5 Cards

5.1 Card Classification

NOTE

This document describes all the cards supported by the CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. The cards that can be supplied will be specified in the product change notices (PCNs). For details, contact the product manager of Huawei local office.

Among the CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches, only CE8868EI, CE8861EI, and CE8860EI support pluggable cards, as listed in **Table 5-1**.

Table 5-1 Cards supported by the CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches

Card Name	Description	Hot Swap
CE88-D8CQ	8-port 40GE/100GE interface card (QSFP28)	Supported
CE88-D16Q	16-port 40GE interface card (QSFP+)	

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Card Name	Description	Hot Swap
CE88-D24T2CQ	24-port GE/10GBASE-T (RJ45) and 2-port 40GE/100GE (QSFP28) interface card	
CE88-D24S2CQ	24-port 10GE/25GE (SFP28) and 2-port 40GE/100GE (QSFP28) interface card	
CE88-D24S2CQ-U	24-port 25GE/16G FC (SFP28) and 2-port 40GE/100GE (QSFP28) interface card	

5.2 Card Naming Conventions

Figure 5-1 shows the CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches naming conventions.

Figure 5-1 CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches naming conventions

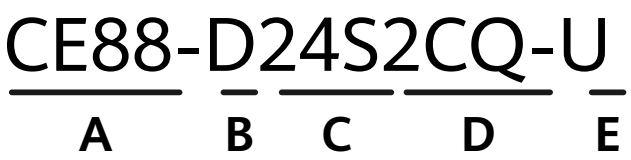

Table 5-2 describes the CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches naming conventions.

Table 5-2 CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches naming conventions

Field	Description
A	**CE88**: cards for CE8860EI/CE8861EI/CE8868EI **CE98**: cards for CE9860EI
B	Cards for top of rack (ToR) switches

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Field	Description
C	Number and type of downlink interfaces: • **T**: GE/10GBase-T electrical interfaces • **S**: 10GE SFP+/25GE SFP28 optical interfaces • **Q**: QSFP+ optical interfaces • **CQ**: QSFP28 optical interfaces
D	Number and type of uplink interfaces: • **T**: GE/10GBase-T electrical interfaces • **S**: 10GE SFP+/25GE SFP28 optical interfaces • **Q**: QSFP+ optical interfaces • **CQ**: QSFP28 optical interfaces **NOTE** This field will not be included in a card's name if the uplink and downlink interfaces on the card are the same type.
E	Special function flag. This flag is not present if the card does not provide special functions. **U**: The card supports FC ports.

5.3 CE88-D8CQ (8-Port 40GE/100GE Interface Card (QSFP28))

Version Mapping

Table 5-3 describes the mapping between the CE88-D8CQ card, switch models, and software versions.

Table 5-3 Version mapping

Switch Model	CE88-D8CQ
CE7800, CE6800, and CE5800 series switches and the CE8850EI	Not supported
CE8860-4C-EI	Supported in V100R006C00 and later versions

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Switch Model	CE88-D8CQ
CE8861-4C-EI CE8868-4C-EI	Supported in V200R005C10 and later versions **NOTE** • The registration and interface usage of the CE88-D8CQ subcards on the CE8868EI are controlled by licenses. By default, the CE88-D8CQ subcards on the CE8868EI are not enabled. To use these subcards on the CE8868EI, apply for and purchase the license from the equipment supplier. • For the CE8868EI, after the above license is loaded, you need to run the **active card-license** command to enable the corresponding license in the specified subcard slot. The CE8868EI has four subcard slots. You can purchase licenses based on the number of required subcard slots.

Card Overview

The CE88-D8CQ card can be install in any slot of the CE8860-4C-EI, CE8861-4C-EI, or CE8868-4C-EI chassis.

Figure 5-2 shows the appearance of the CE88-D8CQ card.

Figure 5-2 CE88-D8CQ card

Functions and Features

Table 5-4 describes functions and features of the CE88-D8CQ card.

Table 5-4 Functions and features

Function and Feature	Item
Basic function	Provides data packet processing and traffic management on eight 40GE/100GE QSFP28 optical ports.

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Function and Feature	Item
Port split	Each QSFP28 optical port can be split into four 25GE ports or four 10GE ports. Such 25GE or 10GE ports cannot work at 1 Gbit/s. With the port split function, each card can provide up to 32 25GE or 10GE optical ports. **NOTE** All the QSFP28 ports are independent, and each can be configured as four 10GE or 25GE ports.
Hot swap	Supported
Service port stacking	Ports on the card can be used as stack ports.

Indicators and Ports

Figure 5-3 shows indicators on the CE88-D8CQ panel.

Figure 5-3 Indicators on the CE88-D8CQ panel

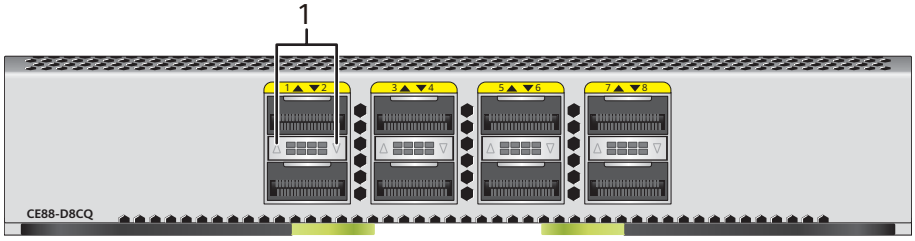

Table 5-5 describes indicators on the CE88-D8CQ panel.

Table 5-5 Indicator description

Number	Indicator	Color	Status	Description
1	One single-color indicator for each interface	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.

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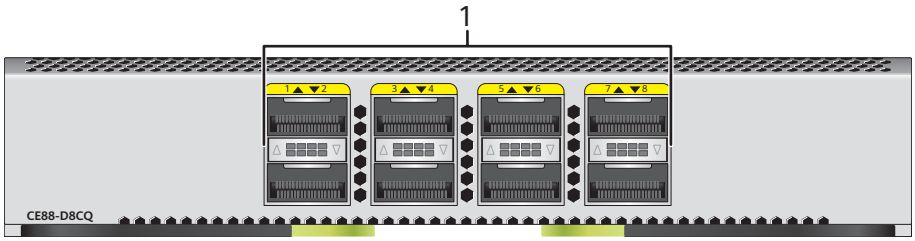
Number	Indicator	Color	Status	Description
	NOTE Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.		Blinking	The port is transmitting or receiving data.

Figure 5-4 shows the ports on the CE88-D8CQ card.

Figure 5-4 Ports on the CE88-D8CQ card



1. Eight 40GE/100GE QSFP28 optical ports

40GE/100GE QSFP28 optical port

Table 5-6 describes the attributes of a 40GE/100GE QSFP28 optical port.

Table 5-6 Attributes of a 40GE/100GE QSFP28 optical port

Attribute	Description
Connector type	Depends on the optical module used.
Optical attributes	Depends on the QSFP+ or QSFP28 optical module used. See 40GE QSFP+ Optical Modules or 100GE QSFP28 Optical Modules.

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Attribute	Description
Applicable cables	When the port works in 100GE mode, it can use: • QSFP28 optical module and MPO-MPO or LC-LC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to QSFP28 high-speed cable • QSFP28 to QSFP28 AOC cable
	When the port works in 40GE mode, it can use: • QSFP+ optical module and MPO-MPO or LC-LC optical fiber • QSFP+ to QSFP+ high-speed cable • QSFP+ to QSFP+ AOC cable
	When the port works in 4*25GE mode, it can use: • QSFP28 optical module and MPO-4*DLC or MPO-8*FC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to 4*SFP28 high-speed cable **NOTE** When a QSFP28-100G-SR4 optical module is installed on the port, the port cannot be connected to a port with an SFP-25G-SR optical module. When a QSFP28 to 4*SFP28 high-speed cable is installed on the port: • If auto-negotiation is disabled on the remote port, the local port supports only the QSFP-4SFP25G-CU1M or QSFP-4SFP25G-CU3M-N high-speed cable. • If auto-negotiation is disabled and Base-R FEC is enabled on the remote port, the local port supports only the QSFP-4SFP25G-CU3M high-speed cable.
	When the port works in 4*10GE mode, it can use: • QSFP+ optical module and MPO-4*DLC or MPO-8*FC optical fiber • QSFP+ to 4*SFP+ high-speed cable • QSFP+ to 4*SFP+ AOC cable

Specifications

Table 5-7 lists technical specifications of the CE88-D8CQ card.

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Table 5-7 Technical specifications

Item	Description
Physical specifications	• Dimensions (W x D x H): 210.0 mm x 205.2 mm x 41.8 mm (8.3 in. x 8.1 in. x 1.6 in.) • Weight: 1.3 kg (2.87 lb) • Typical power consumption: 33 W • Maximum power consumption: 71 W • Typical heat dissipation: 113 BTU/hr • Maximum heat dissipation: 242 BTU/hr
Environment parameters	• Operating temperature: 0°C to 40°C (32°F to 104°F) • Relative humidity: 5% RH to 95% RH • Storage temperature: -40°C to +70°C (-40°F to +158°F)

Ordering Information

Table 5-8 provides the ordering information.

Table 5-8 Ordering information

Part Number	Card Model	Card Description
03023CRS	CE88-D8CQ	8-port 40GE/ 100GE interface card (QSFP28)

5.4 CE88-D16Q (16-Port 40GE Interface Card (QSFP+))

Version Mapping

Table 5-9 describes the mapping between the CE88-D16Q card, switch models, and software versions.

Table 5-9 Version mapping

Switch Model	CE88-D16Q
CE7800, CE6800, and CE5800 series switches and the CE8850EI	Not supported
CE8860-4C-EI	Supported in V100R006C00 and later versions

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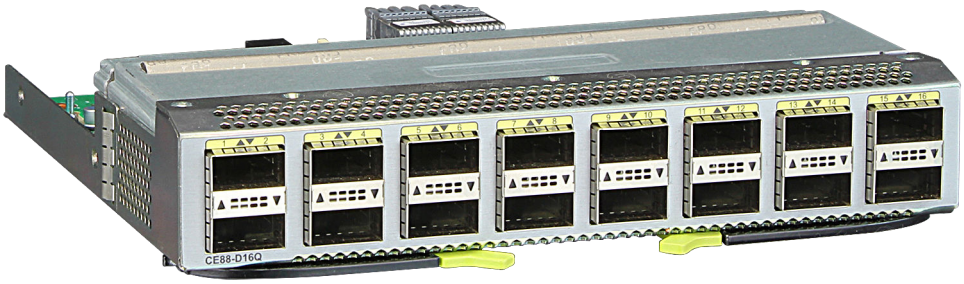
Switch Model	CE88-D16Q
CE8861-4C-EI CE8868-4C-EI	Supported in V200R005C10 and later versions **NOTE** • The registration and interface usage of the CE88-D16Q subcards on the CE8868EI are controlled by licenses. By default, the CE88-D8CQ and CE88-D16Q subcards on the CE8868EI are not enabled. To use these subcards on the CE8868EI, apply for and purchase the license from the equipment supplier. • For the CE8868EI, after the above license is loaded, you need to run the **active card-license** command to enable the corresponding license in the specified subcard slot. The CE8868EI has four subcard slots. You can purchase licenses based on the number of required subcard slots.

Card Overview

The CE88-D16Q card can be install in any slot of the CE8860-4C-EI, CE8861-4C-EI, or CE8868-4C-EI chassis.

Figure 5-5 shows the appearance of the CE88-D16Q card.

Figure 5-5 CE88-D16Q card



Functions and Features

Table 5-10 describes functions and features of the CE88-D16Q card.

Table 5-10 Functions and features

Function and Feature	Description
Basic function	Provides data packet processing and traffic management on 16 40GE QSFP+ optical ports.

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Function and Feature	Description
Port split	• Each QSFP+ optical port can be split into two 10GE ports. The two 10GE cannot work at 1 Gbit/s. With the port split function, each card can provide up to 32 10GE optical ports. **NOTE** All the 40GE QSFP+ optical ports are independent, and each can be configured as two 10GE ports. For CE8861EI and CE8868EI, the two 40GE interfaces must be split simultaneously so that converted 10GE interfaces can work properly.
Hot swap	Supported
Service port stacking	Ports on the card can be used as stack ports.

Indicators and Ports

Figure 5-6 shows indicators on the CE88-D16Q panel.

Figure 5-6 Indicators on the CE88-D16Q panel

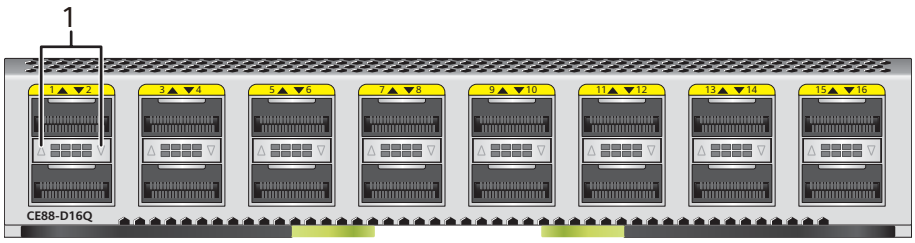

Table 5-11 describes indicators on the CE88-D16Q panel.

Table 5-11 Indicator description

Number	Indicator	Color	Status	Description
1	One single-color indicator for each interface	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.

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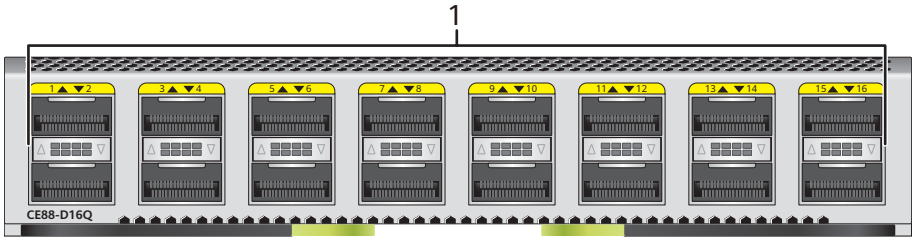
Number	Indicator	Color	Status	Description
	NOTE Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.		Blinking	The port is transmitting or receiving data.

Figure 5-7 shows the ports on the CE88-D16Q card.

Figure 5-7 Ports on the CE88-D16Q card



1. Sixteen 40GE QSFP+ optical ports

40GE QSFP+ optical port

Table 5-12 describes the attributes of a 40GE QSFP+ optical port.

Table 5-12 Attributes of a 40GE QSFP+ optical port

Attribute	Description
Connector type	Depends on the optical module used.
Optical attributes	Depends on the QSFP+ optical module used. See 40GE QSFP+ Optical Modules.

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Attribute	Description
Applicable cables	When the port works in 40GE mode, it can use: • QSFP+ optical module and MPO-MPO or LC-LC optical fiber • QSFP+ to QSFP+ high-speed cable • QSFP+ to QSFP+ AOC cable
	When the port works in 2*10GE mode, it can use: • QSFP+ optical module and MPO-4*DLC or MPO-8*FC optical fiber (Among the four pairs of DLC or FC fibers, only the two pairs marked 1 and 2 can be used to connect to remote interfaces.) • QSFP+ to 4*SFP+ high-speed cable (Among the four SFP+ wires, only the two marked A and B can be used to connect to remote interfaces.) • QSFP+ to 4*SFP+ AOC cable (Among the four SFP+ wires, only the two marked 1 and 2 can be used to connect to remote interfaces.)

Specifications

Table 5-13 lists technical specifications of the CE88-D16Q card.

Table 5-13 Technical specifications

Item	Description
Physical specifications	• Dimensions (W x D x H): 210.0 mm x 205.2 mm x 41.8 mm (8.3 in. x 8.1 in. x 1.6 in.) • Weight: 1.3 kg (2.87 lb) • Typical power consumption: 27 W • Maximum power consumption: 58 W • Typical heat dissipation: 92 BTU/hr • Maximum heat dissipation: 198 BTU/hr
Environment parameters	• Operating temperature: 0°C to 40°C (32°F to 104°F) • Relative humidity: 5% RH to 95% RH • Storage temperature: -40°C to +70°C (-40°F to +158°F)

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Ordering Information

Table 5-14 provides the ordering information.

Table 5-14 Ordering information

Part Number	Card Model	Card Description
03023CRR	CE88-D16Q	16-port 40GE interface card (QSFP+)

5.5 CE88-D24T2CQ (24-Port GE/10GBASE-T (RJ45) and 2-Port 40GE/100GE (QSFP28) Interface Card)

Version Mapping

Table 5-15 describes the mapping between the CE88-D24T2CQ card, switch models, and software versions.

Table 5-15 Version mapping

Switch Model	CE88-D24T2CQ
CE7800, CE6800, and CE5800 series switches and the CE8850EI	Not supported
CE8860-4C-EI	Supported in V100R006C00 and later versions
CE8861-4C-EI CE8868-4C-EI	Supported in V200R005C10 and later versions

Card Overview

The CE88-D24T2CQ card can be install in any slot of the CE8860-4C-EI, CE8861-4C-EI, or CE8868-4C-EI chassis.

Figure 5-8 shows the appearance of the CE88-D24T2CQ card.

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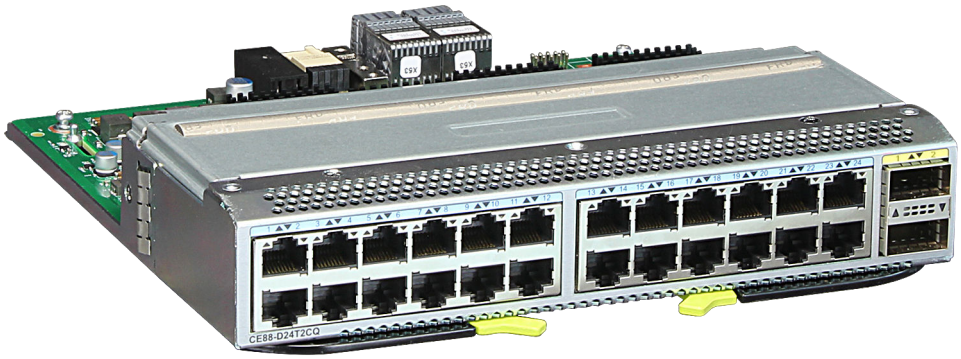
Figure 5-8 CE88-D24T2CQ card



Functions and Features

Table 5-16 describes functions and features of the CE88-D24T2CQ card.

Table 5-16 Functions and features

Function and Feature	Description
Basic function	Provides data packet processing and traffic management on 24 GE/10GBASE-T RJ45 electrical ports and 2 40GE/100GE QSFP28 optical ports.
Port split	Each QSFP28 optical port can be split into four 25GE ports or four 10GE ports. Such 25GE or 10GE ports cannot work at 1 Gbit/s. **NOTE** The two QSFP28 ports are independent, and each can be configured as four 10GE or 25GE ports.
Hot swap	Supported
Service port stacking	Ports on the card can be used as stack ports.

Indicators and Ports

Figure 5-9 shows indicators on the CE88-D24T2CQ panel.

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Figure 5-9 Indicators on the CE88-D24T2CQ panel

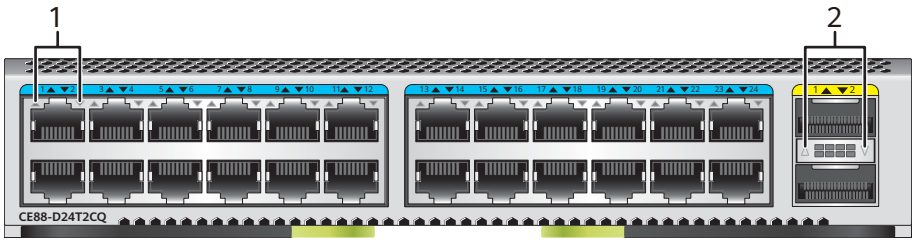

Table 5-17 describes indicators on the CE88-D24T2CQ panel.

Table 5-17 Indicator description

Number	Indicator	Color	Status	Description
1	RJ45 electrical ports: one single-color indicator for each port **NOTE** Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.
			Blinking	The port is transmitting or receiving data.
2	QSFP28 optical ports: one single-color indicator for each port	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.

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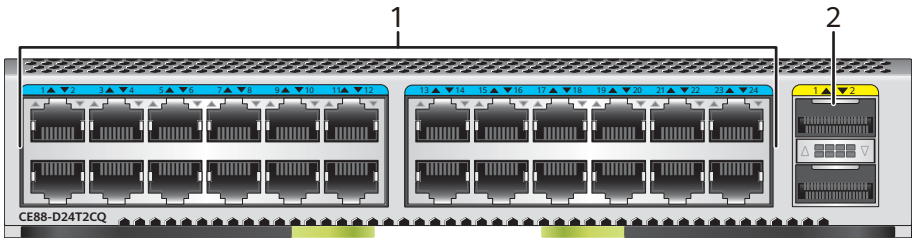
Number	Indicator	Color	Status	Description
	NOTE Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.		Blinking	The port is transmitting or receiving data.

Figure 5-10 shows the ports on the CE88-D24T2CQ card.

Figure 5-10 Ports on the CE88-D24T2CQ card



1. Twenty-four GE/10GBASE-T RJ45 electrical ports	2. Two 40GE/100GE QSFP28 optical ports

GE/10GBASE-T RJ45 electrical port

The 24 GE/10GBASE-T RJ45 electrical ports on the CE88-D24T2CQ card can only transmit services at 1000 Mbit/s or 10 Gbit/s and cannot work at 100 Mbit/s. The ports must use Category 6A shielded twisted pair (STP) cables. **Table 5-18** describes attributes of a GE/10GBASE-T RJ45 electrical port.

Table 5-18 Attributes of a GE/10GBASE-T RJ45 electrical port

Attribute	Description
Connector type	RJ45
Standards compliance	IEEE802.3an, IEEE802.3az

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Attribute	Description
Applicable cables	Straight-through cable and crossover cable
Working Mode	1000 Mbit/s or 10 Gbit/s Full-duplex
Maximum transmission distance	100 m

40GE/100GE QSFP28 optical port

Table 5-19 describes the attributes of a 40GE/100GE QSFP28 optical port.

Table 5-19 Attributes of a 40GE/100GE QSFP28 optical port

Attribute	Description
Connector type	Depends on the optical module used.
Optical attributes	Depends on the QSFP+ or QSFP28 optical module used. See 40GE QSFP+ Optical Modules or 100GE QSFP28 Optical Modules.
Applicable cables	When the port works in 100GE mode, it can use: • QSFP28 optical module and MPO-MPO or LC-LC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to QSFP28 high-speed cable • QSFP28 to QSFP28 AOC cable
	When the port works in 40GE mode, it can use: • QSFP+ optical module and MPO-MPO or LC-LC optical fiber • QSFP+ to QSFP+ high-speed cable • QSFP+ to QSFP+ AOC cable

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Attribute	Description
	When the port works in 4*25GE mode, it can use: • QSFP28 optical module and MPO-4*DLC or MPO-8*FC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to 4*SFP28 high-speed cable **NOTE** When a QSFP28-100G-SR4 optical module is installed on the port, the port cannot be connected to a port with an SFP-25G-SR optical module. When a QSFP28 to 4*SFP28 high-speed cable is installed on the port: • If auto-negotiation is disabled on the remote port, the local port supports only the QSFP-4SFP25G-CU1M or QSFP-4SFP25G-CU3M-N high-speed cable. • If auto-negotiation is disabled and Base-R FEC is enabled on the remote port, the local port supports only the QSFP-4SFP25G-CU3M high-speed cable.
	When the port works in 4*10GE mode, it can use: • QSFP+ optical module and MPO-4*DLC or MPO-8*FC optical fiber • QSFP+ to 4*SFP+ high-speed cable • QSFP+ to 4*SFP+ AOC cable

Specifications

Table 5-20 lists technical specifications of the CE88-D24T2CQ card.

Table 5-20 Technical specifications

Item	Description
Physical specifications	• Dimensions (W x D x H): 210.0 mm x 205.2 mm x 41.8 mm (8.3 in. x 8.1 in. x 1.6 in.) • Weight: 1.3 kg (2.87 lb) • Typical power consumption: 72 W • Maximum power consumption: 109 W • Typical heat dissipation: 246 BTU/hr • Maximum heat dissipation: 372 BTU/hr

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Item	Description
Environment parameters	• Operating temperature: 0°C to 40°C (32°F to 104°F) • Relative humidity: 5% RH to 95% RH • Storage temperature: -40°C to +70°C (-40°F to +158°F)

Ordering Information

Table 5-21 provides the ordering information.

Table 5-21 Ordering information

Part Number	Card Model	Card Description
03023CRP	CE88-D24T2CQ	24-port GE/10GBASE-T (RJ45) and 2-port 40GE/100GE (QSFP28) interface card

5.6 CE88-D24S2CQ (24-Port 10GE/25GE (SFP28) and 2-Port 40GE/100GE (QSFP28) Interface Card)

Version Mapping

Table 5-22 describes the mapping between the CE88-D24S2CQ card, switch models, and software versions.

Table 5-22 Version mapping

Switch Model	CE88-D24S2CQ
CE7800, CE6800, and CE5800 series switches and the CE8850EI	Not supported
CE8860-4C-EI	Supported in V100R006C00 and later versions

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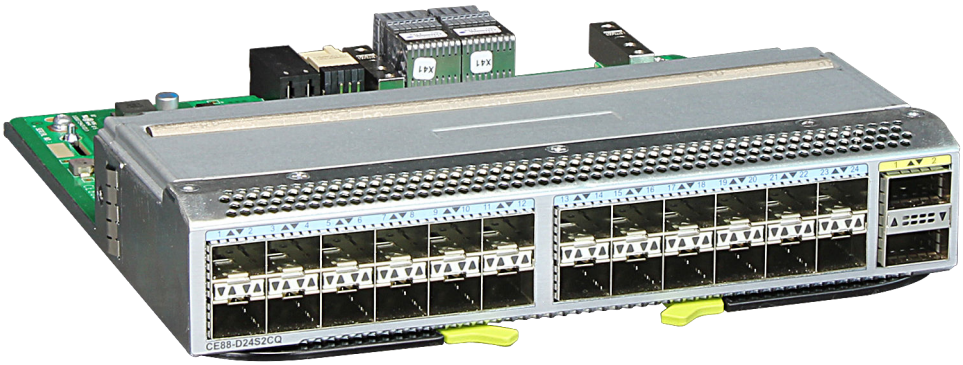
Switch Model	CE88-D24S2CQ
CE8861-4C-EI CE8868-4C-EI	Supported in V200R005C10 and later versions **NOTE** • By default, the 25GE interfaces on the CE88-D24S2CQ subcard of the CE8868EI work at the rate of 10 Gbit/s. After the license is loaded, you can run the **undo port mode 10g** command to set the interface to work at the rate of 25 Gbit/s. To use the 25GE interfaces on these subcards of the CE8868EI, apply for and purchase the license from the equipment supplier. • For the CE8868EI, after the above license is loaded, you need to run the **active card-license** command to enable the corresponding license in the specified subcard slot. The CE8868EI has four subcard slots. You can purchase licenses based on the number of required subcard slots.

Card Overview

The CE88-D24S2CQ card can be install in any slot of the CE8860-4C-EI, CE8861-4C-EI, or CE8868-4C-EI chassis.

Figure 5-11 shows the appearance of the CE88-D24S2CQ card.

Figure 5-11 CE88-D24S2CQ card



Functions and Features

Table 5-23 describes functions and features of the CE88-D24S2CQ card.

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Table 5-23 Functions and features

Function and Feature	Description
Basic function	Provides data packet processing and traffic management on 24 10GE/25GE SFP28 optical ports and 2 40GE/100GE QSFP28 optical ports.
Port split	Each QSFP28 optical port can be split into four 25GE ports or four 10GE ports. Such 25GE or 10GE ports cannot work at 1 Gbit/s.
Hot swap	Supported
Service port stacking	Ports on the card can be used as stack ports. **NOTE** SFP28 ports that have GE copper modules, GE optical modules, 10GE optical modules, 10GE high-speed cables, or 10GE AOC cables installed cannot be used for stack connections.

Indicators and Ports

Figure 5-12 shows indicators on the CE88-D24S2CQ panel.

Figure 5-12 Indicators on the CE88-D24S2CQ panel

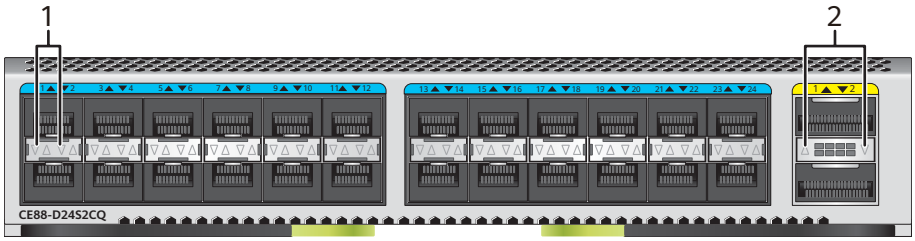

Table 5-24 describes indicators on the CE88-D24S2CQ panel.

Table 5-24 Indicator description

Number	Indicator	Color	Status	Description
1	SFP28 optical ports: two single-color indicators	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.

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Number	Indicator	Color	Status	Description
	for each port • Steady green: LINK indicator • Blinking yellow: ACT indicator **NOTE** Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.	Yellow	Off	The port is not transmitting or receiving data.
			Blinking	The port is transmitting or receiving data.
2	QSFP28 optical ports: one single-color indicator for each port **NOTE** Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.
			Blinking	The port is transmitting or receiving data.

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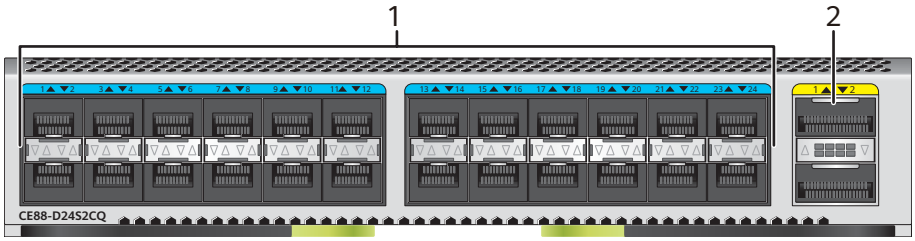
Figure 5-13 shows the ports on the CE88-D24S2CQ card.

Figure 5-13 Ports on the CE88-D24S2CQ card



1. Twenty-four 10GE/25GE SFP28 optical ports	2. Two 40GE/100GE QSFP28 optical ports

10GE/25GE SFP28 optical port

Table 5-25 describes attributes of a 10GE/25GE SFP28 optical port.

Table 5-25 Attributes of a 10GE/25GE SFP28 optical port

Attribute	Description
Connector type	Depends on the optical module used.
Optical attributes	Depends on the optical module used.

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Attribute	Description
Port use constraints	The 24 10GE/25GE SFP28 optical ports on the CE88-D24S2CQ card of CE8868EI work at 10 Gbit/s by default. You can set the port speed to 1 Gbit/s using the **port mode ge** command. After the corresponding license is loaded, you can run the **undo port mode 10g** command to set the interface to work at the rate of 25 Gbit/s. In addition to CE8868EI, the 24 10GE/25GE SFP28 optical ports of a CE88-D24S2CQ card work at 25 Gbit/s by default. You can set the port speed to 10 Gbit/s or 1 Gbit/s using the **port mode 10g** or **port mode ge** command. The 24 10GE/25GE SFP28 optical ports are divided into 6 port groups, with four ports in each group (1-4, 5-8, 9-12...21-24). ● If the speed of any port in a port group is set to 1 Gbit/s, 10G bit/s, or 25G bit/s, all the other ports in this group also work at 1 Gbit/s, 10G bit/s, or 25G bit/s. ● When the ports in a port group work at 25 Gbit/s, they support only 25GE modules or cables and will go Down if other types of modules or cables are used. When the ports in a port group work at 10 Gbit/s, they support only 10GE or 25GE variable-rate modules or cables and will go Down if other types of modules or cables are used. When the ports in a port group work at 1 Gbit/s, they support only GE modules or cables and will go Down if other types of modules or cables are used. ● If the switch is running a version earlier than V200R002C50, the ports in a port group must use the same type of transmission medium (copper or fiber). This constraint does not apply to V200R002C50 and later versions. ● A 25GE optical interface does not support auto-negotiation when it has a GE optical module installed. To connect the two interfaces at both ends of a link, disable auto-negotiation on the peer interface. Otherwise, one interface may go Up and the other may go Down.

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Attribute	Description
Applicable cables **NOTE** After a CE88-D24S2CQ card is installed on the CE8860EI, 10GE/25GE SFP28 optical ports on the card do not support SFP-25G-SR optical modules.	When the port works in GE or 10GE mode, it can use: • 10GE optical module (OSXD22N00, LE2MXSC80FF0 and SFP-10G-ZDWT-L not supported) • GE optical module (supported from V200R005C00 version) • GE cooper module (supported from V200R005C00 version and only works at 1000 Mbit/s) • SFP+ to SFP+ high-speed cable • SFP+ to SFP+ AOC cable
	When the port works in 25GE mode, it can use: • SFP-25G-SR optical module • SFP28 to SFP28 AOC cable • SFP28 to SFP28 high-speed cable (1m or 3m) **NOTE** The port supports the SFP28 to SFP28 AOC cable only when FEC is disabled on the remote port. When an SFP28 to SFP28 high-speed cable is installed on the port: • If auto-negotiation is disabled on the remote port, the local port supports only the SFP-25G-CU1M or SFP-25G-CU3M-N high-speed cable. • If auto-negotiation is disabled and Base-R FEC is enabled on the remote port, the local port supports only the SFP-25G-CU3M high-speed cable.

40GE/100GE QSFP28 optical port

Table 5-26 describes the attributes of a 40GE/100GE QSFP28 optical port.

Table 5-26 Attributes of a 40GE/100GE QSFP28 optical port

Attribute	Description
Connector type	Depends on the optical module used.
Optical attributes	Depends on the QSFP+ or QSFP28 optical module used. See 40GE QSFP+ Optical Modules or 100GE QSFP28 Optical Modules.

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Attribute	Description
Applicable cables	When the port works in 100GE mode, it can use: • QSFP28 optical module and MPO-MPO or LC-LC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to QSFP28 high-speed cable • QSFP28 to QSFP28 AOC cable
	When the port works in 40GE mode, it can use: • QSFP+ optical module and MPO-MPO or LC-LC optical fiber • QSFP+ to QSFP+ high-speed cable • QSFP+ to QSFP+ AOC cable
	When the port works in 4*25GE mode, it can use: • QSFP28 optical module and MPO-4*DLC or MPO-8*FC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to 4*SFP28 high-speed cable **NOTE** When a QSFP28-100G-SR4 optical module is installed on the port, the port cannot be connected to a port with an SFP-25G-SR optical module. When a QSFP28 to 4*SFP28 high-speed cable is installed on the port: • If auto-negotiation is disabled on the remote port, the local port supports only the QSFP-4SFP25G-CU1M or QSFP-4SFP25G-CU3M-N high-speed cable. • If auto-negotiation is disabled and Base-R FEC is enabled on the remote port, the local port supports only the QSFP-4SFP25G-CU3M high-speed cable.
	When the port works in 4*10GE mode, it can use: • QSFP+ optical module and MPO-4*DLC or MPO-8*FC optical fiber • QSFP+ to 4*SFP+ high-speed cable • QSFP+ to 4*SFP+ AOC cable

Specifications

Table 5-27 lists technical specifications of the CE88-D24S2CQ card.

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Table 5-27 Technical specifications

Item	Description
Physical specifications	• Dimensions (W x D x H): 210.0 mm x 205.2 mm x 41.8 mm (8.3 in. x 8.1 in. x 1.6 in.) • Weight: 1.4 kg (3.09 lb) • Typical power consumption: 43 W • Maximum power consumption: 71 W • Typical heat dissipation: 147 BTU/hr • Maximum heat dissipation: 243 BTU/hr
Environment parameters	• Operating temperature: 0°C to 40°C (32°F to 104°F) • Relative humidity: 5% RH to 95% RH • Storage temperature: -40°C to +70°C (-40°F to +158°F)

Ordering Information

Table 5-28 provides the ordering information.

Table 5-28 Ordering information

Part Number	Card Model	Card Description
03023CRM	CE88-D24S2CQ	24-port 10GE/25GE (SFP28) and 2-port 40GE/100GE (QSFP28) interface card

5.7 CE88-D24S2CQ-U (24-Port 25GE/16G FC (SFP28) and 2-Port 40GE/100GE (QSFP28) Interface Card)

Version Mapping

Table 5-29 describes the mapping between the CE88-D24S2CQ-U card, switch models, and software versions.

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Table 5-29 Version mapping

Switch Model	CE88-D24S2CQ-U
CE7800, CE6800, and CE5800 series switches, CE8850EI, and the CE8868-4C-EI	Not supported
CE8860-4C-EI	Supported in V200R003C00 and later version
CE8861-4C-EI	Supported in V200R005C10 and later version

Card Overview

The CE88-D24S2CQ-U card can be install in any slot of the CE8860-4C-EI or CE8861-4C-EI chassis.

Figure 5-14 shows the appearance of the CE88-D24S2CQ-U card.

Figure 5-14 CE88-D24S2CQ-U card

Functions and Features

Table 5-30 describes functions and features of the CE88-D24S2CQ-U card.

Table 5-30 Functions and features

Function and Feature	Description
Basic function	Provides data packet processing and traffic management on 24 25GE/10GE SFP28 optical ports and two 40GE/100GE QSFP28 optical ports. The 24 25GE/10GE SFP28 optical ports can be configured as 24 FC interfaces (supporting rates of 4 Gbit/s, 8 Gbit/s, and 16 Gbit/s).

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Function and Feature	Description
Port split	Each QSFP28 optical port can be split into four 25GE ports or four 10GE ports. Such 25GE or 10GE ports cannot work at 1 Gbit/s.
Hot swap	Supported
Service port stacking	Ports on the card can be used as stack ports. **NOTE** 24 25GE/16G FC optical ports cannot be used for stack connections.

Indicators and Ports

Figure 5-15 shows indicators on the CE88-D24S2CQ-U panel.

Figure 5-15 Indicators on the CE88-D24S2CQ-U panel

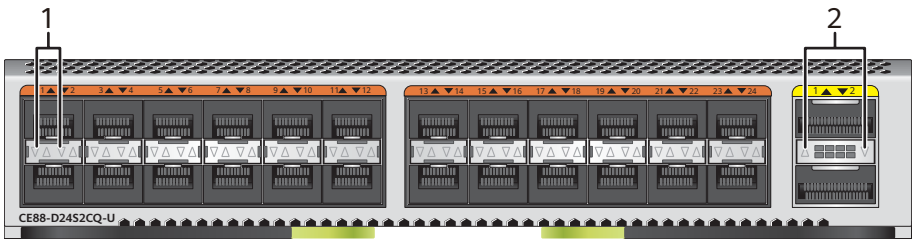

Table 5-31 describes indicators on the CE88-D24S2CQ-U panel.

Table 5-31 Indicator description

Number	Indicator	Color	Status	Description
1	SFP28 optical ports: two single-color indicators for each port • Steady green: LINK indicator	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.
		Yellow	Off	The port is not transmitting or receiving data.

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Number	Indicator	Color	Status	Description
	• Blinking yellow: ACT indicator **NOTE** Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.		Blinking	The port is transmitting or receiving data.
2	QSFP28 optical ports: one single-color indicator for each port **NOTE** Arrowheads show the positions of ports. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.	Green	Off	No link is established on the port.
			Steady on	A link has been established on the port.
			Blinking	The port is transmitting or receiving data.

Figure 5-16 shows the ports on the CE88-D24S2CQ-U card.

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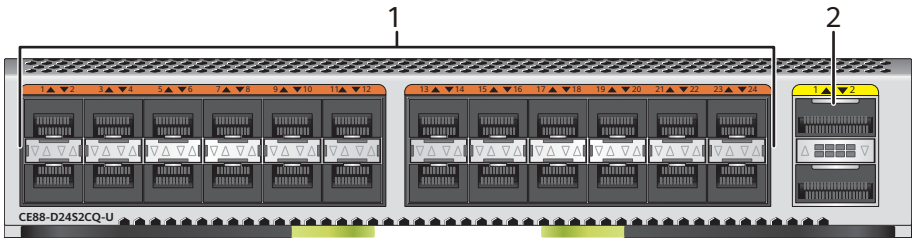
Figure 5-16 Ports on the CE88-D24S2CQ-U card



1. 24 25GE/16G FC (SFP28) optical ports	2. Two 40GE/100GE QSFP28 optical ports

25GE/16G FC (SFP28) optical port

25GE/16G FC (SFP28) optical ports cannot work at 100 Mbit/s. **Table 5-32** describes attributes of a 25GE/16G FC (SFP28) optical port.

Table 5-32 Attributes of a 25GE/16G FC (SFP28) optical port

Attribute	Description
Connector type	Depending on the optical module used.
Optical attributes	Depending on the optical module used.

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Attribute	Description
Port use constraints	The 24 25GE/16G FC (SFP28) optical ports of the CE88-D24S2CQ-U work at 25 Gbit/s by default and do not support GE/10GE auto-sensing. You can set the port speed to 10 Gbit/s or 1 Gbit/s using the **port mode 10g** or **port mode ge** command. The 24 25GE/16G FC (SFP28) optical ports are divided into six port groups, each of which contains four ports (1-4, 5-8, 9-12...21-24). ● If the speed of any port in a port group is set to 1 Gbit/s, 10G bit/s, or 25G bit/s, all the other ports in this group also work at 1 Gbit/s, 10G bit/s, or 25G bit/s. ● When the ports in a port group work at 25 Gbit/s, they support only 25GE modules or cables and will go Down if other types of modules or cables are used. When the ports in a port group work at 10 Gbit/s, they support only 10GE or 25GE variable-rate modules or cables and will go Down if other types of modules or cables are used. When the ports in a port group work at 1 Gbit/s, they support only GE modules or cables and will go Down if other types of modules or cables are used. ● The maximum rate supported by a 16GE FC optical port is 14 Gbit/s. ● A 25GE optical interface does not support auto-negotiation when it has a GE optical module installed. To connect the two interfaces at both ends of a link, disable auto-negotiation on the peer interface. Otherwise, one interface may go Up and the other may go Down.
Applicable cables	When the port works in 10GE mode, it can use: ● 10GE optical module (OSXD22N00, LE2MXSC80FF0 and SFP-10G-ZDWT-L not supported) ● GE cooper module (supported from V200R005C100 version and only works at 1000 Mbit/s) ● GE optical module (supported from V200R005C100 version) ● SFP+ to SFP+ high-speed cable ● SFP+ to SFP+ AOC cable

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Attribute	Description
	When the port works in 25GE mode, it can use: • SFP-25G-SR optical module • SFP28 to SFP28 AOC cable • SFP28 to SFP28 high-speed cable (1m, 3m, or 5m)
	When the port is configured as an FC port, it can use: • 4G/8G/16G SFP optical module and LC optical fiber

40GE/100GE QSFP28 optical port

Table 5-33 describes the attributes of a 40GE/100GE QSFP28 optical port.

Table 5-33 Attributes of a 40GE/100GE QSFP28 optical port

Attribute	Description
Connector type	Depends on the optical module used.
Optical attributes	Depends on the QSFP+ or QSFP28 optical module used. See 40GE QSFP+ Optical Modules or 100GE QSFP28 Optical Modules.
Applicable cables	When the port works in 100GE mode, it can use: • QSFP28 optical module and MPO-MPO or LC-LC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to QSFP28 high-speed cable • QSFP28 to QSFP28 AOC cable
	When the port works in 40GE mode, it can use: • QSFP+ optical module and MPO-MPO or LC-LC optical fiber • QSFP+ to QSFP+ high-speed cable • QSFP+ to QSFP+ AOC cable

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Attribute	Description
	When the port works in 4*25GE mode, it can use: • QSFP28 optical module and MPO-4*DLC or MPO-8*FC optical fiber (QSFP28-100G-4WDM-40 not supported) • QSFP28 to 4*SFP28 high-speed cable **NOTE** When a QSFP28-100G-SR4 optical module is installed on the port, the port cannot be connected to a port with an SFP-25G-SR optical module. When a QSFP28 to 4*SFP28 high-speed cable is installed on the port: • If auto-negotiation is disabled on the remote port, the local port supports only the QSFP-4SFP25G-CU1M or QSFP-4SFP25G-CU3M-N high-speed cable. • If auto-negotiation is disabled and Base-R FEC is enabled on the remote port, the local port supports only the QSFP-4SFP25G-CU3M high-speed cable.
	When the port works in 4*10GE mode, it can use: • QSFP+ optical module and MPO-4*DLC or MPO-8*FC optical fiber • QSFP+ to 4*SFP+ high-speed cable • QSFP+ to 4*SFP+ AOC cable

Specifications

Table 5-34 lists technical specifications of the CE88-D24S2CQ-U card.

Table 5-34 Technical specifications

Item	Description
Physical specifications	• Dimensions (W x D x H): 210.0 mm x 205.2 mm x 41.8 mm (8.3 in. x 8.1 in. x 1.6 in.) • Weight: 1.4 kg (3.09 lb) • Typical power consumption: 43 W • Maximum power consumption: 71 W • Typical heat dissipation: 147 BTU/hr • Maximum heat dissipation: 243 BTU/hr

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Item	Description
Environment parameters	• Operating temperature: 0°C to 40°C (32°F to 104°F) • Relative humidity: 5% RH to 95% RH • Storage temperature: -40°C to +70°C (-40°F to +158°F)

Ordering Information

Table 5-35 provides the ordering information.

Table 5-35 Ordering information

Part Number	Card Model	Card Description
03024GEG	CE88-D24S2CQ-U	24-port 25GE/16G FC (SFP28) and 2-port 40GE/100GE (QSFP28) interface card

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