4 Cables

4.1 Power Cables
4.2 Console Cable
4.3 Ethernet Cable
4.4 Ground Cable
4.5 Optical Fiber

4.1 Power Cables

4.1.1 AC Power Cable

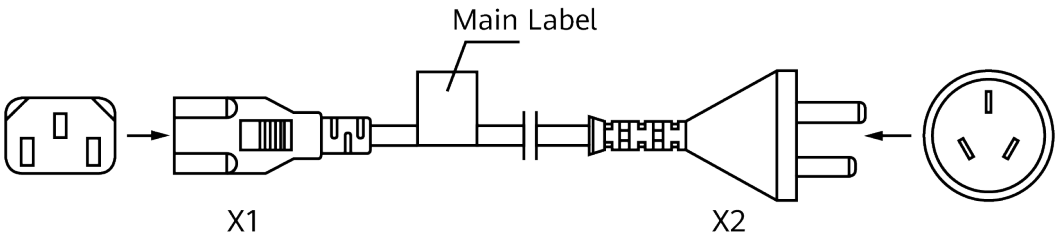
Connection

An AC power cable is connected as follows:

- The C13 straight female connector is connected to the AC power socket of a router.
- The PI straight male connector is connected to an external power source.

Appearance and Structure

Figure 4-1 Structure of the AC Power Cable



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NOTE

An AC power cable has a C13 connector at one end, and the connector on the other end is determined based on the standard in the country or region to which the cable is delivered. This section describes the AC power cable used in China.

Technical Specifications

Table 4-1 Technical specifications of the AC Power Cable

Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Power Cable, America AC Power Cable 125V10A, 3.0m, PBSM, 18SJT(3C), C13SF, Black	04020728	CC13NA300	3 m	C13	PB
Power Cable, Japan AC Power Cable 125V12A, 3.0m, PBSM, HVCTF-1.25mm^2(3C), C13SF, Black	04040887	CC13JP300	3 m	C13	PB
Power Cords Cable, Australia AC Power Cable 250V10A, 3.0m, PISM, H05VV-F-1.0mm^2(3C), C13SF, Black	04040888	CC13AU300	3 m	C13	PI

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Power cord,BS546 250V10A,3.0m,PM-IAM,H05VV-F-1.5mm^2(3C),C13SF,250V,10A, Black	04040889	CC13HK300	3 m	C13	PD
Power Cable, Britain AC Power Cable 250V10A, 3.0m, PGAM, H05VV-F-1.0mm^2(3C), C13SF, Black	04040890	CC13UK300	3 m	C13	PG
Power Cords Cable, Europe AC Power Cable 250V10A, 3m, PFSM, H05VVF 1.0^2(3C), C13SF, Black	04041056	CC13EU300	3 m	C13	PF
Power Cords Cable, China AC Power 250V10A, 3.0m, PISM, 227IEC53-1.0^2(3C), C13SF, Black	04041104	CPACH0301	3 m	C13	PI

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Power Cable, Switzerland AC Power Cable 250V10A, 3.0m, PJSM, H05VV-F-1.0mm^2(3C), C13SF, Black	04041119	CC13CH300	3 m	C13	PJ
Power Cable, Italy AC Power Cable 250V10A, 3.0m, PLSM, H05VV-F-1.0mm^2(3C), C13SF, Black	04041120	CC13IT300	3 m	C13	PL
Power Cords Cable, Argentina AC Power 250V10A, 3.0m, PISM, H05VV-F-1.0mm^2(3C), C13SF, Black	04047785	CC13AR300	3 m	C13	PI

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Power cord,India AC Power 250V6A,3m,PM-IIAM,IS 694-1.0^2(3C),C13 SF,250V,6A, Black	04051035	CC13ID300	3 m	C13	PD-I
Power Cords Cable, Korea AC Power 250V10A, 3m, PFSM, H05VV-F 3*1.0^2(3C), C13SF, Black	0405G028	CC13KO300	3 m	C13	PF
Power Cords Cable, Denmark AC Power 250V10A, 3m, PKSM, H05VV-F-3*1.0^2(3C), C13SF, Black	0405G02K	CC13DE300	3 m	C13	PK
Power Cords Cable, China AC Power 250V10A, 1.0m, PIAM, 227IEC53-1.0^2(3C), C13SF, Black	04150254	CPACH0303	3 m	C13	PI

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Power Cable, Brazil AC Power Cable 250V10A, 3.0m, PNSM, H05VV-F-1.0mm^2(3C), C13SF, Black	04150258	CC13BR300	3 m	C13	PJ

4.1.2 DC Power Cable

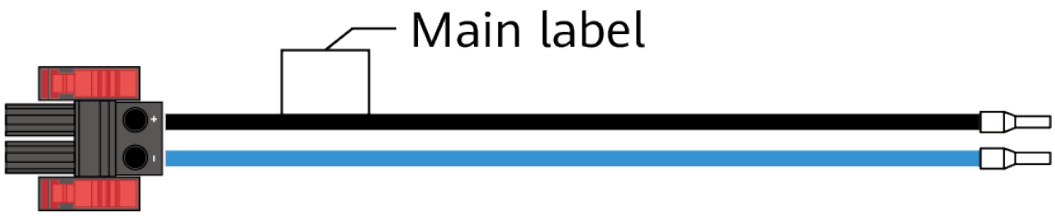
Connection

A DC power cable is connected as follows:

- One end is connected to the matching DC power terminal on the DC power module of a router.
- The other end is connected to an external power source.

Appearance and Structure

Figure 4-2 Structure of the DC Power Cable



NOTE

DC power cables for a router include a -48 V return ground cable (blue) and a -48 V power cable (black), which are connected to the RTN(+) and NEG(-) terminals on the router's DC power module respectively.

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Technical Specifications

Table 4-2 Technical specifications of the DC Power Cable

Item	Details
Part Number	04150368
Model	-
Description	Power Cable,3m,2.5mm^2,(TB2PIN +2*T2.5^2BL),(14UL3386B-I +14UL3386BL-I),LSZH
Connector type X1	TB2PIN

4.2 Console Cable

4.2.1 Console Cable

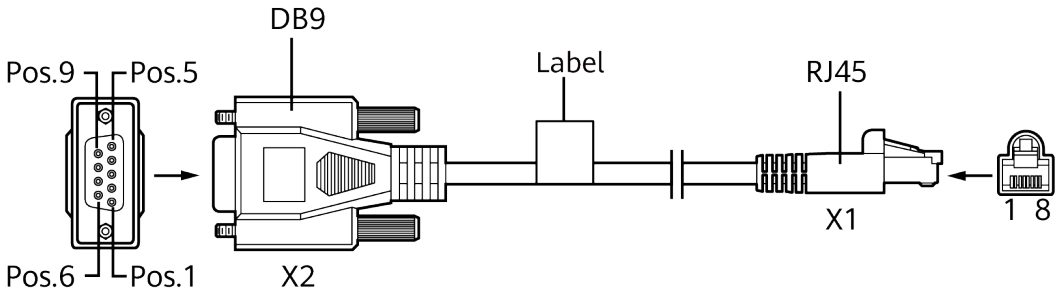
Connection

A console cable is connected as follows:

- The RJ45 connector is connected to the console interface of a router.
- The DB9 connector is connected to a maintenance terminal, generally a computer.

Appearance and Structure

Figure 4-3 Structure of the Console Cable



Pin Assignments

Table 4-3 lists the pin assignments of a console cable.

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Table 4-3 Pin assignments of a console cable

X1 (RJ45)	Signal	Direction	X2 (DB9)
3	TXD	→	2
5	GND	-	5
6	RXD	←	3

NOTE

- TXD and RXD are defined based on signal stream direction on the router, and the corresponding wires must be connected to the RXD and TXD wires on the remote device (computer).
- A console cable does not have an RTS, CTS, DSR, or DTR signal wire, and therefore does not support hardware-based flow control.
- Pins not listed in the table are not connected.

Technical Specifications

Table 4-4 Technical specifications of the Console Cable

Item	Details
Part Number	04051113
Model	A0602443039
Description	Serial Port Cable, 3m, D9 FM, CC2P0.32PWG1U, MP8-I
Cable length [m]	3m
Connector type X1	RJ45
Connector type X2	DB9

4.3 Ethernet Cable

4.3.1 Ethernet Cable

Connection

A straight-through cable can connect devices at different network layers in the following scenarios:

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- Connect a switch or hub to a router.
- Connect a computer (server or workstation) to a switch or hub.
- Connect a switch to an upper-layer switch through an uplink interface.

A crossover cable can connect devices at the same network layer in the following scenarios:

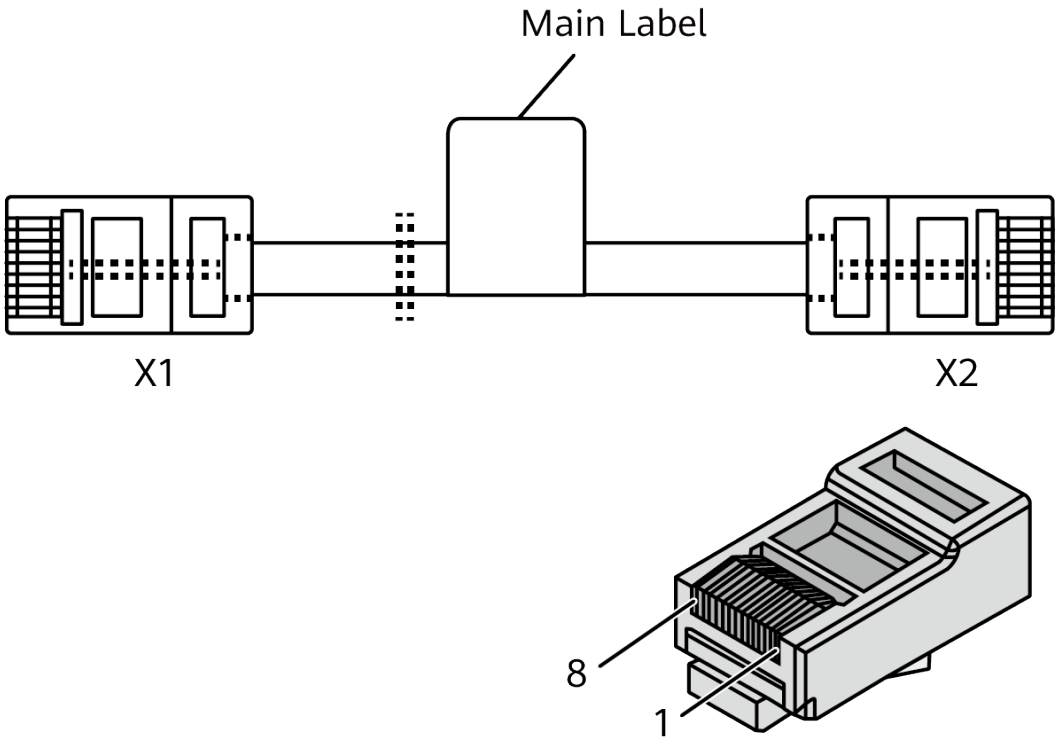
- Connect a computer to a router.
- Connect two switches at the same layer.
- Connect two hubs.
- Connect two computers.
- Connect two routers.
- Connect an Ethernet interface of an ADSL modem to the network interface of a computer.

NOTE

Most network devices support auto-negotiation on their interfaces. After auto-negotiation is enabled, the local and remote interfaces can automatically negotiate about communication parameters. In this case, the two interfaces can be connected by either a straight-through cable or a crossover cable.

Appearance and Structure

Figure 4-4 Structure of the Ethernet Cable



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NOTE

An Ethernet cable consists of twisted pairs and RJ45 connectors at both ends. Pin assignments in the RJ45 connectors comply with the T568A or T568B standard. Table 4-5 describes the two standards.

Table 4-5 T568A and T568B standards

T568A		T568B	
Pin	**Wire Color**	**Pin**	**Wire Color**
1	White and green	1	White and orange
2	Green	2	Orange
3	White and orange	3	White and green
4	Blue	4	Blue
5	White and blue	5	White and blue
6	Orange	6	Green
7	White and brown	7	White and brown
8	Brown	8	Brown

Pin Assignments

Depending on whether RJ45 connectors at both ends comply with the same standard, Ethernet cables are classified into two types:

- Straight-through cable: The RJ45 connectors at both ends comply with the T568B standard.

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

  Table 4-6 Pin assignments of a straight-through cable

X1 (RJ45)	Wire Color	X2 (RJ45)
1	White and orange	1
2	Orange	2
3	White and green	3
4	Blue	4
5	White and blue	5
6	Green	6
7	White and brown	7
8	Brown	8

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- Crossover cable: One RJ45 connector complies with the T568A standard, and the other RJ45 connector complies with the T568B standard.

  Table 4-7 lists the pin assignments of a crossover cable.

  Table 4-7 Pin assignments of a crossover cable

X1 (RJ45)	Wire Color	X2 (RJ45)
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

Technical Specifications

Table 4-8 Technical specifications of the Ethernet Cable

Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Single Cable, Straight Through Cable, 2.00m, MP8-I, CC4P0.5GY, MP8-I, Unshielded, DL3470d	04024336	S-8-0.4-RJ45-5	2 m	RJ45	RJ45
Signal Cable, Shielded Straight Through Cable, 3m, MP8-II, CC4P0.5GY(S), MP8-II, FTP	04070006	CSST00301	3 m	RJ45	RJ45

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Signal Cable, Shielded Crossover Network Cable, 3m, MP8-II,CC4P0.5GY(S), MP8-II, FTP	04070007	C00SCNC03	3 m	RJ45	RJ45
Signal Cable, Shielded Straight Through Cable, 2.0m, MP8-II, CC4P0.5GY(S), MP8-II, FTP	04070050	S-8-0.4-RJ45-2	2 m	RJ45	RJ45

NOTE

Select straight-through or crossover cables according to your network requirements. In an environment with severe electromagnetic interference, shielded Ethernet cables are recommended. If the cables need to be extended, configure one network interface connector (part number: 14080099) and one extension cable based on the number of the cables.

4.4 Ground Cable

4.4.1 Ground Cable

Connection

A ground cable is connected as follows:

- The M4 lug is connected to the ground point on a router.
- The M6 lug is connected to the ground point or equipotential terminal on a cabinet.

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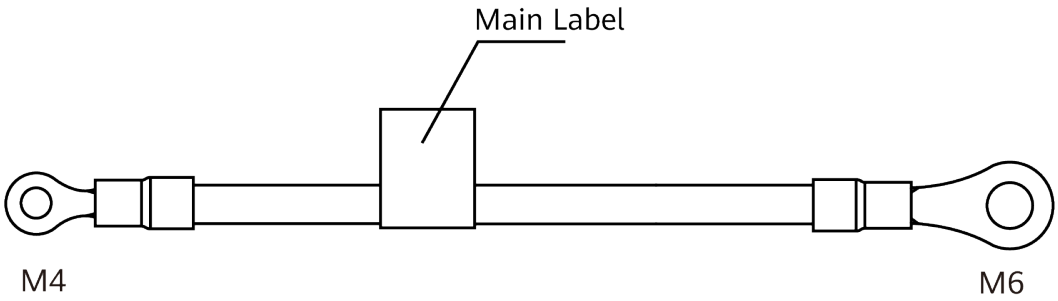
Appearance and Structure

Figure 4-5 Structure of the Ground Cable



NOTE

A ground cable grounds a router to protect it from lightning and electromagnetic interference.

Technical Specifications

Table 4-9 Technical specifications of the Ground Cable

Item	Details
Part Number	04150052
Model	CGND04600
Description	Power Cable, 0.4m, 6mm^2, Yellow&Green, OT6-4, H07Z-K-6^2G&Y, OT6-6, LSZH
Cable length [m]	0.4 m
Connector type X1	OT6-4
Connector type X2	OT6-6

4.5 Optical Fiber

4.5.1 Optical Fiber

Connection

An optical fiber is a carrier of optical signals and transmits optical signals over a short distance. An optical fiber is connected as follows:

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- One end is connected to an optical interface of router.
- The other end is connected to an optical distribution frame (ODF) or an optical interface of the upstream device or another device.

Appearance and Structure

Figure 4-6 shows the structure of an LC/PC single-mode optical fiber.

Figure 4-6 Structure of an LC/PC single-mode optical fiber

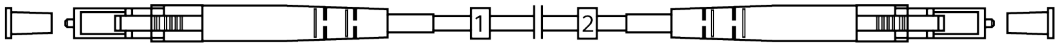


Figure 4-7 shows the structure of an SC/PC single-mode optical fiber.

Figure 4-7 Structure of an SC/PC single-mode optical fiber

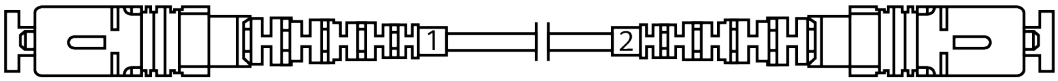
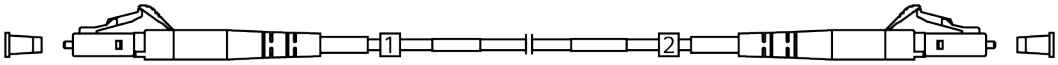


Figure 4-8 shows the structure of an LC/PC multimode optical fiber.

Figure 4-8 Structure of an LC/PC multimode optical fiber



Determine the type and number of optical fibers based on the optical modules used:

- Single-mode optical modules must be used with single-mode optical fibers.
- Multimode optical modules must be used with multimode optical fibers.
- PON optical modules must be used with 1SC/PC-1SC/PC single-mode optical fibers.
- Each optical module with separate Tx and Rx channels must be used with two optical fibers of the same type.
- Each single-fiber-bidirectional optical module is used with only one optical fiber.

NOTE

A single-mode optical fiber and a multimode optical fiber have the same appearance but different colors. A single-mode optical fiber is yellow and a multimode optical fiber is orange.

Pin Assignments

Table 4-10 lists the pin assignments of an optical fiber.

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Table 4-10 Pin assignments of an optical fiber

Terminal on the Local Device	Signal Direction	Terminal on the Remote Device
Optical interface Tx terminal	->	Optical interface Rx terminal
Optical interface Rx terminal	<-	Optical interface Tx terminal

Technical Specifications

Table 4-11 Technical specifications of the Optical Fiber

Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Adapter, FC-FC, 2, Silvery white, Shell:Metal, Sleeve:Zirconia, Round	14130001	SS-OP-AD-FC-FC	-	FC	FC
Patch Cord,SC/PC,SC/PC,Single-mode,5m,G.652D,3mm	14130098	SS-OP-D-SC-S-5	5 m	SC/PC	SC/PC
Patch Cord,SC/PC,SC/PC,Single-mode,15m,G.652D,3mm	14130126	SS-OP-D-SC-S-15	15 m	SC/PC	SC/PC
Adapter,SC,SC,2,Blue,Shell:Plastic,Sleeve:Zirconia,Square	14130134	QW1P0FIBER04	-	SC	SC

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Patch Cord,SC/PC,SC/PC,Single-mode,20m,G.652D,3mm	14130147	SS-OP-D-SC-S-20	20 m	SC/PC	SC/PC
Patch Cord,LC/PC,SC/PC,Single-mode,10m,G.652D,2mm	14130196	SS-OP-LC-SC-S-10	10 m	LC/PC	SC/PC
Patch Cord,LC/PC,FC/PC,Single-mode,10m,G.652D,2mm	14130197	SS-OP-LC-FC-S-10	10 m	LC/PC	FC/PC
Patch Cord,LC/PC,LC/PC,Single-mode,10m,G.652D,2mm	14130199	SS-OP-D-LC-S-10	10 m	LC/PC	LC/PC
Patch Cord,LC/PC,FC/PC,Multi-mode,10m,A1b,2mm	14130221	SS-OP-LC-FC-M-10	10 m	LC/PC	FC/PC
Patch Cord,LC/PC,LC/PC,Multi-mode,10m,A1B,2mm	14130222	SS-OP-D-LC-M-10	10 m	LC/PC	LC/PC

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Patch Cord,LC/PC,SC/PC,Multi-mode,10m,A1b,2mm	14130223	SS-OP-LC-SC-M-10	10 m	LC/PC	SC/PC
Patch Cord,SC/PC,SC/PC,Single-mode,10m,G.652D,3mm	14130230	SS-OP-D-SC-S-10	10 m	SC/PC	SC/PC
Adapter,LC/PC-LC/PC,2,Blue,Shell:Plastic,Sleeve:Zirconia,Square	14130248	QW1P0FIBER06	-	LC/PC	LC/PC
Patch Cord,LC/PC,LC/PC,Single-mode,20m,G.652D,2mm	14130251	SS-OP-D-LC-S-20	-	LC/PC	LC/PC
Patch Cord,FC/PC,SC/PC,Single-mode,10m,G.652D,3mm	14130253	SS-OP-FC-SC-S-10	10 m	FC/PC	SC/PC
Patch Cord,LC/PC,FC/PC,Multi-mode,20m,A1b,2mm	14130273	SS-OP-LC-FC-M-20	20 m	LC/PC	FC/PC

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Patch Cord,LC/PC,FC/PC,Single-mode,20m,G.652D,2mm	14130274	SS-OP-LC-FC-S-20	20 m	LC/PC	FC/PC
Patch Cord,LC/PC,SC/PC,Multi-mode,30m,A1b,2mm	14130275	SS-OP-LC-SC-M-30	30 m	LC/PC	SC/PC
Patch Cord,LC/PC,SC/PC,Single-mode,30m,G.652D,2mm	14130276	SS-OP-LC-SC-S-30	30 m	LC/PC	SC/PC
Patch Cord,LC/PC,FC/PC,Multi-mode,30m,A1b,2mm	14130277	SS-OP-LC-FC-M-30	30 m	LC/PC	FC/PC
Patch Cord,LC/PC,FC/PC,Single-mode,30m,G.652D,2mm	14130278	F000OPS01	30 m	LC/PC	FC/PC
Patch Cord,LC/PC,SC/PC,Multi-mode,20m,A1b,2mm	14130279	SS-OP-LC-SC-M-20	20 m	LC/PC	SC/PC

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Description	Part Number	Model	Cable length	Connector type X1	Connector type X2
Patch Cord,LC/PC,SC/PC,Single-mode,20m,G.652D,2mm	14130280	SS-OP-LC-SC-S-20	20 m	LC/PC	SC/PC
Patch Cord,LC/PC,LC/PC,Single-mode,30m,G.652D,2mm	14130282	SS-OP-D-LC-S-30	30 m	LC/PC	LC/PC
Patch Cord,LC/PC,LC/PC,Multi-mode,30m,A1b,2mm	14130294	SS-OP-D-LC-M-30	30 m	LC/PC	LC/PC
Patch Cord,LC/PC,LC/PC,Multi-mode,20m,A1b,2mm	14130295	SS-OP-D-LC-M-20	20 m	LC/PC	LC/PC

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