6 Cables

6.1 AC Power Cable

Types of AC Power Cables

NOTE

The AC power cables delivered must comply with the standards used in the delivery destination. This section uses the AC power cables complying with China's national standards as an example.

AC power cables are classified into two types: C13 straight female to PI straight male AC power cable and C13 straight female to C14 straight male AC power cable.

Appearance and Structure

Figure 6-1 shows the appearance of a C13 straight female to PI straight male AC power cable.

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Figure 6-1 C13 straight female to PI straight male AC power cable

Figure 6-2 shows the appearance of a C13 straight female to C14 straight male AC power cable.

Figure 6-2 C13 straight female to C14 straight male AC power cable

Connection

An AC power cable is connected to the AC power module of the device:

- The C13 straight female connector is connected to the power socket of a power module.
- The PI straight male or C14 straight male connector is connected to a power source.

When a 600 W AC&240 V DC power module or 1200 W AC&240 V DC power module uses 240 V high-voltage power input, it must be connected to the power supply device using a C13 straight female to C14 straight male AC power cable. This power cable is connected as follows:

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- The C13 straight female connector is connected to the power socket of the 600 W AC&240 V DC power module or 1200 W AC&240 V DC power module.
- The C14 straight male connector is connected to a high-voltage DC PDU. If a high-voltage DC power distribution box is used, make OT or cord end terminals for the cable. Cut the C14 straight male connector off and crimp OT or cord end terminals on the bare wires. Connect the blue wire to a positive terminal on the DC power distribution box, the brown wire to a negative terminal, and the yellow-green wire to a protection ground. If the switch fails to be powered on after you connect the power cable, swap the wires on the positive and negative terminals.

6.2 DC Power Cable

Appearance and Structure

DC power cables consist of the power cable for a 350 W/600 W DC power module, the power cable for a 1000 W DC power module, and the power cable for a 1200 W DC power module.

Figure 6-3 shows the appearance of the power cable for a 350 W/600 W DC power module.

Figure 6-3 Appearance of the power cable for a 350 W/600 W DC power module

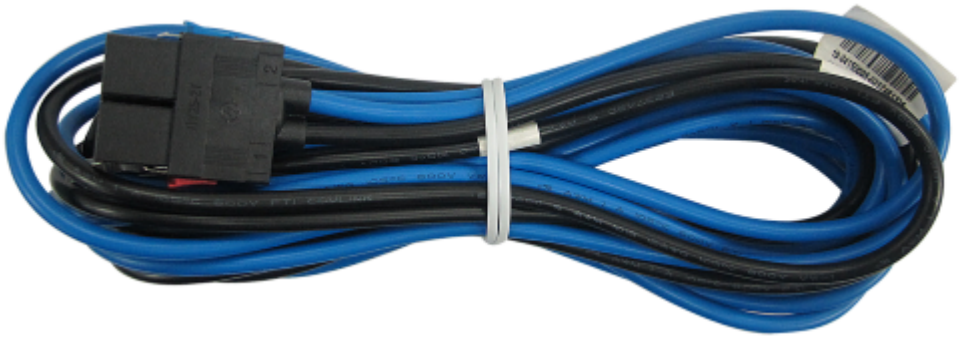

Figure 6-4 shows the structure of the power cable for a 350 W/600 W DC power module.

Figure 6-4 Structure of the power cable for a 350 W/600 W DC power module

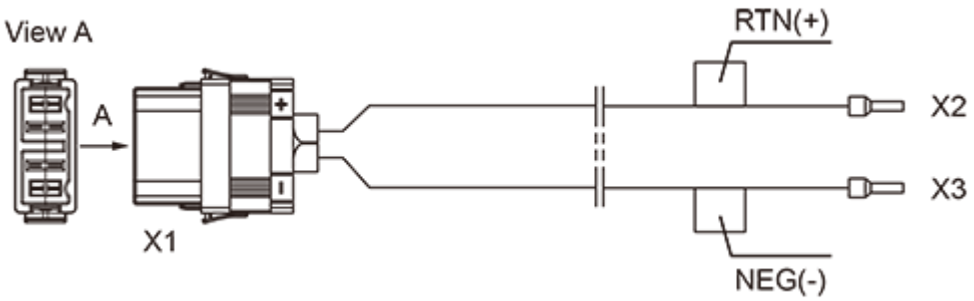

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Figure 6-5 shows the appearance of the power cable for a 1000 W DC power module.

Figure 6-5 Appearance of the power cable for a 1000 W DC power module

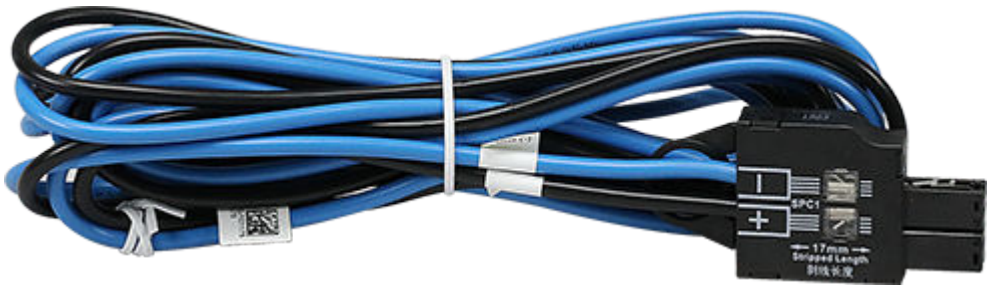

Figure 6-6 shows the structure of the power cable for a 1000 W DC power module.

Figure 6-6 Structure of the power cable for a 1000 W DC power module

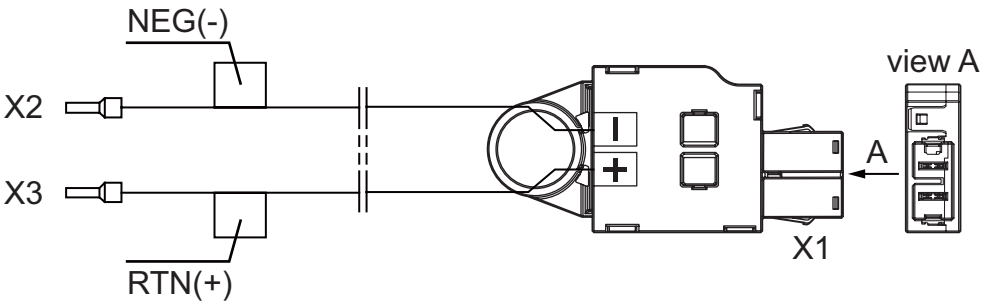

Figure 6-7 shows the appearance of the power cable for a 1200 W DC power module.

Figure 6-7 Appearance of the power cable for a 1200 W DC power module

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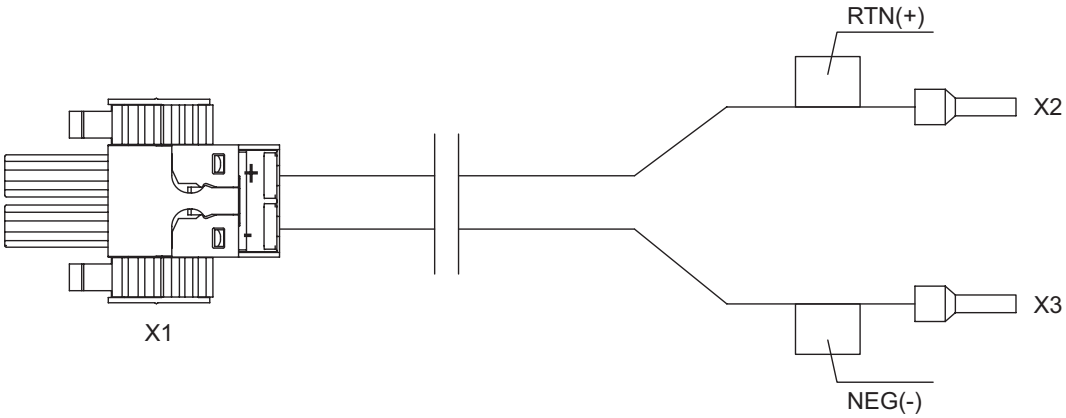
Figure 6-8 shows the structure of the power cable for a 1200 W DC power module.

Figure 6-8 Structure of the power cable for a 1200 W DC power module



Pin Assignments

Table 6-1 lists the pin assignments of the power cable for a 350 W/600 W DC power module.

Table 6-1 Pin assignments of the power cable for a 350 W/600 W DC power module

X1	X2	X3	Length	Conductor Cross-Sectional Area
2 female	Cord end terminal 4^2 grey	Cord end terminal 4^2 grey	3 m	3.332 mm^2 (12AWG)

Table 6-2 lists the pin assignments of the power cable for a 1000 W DC power module.

Table 6-2 Pin assignments of the power cable for a 1000 W DC power module

X1	X2	X3	Length	Conductor Cross-Sectional Area
2 female	Cord end terminal 4^2 grey	Cord end terminal 4^2 grey	3 m	4 mm^2 (14AWG)

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Table 6-3 lists the pin assignments of the power cable for a 1200 W DC power module.

Table 6-3 Pin assignments of the power cable for a 1200 W DC power module

X1	X2	X3	Length	Conductor Cross-Sectional Area
2 female	Cord end terminal 6^2 black	Cord end terminal 6^2 black	3 m	6 mm^2 (10AWG)

Connection

A DC power cable connects to the DC power module of the device:

- X1 connector connects to the input port on the DC power module.
- X2/X3 cord end terminal connects to an external power module.

6.3 380 V High-Voltage DC Power Cable

Appearance and Structure

Figure 6-9 shows the appearance of a 380 V high-voltage DC power cable.

Figure 6-9 380 V high-voltage DC power cable (high-voltage DC straight female connector to bare wires)

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Connection

A 380 V high-voltage DC power cable has a high-voltage DC straight female connector at one end and bare wires at the other end, and is used to connect a 600 W high-voltage DC power module or 1200 W high-voltage DC power module to a power supply device:

- The high-voltage DC straight female connector is connected to the power socket of the 600 W high-voltage DC power module or 1200 W high-voltage DC power module.
- The bare wires are connected to a 380 V high-voltage DC power distribution frame or power distribution box. Crimp OT or cord end terminals on the bare wires, and then connect the blue wire to a negative terminal, the brown wire to a positive terminal, and the yellow-green wire to a protection ground. If the switch fails to be powered on after you connect the power cable, swap the wires on the positive and negative terminals.

6.4 Ground Cable

Appearance and Structure

NOTE

Different types of ground cables have similar appearance, except for the cross-sectional area, size of the cable lugs, and cable length. The following figure is for reference.

Figure 6-10 shows the appearance of a ground cable.

Figure 6-10 Ground cable appearance

Figure 6-11 shows the structure of a ground cable.

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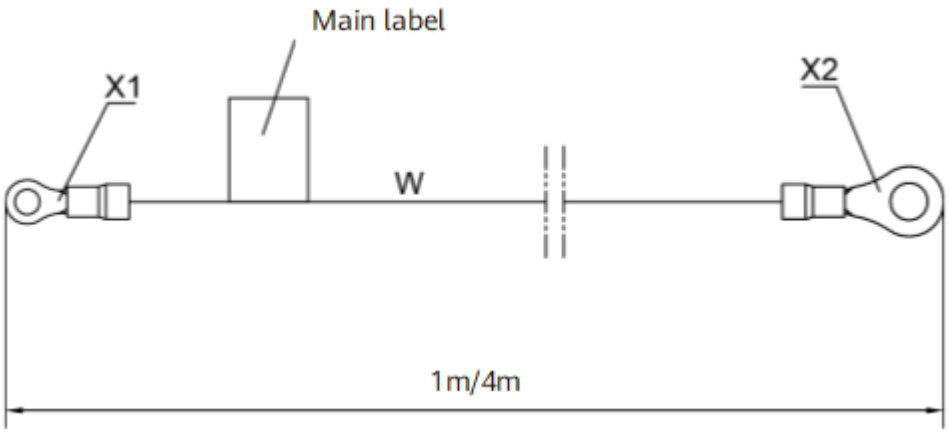
Figure 6-11 Ground cable structure



Pin Assignments

Table 6-4 lists the pin assignments of a ground cable.

Table 6-4 Pin assignments

X1	X2	Wire Color	Conductor Cross-Sectional Area	Length
OT6-4	OT6-6	Green-yellow	4 mm^2	1 m or 4 m **NOTE** The default ground cable delivered with a switch is 1 m long. You can also order a 4 m ground cable for a switch based on your installation environment.

Connection

A ground cable grounds a device to protect it from lightning and electromagnetic interference. A ground cable is connected to a chassis in the following way:

- The OT6-4 naked crimping connector connects to the ground point on the chassis.
- The OT6-6 naked crimping connector connects to the ground point on the cabinet.

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6.5 Console Cable

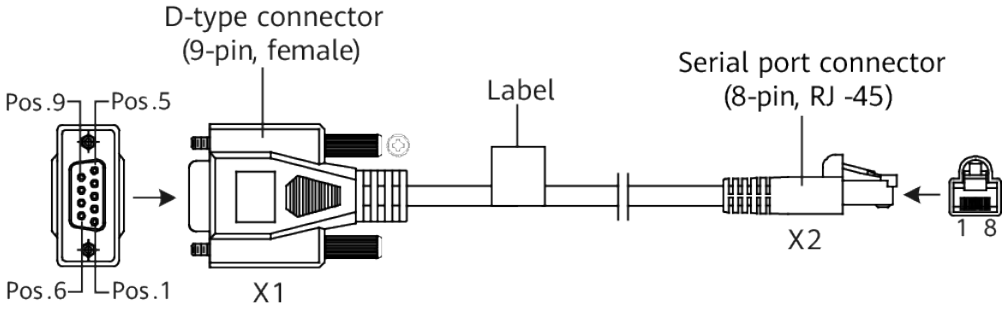
Appearance and Structure

Figure 6-12 shows the appearance of a console cable.

Figure 6-12 Console cable appearance

Figure 6-13 shows the structure of a console cable.

Figure 6-13 Console cable structure



Pin Assignments

Table 6-5 lists the pin assignments of console cable connectors.

Table 6-5 Pin assignments

Connector	X1 (DB-9)	X2 (RJ45)
Pin assignment	2	3
	3	6
	5	5

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Connection

A console cable connects the console port of a device to the serial port of an operation terminal, enabling users to commission or locally maintain the device.

A console cable connects a device and a console as follows:

- The 8-pin RJ45 connector is connected to the console port of the device.
- The DB-9 female connector is connected to a maintenance terminal, such as a computer.

6.6 Ethernet Cable

Types of Ethernet Cables

Ethernet cables are classified into straight-through cables and crossover cables.

- Straight-through cable: The pin assignments of RJ45 connectors at both ends are shown in **Table 6-6**.
- Crossover cable: The pin assignments of RJ45 connectors at both ends are shown in **Table 6-7**.

Appearance and Structure

NOTE

- Straight-through cables and crossover cables are standard unshielded twisted pairs that use RJ45 connectors.
- A straight-through cable and a crossover cable have the same appearance.

Figure 6-14 and **Figure 6-15** show the appearance of an Ethernet cable.

Figure 6-14 Ethernet cable appearance (1)

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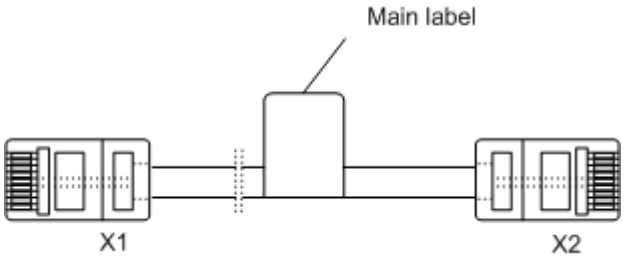
Figure 6-15 Ethernet cable appearance (2)

Figure 6-16 shows the structure of an Ethernet cable.

Figure 6-16 Ethernet cable structure



Pin Assignments

Table 6-6 lists the pin assignments of a straight-through cable.

Table 6-6 Pin assignments of a straight-through cable

X1 Pin	Wire Color	X2 Pin
1	White and orange	1
2	Orange	2
3	White and green	3
4	Blue	4
5	White and blue	5

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X1 Pin	Wire Color	X2 Pin
6	Green	6
7	White and brown	7
8	Brown	8

Table 6-7 lists the pin assignments of a crossover cable.

Table 6-7 Pin assignments of a crossover cable

X1 Pin	Wire Color	X2 Pin
1	White and orange	3
2	Orange	6
3	White and green	1
4	Blue	4
5	White and blue	5
6	Green	2
7	White and brown	7
8	Brown	8

NOTE

To achieve the best electrical transmission performance, ensure that the wires connected to pins 1 and 2 and to pins 3 and 6 are twisted pairs.

Connection

Ethernet cables connect network devices to each other to enable the devices to communicate or to allow local maintenance and remote access.

- A straight-through cable connects a terminal (such as a PC or switch) to a network device.
- A crossover cable connects two terminals (such as PCs and switches).

Supported Cabling Types for 10GBASE-T

Table 6-8 describes the supported cabling types for a 10GBASE-T Ethernet electrical port.

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Table 6-8 Supported cabling types for 10GBASE-T

Item	Category 7 STP	Category 6A STP	Category 6A F/UTP	Category 6A U/UTP	Category 6 STP	Category 6 UTP
Cable Description	Category 7 shielded twisted pair (STP)	Category 6A shielded twisted pair	Category 6A foiled/ unshielded twisted pair (Cat6A F/UTP)	Not supported	Not supported	Not supported
Type	Class F	Class Ea	Class Ea			
Maximum transmission distance	100 m	100 m	100 m			
Cabling system bandwidth	600 MHz **NOTE** The cabling system exceeds the requirements for IEEE 10GBASE-T performance.	500 MHz **NOTE** The cabling system exceeds the requirements for IEEE 10GBASE-T performance.				

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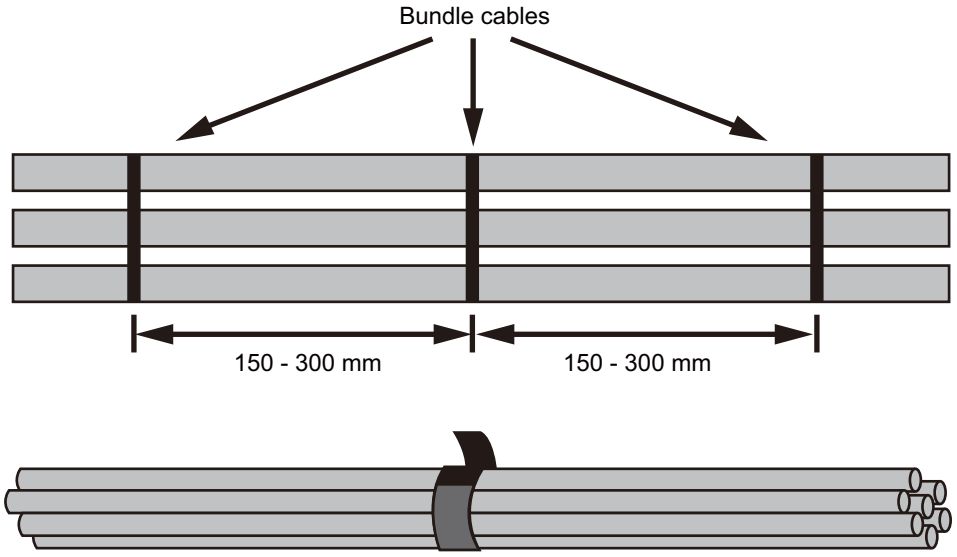
NOTE

- In a new built equipment room, Category 6A shielded twisted pairs or Category 7 twisted pairs are recommended. These cables can avoid alien crosstalk while having no special installation requirements. In addition, they can be used with other types of cables.
- If Category 6A foiled/unshielded twisted pairs are used in an equipment room and the cabling systems can meet requirements of TSB-155, follow these rules route these cables:
  - Separate these cables with other types of cables. If they must be routed in the same cable trough with other types of cables, separated them from other cables using a metal plate.
  - Separate cables as much as possible at the outlet and keep the cables parallel with each other. Most alien crosstalk appears within 20 m away from the outlet. To reduce alien crosstalk, do not bundle cables in the first 5 m to 20 m.
  - If cables need to be bundled, bundle cables with cable ties placed every 150 mm to 300 mm. See **Table 6-9**. Bundle cables loosely, as shown in **Figure 6-17**.
  - You are advised to add no more than 12 cables in a bundle. A bundle cannot have more than 24 cables.
- Strong interference may trigger the fast retrain function on 10GBASE-T Ethernet electrical ports, and a large number of bit errors occur for about 30 ms. To avoid this problem, keep the switch away from interference sources or take adequate interference shielding measures.

Table 6-9 Intervals between cable ties

Diameter of an Ethernet Cable Bundle (mm)	Interval Between Cable Ties (mm)
< 10	150
10-30	200
> 30	300

Figure 6-17 Method to bundle cables



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6.7 Clock Cable

Overview

The external clock ports of a switch are used for clock and time synchronization.

A clock cable connects a switch to an external clock source or a time source device.

When a switch connects to external devices through clock cables, it provides the following functions:

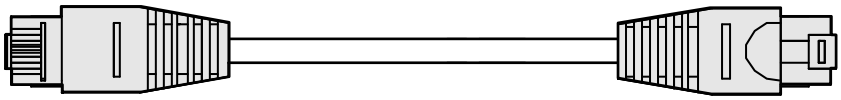
- Receives 2-channel 2.048 MHz or 2.048 Mbit/s clock signals from the upstream device and delivers 2-channel 2.048 MHz or 2.048 Mbit/s clock signals to the downstream device.
- Receives 2-channel ToD or DCLS time signals from the upstream device and delivers 2-channel ToD or DCLS time signals to the downstream device.

Appearance and Structure

RJ48 Cable

RJ48 cables applicable to the CE6875 switch are 120-ohm trunk cables (shielded cables), as shown in **Figure 6-18**.

Figure 6-18 Structure of a 120-ohm trunk cable



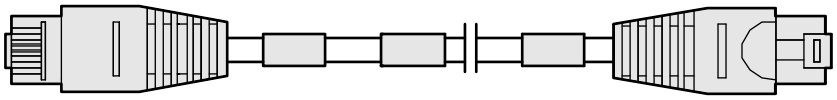
NOTE

An RJ48 cable can connect a CE6875 switch to a clock source device with an RJ45 interface.

RJ45 Cable

RJ45 cables applicable to the CE6875 switch are straight-through cables (shielded cables), as shown in **Figure 6-19**.

Figure 6-19 Structure of a straight-through cable



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NOTE

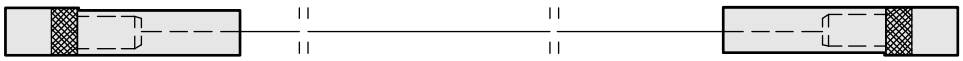
An RJ45 cable can connect a CE6875 switch to a time source device with an RJ45 interface.

To connect a switch to a clock source that has a sub-miniature B (SMB) or bayonet-neill-concelman (BNC) interface, use an RJ45 cable and a transmultiplexer.

SMB/SMB Trunk Cable

An SMB/SMB trunk cable is a 75-ohm trunk cable with SMB connectors at both ends, as shown in **Figure 6-20**.

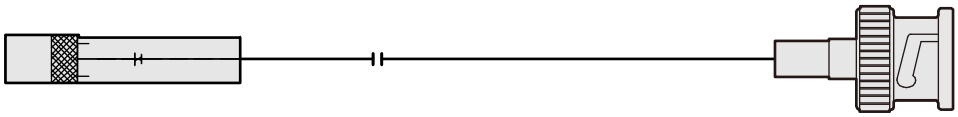
Figure 6-20 SMB/SMB trunk cable



SMB/BNC Trunk Cable

An SMB/BNC trunk cable is a 75-ohm trunk cable with an SMB connector and a BNC connector, as shown in **Figure 6-21**.

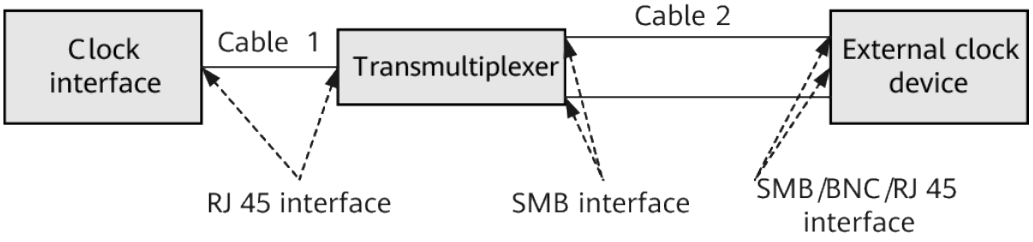
Figure 6-21 SMB/BNC trunk cable



Connection

One end of the clock cable is the RJ45 connector, which is connected to the BITS port on a CE6875 switch. The other end of the clock cable is connected to an external clock device. The connector type depends on the type of the external clock device. The external clock device can be a clock source that has an SMB, BNC, or RJ45 interface or a time source providing an RJ45 interface.

Figure 6-22 Clock cable connections



Based on the functions and interface types of the external clock device connected to the 6875 switch, the following cables can be selected:

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- When the connected device is a clock source with an RJ45 interface:

  Cable 1 can be an RJ48 cable. No transmultiplexer or cable 2 is required.
- When the connected device is a time source with an RJ45 interface:

  Cable 1 can be an RJ45 cable. No transmultiplexer or cable 2 is required.
- When the connected device is a clock source with an SMB interface:

  Cable 1 can be an RJ45 cable, and cable 2 can be an SMB/SMB trunk cable. A transmultiplexer is required.
- When the connected device is a clock source with a BNC interface:

  Cable 1 can be an RJ45 cable, and cable 2 can be an SMB/BNC trunk cable. A transmultiplexer is required.

6.8 Optical Fiber

Appearance and Structure

A fiber jumper consists of one or more fibers of a certain length and the optical connectors at both ends. A fiber jumper connects an optical module to a fiber terminal box.

NOTE

The MPO-MPO fibers for CE series switches use type B connectors (key Up/key Up).

Figure 6-23 shows the appearance of an LC single-mode fiber.

Figure 6-23 LC single-mode fiber appearance

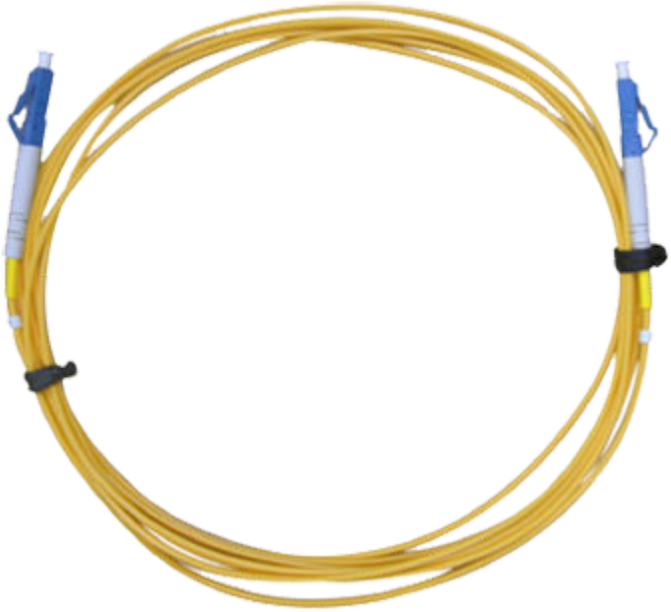

Figure 6-24 shows the appearance of an LC multi-mode fiber.

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Figure 6-24 LC multi-mode fiber appearance

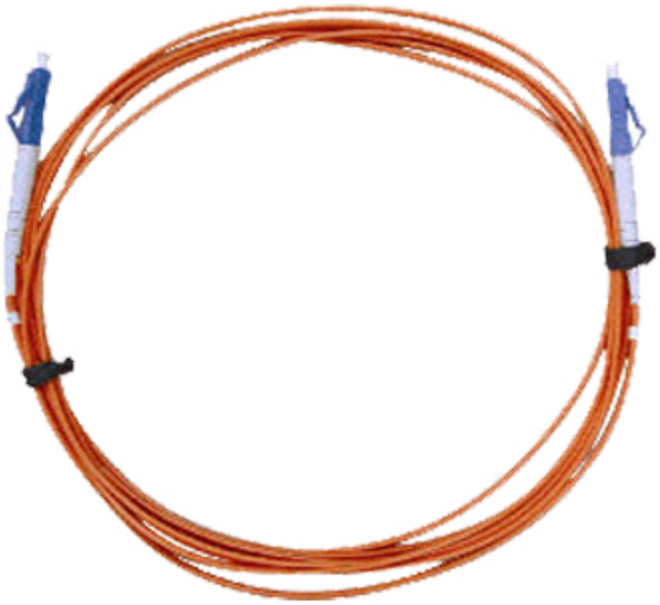

Figure 6-25 shows the appearance of an MPO-MPO fiber.

Figure 6-25 MPO-MPO fiber appearance

Figure 6-26 shows the appearance of an MPO-4*DLC fiber.

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Figure 6-26 MPO-4*DLC fiber appearance

Figure 6-27 shows the appearance of an MPO-8*FC fiber.

Figure 6-27 MPO-8*FC fiber appearance

The following figures show structures of various optical fibers.

1. Determine the length of fiber jumpers based on the onsite cabling distance.
2. Determine the fiber type based on the optical module type.
   - Use a multimode fiber jumper for a multimode optical module.
   - Use a single-mode fiber jumper for a single-mode optical module.
3. Determine the optical connector type based on the interface type.

   Ensure that the optical connector at each end of a fiber jumper is the same type as the interface to which it will be connected.

Figure 6-28 shows the structure of an 8-strand MPO-MPO fiber jumper.

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Figure 6-28 Structure of an 8-strand MPO-MPO fiber jumper

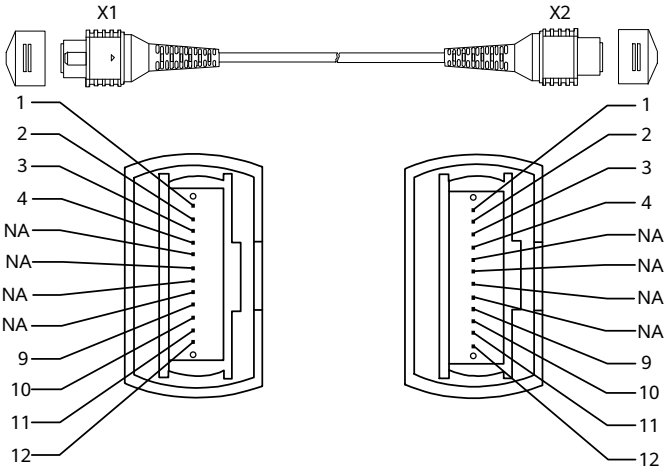

Figure 6-29 shows the structure of a 12-strand MPO-MPO fiber jumper.

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Figure 6-29 Structure of a 12-strand MPO-MPO fiber jumper

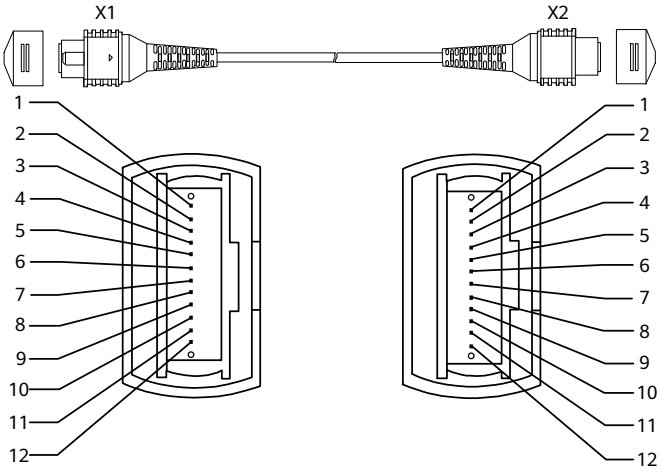

Figure 6-30 shows the structure of an MPO-4*DLC fiber.

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Figure 6-30 MPO-4*DLC fiber structure

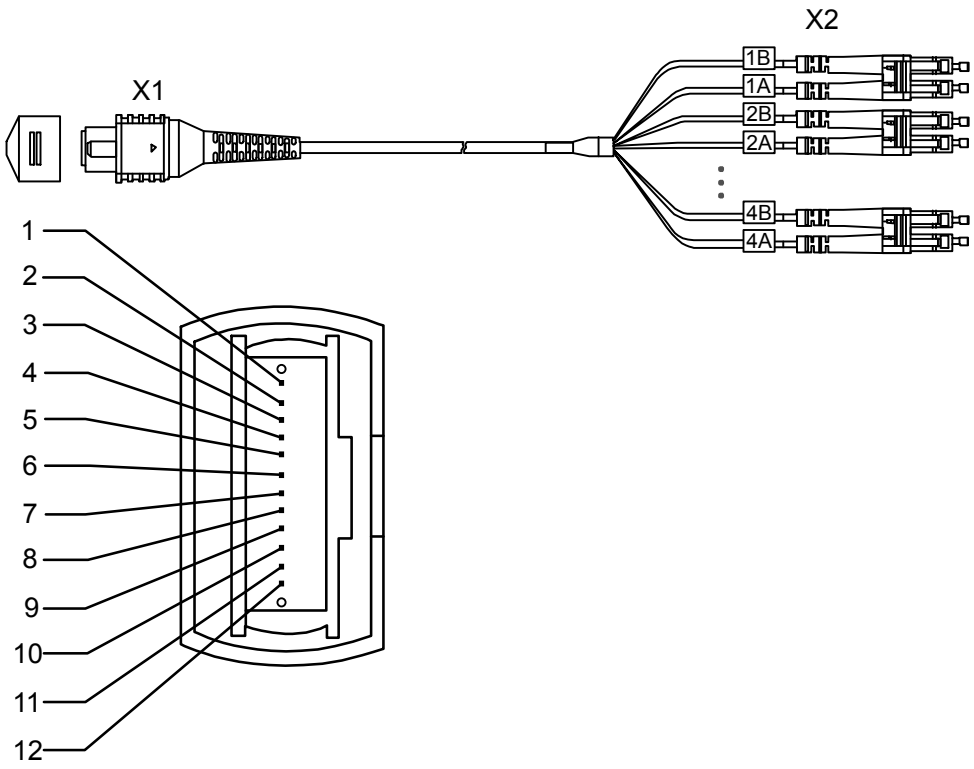

Figure 6-31 shows the structure of an MPO-8*FC fiber.

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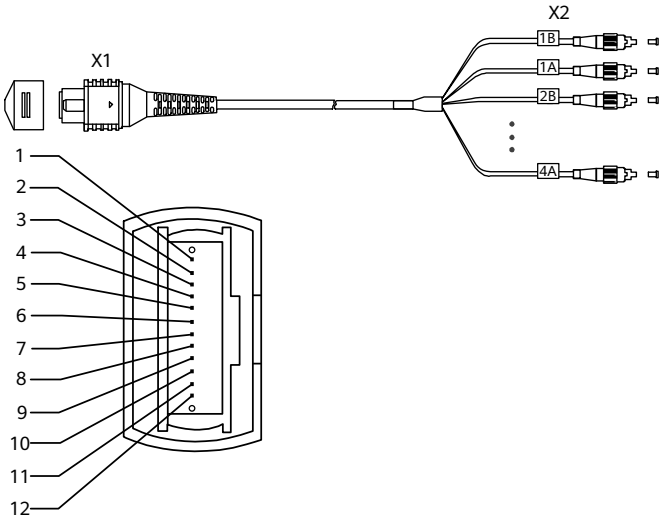
Figure 6-31 MPO-8*FC fiber structure



Pin Assignments

Table 6-10 lists the pin assignments of an 8-strand MPO-MPO fiber jumper.

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Table 6-10 Pin assignments of an 8-strand MPO-MPO fiber jumper

X1 Pin	X2 Pin
1	12
2	11
3	10
4	9
9	4
10	3
11	2
12	1

Table 6-11 lists the pin assignments of a 12-strand MPO-MPO fiber jumper.

Table 6-11 Pin assignments of a 12-strand MPO-MPO fiber jumper

X1 Pin	X2 Pin
1	12
2	11
3	10
4	9
5	8
6	7
7	6
8	5
9	4
10	3
11	2
12	1

MPO-4*DLC and MPO-8*FC fibers have the same pin assignments, as shown in Table 6-12.

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Table 6-12 Pin assignments of MPO-4*DLC and MPO-8*FC fibers

X1 Pin	X2 Pin
1	1B
2	2B
3	3B
4	4B
9	4A
10	3A
11	2A
12	1A

Optical Fibers and Optical Connectors

Optical Fibers

Optical fibers are classified into single-mode fibers and multimode fibers.

- Single-mode fibers have a diameter of 5-10 μm and transmit laser in one mode under a specified wavelength. These fibers support a wide frequency band and a large transmission capacity, so they are used for long-distance transmission. Most single-mode fibers are yellow, as shown in **Figure 6-23**.
- Multimode fibers have a diameter of 50 μm or 62.5 μm and transmit laser in multiple modes with a specified wavelength. They have a small capacity and their performance is inferior to that of single-mode fibers, making them suitable to short-distance transmission.

  In the latest cabling infrastructure of ISO/IEC 11801, multimode fibers are classified into four categories: OM1, OM2, OM3, and OM4.

  - OM1: traditional 62.5/125 μm multimode fibers. OM1 fibers have a large core diameter and numerical aperture, and provide high light gathering ability and bending resistance.
  - OM2: traditional 50/125 μm multimode fibers. OM2 fibers have a small core diameter and numerical aperture. Compared with OM1 fibers, OM2 fibers provide higher bandwidth because they significantly reduce the modal dispersion. When transmitting data at 1 Gbit/s with 850 nm wavelength, OM1 and OM2 fibers support maximum link lengths of 220 m and 550 m, respectively. OM1 and OM2 fibers can provide sufficient bandwidth within a distance of 300 m. Generally, OM1 and OM2 fibers are orange, as shown in **Figure 6-24**.
  - OM3: new-generation multimode fibers, with longer transmission distances than OM1 and OM2 fibers.
  - OM4: laser optimized multimode fibers with 50 μm core diameter. OM4 is an improvement to OM3 and only increases the modal bandwidth. OM4 fibers provide 4700 MHz*km of modal bandwidth, whereas OM3 fibers provide only 2000 MHz*km of modal bandwidth. Generally, OM3

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and OM4 fibers are light green, as shown in **Figure 6-25**. You can identify OM3 and OM4 fibers by their labels or printed marks.

MPO fibers are used for 40G and 100G optical modules. An MPO fiber consists of multiple multi-mode fiber strands, and each multi-mode fiber strand provides one laser transmission channel. Some fiber suppliers produce 8-strand MPO optical fibers, while some suppliers produce 12-strand or 24-strand MPO fibers.

- A 40G optical module uses four channels to transmit laser and four channels to receive laser. That is, a total of eight channels are required for a 40G optical module. 8-core and 12-core MPO fibers use the same definition of fiber channels. Therefore, they are equivalent in functionality when connecting to 40G optical modules.
- When 100G optical modules are used, choose MPO fibers according to the following principles:
  - For CFP optical modules, choose 24-strand fibers for the CFP-100G-SR10 module and 8-strand or 12-strand fibers for other modules.
  - Choose 8-strand or 12-strand fibers for QSFP28 modules.

Optical Connector

Optical connectors are used to connect optical fibers of the same type. **Table 6-13** lists common optical connectors.

Table 6-13 Common optical connectors

Common Type	Optical Connector			
Square connector	SC/PC connector 	LC/PC connector 	MTRJ/PC connector 	MPO connector 
Round connector	FC/PC connector 	ST/PC connector 	-	-

Figure 6-32 shows an LC/PC optical connector.

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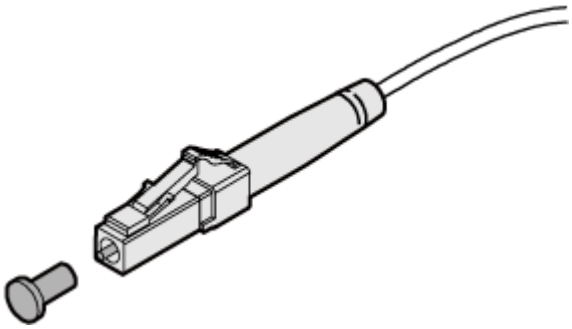
Figure 6-32 LC/PC optical connector



NOTICE

When connecting or removing an LC/PC optical connector, align the connector with the optical port and do not rotate the fiber. Pay attention to the following points:

- To connect a fiber, align the optical connector with the optical port and gently insert the optical fiber into the port.
- To remove a fiber, press the clip on the connector and pull the fiber out.

Ceramic Ferrule End Face

Based on the return loss, the end faces of the fiber's ceramic ferrule are classified into three types: PC, UPC, and APC, as shown in **Figure 6-33**.

Figure 6-33 Polishing types of the fiber's ceramic ferrule end face

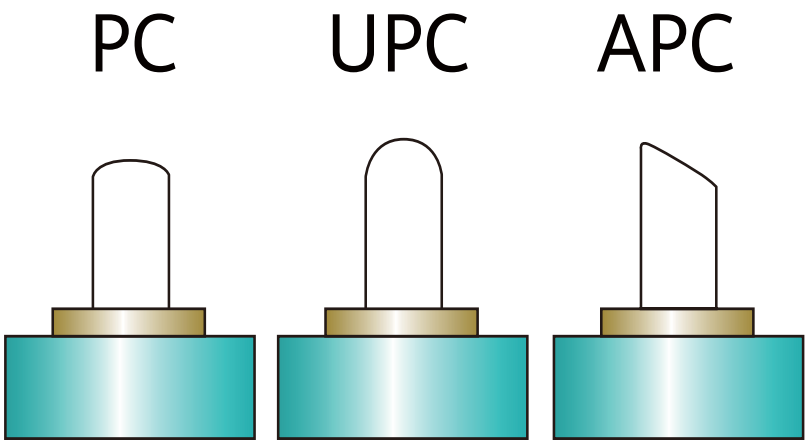


Table 6-14 Polishing types of the fiber's ceramic ferrule end face

Polishing Type	Return Loss	Characteristics	Application Scenario
PC	-35 dB	Polished with a slight curvature	Scenarios with no high requirements on return loss

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Polishing Type	Return Loss	Characteristics	Application Scenario
UPC	-50 dB	Dome-shaped	Scenarios with high requirements on return loss
APC	-60 dB	Polished with an 8-degree angle	

NOTICE

In principle, optical fibers with different ceramic ferrule end faces cannot be directly connected through optical connectors. Interconnection between PC and UPC connectors does not cause permanent physical damage to them. The structure of APC end faces is totally different from that of PC end faces. Therefore, if fibers with APC end faces and fibers with PC end faces are connected through optical connectors, their ceramic ferrule end faces will be damaged. To connect them together, use a fiber jumper. This, however, adversely affects the transmission performance.

Figure 6-34 shows the requirements of different types of ceramic ferrule end face of fibers.

Figure 6-34 Fiber's ceramic ferrule end faces

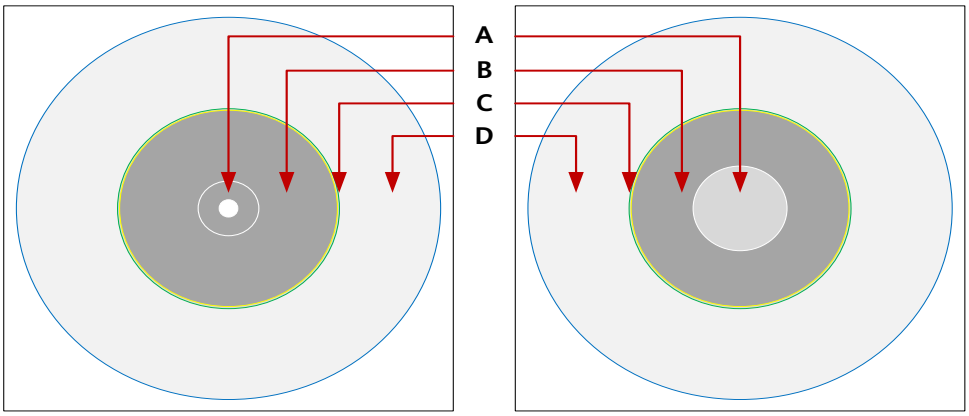

Table 6-15 End face requirements for fiber ceramic ferrules

Type	Zone	Diameter	Defects	Scratches
Single mode connector	A. Core	0-25 μm	None	None
	B. Cladding	25-120 μm	< 2 μm: no limit 2-5 μm: 5 > 5 μm: 0	≤ 3 μm: no limit > 3 μm: 0

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Type	Zone	Diameter	Defects	Scratches
	C. Adhesive	120-130 μm	No limit	No limit
	D. Contact	130-250 μm	≥ 10 μm: 0	No limit
Multi mode connector	A. Core	0-65 μm	≤ 5 μm: 4 > 5 μm: 0	≤ 5 μm: no limit > 5 μm: 0
	B. Cladding	65-120 μm	< 2 μm: no limit 2-5 μm: 5 > 5 μm: 0	≤ 5 μm: no limit > 5 μm: 0
	C. Adhesive	120-130 μm	No limit	No limit
	D. Contact	130-250 μm	≥ 10 μm: 0	No limit

6.9 AOC Cable

Types of AOC Cables

An active optical cable (AOC) is an active optical fiber with optical modules at both ends, and therefore is easy to use. **Figure 6-35**, **Figure 6-36**, and **Figure 6-37** show different types of AOC cables.

Figure 6-35 SFP+ to SFP+/SFP28 to SFP28 AOC cable

Figure 6-36 QSFP+ to QSFP+/QSFP28 to QSFP28 AOC cable

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Figure 6-37 QSFP+ to 4*SFP+ AOC cable

Table 6-16 lists the attributes of various AOC cables.

Table 6-16 Attributes of AOC cables

Model	Version Support	Length	Operating Wavelength	Connector Type	Part Number	Operating Temperature
SFP-10G-AOC-3M	V100R005C00 and later versions	3 m	850 nm	SFP+ connectors at both ends	02311BKP	0°C to 70°C
SFP-10G-AOC-5M	V200R001C00 and later versions	5 m	850 nm	SFP+ connectors at both ends	02311PQS	0°C to 70°C
SFP-10G-AOC-7M	V200R001C00 and later versions	7 m	850 nm	SFP+ connectors at both ends	02311PQT	0°C to 70°C
SFP-10G-AOC10M	V100R003C10 and later versions	10 m	850 nm	SFP+ connectors at both ends	02310QWH	0°C to 70°C
SFP-10G-AOC20M	V100R003C10 and later versions	20 m	850 nm	SFP+ connectors at both ends	02310SSK	0°C to 70°C

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Model	Version Support	Length	Operating Wavelength	Connector Type	Part Number	Operating Temperature
QSFP-H40G-AOC10M	V100R005C00 and later versions	10 m	850 nm	QSFP+ connectors at both ends	02310SSH	0°C to 70°C
SFP-25G-AOC-3M	V200R001C00 and later versions	3 m	850 nm	SFP28 connectors at both ends	02311MPE	0°C to 70°C
SFP-25G-AOC-5M	V200R001C00 and later versions	5 m	850 nm	SFP28 connectors at both ends	02311MPD	0°C to 70°C
SFP-25G-AOC-7M	V200R001C00 and later versions	7 m	850 nm	SFP28 connectors at both ends	02311MPC	0°C to 70°C
SFP-25G-AOC-10M	V200R001C00 and later versions	10 m	850 nm	SFP28 connectors at both ends	02311KNT	0°C to 70°C
QSFP-4SFP10-AOC10M	V100R006C00 and later versions	10 m	850 nm	QSFP+ connector at one end and four SFP+ connectors at the other end	02310SSJ	0°C to 70°C
QSFP-100G-AOC-10M	V200R002C50 and later versions	10 m	850 nm	QSFP28 connectors at both ends	02311KNQ	0°C to 70°C

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Model	Version Support	Length	Operating Wavelength	Connector Type	Part Number	Operating Temperature
QSFP-100G-AOC-30M	V200R002C50 and later versions	30 m	850 nm	QSFP28 connectors at both ends	02311RAH	0°C to 70°C

Connection

Table 6-17 describes usage scenarios of AOC cables and cable connections in these scenarios.

Table 6-17 AOC cable usage scenarios and connections

Cable Type	Connection
SFP+ to SFP+ AOC cable	• Scenario 1: used for 10GE optical port connection or stacking between CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. • Scenarios 2: used for 10GE connection between and CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. Both ends connect to a 10GE optical port.
QSFP+ to QSFP+ AOC cable	• Scenario 1: used for 40GE/100GE optical port connection or stacking between CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. • Scenarios 2: used for 40GE/100GE optical port connection between and CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches.
QSFP+ to 4*SFP+ AOC cable	When a 40GE optical port is split into four 10GE optical ports: • Scenario 1: used for 10GE optical port connection or stacking between CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. • Scenarios 2: used for 10GE connection between and CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. One end connects to the 40GE optical port, and the other end connects to four 10GE optical ports.

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Cable Type	Connection
SFP28 to SFP28 AOC cable	Used for 25GE optical port connection or stacking between CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. Both ends connect to a 25GE optical port.
QSFP28 to QSFP28 AOC cable	Used for 100GE optical port connection or stacking between CloudEngine 9800, 8800, 7800, 6800, and 5800 series switches. Both ends connect to a 100GE optical port.

6.10 High-Speed Cable

Types of High-Speed Cables

Table 6-18 shows the types of high-speed cables.

Table 6-18 Types of high-speed cables

Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
SFP+ - SFP+ high-speed cable	1 m SFP+ high-speed cable	SFP-10G-CU1M	1 m	Passive	25 mm	• Minimum clearance for cable routing: 60 mm • Minimum bend radius: 35 mm	SFP+ to SFP+	02310MUN
	3 m SFP+ high-speed cable	SFP-10G-CU3M	3 m	Passive	25 mm		SFP+ to SFP+	02310MUP

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Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
	5 m SFP+ high-speed cable	SFP-10G-CU5M	5 m	Passive	30 mm		SFP+ to SFP+	02310QPR
	7 m SFP+ active high-speed cable	SFP-10G-AC7M	7 m	Active	25 mm		SFP+ to SFP+	02310QPS
	10 m SFP+ active high-speed cable	SFP-10G-AC10M	10 m	Active	25 mm		SFP+ to SFP+	02310MUQ
SFP28-SFP28 high-speed cable	1 m SFP28 high-speed cable	SFP-25G-CU1M	1 m	Passive	25 mm	• Minimum clearance for cable routing: 70 mm • Minimum bend radius: 40 mm	SFP28 to SFP28	02311NKS

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Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
	3 m SFP28 high-speed cable	SFP-25G-CU3M	3 m	Passive	25 mm		SFP28 to SFP28	02311NKV
	3 m SFP28 high-speed cable	SFP-25G-CU3M-N	3 m	Passive	30 mm		SFP28 to SFP28	02311MNV
	5 m SFP28 high-speed cable	SFP-25G-CU5M	5 m	Passive	30 mm		SFP28 to SFP28	02311MNW
	10 m SFP28 high-speed cable	SFP-25G-AC10M	10 m	Active	30 mm		SFP28 to SFP28	02312LNP

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Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
QSFP+ - QSFP+ high-speed cable	1 m QSFP+ - QSFP+ high-speed cable	QSFP-40G-CU1M	1 m	Passive	35 mm	• Minimum clearance for cable routing: 75 mm • Minimum bend radius: 50 mm	QSFP+ to QSFP+	02310MUG
	3 m QSFP+ - QSFP+ high-speed cable	QSFP-40G-CU3M	3 m	Passive	40 mm		QSFP+ to QSFP+	02310MUH
	5 m QSFP+ - QSFP+ high-speed cable	QSFP-40G-CU5M	5 m	Passive	45 mm		QSFP+ to QSFP+	02310MUJ
QSFP+ - 4*SFP+ high-speed cable	1 m QSFP+ - 4*SFP+ high-speed cable	QSFP-4SFP10G-CU1M	1 m	Passive	25 mm	QSFP+ end: • Minimum clearance for cable routing: 100 mm • Minimum bend radius: 50 mm SFP+ end: • Minimum clearance for	QSFP+ to 4*SFP+	02310MUK

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Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
	3 m QSFP+ - 4*SFP+ high-speed cable	QSFP-4SFP10G-CU3M	3 m	Passive	25 mm	cable routing: 60 mm • Minimum bend radius: 35 mm	QSFP+ to 4*SFP+	02310MUL
	5 m QSFP+ - 4*SFP+ high-speed cable	QSFP-4SFP10G-CU5M	5 m	Passive	30 mm		QSFP+ to 4*SFP+	02310MUM
QSFP28 to QSFP28 high-speed cable	1 m QSFP28 - QSFP28 high-speed cable	QSFP28-100G-CU1M	1 m	Passive	70 mm	• Minimum clearance for cable routing: 90 mm • Minimum bend radius: 70 mm	QSFP28 to QSFP28	02311KNW

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Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
	3 m QSFP28-QSFP28 high-speed cable	QSFP28-100G-CU3M	3 m	Passive	70 mm		QSFP28 to QSFP28	02311KNX
	5 m QSFP28-QSFP28 high-speed cable	QSFP28-100G-CU5M	5 m	Passive	70 mm		QSFP28 to QSFP28	02311KNY
QSFP28 to 4*SFP28 high-speed cable	1 m QSFP28-4*SFP28 high-speed cable	QSFP-4SFP25G-CU1M	1 m	Passive	35 mm	QSFP28 end: • Minimum clearance for cable routing: 100 mm • Minimum bend radius: 50 mm SFP28 end: • Minimum clearance for cable routing: 70 mm • Minimum bend radius: 40 mm	QSFP28 to 4*SFP28	02311MNX

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Cable Type		Model	Length	Electrical attribute	Bend Radius	Minimum clearance for cable routing & Minimum bend radius	Connector Type	Part Number
	1 m QSFP28-4*SFP28 high-speed cable	QSFP-4SFP25G-CU3M	3 m	Passive	35 mm		QSFP28 to 4*SFP28	02311MNY
	3 m QSFP28-4*SFP28 high-speed cable	QSFP-4SFP25G-CU3M-N	3 m	Passive	45 mm		QSFP28 to 4*SFP28	02311MPA
	5 m QSFP28-4*SFP28 high-speed cable	QSFP-4SFP25G-CU5M	5 m	Passive	45 mm		QSFP28 to 4*SFP28	02311MPB

Appearance and Structure

The following figures appearances various high-speed cables.

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Figure 6-38 Appearance of an SFP+ to SFP+ or SFP28 to SFP28 high-speed cable

Figure 6-39 Appearance of a QSFP+ to QSFP+ or QSFP28 to QSFP28 high-speed cable

Figure 6-40 Appearance of a QSFP+ to 4*SFP+ or QSFP28 to 4*SFP28 high-speed cable

The following figures show structures of various high-speed cables.

Figure 6-41 Structure of an SFP+ to SFP+ or SFP28 to SFP28 high-speed cable

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Figure 6-42 Structure of a QSFP+ to QSFP+ or QSFP28 to QSFP28 high-speed cable

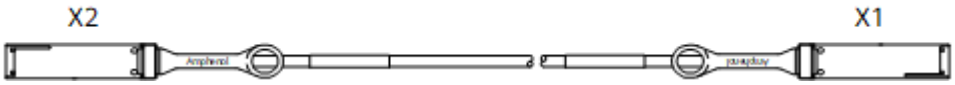
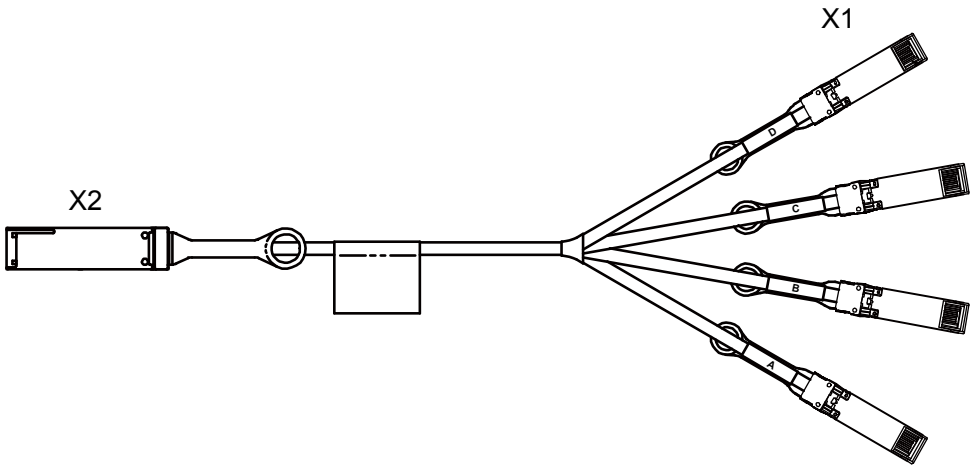


Figure 6-43 Structure of a QSFP+ to 4*SFP+ or QSFP28 to 4*SFP28 high-speed cable



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