recovers and retimes the 10-Gbps optical data stream from a photo-detector transimpedance amplifier and passes it to an output driver.

See the label on the XFP module for technology type and model.

- XFP module dimensions are:
- Height: 12.5 mm
- Width: 18.35 mm
- Length: 71.1mm

The XFP module temperature range is 0°C to 70°C.

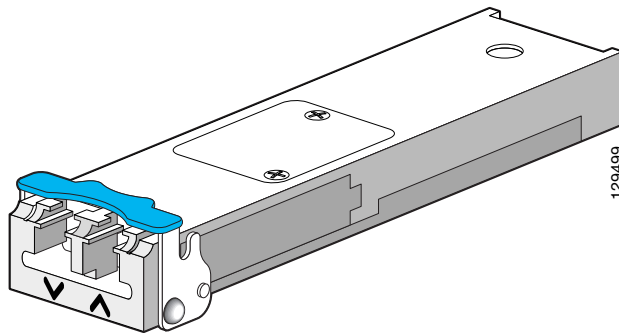
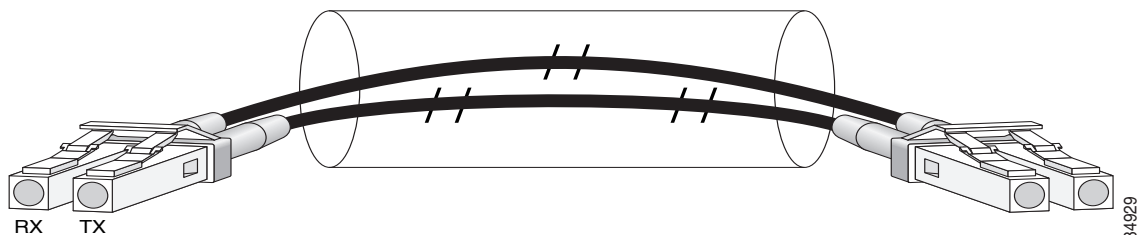
Figure 2-2 XFP Module

Table 2-6 lists XFP module port cabling specifications.

Table 2-6 Port Cabling Specifications.

XFP	Wavelength	Fiber Type
XFP-10GLR-OC192SR	1310 nm	SMF
XFP-10GER-OC192IR	1550 nm	SMF
XFP-10GZR-OC192LR	1550 nm	SMF

Figure 2-3 shows the cable type for use with the XFP optical transceiver module on the Cisco 7600-ES20-10G line card.

Figure 2-3 LC-Type Cable for the XFP Optical Transceiver Modules

Cisco 7600-ES20-GE Line Card Overview

The following sections describe the Cisco 7600-ES20-GE line card:

- [Cisco 7600-ES20-GE Line Card Processor, page 2-7](#)
- [Cisco 7600-ES20-GE Line Card LEDs, page 2-7](#)
- [20-Port 10GE ES20 Physical Specifications, page 2-8](#)

Cisco 7600-ES20-GE Line Card Processor

The processor on a Cisco 7600-ES20-GE line card is described in [Table 2-7](#).

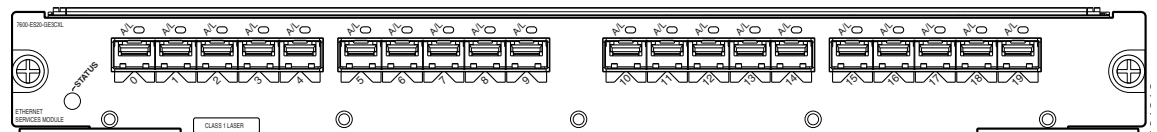
Table 2-7 Cisco 7600-ES20-GE Line Card Processor

Type	Speed	Description
CPU	400 megahertz (MHz) internal operating frequency	Broadcom 1125 MIPS-based design

Cisco 7600-ES20-GE Line Card LEDs

The Cisco 7600-ES20-GE line card has 21 LEDs, as shown in [Figure 2-4](#).

Figure 2-4 Cisco 7600-ES20-GE Line Card Faceplate



There is one line card STATUS LED and twenty A/L (Active Loopback) LEDs. [Table 2-8](#) provides LED descriptions.

Table 2-8 Cisco 7600-ES20-GE Line Card LEDs

LED Label	Color	State	Meaning
STATUS	Red	On	The line card has encountered an error.
	Green	On	The line card is online.
	Yellow	On	The line card is loading.
	Off	Off	The line card is powered off.
A/L	Amber	On	The port is enabled but there is not a valid Ethernet link.
	Green	On	The port is enabled and a valid Ethernet link has been established.
	Green and Amber	On	Undefined condition.
	Off	Off	The port is not enabled by software.

20-Port 10GE ES20 Physical Specifications

The Cisco 7600-ES20-GE line card physical specifications are shown in [Table 2-9](#).

Table 2-9 Cisco 7600-ES20-GE Line Card Physical Specifications

Description	Specifications
Physical dimensions	The Cisco 7600-ES20-GE line card occupies one module slot and can be operated in all Cisco 7600 Series Routers.
Shipping weight	8 lb (3.64 kg)
Operating temperature	32 to 104°F (0 to 40°C)
Relative humidity	10 to 90 percent, noncondensing
Storage temperature	-4 to 149°F (-20 to 65°C)

Cisco 7600-ES20-GE Line Card Memory Options

[Table 2-10](#) lists the memory options available for the Cisco 7600-ES20-GE line card:

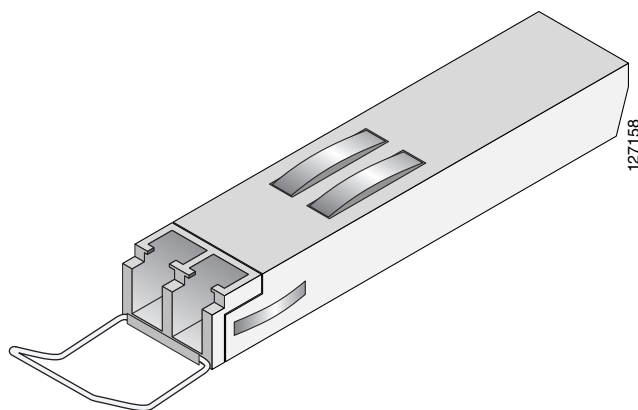
Table 2-10 Cisco 7600-ES20-10G Line Card Memory Options

Line Card	Memory Options
Cisco 7600-ES20-GE line card	1 GB

Cisco 7600-ES20-GE Line Card Cables and Connectors

The Cisco 7600-ES20-GE line card uses a small form-factor pluggable (SFP) optical transceiver module installed in each GE SFP port.

Figure 2-5 SFP Optics Module



Long-range SFP optical transceiver modules (for long-reach configurations) cannot be connected back-to-back without using an attenuator between the two of them.

**Note**

When shorter distances of single-mode fiber are used, it may be necessary to insert an inline optical attenuator in the link to avoid overloading the receiver.

Figure 2-6 LC Type Cables

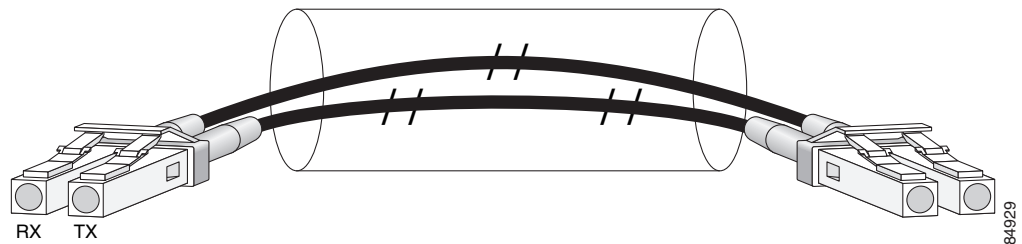


Table 2-11 provides cabling specifications for the SFP modules that can be installed on the Cisco 7600-ES20-GE line card. Note that all SFP ports have LC-type connectors.

Table 2-11 SFP Module Port Cabling Specifications

SFP Modules	Wavelength (nm)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Maximum Cable Distance
SFP-GE-S	850	MMF ¹	62.5	160	722 ft (220 m)
			62.5	200	984 ft (300 m)
			50.0	400	1640 ft (500 m)
			50.0	500	1804 ft (550 m)
SFP-GE-L	1300	MMF ² and SMF	62.5	500	1804 ft (550 m)
			50.0	400	1804 ft (550 m)
			50.0	500	1804 ft (550 m)
			9/10	—	6.2 miles (10 km)
SFP-GE-Z	1550	SMF	9/10	—	49.7 miles (80 km)
		SMF ³	8	—	62.1 miles (100 km)
SFP-GE-T	N/A	Copper	N/A	N/A	328 ft. (100 m)

- Multimode fiber (MMF) only.
- A mode-conditioning patch cord is required.
When using the SFP-GE-L with 62.5-micron diameter MMF, you must install a mode-conditioning patch cord between the SFP module and the MMF cable on both the transmit and the receive ends of the link when link distances are greater than 984 ft (300 m).
We do not recommend using the SFP-GE-L and MMF with no patch cord for very short link distance (tens of meters). The result could be an elevated bit error rate (BER).
- Dispersion-shifted single-mode fiber-optic cable.

Table 2-12 DWDM SFP Module Specifications

SFP Modules	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Maximum Cable Distance
DWDM-SFP-3346=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-3739=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-4134=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-4532=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-4931=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-5332=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-5736=	SMF	9um	N/A	49.7 miles (80 km)
DWDM-SFP-6141=	SMF	9um	N/A	49.7 miles (80 km)

For information on the supported wavelengths for the DWDM SFP modules specified in [Table 2-11](#), see [Table 1-5](#).