Cisco CPAK 100GBASE Modules

Product Overview

The Cisco CPAK™ 100GBASE modules offer customers a wide variety of high-density 100Gbps connectivity solutions for data center networking, high-performance computing networks, enterprise core aggregation, and service provider transport applications. Some CPAK modules, such as the Cisco CPAK 100GBASE-LR4, use Cisco® complementary metal-oxide semiconductor (CMOS) photonic technology to provide industry-leading optical integration, performance, low power consumption, and scalability.

Features and Benefits

Key features of Cisco CPAK 100GBASE modules include:

- Support for 100 Gigabit Ethernet
- Hot-swappable input/output device that plugs into a Cisco CPAK-module-based switch, router, or optical platform port
- Flexibility of interface choice
- Support for a “pay-as-you-grow” model
- Support for digital optical monitoring (DOM)
- Interoperability with any IEEE-compliant 100GBASE-LR4 or 100GBASE-SR10 form factors
- Support for the Cisco quality identification (ID) feature, which enables a Cisco platform to identify whether the module is certified and tested by Cisco
- Size that is 70 percent smaller than C Form-Factor Pluggable (CFP) modules, providing higher-density 100-gigabit interfaces
- Green design, with up to 70 percent less power consumption than CFP modules
- Easy-to-use pull-release handle that is color coded for reach identification

Cisco CPAK 100GBASE-LR4 Module

The Cisco CPAK 100GBASE-LR4 module (Figure 1) is IEEE 802.3ba compliant and supports link lengths of up to 10 km over standard single-mode fiber (SMF, G.652). It delivers an aggregate data signal of 100 gigabits per second, carried over four LAN wavelength-division multiplexing (WDM) wavelengths operating at a nominal 25 Gbps per lane. Optical multiplexing and demultiplexing of the four wavelengths are managed within the module. Its primary application is to support high-bandwidth 100Gbps optical links over standard single-mode fiber terminated with SC connectors. Nominal power consumption is less than 5.5W.

Figure 1. Cisco CPAK 100GBASE-LR4 Module

Cisco CPAK 100GBASE-SR10 Module

The Cisco CPAK 100GBASE-SR10 module (Figure 2) supports link lengths of 100m and 150m on laser-optimized OM3 and OM4 multifiber cables, respectively. The module delivers high-bandwidth 100-gigabit links over 24-fiber ribbon cables terminated with MPO/MTP connectors. It can also be used in 10 x 10-Gb mode along with ribbon-to-duplex-fiber breakout cables for connectivity to ten 10GBASE-SR optical interfaces.

Figure 2. Cisco CPAK 100GBASE-SR10 Module

Technical Specifications

Platform Support

Cisco CPAK modules are supported on Cisco switches and routers. For more details, refer to Cisco 100 Gigabit Ethernet Transceiver Modules Compatibility Matrix.

Connectors and Cabling

- Dual SC/PC connector (CPAK 100GBASE-LR4 module)
- 24-fiber MPO/MTP connector (CPAK 100GBASE-SR10 module receives a female MPO/MTP-24 connector)

Note: Only connections with patch cords with PC or UPC connectors are supported. Patch cords with APC connectors are not supported. All cables and cable assemblies used must be compliant with the standards specified in the Regulatory and Standards Compliance section, later in this document.

Table 1 provides cabling specifications for the Cisco CPAK modules.

Table 1. CPAK Port Cabling Specifications

Cisco CPAK Module	Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz*km)***	Cable Distance*
CPAK 100GBASE-LR4	1310	SMF	9-micron core SMF per G.652	-	10 km
CPAK 100GBASE-SR10	850	MMF	50.0 50.0	2000 (OM3) 4700 (OM4)	100m 150m**

* Minimum cabling distance for -LR4 modules is 2m, according to the IEEE 802.3ba.
** Considered an engineered link with maximum 1dB allocated to connectors and splice loss.
*** Specified at transmission wavelength.

Table 2 shows the primary optical characteristics for the Cisco CPAK 100GBASE modules.

Table 2. Optical Transmit and Receive Specifications

Module	Type	Transmit Power (dBm)*		Receive Power (dBm)*		Transmit and Receive Center Wavelength Range (nm)
		Maximum	Minimum	Maximum	Minimum	
CPAK 100GBASE-LR4	100GBASE-LR4 1310 nm SMF	4.5 per lane	-4.3 per lane	4.5 per lane	-10.6 per lane	Four lanes: 1294.53 to 1296.59 1299.02 to 1301.09 1303.54 to 1305.63 1308.09 to 1310.19
CPAK 100GBASE-SR10	100GBASE-SR10 850 nm MMF	-1.0 per lane	-7.6 per lane	2.4 per lane	-9.5 per lane	Ten lanes: 850 to 860 nm

* Transmitter and receiver power are in averages, unless specified.

Dimensions

Maximum outer dimensions for the CPAK modules are (H x W x D): 11.6 x 34.8 x 101.2 mm (0.46 x 1.37 x 3.98 in).

The Cisco CPAK modules typically weigh approximately 127 grams (4.48 oz.).

Environmental Conditions and Power Requirements

- Storage temperature range: -40 to 85°C (-40 to 185 °F)
- CPAK 100GBASE-LR4 operating temperature range: 0 to 70°C (32 to 158°F)
- CPAK 100GBASE-SR10 operating temperature range: 0 to 70°C (32 to 158°F)
- CPAK 100GBASE-LR4 power consumption at 70°C: <6.75 W maximum
- CPAK 100GBASE-SR10 power consumption at 70°C: <4.5 W maximum

Warranty

- Standard warranty: 90 days
- Extended warranty (optional): Cisco CPAK modules can be covered in a Cisco SMARTnet® Service support contract for the Cisco switch or router chassis

Ordering Information

Table 3 provides ordering information for Cisco CPAK modules and related cables.

Table 3. Ordering Information

Description	Product Number
100GBASE-LR4 CPAK Module for SMF	CPAK-100G-LR4
100GBASE-SR10 CPAK Module for MMF	CPAK-100G-SR10

Regulatory and Standards Compliance

Standards:

- 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
- IEEE 802.3ba (LR4, SR10)
- Reduction of Hazardous Substances (RoHS) 6 compliant

Safety:

- Laser Class 1 21CFR-1040 LN50 7/2001
- Laser Class 1 IEC60825-1

Additional Information

For more information about Cisco CPAK 100GBASE optics and copper modules, contact your sales representative or visit: http://www.cisco.com/go/dcnm.

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