HiSecEngine USG6000F Series Hardware Guide

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Huawei Technologies Co., Ltd.

Contents

1 Using the Info-Finder

Info-Finder is a tool platform. It allows you to search for key product information by product series and model. The key product information includes basic information such as the software specifications, life cycles, and hardware information, and operation and maintenance information such as the licenses, alarms, logs, commands, and MIBs. The hardware-related tools are as follows:

- Product image gallery: provides product photos and network element icons for you to produce design drawings and networking diagrams.

- Hardware configuration: automatically generates hardware configuration diagrams after you select components are required and calculates the weight, power consumption, and heat consumption.

- Hardware center: provides the technical specifications of devices and components, as well as the mapping between devices, components, and versions.

- 3D model: Using this function, you can query product images, product overview, and component insertion/removal videos, enabling you to quickly obtain product information in one-stop mode.

2 Software Versions Compatible with Hardware

This section describes software versions compatible with the USG hardware.

Since its debut, USG has undergone multiple updates and optimizations. You can use either of the following methods to query the supported software versions, evolution roadmaps of software versions, and software-hardware mappings.

- Method 1: Info-Finder tool. Select a product and click **Hardware Center**, In the **Part type** area, click the component to be queried. In the **Specifications** area, view the **First supported version** of the component.

- Method 2: *Hardware Guide*. For the first supported version of a chassis, see the **First Supported Version** column in the **Overview** section of the corresponding product model. For the mapping between components and chassis, see the **Version Mapping** section of the corresponding component.

📖 **NOTE**

- As documentation and software versions are evolving, the *Hardware Guide* may describe a collection of all hardware of a product series, which does not mean that all hardware in this document is supported in this version. Before using hardware, carefully check the **First Supported Version** of the hardware in *Hardware Guide*.

- The *Hardware Guide* describes all the device models supported in a version, and these models may not be available for sales currently. To obtain accurate subscription information, regularly check the official **https://support.huawei.com/enterprise** for product change notices (PCNs) and lifecycle management bulletins, or you can use the Info-Finder tool to query product EOX information.

Figure 2-1 Software versions compatible with hardware
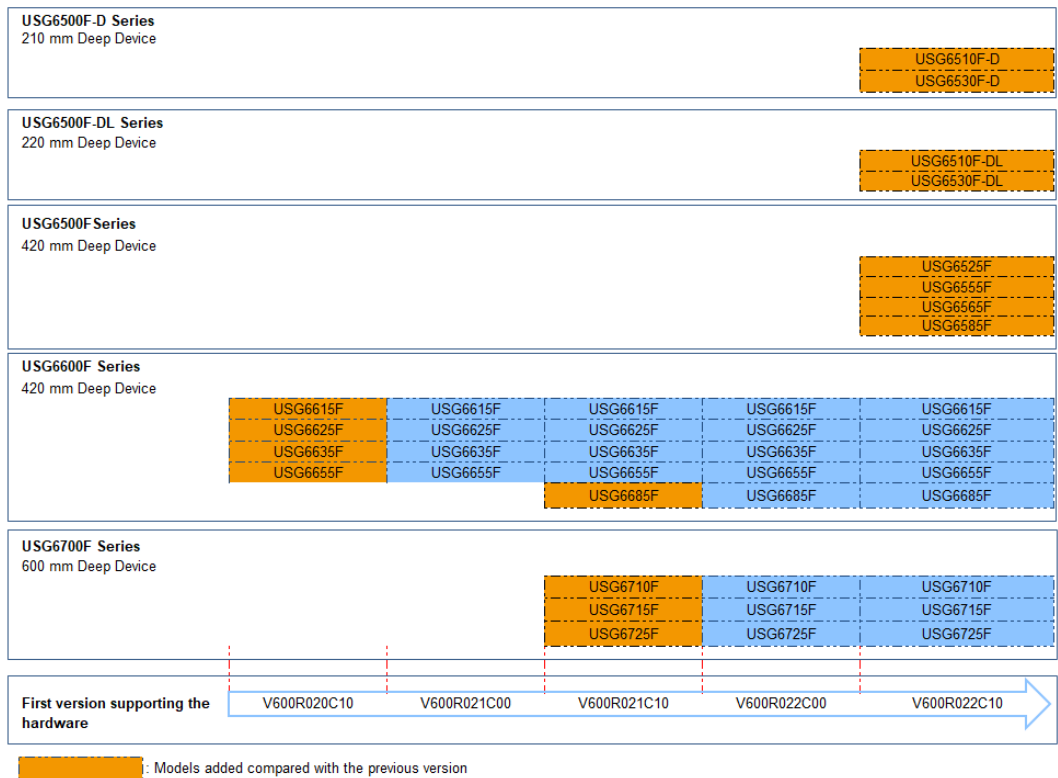
3 Hardware Overview

This chapter describes hardware information for all USG series and main components.

3.1 Chassis

This chapter describes hardware information for all USG6000F series, including hardware appearance, front and real panels, power supply system, heat dissipation system, and technical specifications.

☐ NOTE

- The model shown on the panel of the some USG is the series number USG6000F. For the specific model, see the nameplate attached on the bottom of the USG.

- The device series number can be provided using laser marking on the panel or film silkscreen. The device functions are the same regardless of the series number presentation mode.

3.1.1 USG6510F-D

Overview

Table 3-1 Basic information about the USG6510F-D

Description	Part Number	Model	First supported version
USG6510F-D(HTM)-AC Host(10*GE RJ45+2*GE SFP, 1*Adapter)	02355EHU	USG6510F-D-AC	V600R022C10

Appearance

Figure 3-1 Appearance of the USG6510F-D (front view)

Figure 3-2 Appearance of the USG6510F-D (rear view)
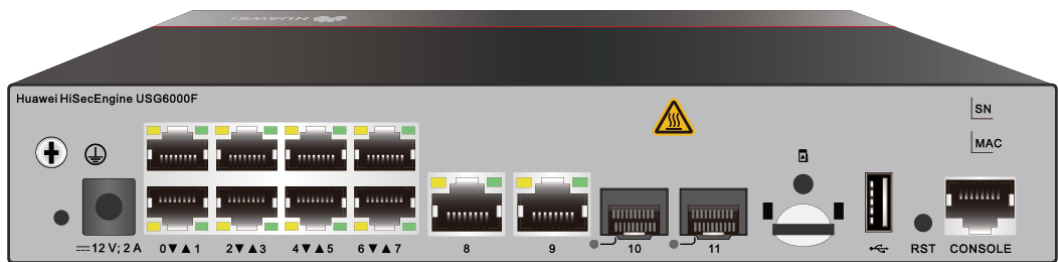
Structure

Figure 3-3 Components of the USG6510F-D
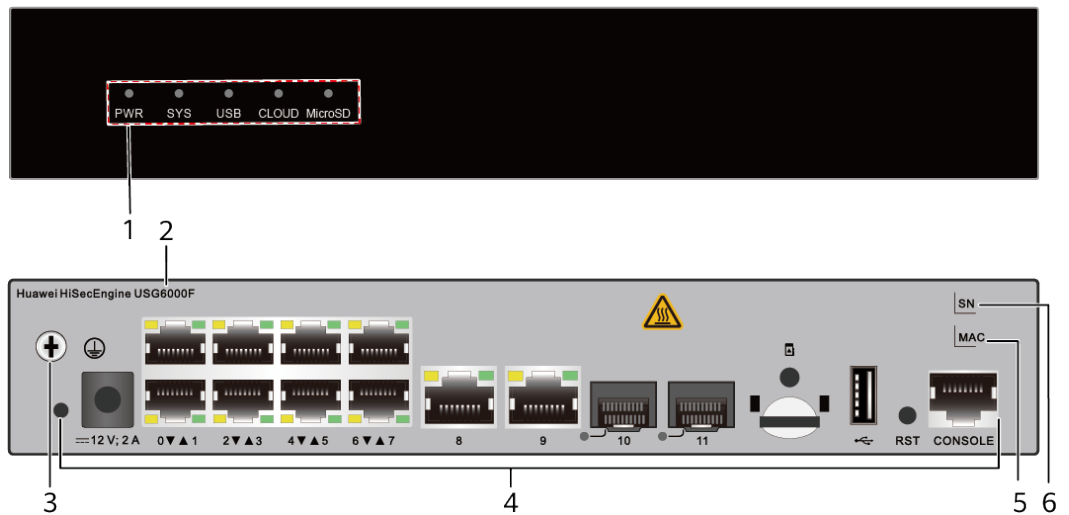
1. Indicator area	2. Product series ID	3. Protective ground terminal	4. Fixed interface area	5. MAC label
6. SN label	-	-	-	-

Table 3-2 Component functions

Name	Description
Indicator area	Provides various indicators to display the device running status in real time.
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
Fixed interface area	- Provides clip hole and power receptacle. - Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance. - Houses a Micro SD card to store logs and reports.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.

Indicators and Buttons

Figure 3-4 Indicators and Buttons of the USG6510F-D

1. PWR, SYS, USB, CLOUD and MicroSD indicators	2. GE electrical port ACT indicator	3. GE electrical port LINK indicator	4. Optical port indicator	5. RST button

Table 3-3 Indicators on the USG6510F-D

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz)	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	A system fault occurs.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.

Silkscreen	Name	Color	Status	Description
		-	Off	USB-based deployment is disabled (default state).
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
MicroSD	Micro SD indicator	Green	Steady on	The micro SD card is present.
		-	Off	The micro SD card is not detected.
-	ACT indicator of the GE electrical ports	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.
-	LINK indicator of the GE electrical ports	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-4 Buttons on the USG6510F-D

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-5 Ports of the USG6510F-D
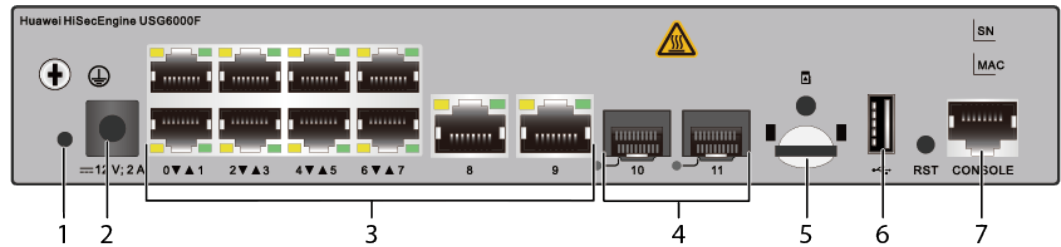
1. Clip hole	2. Power receptacle	3. GE electrical port	4. GE optical port	5. Micro SD card slot
6. USB 2.0 port	7. Console port	-	-	-

Table 3-5 Ports on the USG6510F-D

Port	Connector Type	Description	Available Components
Clip hole	-	The hole is used to install the power cable clip, which is used to bind and fix the power cable.	Power cable clip
Power receptacle	-	The receptacle connects to the tuning fork plug of the power adapter.	**36 W Power Adapter (02221468)**
GE electrical ports (0 to 9)	RJ45	10 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/0 to GE0/0/9. GE0/0/0 is an inband management port and its default IP address is 192.168.0.1. After this port is connected to your PC through Ethernet cables, you can log in to the device using Telnet, STelnet, or web UI to configure or manage the device. **NOTE** Arrowheads show the positions of ports GE0/0/0 to GE0/0/7. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.	**Ethernet Cable**

Port	Connector Type	Description	Available Components
GE optical port (10 to 11)	SFP	2 GE Ethernet optical ports, numbered from GigabitEthernet 0/0/10 to GigabitEthernet 0/0/11. Compatible with GE Ethernet optical ports.	• **100Mbps SFP Optical Modules** • **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules**
Micro SD card slot	-	The micro SD card slot allows you to insert a micro SD card to record logs and reports in real time. The micro SD card is optional. You can purchase one from Huawei if needed. You are advised to install an anti-theft board delivered with the device to protect the micro SD card.	SDSDQAE-064G (BOM code: 06010308, capacity: 64GB, dimensions (H x W x D): 1 mm x 15.00 mm x 11.00 mm/0.04 in. x 0.59 in. x 0.43 in)
USB 2.0 port	USB 2.0 Type A	USB port allows you to insert an USB flash drive for system software upgrades. For details on upgrades through USB flash drives, refer to the Upgrade Guide delivered with the device.	USB flash drive

Port	Connector Type	Description	Available Components
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Power Supply System

The device has no built-in power modules and uses a 36W AC Power Module(02221468) for power supply.

Heat Dissipation System

The device has no fans and uses natural heat dissipation.

Technical Specifications

Table 3-6 Technical specifications of the USG6510F-D-AC

Item	Specification
Installation Type	● Rack ● Work bench ● Against the wall
Cabinet installation standard	Cabinet with a depth of 300 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	43.6 mm x 250 mm x 210 mm (1.72 in. x 9.84 in. x 8.27 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	110 mm x 465 mm x 335 mm (4.33 in. x 18.31 in. x 13.19 in.)

Item	Specification
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	2.72 kg (6.0 lb)
Weight without packaging [kg(lb)]	1.55 kg (3.42 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.2 GHz
Memory	DDR4 4 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional. Purchase one 64-GB micro SD card from Huawei as required.
Console port	RJ45
Maximum power consumption [W]	23.67 W
Maximum heat dissipation [BTU/hour]	80.8 BTU/hour
MTBF [years]	57.29 years
MTTR [hours]	2 hours
Power supply mode	Power adapter external
Number of power modules	1
Rated input voltage [V]	100 V to 240 V, 50 Hz/60 Hz
Input voltage range [V]	90 V to 264 V, 47 Hz to 63 Hz
Maximum input current [A]	1 A
Rated output power [W]	36W/12V
Maximum output power [W]	36 W
Types of fans	None
Number of fan modules	0
Heat dissipation mode	Has no fan and uses natural cooling.
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m

Item	Specification
Storage altitude [m(ft.)]	0 m to 5000 m

☐ NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.2 USG6510F-DL

Overview

Table 3-7 Basic information about the USG6510F-DL

Description	Part Number	Model	First supported version
USG6510F-DL(HTM)-AC Host(4*GE SFP +8*GE RJ45+ LTE, 1*Adapter)	02355FAF	USG6510F-DL-AC	V600R022C10

Appearance

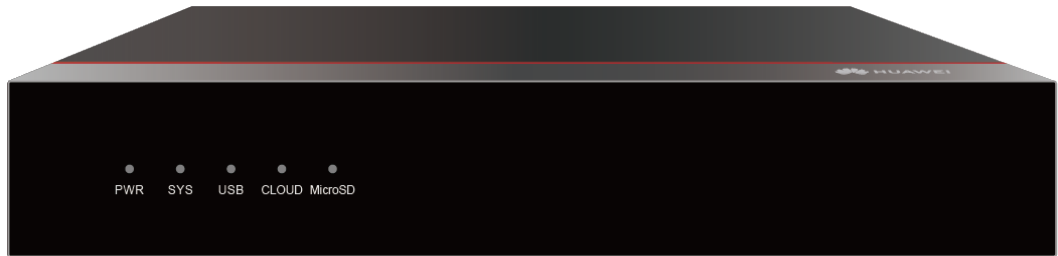Figure 3-6 Appearance of the USG6510F-DL (front view)
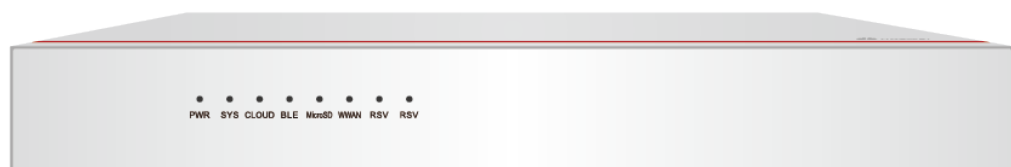
Figure 3-7 Appearance of the USG6510F-DL (rear view)
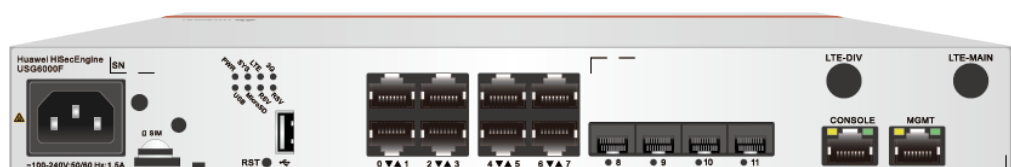
Structure

Figure 3-8 Components of the USG6510F-DL
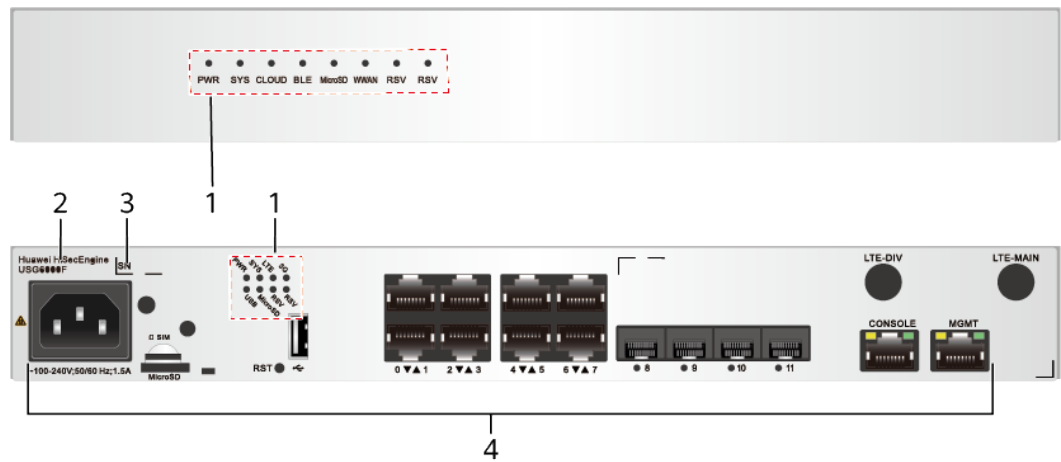
1. Indicator area	2. Product series ID	3. SN label	4. Fixed interface area

Table 3-8 Component functions

Name	Description
Indicator area	Provides various indicators to display the device running status in real time.
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fixed interface area	• Provides clip hole and power receptacle. • Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance. • Houses a Micro SD card to store logs and reports.

Indicators and Buttons

Figure 3-9 Indicators and Buttons of the USG6510F-DL
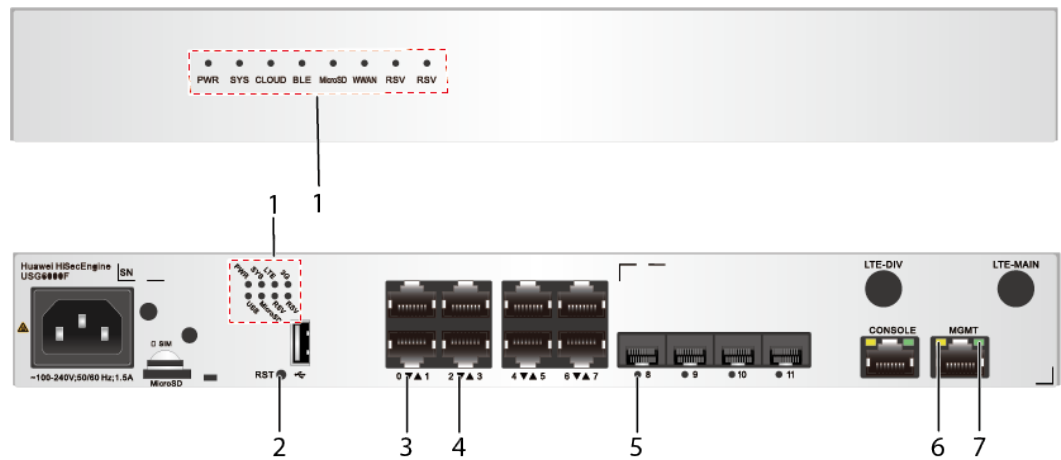
1. PWR, SYS, CLOUD, BLE, MicroSD, WWAN, RSV, USB, LTE and 3G indicators	2. RST button	3. GE electrical port ACT indicator	4. GE electrical port LINK indicator	5. GE optical port indicator
6. MGMT port ACT indicator	7. MGMT port LINK indicator	-	-	-

Table 3-9 Indicators on the USG6510F-DL

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	A system fault occurs.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
MicroSD	Micro SD indicator	Green	Steady on	The micro SD card is present.
		-	Off	The micro SD card is not detected.
LTE	LTE indicator	Green	Steady on	The LTE signal strength is high.
		Green	Blinking four times every second (4 Hz)	The LTE signal strength is medium.

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	The LTE signal strength is low.
		-	Off	No LTE signal is available.
3G	3G indicator	Green	Steady on	The 3G signal strength is high.
		Green	Blinking four times every second (4 Hz)	The 3G signal strength is medium.
		Green	Blinks once every 2 seconds (0.5 Hz).	The 3G signal strength is low.
		-	Off	No 3G signal is available.
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	A system fault occurs.
		-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
BLE	Bluetooth indicator	-	Off	Reserved function. This function is not enabled.
MicroSD	Micro SD indicator	Green	Steady on	The micro SD card is present.
		-	Off	The micro SD card is not detected.
WWAN	WWAN indicator	Green	Steady on	An LTE/3G/2G connection has been established or is active.
		Green	Blinking four times every second (4 Hz)	Data is being transmitted on the LTE/3G/2G network.
		-	Off	The LTE/3G/2G connection has not been established or is inactive.
RSV	RSV indicator	-	Off	Reserved function. This function is not enabled.
-	ACT indicator of the MGMT port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of the MGMT port	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-10 Buttons on the USG6510F-DL

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button.
		This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-10 Ports of the USG6510F-DL
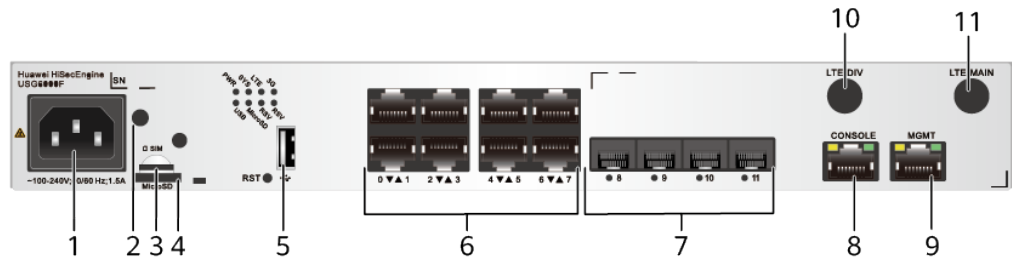
1. Power receptacle	2. Clip hole	3. SIM card slot	4. Micro SD card slot	5. USB 2.0 port
6. GE electrical port	7. GE optical port	8. Console port	9. MGMT port	10. LTE-DIV antenna port
11. LTE-MAIN antenna port	-	-	-	-

Table 3-11 Ports on the USG6510F-DL

Port	Connector Type	Description	Available Components
Clip hole	-	The hole is used to install the power cable clip, which is used to bind and fix the power cable.	Power cable clip
Power receptacle	-	The receptacle connects to the tuning fork plug of the power adapter.	Power cable

Port	Connector Type	Description	Available Components
GE electrical ports (0 to 7)	RJ45	8 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/0 to GE0/0/7. **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.	**Ethernet Cable**
GE optical port (8 to 11)	SFP	4 GE Ethernet optical ports, numbered from GE0/0/8 to GE0/0/11.	• **100Mbps SFP Optical Modules** • **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules**
Micro SD card slot	Micro SD	The micro SD card slot allows you to insert a micro SD card to record logs and reports in real time. The micro SD card is optional. You can purchase one from Huawei if needed. You are advised to install an anti-theft board delivered with the device to protect the micro SD card.	SDSDQAE-064G (BOM code: 06010308, capacity: 64GB, dimensions (H x W x D): 1 mm x 15.00 mm x 11.00 mm/0.04 in. x 0.59 in. x 0.43 in)

Port	Connector Type	Description	Available Components
SIM card slot	-	Inserts a SIM card to provide LTE/3G networks for subscribers. The SIM card is optional and purchased by the customer.	SIM card
USB 2.0 port	USB 2.0 Type A	USB port allows you to insert an USB flash drive for system software upgrades. For details on upgrades through USB flash drives, refer to the Upgrade Guide delivered with the device.	USB flash drive
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT interface	RJ45	Outband management interface, which is a 10/100/1000 Mbit/s RJ45 auto-sensing Ethernet interface. The interface number is MEth0/0/0 and the default IP address is 192.168.0.1. Connect this interface to the network port of the PC or a reachable network interface of the PC using a network cable. You can use Telnet to access the command configuration interface of the device or use a web browser to access the web configuration interface of the device to configure, manage, and maintain the device. **NOTE** The MGMT interface cannot be used as a service interface.	**Ethernet Cable**

Port	Connector Type	Description	Available Components
Two LTE antenna ports	SMA-K (external thread + inner hole)	The LTE antenna ports consist of the main antenna port (MAIN) and secondary antenna port (DIV). The primary and secondary LTE antenna ports can work at the same time. The primary antenna port is used to receive and transmit LTE signals, and the secondary antenna port is used to receive only LTE signals to increase the downlink receive rate. Interface standards and supported frequency bands: EC200A-EH: LTE FDD:Band 1/3/7/8/20/28 LTE TDD:Band 38/40/41 WCDMA:Band 1/8 GSM:900/1800 (MHz) Supported rate: LTE FDD: 50 Mbit/s in the uplink and 150 Mbit/s in the downlink LTE TDD: 30 Mbit/s in the uplink and 130 Mbit/s in the downlink	**LTE Whip Antenna** **NOTE** The LTE whip antenna with the LTE antenna interface is delivered with the installation accessory package.

Port	Connector Type	Description	Available Components
		DC-HSPA+: 5.76 Mbit/s in the uplink and 42 Mbit/s in the downlink	
		HSPA+: 5.76 Mbit/s in the uplink and 21.6 Mbit/s in the downlink	
		WCDMA PS: 384 kbit/s in the uplink and 384 kbit/s in the downlink	
		WCDMA CS: 64 kbit/s in the uplink and 64 kbit/s in the downlink	
		EDGE: uplink 236.8 kbit/s, downlink 236.8 kbit/s	
		GPRS: uplink 85.6 kbit/s, downlink 85.6 kbit/s	
		GSM: 9.6 kbit/s in the uplink and 14.4 kbit/s in the downlink	

Power Supply System

The device has a built-in power module, which supplies power to the switch through a power cable.

Heat Dissipation System

The heat dissipation system of the switch consists of two built-in fans. From the front panel, the air channel of the system is left-in and right-out. The air intake vent is located on the left and the air exhaust vent is located on the right. The fan module is located at the air exhaust vent of the system.

Figure 3-11 System air flow of the USG6510F-DL

Cool air ▬▶   Hot air ▬▶
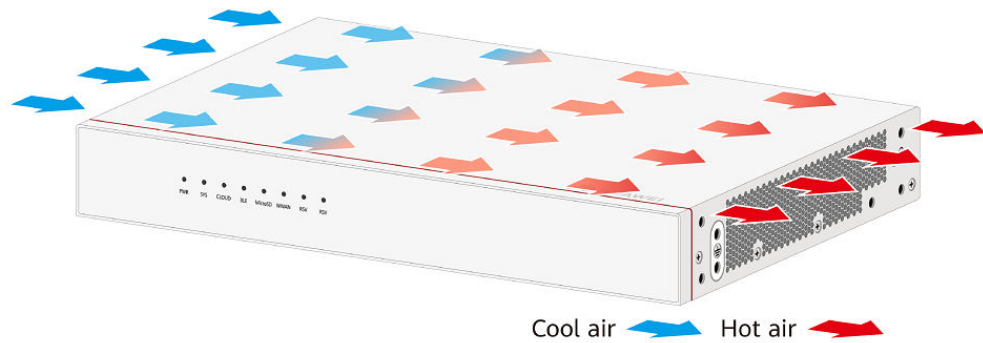
Technical Specifications

Table 3-12 Technical specifications of the USG6510F-DL-AC

Item	Specification
Installation Type	- Rack - Work bench - Against the wall
Cabinet installation standard	Cabinet with a depth of 300 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	- Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 320 mm x 220 mm (1.72 in. x 12.6 in. x 8.66 in.) - Maximum dimensions (the depth is the distance from ports on the rear panel to the front panel): 43.6 mm x 320 mm x 230 mm (1.72 in. x 12.6 in. x 9.06 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	225 mm x 485 mm x 385 mm (8.86 in. x 19.09 in. x 15.16 in.)
Weight with packaging [kg(lb)]	4.45 kg (9.81 lb)
Weight without packaging [kg(lb)]	2.34 kg (5.16 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.4 GHz
Memory	DDR4 4 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional. Purchase one 64-GB micro SD card from Huawei as required.
Console port	RJ45

Item	Specification
Eth Management port	RJ45
Maximum power consumption [W]	46.5 W
Maximum heat dissipation [BTU/hour]	158.7 BTU/hour
MTBF [years]	46.77 years
MTTR [hours]	2 hours
Power supply mode	Built-in AC
Number of power modules	1
Rated input voltage [V]	100 V to 240 V, 50 Hz/60 Hz
Rated output power [W]	70 W/12 V
Types of fans	Built-in
Number of fan modules	2
Automatic fan speed adjustment	Supported
Heat dissipation mode	Absorbing cold air into the device
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m
Storage altitude [m(ft.)]	0 m to 5000 m

◻ NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.3 USG6525F

Overview

Table 3-13 Basic information about the USG6525F

Description	Part Number	Model	First supported version
USG6525F(HTM)-AC Host(2*GE RJ45 + 8*GE COMBO + 2*10GE SFP+,1 AC power)	02355FCP	USG6525F-AC	V600R022C10
USG6525F(HTM)-DC Host(2*GE RJ45 + 8*GE COMBO + 2*10GE SFP+)	02355FDT	USG6525F-DC	V600R022C10

Appearance

◻ NOTE

The appearance difference between the DC model and AC model is the power module installed on the rear of the device. The following figure uses the AC model as an example.

Figure 3-12 Appearance of the USG6525F (front view)
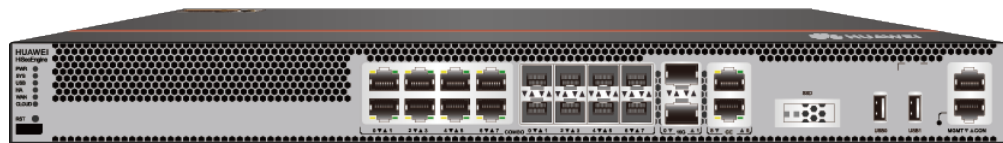
Figure 3-13 Appearance of the USG6525F (rear view)
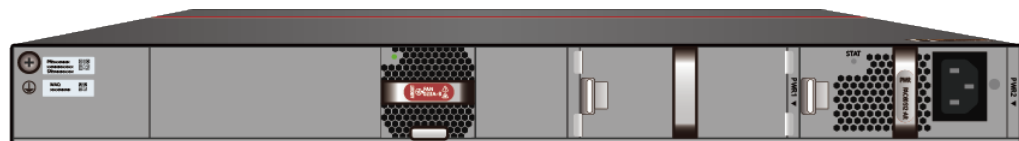
Structure

Figure 3-14 Components of the USG6525F
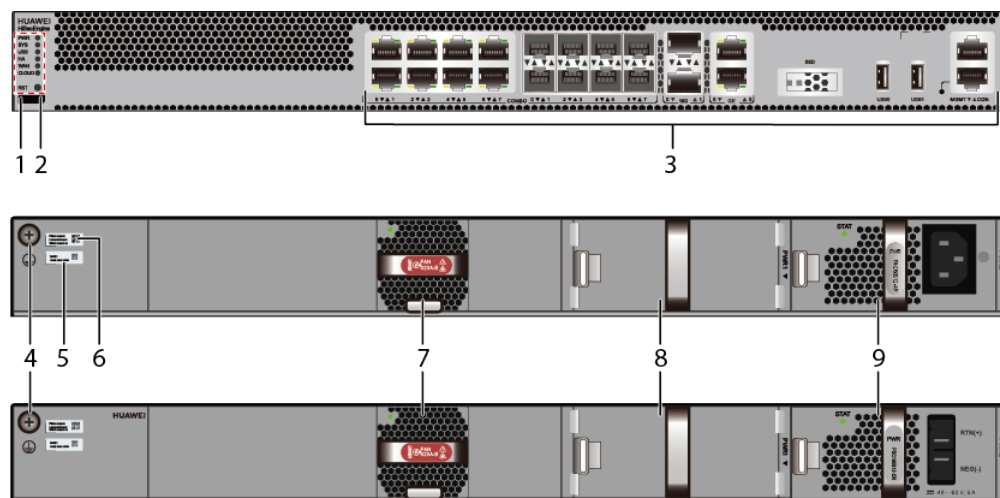
1. Product series ID	2. Indicator and button area	3. Fixed interface area	4. Protective ground terminal	5. MAC label
6. SN label	7. Fan module	8. Optional power module slot	9. Power module	-

Table 3-14 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.

Name	Description
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-15 Slot Layout of the USG6525F

Front

Back
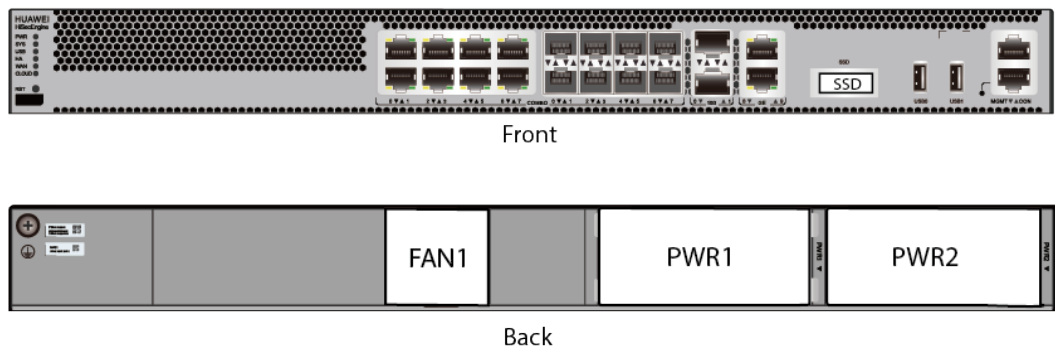
Table 3-15 Slots on the USG6525F

Slot Type	Slot ID	Slot Direction	Remarks
SSD slot	-	Horizontal	M.2 SSDs (64 GB/240 GB) can be configured.
Fan module (FAN) slot	-	Horizontal	If a fan module is faulty, replace it immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-16 Indicators and Buttons of the USG6525F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. GE electrical port ACT indicator	3. GE electrical port LINK indicator	4. Optical port ACT indicator	5. Optical port LINK indicator
6. MGMT port indicator	7. RST button	-	-	-

NOTE

Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-16 Indicators on the USG6525F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.

Silkscreen	Name	Color	Status	Description
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	ACT indicator of the GE electrical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.
-	LINK indicator of the GE electrical ports	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of an optical port	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	MGMT port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-17 Buttons on the USG6525F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button.
		This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-17 Ports of the USG6525F
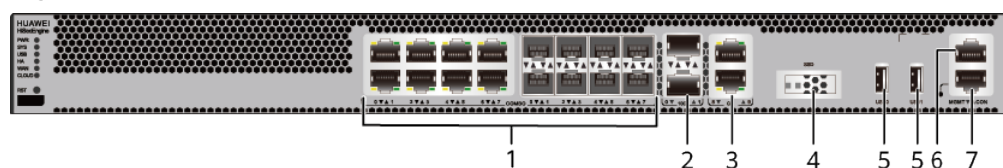
1. Combo port	2. 10GE optical port	3. GE electrical port	4. SSD card slot	5. USB 2.0 port
6. Console port	7. MGMT port	-	-	-

Table 3-18 Ports on the USG6525F

Port	Connector Type	Description	Available Components
Combo ports (0 to 7)	RJ45 + SFP	Combo ports. Combo ports are logic ports. One combo port can work as a GE electrical interface or a GE optical port. Each combo port has only one internal forwarding port. When the electrical port is enabled, the optical port is disabled. When the optical port is enabled, the electrical port is disabled. The electrical and optical ports of a combo port use the same interface view, numbered from GigabitEthernet 0/0/0 to GigabitEthernet 0/0/7. By default, the combo port is used as an electrical port. You can use the combo enable fiber /undo combo enable fiber command to set the working mode of combo ports according to network requirements.	**Ethernet Cable** **100Mbps SFP Optical Modules** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
		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.	
10GE optical ports (0 to 1)	SFP+	2 10GE optical ports numbered from 10GE0/0/0 to 10GE0/0/1, which can be reduced to GE optical ports. You can run the following command to switch the switch based on the networking requirements: speed 1000-switch to GE undo speed 1000-undo switch	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
GE electrical port (8 to 9)	RJ45	2 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/8~GE0/0/9.	**Ethernet Cable**
SSD card slot	-	The M.2 module is inserted to record logs and reports in real time. The M.2 module is optional. You can purchase the M.2 module as required.	• **Hard Disk Unit M.2-SATA64G-A** • **Hard Disk Unit M.2-SATA240G-A** • **Hard Disk Unit M.2-SATA64G-B**

Port	Connector Type	Description	Available Components
USB 2.0 port or USB0	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
USB 2.0 port or USB1	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	Out-of-band 10/100/1000M RJ45 autosensing Ethernet management port. The interface number is METH 0/0/0 and the default IP address of the interface is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through a network cable. Then, you can use Telnet to access the CLI or use a web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**

Power Supply System

The power supply system has one PAC60S12-AR or PDC180S12-CR DC power module. Two power modules can be configured for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system uses one FAN-023A-B module to dissipate heat for the system. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-18 System air flow of the USG6525F
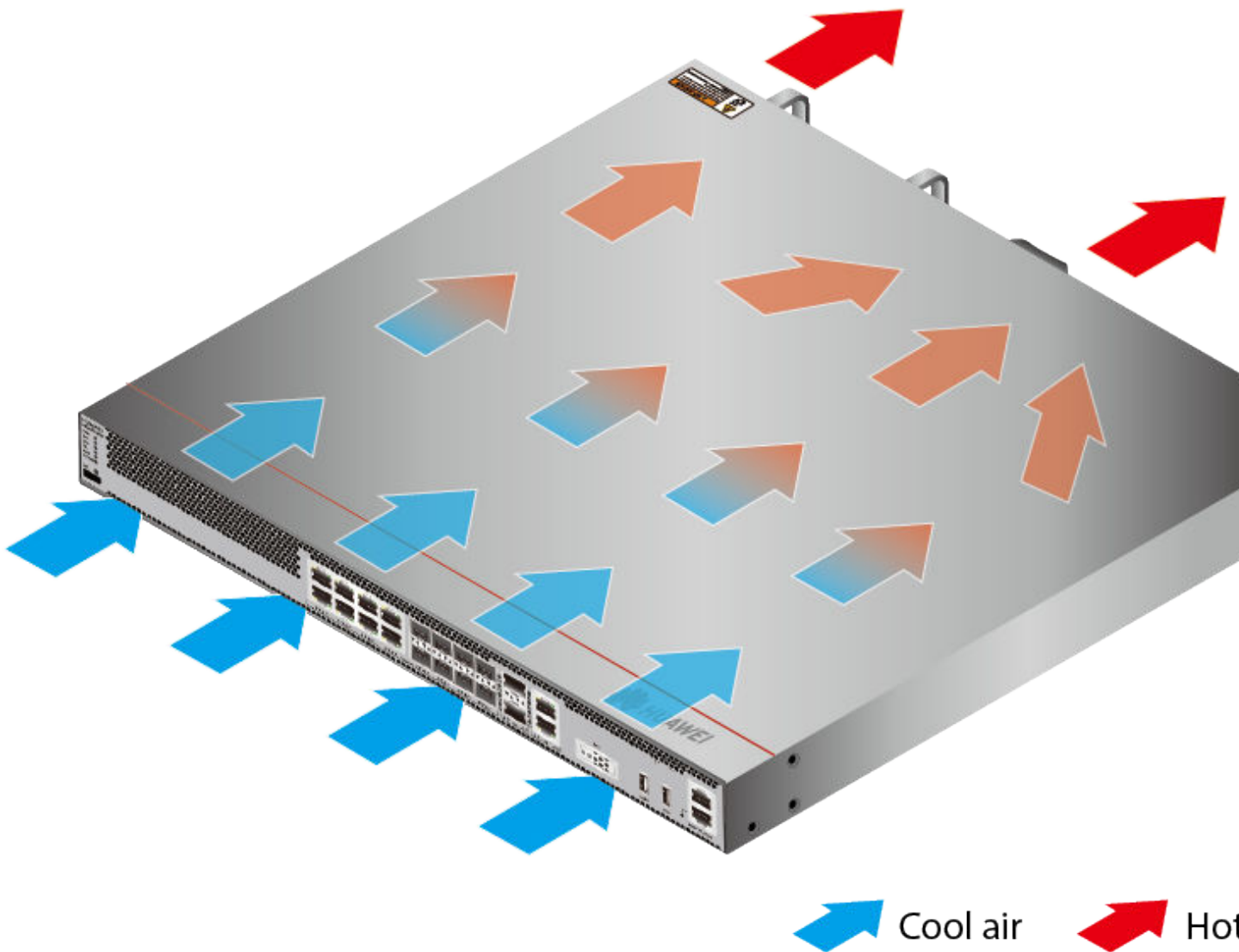
Technical Specifications

Table 3-19 Technical specifications of the USG6525F

Item	Specification
Installation Type	● Rack ● Work bench
Cabinet installation standard	Cabinet with a depth of 600 mm or above

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	• Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm (1.72 in. x 17.4 in. x 16.54 in.) • Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 453 mm (1.72 in. x 17.4 in. x 17.83 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	175 mm x 550 mm x 650 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	7.83 kg (17.26 lb)
Weight without packaging [kg(lb)]	5.46 kg (12.04 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.4 GHz
Memory	DDR4 8 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional, M.2 SSD (64 GB/240 GB), hot-swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	49.5 W
Maximum heat dissipation [BTU/hour]	168.9 BTU/hour
MTBF [years]	68.98 years
MTTR [hours]	2 hours
Power supply mode	• USG6525F-AC (02355FCP): Built-in AC • USG6525F-DC (02355FDT): Built-in DC PM
Number of power modules	1
Rated input voltage [V]	• USG6525F-AC (02355FCP): 100 V to 240 V, 50 Hz/60 Hz • USG6525F-DC (02355FDT): -48 V to -60 V

Item	Specification
Input voltage range [V]	• USG6525F-AC (02355FCP): 90 V to 290 V, 47 Hz to 63 Hz • USG6525F-DC (02355FDT): -38.4 V to -72 V
Types of fans	Pluggable
Number of fan modules	1
Heat dissipation mode	Absorbing cold air into the device
Airflow direction	Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	Dual power modules can be purchased to form 1+1 redundancy backup.
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m
Storage altitude [m(ft.)]	0 m to 5000 m

📖 **NOTE**

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.4 USG6530F-D

Overview

Table 3-20 Basic information about the USG6530F-D

Description	Part Number	Model	First supported version
USG6530F-D(HTM)-AC Host(10*GE RJ45+2*10GE SFP +,1*Adapter)	02355FBU	USG6530F-D-AC	V600R022C10

Appearance

Figure 3-19 Appearance of the USG6530F-D (front view)

Figure 3-20 Appearance of the USG6530F-D (rear view)

Structure

Figure 3-21 Components of the USG6530F-D
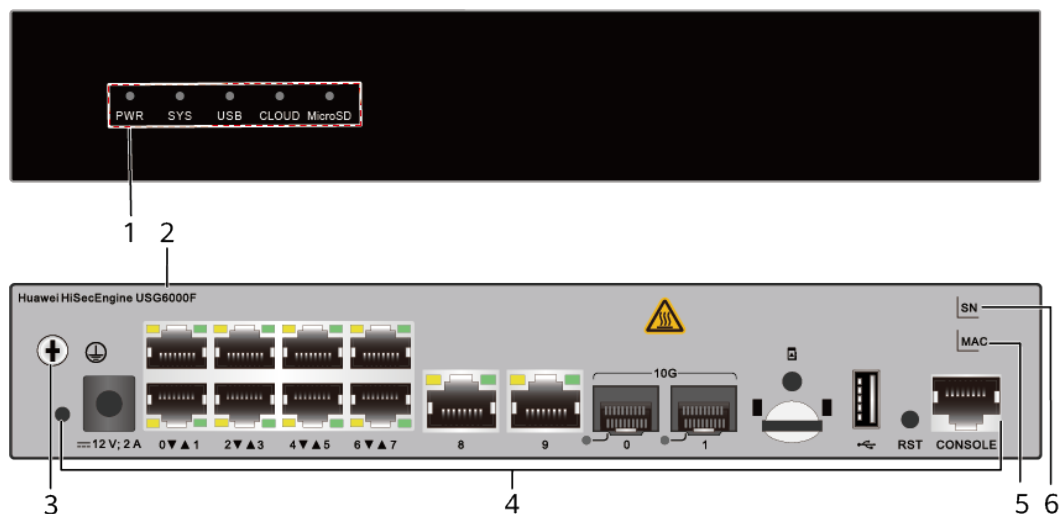
1. Indicator area	2. Product series ID	3. Protective ground terminal	4. Fixed interface area	5. MAC label
6. SN label	-	-	-	-

Table 3-21 Component functions

Name	Description
Indicator area	Provides various indicators to display the device running status in real time.
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
Fixed interface area	• Provides clip hole and power receptacle. • Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance. • Houses a Micro SD card to store logs and reports.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.

Name	Description
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.

Indicators and Buttons

Figure 3-22 Indicators and Buttons of the USG6530F-D

1. PWR, SYS, USB, CLOUD and MicroSD indicators	2. GE electrical port ACT indicator	3. GE electrical port LINK indicator	4. Optical port indicator	5. RST button

Table 3-22 Indicators on the USG6530F-D

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.

Silkscreen	Name	Color	Status	Description
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz)	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	A system fault occurs.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
MicroSD	Micro SD indicator	Green	Steady on	The micro SD card is present.
		-	Off	The micro SD card is not detected.

Silkscreen	Name	Color	Status	Description
-	ACT indicator of the GE electrical ports	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.
-	LINK indicator of the GE electrical ports	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-23 Buttons on the USG6530F-D

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-23 Ports of the USG6530F-D
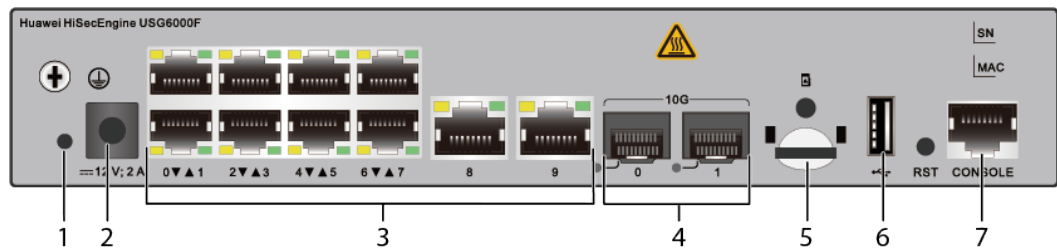
1. Clip hole	2. Power receptacle	3. GE electrical port	4. GE optical port	5. Micro SD card slot
6. USB 2.0 port	7. Console port	-	-	-

Table 3-24 Ports on the USG6530F-D

Port	Connector Type	Description	Available Components
Clip hole	-	The hole is used to install the power cable clip, which is used to bind and fix the power cable.	Power cable clip
Power receptacle	-	The receptacle connects to the tuning fork plug of the power adapter.	**36 W Power Adapter (02221468)**

Port	Connector Type	Description	Available Components
GE electrical ports (0 to 9)	RJ45	10 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/0 to GE0/0/9. GE0/0/0 is an inband management port and its default IP address is 192.168.0.1. After this port is connected to your PC through Ethernet cables, you can log in to the device using Telnet, STelnet, or web UI to configure or manage the device. **NOTE** Arrowheads show the positions of ports GE0/0/0 to GE0/0/7. A down arrowhead indicates a port at the bottom, and an up arrowhead indicates a port at the top.	**Ethernet Cable**
10GE optical ports (0 to 1)	SFP+	2 GE/10GE autosensing Ethernet optical ports, numbered from 10GE0/0/0 to 10GE0/0/1.They can be used as GE optical ports.	• **100Mbps SFP Optical Modules** • **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
Micro SD card slot	-	The micro SD card slot allows you to insert a micro SD card to record logs and reports in real time. The micro SD card is optional. You can purchase one from Huawei if needed. You are advised to install an anti-theft board delivered with the device to protect the micro SD card.	SDSDQAE-064G (BOM code: 06010308, capacity: 64GB, dimensions (H x W x D): 1 mm x 15.00 mm x 11.00 mm/0.04 in. x 0.59 in. x 0.43 in)
USB 2.0 port	USB 2.0 Type A	USB port allows you to insert an USB flash drive for system software upgrades. For details on upgrades through USB flash drives, refer to the Upgrade Guide delivered with the device.	USB flash drive

Port	Connector Type	Description	Available Components
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Power Supply System

The device has no built-in power modules and uses a 36W AC Power Module(02221468) for power supply.

Heat Dissipation System

The device has no fans and uses natural heat dissipation.

Technical Specifications

Table 3-25 Technical specifications of the USG6530F-D-AC

Item	Specification
Installation Type	● Rack ● Work bench ● Against the wall
Cabinet installation standard	Cabinet with a depth of 300 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	43.6 mm x 250 mm x 210 mm (1.72 in. x 9.84 in. x 8.27 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	110 mm x 465 mm x 335 mm (4.33 in. x 18.31 in. x 13.19 in.)

Item	Specification
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	2.72 kg (6.0 lb)
Weight without packaging [kg(lb)]	1.55 kg (3.42 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.2 GHz
Memory	DDR4 4 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional. Purchase one 64-GB micro SD card from Huawei as required.
Console port	RJ45
Maximum power consumption [W]	24.1 W
Maximum heat dissipation [BTU/hour]	82.2 BTU/hour
MTBF [years]	57.29 years
MTTR [hours]	2 hours
Power supply mode	Power adapter external
Number of power modules	1
Rated input voltage [V]	100 V to 240 V, 50 Hz/60 Hz
Input voltage range [V]	90 V to 264 V, 47 Hz to 63 Hz
Maximum input current [A]	1 A
Rated output power [W]	36W/12V
Maximum output power [W]	36 W
Types of fans	None
Number of fan modules	0
Heat dissipation mode	Has no fan and uses natural cooling.
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m

Item	Specification
Storage altitude [m(ft.)]	0 m to 5000 m

📖 **NOTE**

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.5 USG6530F-DL

Overview

Table 3-26 Basic information about the USG6530F-DL

Description	Part Number	Model	First supported version
USG6530F-DL(HTM)-AC Host(2*10GE SFP++ 2*GE SFP+8*GE RJ45+ LTE, 1*Adapter)	02355FBX	USG6530F-DL-AC	V600R022C10

Appearance

Figure 3-24 Appearance of the USG6530F-DL (front view)
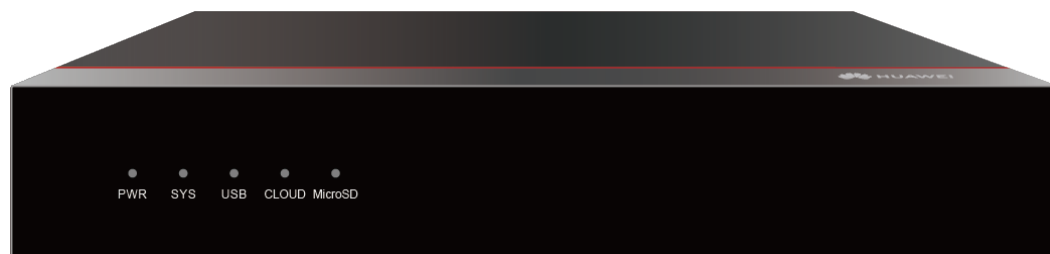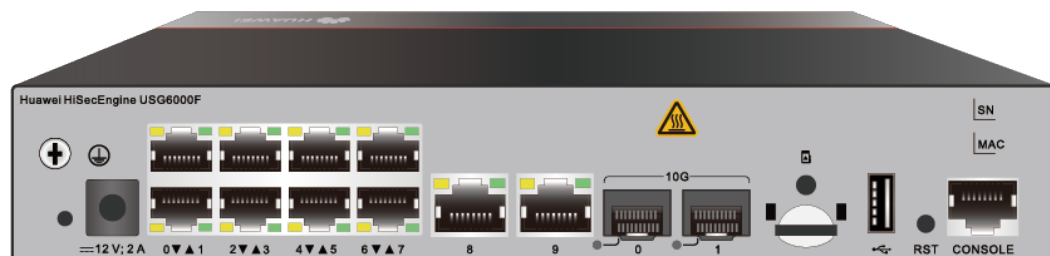

Figure 3-25 Appearance of the USG6530F-DL (rear view)
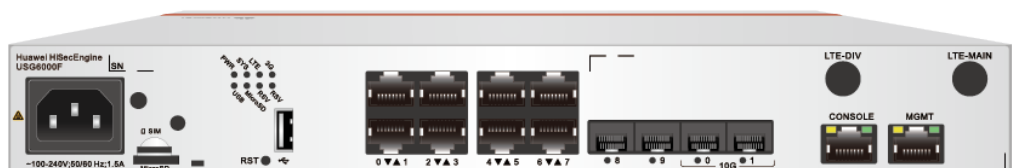
Structure

Figure 3-26 Components of the USG6530F-DL

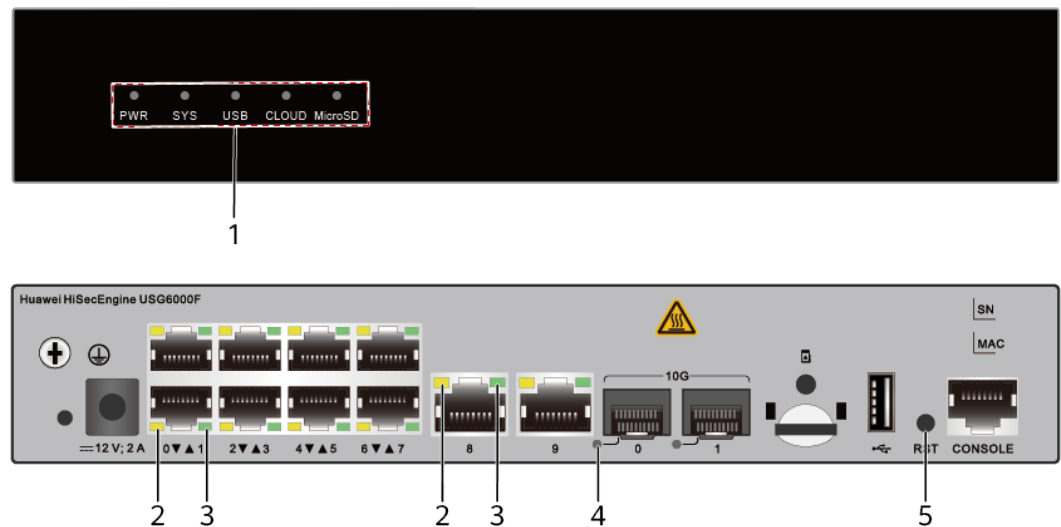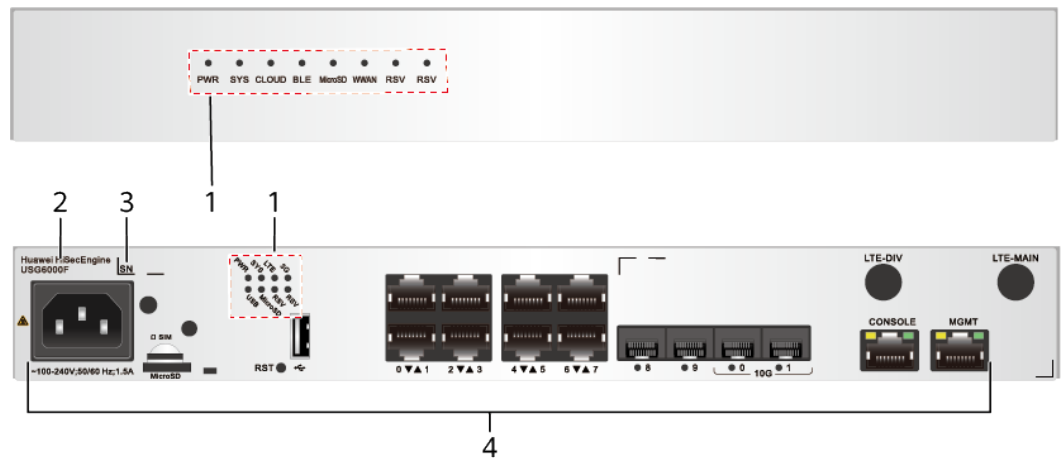| 1. Indicator area	2. Product series ID	3. SN label	4. Fixed interface area

Table 3-27 Component functions

Name	Description
Indicator area	Provides various indicators to display the device running status in real time.
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fixed interface area	● Provides clip hole and power receptacle. ● Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance. ● Houses a Micro SD card to store logs and reports.

Indicators and Buttons

Figure 3-27 Indicators and Buttons of the USG6530F-DL
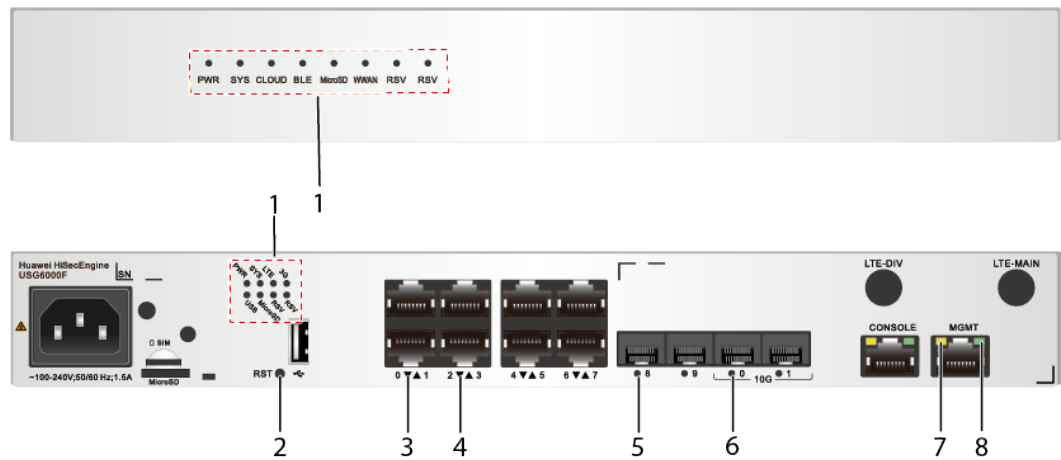
1. PWR, SYS, CLOUD, BLE, MicroSD, WWAN, RSV, USB, LTE and 3G indicators	2. RST button	3. GE electrical port ACT indicator	4. GE electrical port LINK indicator	5. GE optical port indicator
6. 10GE optical port indicator	7. MGMT port ACT indicator	8. MGMT port LINK indicator	-	-

Table 3-28 Indicators on the USG6530F-DL

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	A system fault occurs.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
MicroSD	Micro SD indicator	Green	Steady on	The micro SD card is present.
		-	Off	The micro SD card is not detected.
LTE	LTE indicator	Green	Steady on	The LTE signal strength is high.
		Green	Blinking four times every second (4 Hz)	The LTE signal strength is medium.

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	The LTE signal strength is low.
		-	Off	No LTE signal is available.
3G	3G indicator	Green	Steady on	The 3G signal strength is high.
		Green	Blinking four times every second (4 Hz)	The 3G signal strength is medium.
		Green	Blinks once every 2 seconds (0.5 Hz).	The 3G signal strength is low.
		-	Off	No 3G signal is available.
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	A system fault occurs.
		-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
BLE	Bluetooth indicator	-	Off	Reserved function. This function is not enabled.
MicroSD	Micro SD indicator	Green	Steady on	The micro SD card is present.
		-	Off	The micro SD card is not detected.
WWAN	WWAN indicator	Green	Steady on	An LTE/3G/2G connection has been established or is active.
		Green	Blinking four times every second (4 Hz)	Data is being transmitted on the LTE/3G/2G network.
		-	Off	The LTE/3G/2G connection has not been established or is inactive.
RSV	RSV indicator	-	Off	Reserved function. This function is not enabled.
-	ACT indicator of the MGMT port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of the MGMT port	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-29 Buttons on the USG6530F-DL

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-28 Ports of the USG6530F-DL
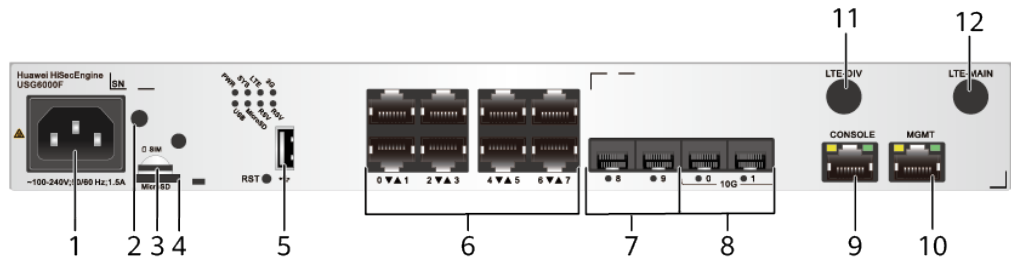
1. Power receptacle	2. Clip hole	3. SIM card slot	4. Micro SD card slot	5. USB 2.0 port
6. GE electrical port	7. GE optical port	8. 10GE optical port	9. Console port	10. MGMT port
11. LTE-DIV antenna port	12. LTE-MAIN antenna port	-	-	-

Table 3-30 Ports on the USG6530F-DL

Port	Connector Type	Description	Available Components
Clip hole	-	The hole is used to install the power cable clip, which is used to bind and fix the power cable.	Power cable clip
Power receptacle	-	The receptacle connects to the tuning fork plug of the power adapter.	Power cable

Port	Connector Type	Description	Available Components
GE electrical ports (0 to 7)	RJ45	8 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/0 to GE0/0/7. **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.	**Ethernet Cable**
GE optical port (8 to 9)	RJ45	2 GE optical ports, numbered from GE0/0/8 to GE0/0/9.	• **100Mbps SFP Optical Modules** • **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules**
10GE optical port (0 to 1)	SFP+	2 10GE auto-sensing Ethernet optical ports numbered from 10GE 0/0/0 to 10GE 0/0/1. They can be used as GE optical ports.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
Micro SD card slot	-	The micro SD card slot allows you to insert a micro SD card to record logs and reports in real time. The micro SD card is optional. You can purchase one from Huawei if needed. You are advised to install an anti-theft board delivered with the device to protect the micro SD card.	SDSDQAE-064G (BOM code: 06010308, capacity: 64GB, dimensions (H x W x D): 1 mm x 15.00 mm x 11.00 mm/0.04 in. x 0.59 in. x 0.43 in)
SIM card slot	-	Inserts a SIM card to provide LTE/3G networks for subscribers. The SIM card is optional and purchased by the customer.	SIM card
USB 2.0 port	USB 2.0 Type A	USB port allows you to insert an USB flash drive for system software upgrades. For details on upgrades through USB flash drives, refer to the Upgrade Guide delivered with the device.	USB flash drive

Port	Connector Type	Description	Available Components
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT interface	RJ45	Outband management interface, which is a 10/100/1000 Mbit/s RJ45 auto-sensing Ethernet interface. The interface number is MEth0/0/0 and the default IP address is 192.168.0.1. Connect this interface to the network port of the PC or a reachable network interface of the PC using a network cable. You can use Telnet to access the command configuration interface of the device or use a web browser to access the web configuration interface of the device to configure, manage, and maintain the device. **NOTE** The MGMT interface cannot be used as a service interface.	**Ethernet Cable**

Port	Connector Type	Description	Available Components
Two LTE antenna ports	SMA-K (external thread + inner hole)	The LTE antenna ports consist of the main antenna port (MAIN) and secondary antenna port (DIV). The primary and secondary LTE antenna ports can work at the same time. The primary antenna port is used to receive and transmit LTE signals, and the secondary antenna port is used to receive only LTE signals to increase the downlink receive rate. Interface standards and supported frequency bands: EC200A-EH: LTE FDD:Band 1/3/7/8/20/28 LTE TDD:Band 38/40/41 WCDMA:Band 1/8 GSM:900/1800 (MHz) Supported rate: LTE FDD: 50 Mbit/s in the uplink and 150 Mbit/s in the downlink LTE TDD: 30 Mbit/s in the uplink and 130 Mbit/s in the downlink	**LTE Whip Antenna** **NOTE** The LTE whip antenna with the LTE antenna interface is delivered with the installation accessory package.

Port	Connector Type	Description	Available Components
		DC-HSPA+: 5.76 Mbit/s in the uplink and 42 Mbit/s in the downlink	
		HSPA+: 5.76 Mbit/s in the uplink and 21.6 Mbit/s in the downlink	
		WCDMA PS: 384 kbit/s in the uplink and 384 kbit/s in the downlink	
		WCDMA CS: 64 kbit/s in the uplink and 64 kbit/s in the downlink	
		EDGE: uplink 236.8 kbit/s, downlink 236.8 kbit/s	
		GPRS: uplink 85.6 kbit/s, downlink 85.6 kbit/s	
		GSM: 9.6 kbit/s in the uplink and 14.4 kbit/s in the downlink	

Power Supply System

The device has a built-in power module, which supplies power to the switch through a power cable.

Heat Dissipation System

The heat dissipation system of the switch consists of two built-in fans. From the front panel, the air channel of the system is left-in and right-out. The air intake vent is located on the left and the air exhaust vent is located on the right. The fan module is located at the air exhaust vent of the system.

Figure 3-29 System air flow of the USG6530F-DL

Cool air   Hot air
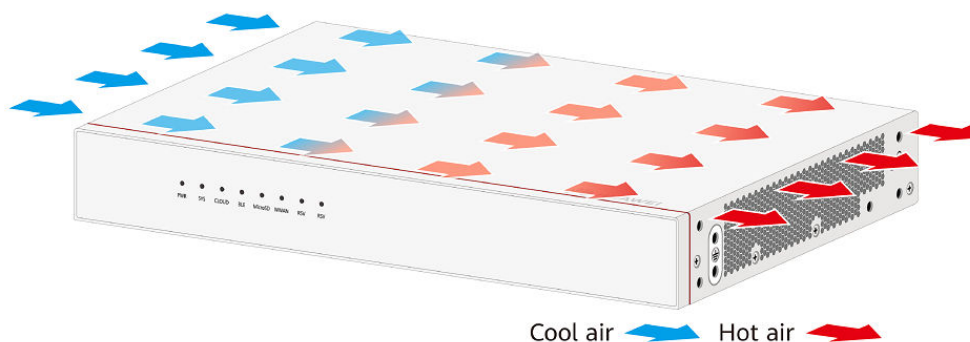
Technical Specifications

Table 3-31 Technical specifications of the USG6530F-DL-AC

Item	Specification
Installation Type	- Rack - Work bench - Against the wall
Cabinet installation standard	Cabinet with a depth of 300 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	- Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 320 mm x 220 mm (1.72 in. x 12.6 in. x 8.66 in.) - Maximum dimensions (the depth is the distance from ports on the rear panel to the front panel): 43.6 mm x 320 mm x 230 mm (1.72 in. x 12.6 in. x 9.06 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	225 mm x 485 mm x 385 mm (8.86 in. x 19.09 in. x 15.16 in.)
Weight with packaging [kg(lb)]	4.45 kg (9.81 lb)
Weight without packaging [kg(lb)]	2.34 kg (5.16 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.4 GHz
Memory	DDR4 4 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional. Purchase one 64-GB micro SD card from Huawei as required.
Console port	RJ45

Item	Specification
Eth Management port	RJ45
Maximum power consumption [W]	46.5 W
Maximum heat dissipation [BTU/hour]	158.7 BTU/hour
MTBF [years]	47.26 years
MTTR [hours]	2 hours
Power supply mode	Built-in AC
Number of power modules	1
Rated input voltage [V]	100 V to 240 V, 50 Hz/60 Hz
Rated output power [W]	70 W/12 V
Types of fans	Built-in
Number of fan modules	2
Automatic fan speed adjustment	Supported
Heat dissipation mode	Absorbing cold air into the device
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m
Storage altitude [m(ft.)]	0 m to 5000 m

 NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.6 USG6555F

Overview

Table 3-32 Basic information about the USG6555F

Description	Part Number	Model	First supported version
USG6555F(HTM)-AC Host(2*GE RJ45 + 8*GE COMBO + 2*10GE SFP+,1 AC power)	02355FCQ	USG6555F-AC	V600R022C10

Appearance

Figure 3-30 Appearance of the USG6555F (front view)
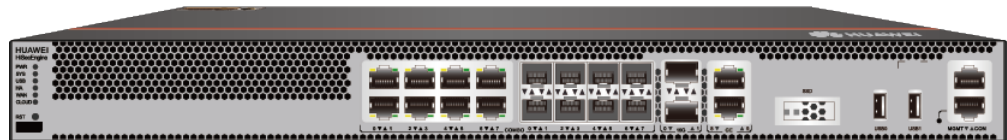
Figure 3-31 Appearance of the USG6555F (rear view)
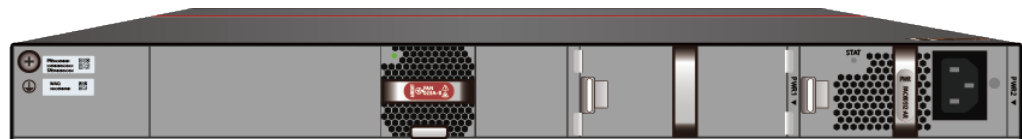
Structure

Figure 3-32 Components of the USG6555F

1. Product series ID	2. Indicator and button area	3. Fixed interface area	4. Protective ground terminal	5. MAC label

6. SN label	7. Fan module	8. Optional power module slot	9. Power module	-

Table 3-33 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-33 Slot Layout of the USG6555F

Front

Back
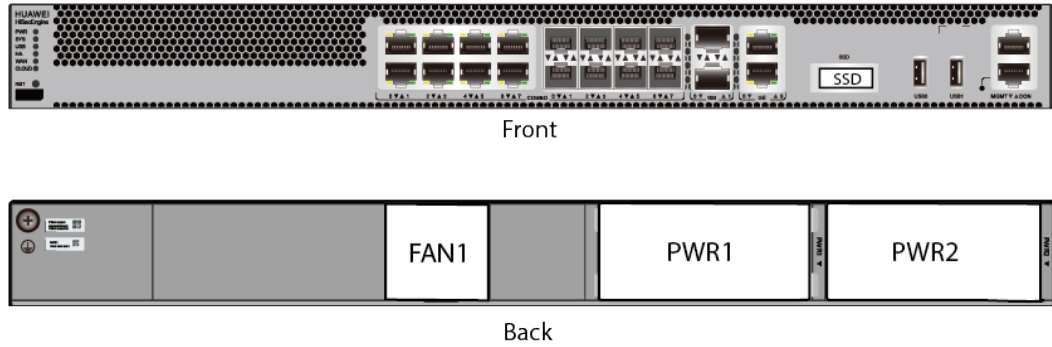
Table 3-34 Slots on the USG6555F

Slot Type	Slot ID	Slot Direction	Remarks
SSD slot	-	Horizontal	M.2 SSDs (64 GB/240 GB) can be configured.
Fan module (FAN) slot	-	Horizontal	If a fan module is faulty, replace it immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-34 Indicators and Buttons of the USG6555F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. GE electrical port ACT indicator	3. GE electrical port LINK indicator	4. Optical port ACT indicator	5. Optical port LINK indicator

6. MGMT port indicator	7. RST button	-	-	-

📖 **NOTE**

Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-35 Indicators on the USG6555F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	ACT indicator of the GE electrical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
-		-	Off	The port is not sending or receiving data.
-	LINK indicator of the GE electrical ports	Green	Steady on	The port link is connected.
-		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
-		-	Off	The port is not sending or receiving data.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of an optical port	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	MGMT port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-36 Buttons on the USG6555F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button.
		This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-35 Ports of the USG6555F
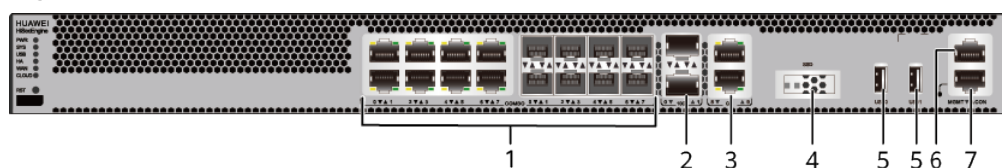
1. Combo port	2. 10GE optical port	3. GE electrical port	4. SSD card slot	5. USB 2.0 port
6. Console port	7. MGMT port	-	-	-

Table 3-37 Ports on the USG6555F

Port	Connector Type	Description	Available Components
Combo ports (0 to 7)	RJ45 + SFP	Combo ports. Combo ports are logic ports. One combo port can work as a GE electrical interface or a GE optical port. Each combo port has only one internal forwarding port. When the electrical port is enabled, the optical port is disabled. When the optical port is enabled, the electrical port is disabled. The electrical and optical ports of a combo port use the same interface view, numbered from GigabitEthernet 0/0/0 to GigabitEthernet 0/0/7. By default, the combo port is used as an electrical port. You can use the combo enable fiber /undo combo enable fiber command to set the working mode of combo ports according to network requirements.	**Ethernet Cable** **100Mbps SFP Optical Modules** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
		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.	
10GE optical ports (0 to 1)	SFP+	2 10GE optical ports numbered from 10GE0/0/0 to 10GE0/0/1, which can be reduced to GE optical ports. You can run the following command to switch the switch based on the networking requirements: speed 1000-switch to GE undo speed 1000-undo switch	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
GE electrical port (8 to 9)	RJ45	2 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/8~GE0/0/9.	**Ethernet Cable**
SSD card slot	-	The M.2 module is inserted to record logs and reports in real time. The M.2 module is optional. You can purchase the M.2 module as required.	• **Hard Disk Unit M.2-SATA64G-A** • **Hard Disk Unit M.2-SATA240G-A** • **Hard Disk Unit M.2-SATA64G-B**

Port	Connector Type	Description	Available Components
USB 2.0 port or USB0	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
USB 2.0 port or USB1	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	Out-of-band 10/100/1000M RJ45 autosensing Ethernet management port. The interface number is METH 0/0/0 and the default IP address of the interface is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through a network cable. Then, you can use Telnet to access the CLI or use a web browser to access the web UI to configure, manage, and maintain the device. **NOTE** 　The MGMT port cannot be used as a service port.	**Ethernet Cable**

Power Supply System

The power supply system has one PAC60S12-AR AC power module. Two power modules can be configured for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system uses one FAN-023A-B module to dissipate heat for the system. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-36 System air flow of the USG6555F

Cool air   Hot
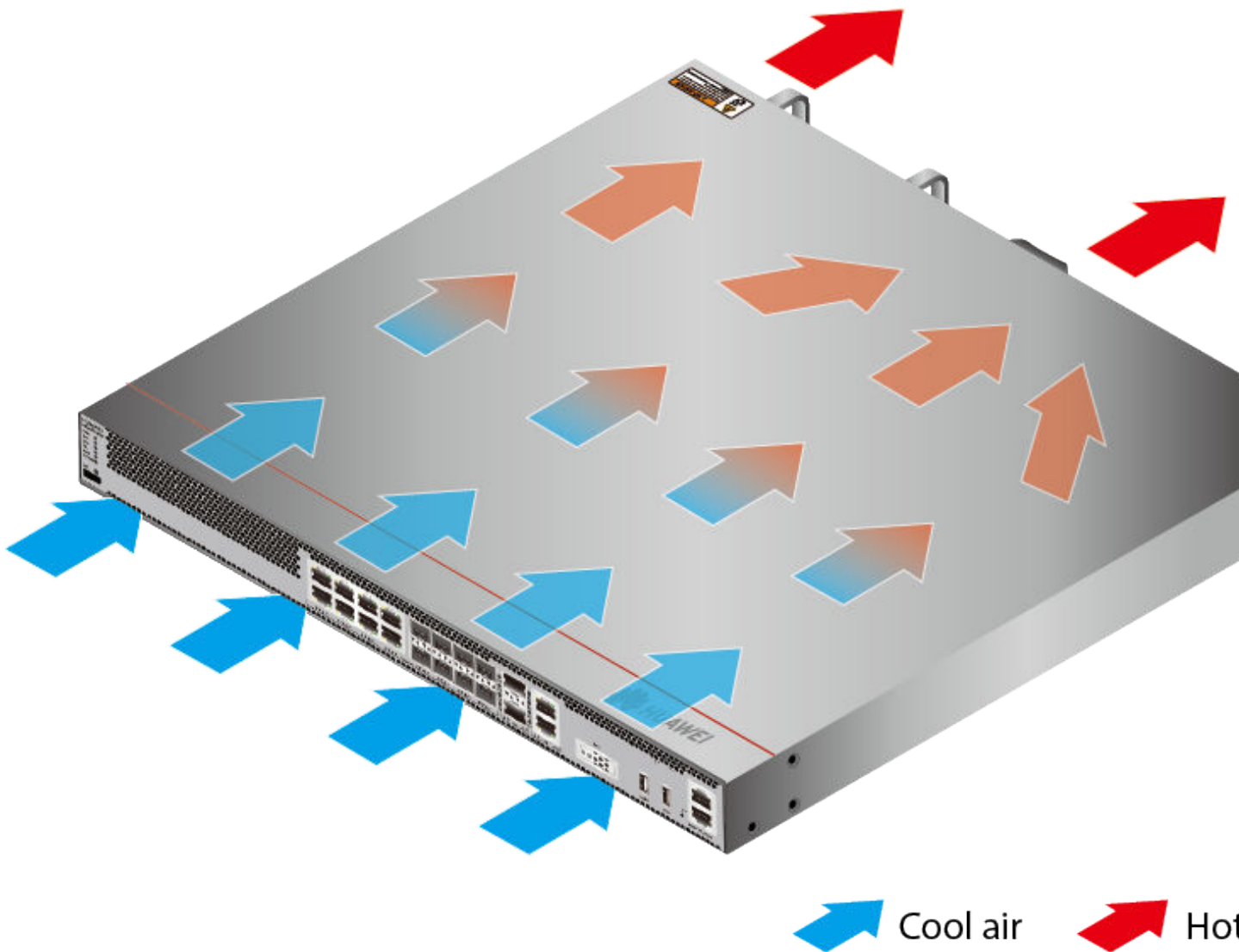
Technical Specifications

Table 3-38 Technical specifications of the USG6555F-AC

Item	Specification
Installation Type	● Rack ● Work bench
Cabinet installation standard	Cabinet with a depth of 600 mm or above

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	- Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm (1.72 in. x 17.4 in. x 16.54 in.) - Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 453 mm (1.72 in. x 17.4 in. x 17.83 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	175 mm x 550 mm x 650 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	7.83 kg (17.26 lb)
Weight without packaging [kg(lb)]	5.46 kg (12.04 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.4 GHz
Memory	DDR4 8 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional, M.2 SSD (64 GB/240 GB), hot-swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	49.5 W
Maximum heat dissipation [BTU/hour]	168.9 BTU/hour
MTBF [years]	68.98 years
MTTR [hours]	2 hours
Power supply mode	Built-in AC
Number of power modules	1
Rated input voltage [V]	100 V to 240 V, 50 Hz/60 Hz
Input voltage range [V]	90 V to 290 V, 47 Hz to 63 Hz
Types of fans	Pluggable
Number of fan modules	1
Heat dissipation mode	Absorbing cold air into the device

Item	Specification
Airflow direction	Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	Dual power modules can be purchased to form 1+1 redundancy backup.
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m
Storage altitude [m(ft.)]	0 m to 5000 m

 NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.7 USG6565F

Overview

Table 3-39 Basic information about the USG6565F

Description	Part Number	Model	First supported version
USG6565F(HTM)-AC Host(2*GE RJ45 + 8*GE COMBO + 2*10GE SFP+,1 AC power)	02355FCR	USG6565F-AC	V600R022C10
USG6565F(HTM)-DC Host(2*GE RJ45 + 8*GE COMBO + 2*10GE SFP+)	02355FDR	USG6565F-DC	V600R022C10

Appearance

> ☐ NOTE
>
> The appearance difference between the DC model and AC model is the power module installed on the rear of the device. The following figure uses the AC model as an example.

Figure 3-37 Appearance of the USG6565F (front view)

Figure 3-38 Appearance of the USG6565F (rear view)

Structure

Figure 3-39 Components of the USG6565F

1. Product series ID	2. Indicator and button area	3. Fixed interface area	4. Protective ground terminal	5. MAC label
6. SN label	7. Fan module	8. Optional power module slot	9. Power module	-

Table 3-40 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-40 Slot Layout of the USG6565F

Front

Back
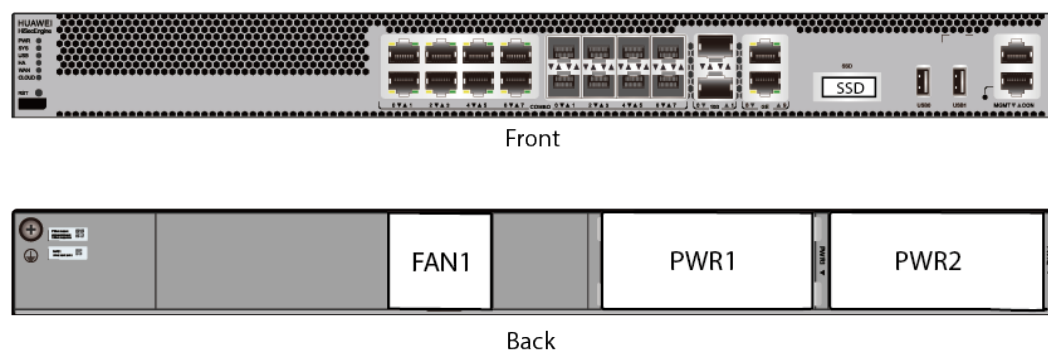
Table 3-41 Slots on the USG6565F

Slot Type	Slot ID	Slot Direction	Remarks
SSD slot	-	Horizontal	M.2 SSDs (64 GB/240 GB) can be configured.
Fan module (FAN) slot	-	Horizontal	If a fan module is faulty, replace it immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-41 Indicators and Buttons of the USG6565F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. GE electrical port ACT indicator	3. GE electrical port LINK indicator	4. Optical port ACT indicator	5. Optical port LINK indicator
6. MGMT port indicator	7. RST button	-	-	-

> **NOTE**
>
> Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-42 Indicators on the USG6565F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.

Silkscreen	Name	Color	Status	Description
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.

Silkscreen	Name	Color	Status	Description
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	ACT indicator of the GE electrical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of the GE electrical ports	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.
-	LINK indicator of an optical port	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	MGMT port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-43 Buttons on the USG6565F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-42 Ports of the USG6565F
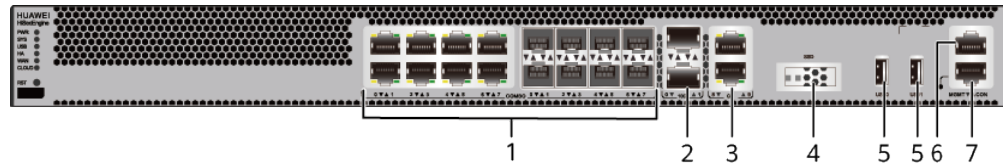
1. Combo port	2. 10GE optical port	3. GE electrical port	4. SSD card slot	5. USB 2.0 port
6. Console port	7. MGMT port	-	-	-

Table 3-44 Ports on the USG6565F

Port	Connector Type	Description	Available Components
Combo ports (0 to 7)	RJ45 + SFP	Combo ports. Combo ports are logic ports. One combo port can work as a GE electrical interface or a GE optical port. Each combo port has only one internal forwarding port. When the electrical port is enabled, the optical port is disabled. When the optical port is enabled, the electrical port is disabled. The electrical and optical ports of a combo port use the same interface view, numbered from GigabitEthernet 0/0/0 to GigabitEthernet 0/0/7. By default, the combo port is used as an electrical port. You can use the combo enable fiber /undo combo enable fiber command to set the working mode of combo ports according to network requirements.	**Ethernet Cable** **100Mbps SFP Optical Modules** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
		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.	
10GE optical ports (0 to 1)	SFP+	2 10GE optical ports numbered from 10GE0/0/0 to 10GE0/0/1, which can be reduced to GE optical ports. You can run the following command to switch the switch based on the networking requirements: speed 1000-switch to GE undo speed 1000-undo switch	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
GE electrical port (8 to 9)	RJ45	2 10/100/1000M autosensing Ethernet electrical ports, numbered from GE0/0/8~GE0/0/9.	**Ethernet Cable**
SSD card slot	-	The M.2 module is inserted to record logs and reports in real time. The M.2 module is optional. You can purchase the M.2 module as required.	• **Hard Disk Unit M.2-SATA64G-A** • **Hard Disk Unit M.2-SATA240G-A** • **Hard Disk Unit M.2-SATA64G-B**

Port	Connector Type	Description	Available Components
USB 2.0 port or USB0	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
USB 2.0 port or USB1	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	Out-of-band 10/100/1000M RJ45 autosensing Ethernet management port. The interface number is METH 0/0/0 and the default IP address of the interface is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through a network cable. Then, you can use Telnet to access the CLI or use a web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**

Power Supply System

The power supply system has one PAC60S12-AR or PDC180S12-CR DC power module. Two power modules can be configured for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system uses one FAN-023A-B module to dissipate heat for the system. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-43 System air flow of the USG6565F

Cool air   Hot
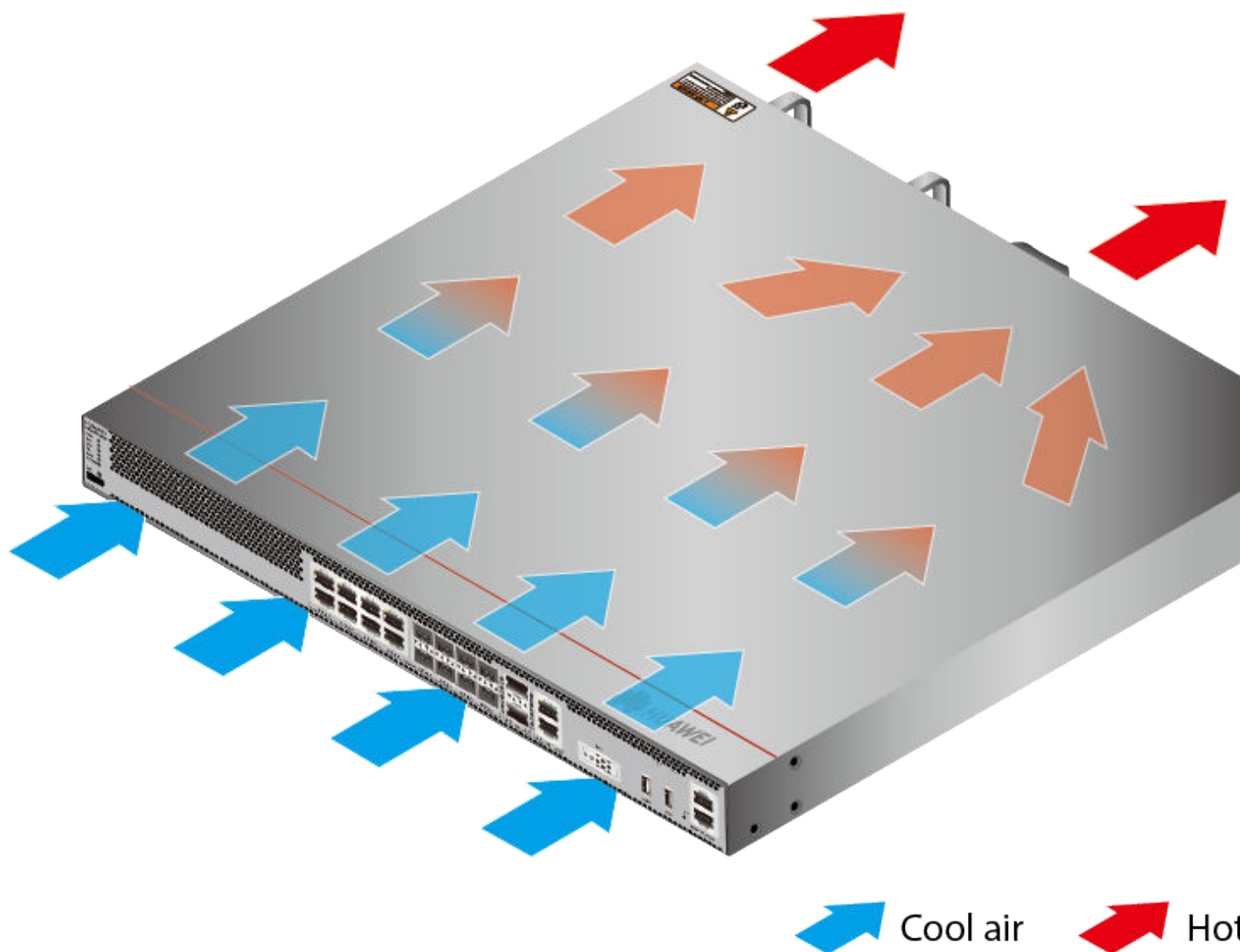
Technical Specifications

Table 3-45 Technical specifications of the USG6565F

Item	Specification
Installation Type	● Rack ● Work bench
Cabinet installation standard	Cabinet with a depth of 600 mm or above

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	● Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm (1.72 in. x 17.4 in. x 16.54 in.) ● Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 453 mm (1.72 in. x 17.4 in. x 17.83 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	175 mm x 550 mm x 650 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	7.83 kg (17.26 lb)
Weight without packaging [kg(lb)]	5.46 kg (12.04 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.4 GHz
Memory	DDR4 8 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional, M.2 SSD (64 GB/240 GB), hot-swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	49.5 W
Maximum heat dissipation [BTU/hour]	168.9 BTU/hour
MTBF [years]	68.98 years
MTTR [hours]	2 hours
Power supply mode	● USG6565F-AC (02355FCR): Built-in AC ● USG6565F-DC (02355FDR): Built-in DC PM
Number of power modules	1
Rated input voltage [V]	● USG6565F-AC (02355FCR): 100 V to 240 V, 50 Hz/60 Hz ● USG6565F-DC (02355FDR): -48 V to -60 V

Item	Specification
Input voltage range [V]	• USG6565F-AC (02355FCR): 90 V to 290 V, 47 Hz to 63 Hz • USG6565F-DC (02355FDR): -38.4 V to -72 V
Types of fans	Pluggable
Number of fan modules	1
Heat dissipation mode	Absorbing cold air into the device
Airflow direction	Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	Dual power modules can be purchased to form 1+1 redundancy backup.
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m
Storage altitude [m(ft.)]	0 m to 5000 m

📖 **NOTE**

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.8 USG6585F

Overview

Table 3-46 Basic information about the USG6585F

Description	Part Number	Model	First supported version
USG6585F(HTM)-AC Host(2*GE RJ45 + 8*GE COMBO + 2*10GE SFP+,1 AC power)	02355FCS	USG6585F-AC	V600R022C10

Appearance

Figure 3-44 Appearance of the USG6585F (front view)
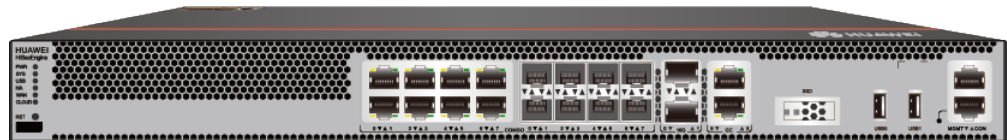
Figure 3-45 Appearance of the USG6585F (rear view)
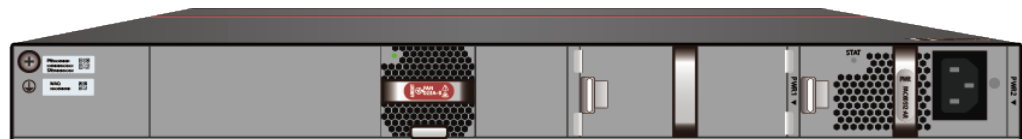
Structure

Figure 3-46 Components of the USG6585F

1. Product series ID	2. Indicator and button area	3. Fixed interface area	4. Protective ground terminal	5. MAC label

6. SN label	7. Fan module	8. Optional power module slot	9. Power module	-

Table 3-47 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-47 Slot Layout of the USG6585F

Front

Back
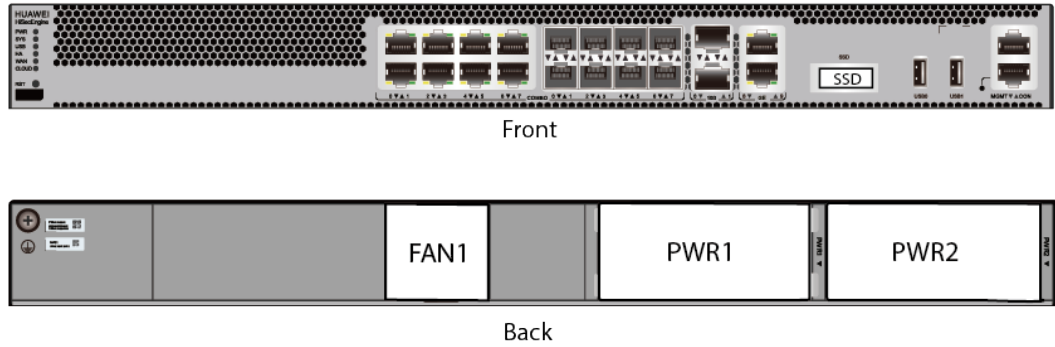
Table 3-48 Slots on the USG6585F

Slot Type	Slot ID	Slot Direction	Remarks
SSD slot	-	Horizontal	M.2 SSDs (64 GB/240 GB) can be configured.
Fan module (FAN) slot	-	Horizontal	If a fan module is faulty, replace it immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-48 Indicators and Buttons of the USG6585F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. GE electrical port ACT indicator	3. GE electrical port LINK indicator	4. Optical port ACT indicator	5. Optical port LINK indicator

6. MGMT port indicator	7. RST button	-	-	-

📖 **NOTE**

Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-49 Indicators on the USG6585F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	ACT indicator of the GE electrical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.
-	LINK indicator of the GE electrical ports	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	The port is not sending or receiving data.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of an optical port	Green	Steady on	The port link is connected.
		-	Off	No link is established on the port.
-	MGMT port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-50 Buttons on the USG6585F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button.
		This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Ports

Figure 3-49 Ports of the USG6585F
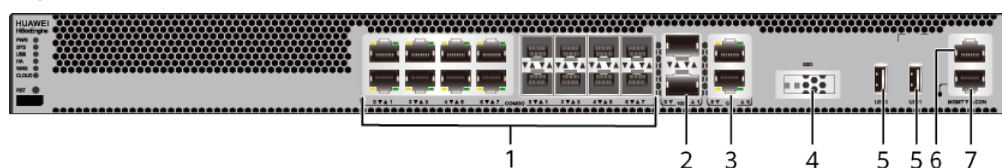
1. Combo port	2. 10GE optical port	3. GE electrical port	4. SSD card slot	5. USB 2.0 port
6. Console port	7. MGMT port	-	-	-

Table 3-51 Ports on the USG6585F

Port	Connector Type	Description	Available Components
Combo ports (0 to 7)	RJ45 + SFP	Combo ports. Combo ports are logic ports. One combo port can work as a GE electrical interface or a GE optical port. Each combo port has only one internal forwarding port. When the electrical port is enabled, the optical port is disabled. When the optical port is enabled, the electrical port is disabled. The electrical and optical ports of a combo port use the same interface view, numbered from GigabitEthernet 0/0/0 to GigabitEthernet 0/0/7. By default, the combo port is used as an electrical port. You can use the combo enable { copper | fiber } command to set the working mode of combo ports according to network requirements.	**Ethernet Cable** **100Mbps SFP Optical Modules** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
		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.	
10GE optical ports (0 to 1)	SFP+	2 10GE optical ports, numbered from XGigabitEthernet 0/0/0 to XGigabitEthernet 0/0/1. **NOTE** By default, the rate of 10GE optical ports are 10GE. You can run the set device port-config-mode [10ge | ge] command to set the rate of 10GE optical ports are to 10GE or GE as required.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
GE electrical port (8 to 9)	RJ45	2 10/100/1000M autosensing Ethernet electrical ports, numbered from GigabitEthernet0/0/8~GigabitEthernet0/0/9.	**Ethernet Cable**
SSD card slot	-	The M.2 module is inserted to record logs and reports in real time. The M.2 module is optional. You can purchase the M.2 module as required.	• **Hard Disk Unit M.2-SATA64G-A** • **Hard Disk Unit M.2-SATA240G-A** • **Hard Disk Unit M.2-SATA64G-B**

Port	Connector Type	Description	Available Components
USB 2.0 port or USB0	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
USB 2.0 port or USB1	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details on upgrades through USB devices, refer to the Upgrade Guide delivered with the device.	USB flash drive
Console port	RJ45	Console ports allow you to locally connect a PC to the device. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use a serial port terminal program on your PC to access, configure, and manage the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	Out-of-band 10/100/1000M RJ45 autosensing Ethernet management port. The interface number is METH 0/0/0 and the default IP address of the interface is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through a network cable. Then, you can use Telnet to access the CLI or use a web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**

Power Supply System

The power supply system has one PAC60S12-AR AC power module. Two power modules can be configured for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system uses one FAN-023A-B module to dissipate heat for the system. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-50 System air flow of the USG6585F

Cool air   Hot
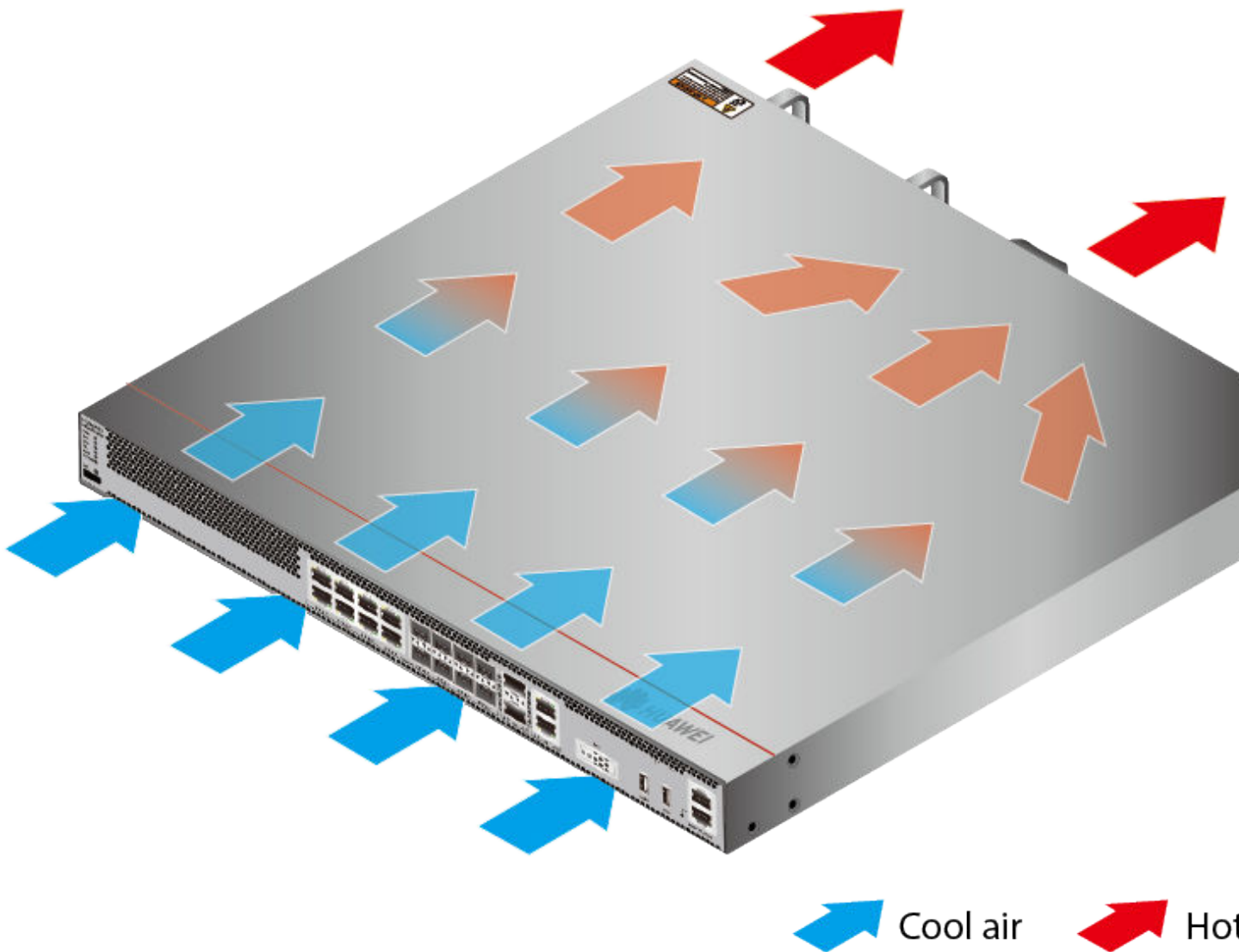
Technical Specifications

Table 3-52 Technical specifications of the USG6585F-AC

Item	Specification
Installation Type	● Rack ● Work bench
Cabinet installation standard	Cabinet with a depth of 600 mm or above

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	● Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm (1.72 in. x 17.4 in. x 16.54 in.) ● Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 453 mm (1.72 in. x 17.4 in. x 17.83 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	175 mm x 550 mm x 650 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	7.83 kg (17.26 lb)
Weight without packaging [kg(lb)]	5.46 kg (12.04 lb)
CPU	1 CPU, 4 cores/CPU, up to 1.4 GHz
Memory	DDR4 8 GB
NOR Flash	64MB
NAND Flash	2 GB
Hard disk	Optional, M.2 SSD (64 GB/240 GB), hot-swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	49.5 W
Maximum heat dissipation [BTU/hour]	168.9 BTU/hour
MTBF [years]	68.98 years
MTTR [hours]	2 hours
Power supply mode	Built-in AC
Number of power modules	1
Rated input voltage [V]	100 V to 240 V, 50 Hz/60 Hz
Input voltage range [V]	90 V to 290 V, 47 Hz to 63 Hz
Types of fans	Pluggable
Number of fan modules	1
Heat dissipation mode	Absorbing cold air into the device

Item	Specification
Airflow direction	Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	Dual power modules can be purchased to form 1+1 redundancy backup.
Long-term operating temperature [°C(°F)]	0°C to 45°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	0 m to 5000 m
Storage altitude [m(ft.)]	0 m to 5000 m

◻ **NOTE**

● The width does not include the size of mounting ears.
● The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
● Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.

3.1.9 USG6615F

Overview

Table 3-53 Basic information about the USG6615F

Description	Part Number	Model	First supported version
USG6615F(HTM) AC Host(8*GE COMBO + 4*GE RJ45 + 4*GE SFP + 6*10GE SFP+ , 1 AC POWER)	02353WAU	USG6615F-AC	V600R020C10

Appearance

Figure 3-51 Appearance of the USG6615F (front view)
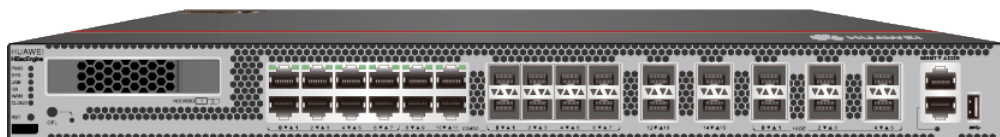
Figure 3-52 Appearance of the USG6615F (rear view)

Structure

Figure 3-53 Components of the USG6615F

1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal
6. MAC label	7. SN label	8. Slot ID	9. Expansion slot	10. Fan module
11. Optional power module slot	12. Power module	-	-	-

Table 3-54 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data. **NOTE** The report function is supported in V600R021C10 and later versions.

Name	Description
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Slot ID	Slot arrangement mode and number of the device.
Expansion slot	The provides expansion slots for installing expansion cards. When no expansion card is installed in the slot, install a filler panel on the vacant slot to ensure normal air flow and keep out dust.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-54 Slot Layout of the USG6615F

Front

Back
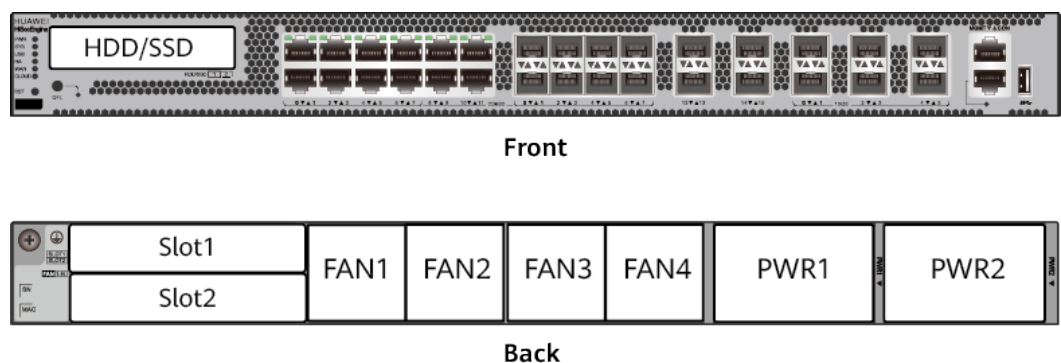
Table 3-55 Slots on the USG6615F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/480 GB/960 GB/1000 GB/1920 GB)
Expansion card slot	Slots 1 and 2	Horizontal	The SIC-2SM-BF and SIC-4GE-BC cards are supported. **NOTE** The SIC-4GE-BC card is supported in V600R022C10 and later versions.
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-55 Indicators and Buttons of the USG6615F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. GE electrical port indicator	4. Optical port ACT indicator	5. Optical port LINK indicator
6. MGMT port indicator	7. RST button	8. OFL button	-	-

◻ **NOTE**

- GE electrical interface indicators from left to right correspond to GE electrical interfaces in ascending order. For example, the first indicator on the panel corresponds to GE 0/0/0 and the second indicator corresponds to GE 0/0/1.
- Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-56 Indicators on the USG6615F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator **NOTE** This indicator has been supported since V600R021C00.	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.
		-	Off	The hard disk cannot be removed.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.
		-	Off	No data is being transmitted or received.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-57 Buttons on the USG6615F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-56 Ports of the USG6615F
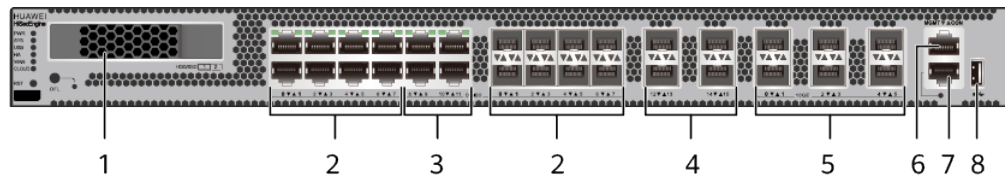
1. HDD/SSD slot	2. Combo port	3. GE electrical port	4. GE optical port	5. 10 GE optical port
6. Console port	7. MGMT port	8. USB 3.0 port	-	-

Table 3-58 Ports on the USG6615F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	**SSD-Sata240G-A** **SSD-SATA240G-C** **SSD-SATA960G-B** **SSD-SATA960G-C** **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD–SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
Combo port, 0-7	RJ45+SFP	The combo port is a logical port that consists of an electrical port and an optical port on the panel. The device has only one internal forwarding interface. The electrical port and its corresponding optical port are multiplexed. They cannot work at the same time. (For example, when an optical port is activated, the corresponding electrical port is automatically disabled.) Electrical and optical ports share the same interface view and are numbered from GE 0/0/0 to GE 0/0/7. By default, the combo port works as an electrical port. You can run the combo enable fiber command to enable the combo port to work as an optical port or run the undo combo enable fiber command to enable the combo port to work as an electrical port based on networking requirements.	**Ethernet Cable** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
GE electrical ports (8–11)	RJ45	Four 10/100/1000M auto-sensing Ethernet electrical ports numbered from GE 0/0/8 to GE 0/0/11.	**Ethernet Cable**
GE optical ports (12–15)	SFP	Four GE optical ports numbered from GE 0/0/12 to GE 0/0/15.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules**
10GE optical ports (0-5)	SFP+	Six 10GE auto-sensing Ethernet optical ports numbered from 10GE 0/0/0 to 10GE 0/0/5. They can be used as GE optical ports.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** 　The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB 3.0 port	USB 3.0 Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version. **NOTE** 　This interface is supported in V600R021C00 and later versions.	• USB 2.0-compliant USB flash drive • USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has one PAC600S12-PB AC power module, but two power modules can be configured for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-031A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-57 System air flow of the USG6615F

Cool air   Hot air
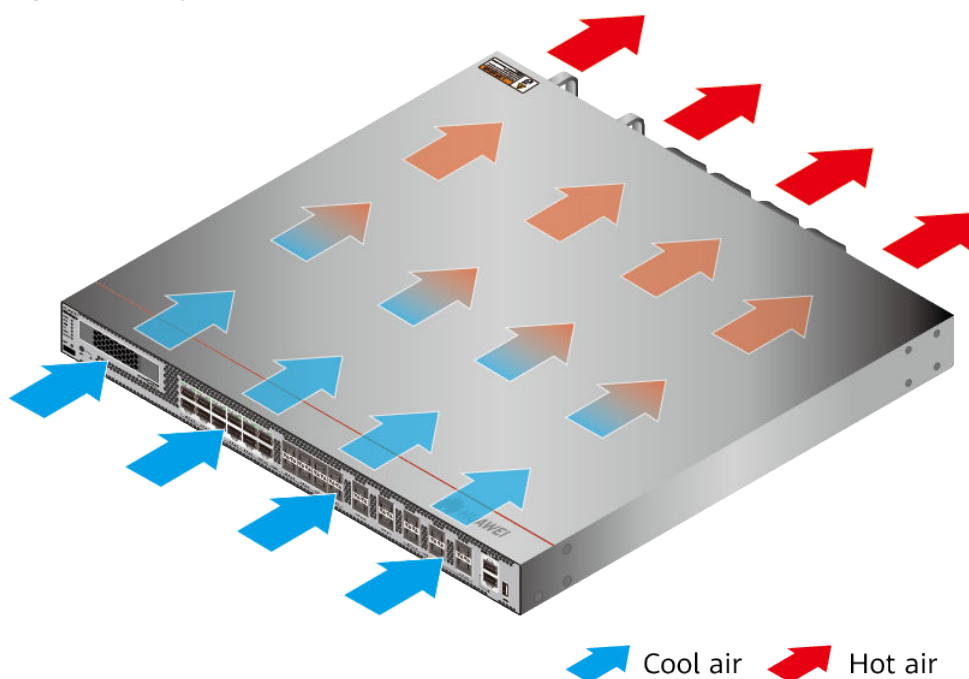
Technical Specifications

Table 3-59 Technical specifications of the USG6615F-AC

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinet with a depth of 600 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	● Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm ● Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 470 mm

Item	Specification
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 550 mm x 650 mm (7.28 in. x 21.65 in. x 25.59 in.)
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	9.3 kg (20.5 lb)
Weight without packaging [kg(lb)]	6.3 kg (13.89 lb)
Weight with packaging (full configuration) [kg(lb)]	10.3 kg (22.71 lb)
CPU	1 CPU, 16 Cores/CPU, up to 2.0 GHz
Memory	DDR4 16GB with ECC
NOR Flash	64MB
NAND Flash	4 GB
Hard disk	Optional. You can purchase a 2.5-inch SATA hard disk (240 GB/960 GB/1000 GB) from Huawei based on the site requirements. The hard disk is hot swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	222 W
Maximum heat dissipation [BTU/hour]	757.46 BTU/hour
MTBF [years]	31.63 years
MTTR [hours]	2 hours
Power supply mode	AC built-in
Number of power modules	1
Rated input voltage [V]	● AC: 100 V to 240 V, 50 Hz/60 Hz ● High-voltage DC: 240 V, DC
Input voltage range [V]	● AC: 90 V to 290 V, 45 Hz to 65 Hz ● High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Maximum output power [W]	600 W
Types of fans	Pluggable
Number of fan modules	4

Item	Specification
Heat dissipation mode	The fan module locates at the air exhaust of the system.
Airflow direction	Air intake vent from front and air outlet from rear.
Redundant power supply	Two power modules are supported for 1+1 power redundancy.
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	≤72 dB(A)
Long-term operating temperature [°C(°F)]	Without hard disk driver: 0°C to 45°C With hard disk driver: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	Without hard disk driver: 0 m to 5000 m With hard disk driver: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.1.10 USG6625F

Overview

Table 3-60 Basic information about the USG6625F

Description	Part Number	Model	First supported version
USG6625F(HTM) AC Host(8*GE COMBO + 4*GE RJ45 + 4*GE SFP + 6*10GE SFP+ , 1 AC POWER)	02353WAQ	USG6625F-AC	V600R020C10

Appearance

Figure 3-58 Appearance of the USG6625F (front view)
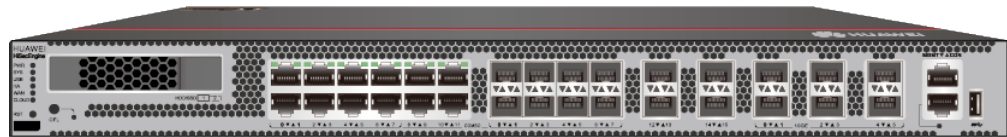
Figure 3-59 Appearance of the USG6625F (rear view)

Structure

Figure 3-60 Components of the USG6625F
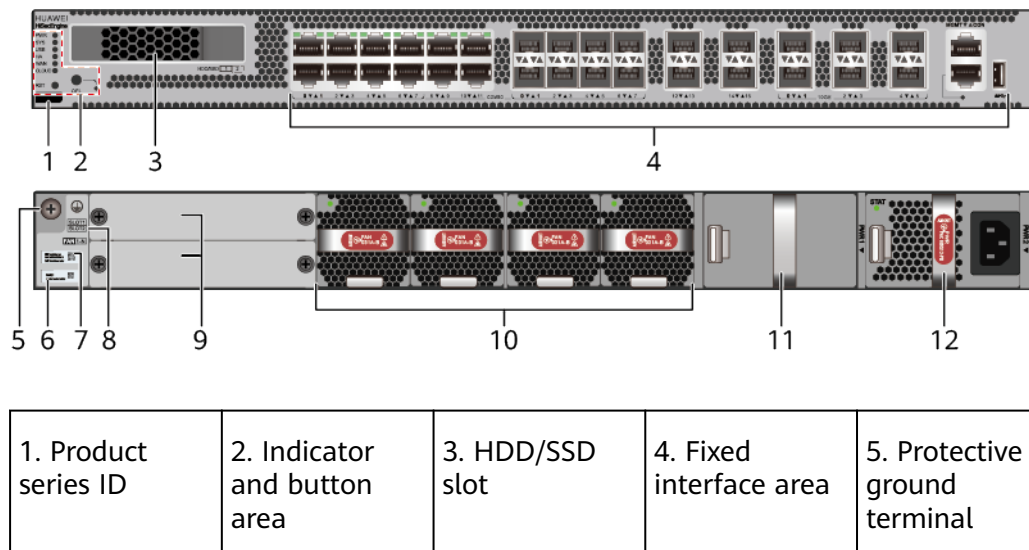
1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal

6. MAC label	7. SN label	8. Slot ID	9. Expansion slot	10. Fan module
11. Optional power module slot	12. Power module	-	-	-

Table 3-61 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data. **NOTE** The report function is supported in V600R021C10 and later versions.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Slot ID	Slot arrangement mode and number of the device.
Expansion slot	The provides expansion slots for installing expansion cards. When no expansion card is installed in the slot, install a filler panel on the vacant slot to ensure normal air flow and keep out dust.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.

Name	Description
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-61 Slot Layout of the USG6625F
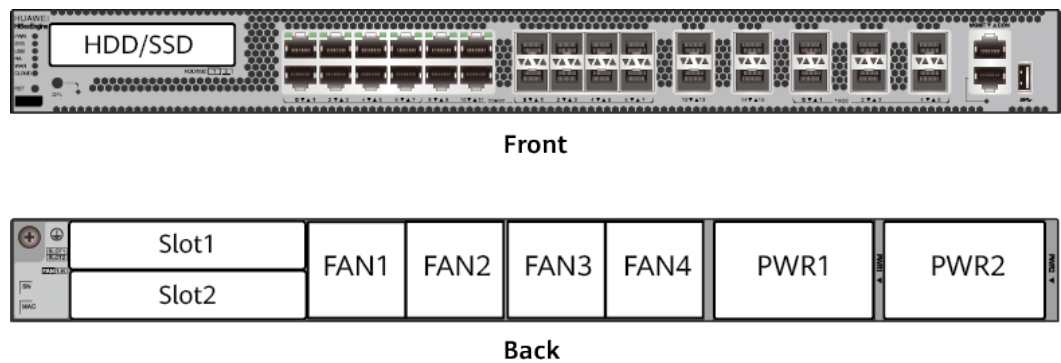
Table 3-62 Slots on the USG6625F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Expansion card slot	Slots 1 and 2	Horizontal	The SIC-2SM-BF and SIC-4GE-BC cards are supported. **NOTE** The SIC-4GE-BC card is supported in V600R022C10 and later versions.

Slot Type	Slot ID	Slot Direction	Remarks
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-62 Indicators and Buttons of the USG6625F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. GE electrical port indicator	4. Optical port ACT indicator	5. Optical port LINK indicator
6. MGMT port indicator	7. RST button	8. OFL button	-	-

☐ **NOTE**

- GE electrical interface indicators from left to right correspond to GE electrical interfaces in ascending order. For example, the first indicator on the panel corresponds to GE 0/0/0 and the second indicator corresponds to GE 0/0/1.
- Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-63 Indicators on the USG6625F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
USB	USB indicator **NOTE** This indicator has been supported since V600R021C00.	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.

Silkscreen	Name	Color	Status	Description
		-	Off	The hard disk cannot be removed.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.
		-	Off	No data is being transmitted or received.
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-64 Buttons on the USG6625F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-63 Ports of the USG6625F
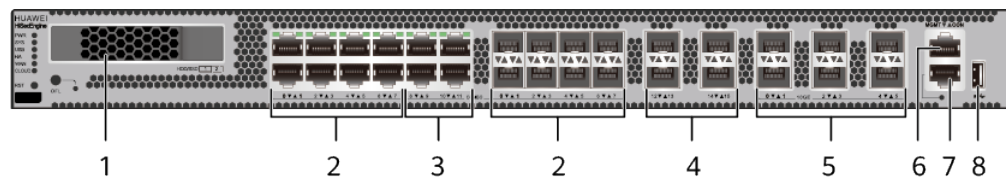
1. HDD/SSD slot	2. Combo port	3. GE electrical port	4. GE optical port	5. 10 GE optical port
6. Console port	7. MGMT port	8. USB 3.0 port	-	-

Table 3-65 Ports on the USG6625F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	• **SSD-Sata240G-A** • **SSD-SATA240G-C** • **SSD-SATA960G-B** • **SSD-SATA960G-C** • **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
Combo port, 0-7	RJ45+SFP	The combo port is a logical port that consists of an electrical port and an optical port on the panel. The device has only one internal forwarding interface. The electrical port and its corresponding optical port are multiplexed. They cannot work at the same time. (For example, when an optical port is activated, the corresponding electrical port is automatically disabled.) Electrical and optical ports share the same interface view and are numbered from GE 0/0/0 to GE 0/0/7. By default, the combo port works as an electrical port. You can run the combo enable fiber command to enable the combo port to work as an optical port or run the undo combo enable fiber command to enable the combo port to work as an electrical port based on networking requirements.	• **Ethernet Cable** • **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
GE electrical ports (8–11)	RJ45	Four 10/100/1000M auto-sensing Ethernet electrical ports numbered from GE 0/0/8 to GE 0/0/11.	**Ethernet Cable**
GE optical ports (12–15)	SFP	Four GE optical ports numbered from GE 0/0/12 to GE 0/0/15.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules**
10GE optical ports (0-5)	SFP+	Six 10GE auto-sensing Ethernet optical portss numbered from 10GE 0/0/0 to 10GE 0/0/5. They can be used as GE optical ports.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB 3.0 port	USB 3.0 Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version. **NOTE** This interface is supported in V600R021C00 and later versions.	• USB 2.0-compliant USB flash drive • USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has one PAC600S12-PB AC power module, but two power modules can be configured for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-031A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-64 System air flow of the USG6625F

Cool air   Hot air
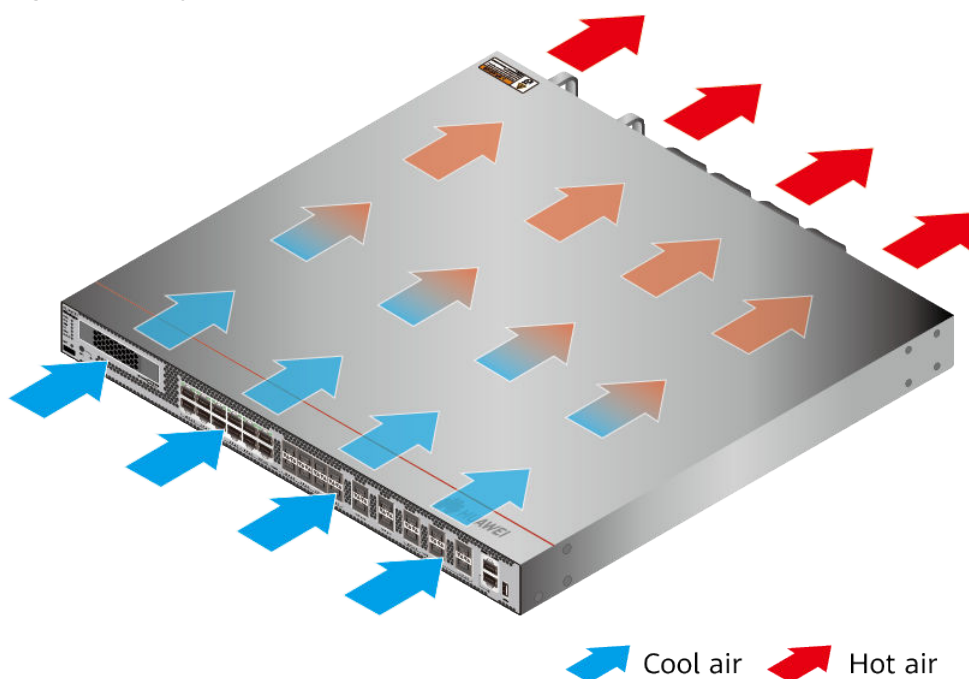
Technical Specifications

Table 3-66 Technical specifications of the USG6625F-AC

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinet with a depth of 600 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	● Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm ● Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 470 mm

Item	Specification
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 550 mm x 650 mm (7.28 in. x 21.65 in. x 25.59 in.)
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	9.3 kg (20.5 lb)
Weight without packaging [kg(lb)]	6.3 kg (13.89 lb)
Weight with packaging (full configuration) [kg(lb)]	10.3 kg (22.71 lb)
CPU	1 CPU, 16 Cores/CPU, up to 2.0 GHz
Memory	DDR4 16GB with ECC
NOR Flash	64MB
NAND Flash	4 GB
Hard disk	Optional. You can purchase a 2.5-inch SATA hard disk (240 GB/960 GB/1000 GB) from Huawei based on the site requirements. The hard disk is hot swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	222 W
Maximum heat dissipation [BTU/hour]	757.46 BTU/hour
MTBF [years]	31.63 years
MTTR [hours]	2 hours
Power supply mode	AC built-in
Number of power modules	1
Rated input voltage [V]	● AC: 100 V to 240 V, 50 Hz/60 Hz ● High-voltage DC: 240 V, DC
Input voltage range [V]	● AC: 90 V to 290 V, 45 Hz to 65 Hz ● High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Maximum output power [W]	600 W
Types of fans	Pluggable
Number of fan modules	4

Item	Specification
Heat dissipation mode	The fan module locates at the air exhaust of the system.
Airflow direction	Air intake vent from front and air outlet from rear.
Redundant power supply	Two power modules are supported for 1+1 power redundancy.
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	≤72 dB(A)
Long-term operating temperature [°C(°F)]	Without hard disk driver: 0°C to 45°C With hard disk driver: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	Without hard disk driver: 0 m to 5000 m With hard disk driver: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

☐ NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.1.11 USG6635F

Overview

Table 3-67 Basic information about the USG6635F

Description	Part Number	Model	First supported version
USG6635F(HTM) AC Host(8*GE COMBO + 4*GE RJ45 + 10*10GE SFP+ ,2 AC POWER)	02353WAV	USG6635F-AC	V600R020C10
USG6635F(HTM) DC host(8*GE COMBO + 4*GE RJ45 + 10*10GE SFP+)	02355FDP	USG6635F-DC	V600R022C10

Appearance

☐ NOTE

The appearance difference between the DC model and AC model is the power module installed on the rear of the device. The following figure uses the AC model as an example.

Figure 3-65 Appearance of the USG6635F (front view)
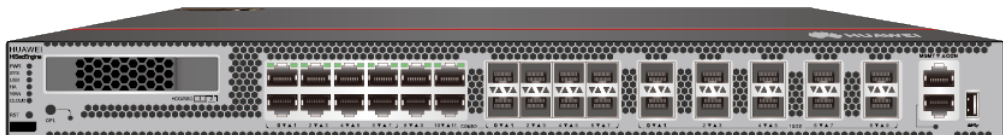
Figure 3-66 Appearance of the USG6635F (rear view)

Structure

Figure 3-67 Components of the USG6635F
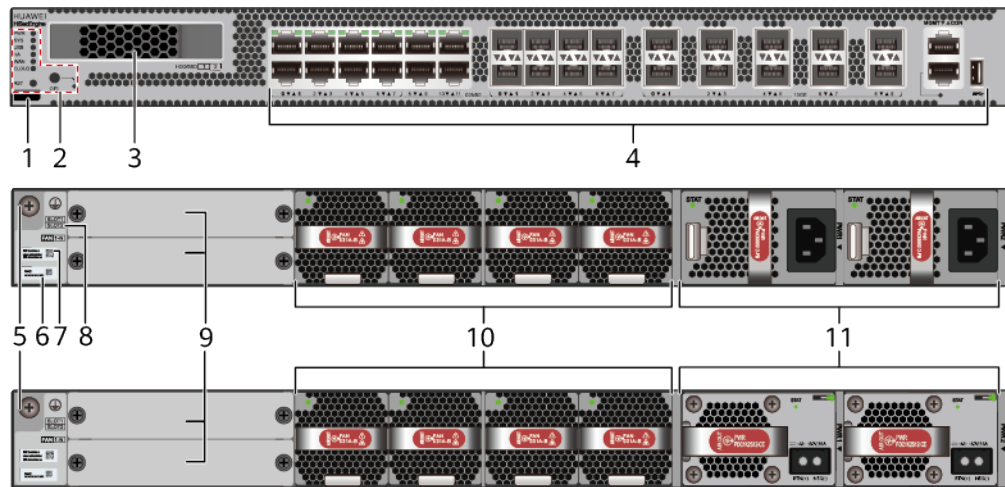
1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal
6. MAC label	7. SN label	8. Slot ID	9. Expansion slot	10. Fan module
11. Power module	-	-	-	-

Table 3-68 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data. **NOTE** The report function is supported in V600R021C10 and later versions.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.

Name	Description
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Slot ID	Slot arrangement mode and number of the device.
Expansion slot	The provides expansion slots for installing expansion cards. When no expansion card is installed in the slot, install a filler panel on the vacant slot to ensure normal air flow and keep out dust.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-68 Slot Layout of the USG6635F

Front

Back
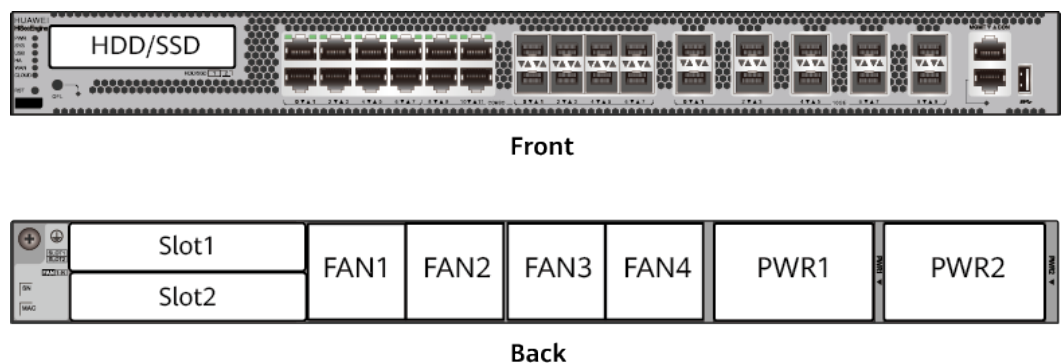
Table 3-69 Slots on the USG6635F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Expansion card slot	Slots 1 and 2	Horizontal	The SIC-2SM-BF and SIC-4GE-BC cards are supported. **NOTE** The SIC-4GE-BC card is supported in V600R022C10 and later versions.
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-69 Indicators and Buttons of the USG6635F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. GE electrical port indicator	4. Optical port ACT indicator	5. Optical port LINK indicator

6. MGMT port indicator	7. RST button	8. OFL button	-	-

NOTE

- GE electrical interface indicators from left to right correspond to GE electrical interfaces in ascending order. For example, the first indicator on the panel corresponds to GE 0/0/0 and the second indicator corresponds to GE 0/0/1.

- Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-70 Indicators on the USG6635F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	- The system is faulty. - The power supply is abnormal. - The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator **NOTE** This indicator has been supported since V600R021C00.	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.
		-	Off	The hard disk cannot be removed.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.
		-	Off	No data is being transmitted or received.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-71 Buttons on the USG6635F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-70 Ports of the USG6635F
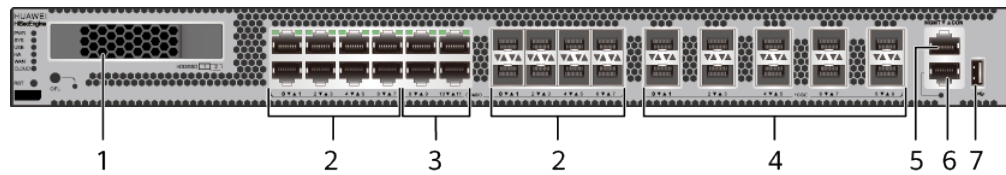
1. HDD/SSD slot	2. Combo port	3. GE electrical port	4. 10GE optical port	5. Console port
6. MGMT port	7. USB 3.0 port	-	-	-

Table 3-72 Ports on the USG6635F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	**SSD-Sata240G-A** **SSD-SATA240G-C** **SSD-SATA960G-B** **SSD-SATA960G-C** **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
Combo port, 0-7	RJ45+SFP	The combo port is a logical port that consists of an electrical port and an optical port on the panel. The device has only one internal forwarding interface. The electrical port and its corresponding optical port are multiplexed. They cannot work at the same time. (For example, when an optical port is activated, the corresponding electrical port is automatically disabled.) Electrical and optical ports share the same interface view and are numbered from GE 0/0/0 to GE 0/0/7. By default, the combo port works as an electrical port. You can run the combo enable fiber command to enable the combo port to work as an optical port or run the undo combo enable fiber command to enable the combo port to work as an electrical port based on networking requirements.	**Ethernet Cable** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
GE electrical ports (8–11)	RJ45	Four 10/100/1000M auto-sensing Ethernet electrical ports numbered from GE 0/0/8 to GE 0/0/11.	**Ethernet Cable**
10GE optical ports (0 to 9)	SFP+	Ten 10GE auto-sensing Ethernet optical ports numbered from 10GE 0/0/0 to 10GE 0/0/9. They can be used as GE optical ports.	**1Gbps SFP Copper Modules** **1Gbps eSFP Optical Modules** **10Gbps SFP+ Optical Modules**
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB 3.0 port	USB 3.0 Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version. **NOTE** This interface is supported in V600R021C00 and later versions.	• USB 2.0-compliant USB flash drive • USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has two PAC600S12-PB AC power modules or PDC1K2S12-CE DC power modules for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-031A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-71 System air flow of the USG6635F

Cool air   Hot air
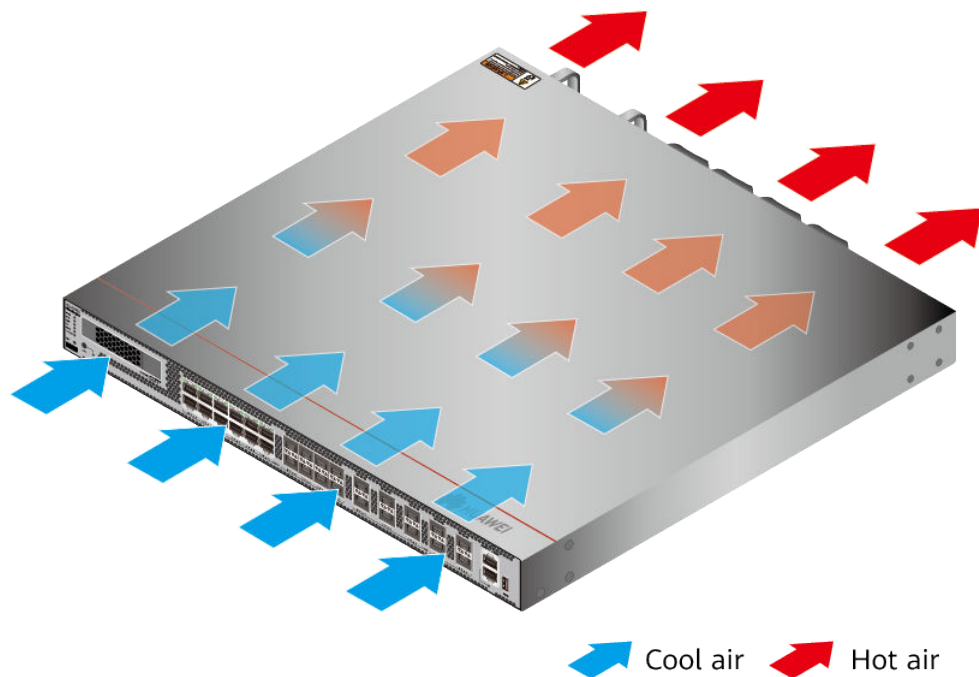
Technical Specifications

Table 3-73 Technical specifications of the USG6635F

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinet with a depth of 600 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	- Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm - Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 470 mm

Item	Specification
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 550 mm x 650 mm (7.28 in. x 21.65 in. x 25.59 in.)
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	10.3 kg (22.71 lb)
Weight without packaging [kg(lb)]	7.3 kg (16.09 lb)
Weight with packaging (full configuration) [kg(lb)]	10.3 kg (22.71 lb)
CPU	• USG6635F-AC (02353WAV): 1 CPU, 16 Cores/CPU, up to 2.0 GHz • USG6635F-DC (02355FDP): One CPU, 16 cores/CPU, 2.0 GHz dominant frequency
Memory	• USG6635F-AC (02353WAV): DDR4 32GB with ECC • USG6635F-DC (02355FDP): 32 GB DDR4, supporting ECC
NOR Flash	64MB
NAND Flash	• USG6635F-AC (02353WAV): 4 GB • USG6635F-DC (02355FDP): 4GB
Hard disk	• USG6635F-AC (02353WAV): Optional. You can purchase a 2.5-inch SATA hard disk (240 GB/960 GB/1000 GB) from Huawei based on the site requirements. The hard disk is hot swappable. • USG6635F-DC (02355FDP): Optional. Purchase a 2.5-inch hot-swappable SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	• USG6635F-AC (02353WAV): 242 W • USG6635F-DC (02355FDP): 247 W
Maximum heat dissipation [BTU/hour]	• USG6635F-AC (02353WAV): 825.7 BTU/hour • USG6635F-DC (02355FDP): 842.8 BTU/hour
MTBF [years]	31.63 years

Item	Specification
MTTR [hours]	2 hours
Power supply mode	• USG6635F-AC (02353WAV): AC built-in • USG6635F-DC (02355FDP): Built-in DC PM
Number of power modules	2

Rated input voltage [V]	• USG6635F-AC (02353WAV):
	  – AC: 100 V to 240 V, 50 Hz/60 Hz
	  – High-voltage DC: 240 V, DC
	• USG6635F-DC (02355FDP):
	  – +48 V DC
	  – -48 V DC to -60 V DC

Input voltage range [V]	• USG6635F-AC (02353WAV):
	  – AC: 90 V to 290 V, 45 Hz to 65 Hz
	  – High-voltage DC: 190–290 V, DC
	• USG6635F-DC (02355FDP):
	  – +40 V DC to +57 V DC
	  – -38.4 V DC to -72 V DC

Maximum input current [A]	• USG6635F-AC (02353WAV): 8 A • USG6635F-DC (02355FDP): 38 A
Maximum output power [W]	• USG6635F-AC (02353WAV): 600 W • USG6635F-DC (02355FDP): 1200 W
Types of fans	Pluggable
Number of fan modules	4
Heat dissipation mode	• USG6635F-AC (02353WAV): The fan module locates at the air exhaust of the system. • USG6635F-DC (02355FDP): Absorbing cold air into the device
Airflow direction	• USG6635F-AC (02353WAV): Air intake vent from front and air outlet from rear. • USG6635F-DC (02355FDP): Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	1+1

Item	Specification
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	- USG6635F-AC (02353WAV): ≤72 dB(A) - USG6635F-DC (02355FDP): ≤ 72 db(A)
Long-term operating temperature [°C(°F)]	- USG6635F-AC (02353WAV): Without hard disk driver: 0°C to 45°C With hard disk driver: 5°C to 40°C - USG6635F-DC (02355FDP): Without HDDs: 0°C to 45°C With HDDs: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	- USG6635F-AC (02353WAV): Without hard disk driver: 0 m to 5000 m With hard disk driver: 0 m to 3000 m - USG6635F-DC (02355FDP): Without HDDs: 0 m to 5000 m With HDDs: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

☐ NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.1.12 USG6655F

Overview

Table 3-74 Basic information about the USG6655F

Description	Part Number	Model	First supported version
USG6655F(HTM) AC Host(8*GE COMBO + 4*GE RJ45 + 10*10GE SFP+ ,2 AC POWER)	02353WAW	USG6655F-AC	V600R020C10

Appearance

Figure 3-72 Appearance of the USG6655F (front view)
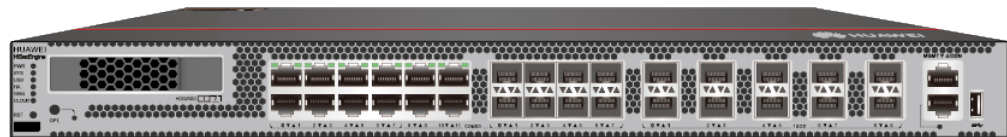
Figure 3-73 Appearance of the USG6655F (rear view)

Structure

Figure 3-74 Components of the USG6655F

1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal

6. MAC label	7. SN label	8. Slot ID	9. Expansion slot	10. Fan module
11. Power module	-	-	-	-

Table 3-75 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data. NOTE The report function is supported in V600R021C10 and later versions.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Slot ID	Slot arrangement mode and number of the device.
Expansion slot	The provides expansion slots for installing expansion cards. When no expansion card is installed in the slot, install a filler panel on the vacant slot to ensure normal air flow and keep out dust.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-75 Slot Layout of the USG6655F

Front

Back
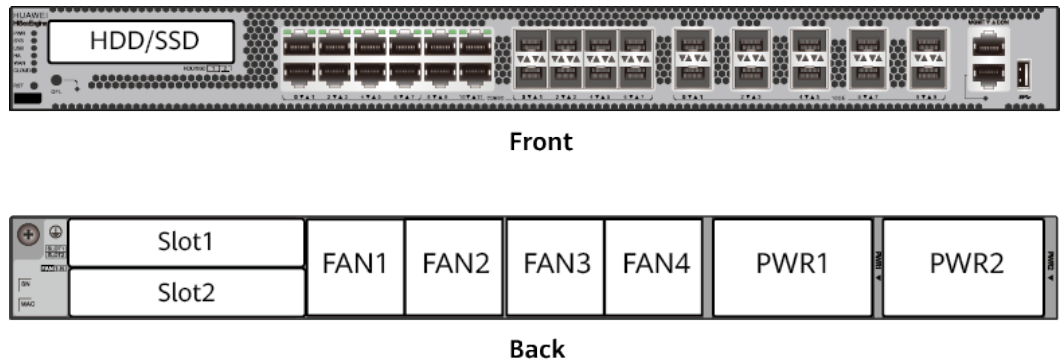
Table 3-76 Slots on the USG6655F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Expansion card slot	Slots 1 and 2	Horizontal	The SIC-2SM-BF and SIC-4GE-BC cards are supported. **NOTE** The SIC-4GE-BC card is supported in V600R022C10 and later versions.
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-76 Indicators and Buttons of the USG6655F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. GE electrical port indicator	4. Optical port ACT indicator	5. Optical port LINK indicator
6. MGMT port indicator	7. RST button	8. OFL button	-	-

◯ NOTE

- GE electrical interface indicators from left to right correspond to GE electrical interfaces in ascending order. For example, the first indicator on the panel corresponds to GE 0/0/0 and the second indicator corresponds to GE 0/0/1.
- Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-77 Indicators on the USG6655F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator **NOTE** This indicator has been supported since V600R021C00.	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.

Silkscreen	Name	Color	Status	Description
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.
		-	Off	The hard disk cannot be removed.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.
		-	Off	No data is being transmitted or received.
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-78 Buttons on the USG6655F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Silkscreen	Name	Description
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-77 Ports of the USG6655F
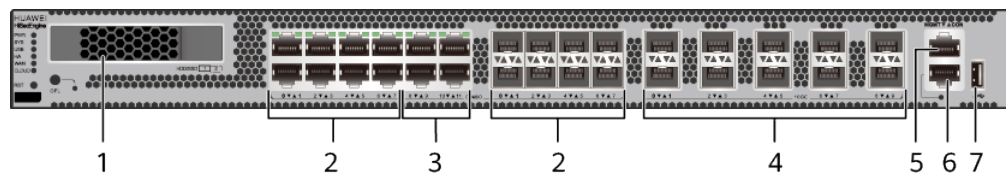
1. HDD/SSD slot	2. Combo port	3. GE electrical port	4. 10GE optical port	5. Console port
6. MGMT port	7. USB 3.0 port	-	-	-

Table 3-79 Ports on the USG6655F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	• **SSD-Sata240G-A** • **SSD-SATA240G-C** • **SSD-SATA960G-B** • **SSD-SATA960G-C** • **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
Combo port, 0-7	RJ45+SFP	The combo port is a logical port that consists of an electrical port and an optical port on the panel. The device has only one internal forwarding port. The electrical port and its corresponding optical port are multiplexed. They cannot work at the same time. (For example, when an optical port is activated, the corresponding electrical port is automatically disabled.) Electrical and optical ports share the same interface view and are numbered from GE 0/0/0 to GE 0/0/7. By default, the combo port works as an electrical port. You can run the combo enable fiber command to select an optical port or run the undo combo enable fiber command to select an electrical port based on networking requirements.	**Ethernet Cable** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
GE electrical ports (8–11)	RJ45	Four 10/100/1000M autosensing Ethernet electrical ports numbered from GE 0/0/8 to GE 0/0/11.	**Ethernet Cable**
10GE optical ports (0 to 9)	SFP+	Ten 10GE auto-sensing Ethernet optical ports numbered from 10GE 0/0/0 to 10GE 0/0/9. They can also be used as GE optical ports.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the command configuration interface of the device to configure, manage, and maintain the device through commands.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** 　The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB 3.0 port	USB 3.0 Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version. **NOTE** 　This interface is supported in V600R021C00 and later versions.	● USB 2.0-compliant USB flash drive ● USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has two PAC600S12-PB AC power modules for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-031A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-78 System air flow of the USG6655F

Cool air   Hot air
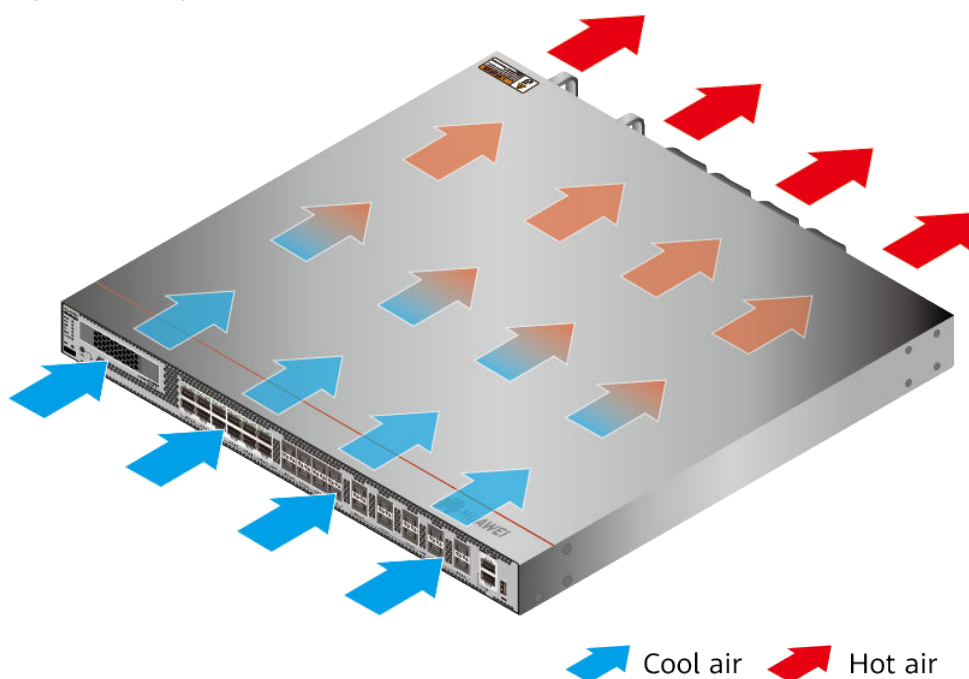
Technical Specifications

Table 3-80 Technical specifications of the USG6655F-AC

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinet with a depth of 600 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	● Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm ● Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 470 mm

Item	Specification
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 550 mm x 650 mm (7.28 in. x 21.65 in. x 25.59 in.)
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	10.3 kg (22.71 lb)
Weight without packaging [kg(lb)]	7.3 kg (16.09 lb)
Weight with packaging (full configuration) [kg(lb)]	10.3 kg (22.71 lb)
CPU	1 CPU, 16 Cores/CPU, up to 2.0 GHz
Memory	DDR4 32GB with ECC
NOR Flash	64MB
NAND Flash	4 GB
Hard disk	Optional. You can purchase a 2.5-inch SATA hard disk (240 GB/960 GB/1000 GB) from Huawei based on the site requirements. The hard disk is hot swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	242 W
Maximum heat dissipation [BTU/hour]	825.7 BTU/hour
MTBF [years]	31.63 years
MTTR [hours]	2 hours
Power supply mode	AC built-in
Number of power modules	2
Rated input voltage [V]	● AC: 100 V to 240 V, 50 Hz/60 Hz ● High-voltage DC: 240 V, DC
Input voltage range [V]	● AC: 90 V to 290 V, 45 Hz to 65 Hz ● High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Maximum output power [W]	600 W
Types of fans	Pluggable
Number of fan modules	4

Item	Specification
Heat dissipation mode	The fan module locates at the air exhaust of the system.
Airflow direction	Air intake vent from front and air outlet from rear.
Redundant power supply	1+1
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	≤72 dB(A)
Long-term operating temperature [°C(°F)]	Without hard disk driver: 0°C to 45°C With hard disk driver: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	Without hard disk driver: 0 m to 5000 m With hard disk driver: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

 NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.1.13 USG6685F

Overview

Table 3-81 Basic information about the USG6685F

Description	Part Number	Model	First supported version
USG6685F(HTM) AC Host(8*GE COMBO + 4*GE RJ45 + 10*10GE SFP+ ,2 AC POWER)	02354MKU	USG6685F-AC	V600R021C10

Appearance

Figure 3-79 Appearance of the USG6685F (front view)
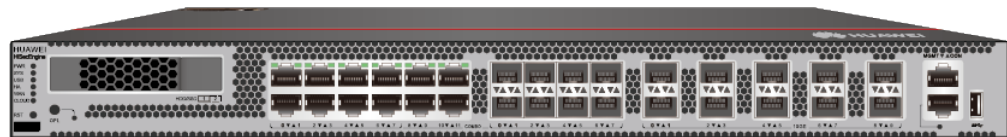
Figure 3-80 Appearance of the USG6685F (rear view)

Structure

Figure 3-81 Components of the USG6685F

1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal

6. MAC label	7. SN label	8. Slot ID	9. Expansion slot	10. Fan module
11. Power module	-	-	-	-

Table 3-82 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data. **NOTE** The report function is supported in V600R021C10 and later versions.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Slot ID	Slot arrangement mode and number of the device.
Expansion slot	The provides expansion slots for installing expansion cards. When no expansion card is installed in the slot, install a filler panel on the vacant slot to ensure normal air flow and keep out dust.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-82 Slot Layout of the USG6685F

Front

Back
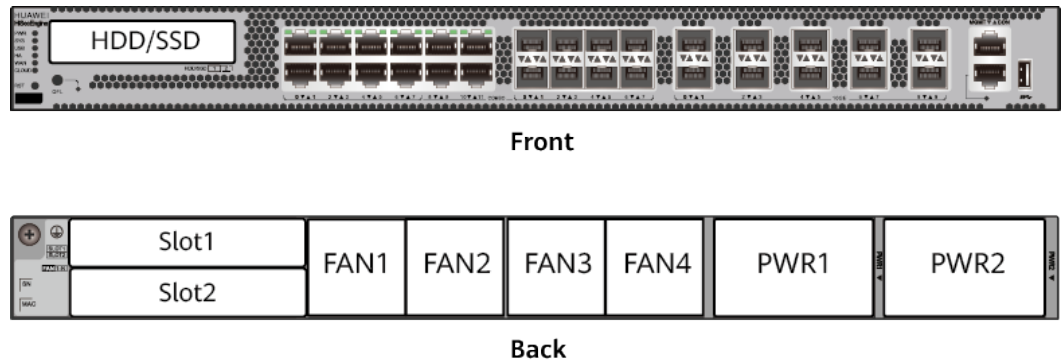
Table 3-83 Slots on the USG6685F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Expansion card slot	Slots 1 and 2	Horizontal	The SIC-2SM-BF and SIC-4GE-BC cards are supported. **NOTE** The SIC-4GE-BC card is supported in V600R022C10 and later versions.
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-83 Indicators and Buttons of the USG6685F
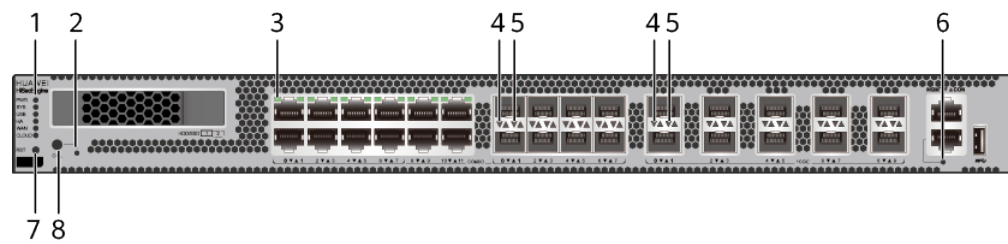
| 1. PWR, SYS, USB, HA, WAN and CLOUD indicators | 2. OFL indicator | 3. GE electrical port indicator | 4. Optical port ACT indicator | 5. Optical port LINK indicator |
| 6. MGMT port indicator | 7. RST button | 8. OFL button | - | - |

  NOTE

- GE electrical interface indicators from left to right correspond to GE electrical interfaces in ascending order. For example, the first indicator on the panel corresponds to GE 0/0/0 and the second indicator corresponds to GE 0/0/1.
- Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-84 Indicators on the USG6685F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.

Silkscreen	Name	Color	Status	Description
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	- The system is faulty. - The power supply is abnormal. - The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.
		-	Off	The hard disk cannot be removed.
-	GE electrical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.
		-	Off	No data is being transmitted or received.

Silkscreen	Name	Color	Status	Description
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-85 Buttons on the USG6685F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-84 Ports of the USG6685F
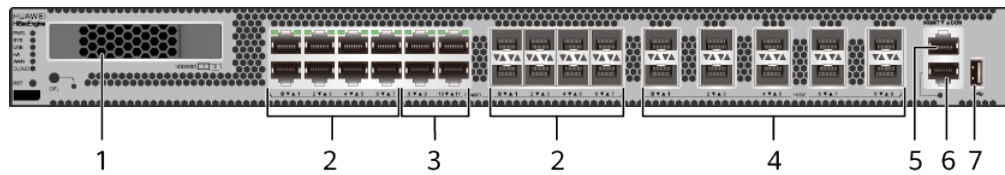
1. HDD/SSD slot	2. Combo port	3. GE electrical port	4. 10GE optical port	5. Console port
6. MGMT port	7. USB 3.0 port	-	-	-

Table 3-86 Ports on the USG6685F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	**SSD-Sata240G-A** **SSD-SATA240G-C** **SSD-SATA960G-B** **SSD-SATA960G-C** **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
Combo port, 0-7	RJ45+SFP	The combo port is a logical port that consists of an electrical port and an optical port on the panel. The device has only one internal forwarding interface. The electrical port and its corresponding optical port are multiplexed. They cannot work at the same time. (For example, when an optical port is activated, the corresponding electrical port is automatically disabled.) Electrical and optical ports share the same interface view and are numbered from GE 0/0/0 to GE 0/0/7. By default, the combo port works as an electrical port. You can run the combo enable fiber command to enable the combo port to work as an optical port or run the undo combo enable fiber command to enable the combo port to work as an electrical port based on networking requirements.	**Ethernet Cable** **1Gbps eSFP Optical Modules**

Port	Connector Type	Description	Available Components
GE electrical ports (8–11)	RJ45	Four 10/100/1000M auto-sensing Ethernet electrical ports numbered from GE 0/0/8 to GE 0/0/11.	**Ethernet Cable**
10GE optical ports (0 to 9)	SFP+	Ten 10GE auto-sensing Ethernet optical ports numbered from 10GE 0/0/0 to 10GE 0/0/9. They can be used as GE optical ports.	• **1Gbps SFP Copper Modules** • **1Gbps eSFP Optical Modules** • **10Gbps SFP+ Optical Modules**
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** 　The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB 3.0 port	USB 3.0 Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version.	● USB 2.0-compliant USB flash drive ● USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has two PAC600S12-PB AC power modules for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-031A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-85 System air flow of the USG6685F

Cool air   Hot air
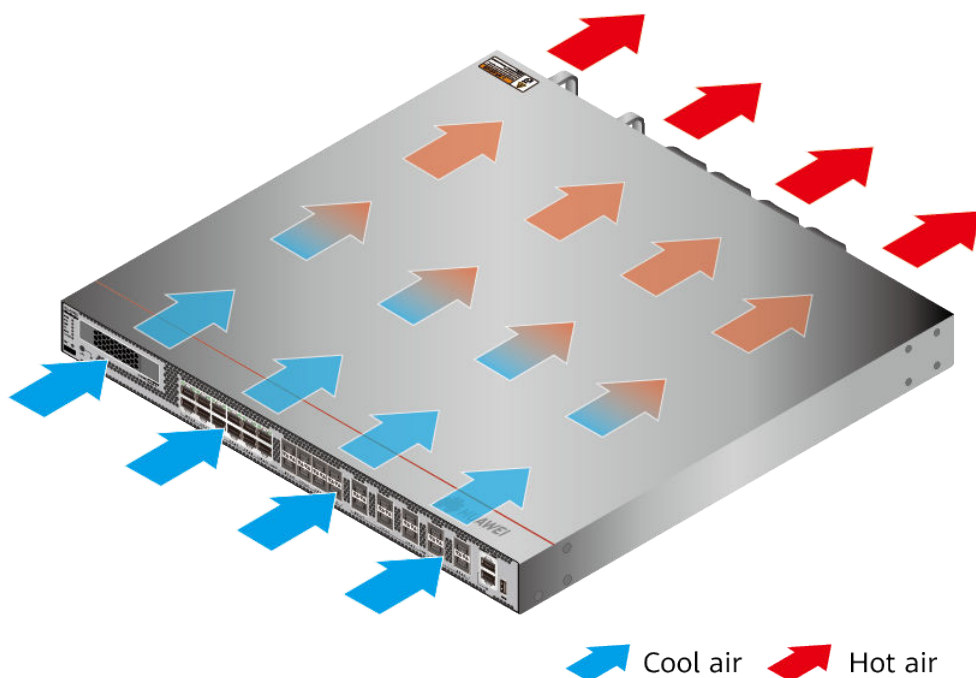
Technical Specifications

Table 3-87 Technical specifications of the USG6685F-AC

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinet with a depth of 600 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	• Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 420 mm • Maximum dimensions (the depth is the distance from ports on the front panel to the handle on the rear panel): 43.6 mm x 442 mm x 470 mm
Dimensions with packaging (H x W x D) [mm(in.)]	185 mm x 550 mm x 650 mm (7.28 in. x 21.65 in. x 25.59 in.)
Chassis height [U]	1 U

Item	Specification
Weight with packaging [kg(lb)]	10.3 kg (22.71 lb)
Weight without packaging [kg(lb)]	7.3 kg (16.09 lb)
Weight with packaging (full configuration) [kg(lb)]	10.3 kg (22.71 lb)
CPU	1 CPU, 16 Cores/CPU, up to 2.0 GHz
Memory	DDR4 32GB with ECC
NOR Flash	64MB
NAND Flash	4 GB
Hard disk	Optional. You can purchase a 2.5-inch SATA hard disk (240 GB/960 GB/1000 GB) from Huawei based on the site requirements. The hard disk is hot swappable.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	242 W
Maximum heat dissipation [BTU/hour]	825.7 BTU/hour
MTBF [years]	31.63 years
MTTR [hours]	2 hours
Power supply mode	AC built-in
Number of power modules	2
Rated input voltage [V]	● AC: 100 V to 240 V, 50 Hz/60 Hz ● High-voltage DC: 240 V, DC
Input voltage range [V]	● AC: 90 V to 290 V, 45 Hz to 65 Hz ● High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Maximum output power [W]	600 W
Types of fans	Pluggable
Number of fan modules	4
Heat dissipation mode	The fan module locates at the air exhaust of the system.
Airflow direction	Air intake vent from front and air outlet from rear.

Item	Specification
Redundant power supply	1+1
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	≤72 dB(A)
Long-term operating temperature [°C(°F)]	Without hard disk driver: 0°C to 45°C With hard disk driver: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	Without hard disk driver: 0 m to 5000 m With hard disk driver: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

 NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.1.14 USG6710F

Overview

Table 3-88 Basic information about the USG6710F

Description	Part Number	Model	First supported version	Remarks
USG6710F-AC-(HTM) host(2*QSFP28 + 2*QSFP+ + 8*ZSFP+ + 20*SFP+ , 2 AC POWER)	02354TPX	USG6710F-AC	V600R021C10	-
USG6710F-AC-(HTM) host(2*QSFP28 + 2*QSFP+ + 8*ZSFP+ + 20*SFP+ , 2 AC POWER)	02354TPX-001	USG6710F-AC	V600R021C10SPC100	● If the device is used in V600R021C10SPC100, install V600R021SPH020 or a later patch. ● Unsupported version: V600R021C10SPC600

Appearance

Figure 3-86 Appearance of the USG6710F (front view)

Figure 3-87 Appearance of the USG6710F (rear view)

Structure

Figure 3-88 Components of the USG6710F
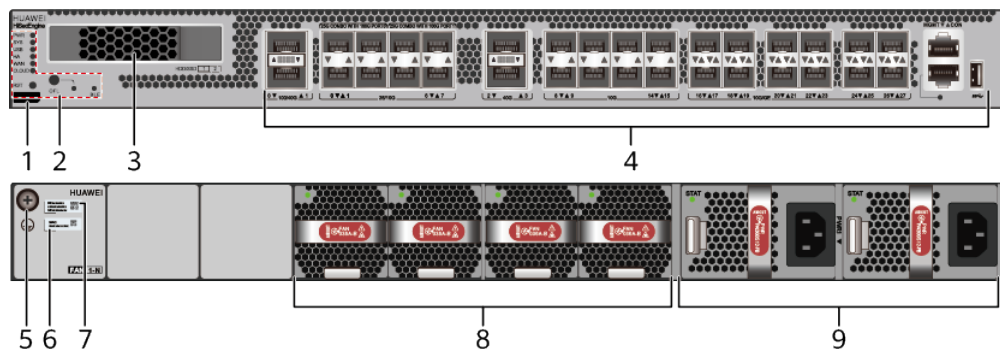
1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal
6. MAC label	7. SN label	8. Fan module	9. Power module	-

Table 3-89 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.

Name	Description
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-89 Slot Layout of the USG6710F

正面

背面
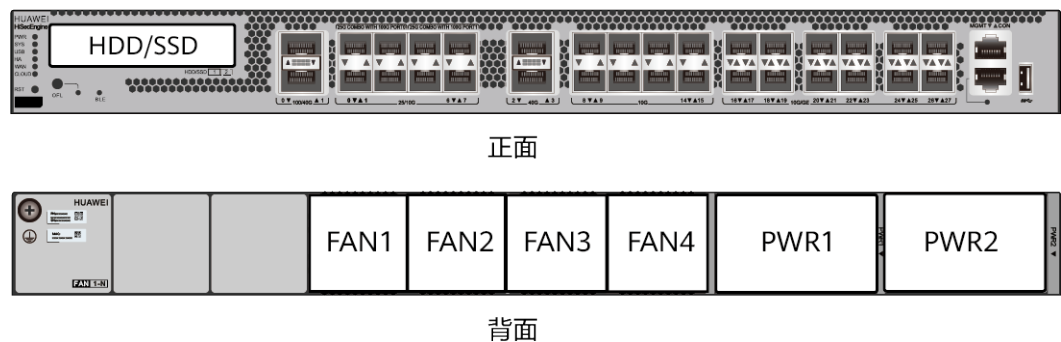
Table 3-90 Slots on the USG6710F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-90 Indicators and Buttons of the USG6710F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. BLE indicator	4. Optical port indicator	5. 10GE/GE optical port ACT indicator
6. 10GE/GE optical port LINK indicator	7. MGMT port indicator	8. RST button	9. OFL button	-

☐ **NOTE**

Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-91 Indicators on the USG6710F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.

Silkscreen	Name	Color	Status	Description
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	• The system is faulty. • The power supply is abnormal. • The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.
		-	Off	The hard disk cannot be removed.
BLE	BLE indicator	-	Off	Reserved function. This function is not enabled.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.

Silkscreen	Name	Color	Status	Description
		-	Off	No data is being transmitted or received.
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-92 Buttons on the USG6710F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button.
		This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Silkscreen	Name	Description
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-91 Ports of the USG6710F
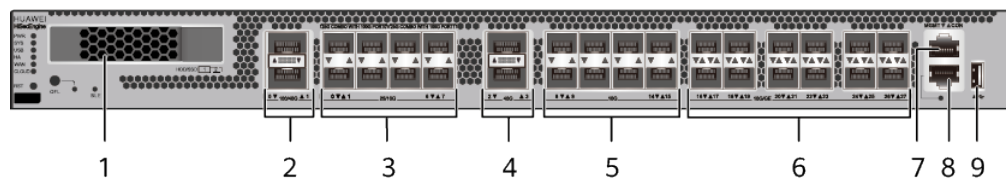
| 1 | 2 | 3 | 4 | 5 | 6 | 7 8 9 |

1. HDD/SSD slot	2. 100GE/40GE optical port	3. 25GE/10GE optical port	4. 40GE optical port	5. 10GE optical port
6. 10GE/GE optical port	7. Console port	8. MGMT port	9. USB port	-

Table 3-93 Ports on the USG6710F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	• **SSD-Sata240G-A** • **SSD-SATA240G-C** • **SSD-SATA960G-B** • **SSD-SATA960G-C** • **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
100GE/40GE optical ports (0 to 1)	QSFP28	Two 100GE/40GE auto-sensing Ethernet optical ports numbered from 100GE0/0/0 to 100GE0/0/1. A 100GE/40GE port works at 100 Gbit/s by default and can work at 40 Gbit/s when it has a 40GE optical module installed.	- **100Gbps QSFP28 Optical Modules** - **40Gbps QSFP+ Optical Modules**

Port	Connector Type	Description	Available Components
25GE/10GE optical ports (0 to 7)	SFP28	The 25GE/10GE and 100GE/40GE optical ports are multiplexed. Four 25GE/10GE ports correspond to one 100GE/40GE port (25GE/10GE ports 0 to 3, and ports 4 to 7 correspond to 100GE/40GE ports 0 and 1, respectively). By default, 25GE/10GE ports work at 10 Gbit/s and are numbered from 10GE0/0/0 to 10GE0/0/7. To configure a 25GE/10GE port to work at 25 Gbit/s, run the port mode 40GE interface 100GE0/0/x command. After the rate mode is switched, the 25GE/10GE port works at 25 Gbit/s when it has a 25GE optical module installed and can also work at 10 Gbit/s when it has a 10GE optical module installed. In addition, the corresponding 100GE/40GE ports can work normally only when they have 40GE optical modules installed. They cannot work normally when	**25Gbps SFP28 Optical Modules** **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
		they have 100GE optical modules installed. **NOTE** ● The port mode 40GE interface 100GE0/0/x command does not support multi-port operations. x indicates the number of a port. ● After the command is executed, a new port number is generated. That is, the port numbers 10GE0/0/x to 10GE0/0/x change to 25GE0/0/x to 25GE0/0/x, and the port number 100GE0/0/x changes to 40GE0/0/x.	
40GE optical ports (2–3)	QSFP+	Two 40GE Ethernet optical ports numbered from 40GE0/0/2 to 40GE0/0/3.	**40Gbps QSFP+ Optical Modules**
10GE optical ports (8–15)	SFP+	Eight 10GE optical ports numbered from 10GE0/0/8 to 10GE0/0/15.	**10Gbps SFP+ Optical Modules**
10GE/GE optical ports (16–27)	SFP+	Twelve 10GE auto-sensing Ethernet optical ports numbered from 10GE0/0/16 to 10GE0/0/27. They can also be used as GE optical ports.	● **1Gbps eSFP Optical Modules** ● **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version.	● USB 2.0-compliant USB flash drive ● USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has two PAC600S12-PB AC power modules for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-036A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-92 System air flow of the USG6710F

Cool air   Hot air
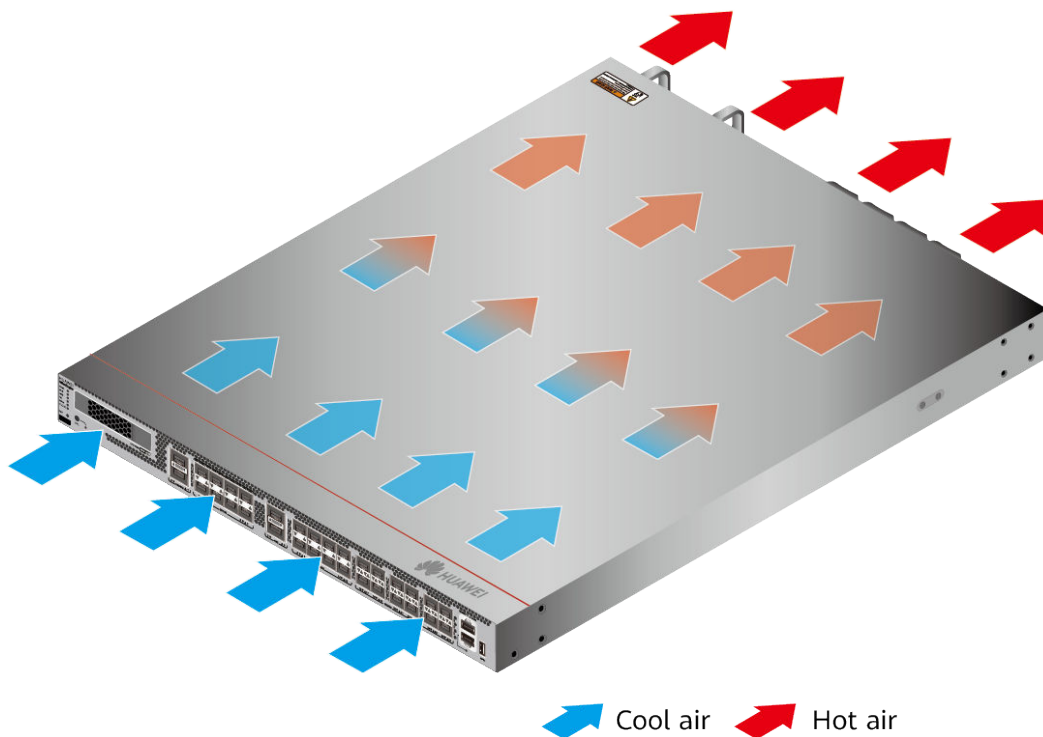
Technical Specifications

Table 3-94 Technical specifications of the USG6710F

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinet with a depth of 800 mm or above
Dimensions without packaging (H x W x D) [mm(in.)]	• Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 600 mm (1.72 in. x 17.40 in. x 23.62 in.) • Maximum dimensions (the depth is the distance from ports on the front panel to the parts protruding from the rear panel): 43.6 mm x 442 mm x 633 mm (1.72 in. x 17.40 in. x 24.92 in.)

Item	Specification
Dimensions with packaging (H x W x D) [mm(in.)]	260 mm x 590 mm x 790 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	15.48 kg (34.13 lb)
Weight without packaging [kg(lb)]	10.26 kg (22.62 lb)
CPU	2 CPUs, 16 cores/CPU, 2.0 GHz dominant frequency
Memory	DDR4 DIMM 64GB TOTAL, 32GB/CPU, ECC supported
Storage	32GB
NOR Flash	64 MB/CPU, 128 MB in total
Hard disk	Optional. Purchase a hot-swappable 2.5-inch SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei on demand.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	391 W
Maximum heat dissipation [BTU/hour]	1334.1 BTU/hour
MTBF [years]	42.63 years
MTTR [hours]	2 hours
Power supply mode	Built-in AC
Number of power modules	2
Rated input voltage [V]	● AC: 100 V to 240 V, 50 Hz/60 Hz ● High-voltage DC: 240 V, DC
Input voltage range [V]	● AC: 90 V to 290 V, 45 Hz to 65 Hz ● High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Maximum output power [W]	600 W
Types of fans	Pluggable
Number of fan modules	4
Heat dissipation mode	Absorbing cold air into the device

Item	Specification
Airflow direction	Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	1+1
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	≤72dB(A)
Long-term operating temperature [°C(°F)]	● Without hard disk driver: 0°C to 45°C ● With hard disk driver: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	● Without hard disk driver: 0 m to 5000 m ● With hard disk driver: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

☐ NOTE

● The width does not include the size of mounting ears.
● The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
● Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
● The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.1.15 USG6715F

Overview

Table 3-95 Basic information about the USG6715F

Description	Part Number	Model	First supported version	Remarks
USG6715F(HTM) AC host(2*QSFP28 + 2*QSFP+ + 8*ZSFP+ + 20*SFP+ , 2 AC POWER)	02354MKN	USG6715F-AC	V600R021C10	-
USG6715F(HTM) AC host(2*QSFP28 + 2*QSFP+ + 8*ZSFP+ + 20*SFP+ , 2 AC POWER)	02354MKN-001	USG6715F-AC	V600R021C10SPC100	● If the device is used in V600R021C10SPC100 , install V600R021SPH020 or a later patch. ● Unsupported version: V600R021C10SPC600
USG6715F(HTM)host(2*QSFP28 + 2*QSFP+ + 8*ZSFP+ + 20*SFP+)	02354TQE	USG6715F-DC	V600R021C10	-
USG6715F(HTM)host(2*QSFP28 + 2*QSFP+ + 8*ZSFP+ + 20*SFP+)	02354TQE-001	USG6715F-DC	V600R021C10SPC100	● If the device is used in V600R021C10SPC100 , install V600R021SPH020 or a later patch. ● Unsupported version: V600R021C10SPC600

Appearance

> 📖 **NOTE**
>
> The appearance difference between the DC model and AC model is the power module installed on the rear of the device. The following figure uses the AC model as an example.

Figure 3-93 Appearance of the USG6715F (front view)

Figure 3-94 Appearance of the USG6715F (rear view)

Structure

Figure 3-95 Components of the USG6715F
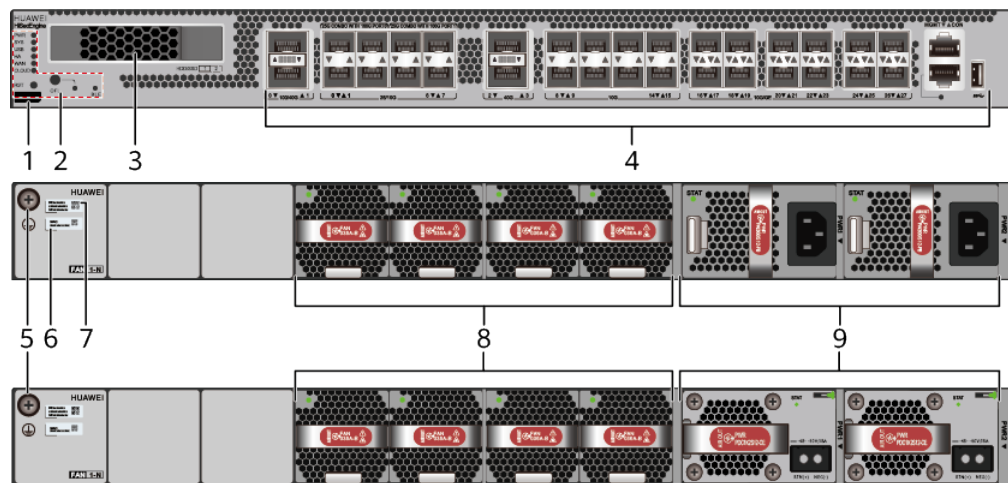
1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal
6. MAC label	7. SN label	8. Fan module	9. Power module	-

Table 3-96 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-96 Slot Layout of the USG6715F

Front

Back
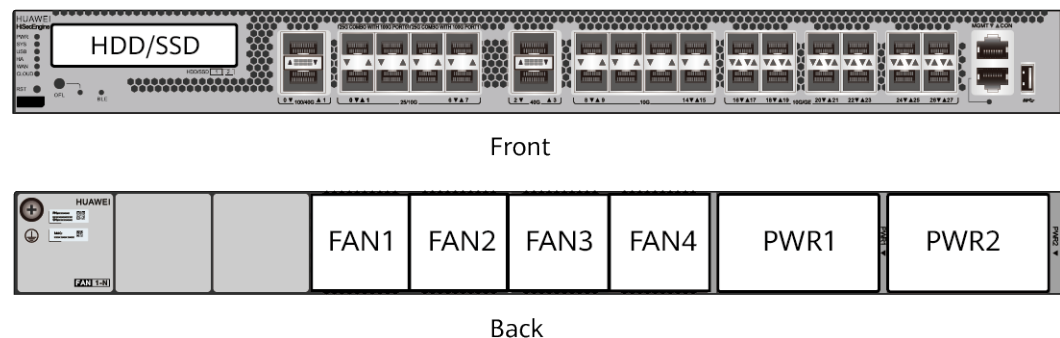
Table 3-97 Slots on the USG6715F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Fan module (FAN) slot	Slots 1 to 4	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-97 Indicators and Buttons of the USG6715F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. BLE indicator	4. Optical port indicator	5. 10GE/GE optical port ACT indicator
6. 10GE/GE optical port LINK indicator	7. MGMT port indicator	8. RST button	9. OFL button	-

◫ **NOTE**

Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-98 Indicators on the USG6715F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.
		Red	Steady on	- The system is faulty. - The power supply is abnormal. - The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.

Silkscreen	Name	Color	Status	Description
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.

Silkscreen	Name	Color	Status	Description
		-	Off	The hard disk cannot be removed.
BLE	BLE indicator	-	Off	Reserved function. This function is not enabled.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.
		-	Off	No data is being transmitted or received.
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-99 Buttons on the USG6715F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button.
		This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-98 Ports of the USG6715F
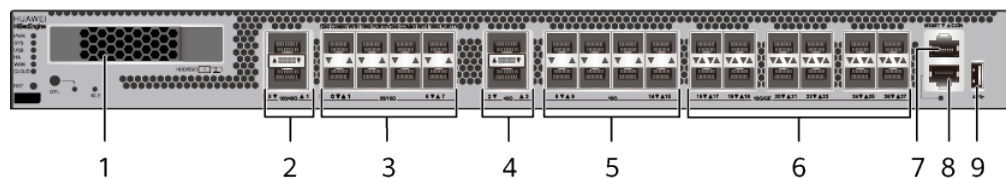
1. HDD/SSD slot	2. 100GE/40GE optical port	3. 25GE/10GE optical port	4. 40GE optical port	5. 10GE optical port
6. 10GE/GE optical port	7. Console port	8. MGMT port	9. USB port	-

Table 3-100 Ports on the USG6715F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	• **SSD-Sata240G-A** • **SSD-SATA240G-C** • **SSD-SATA960G-B** • **SSD-SATA960G-C** • **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.
100GE/40GE optical ports (0 to 1)	QSFP28	Two 100GE/40GE auto-sensing Ethernet optical ports numbered from 100GE0/0/0 to 100GE0/0/1. A 100GE/40GE port works at 100 Gbit/s by default and can work at 40 Gbit/s when it has a 40GE optical module installed.	• **100Gbps QSFP28 Optical Modules** • **40Gbps QSFP+ Optical Modules**

Port	Connector Type	Description	Available Components
25GE/10GE optical ports (0 to 7)	SFP28	The 25GE/10GE and 100GE/40GE optical ports are multiplexed. Four 25GE/10GE ports correspond to one 100GE/40GE port (25GE/10GE ports 0 to 3, and ports 4 to 7 correspond to 100GE/40GE ports 0 and 1, respectively). By default, 25GE/10GE ports work at 10 Gbit/s and are numbered from 10GE0/0/0 to 10GE0/0/7. To configure a 25GE/10GE port to work at 25 Gbit/s, run the port mode 40GE interface 100GE0/0/x command. After the rate mode is switched, the 25GE/10GE port works at 25 Gbit/s when it has a 25GE optical module installed and can also work at 10 Gbit/s when it has a 10GE optical module installed. In addition, the corresponding 100GE/40GE ports can work normally only when they have 40GE optical modules installed. They cannot work normally when	• **25Gbps SFP28 Optical Modules** • **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
		they have 100GE optical modules installed. **NOTE** ● The port mode 40GE interface 100GE0/0/x command does not support multi-port operations. x indicates the number of a port. ● After the command is executed, a new port number is generated. That is, the port numbers 10GE0/0/x to 10GE0/0/x change to 25GE0/0/x to 25GE0/0/x, and the port number 100GE0/0/x changes to 40GE0/0/x.	
40GE optical ports (2–3)	QSFP+	Two 40GE Ethernet optical ports numbered from 40GE0/0/2 to 40GE0/0/3.	**40Gbps QSFP+ Optical Modules**
10GE optical ports (8–15)	SFP+	Eight 10GE optical ports numbered from 10GE0/0/8 to 10GE0/0/15.	**10Gbps SFP+ Optical Modules**
10GE/GE optical ports (16–27)	SFP+	Twelve 10GE auto-sensing Ethernet optical ports numbered from 10GE0/0/16 to 10GE0/0/27. They can also be used as GE optical ports.	● **1Gbps eSFP Optical Modules** ● **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version.	• USB 2.0-compliant USB flash drive • USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has two PAC600S12-PB AC power modules or PDC1K2S12-CE DC power modules for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of four FAN-036A-B modules working in 3+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-99 System air flow of the USG6715F
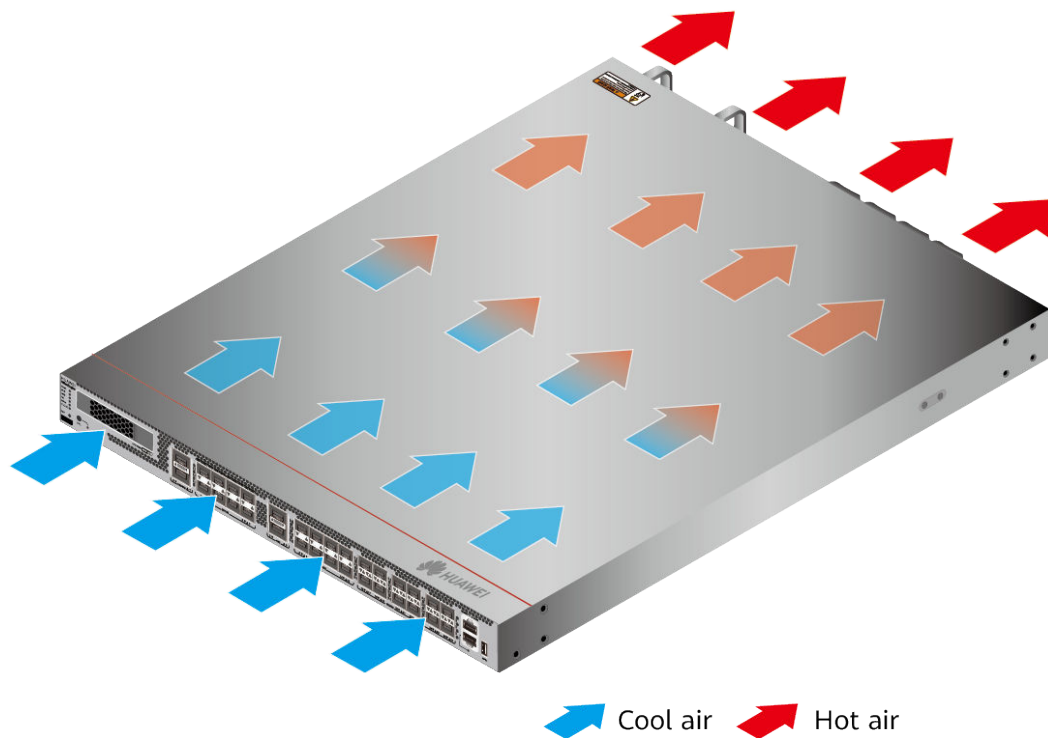
Technical Specifications

Table 3-101 Technical specifications of the USG6715F

Item	Specification
Installation Type	Rack
Cabinet installation standard	● USG6715F-AC (02354MKN): Cabinets with a depth of 800 mm or more ● USG6715F-AC (02354MKN-001): Cabinets with a depth of 800 mm or more ● USG6715F-DC (02354TQE): Cabinet with a depth of 800 mm or above ● USG6715F-DC (02354TQE-001): Cabinet with a depth of 800 mm or above

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	- Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 600 mm (1.72 in. x 17.40 in. x 23.62 in.) - Maximum dimensions (the depth is the distance from ports on the front panel to the parts protruding from the rear panel): 43.6 mm x 442 mm x 633 mm (1.72 in. x 17.40 in. x 24.92 in.)
Dimensions with packaging (H x W x D) [mm(in.)]	260 mm x 590 mm x 790 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	15.48 kg (34.13 lb)
Weight without packaging [kg(lb)]	10.26 kg (22.62 lb)
CPU	- USG6715F-AC (02354MKN): 2 CPUs, 16-core/CPU, 2.0 GHz dominant frequency - USG6715F-AC (02354MKN-001): 2 CPUs, 16-core/CPU, 2.0 GHz dominant frequency - USG6715F-DC (02354TQE): 2 CPUs, 16 cores/CPU, 2.0 GHz dominant frequency - USG6715F-DC (02354TQE-001): 2 CPUs, 16 cores/CPU, 2.0 GHz dominant frequency
Memory	- USG6715F-AC (02354MKN): DDR4 DIMM 64GB TOTAL, 32GB/CPU, supporting ECC - USG6715F-AC (02354MKN-001): DDR4 DIMM 64GB TOTAL, 32GB/ CPU, supporting ECC - USG6715F-DC (02354TQE): DDR4 DIMM, 64 GB TOTAL, 32 GB/CPU, ECC supported - USG6715F-DC (02354TQE-001): DDR4 DIMM, 64 GB TOTAL, 32 GB/ CPU, ECC supported
Storage	32GB
NOR Flash	64 MB/CPU, 128 MB in total

Item	Specification
Hard disk	- USG6715F-AC (02354MKN): Optional. Purchase a 2.5-inch hot-swappable SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei. - USG6715F-AC (02354MKN-001): Optional. Purchase a 2.5-inch hot-swappable SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei. - USG6715F-DC (02354TQE): Optional. Purchase a hot-swappable 2.5-inch SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei on demand. - USG6715F-DC (02354TQE-001): Optional. Purchase a hot-swappable 2.5-inch SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei on demand.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	- USG6715F-AC (02354MKN): 391 W - USG6715F-AC (02354MKN-001): 391 W - USG6715F-DC (02354TQE): 399 W - USG6715F-DC (02354TQE-001): 399 W
Maximum heat dissipation [BTU/hour]	- USG6715F-AC (02354MKN): 1334.1 BTU/hour - USG6715F-AC (02354MKN-001): 1334.1 BTU/hour - USG6715F-DC (02354TQE): 1361.4 BTU/hour - USG6715F-DC (02354TQE-001): 1361.4 BTU/hour
MTBF [years]	42.63 years
MTTR [hours]	2 hours

Item	Specification
Power supply mode	- USG6715F-AC (02354MKN): Built-in AC - USG6715F-AC (02354MKN-001): Built-in AC - USG6715F-DC (02354TQE): Built-in DC PM - USG6715F-DC (02354TQE-001): Built-in DC PM
Number of power modules	2
Rated input voltage [V]	- USG6715F-AC (02354MKN): - AC: 100 V to 240 V, 50 Hz or 60 Hz - High-voltage DC: 240 V, DC - USG6715F-AC (02354MKN-001): - AC: 100 V to 240 V, 50 Hz or 60 Hz - High-voltage DC: 240 V, DC - USG6715F-DC (02354TQE): +48 V DC -48 V DC to -60 V DC - USG6715F-DC (02354TQE-001): +48 V DC -48 V DC to -60 V DC
Input voltage range [V]	- USG6715F-AC (02354MKN): - AC: 90 V to 290 V, 45 Hz to 65 Hz - High-voltage DC: 190–290 V, DC - USG6715F-AC (02354MKN-001): - AC: 90 V to 290 V, 45 Hz to 65 Hz - High-voltage DC: 190–290 V, DC - USG6715F-DC (02354TQE): +40 V DC to +57 V DC -38.4 V DC to -72 V DC - USG6715F-DC (02354TQE-001): +40 V DC to +57 V DC -38.4 V DC to -72 V DC

Item	Specification
Maximum input current [A]	• USG6715F-AC (02354MKN): 8 A • USG6715F-AC (02354MKN-001): 8 A • USG6715F-DC (02354TQE): 38 A • USG6715F-DC (02354TQE-001): 38 A
Maximum output power [W]	• USG6715F-AC (02354MKN): 600 W • USG6715F-AC (02354MKN-001): 600 W • USG6715F-DC (02354TQE): 1200 W • USG6715F-DC (02354TQE-001): 1200 W
Types of fans	Pluggable
Number of fan modules	4
Heat dissipation mode	Absorbing cold air into the device
Airflow direction	• USG6715F-AC (02354MKN): Air flows in from the front panel and flows out from the rear panel. • USG6715F-AC (02354MKN-001): Air flows in from the front panel and flows out from the rear panel. • USG6715F-DC (02354TQE): Air flows in from the front panel and exhausts from the rear panel. • USG6715F-DC (02354TQE-001): Air flows in from the front panel and exhausts from the rear panel.
Redundant power supply	1+1
Redundant fans	3+1
Noise at normal temperature (acoustic power) [db(A)]	≤ 72 dB(A)

Item	Specification

Long-term operating temperature [°C(°F)]	• USG6715F-AC (02354MKN): Without HDDs: 0°C to 45°C
	  With HDDs: 5°C to 40°C
	• USG6715F-AC (02354MKN-001): Without HDDs: 0°C to 45°C
	  With HDDs: 5°C to 40°C
	• USG6715F-DC (02354TQE):
	  – Without hard disk driver: 0°C to 45°C
	  – With hard disk driver: 5°C to 40°C
	• USG6715F-DC (02354TQE-001):
	  – Without hard disk driver: 0°C to 45°C
	  – With hard disk driver: 5°C to 40°C

Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing

Long-term operating altitude [m(ft.)]	• USG6715F-AC (02354MKN): Without HDDs: 0 m to 5000 m
	  With HDDs: 0 m to 3000 m
	• USG6715F-AC (02354MKN-001): Without HDDs: 0 m to 5000 m
	  With HDDs: 0 m to 3000 m
	• USG6715F-DC (02354TQE):
	  – Without hard disk driver: 0 m to 5000 m
	  – With hard disk driver: 0 m to 3000 m
	• USG6715F-DC (02354TQE-001):
	  – Without hard disk driver: 0 m to 5000 m
	  – With hard disk driver: 0 m to 3000 m

Item	Specification
Storage altitude [m(ft.)]	● USG6715F-AC (02354MKN): 0 m to 5000 m ● USG6715F-AC (02354MKN-001): 0 m to 5000 m ● USG6715F-DC (02354TQE): 0–5000 m (0–16404 ft.) ● USG6715F-DC (02354TQE-001): 0–5000 m (0–16404 ft.)

 NOTE

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20℃/hour.

3.1.16 USG6725F

Overview

Table 3-102 Basic information about the USG6725F

Description	Part Number	Model	First supported version	Remarks
USG6725F(HTM) AC host(4*QSFP28 + 16*ZSFP+ + 8*SFP+ , 2 AC POWER)	02354MKE	USG6725F-AC	V600R021C10	-

Description	Part Number	Model	First supported version	Remarks
USG6725F-AC-(HTM) host(4*QSFP28 + 16*ZSFP+ + 8*SFP+ , 2 AC POWER)	02354MKE-001	USG6725F-AC	V600R021C10 SPC100	• If the device is used in V600R021 C10SPC100 , install V600R021S PH020 or a later patch. • Unsupport ed version: V600R021 C10SPC600

Appearance

Figure 3-100 Appearance of the USG6725F (front view)
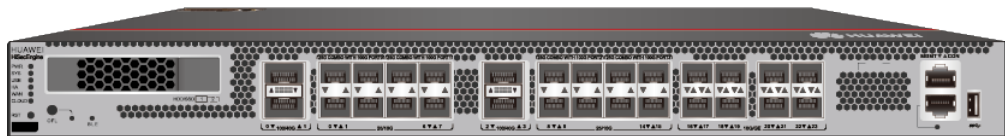
Figure 3-101 Appearance of the USG6725F (rear view)

Structure

Figure 3-102 Components of the USG6725F
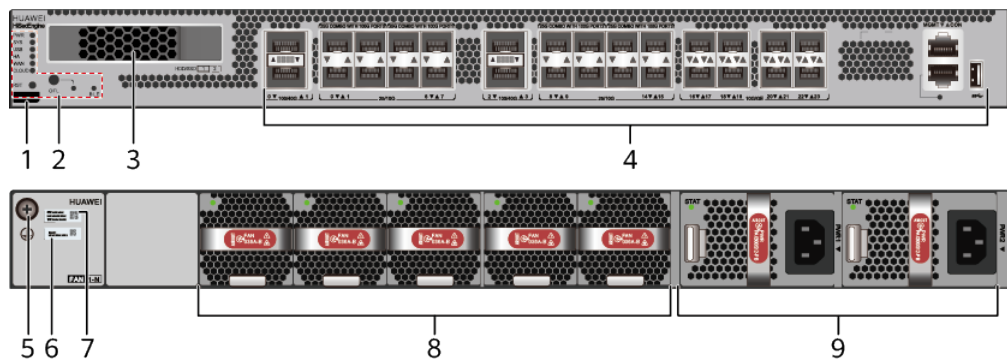
1. Product series ID	2. Indicator and button area	3. HDD/SSD slot	4. Fixed interface area	5. Protective ground terminal
6. MAC label	7. SN label	8. Fan module	9. Power module	-

Table 3-103 Component functions

Name	Description
Product series ID	Indicates the product series of the device. For details about the product model, see the nameplate in the lower part of the device.
Indicator and button area	Provides multiple indicators to display the running status of the device in real time and provides the RSTand OFL buttons for emergency maintenance.
HDD/SSD slot	Houses hard disks for storing log and report data.
Fixed interface area	Provides service ports, USB ports, console ports, and out-of-band management ports for device configuration and maintenance.
Protective ground terminal	Connects the M4 OT terminal of a PGND cable to the cabinet or the ground bar in the equipment room.
MAC label	Uniquely identifies the MAC address of the device, which is required during network forwarding configuration.
SN label	Uniquely identifies the device, which needs to be provided for the local technical support personnel to apply for a license.
Fan module	Dissipates heat for the device and is swappable. The fan module can be removed for no more than 1 minute.
Power module	Provides power input and distribution for the device. Two power modules are included in the standard configuration to provide 1+1 power redundancy. When one power module is running properly, the other one is hot swappable.

Slot Layout

Figure 3-103 Slot Layout of the USG6725F

Front

Back
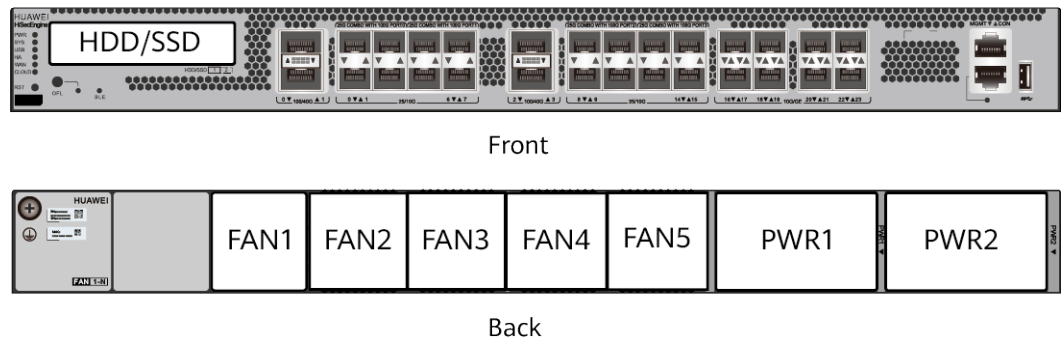
Table 3-104 Slots on the USG6725F

Slot Type	Slot ID	Slot Direction	Remarks
Hard disk (HDD/SSD) slot	-	Horizontal	2.5-inch SATA hard disk (240 GB/960 GB/1000 GB)
Fan module (FAN) slot	1-5	Horizontal	At the normal temperature range, the system can operate properly for a short time after a single fan module fails. You are advised to replace the faulty fan module immediately.
Power module (PWR) slot	Slots 1 and 2	Horizontal	Power modules are plug-and-play.

Indicators and Buttons

Figure 3-104 Indicators and Buttons of the USG6725F

1. PWR, SYS, USB, HA, WAN and CLOUD indicators	2. OFL indicator	3. BLE indicator	4. Optical port indicator	5. 10GE/GE optical port ACT indicator
6. 10GE/GE optical port LINK indicator	7. MGMT port indicator	8. RST button	9. OFL button	-

📖 **NOTE**

Arrowheads of optical ports show the positions of the ports. A down arrowhead indicates a port in the upper part, and an up arrowhead indicates a port in the lower part.

Table 3-105 Indicators on the USG6725F

Silkscreen	Name	Color	Status	Description
PWR	Power indicator	Green	Steady on	The power module is working properly.
		-	Off	The power module is faulty or the device is not powered on.
SYS	SYS indicator	Green	Steady on	The system is being powered on or restarted.
		Green	Blinks once every 2 seconds (0.5 Hz).	The system is running normally.
		Green	Blinking four times every second (4 Hz)	The system is starting.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	- The system is faulty. - The power supply is abnormal. - The fan module is abnormal. **NOTE** If the system starts with two power modules and one power module is not powered on, the SYS indicator is steady red, but the system is running properly.
		-	Off	The system is not running.
USB	USB indicator	Green	Steady on	USB-based deployment has been completed.
		Green	Blinking four times every second (4 Hz)	The system is reading data from the USB flash drive.
		Red	Steady on	USB-based deployment fails.
		-	Off	USB-based deployment is disabled (default state).
HA	HA indicator	Green	Steady on	Hot backup, managing the master device

Silkscreen	Name	Color	Status	Description
		Green	Blinks once every 2 seconds (0.5 Hz).	Hot backup, managing the slave device
		Red	Steady on	Dual-system hot backup is faulty.
		-	Off	The dual-system hot backup function is disabled.
WAN	WAN indicator	-	Off	Reserved function. This function is not enabled.
CLOUD	CLOUD indicator	-	Off	Reserved function. This function is not enabled.
-	OFL indicator	Green	Steady on	The hard disk can be removed.
		-	Off	The hard disk cannot be removed.
BLE	BLE indicator	-	Off	Reserved function. This function is not enabled.
-	Optical port indicator	Green	Steady on	The port link is connected.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.
-	LINK indicator of the optical port	Yellow	Blinking (12 Hz)	Data is being transmitted or received.

Silkscreen	Name	Color	Status	Description
		-	Off	No data is being transmitted or received.
-	LINK indicator of an optical port	Green	Steady on	A link has been established.
		-	Off	No link is established.
-	MGMT port indicator	Green	Steady on	A link has been established.
		Green	Blinking (12 Hz)	The port is sending or receiving data.
		-	Off	No link is established on the port.

Table 3-106 Buttons on the USG6725F

Silkscreen	Name	Description
RST	RST button	To restart the device, press the RST button. Ensure that the running configuration is saved before pressing the RST button. This button enables you to restore the default settings with one click. To be specific, you can press and hold down the RST button for 5 seconds and then release it to restore the default settings and restart the device.

Silkscreen	Name	Description
OFL	OFL button	To remove a hard disk, press and hold the OFL button for 4 seconds until the OFL indicator turns on.

Ports

Figure 3-105 Ports of the USG6725F
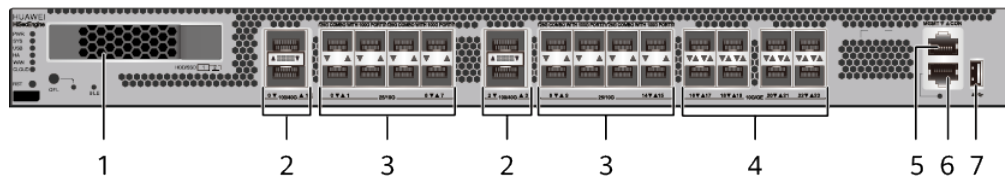
1. HDD/SSD slot	2. 100GE/40GE optical port	3. 25GE/10GE optical port	4. 10GE/GE optical port	5. Console port
6. MGMT port	7. USB port	-	-	-

Table 3-107 Ports on the USG6725F

Port	Connector Type	Description	Available Components
HDD/SSD slot	-	Hard disks are optional and can be purchased from Huawei if necessary.	**SSD-Sata240G-A** **SSD-SATA240G-C** **SSD-SATA960G-B** **SSD-SATA960G-C** **HDD-SATA1000G-A** **NOTE** In V600R022C00 and later versions, SSD-SATA240G-C and SSD-SATA960G-C hard disks are supported.

Port	Connector Type	Description	Available Components
100GE/40GE optical ports (0 to 3)	QSFP28	Four 100GE/40GE auto-sensing Ethernet optical ports numbered from 100GE0/0/0 to 100GE0/0/3. A 100GE/40GE port works at 100 Gbit/s by default and can work at 40 Gbit/s when it has a 40GE optical module installed.	**100Gbps QSFP28 Optical Modules** **40Gbps QSFP+ Optical Modules**

Port	Connector Type	Description	Available Components
25GE/10GE optical ports (0–15)	SFP28	The 25GE/10GE and 100GE/40GE optical ports are multiplexed. Four 25GE/10GE ports correspond to one 100GE/40GE port (25GE/10GE ports 0 to 3, 4 to 7, 8 to 11, and 12 to 15 correspond to 100GE/40GE ports 0, 1, 2, and 3, respectively). By default, 25GE/10GE ports work at 10 Gbit/s and are numbered from 10GE0/0/0 to 10GE0/0/15. To configure a 25GE/10GE port to work at 25 Gbit/s, run the port mode 40GE interface 100GE0/0/x command. After the rate mode is switched, the 25GE/10GE port works at 25 Gbit/s when it has a 25GE optical module installed and can also work at 10 Gbit/s when it has a 10GE optical module installed. In addition, the corresponding 100GE/40GE ports can work normally only when they have 40GE optical modules installed. They cannot work	• **25Gbps SFP28 Optical Modules** • **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
		normally when they have 100GE optical modules installed. **NOTE** ● The port mode 40GE interface 100GE0/0/x command does not support multi-port operations. x indicates the number of a port. ● After the command is executed, a new port number is generated. That is, the port numbers 10GE0/0/x to 10GE0/0/x change to 25GE0/0/x to 25GE0/0/x, and the port number 100GE0/0/x changes to 40GE0/0/x.	
10GE/GE optical ports (16 to 23)	SFP+	Eight 10GE auto-sensing Ethernet optical ports: 10GE0/0/16 to 10GE0/0/23. They can also be used as GE optical ports.	● **1Gbps eSFP Optical Modules** ● **10Gbps SFP+ Optical Modules**

Port	Connector Type	Description	Available Components
Console port	RJ45	The console port is connected to a console for on-site configuration. You can use a console cable to connect the console port (RJ45) on the device to the COM port on your PC and use the terminal emulation program on the PC to access the CLI of the device to configure, manage, and maintain the device.	**Console Cable**

Port	Connector Type	Description	Available Components
MGMT port	RJ45	The out-of-band management port is a 10/100/1000M RJ45 autosensing Ethernet port. The port number is MEth0/0/0 and the default IP address is 192.168.0.1. You can connect this port to the network port or any reachable port on a PC through an Ethernet cable. Then, you can use STelnetv2 to access the CLI of the device or use the web browser to access the web UI to configure, manage, and maintain the device. **NOTE** The MGMT port cannot be used as a service port.	**Ethernet Cable**
USB	USB Type A	USB ports allow you to insert USB devices for system software upgrades. For details about the upgrade through a USB flash drive, see the Upgrade Guide delivered with the version.	● USB 2.0-compliant USB flash drive ● USB 3.0-compliant USB flash drive

Power Supply System

The power supply system has two PAC600S12-PB AC power modules for 1+1 power redundancy.

Heat Dissipation System

The heat dissipation system consists of five FAN-036A-B modules working in 4+1 backup mode. From the front panel, the device provides a front-to-rear air flow. The fan module locates at the air exhaust of the system.

Figure 3-106 System air flow of the USG6725F

Cool air   Hot air
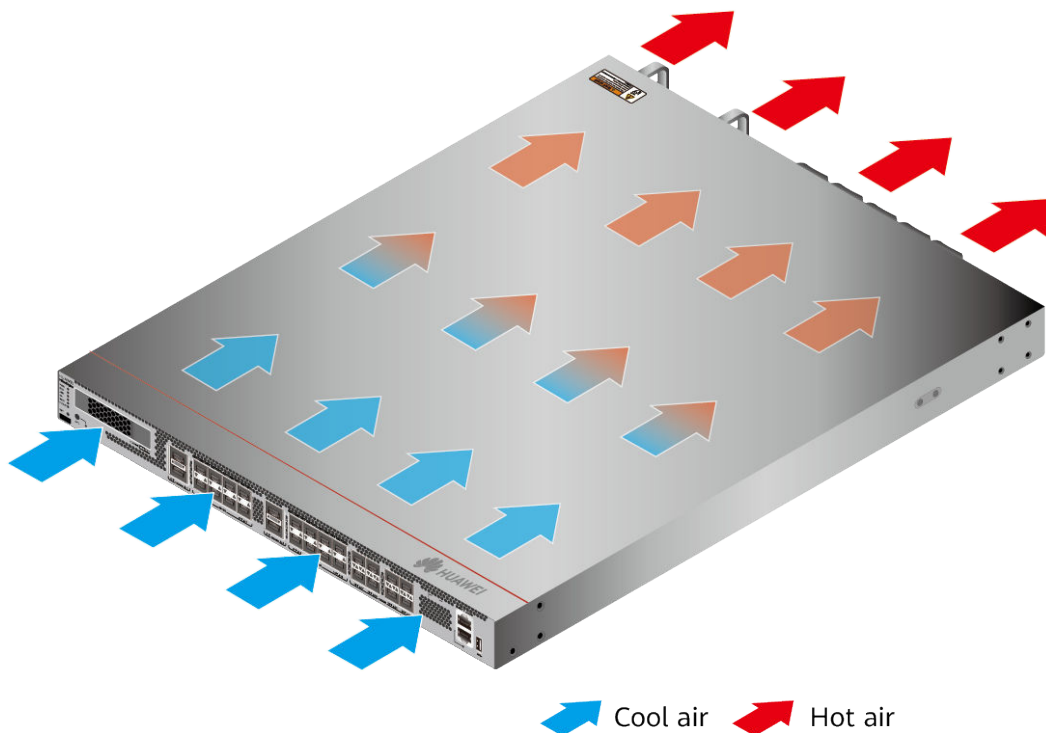
Technical Specifications

Table 3-108 Technical specifications of the USG6725F

Item	Specification
Installation Type	Rack
Cabinet installation standard	Cabinets with a depth of 800 mm or more
Dimensions without packaging (H x W x D) [mm(in.)]	• Typical dimensions (excluding the parts protruding from the body): 43.6 mm x 442 mm x 600 mm (1.72 in. x 17.40 in. x 23.62 in.) • Maximum dimensions (the depth is the distance from ports on the front panel to the parts protruding from the rear panel): 43.6 mm x 442 mm x 633 mm (1.72 in. x 17.40 in. x 24.92 in.)

Item	Specification
Dimensions with packaging (H x W x D) [mm(in.)]	260 mm x 590 mm x 790 mm
Chassis height [U]	1 U
Weight with packaging [kg(lb)]	15.82 kg (34.88 lb)
Weight without packaging [kg(lb)]	10.6 kg (23.37 lb)
CPU	3 CPUs, 16 cores/CPU, dominant frequency 2.0 GHz
Memory	DDR4 DIMM, 96 GB TOTAL, 32 GB/CPU, supporting ECC
Storage	32GB
NOR Flash	64 MB/CPU, 192 MB in total
Hard disk	Optional. Purchase a 2.5-inch hot-swappable SATA hard disk (240 GB, 960 GB, or 1000 GB) from Huawei.
Console port	RJ45
Eth Management port	RJ45
Maximum power consumption [W]	445 W
Maximum heat dissipation [BTU/hour]	1518.3 BTU/hour
MTBF [years]	31.63 years
MTTR [hours]	2 hours
Power supply mode	Built-in AC
Number of power modules	2
Rated input voltage [V]	● AC: 100 V to 240 V, 50 Hz or 60 Hz ● High-voltage DC: 240 V, DC
Input voltage range [V]	● AC: 90 V to 290 V, 45 Hz to 65 Hz ● High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Maximum output power [W]	600 W
Types of fans	Pluggable
Number of fan modules	5
Heat dissipation mode	Absorbing cold air into the device
Airflow direction	Air flows in from the front panel and flows out from the rear panel.

Item	Specification
Redundant power supply	1+1
Redundant fans	4+1
Noise at normal temperature (acoustic power) [db(A)]	≤ 72 dB(A)
Long-term operating temperature [°C(°F)]	Without HDDs: 0°C to 45°C With HDDs: 5°C to 40°C
Storage temperature [°C(°F)]	-40°C to 70°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Storage relative humidity [RH]	5% RH to 95% RH, non-condensing
Long-term operating altitude [m(ft.)]	Without HDDs: 0 m to 5000 m With HDDs: 0 m to 3000 m
Storage altitude [m(ft.)]	0 m to 5000 m

☐ **NOTE**

- The width does not include the size of mounting ears.
- The height is 1U (1U = 1.75 inches, or about 44.45 mm), which is a height unit defined in International Electrotechnical Commission (IEC) 60297 standards.
- Temperature and humidity are measured 1.5 m above the floor and 0.4 m in front of the rack when no protection plate exists before or after the rack.
- The operating temperature change rate of a device with HDDs must be less than or equal to 20°C/hour.

3.2 Power Modules

This chapter describes hardware information for power modules of the USG, including hardware appearance, functions, and technical specifications.

3.2.1 HW-120300D1D (36W AC Power Module)

Overview

Table 3-109 Basic information about the HW-120300D1D

Item	Details
Description	36W AC Power Module
Part Number	02221468

Item	Details
Model	HW-120300D1D

Appearance

Figure 3-107 Appearance of the HW-120300D1D

Version Mapping

Table 3-110 Mappings between HW-120300D1D and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6530F-D	USG6530F-D-AC (02355FBU)	V600R022C10	-	-
USG6510F-D	USG6510F-D-AC (02355EHU)	V600R022C10	-	-

Functions and Features

Table 3-111 Functions and features of the HW-120300D1D

Functions and Features	Description
Input overcurrent protection	Stops power output and does not automatically restore power output after the input current becomes normal.

Functions and Features	Description
Output current limiting protection	Intermittently provides output and automatically restores normal output after the output current falls within a normal range.
Output overvoltage protection	Intermittently stops output and automatically restores output after the overvoltage condition is removed.
Output short circuit protection	Intermittently provides output and automatically restores normal output after the output short circuit is removed.
Heat dissipation	The power adapter does not have fans and uses natural cooling.

Technical Specifications

Table 3-112 Technical specifications of the HW-120300D1D

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	32 mm x 53.95 mm x 99.45 mm (1.26 in. x 2.12 in. x 3.92 in.)
Weight without packaging [kg(lb)]	0.205 kg (0.45 lb)
Number of inputs	1
Rated input voltage [V]	100 V AC to 240 V AC (50 Hz/60 Hz)
Input voltage range [V]	90 V AC to 264 V AC (47 Hz to 63 Hz)
Maximum input current [A]	1 A
Rated output voltage [V]	12V DC
Rated output current [A]	3 A
Rated output power [W]	36 W
Type of power cables	C7

3.2.2 PAC600S12-PB (600W AC Power Module(Back to Front, Power panel side exhaust, small form factor))

The PAC600S12-PB AC&240 V DC power module is a AC-input and DC-output power module.

Overview

Table 3-113 Basic information about the PAC600S12-PB

Item	Details
Description	600W AC Power Module(Back to Front, Power panel side exhaust, small form factor)
Part Number	02313BUS
Model	PAC600S12-PB

Appearance

Figure 3-108 Appearance of the PAC600S12-PB

Version Mapping

Table 3-114 Mappings between PAC600S12-PB and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R021C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R020C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R020C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R020C10	-	-
USG6725F	USG6725F-AC (02354MKE)	V600R021C10	-	-
USG6725F	USG6725F-AC (02354MKE-0 01)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R021C10	-	-
USG6715F	USG6715F-AC (02354MKN-0 01)	V600R021C10 SPC100	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R020C10	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R021C10	-	-
USG6710F	USG6710F-AC (02354TPX-00 1)	V600R021C10 SPC100	-	-

Panel

Figure 3-109 Panel of the PAC600S12-PB
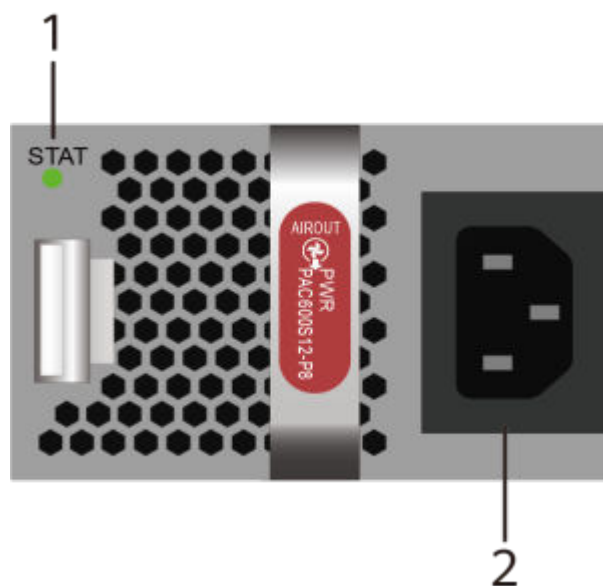
1. Power status indicator	2. Power receptacle

Table 3-115 Indicators on the PAC600S12-PB

Silkscreen	Name	Color	Status	Description
STAT	Power status indicator	Green	Steady on	The output of the AC power module is normal.

Silkscreen	Name	Color	Status	Description
		-	Off	• The input of the AC power module is out of range. For example, no AC input, AC input overvoltage, or AC input undervoltage has occurred. • The output of the AC power module is out of range. For example, undervoltage, or overtemperature has occurred.

Table 3-116 Ports on the PAC600S12-PB

Port	Connector Type	Description	Available Components
Power receptacle	-	Connects the C13 plug of the AC power cable. For details, see AC Power Cables.	-

Functions and Features

Table 3-117 Functions and features of the PAC600S12-PB

Functions and Features	Description
Input undervoltage protection	Stops power output and automatically restores power output after the input voltage becomes normal.
Input overvoltage protection	Stops power output and automatically restores power output after the input voltage becomes normal.
Input overcurrent protection	Stops power output and does not automatically restore power output after the input current becomes normal.
Output current limiting protection	Intermittently provides output and automatically restores normal output after the output current falls within a normal range.
Output overvoltage protection	Intermittently stops output and automatically restores output after the overvoltage condition is removed.
Output short circuit protection	Intermittently provides output and automatically restores normal output after the output short circuit is removed.
Overtemperature protection	When the temperature of the power module reaches a preset threshold, the power module stops power output and will automatically restore power output after the temperature drops back to the normal range.
Heat dissipation	The heat dissipation is provided by the fan of the power module.
Hot swap	The device has 1+1 power module redundancy. You can hot-swap a power module without interrupting device operation.

Technical Specifications

Table 3-118 Technical specifications of the PAC600S12-PB

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	39.6 mm x 66 mm x 215 mm (1.56 in. x 2.60 in. x 8.47 in.)
Weight without packaging [kg(lb)]	1 kg (2.2 lb)
Rated input voltage [V]	• AC: 100 V to 240 V, 50 Hz or 60 Hz • High-voltage DC: 240 V, DC
Input voltage range [V]	• AC: 90 V to 290 V, 45 Hz to 65 Hz • High-voltage DC: 190–290 V, DC
Maximum input current [A]	8 A
Rated output voltage [V]	12 V
Rated output current [A]	50 A
Rated output power [W]	600 W
Hot swapping	Supported
Type of power cables	C13

3.2.3 PAC60S12-AR (60W AC Power Module)

Overview

Table 3-119 Basic information about the PAC60S12-AR

Item	Details
Description	60W AC Power Module
Part Number	02312SLE
Model	PAC60S12-AR

Appearance

**Figure 3-110** Appearance of the PAC60S12-AR
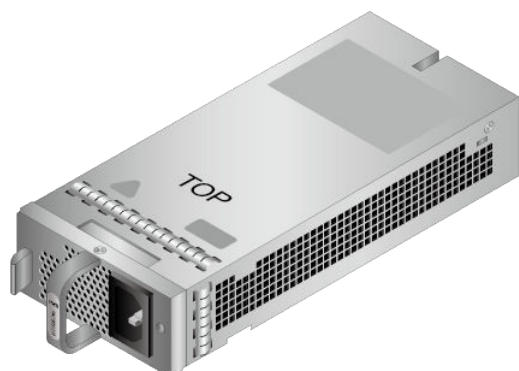
Version Mapping

Table 3-120 Mappings between PAC60S12-AR and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6585F	USG6585F-AC (02355FCS)	V600R022C10	-	-
USG6525F	USG6525F-AC (02355FCP)	V600R022C10	-	-
USG6565F	USG6565F-AC (02355FCR)	V600R022C10	-	-
USG6555F	USG6555F-AC (02355FCQ)	V600R022C10	-	-

Panel

Figure 3-111 Panel of the PAC60S12-AR
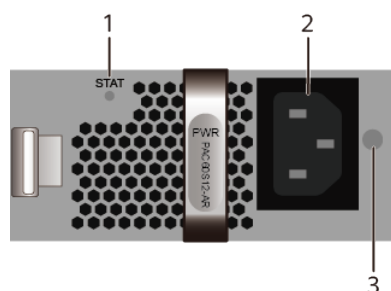
1. Power status indicator	2. Power receptacle	3. Clip hole

Table 3-121 Indicators on the PAC60S12-AR

Silkscreen	Name	Color	Status	Description
STAT	Power status indicator	Green	Steady on	The output of the AC power module is normal.
		Green	Blinking	The output power is out of range. For example, overvoltage, overcurrent, or short circuit has occurred.
		-	Off	● The input of the AC power module is out of range. For example, no AC input, AC input overvoltage, or AC input undervoltage has occurred. ● The output of the AC power module is out of range. For example, undervoltage, or overtemperature has occurred.

Table 3-122 Ports on the PAC60S12-AR

Port	Connector Type	Description	Available Components
Power receptacle	-	Connects the C13 plug of the AC power cable. For details, see AC Power Cables.	-
Clip hole	-	The hole is used to install the power cable clip, which is used to bind and fix the power cable. The power cable clip is installed before shipment.	-

Functions and Features

Table 3-123 Functions and features of the PAC60S12-AR

Functions and Features	Description
Input undervoltage protection	Stops power output and automatically restores power output after the input voltage becomes normal.
Input overcurrent protection	Stops power output and does not automatically restore power output after the input current becomes normal.
Output current limiting protection	Intermittently provides output and automatically restores normal output after the output current falls within a normal range.
Output overvoltage protection	Intermittently stops output and automatically restores output after the overvoltage condition is removed.
Output short circuit protection	Intermittently provides output and automatically restores normal output after the output short circuit is removed.

Functions and Features	Description
Overtemperature protection	When the temperature of the power module reaches a preset threshold, the power module stops power output and will automatically restore power output after the temperature drops back to the normal range.
Heat dissipation	Power module does not have fans. The heat dissipation is provided by the fan module of the device.
Hot swap	The device has 1+1 power module redundancy. You can hot-swap a 170 W power module without interrupting device operation.

Technical Specifications

Table 3-124 Technical specifications of the PAC60S12-AR

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	39.8 mm x 90 mm x 214.3 mm (1.57 in. x 3.54 in. x 8.43 in.)
Weight without packaging [kg(lb)]	0.68 kg (1.5 lb)
Number of inputs	1
Rated input voltage [V]	100 V AC to 240 V AC (50 Hz/60 Hz)
Input voltage range [V]	90 V AC to 264 V AC (47 Hz to 63 Hz)
Maximum input current [A]	2 A
Rated output voltage [V]	12 V
Rated output current [A]	5 A
Rated output power [W]	60 W
Hot swapping	Supported
Type of power cables	C13

3.2.4 PDC180S12-CR (180W DC Power Module)

Overview

Table 3-125 Basic information about the PDC180S12-CR

Item	Details
Description	180W DC Power Module
Part Number	02312VRE
Model	PDC180S12-CR

Appearance

**Figure 3-112** Appearance of the PDC180S12-CR
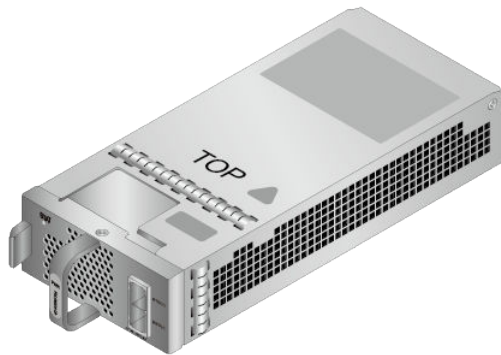
Version Mapping

Table 3-126 Mappings between PDC180S12-CR and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6525F	USG6525F-DC (02355FDT)	V600R022C10	-	-
USG6565F	USG6565F-DC (02355FDR)	V600R022C10	-	-

Panel

Figure 3-113 Panel of the PDC180S12-CR
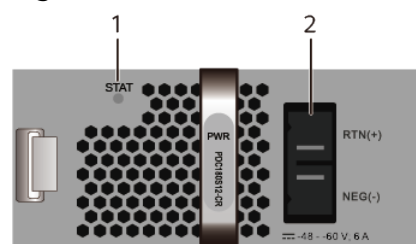
1. Power status indicator	2. Power receptacle

Table 3-127 Indicators on the PDC180S12-CR

Silkscreen	Name	Color	Status	Description
STAT	Power status indicator	Green	Steady on	The output of the DC power module is normal.
		-	Off	- The input of the DC power module is out of range. For example, no DC input, DC input overvoltage, or DC input undervoltage has occurred. - The output of the DC power module is out of range. For example, undervoltage, or overtemperature has occurred.

Table 3-128 Ports on the PDC180S12-CR

Port	Connector Type	Description	Available Components
Power cable terminal	-	Connect the black wire to the RTN (+) terminal and the blue wire to the NEG (-) terminal. For details, see DC Power Cables.	-

Functions and Features

Table 3-129 Functions and features of the PDC180S12-CR

Functions and Features	Description
Input undervoltage protection	Stops power output and automatically restores power output after the input voltage becomes normal.
Output current limiting protection	Intermittently provides output and automatically restores normal output after the output current falls within a normal range.
Output overvoltage protection	Intermittently stops output and automatically restores output after the overvoltage condition is removed.
Output short circuit protection	Intermittently provides output and automatically restores normal output after the output short circuit is removed.
Overtemperature protection	When the temperature of the power module reaches a preset threshold, the power module stops power output and will automatically restore power output after the temperature drops back to the normal range.
Heat dissipation	The power adapter does not have fans. The heat dissipation is provided by the fan module of the device.
Hot swap	The device has 1+1 power module redundancy. You can hot-swap a power module without interrupting device operation.

Technical Specifications

Table 3-130 Technical specifications of the PDC180S12-CR

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	39.8 mm x 90 mm x 215 mm (1.57 in. x 3.54 in. x 8.46 in.)
Weight without packaging [kg(lb)]	0.689 kg (1.52 lb)
Number of inputs	1
Rated input voltage [V]	-48V DC to -60V DC
Input voltage range [V]	-38.4V DC to -72V DC
Maximum input current [A]	11 A
Rated output voltage [V]	12 V
Rated output power [W]	180 W
Hot swapping	Supported

3.2.5 PDC1K2S12-CE (1200W DC Power Module(Power panel side exhaust))

The PDC1K2S12-CE DC power module is a DC-input and DC-output power module.

Overview

Table 3-131 Basic information about the PDC1K2S12-CE

Item	Details
Description	1200W DC Power Module(Power panel side exhaust)
Part Number	02270205
Model	PDC1K2S12-CE

Appearance

Figure 3-114 Appearance of the PDC1K2S12-CE

Version Mapping

Table 3-132 Mappings between PDC1K2S12-CE and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6715F	USG6715F-DC (02354TQE)	V600R021C10	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R021C10 SPC100	-	-

Panel

Figure 3-115 Panel of the PDC1K2S12-CE
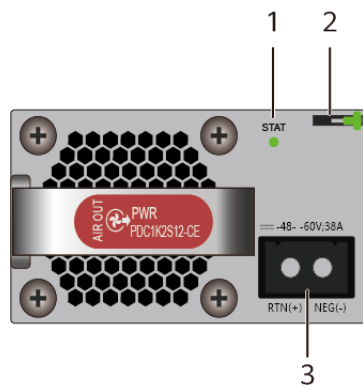
1. Power status indicator	2. Lock	3. Power receptacle

Table 3-133 Indicators on the PDC1K2S12-CE

Silkscreen	Name	Color	Status	Description
STAT	Power status indicator	Green	Steady on	The power module is working normally.
		Green	Blinking	The power module is in loading or standby state, or the power cable has been connected but the power module is not installed in the device.

Silkscreen	Name	Color	Status	Description
		Red	Steady on	• Fans of the power module fail. • The power module is in overtemperature protection state. • The power input is abnormal (input undervoltage or input overvoltage). • The power output is abnormal (output overcurrent, output short-circuit, or output overvoltage).
		-	Off	The power module receives no power input.

Table 3-134 Ports on the PDC1K2S12-CE

Port	Connector Type	Description	Available Components
Power cable terminal	-	Connect the black wire to the RTN (+) terminal and the blue wire to the NEG (-) terminal. For details, see DC Power Cables.	-

Functions and Features

Table 3-135 Functions and features of the PDC1K2S12-CE

Functions and Features	Description
Input undervoltage protection	Stops power output and automatically restores power output after the input voltage becomes normal.
Input overvoltage protection	Stops power output and automatically restores power output after the input voltage becomes normal.
Input overcurrent protection	Stops power output and does not automatically restore power output after the input current becomes normal.
Output current limiting protection	Intermittently provides output and automatically restores normal output after the output current falls within a normal range.
Output overvoltage protection	Intermittently stops output and automatically restores output after the overvoltage condition is removed.
Output short circuit protection	Intermittently provides output and automatically restores normal output after the output short circuit is removed.
Overtemperature protection	When the temperature of the power module reaches a preset threshold, the power module stops power output and will automatically restore power output after the temperature drops back to the normal range.

Functions and Features	Description
Heat dissipation	The heat dissipation is provided by the fan of the power module.
Hot swap	The device has 1+1 power module redundancy. You can hot-swap a power module without interrupting device operation.

Technical Specifications

Table 3-136 Technical specifications of the PDC1K2S12-CE

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	39.6 mm(in.) x 66 mm(in.) x 215 mm(in.)
Weight without packaging [kg(lb)]	1.5 kg (3.31 lb)
Rated input voltage [V]	• +48 V DC • -48 V DC to -60 V DC
Input voltage range [V]	• +40 V DC to +57 V DC • -38.4 V DC to -72 V DC
Maximum input current [A]	38 A
Rated output voltage [V]	12 V
Rated output power [W]	1200 W
Hot swapping	Supported

3.3 Fan Modules

This chapter describes hardware information for all fan modules of the USG, including hardware appearance, and technical specifications.

3.3.1 FAN-023A-B (FAN-023A-B,Fan box(B,FAN panel side exhaust))

Overview

Table 3-137 Basic information about the FAN-023A-B

Item	Details
Description	FAN-023A-B,Fan box(B,FAN panel side exhaust)
Part Number	02312DKW
Model	FAN-023A-B

Appearance

**Figure 3-116** Appearance of the FAN-023A-B
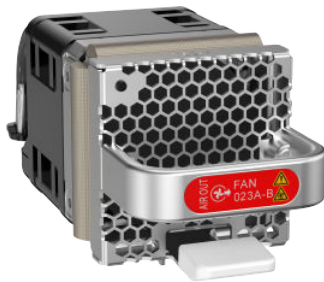
Version Mapping

Table 3-138 Mappings between FAN-023A-B and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6585F	USG6585F-AC (02355FCS)	V600R022C10	-	-
USG6525F	USG6525F-AC (02355FCP)	V600R022C10	-	-
USG6525F	USG6525F-DC (02355FDT)	V600R022C10	-	-
USG6565F	USG6565F-AC (02355FCR)	V600R022C10	-	-
USG6565F	USG6565F-DC (02355FDR)	V600R022C10	-	-
USG6555F	USG6555F-AC (02355FCQ)	V600R022C10	-	-

Panel

Figure 3-117 Panel of the FAN-023A-B
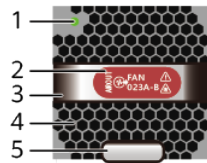
1. Indicator	2. Airflow flag AIR OUT : back-to-front airflow	3. Handle
4. Fan air vent	5. Lock	-

Table 3-139 Indicators on the FAN-023A-B

Silkscreen	Name	Color	Status	Description
-	Fan module indicator	Green	Blinking once every 2 seconds (0.5 Hz)	The fan module is running properly.
		Red	Steady on	The fan module has a hardware fault and must be replaced. For details about the alarm information, see. VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.1 hwFanRemove, VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.3 hwFanFail

Silkscreen	Name	Color	Status	Description
		Red	Blinking once every 2 seconds (0.5 Hz)	The fan module has an alarm, and the alarm must be handled as soon as possible. For details about the alarm information, see VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.5 hwFanInvalid.
		-	Steady off	The fan module is absent.

Functions and Features

Table 3-140 Functions and features of the FAN-023A-B

Functions and Features	Description
Basic function	The fan module is hot swappable and consists of a fan tray, fans, and light pipe.
Automatic fan speed adjustment	When the fan modules communicate normally with the MPU, the MPU controls the speed of fans according to temperature of the chassis.
Hot swapping	Supported
Heat dissipation	Back-to-front airflow

Technical Specifications

Table 3-141 Technical specifications of the FAN-023A-B

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	40 mm x 40 mm x 100.3 mm (1.57 in. x 1.57 in. x 3.95 in.)
Weight without packaging [kg(lb)]	0.1 kg (0.22 lb)
Number of fans	1
Typical power consumption [W]	7.2 W
Maximum power consumption (40°C) [W]	8.64 W
Operating voltage range [V]	7 V DC to 15 V DC
Maximum airflow [CFM]	25.29 CFM
Maximum noise level [dB(A)]	59 dB(A)
Maximum wind pressure [Pa]	531.94 Pa

3.3.2 FAN-031A-B (FAN-031A-B,Fan box(B,FAN panel side exhaust))

Overview

Table 3-142 Basic information about the FAN-031A-B

Item	Details
Description	FAN-031A-B,Fan box(B,FAN panel side exhaust)
Part Number	02352CAB
Model	FAN-031A-B

Appearance

Figure 3-118 Appearance of the FAN-031A-B

Version Mapping

Table 3-143 Mappings between FAN-031A-B and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R021C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R020C10	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R020C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R020C10	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R020C10	-	-

Panel

Figure 3-119 Panel of the FAN-031A-B
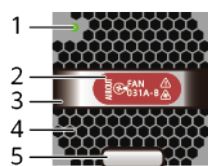
1. Indicator	2. Airflow flag : back-to-front airflow	3. Handle
4. Fan air vent	5. Lock	-

Table 3-144 Indicators on the FAN-031A-B

Silkscreen	Name	Color	Status	Description
-	FAN indicator	Green	Blink every two seconds (0.5 Hz)	The fan module is running normally.
		Red	Steady on	The fan module has a hardware fault and must be replaced. For details about the alarm information, see. VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.1 hwFanRemove, VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.3 hwFanFail

Silkscreen	Name	Color	Status	Description
		Red	Blink every two seconds (0.5 Hz)	An alarm is generated on the fan module and needs to be processed accordingly. For details, see VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.5 hwFanInvalid.
		-	Off	The fan module is not installed.

Functions and Features

Table 3-145 Functions and features of the FAN-031A-B

Functions and Features	Description
Basic function	The fan module supports hot swapping. It consists of the fan module frame, fan, and light pipe.
Automatic fan speed adjustment	After the fan module communicates normally with the switch, the switch controls the speed of the fan based on temperature of the chassis.
Hot swap	Supported
Heat dissipation	Back-to-front airflow

Technical Specifications

Table 3-146 Technical specifications of the FAN-031A-B

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	40 mm x 40 mm x 100.3 mm (1.57 in. x 1.57 in. x 3.95 in.)
Weight without packaging [kg(lb)]	0.1 kg (0.22 lb)

Item	Specification
Number of fans	1
Typical power consumption [W]	16.8 W
Maximum power consumption (40°C) [W]	21.6 W
Operating voltage range [V]	7 V DC to 15 V DC
Maximum airflow [CFM]	31 CFM
Maximum noise level [dB(A)]	63.5 dB(A)
Maximum wind pressure [Pa]	720 Pa

3.3.3 FAN-036A-B (FAN-036A-B,Fan box(B, FAN panel side exhaust))

Overview

Table 3-147 Basic information about the FAN-036A-B

Item	Details
Description	FAN-036A-B,Fan box(B, FAN panel side exhaust)
Part Number	02312EYW
Model	FAN-036A-B

Appearance

Figure 3-120 Appearance of the FAN-036A-B

Version Mapping

Table 3-148 Mappings between FAN-036A-B and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6725F	USG6725F-AC (02354MKE)	V600R021C10	-	-
USG6725F	USG6725F-AC (02354MKE-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R021C10	-	-
USG6715F	USG6715F-DC (02354TQE)	V600R021C10	-	-
USG6715F	USG6715F-AC (02354MKN-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R021C10 SPC100	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R021C10	-	-
USG6710F	USG6710F-AC (02354TPX-001)	V600R021C10 SPC100	-	-

Panel

Figure 3-121 Panel of the FAN-036A-B
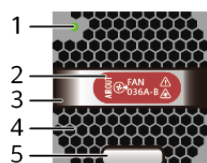
1. Indicator	2. Airflow flag : back-to-front airflow	3. Handle
4. Fan air vent	5. Lock	-

Table 3-149 Indicators on the FAN-036A-B

Silkscreen	Name	Color	Status	Description
-	Fan module indicator	Green	Blinking once every 2 seconds (0.5 Hz)	The fan module is running properly.
		Red	Steady on	The fan module has a hardware fault and must be replaced. For details about the alarm information, see. VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.1 hwFanRemove, VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.3 hwFanFail

Silkscreen	Name	Color	Status	Description
		Red	Blinking once every 2 seconds (0.5 Hz)	The fan module has an alarm, and the alarm must be handled as soon as possible. For details about the alarm information, see VCMU_1.3.6.1.4.1.2011.5.25.219.2.6.5 hwFanInvalid.
		-	Steady off	The fan module is absent.

Functions and Features

Table 3-150 Functions and features of the FAN-036A-B

Functions and Features	Description
Basic function	The fan module is hot swappable and consists of a fan tray, fans, and light pipe.
Automatic fan speed adjustment	When the fan modules communicate normally with the MPU, the MPU controls the speed of fans according to temperature of the chassis.
Hot swapping	Supported
Heat dissipation	Back-to-front airflow

Technical Specifications

Table 3-151 Technical specifications of the FAN-036A-B

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	40 mm x 40 mm x 128.3 mm
Weight without packaging [kg(lb)]	0.165 kg (0.36 lb)
Number of fans	1
Typical power consumption [W]	28 W
Maximum power consumption (40°C) [W]	33.6 W
Operating voltage range [V]	10.8 V DC to 13.2 V DC
Maximum airflow [CFM]	36 CFM
Maximum noise level [dB(A)]	69.8 dB(A)
Maximum wind pressure [Pa]	950 Pa

3.4 Cards

The USG supports the bypass card with enhanced reliability. Purchase the bypass card as required.

3.4.1 SIC

3.4.1.1 SIC-2SM-BF (SIC-2SM-BF, Single mode fiber bypass SIC card)

Overview

Table 3-152 Basic information about the SIC-2SM-BF

Item	Details
Description	SIC-2SM-BF, Single mode fiber bypass SIC card
Part Number	03027SYK
Model	SIC-2SM-BF
Card Type	SIC

Item	Details
Silkscreen	SIC-2SM-BF

Appearance

Figure 3-122 Appearance of the SIC-2SM-BF
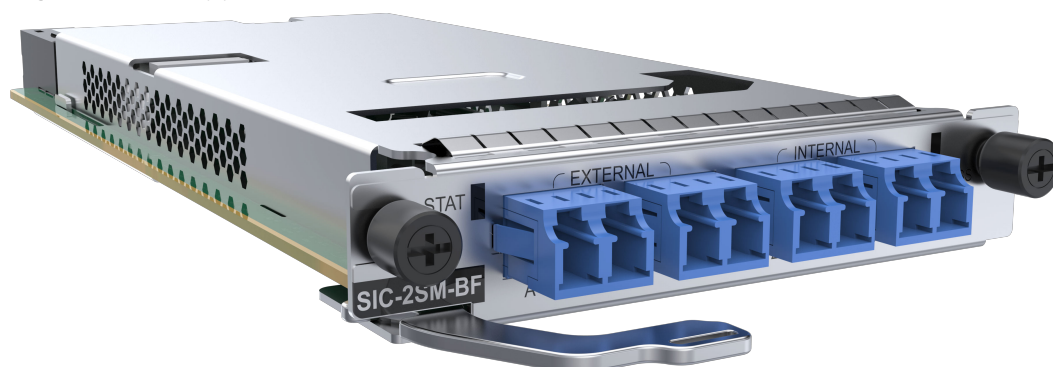
Version Mapping

Table 3-153 Mappings between SIC-2SM-BF and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R021C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R020C10	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R020C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R020C10	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R020C10	-	-

Indicators

Figure 3-123 Indicators on the SIC-2SM-BF
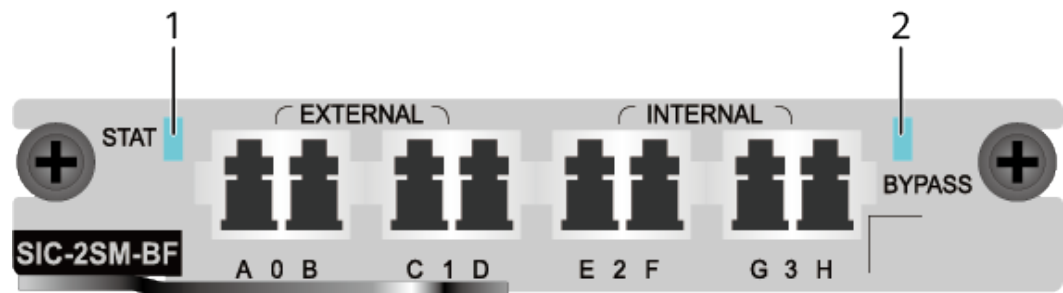
1. STAT indicator	2. BYPASS indicator

Table 3-154 Indicators on the SIC-2SM-BF

Silkscreen	Name	Color	Status	Description
STAT	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
		Green	Blink every two seconds (0.5 Hz)	The card is working properly.
		Green	Blinking four times every second (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		-	Steady off	The card is in power-off state.

Silkscreen	Name	Color	Status	Description
BYPASS	BYPASS Function indicator	Green	Steady on	The device has been powered on and the card is in bypass state.
		Green	Blink every two seconds (0.5 Hz)	The device has been powered on and the card is in non-bypass state.
		-	Steady off	The device has been powered off and the card is in bypass state.

Ports

Figure 3-124 Ports on the SIC-2SM-BF
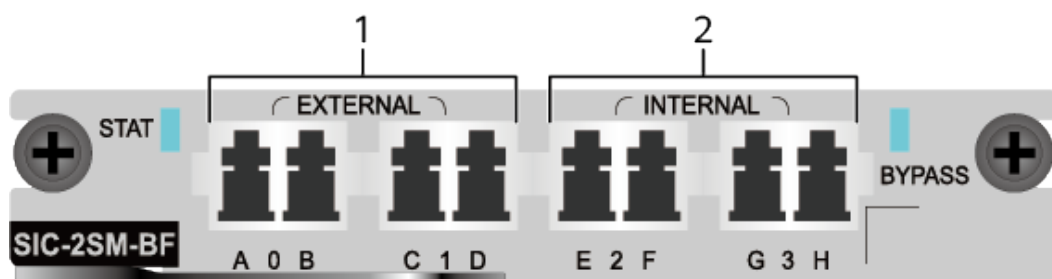
The optical bypass card provides four interfaces, including two EXTERNAL interfaces and two INTERNAL interfaces. When the bypass link is in the bypass state, EXTERNAL interface 0 and INTERNAL interface 2 form a link, and EXTERNAL interface 1 and INTERNAL interface 3 form another link. When the bypass link is in the non-bypass state, two EXTERNAL interfaces are directly connected to form a link.

1. EXTERNAL	2. INTERNAL

☐ **NOTE**

External and internal interfaces connect to GE and 10GE interfaces by default.

Table 3-155 Ports on the SIC-2SM-BF

Port	Connector Type	Description	Available Components
EXTERNAL	LC	2 external firber port, Port 0 to Port 1	SM Firber
INTERNAL	LC	2 internal firber port, Port 2 to Port 3	SM Firber

Functions and Features

Table 3-156 Functions and features of the SIC-2SM-BF

Functions and Features	Description
Basic function	The SIC-2SM-BF card is also known as the single-mode optical bypass card. It provides one optical bypass link and is hot swappable. When a device is powered off or faulty, the upstream and downstream devices of the device can directly connect to each other through the two EXTERNAL ports on the optical bypass card. Then traffic can be forwarded between upstream and downstream device, ensuring service continuity.

Technical Specifications

Table 3-157 Technical specifications of the SIC-2SM-BF

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	19.4mm x 100.1mm × 233.6mm(0.76 in. x 3.94 in. x 9.20 in.)
Weight without packaging [kg(lb)]	0.39 kg (0.86 lb)
Weight with packaging [kg(lb)]	0.59 kg (1.3 lb)
Typical power consumption [W]	1.6 W
Typical heat dissipation [BTU/hour]	5.46 BTU/hour
Maximum power consumption [W]	5 W

Item	Specification
Maximum heat dissipation [BTU/hour]	17.06 BTU/hour
Long-term operating temperature [°C(°F)]	0°C to 45°C
Short-term operating temperature [°C(°F)]	0°C to 45°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Short-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing

3.4.1.2 SIC-4GE-BC (SIC-4GE-BC-4*GE RJ45 bypass SIC card)

Overview

Table 3-158 Basic information about the SIC-4GE-BC

Item	Details
Description	SIC-4GE-BC-4*GE RJ45 bypass SIC card
Part Number	0302023460
Model	SIC-4GE-BC
Card Type	SIC
Silkscreen	SIC-4GE-BC

Appearance

Figure 3-125 Appearance of the SIC-4GE-BC
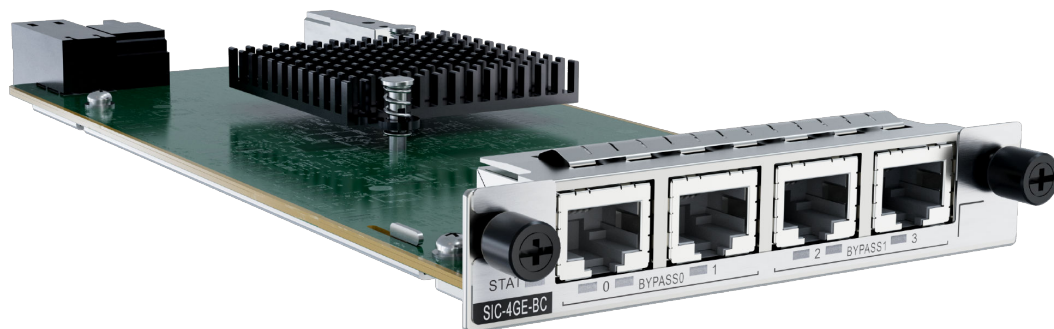
Version Mapping

Table 3-159 Mappings between SIC-4GE-BC and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R022C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R022C10	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R022C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R022C10	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R022C10	-	-

Indicators

Figure 3-126 Indicators on the SIC-4GE-BC
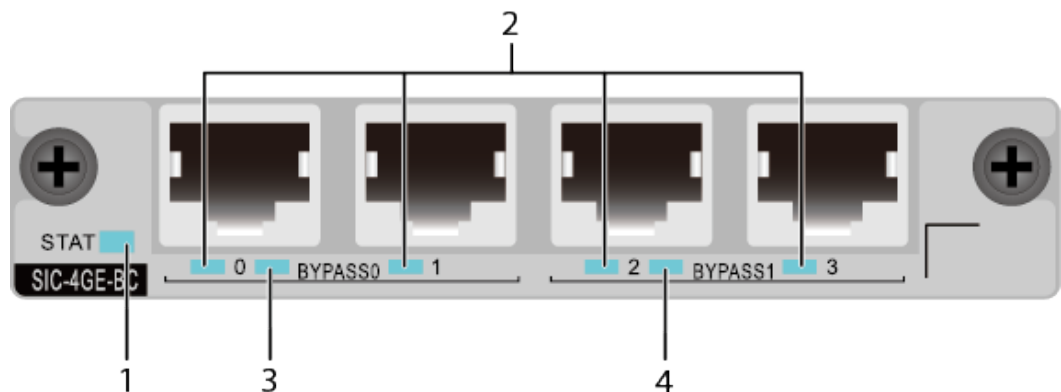
1. STAT indicator	2. GE electrical port indicator
3. BYPASS0 indicator	4. BYPASS1 indicator

Table 3-160 Indicators on the SIC-4GE-BC

Silkscreen	Name	Color	Status	Description
STAT	Running status indicator	Green	Steady on	The card has been powered on but the system software is not running.
		Green	Blink every two seconds (0.5 Hz)	The card is working properly.
		Green	Blinking four times every second (4 Hz)	The card is loading the system software or is resetting.
		Red	Steady on	The card has a fault that affects services and cannot be rectified automatically (critical alarm about hardware).
		-	Steady off	The card is in power-off state.
BYPASS 0 indicator	BYPASS Function indicator	Green	Steady on	The device is powered on. Bypass0 is in protection state.
		Green	Blink every two seconds (0.5 Hz)	The device is powered on. Bypass0 is in working state.
		-	Steady off	The device is powered off. Bypass0 is in protection state.

Silkscreen	Name	Color	Status	Description
BYPASS 1 indicator		Green	Steady on	The device is powered on. Bypass1 is protection state.
		Green	Blink every two seconds (0.5 Hz)	The device is powered on. Bypass1 is in working state.
		-	Steady off	The device is powered off. Bypass1 is in protection state.
-	GE electrical port indicator	Green	Steady on	LINK indicator of a port
		Green	Blinking (12 Hz)	Data is being transmitted or received.
		-	Steady off	The device has been powered off, or the interface has no LINK indicator.

Ports

Figure 3-127 Ports on the SIC-4GE-BC
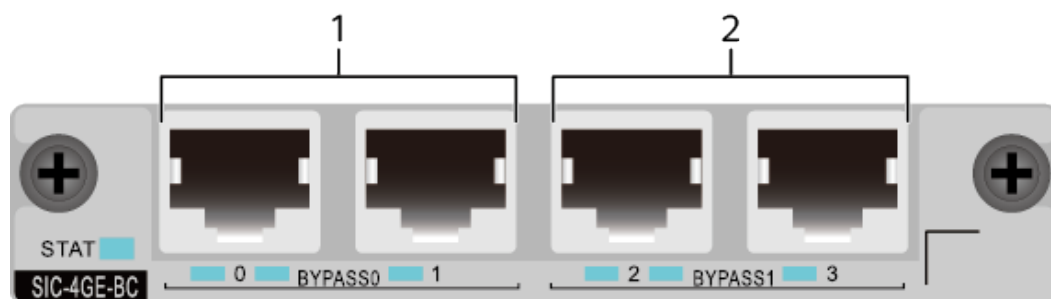
The electrical bypass card provides four interfaces, including two Bypass0 interfaces and two Bypass1 interfaces. When the bypass link is in the working loop, bypass interface 0 and bypass interface 1 form one link, and bypass interface 2 and bypass interface 3 form another link. When the bypass link is in the protection loop, two bypass ports are directly connected to form a link.

| 1. BYPASS0 interface | 2. BYPASS1 interface |

Table 3-161 Ports on the SIC-4GE-BC

Port	Connector Type	Description	Available Components
GE electrical ports (0–3)	RJ45	Four 10/100/1000M auto-sensing Ethernet electrical ports numbered from GE0 to GE3. (GE0 and GE1: Bypass0; GE2 and GE3: Bypass1)	**Ethernet Cable**

Functions and Features

Table 3-162 Functions and features of the SIC-4GE-BC

Functions and Features	Description
Basic function	The SIC-4GE-BC card provides four Ethernet electrical interfaces and two electrical bypass links and is hot swappable. When the device is powered off or faulty, traffic bypasses the device for a direction connection between the upstream and downstream devices of the device, ensuring service continuity.

Technical Specifications

Table 3-163 Technical specifications of the SIC-4GE-BC

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	19.42 mm x 100.1 mm x 217.45 mm (0.76 in. x 3.94 in. x 8.56 in.)
Weight without packaging [kg(lb)]	0.3 kg (0.66 lb)
Weight with packaging [kg(lb)]	0.4 kg (0.88 lb)
Typical power consumption [W]	18.8 W

Item	Specification
Typical heat dissipation [BTU/hour]	51.3 BTU/hour
Maximum power consumption [W]	19.4 W
Maximum heat dissipation [BTU/hour]	51.3 BTU/hour
Long-term operating temperature [°C(°F)]	0°C to 45°C
Short-term operating temperature [°C(°F)]	0°C to 45°C
Long-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing
Short-term operating relative humidity [RH]	5% RH to 95% RH, non-condensing

3.5 Storage Devices

This chapter describes hardware information for hard disk modules of the USG, including hardware appearance, functions, and technical specifications.

3.5.1 Hard Disk

3.5.1.1 HDD-SATA1000G-A (HardDisk-1000GB-SATA-7200rpm-2.5"-64M-hot-swap-built-in-Front Panel-Silver)

The HDD-SATA1000G-A consists of the 2.5-inch SATA 1000GB hard disk and hard disk tray.

Overview

Table 3-164 Basic information about the HDD-SATA1000G-A

Item	Details
Description	HardDisk-1000GB-SATA-7200rpm-2.5"-64M-hot-swap-built-in-Front Panel-Silver
Part Number	02312DLF
Model	HDD-SATA1000G-A

Item	Details
Silkscreen	SATA 1000GB 7.2K 02312DLF

Appearance

Figure 3-128 Appearance of the HDD-SATA1000G-A

Version Mapping

Table 3-165 Mappings between HDD-SATA1000G-A and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R021C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R020C10	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R020C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R020C10	-	-
USG6725F	USG6725F-AC (02354MKE)	V600R021C10	-	-
USG6725F	USG6725F-AC (02354MKE-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R021C10	-	-

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6715F	USG6715F-DC (02354TQE)	V600R021C10	-	-
USG6715F	USG6715F-AC (02354MKN-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R021C10 SPC100	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R020C10	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R021C10	-	-
USG6710F	USG6710F-AC (02354TPX-001)	V600R021C10 SPC100	-	-

Panel

Figure 3-129 Panel of the HDD-SATA1000G-A
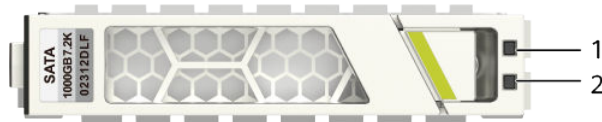
1. ALM indicator	2. RUN indicator

Table 3-166 Indicators on the HDD-SATA1000G-A

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.
-	RUN indicator	Green	Steady on	The hard disk is in position.

Silkscreen	Name	Color	Status	Description
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-167 Functions and features of the HDD-SATA1000G-A

Functions and Features	Description
Basic functions	Storage log.
Hot swap	Hot swap is supported, but hard disks cannot be directly swapped or removed. Run the disk offline command. Remove the hard disk about 30 seconds after the system displays a message indicating that the hard disk stops working. Alternatively, press and hold the OFL button for about 4 seconds until the OFL indicator is on, and then remove the hard disk unit. Otherwise, the hard disk may be damaged, data may be lost, and the system may crash.
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-168 Technical specifications of the HDD-SATA1000G-A

Item	Specification
Form factor	2.5 inch

Item	Specification
Dimensions without packaging (H x W x D) [mm(in.)]	15 mm x 75 mm x 130 mm (0.59 in. x 2.95 in. x 5.12 in.)
Weight without packaging [kg(lb)]	0.135 kg (0.3 lb)
Storage capacity [GB]	1000
Port type	SATA
Maximum power consumption [W]	16.72 W
Maximum heat dissipation [BTU/hour]	57.03 BTU/hour

3.5.1.2 M.2-SATA240G-A (M.2 SSD,SATA 6Gb/s-240GB,Hot-Swappable)

Overview

Table 3-169 Basic information about the M.2-SATA240G-A

Item	Details
Description	M.2 SSD,SATA 6Gb/s-240GB,Hot-Swappable
Part Number	02312DLK
Model	M.2-SATA240G-A

Appearance

Figure 3-130 Appearance of the M.2-SATA240G-A

Version Mapping

Table 3-170 Mappings between M.2-SATA240G-A and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6585F	USG6585F-AC (02355FCS)	V600R022C10	-	-
USG6525F	USG6525F-AC (02355FCP)	V600R022C10	-	-
USG6525F	USG6525F-DC (02355FDT)	V600R022C10	-	-
USG6565F	USG6565F-AC (02355FCR)	V600R022C10	-	-
USG6565F	USG6565F-DC (02355FDR)	V600R022C10	-	-
USG6555F	USG6555F-AC (02355FCQ)	V600R022C10	-	-

Panel

Figure 3-131 Panel of the M.2-SATA240G-A
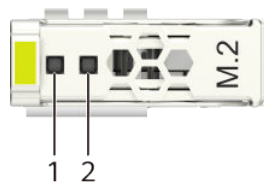
1. ALM indicator	2. RUN indicator

Table 3-171 Indicators on the M.2-SATA240G-A

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.

Silkscreen	Name	Color	Status	Description
-	RUN indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-172 Functions and features of the M.2-SATA240G-A

Functions and Features	Description
Basic functions	Storage log.
Hot swap	Supports hot swap.
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-173 Technical specifications of the M.2-SATA240G-A

Item	Specification
Form factor	M.2
Dimensions without packaging (H x W x D) [mm(in.)]	10 mm x 25 mm x 110 mm (0.39 in. x 0.98 in. x 4.33 in.)
Weight without packaging [kg(lb)]	0.1 kg (0.22 lb)
Storage capacity [GB]	240
Port type	SATA
Maximum power consumption [W]	5 W
Maximum heat dissipation [BTU/hour]	5 BTU/hour

3.5.1.3 M.2-SATA64G-A (M.2 SSD,SATA 6Gb/s-64GB,Hot-Swappable)

Overview

Table 3-174 Basic information about the M.2-SATA64G-A

Item	Details
Description	M.2 SSD,SATA 6Gb/s-64GB,Hot-Swappable
Part Number	02312DLJ
Model	M.2-SATA64G-A

Appearance

**Figure 3-132** Appearance of the M.2-SATA64G-A

Version Mapping

Table 3-175 Mappings between M.2-SATA64G-A and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6585F	USG6585F-AC (02355FCS)	V600R022C10	-	-
USG6525F	USG6525F-AC (02355FCP)	V600R022C10	-	-
USG6525F	USG6525F-DC (02355FDT)	V600R022C10	-	-
USG6565F	USG6565F-AC (02355FCR)	V600R022C10	-	-
USG6565F	USG6565F-DC (02355FDR)	V600R022C10	-	-
USG6555F	USG6555F-AC (02355FCQ)	V600R022C10	-	-

Panel

Figure 3-133 Panel of the M.2-SATA64G-A
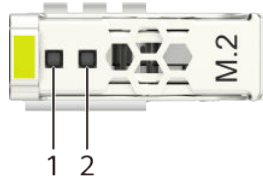
1. ALM indicator	2. RUN indicator

Table 3-176 Indicators on the M.2-SATA64G-A

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.
-	RUN indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-177 Functions and features of the M.2-SATA64G-A

Functions and Features	Description
Basic functions	Storage log.
Hot swap	Supports hot swap.

Functions and Features	Description
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-178 Technical specifications of the M.2-SATA64G-A

Item	Specification
Form factor	M.2
Dimensions without packaging (H x W x D) [mm(in.)]	10 mm x 25 mm x 110 mm (0.39 in. x 0.98 in. x 4.33 in.)
Weight without packaging [kg(lb)]	0.1 kg (0.22 lb)
Storage capacity [GB]	64
Port type	SATA
Maximum power consumption [W]	2.7 W
Maximum heat dissipation [BTU/hour]	2.7 BTU/hour

3.5.1.4 M.2-SATA64G-B (M.2 SSD,SATA 6Gb/s-64GB,Hot-Swappable)

Overview

Table 3-179 Basic information about the M.2-SATA64G-B

Item	Details
Description	M.2 SSD,SATA 6Gb/s-64GB,Hot-Swappable
Part Number	02314JAM
Model	M.2-SATA64G-B

Appearance

Figure 3-134 Appearance of the M.2-SATA64G-B

Version Mapping

Table 3-180 Mappings between M.2-SATA64G-B and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6585F	USG6585F-AC (02355FCS)	V600R022C10	-	-
USG6525F	USG6525F-AC (02355FCP)	V600R022C10	-	-
USG6525F	USG6525F-DC (02355FDT)	V600R022C10	-	-
USG6565F	USG6565F-AC (02355FCR)	V600R022C10	-	-
USG6565F	USG6565F-DC (02355FDR)	V600R022C10	-	-
USG6555F	USG6555F-AC (02355FCQ)	V600R022C10	-	-

Panel

Figure 3-135 Panel of the M.2-SATA64G-B
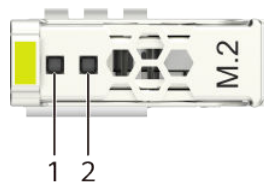
1. ALM indicator	2. RUN indicator

Table 3-181 Indicators on the M.2-SATA64G-B

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.

Silkscreen	Name	Color	Status	Description
-	RUN indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-182 Functions and features of the M.2-SATA64G-B

Functions and Features	Description
Basic functions	Storage log.
Hot swap	Supports hot swap.
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-183 Technical specifications of the M.2-SATA64G-B

Item	Specification
Form factor	M.2
Dimensions without packaging (H x W x D) [mm(in.)]	10 mm x 25 mm x 110 mm (0.39 in. x 0.98 in. x 4.33 in.)
Weight without packaging [kg(lb)]	0.1 kg (0.22 lb)
Storage capacity [GB]	64
Port type	SATA
Maximum power consumption [W]	2.7 W
Maximum heat dissipation [BTU/hour]	2.7 BTU/hour

3.5.1.5 SSD-SATA240G-C (SSD-SATA240G-C-Solid State Drives,2.5inch)

Overview

Table 3-184 Basic information about the SSD-SATA240G-C

Item	Details
Description	SSD-SATA240G-C-Solid State Drives, 2.5inch
Part Number	02313XED
Model	SSD-SATA240G-C
Silkscreen	M.2

Appearance

Figure 3-136 Appearance of the SSD-SATA240G-C

Version Mapping

Table 3-185 Mappings between SSD-SATA240G-C and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R022C00	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R022C00	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6625F	USG6625F-AC (02353WAQ)	V600R022C00	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R022C00	-	-
USG6725F	USG6725F-AC (02354MKE)	V600R022C00	-	-
USG6725F	USG6725F-AC (02354MKE-001)	V600R022C00	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R022C00	-	-
USG6715F	USG6715F-DC (02354TQE)	V600R022C00	-	-
USG6715F	USG6715F-AC (02354MKN-001)	V600R022C00	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R022C00	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R022C00	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R022C00	-	-
USG6710F	USG6710F-AC (02354TPX-001)	V600R022C00	-	-

Panel

Figure 3-137 Panel of the SSD-SATA240G-C
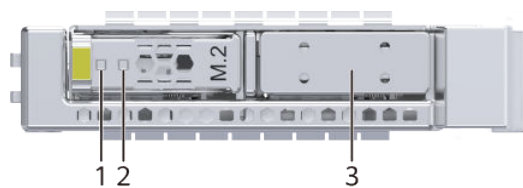
1. ALM indicator	2. RUN indicator	3. Filler panel of the M.2 hard disk slot
		NOTE The hard disk slot function is reserved and is not enabled.

Table 3-186 Indicators on the SSD-SATA240G-C

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.
-	RUN indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-187 Functions and features of the SSD-SATA240G-C

Functions and Features	Description
Basic functions	Storage log.

Functions and Features	Description
Hot swap	Hot swap is supported, but hard disks cannot be directly swapped or removed. Run the disk offline command. Remove the hard disk about 30 seconds after the system displays a message indicating that the hard disk stops working. Alternatively, press and hold the OFL button for about 4 seconds until the OFL indicator is on, and then remove the hard disk unit. Otherwise, the hard disk may be damaged, data may be lost, and the system may crash.
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-188 Technical specifications of the SSD-SATA240G-C

Item	Specification
Form factor	2.5 inch
Dimensions without packaging (H x W x D) [mm(in.)]	15 mm x 75 mm x 130 mm (0.59 in. x 2.95 in. x 5.12 in.)
Weight without packaging [kg(lb)]	0.135 kg (0.3 lb)
Storage capacity [GB]	240
Port type	SATA
Maximum power consumption [W]	5.23 W
Maximum heat dissipation [BTU/hour]	17.85 BTU/hour

3.5.1.6 SSD-SATA960G-B (SSD 960GB,SATA 6Gb/s,Read Intensive,2.5inch)

The SSD-Sata960G-B consists of the 2.5-inch SATA 960GB hard disk and hard disk tray.

Overview

Table 3-189 Basic information about the SSD-SATA960G-B

Item	Details
Description	SSD 960GB,SATA 6Gb/s,Read Intensive, 2.5inch
Part Number	02312YNW
Model	SSD-SATA960G-B
Silkscreen	SATA 960GB SSD 02312YNW

Appearance

Figure 3-138 Appearance of the SSD-SATA960G-B

Version Mapping

Table 3-190 Mappings between SSD-SATA960G-B and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R021C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R020C10	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R020C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R020C10	-	-

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6725F	USG6725F-AC (02354MKE)	V600R021C10	-	-
USG6725F	USG6725F-AC (02354MKE-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R021C10	-	-
USG6715F	USG6715F-DC (02354TQE)	V600R021C10	-	-
USG6715F	USG6715F-AC (02354MKN-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R021C10 SPC100	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R020C10	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R021C10	-	-
USG6710F	USG6710F-AC (02354TPX-001)	V600R021C10 SPC100	-	-

Panel

Figure 3-139 Panel of the SSD-SATA960G-B

1. ALM indicator	2. RUN indicator

Table 3-191 Indicators on the SSD-SATA960G-B

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.
-	RUN indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-192 Functions and features of the SSD-SATA960G-B

Functions and Features	Description
Basic functions	Storage log.
Hot swap	Hot swap is supported, but hard disks cannot be directly swapped or removed. Run the disk offline command. Remove the hard disk about 30 seconds after the system displays a message indicating that the hard disk stops working. Alternatively, press and hold the OFL button for about 4 seconds until the OFL indicator is on, and then remove the hard disk unit. Otherwise, the hard disk may be damaged, data may be lost, and the system may crash.
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-193 Technical specifications of the SSD-SATA960G-B

Item	Specification
Form factor	2.5 inch
Dimensions without packaging (H x W x D) [mm(in.)]	15 mm x 75 mm x 130 mm (0.59 in. x 2.95 in. x 5.12 in.)
Weight without packaging [kg(lb)]	0.135 kg (0.3 lb)
Storage capacity [GB]	960
Port type	SATA
Maximum power consumption [W]	5.23 W
Maximum heat dissipation [BTU/hour]	17.85 BTU/hour

3.5.1.7 SSD-SATA960G-C (SSD-SATA960G-C-Solid State Drives,2.5inch)

Overview

Table 3-194 Basic information about the SSD-SATA960G-C

Item	Details
Description	SSD-SATA960G-C-Solid State Drives, 2.5inch
Part Number	02313XEE
Model	SSD-SATA960G-C
Silkscreen	M.2

Appearance

**Figure 3-140** Appearance of the SSD-SATA960G-C

Version Mapping

Table 3-195 Mappings between SSD-SATA960G-C and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R022C00	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R022C00	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R022C00	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R022C00	-	-
USG6725F	USG6725F-AC (02354MKE)	V600R022C00	-	-
USG6725F	USG6725F-AC (02354MKE-001)	V600R022C00	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R022C00	-	-
USG6715F	USG6715F-DC (02354TQE)	V600R022C00	-	-
USG6715F	USG6715F-AC (02354MKN-001)	V600R022C00	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R022C00	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R022C00	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R022C00	-	-
USG6710F	USG6710F-AC (02354TPX-001)	V600R022C00	-	-

Panel

Figure 3-141 Panel of the SSD-SATA960G-C
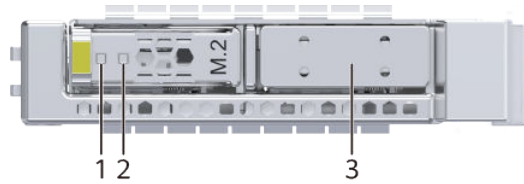
1. ALM indicator	2. RUN indicator	3. Filler panel of the M.2 hard disk slot
		NOTE The hard disk slot function is reserved and is not enabled.

Table 3-196 Indicators on the SSD-SATA960G-C

Silkscreen	Name	Color	Status	Description
-	Alarm indicator	Orange	Steady on	The hard disk is faulty.
		-	Off	The hard disk is running properly.
-	Running indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-197 Functions and features of the SSD-SATA960G-C

Functions and Features	Description
Basic function	Store logs.
Hot swapping	Hot swapping is supported, but hard disks cannot be forcibly inserted or removed. Instead, run the disk offline command and wait for about 30 seconds until the system displays a message indicating that the hard disk stops working. Then you can remove the hard disk. Alternatively, press and hold down the OFL button for about 4 seconds until the OFL indicator is on, and then remove the hard disk unit. Otherwise, the hard disk may be damaged, data may be lost, or the system may break down.
Restrictions and remarks	Do not perform low-level formatting on the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-198 Technical specifications of the SSD-SATA960G-C

Item	Specification
Form factor	2.5 inch
Dimensions without packaging (H x W x D) [mm(in.)]	15 mm x 75 mm x 130 mm (0.59 in. x 2.95 in. x 5.12 in.)
Weight without packaging [kg(lb)]	0.135 kg (0.3 lb)
Storage capacity [GB]	960
Port type	SATA
Maximum power consumption [W]	5.23 W
Maximum heat dissipation [BTU/hour]	17.85 BTU/hour

3.5.1.8 SSD-Sata240G-A (SSD,240GB,SATA 6Gb/s,Read Intensive,2.5inch)

The SSD-Sata240G-A consists of the 2.5-inch SATA 240GB hard disk and hard disk tray.

Overview

Table 3-199 Basic information about the SSD-Sata240G-A

Item	Details
Description	SSD,240GB,SATA 6Gb/s,Read Intensive, 2.5inch
Part Number	02312DLH
Model	SSD-Sata240G-A
Silkscreen	SATA 240GB SSD 02312DLH

Appearance

Figure 3-142 Appearance of the SSD-Sata240G-A

Version Mapping

Table 3-200 Mappings between SSD-Sata240G-A and product models

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6685F	USG6685F-AC (02354MKU)	V600R021C10	-	-
USG6635F	USG6635F-AC (02353WAV)	V600R020C10	-	-
USG6635F	USG6635F-DC (02355FDP)	V600R022C10	-	-
USG6625F	USG6625F-AC (02353WAQ)	V600R020C10	-	-
USG6615F	USG6615F-AC (02353WAU)	V600R020C10	-	-

Product	Product Model	First Supported Version	Last Supported Version	Unsupported Version
USG6725F	USG6725F-AC (02354MKE)	V600R021C10	-	-
USG6725F	USG6725F-AC (02354MKE-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-AC (02354MKN)	V600R021C10	-	-
USG6715F	USG6715F-DC (02354TQE)	V600R021C10	-	-
USG6715F	USG6715F-AC (02354MKN-001)	V600R021C10 SPC100	-	-
USG6715F	USG6715F-DC (02354TQE-001)	V600R021C10 SPC100	-	-
USG6655F	USG6655F-AC (02353WAW)	V600R020C10	-	-
USG6710F	USG6710F-AC (02354TPX)	V600R021C10	-	-
USG6710F	USG6710F-AC (02354TPX-001)	V600R021C10 SPC100	-	-

Panel

Figure 3-143 Panel of the SSD-Sata240G-A

1. ALM indicator	2. RUN indicator

Table 3-201 Indicators on the SSD-Sata240G-A

Silkscreen	Name	Color	Status	Description
-	ALM indicator	Orange	Steady on	The hard disk fails.
		-	Off	The hard disk is running properly.
-	RUN indicator	Green	Steady on	The hard disk is in position.
		Green	Blinking	Data is being read from or written to the hard disk.
		-	Off	The hard disk is not detected or the device is not powered on.

Functions and Features

Table 3-202 Functions and features of the SSD-Sata240G-A

Functions and Features	Description
Basic functions	Storage log.
Hot swap	Hot swap is supported, but hard disks cannot be directly swapped or removed. Run the disk offline command. Remove the hard disk about 30 seconds after the system displays a message indicating that the hard disk stops working. Alternatively, press and hold the OFL button for about 4 seconds until the OFL indicator is on, and then remove the hard disk unit. Otherwise, the hard disk may be damaged, data may be lost, and the system may crash.
Restrictions and limitations	Do not low-level format the hard disk. Otherwise, the hard disk cannot be used.

Technical Specifications

Table 3-203 Technical specifications of the SSD-Sata240G-A

Item	Specification
Form factor	2.5 inch
Dimensions without packaging (H x W x D) [mm(in.)]	15 mm x 75 mm x 130 mm (0.59 in. x 2.95 in. x 5.12 in.)
Weight without packaging [kg(lb)]	0.135 kg (0.3 lb)
Storage capacity [GB]	240
Port type	SATA
Maximum power consumption [W]	4.36 W
Maximum heat dissipation [BTU/hour]	14.86 BTU/hour

3.6 Optical/Electrical Modules

This chapter describes hardware information for optical/electrical modules of the USG.

3.6.1 Before You Start

Before using the optical module, please understand the risk of using the non-certified optical module and how to How to Identify Huawei-Certified optical modules.

> **NOTICE**

- A USG must use optical modules that have been certified for use. Non-certified optical modules cannot ensure transmission reliability and may affect service stability. Huawei is not liable for any problem caused by the use of non-certified optical modules and will not fix such problems.

- The methods provided here are only for reference. To confirm whether optical modules you are using have been certified for use on Huawei USGs, contact Huawei technical support.

Risks of Using Non-Huawei-Certified Optical Modules

During certification of optical modules for USG, Huawei completes comprehensive functionality verification to ensure quality of optical modules. The verified items include optical module plug/unplug, transmit optical power, receive optical power, signal transmission quality, data reading, error tolerance, compatibility, electromagnetic compatibility (EMC), and environmental parameters.

Non-Huawei-certified optical modules may cause the following problems:

- Non-standard structure and size cause failures to install optical modules on adjacent optical interfaces.

  Structures or sizes of some non-Huawei-certified optical modules do not comply with the Multi-Source Agreement (MSA). When such an optical module is installed on an optical interface, the size of this optical module hinders optical module installation on adjacent optical interfaces.

- Data bus defects cause suspension of a USG's data bus.

  Some non-Huawei-certified optical modules have defects in data bus designs. Using such an optical module on a USG causes suspension of the connected data bus on the USG. As a result, data on the suspended bus cannot be read.

- Improper edge connector size damages electronic devices of optical interfaces.

  If a non-Huawei-certified USG optical module with improper edge connector size is used on an optical interface, electronic devices of the optical interface will be damaged by short circuits.

- Unnormalized temperature monitoring causes incorrect alarms.

  The temperature monitoring systems of some non-Huawei-certified USG optical modules do not comply with industry standards and report temperature values higher than the real temperature. When such optical modules are used on a USG, the system will report incorrect temperature alarms.

- Improper register settings cause errors or failures in reading parameters or diagnostic information.

  Some non-Huawei-certified USG optical modules have improper register values on page A0, which can cause errors or failures when the system attempts to read parameters or diagnostic information from a data bus.

- Some non-Huawei-certified USG optical modules are not designed in compliance with EMC standards and have low anti-interference capability. Additionally, they bring electromagnetic interference to nearby devices.

- The operating temperature ranges of non-Huawei-certified optical modules cannot meet service requirements. When they are used under relatively high temperature, the optical power decreases, resulting in service interruption.

How to Identify Huawei-Certified Optical Modules

Method 1: Check the label of the optical module.

1. The labels of Huawei-certified optical modules contain **HUAWEI**, as shown in **Figure1 The label of a Huawei-certified optical module**.

2. Check the BOM number of the optical module. The BOM number starting with 02 indicates that the optical module is certified by Huawei. Otherwise, the optical module is not a Huawei-certified one.

Figure 3-144 The label of a Huawei-certified optical module

**Method 2: Run the display interface transceiver command**

1. If **VendorName** is **HUAWEI** in the **display interface transceiver** command output, the optical module has been certified by Huawei. Otherwise, it is not a Huawei-certified optical module.

2. If the **Non-Huawei-certified transceiver** field is displayed under **Alarm information**, the optical module is not certified by Huawei.

3.6.2 Understanding Copper Modules

Copper modules are also called RJ45 modules. Unlike optical modules, copper modules do not perform electrical-optical conversion. When two optical interfaces have copper modules installed, the interfaces can be connected using a copper cable. Currently, Huawei offers only GE copper modules with RJ45 interfaces. GE copper modules work with Category 5 network cables, comply with 1000BASE-T (IEEE 802.3ab), and support a maximum transmission distance of 100 m.

Figure 3-145 shows a GE SFP copper module.

Figure 3-145 Appearance of a GE SFP copper module
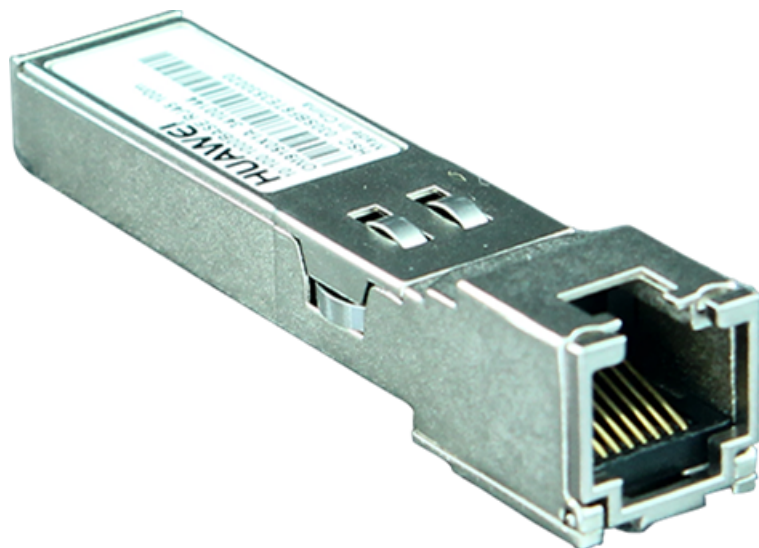
3.6.3 Optical Module Appearance and Structure

Figure 3-146 shows the structure of an optical module.
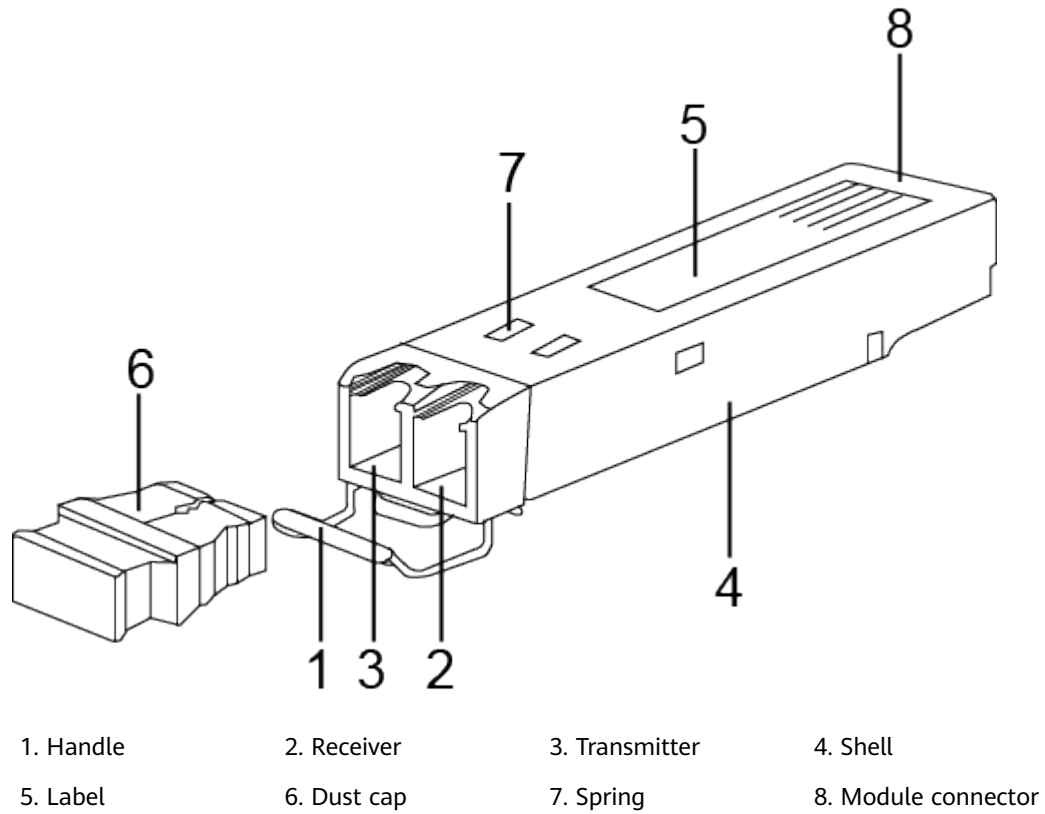
Figure 3-146 Optical module structure

1. Handle	2. Receiver	3. Transmitter	4. Shell
5. Label	6. Dust cap	7. Spring	8. Module connector

Figure 3-147 shows the appearance of an SFP/SFP+ optical module.

Figure 3-147 SFP/SFP+ optical module
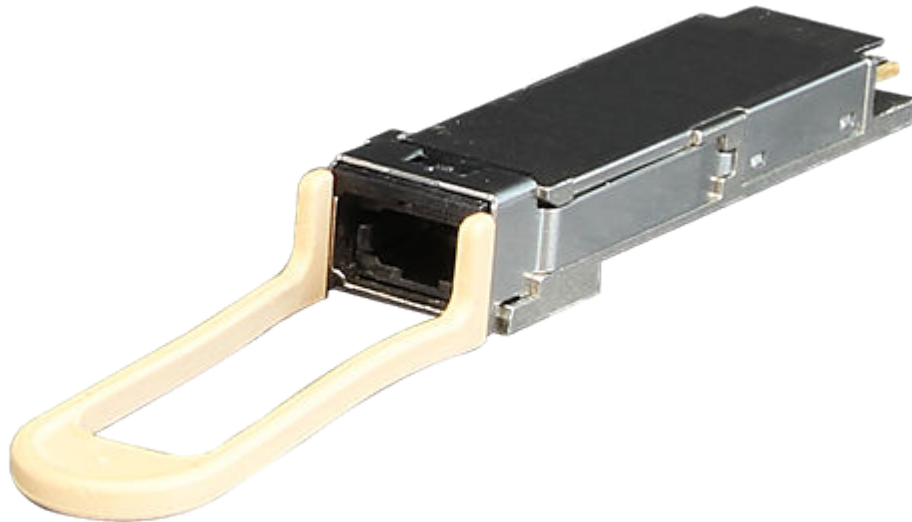

Figure 3-148 shows the appearance of a QSFP+ optical module.

Figure 3-148 QSFP+ optical module

Figure 3-149 and **Figure 3-150** shows the appearance of a QSFP28 optical module.

Figure 3-149 QSFP28 optical module (for LC optical fibers)

Figure 3-150 QSFP28 optical module (for MPO optical fibers)

3.6.4 Types of Optical Modules

Optical modules are available in various types to meet diversified requirements.

- **Classified by transmission rates**

    Depending on transmission rates, optical modules are classified into 100GE, 40GE, 25GE, 10GE, FE, and GE optical modules.

- **Classified by encapsulation types**

    The higher transmission rate an optical module provides, the more complex structure it has. According to the encapsulation type, optical modules are classified into SFP, eSFP, SFP+, XFP, SFP28, QSFP+, CXP, CFP, QSFP28. All optical modules are hot swappable.

    - SFP: small form-factor pluggable. SFP optical modules support LC fiber connectors.

    - eSFP: enhanced small form-factor pluggable. An eSFP module is an SFP module that supports monitoring of voltage, temperature, bias current, transmit optical power, and receive optical power. Because all the SFP optical modules support these monitoring functions, eSFP is also called SFP.

    - SFP+: small form-factor pluggable plus, SFP with a higher rate. SFP+ modules are more sensitive to electromagnetic interference (EMI) because they have a higher rate. To reduce EMI, SFP+ modules have more springs than SFP modules and the cages for SFP+ modules on a card are tighter.

    - XFP: 10 Gigabit small form-factor pluggable. X is the Roman numeral 10, meaning that all XFP optical modules provide a 10 Gbit/s transmission rate. XFP optical modules support LC fiber connectors. XFP optical modules are wider and longer than SFP+ optical modules.

    - SFP28: with the same interface size as an SFP+ module. An SFP28 interface can use a 25GE SFP28 optical module or 10GE SFP+ optical module.

- QSFP+: quad small form-factor pluggable. QSFP+ optical modules support MPO fiber connectors and are larger than SFP+ modules.

- CXP: hot-pluggable high-density parallel optics transceiver form factor, which provides 12 channels of traffic in each of the Tx and Rx directions. It applies only to short multimode links.

- CFP: C form-factor pluggable, a new standard for high-speed, hot-pluggable optical transceivers that support data communication and telecommunication applications. Dimensions of a CFP optical module are 144.75 mm x 82 mm x 13.6 mm (W x D x H).

- QSFP28: with the same interface size as a QSFP+ module. A QSFP28 interface can use a 100GE QSFP28 optical module or a 40GE QSFP+ optical module.

- **Classified by physical layer standards**

  Different physical layer standards are defined to allow data transmission in different modes. Therefore, different types of optical modules are produced to comply with these standards. For details, see **Standards compliance** of the specific optical module.

- **Classified by modes**

  Optical fibers are classified into single-mode and multimode fibers. Therefore, optical modules are also classified into single-mode and multimode modules to support different optical fibers.

  - Single-mode optical modules are used with single-mode fibers. Single-mode fibers support a wide band and large transmission capacity, and are used for long-distance transmission.

  - Multimode optical modules are used with multimode fibers. Multimode fibers have lower transmission performance than single-mode fibers because of modal dispersion, but their costs are also lower. They are used for small-capacity, short-distance transmission.

Wavelength division multiplexing modules differ from other optical modules in center wavelengths. A common optical module has a center wavelength of 850 nm, 1310 nm, or 1550 nm, whereas a wavelength division multiplexing module transmits lights with different center wavelengths. Wavelength division multiplexing modules are classified into two types: coarse wavelength division multiplexing (CWDM) and dense wavelength division multiplexing (DWDM). Within the same band, DWDM modules are available in more types and use wavelength resources more efficiently than CWDM modules. DWDM and CWDM modules allow lights with different center wavelengths to be transmitted on one fiber without interfering each other. Therefore, a passive multiplexer can be used to combine the lights into one channel, which is then split into multiple channels by a demultiplexer on the remote end. This reduces the optical fibers required. DWDM and CWDM modules are used for long-distance transmission.

The transmit power of a long-distance optical module is often larger than its overload power. Therefore, when using such optical modules, select optical fibers of an appropriate length to ensure that the actual receive power is smaller than the overload power. If the optical fibers connected to a long-distance optical module are too short, use an optical attenuator to reduce the receive power on the remote optical module. Otherwise, the remote optical module may be burnt.

3.6.5 Optical Module Terms

Transmission distance
Maximum distance over which optical signals can transmit. Optical signals sent from different types of sources can transmit over different distances due to negative effects of optical fibers, such as dispersion and attenuation.

Interface rate
Maximum rate of electrical signals that an optical device can transmit without bit errors. The interface rates defined in Ethernet standards include 125 Mbit/s, 1.25 Gbit/s, 10.3125 Gbit/s, and 41.25 Gbit/s.

Encapsulation type
Appearance type of an optical module. Encapsulation types of optical modules include SFP, eSFP, SFP+, XFP, SFP28, QSFP+, CXP, CFP, QSFP28.

- SFP: small form-factor pluggable.

- eSFP: enhanced small form-factor pluggable. An eSFP module is an SFP module that supports monitoring of voltage, temperature, bias current, transmit optical power, and receive optical power. Because all the SFP optical modules support these monitoring functions, eSFP is also called SFP.

- SFP+: small form-factor pluggable plus, SFP with a higher rate. SFP+ modules are more sensitive to electromagnetic interference (EMI) because they have a higher rate. To reduce EMI, SFP+ modules have more springs than SFP modules and the cages for SFP+ modules on a card are tighter.

- XFP: 10GE optical module. X is the Roman numeral 10.

- SFP28: with the same interface size as an SFP+ module. An SFP28 interface can use a 25 GE SFP28 optical module or 10GE SFP+ optical module.

- QSFP+: Quad SFP+, four-channel SFP+.

- CXP: hot-pluggable high-density parallel optics transceiver form factor, which provides 12 channels of traffic in each of the Tx and Rx directions. It applies only to short multimode links.

- CFP: C form-factor pluggable, a new standard for high-speed, hot-pluggable optical transceivers that support data communication and telecommunication applications. Dimensions of a CFP optical module are 144.75 mm x 82 mm x 13.6 mm (W x D x H).

- QSFP28: with the same interface size as a QSFP+ module. A QSFP28 interface can use a 100GE QSFP28 optical module or a 40GE QSFP+ optical module.

Center wavelength
Wavelength measured at the midpoint of the half-amplitude line in the transmit spectrum.

Fiber mode	Mode of fibers defining based on core diameters and features of optical fibers. Optical fibers are classified into single-mode fibers and multi-mode fibers. Generally, multi-mode fibers have large core diameters and severe dispersion, so they transmit optical signals over short distances when working with multi-mode optical modules. Single-mode fibers have small dispersion and can transmit optical signals over long distances when working with single-mode optical modules.
Modal bandwidth	Bandwidth measured at a point with transmit power several dB lower than that of the point with the peak center wavelength. Modal bandwidth reflects spectrum characteristics of an optical module.
Fiber diameter	Diameter of the core of a fiber. According to international standards for optical fibers, the diameter of a multi-mode fiber is 62.5 um or 50 um, and the diameter of a single-mode fiber is 9 um.
Fiber class	Optical signals with different wavelengths have their best working windows in different optical fibers. To help efficiently adjust wavelengths or dispersion features of optical fibers and change their refractive indexes, the following classes are defined: multi-mode fiber (G.651), common single-mode fiber (G.652), shifted dispersion fiber (G.653), and non-zero shifted dispersion fiber (G.655). G.651 and G.652 are commonly used fiber classes.
Connector type	Type of the interface on an optical module to accommodate a fiber. Commonly used connector types are LC (applicable to all the SFP, SFP+, and XFP modules) and MPO (applicable to 150 m QSFP+, 100 m CFP, and CXP modules).
Transmit optical power	Output optical power of an optical module when it is working properly.
Receiver sensitivity	Minimum average input optical power that the receiver of an optical module can receive within a range of bit error rate (BER = 10^{-12}).
Overload optical power	Maximum average input optical power that the receiver of an optical module can receive within a range of bit error rate (BER = 10^{-12}).
Extinction ratio	Minimum ratio of the average optical power with signals transmitted against the average optical power without signals transmitted in complete modulation mode. The extinction ratio indicates the capability of an optical module to identify signal 0 and signal 1.

3.6.6 Rules for Optical Module Interoperation

Interoperation Rules

Optical modules with the same standards can interoperate with each other. The standards define the rate, wavelength, and transmission distance of optical modules, but not their encapsulation modes (two interoperated optical modules can have different encapsulation modes).

If you need to achieve interoperability between optical modules with different standards, contact technical support personnel.

When connecting this product to other products, comply with the preceding optical module interoperation rules.

Standards Description

The following describes the standards, using 1000BASE-LX10 as an example:

- 1000 indicates the rate (1000 Mbit/s, in this case). Other rates include 10 Mbit/s, 100 Mbit/s, 10 Gbit/s, 40 Gbit/s, 100 Gbit/s, 200 Gbit/s and 400 Gbit/s.
- BASE indicates baseband transmission.
- L represents a center wavelength of the laser. Currently, the following center wavelengths are available: S (short wavelength: 850 nm), L (long wavelength: 1310 nm), E (extra long wavelength: 1550 nm), and B (single-fiber bidirectional long wavelength).
- X represents the encoding format. The encoding formats include T (twisted pair), X (8B/10B), R (64B/66B), and W (WIS).
- 10 indicates the number of channels. Currently, the value can be 4 or 10. If there is no number, the value is 1.

NOTE

This example provides the definitions in IEEE standards, which are not applicable to all optical modules, for example, non-standard optical modules.

The following organizations or agreements define standards related to optical modules:

- IEEE 802.3, which defines MAC and PHY standards
- Small Form Factor (SFF) committee or Multi-Source Agreements (MSAs), which define optical module hardware, software, and structure standards

3.6.7 100Mbps SFP Optical Modules

3.6.7.1 S-SFP-FE-LH40-SM1310

Table 3-204 S-SFP-FE-LH40-SM1310 specifications

Item	Value
Basic Information	
Module name	S-SFP-FE-LH40-SM1310
Part Number	02317344
Model	S-SFP-FE-LH40-SM1310
Form factor	eSFP
Application standard	STM-1
Connector type	LC

Item	Value
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155Mbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	10.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-37 dBm
Overload power (AVG) [dBm]	-10 dBm

3.6.7.2 S-SFP-FE-LH80-SM1550

Table 3-205 S-SFP-FE-LH80-SM1550 specifications

Item	Value
Basic Information	
Module name	S-SFP-FE-LH80-SM1550
Part Number	02317345
Model	S-SFP-FE-LH80-SM1550
Form factor	eSFP
Application standard	STM-1
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155Mbit/s
Target transmission distance [km]	80 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm

Item	Value
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	10.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-37 dBm
Overload power (AVG) [dBm]	-10 dBm

3.6.7.3 SFP-FE-LX-SM1310-BIDI

Table 3-206 SFP-FE-LX-SM1310-BIDI specifications

Item	Value
Basic Information	
Module name	SFP-FE-LX-SM1310-BIDI
Part Number	02315203
Model	SFP-FE-LX-SM1310-BIDI
Form factor	eSFP
Application standard	100BASE-BX
Connector type	LC/PC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155Mbit/s
Target transmission distance [km]	15 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1550/RX1310
Maximum Tx optical power [dBm]	-8 dBm
Minimum Tx optical power [dBm]	-15 dBm
Minimum extinction ratio [dB]	8.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-32 dBm
Overload power (AVG) [dBm]	-8 dBm

Item	Value
NOTE BIDI optical modules must be used in pairs. For example, SFP-FE-LX-SM1310-BIDI must be used with SFP-FE-LX-SM1550-BIDI.	

3.6.7.4 SFP-FE-LX-SM1550-BIDI

Table 3-207 SFP-FE-LX-SM1550-BIDI specifications

Item	Value
Basic Information	
Module name	SFP-FE-LX-SM1550-BIDI
Part Number	02315202
Model	SFP-FE-LX-SM1550-BIDI
Form factor	eSFP
Application standard	100BASE-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155Mbit/s
Target transmission distance [km]	15 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1550/RX1310
Maximum Tx optical power [dBm]	-8 dBm
Minimum Tx optical power [dBm]	-15 dBm
Minimum extinction ratio [dB]	8.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-32 dBm
Overload power (AVG) [dBm]	-8 dBm
NOTE BIDI optical modules must be used in pairs. For example, SFP-FE-LX-SM1550-BIDI must be used with SFP-FE-LX-SM1310-BIDI.	

3.6.7.5 SFP-FE-SX-MM1310

Table 3-208 SFP-FE-SX-MM1310 specifications

Item	Value
Basic Information	
Module name	SFP-FE-SX-MM1310
Part Number	02315233
Model	SFP-FE-SX-MM1310
Form factor	SFP
Application standard	100BASE-FX
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C (32°F to 158°F)
Transmission rate [bit/s]	100 Mbit/s
Target transmission distance [km]	Multimode fiber (50 μm or 62.5 μm diameter): 2 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	-14.0 dBm
Minimum Tx optical power [dBm]	-19.0 dBm
Minimum extinction ratio [dB]	10 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-30.0 dBm
Overload power (AVG) [dBm]	-14.0 dBm

3.6.7.6 eSFP-FE-LX-SM1310

Table 3-209 eSFP-FE-LX-SM1310 specifications

Item	Value
Basic Information	
Module name	eSFP-FE-LX-SM1310
Part Number	02315205

Item	Value
Model	eSFP-FE-LX-SM1310
Form factor	eSFP
Application standard	STM-1
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155Mbit/s
Target transmission distance [km]	15 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	-8 dBm
Minimum Tx optical power [dBm]	-15 dBm
Minimum extinction ratio [dB]	8.2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-28 dBm
Overload power (AVG) [dBm]	-8 dBm

3.6.8 1Gbps SFP Copper Modules

3.6.8.1 SFP-1000BaseT (02314171)

Table 3-210 SFP-1000BaseT specifications

Item	Value
Basic Information	
Module name	SFP-1000BaseT
Part Number	02314171
Model	SFP-1000BaseT
Form factor	SFP
Application standard	1000BASE-T
Connector type	CAT5 UTP/STP

Item	Value
Optical fiber type	-
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10-1000M
Target transmission distance [km]	0.1 km
Transmitter Optical Characteristics	
Center wavelength [nm]	-
Maximum Tx optical power [dBm]	-
Minimum Tx optical power [dBm]	-
Minimum extinction ratio [dB]	-
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-
Overload power (AVG) [dBm]	-

3.6.8.2 SFP-1000BaseT (02313URG)

Table 3-211 SFP-1000BaseT specifications

Item	Value
Basic Information	
Module name	SFP-1000BaseT
Part Number	02313URG
Model	SFP-1000BaseT
Form factor	SFP
Application standard	1000BASE-T(SFP-GE-T)
Connector type	RJ45
Optical fiber type	-
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10-1000M
Target transmission distance [km]	0.1 km
Transmitter Optical Characteristics	
Center wavelength [nm]	-

Item	Value
Maximum Tx optical power [dBm]	-
Minimum Tx optical power [dBm]	-
Minimum extinction ratio [dB]	-
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-
Overload power (AVG) [dBm]	-

3.6.8.3 SFP-1000BaseT-T1

Table 3-212 SFP-1000BaseT-T1 specifications

Item	Value
Basic Information	
Module name	SFP-1000BaseT-T1
Part Number	34100144
Model	SFP-1000BaseT-T1
Form factor	SFP
Application standard	1000BASE-T
Connector type	CAT5 UTP/STP
Optical fiber type	-
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10-1000M
Target transmission distance [km]	0.1 km
Transmitter Optical Characteristics	
Center wavelength [nm]	-
Maximum Tx optical power [dBm]	-
Minimum Tx optical power [dBm]	-
Minimum extinction ratio [dB]	-
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-
Overload power (AVG) [dBm]	-

3.6.9 1Gbps eSFP Optical Modules

3.6.9.1 S-SFP-GE-LH40-SM1310

Table 3-213 S-SFP-GE-LH40-SM1310 specifications

Item	Value
Basic Information	
Module name	S-SFP-GE-LH40-SM1310
Part Number	02317346
Model	S-SFP-GE-LH40-SM1310
Form factor	eSFP
Application standard	1000base-LX/LH
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.2 S-SFP-GE-LH80-SM1550

Table 3-214 S-SFP-GE-LH80-SM1550 specifications

Item	Value
Basic Information	

Item	Value
Module name	S-SFP-GE-LH80-SM1550
Part Number	02317348
Model	S-SFP-GE-LH80-SM1550
Form factor	eSFP
Application standard	1000BASE-ZX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	80 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	5 dBm
Minimum Tx optical power [dBm]	-2 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.3 SFP-GE-LX-SM1310 (02315200)

Table 3-215 SFP-GE-LX-SM1310 specifications

Item	Value
Basic Information	
Module name	SFP-GE-LX-SM1310
Part Number	02315200
Model	SFP-GE-LX-SM1310
Form factor	eSFP
Application standard	1000BASE-LX10/LH
Connector type	LC

Item	Value
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx operating wavelength range [nm]	-
Rx sensitivity (AVG) [dBm]	-20 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.4 SFP-GE-LX-SM1310-BIDI (02315285)

Table 3-216 SFP-GE-LX-SM1310-BIDI specifications

Item	Value
Basic Information	
Module name	SFP-GE-LX-SM1310-BIDI
Part Number	02315285
Model	SFP-GE-LX-SM1310-BIDI
Form factor	eSFP
Application standard	1000base-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	

Item	Value
Center wavelength [nm]	TX1310/RX1490
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	6 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-19.5 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.5 SFP-GE-LX-SM1490-BIDI (02315286)

Table 3-217 SFP-GE-LX-SM1490-BIDI specifications

Item	Value
Basic Information	
Module name	SFP-GE-LX-SM1490-BIDI
Part Number	02315286
Model	SFP-GE-LX-SM1490-BIDI
Form factor	eSFP
Application standard	1000base-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1490/RX1310
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	6 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-19.5 dBm

Item	Value
Overload power (AVG) [dBm]	-3 dBm

3.6.9.6 eSFP-GE-SX-MM850 (02315204)

Table 3-218 eSFP-GE-SX-MM850 specifications

Item	Value
Basic Information	
Module name	eSFP-GE-SX-MM850
Part Number	02315204
Model	eSFP-GE-SX-MM850
Form factor	eSFP
Application standard	1000base-SX
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	-20°C to 85°C
Transmission rate [bit/s]	2.125Gbit/s
Target transmission distance [km]	- Multimode fiber (with diameter of 62.5 μm): 220 m - Multimode fiber (OM1) (with diameter of 62.5 μm): 275 m - Multimode fiber (with diameter of 50 μm): 500 m - Multimode fiber (OM2) (with diameter of 50 μm): 550 m
Modal bandwidth [MHz*km]	- Multimode fiber: 160 MHz*km - Multimode fiber (OM1): 200 MHz*km - Multimode fiber: 400 MHz*km - Multimode fiber (OM2): 500 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-2.5 dBm
Minimum Tx optical power [dBm]	-9.5 dBm

Item	Value
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-17 dBm
Overload power (AVG) [dBm]	0 dBm

3.6.9.7 LE2MGSC40DE0

Table 3-219 LE2MGSC40DE0 specifications

Item	Value
Basic Information	
Module name	LE2MGSC40DE0
Part Number	02310KVV
Model	LE2MGSC40DE0
Form factor	eSFP
Application standard	1000BASE-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C (32°F to 158°F)
Transmission rate [bit/s]	1 Gbit/s
Target transmission distance [km]	Single-mode fiber: 40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1490 nm (RX) 1310 nm (TX)
Maximum Tx optical power [dBm]	3.0 dBm
Minimum Tx optical power [dBm]	-2.0 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3.0 dBm

3.6.9.8 LE2MGSC40ED0

Table 3-220 LE2MGSC40ED0 specifications

Item	Value
Basic Information	
Module name	LE2MGSC40ED0
Part Number	02310KVU
Model	LE2MGSC40ED0
Form factor	eSFP
Application standard	1000BASE-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C (32°F to 158°F)
Transmission rate [bit/s]	1 Gbit/s
Target transmission distance [km]	Single-mode fiber: 40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm (RX) 1490 nm (TX)
Maximum Tx optical power [dBm]	3.0 dBm
Minimum Tx optical power [dBm]	-2.0 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3.0 dBm

3.6.9.9 OGEBIDI40

Table 3-221 OGEBIDI40 specifications

Item	Value
Basic Information	
Module name	OGEBIDI40
Part Number	34060540

Item	Value
Model	OGEBIDI40
Form factor	eSFP
Application standard	1000Base-BX40-D
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1490/RX1310
Maximum Tx optical power [dBm]	3 dBm
Minimum Tx optical power [dBm]	-2 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.10 OGEBIDI41

Table 3-222 OGEBIDI41 specifications

Item	Value
Basic Information	
Module name	OGEBIDI41
Part Number	34060539
Model	OGEBIDI41
Form factor	eSFP
Application standard	1000Base-BX40-U
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C

Item	Value
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1490/RX1310
Maximum Tx optical power [dBm]	3 dBm
Minimum Tx optical power [dBm]	-2 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.11 OGSME4000

Table 3-223 OGSME4000 specifications

Item	Value
Basic Information	
Module name	OGSME4000
Part Number	34060513
Model	OGSME4000
Form factor	eSFP
Application standard	1000BASE-LX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm

Item	Value
Minimum extinction ratio [dB]	9.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-22 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.12 OSU015N00

Table 3-224 OSU015N00 specifications

Item	Value
Basic Information	
Module name	OSU015N00
Part Number	02310CPX
Model	OSU015N00
Form factor	eSFP
Application standard	-
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155M-2.67G
Target transmission distance [km]	15 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	8.2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-21 dBm
Overload power (AVG) [dBm]	0 dBm

3.6.9.13 S-SFP-GE-LH40-SM1550

Table 3-225 S-SFP-GE-LH40-SM1550 specifications

Item	Value
Basic Information	
Module name	S-SFP-GE-LH40-SM1550
Part Number	02317347
Model	S-SFP-GE-LH40-SM1550
Form factor	eSFP
Application standard	1000BASE-LX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	9.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-22 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.14 SFP-GE-LX-SM1310 (02313URF)

Table 3-226 SFP-GE-LX-SM1310 specifications

Item	Value
Basic Information	
Module name	SFP-GE-LX-SM1310
Part Number	02313URF
Model	SFP-GE-LX-SM1310

Item	Value
Form factor	eSFP
Application standard	1000BASE-LX10
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx operating wavelength range [nm]	-
Rx sensitivity (AVG) [dBm]	-20 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.15 SFP-GE-LX-SM1310-BIDI (34060470)

Table 3-227 SFP-GE-LX-SM1310-BIDI specifications

Item	Value
Basic Information	
Module name	SFP-GE-LX-SM1310-BIDI
Part Number	34060470
Model	SFP-GE-LX-SM1310-BIDI
Form factor	eSFP
Application standard	1000base-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C

Item	Value
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1310/RX1490
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	6 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-19.5 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.16 SFP-GE-LX-SM1490-BIDI (34060475)

Table 3-228 SFP-GE-LX-SM1490-BIDI specifications

Item	Value
Basic Information	
Module name	SFP-GE-LX-SM1490-BIDI
Part Number	34060475
Model	SFP-GE-LX-SM1490-BIDI
Form factor	eSFP
Application standard	1000base-BX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1490/RX1310
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm

Item	Value
Minimum extinction ratio [dB]	6 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-19.5 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.17 eSFP-1310nm-1.25G-40km

Table 3-229 eSFP-1310nm-1.25G-40km specifications

Item	Value
Basic Information	
Module name	eSFP-1310nm-1.25G-40km
Part Number	34060762
Model	eSFP-1310nm-1.25G-40km
Form factor	eSFP
Application standard	1000base-LX/LH
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.18 eSFP-1310nm-1000Base-Lx SM

Table 3-230 eSFP-1310nm-1000Base-Lx SM specifications

Item	Value
Basic Information	
Module name	eSFP-1310nm-1000Base-Lx SM
Part Number	34060473
Model	eSFP-1310nm-1000Base-Lx SM
Form factor	eSFP
Application standard	1000BASE-LX10/LH
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	-3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-20 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.19 eSFP-1550nm-1000Base-Zx/FC100

Table 3-231 eSFP-1550nm-1000Base-Zx/FC100 specifications

Item	Value
Basic Information	
Module name	eSFP-1550nm-1000Base-Zx/FC100
Part Number	34060360
Model	eSFP-1550nm-1000Base-Zx/FC100

Item	Value
Form factor	eSFP
Application standard	1000BASE-ZX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	80 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	5 dBm
Minimum Tx optical power [dBm]	-2 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-23 dBm
Overload power (AVG) [dBm]	-3 dBm

3.6.9.20 eSFP-850nm-1000Base-Sx/FC200 MM

Table 3-232 eSFP-850nm-1000Base-Sx/FC200 MM specifications

Item	Value
Basic Information	
Module name	eSFP-850nm-1000Base-Sx/FC200 MM
Part Number	34060286
Model	eSFP-850nm-1000Base-Sx/FC200 MM
Form factor	eSFP
Application standard	1000base-SX
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	2.125Gbit/s

Item	Value
Target transmission distance [km]	0.5 km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-2.5 dBm
Minimum Tx optical power [dBm]	-9.5 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-17 dBm
Overload power (AVG) [dBm]	0 dBm

3.6.9.21 eSFP-GE-SX-MM850 (02313URD)

Table 3-233 eSFP-GE-SX-MM850 specifications

Item	Value
Basic Information	
Module name	eSFP-GE-SX-MM850
Part Number	02313URD
Model	eSFP-GE-SX-MM850
Form factor	eSFP
Application standard	1000base-SX
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	2.125Gbit/s
Target transmission distance [km]	- Multimode fiber (with diameter of 62.5 μm): 220 m - Multimode fiber (OM1) (with diameter of 62.5 μm): 275 m - Multimode fiber (with diameter of 50 μm): 500 m - Multimode fiber (OM2) (with diameter of 50 μm): 550 m

Item	Value
Modal bandwidth [MHz*km]	- Multimode fiber: 160 MHz*km - Multimode fiber (OM1): 200 MHz*km - Multimode fiber: 400 MHz*km - Multimode fiber (OM2): 500 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-2.5 dBm
Minimum Tx optical power [dBm]	-9.5 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-17 dBm
Overload power (AVG) [dBm]	0 dBm

3.6.9.22 eSFP-GE-ZX100-SM1550 (02315206)

Table 3-234 eSFP-GE-ZX100-SM1550 specifications

Item	Value
Basic Information	
Module name	eSFP-GE-ZX100-SM1550
Part Number	02315206
Model	eSFP-GE-ZX100-SM1550
Form factor	eSFP
Application standard	1000base-ZX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	100 km
Transmitter Optical Characteristics	

Item	Value
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	5 dBm
Minimum Tx optical power [dBm]	0 dBm
Minimum extinction ratio [dB]	8 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-30 dBm
Overload power (AVG) [dBm]	-9 dBm

3.6.9.23 eSFP-GE-ZX100-SM1550 (34060295)

Table 3-235 eSFP-GE-ZX100-SM1550 specifications

Item	Value
Basic Information	
Module name	eSFP-GE-ZX100-SM1550
Part Number	34060295
Model	eSFP-GE-ZX100-SM1550
Form factor	eSFP
Application standard	1000base-ZX
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	1.25Gbit/s
Target transmission distance [km]	100 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	5 dBm
Minimum Tx optical power [dBm]	0 dBm
Minimum extinction ratio [dB]	8 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-30 dBm

Item	Value
Overload power (AVG) [dBm]	-9 dBm

3.6.9.24 eSFP-SM1310-155M~2.5G-15km

Table 3-236 eSFP-SM1310-155M~2.5G-15km specifications

Item	Value
Basic Information	
Module name	eSFP-SM1310-155M~2.5G-15km
Part Number	34060485
Model	eSFP-SM1310-155M~2.5G-15km
Form factor	eSFP
Application standard	-
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	155M-2.67G
Target transmission distance [km]	15 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0 dBm
Minimum Tx optical power [dBm]	-5 dBm
Minimum extinction ratio [dB]	8.2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-21 dBm
Overload power (AVG) [dBm]	0 dBm

3.6.10 10Gbps SFP+ Optical Modules

3.6.10.1 OMXD30000 (02318169)

Table 3-237 OMXD30000 specifications

Item	Value
Basic Information	
Module name	OMXD30000
Part Number	02318169
Model	OMXD30000
Form factor	SFP+
Application standard	10GBASE-SR
Connector type	LC
Optical fiber type	MMF
Bit error ratio (BER)	-
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	0.3 km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-1 dBm
Minimum Tx optical power [dBm]	-7.3 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-9.9 dBm
Overload power (AVG) [dBm]	-1 dBm

3.6.10.2 OSX010000 (02318170)

Table 3-238 OSX010000 specifications

Item	Value
Basic Information	
Module name	OSX010000
Part Number	02318170

Item	Value
Model	OSX010000
Form factor	SFP+
Application standard	10GBASE-LR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-12.6 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.3 OSX040N01

Table 3-239 OSX040N01 specifications

Item	Value
Basic Information	
Module name	OSX040N01
Part Number	02310CNF
Model	OSX040N01
Form factor	SFP+
Application standard	10GBASE-ER
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C

Item	Value
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	4 dBm
Minimum Tx optical power [dBm]	-4.7 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-14.1 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.4 SFP-10G-BXD1

Table 3-240 SFP-10G-BXD1 specifications

Item	Value
Basic Information	
Module name	SFP-10G-BXD1
Part Number	02310QDT
Model	SFP-10G-BXD1
Form factor	SFP+
Application standard	10GBase-BIDI
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	2.5Gbit/s-11.3Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1330/RX1270
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm

Item	Value
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-14.4 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.5 SFP-10G-BXU1

Table 3-241 SFP-10G-BXU1 specifications

Item	Value
Basic Information	
Module name	SFP-10G-BXU1
Part Number	02310QBJ
Model	SFP-10G-BXU1
Form factor	SFP+
Application standard	10GBase-BIDI
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	2.5Gbit/s-11.3Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	TX1270/RX1330
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-14.4 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.6 SFP-10G-USR (02310MNW)

Table 3-242 SFP-10G-USR specifications

Item	Value
Basic Information	
Module name	SFP-10G-USR
Part Number	02310MNW
Model	SFP-10G-USR
Form factor	SFP+
Application standard	10Gbase-USR
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10.31Gbit/s
Target transmission distance [km]	0.1 km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-1 dBm
Minimum Tx optical power [dBm]	-7.3 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10.7 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.7 SFP-10G-ZR

Table 3-243 SFP-10G-ZR specifications

Item	Value
Basic Information	
Module name	SFP-10G-ZR
Part Number	02310SNN
Model	SFP-10G-ZR

Item	Value
Form factor	SFP+
Application standard	10Gbase-ZR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	9.95Gbit/s-10.31Gbit/s
Target transmission distance [km]	80 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	4 dBm
Minimum Tx optical power [dBm]	0 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-24 dBm
Overload power (AVG) [dBm]	-7 dBm

3.6.10.8 OMXD22000

Table 3-244 OMXD22000 specifications

Item	Value
Basic Information	
Module name	OMXD22000
Part Number	34060496
Model	OMXD22000
Form factor	SFP+
Application standard	10Gbase-LRM
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s

Item	Value
Target transmission distance [km]	0.22 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-6.5 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-6.5 dBm
Overload power (AVG) [dBm]	-1.5 dBm

3.6.10.9 OMXD30000 (02313URC)

Table 3-245 OMXD30000 specifications

Item	Value
Basic Information	
Module name	OMXD30000
Part Number	02313URC
Model	OMXD30000
Form factor	SFP+
Application standard	10GBASE-SR
Connector type	LC
Optical fiber type	MMF
Bit error ratio (BER)	-
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s

Item	Value
Target transmission distance [km]	- Multimode fiber (with diameter of 62.5 μm): 26 m - Multimode fiber (OM1) (with diameter of 62.5 μm): 33 m - Multimode fiber (with diameter of 50 μm): 66 m - Multimode fiber (OM2) (with diameter of 50 μm): 82 m - Multimode fiber (OM3) (with diameter of 50 μm): 300 m - Multimode fiber (OM4) (with diameter of 50 μm): 400 m
Modal bandwidth [MHz*km]	- Multimode optical fiber: 160 MHz*km - Multi-mode (OM1) optical fiber: 200 MHz*km - Multimode optical fiber: 400 MHz*km - Multi-mode (OM2) optical fiber: 500 MHz*km - Multi-mode (OM3) optical fiber: 2000 MHz*km - Multi-mode (OM4) optical fiber: 4700 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-1 dBm
Minimum Tx optical power [dBm]	-7.3 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-9.9 dBm
Overload power (AVG) [dBm]	-1 dBm

3.6.10.10 OMXD30001

Table 3-246 OMXD30001 specifications

Item	Value
Basic Information	
Module name	OMXD30001
Part Number	34060494
Model	OMXD30001
Form factor	SFP+
Application standard	10GBASE-SR
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	0.3 km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-1 dBm
Minimum Tx optical power [dBm]	-7.3 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-9.9 dBm
Overload power (AVG) [dBm]	-1 dBm

3.6.10.11 OMXD30020

Table 3-247 OMXD30020 specifications

Item	Value
Basic Information	
Module name	OMXD30020
Part Number	34060494-002
Model	OMXD30020

Item	Value
Form factor	SFP+
Application standard	10GBASE-SR
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	0.3 km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-1 dBm
Minimum Tx optical power [dBm]	-7.3 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-9.9 dBm
Overload power (AVG) [dBm]	-1 dBm

3.6.10.12 OSX001001

Table 3-248 OSX001001 specifications

Item	Value
Basic Information	
Module name	OSX001001
Part Number	34060495
Model	OSX001001
Form factor	SFP+
Application standard	10GBASE-LR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s

Item	Value
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-12.6 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.13 OSX010000 (02313URK)

Table 3-249 OSX010000 specifications

Item	Value
Basic Information	
Module name	OSX010000
Part Number	02313URK
Model	OSX010000
Form factor	SFP+
Application standard	10GBASE-LR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm
Minimum extinction ratio [dB]	3.5 dB

Item	Value
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-12.6 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.14 OSX040N00

Table 3-250 OSX040N00 specifications

Item	Value
Basic Information	
Module name	OSX040N00
Part Number	34060518
Model	OSX040N00
Form factor	SFP+
Application standard	10GBASE-ER
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	9.95G-11.1G
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	4 dBm
Minimum Tx optical power [dBm]	-4.7 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-14.1 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.15 OSX080N00

Table 3-251 OSX080N00 specifications

Item	Value
Basic Information	
Module name	OSX080N00
Part Number	34060672
Model	OSX080N00
Form factor	SFP+
Application standard	10Gbase-ZR
Connector type	LC
Optical fiber type	SMF
Bit error ratio (BER)	-
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	9.95G-10.31G
Target transmission distance [km]	80 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1550 nm
Maximum Tx optical power [dBm]	4 dBm
Minimum Tx optical power [dBm]	0 dBm
Minimum extinction ratio [dB]	9 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-24 dBm
Overload power (AVG) [dBm]	-7 dBm

3.6.10.16 SFP-10G-LR

Table 3-252 SFP-10G-LR specifications

Item	Value
Basic Information	
Module name	SFP-10G-LR
Part Number	02310QDJ

Item	Value
Model	SFP-10G-LR
Form factor	SFP+
Application standard	10GBASE-LR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	10Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-12.6 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.10.17 SFP-10G-USR (02313URN)

Table 3-253 SFP-10G-USR specifications

Item	Value
Basic Information	
Module name	SFP-10G-USR
Part Number	02313URN
Model	SFP-10G-USR
Form factor	SFP+
Application standard	10Gbase-USR
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C

Item	Value
Transmission rate [bit/s]	10.31Gbit/s
Target transmission distance [km]	- Multimode fiber (OM2) (with diameter of 50 μm): 30 m - Multimode fiber (OM3) (with diameter of 50 μm): 100 m - Multimode fiber (OM4) (with diameter of 50 μm): 150 m
Modal bandwidth [MHz*km]	- Multi-mode (OM2) optical fiber: 500 MHz*km - Multi-mode (OM3) optical fiber: 2000 MHz*km - Multi-mode (OM4) optical fiber: 4700 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	-1 dBm
Minimum Tx optical power [dBm]	-7.3 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10.7 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.11 25Gbps SFP28 Optical Modules

3.6.11.1 SFP-25G-LR

Table 3-254 SFP-25G-LR specifications

Item	Value
Basic Information	
Module name	SFP-25G-LR
Part Number	02312LSE
Model	SFP-25G-LR
Form factor	SFP28

Item	Value
Application standard	25GBase-LR, 10GBase-LR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	-40°C to 85°C
Transmission rate [bit/s]	9.8304Gbit/s/10.1376Gbit/s/ 10.3125Gbit/s/24.33024Gbit/s/ 25.78125Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	2 dBm
Minimum Tx optical power [dBm]	-7 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-11.3 dBm
Overload power (AVG) [dBm]	2 dBm

3.6.11.2 SFP-25G-SR

Table 3-255 SFP-25G-SR specifications

Item	Value
Basic Information	
Module name	SFP-25G-SR
Part Number	02313URP
Model	SFP-25G-SR
Form factor	SFP28
Application standard	25GBASE-SR
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C (32°F to 158°F)
Transmission rate [bit/s]	25 Gbit/s

Item	Value
Target transmission distance [km]	Multimode fiber (OM3): - Disables the RS-FEC function: 0.03 km - Enables the RS-FEC function: 0.07 km Multimode fiber (OM4): - Disables the RS-FEC function: 0.04 km - Enables the RS-FEC function: 0.1 km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	2.4 dBm
Minimum Tx optical power [dBm]	-8.4 dBm
Minimum extinction ratio [dB]	2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10.3 dBm
Overload power (AVG) [dBm]	2.4 dBm

3.6.12 40Gbps QSFP+ Optical Modules

3.6.12.1 QSFP-40G-ER4

Table 3-256 QSFP-40G-ER4 specifications

Item	Value
Basic Information	
Module name	QSFP-40G-ER4
Part Number	02311BKT
Model	QSFP-40G-ER4
Form factor	QSFP+
Application standard	40GBASE-ER4
Connector type	LC
Optical fiber type	SMF

Item	Value
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	41.25Gbit/s
Target transmission distance [km]	40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1271nm, 1291nm, 1311nm, 1331nm
Maximum Tx optical power [dBm]	4.5 dBm
Minimum Tx optical power [dBm]	-2.7 dBm
Minimum extinction ratio [dB]	5.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-16.8 dBm
Overload power (AVG) [dBm]	2.3 dBm

3.6.12.2 QSFP-40G-LR4

Table 3-257 QSFP-40G-LR4 specifications

Item	Value
Basic Information	
Module name	QSFP-40G-LR4
Part Number	02313URY
Model	QSFP-40G-LR4
Form factor	QSFP+
Application standard	40GBase-LR4
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	41.25Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	2.3 dBm

Item	Value
Minimum Tx optical power [dBm]	-7 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-11.5 dBm
Overload power (AVG) [dBm]	2.3 dBm

3.6.12.3 QSFP-40G-LR4-Lite

Table 3-258 QSFP-40G-LR4-Lite specifications

Item	Value
Basic Information	
Module name	QSFP-40G-LR4-Lite
Part Number	02313URS
Model	QSFP-40G-LR4-Lite
Form factor	QSFP+
Application standard	40GBase-LR4 Lite
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	40Gbit/s
Target transmission distance [km]	2 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1271nm, 1291nm, 1311nm, 1331nm
Maximum Tx optical power [dBm]	2.3 dBm
Minimum Tx optical power [dBm]	-9 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-13.5 dBm
Overload power (AVG) [dBm]	2.3 dBm

3.6.12.4 QSFP-40G-LX4-MM

Table 3-259 QSFP-40G-LX4-MM specifications

Item	Value
Basic Information	
Module name	QSFP-40G-LX4-MM
Part Number	02313NUG
Model	QSFP-40G-LX4-MM
Form factor	QSFP+
Application standard	40GBASE-LX4
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	40Gbit/s
Target transmission distance [km]	Multimode OM3 optical fiber (diameter: 50 μm): 150 m Multimode OM4 optical fiber (diameter: 50 μm): 150 m
Transmitter Optical Characteristics	
Center wavelength [nm]	1271nm, 1291nm, 1311nm, 1331nm
Maximum Tx optical power [dBm]	2.3 dBm
Minimum Tx optical power [dBm]	-7.0 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10.5 dBm
Overload power (AVG) [dBm]	3.5 dBm

3.6.12.5 QSFP-40G-eSM4

Table 3-260 QSFP-40G-eSM4 specifications

Item	Value
Basic Information	
Module name	QSFP-40G-eSM4

Item	Value
Part Number	02311DTR
Model	QSFP-40G-eSM4
Form factor	QSFP+
Application standard	40GBASE-eSM4 (non-standard)
Connector type	MPO/APC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	40 Gbit/s
Target transmission distance [km]	Single-mode fiber: 10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-8.2 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-12.6 dBm
Overload power (AVG) [dBm]	0.5 dBm

3.6.12.6 QSFP-40G-eSR4

Table 3-261 QSFP-40G-eSR4 specifications

Item	Value
Basic Information	
Module name	QSFP-40G-eSR4
Part Number	02313URU
Model	QSFP-40G-eSR4
Form factor	QSFP+
Application standard	40GBase-eSR4
Connector type	MPO
Optical fiber type	MMF

Item	Value
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	41.25Gbit/s
Target transmission distance [km]	- Multimode fiber (OM2) (with diameter of 50 μm): 82 m - Multimode fiber (OM3) (with diameter of 50 μm): 300 m - Multimode fiber (OM4) (with diameter of 50 μm): 400 m
Modal bandwidth [MHz*km]	- Multi-mode (OM2) optical fiber: 500 MHz*km - Multi-mode (OM3) optical fiber: 2000 MHz*km - Multi-mode (OM4) optical fiber: 4700 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-7.6 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-5.4 dBm
Overload power (AVG) [dBm]	2.4 dBm

3.6.12.7 QSFP-40G-iSR4

Table 3-262 QSFP-40G-iSR4 specifications

Item	Value
Basic Information	
Module name	QSFP-40G-iSR4
Part Number	02313URW
Model	QSFP-40G-iSR4
Form factor	QSFP+
Application standard	40GBase-SR4

Item	Value
Connector type	MPO
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	41.25Gbit/s
Target transmission distance [km]	- Multimode fiber (OM3) (with diameter of 50 μm): 100 m - Multimode fiber (OM4) (with diameter of 50 μm): 150 m
Modal bandwidth [MHz*km]	- Multi-mode (OM3) optical fiber: 2000 MHz*km - Multi-mode (OM4) optical fiber: 4700 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	0.5 dBm
Minimum Tx optical power [dBm]	-7.6 dBm
Minimum extinction ratio [dB]	3 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-9.5 dBm
Overload power (AVG) [dBm]	2.4 dBm

3.6.13 100Gbps QSFP28 Optical Modules

3.6.13.1 QSFP-100G-CWDM4

Table 3-263 QSFP-100G-CWDM4 specifications

Item	Value
Basic Information	
Module name	QSFP-100G-CWDM4
Part Number	02311MNN
Model	QSFP-100G-CWDM4
Form factor	QSFP28

Item	Value
Application standard	100GBase-CWDM4
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	100Gbit/s
Target transmission distance [km]	2 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	2.5 dBm
Minimum Tx optical power [dBm]	-6.5 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10 dBm
Overload power (AVG) [dBm]	2.5 dBm

3.6.13.2 QSFP-100G-CWDM4-Lite

Table 3-264 QSFP-100G-CWDM4-Lite specifications

Item	Value
Basic Information	
Module name	QSFP-100G-CWDM4-Lite
Part Number	02312UJN
Model	QSFP-100G-CWDM4-Lite
Form factor	QSFP28
Application standard	100G-CWDM4-Lite
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	100Gbit/s
Target transmission distance [km]	2 km

Item	Value
Transmitter Optical Characteristics	
Center wavelength [nm]	1310nm
Maximum Tx optical power [dBm]	2.5 dBm
Minimum Tx optical power [dBm]	-6.5 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10 dBm
Overload power (AVG) [dBm]	2.5 dBm

3.6.13.3 QSFP-100G-ER4

Table 3-265 QSFP-100G-ER4 specifications

Item	Value
Basic Information	
Module name	QSFP-100G-ER4
Part Number	02313HLU
Model	QSFP-100G-ER4
Form factor	QSFP28
Application standard	100GBASE-ER4
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C (32°F to 158°F)
Transmission rate [bit/s]	100 Gbit/s
Target transmission distance [km]	Single-mode fiber (G.652): 40 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1295 nm, 1300 nm, 1304 nm, 1309 nm
Maximum Tx optical power [dBm]	2.9 dBm
Minimum Tx optical power [dBm]	-2.9 dBm
Minimum extinction ratio [dB]	8 dB
Receiver Optical Characteristics	

Item	Value
Rx sensitivity (AVG) [dBm]	-20.9 dBm
Overload power (AVG) [dBm]	-3.5 dBm

3.6.13.4 QSFP-100G-SWDM4

Table 3-266 QSFP-100G-SWDM4 specifications

Item	Value
Basic Information	
Module name	QSFP-100G-SWDM4
Part Number	02311QUK
Model	QSFP-100G-SWDM4
Form factor	QSFP28
Application standard	100G-SWDM4
Connector type	LC
Optical fiber type	MMF
Working case temperature [°C(°F)]	PC or UPC
Transmission rate [bit/s]	100Gbit/s
Target transmission distance [km]	Multimode fiber (OM3) (with diameter of 50 μm): 75 m Multimode fiber (OM4) (with diameter of 50 μm): 100 m
Modal bandwidth [MHz*km]	- Multimode fiber (OM3): 2000 MHz*km - Multimode fiber (OM4): 4700 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	3.4 dBm
Minimum Tx optical power [dBm]	-7.5 dBm
Minimum extinction ratio [dB]	2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10.5 dBm

Item	Value
Overload power (AVG) [dBm]	2.4 dBm

3.6.13.5 QSFP-100G-eSR4

Table 3-267 QSFP-100G-eSR4 specifications

Item	Value
Basic Information	
Module name	QSFP-100G-eSR4
Part Number	02311PSH
Model	QSFP-100G-eSR4
Form factor	QSFP28
Application standard	100GBase-eSR4
Connector type	MPO/PC
Optical fiber type	MMF
Working case temperature [°C(°F)]	0°C to 70°C (32°F to 158°F)
Transmission rate [bit/s]	100 Gbit/s
Target transmission distance [km]	Multimode fiber (OM3): 200 m Multimode fiber (OM4): 300 m
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	2.4 dBm
Minimum Tx optical power [dBm]	-8.4 dBm
Minimum extinction ratio [dB]	2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-9.2 dBm
Overload power (AVG) [dBm]	2.4 dBm

3.6.13.6 QSFP28-100G-DR

Table 3-268 QSFP28-100G-DR specifications

Item	Value
Basic Information	
Module name	QSFP28-100G-DR
Part Number	02312VSP
Model	QSFP28-100G-DR
Form factor	QSFP28
Application standard	100GBase-DR
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	100Gbit/s
Target transmission distance [km]	0.5 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1311 nm
Maximum Tx optical power [dBm]	4 dBm
Minimum Tx optical power [dBm]	-2.9 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-5.9 dBm
Overload power (AVG) [dBm]	4 dBm

3.6.13.7 QSFP28-100G-LR4

Table 3-269 QSFP28-100G-LR4 specifications

Item	Value
Basic Information	
Module name	QSFP28-100G-LR4
Part Number	02313URT
Model	QSFP28-100G-LR4

Item	Value
Form factor	QSFP28
Application standard	100GBase-LR4
Connector type	LC
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	100Gbit/s
Target transmission distance [km]	10 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	4.5 dBm
Minimum Tx optical power [dBm]	-4.3 dBm
Minimum extinction ratio [dB]	4 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-8.6 dBm
Overload power (AVG) [dBm]	4.5 dBm

3.6.13.8 QSFP28-100G-PSM4

Table 3-270 QSFP28-100G-PSM4 specifications

Item	Value
Basic Information	
Module name	QSFP28-100G-PSM4
Part Number	02311MNM
Model	QSFP28-100G-PSM4
Form factor	QSFP28
Application standard	100GBASE-PSM4
Connector type	MPO
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	100Gbit/s

Item	Value
Target transmission distance [km]	0.5 km
Transmitter Optical Characteristics	
Center wavelength [nm]	1310 nm
Maximum Tx optical power [dBm]	2 dBm
Minimum Tx optical power [dBm]	-9.4 dBm
Minimum extinction ratio [dB]	3.5 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-11.35 dBm
Overload power (AVG) [dBm]	2.2 dBm

3.6.13.9 QSFP28-100G-SR4

Table 3-271 QSFP28-100G-SR4 specifications

Item	Value
Basic Information	
Module name	QSFP28-100G-SR4
Part Number	02313URQ
Model	QSFP28-100G-SR4
Form factor	QSFP28
Application standard	100GBase-SR4
Connector type	MPO
Optical fiber type	SMF
Working case temperature [°C(°F)]	0°C to 70°C
Transmission rate [bit/s]	100Gbit/s
Target transmission distance [km]	0.1 km
Modal bandwidth [MHz*km]	4700 MHz*km
Transmitter Optical Characteristics	
Center wavelength [nm]	850 nm
Maximum Tx optical power [dBm]	2.4 dBm
Minimum Tx optical power [dBm]	-8.4 dBm

Item	Value
Minimum extinction ratio [dB]	2 dB
Receiver Optical Characteristics	
Rx sensitivity (AVG) [dBm]	-10.3 dBm
Overload power (AVG) [dBm]	2.4 dBm

3.7 Cable

This section describes the PGND cable, power cable, configuration cable, Ethernet cable, and optical fiber of the USG.

3.7.1 PGND Cable

3.7.1.1 PGND Cable

Connection

A ground cable is connected as follows:

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

Appearance and Structure

A PGND cable has two OT terminals and a copper cable with yellow/green plastic encapsulation, One end of the cable is the 90° right angle terminal. **Figure 3-151** shows the appearance of a type of PGND cables.

> 📖 **NOTE**
>
> The figure is for reference only.

A PGND cable has two OT terminals and a copper cable with yellow/green plastic encapsulation, One end of the cable is the 90° right angle terminal. **Figure 3-151** shows the appearance of a type of PGND cables.

Figure 3-151 Appearance of the PGND cable
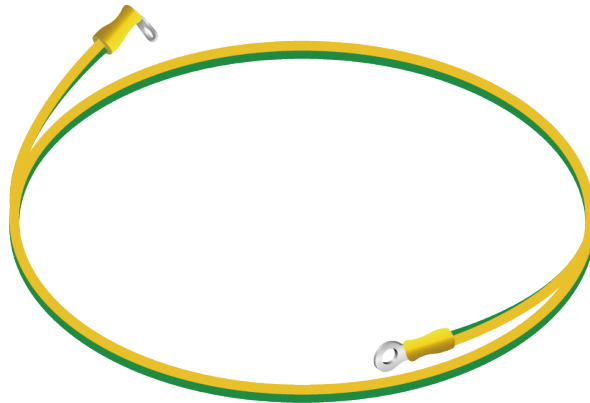
Figure 3-152 shows the appearance of the OT terminal.

Figure 3-152 OT terminal

Technical Specifications

Table 3-272 Technical specifications of the PGND Cable

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,1.5m, 6mm^2,G&Y, (OT6-4),H07Z-K-6^2G&Y, (OT6-6),S6505-LSZH	04150328	CPGND0104	14170017: OT6-4	14170023: OT6-6	1.5 m

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,0.5m, 4mm^2, (OT6-4), (H07Z-K-4^2G&Y) , (OT6-6),LS ZH,YES	04152464	AC05001	14170635: OT6-4	14170637: OT6-6	0.5 m

3.7.2 AC Power Cable

3.7.2.1 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 the USG.

- The PI straight male, PB straight male, PD angle male, or PG angle male connector is connected to an external power source.

Use a single-phase 3-line electrical outlet that has been properly grounded. The grounding point of the power supply must be reliably grounded in the building. Generally, the grounding point of the power supply system of the building has been buried in the grounding during the construction and wiring of the building.

NOTICE

Make sure that the power system of the building has been grounded before you connect the USG with AC power cables.

Appearance and Structure

The USG provides both the European-standard and North American-standard AC power cables. **Figure 3-153** and **Figure 3-154** list the reference specifications. You can select the desired power cables based on your site conditions. Youcan select the desired power cables based on your site conditions. For detailsabout the power cable appearance, see **Quick Reference Tables of Power Cables**. You can view the photo of a power cable according to thecorresponding BOM.

Figure 3-153 England AC power cable

Figure 3-154 North American-standard AC power cable
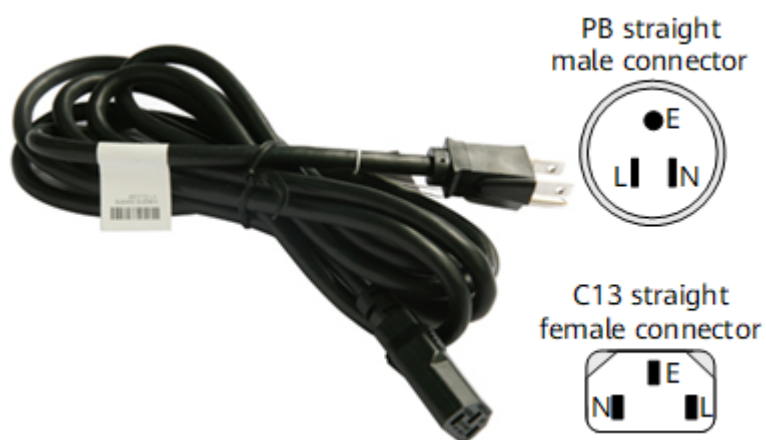
Table 3-273 lists the connectors of AC power cables.

Table 3-273 Connectors of AC power cables

Connector	Description	Wire Color
L	Live wire	Brown
N	Null wire	Blue
E	PGND cable	Yellow/Green

Technical Specifications

Table 3-274 Technical specifications of the AC Power Cable

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,America AC Power Cable, 125V10A, 3.0m,PBSM, 18SJT(3C), C13SF,Black	04020728	CC13NA300	PB straight male	C7 straight female	3 m
Power Cable,Japan AC Power Cable 125V12A, 3.0m,PBSM ,HVCTF-1.25mm^2(3C),C13SF,Black	04040887	CC13JP300	PB straight male	C13 straight female	3 m
Power Cords Cable,Australia AC Power Cable,250V10A, 3.0m,PISM, H05VV-F-1.0mm^2(3C),C13SF,Black	04040888	CC13AU300	PI straight male	C13 straight female	3 m
Power cord,BS546 250V10A, 3.0m,PM-IAM,H05VV-F-1.5mm^2(3C),C13SF,250V, 10A,Black	04040889	CC13HK300	PM-I angle male	C13 straight female	3 m

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,Britain AC Power Cable 250V10A, 3.0m,PGAM ,H05VV-F-1.0mm^2(3C),C13SF,Black	04040890	CC13UK300	PG angle male	C13 straight female	3 m
Power cord,Europe AC Power Cable, 250V10A, 3.0m,PFSM ,(H05VVF 1.0^2(3C)), C13SF, 250V, 10A,BLack	04041056	CC13EU300	PF straight male	C13 straight female	3 m
Power Cords Cable,China AC Power 250V10A, 3.0m,PISM, 227IEC53-1.0^2(3C),C13SF,Black	04041104	CPACH03031	PI straight male	C13 straight female	3 m
Power Cable,Britain AC Power Cable 250V10A, 3.0m,PGAM ,H05VV-F-1.0mm^2(3C),C13AF-L,Black	04041117	CC13UK301	PG angle male	C13 left angle female connector	3 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,Switz erland AC Power Cable 250V10A, 3.0m,PJSM ,H05VV-F-1.0mm^2(3C),C13S F,Black	04041119	CC13CH30 0	PJ straight male	C13 straight female	3 m
Power Cable,Italy AC Power Cable 250V10A, 3.0m,PLSM, H05VV-F-1.0mm^2(3C),C13S F,Black	04041120	CC13IT300	PL straight male	C13 straight female	3 m
Power Cords Cable,Chin a AC Power 250V10A, 10.0m,PIS M, 227IEC53-1 . 0^2(3C),C1 3SF,Black	04042697	C3X1CHN0 0	PI straight male	C13 straight female	10 m
Power Cords Cable,Chin a AC Power 250V10A, 15.0m,PIS M, 227IEC53-1 . 0^2(3C),C1 3SF,Black	04042698	CPWR0010 2	PI straight male	C13 straight female	15 m

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cords Cable,China AC Power 250V10A, 20.0m,PISM, 227IEC53-1. 0^2(3C),C13SF,Black	04042699	CC13CN200	PI straight male	C13 straight female	20 m
External Power Cable, Power Cable 250V2.5A, 2m, 2X0.75mm^2,Black,PASM, 227IEC53-0.75^2(2C)-I,C7SF	04043491	CPC7SF201	PA straight male	C7 straight female	2 m
Power cord,Europe AC Power 250V2,2.0m,PCSM, (H03VVH2F-0.5^2(2C)),C7SF,Black	04044216	C0C7EU200	PC straight male	C7 straight female	2 m
Power Cords Cable,Japan AC Power 125V7A, 2.0m,PASM,VCTFK-0.75^2(2C),C7SF,Black	04044496	C0C7JP200	PA straight male	C7 straight female	2 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,Amer ica AC Power Cable 125V7A, 2.0m,PASM , 18NISPT-1(2C),C7SF,Bl ack	04044497	C0C7NA20 0	PA straight male	C7 straight female	2 m
Power Cable, Britain AC Power Cable 250V2.5A, 2.0m,PGA M,H05VVH 2- F-0.75mm^ 2(2C),C7SF, Black	04044533	C0C7UK20 0	PG angle male	C7 straight female	2 m
Power Cords Cable,Austr alia AC Power 250V2.5A, 2.0m,PISM- I,H03VVH2 F-0.75^2(2 C),C7SF,Bla ck	04044577	C0C7AU20 0	PI-I straight male	C7 straight female	2 m
Power Cords Cable,India AC Power 250V2.5A, 2.0m,PC- IISM,IS 694-0.75^ 2(2C),C7S, 250V, 2.5A,Black	04045094	C0C7IN200	PC-II straight male	C7 straight female	2 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power cord,Korea AC Power 250V2.5A, 2.0m,PCSM -I,K60227 IEC 52 0.75mm^2(2C),C7SF, 250V, 2.5A,Black	04045785	C0C7KO20 0	PC-I straight male	C7 straight female	2 m
Power Cords Cable,Arge ntina AC Power 250V10A, 3.0m,PISM, H05VV-F-1.0mm^ 2(3C),C13S F,Black	04047785	CC13AR30 0	PI straight male	C13 straight female	3 m
Power Cords Cable,Chin a AC Power Cable, 250V10A, 3m,PISM, 227IEC53-1 . 0^2(3C),C1 3SF,Black	04050139	CC13CN30 0	PI straight male	C13 straight female	3 m
Power Cords Cable,Chin a AC Power 250V10A, 1.5m,C14S M, 227IEC53(R VV)1.0mm ^2(3C),C13 SF,PDU Cable	04050188	IDS2PWRC BL00	C14 straight male	C13 straight female	1.5 m

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cable,China AC Power Cable 250V10A, 1.0m,PISM, 227IEC53(RVV)1.0mm^2(3C),C13 SF,Black	04050206	CC13SA300	PI straight male	C13 straight female	1 m
Power Cable,China AC Power Cable 250V10A, 5.0m,PISM, 227IEC53(RVV)1.0mm^2(3C),C13 SF,Black	04050206-001	W-AC250-5	PI straight male	C13 straight female	5 m
Power Cable,China AC Power Cable 250V10A, 2.0m,PISM, 227IEC53(RVV)1.0mm^2(3C),C13 SF,Black	04050517	CPC13SF00	PI straight male	C13 straight female	2 m
Power cord,China AC Power Cable, 250V10A, 3.0m,C14SM, (227IEC53-1.0^2(3C)), C13SF, 250V, 10A,Black,PDU Cable	04050846	-	C14 straight male	C13 straight female	3 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power cord,China AC Power Cable, 250V10A, 6.0m,C14S M, (227IEC53-1.0^2(3C)), C13SF, 250V, 10A,Black,P DU Cable	04050847	W-AC250-6	C14 straight male	C13 straight female	6 m
Power Cords Cable,Chin a AC Power, 250V10A, 1.5m,PISM, 227IEC53(R VV)1.0mm ^2(3C),C13 SF,250V, 10A,Black	04050955	IDSV2DKB M55	PI straight male	C13 straight female	1.5 m
Power cord,India AC Power 250V6A, 3m,PM-IIAM,IS 694-1.0^2(3C),C13 SF, 250V, 6A,Black	04051035	CC13ID300	PM-II angle male	C13 straight female	3 m
Power cord,South Africa AC Power 250V10A, 3m,PMAM, H05VV-F-1.0mm^ 2(3C),C13S F,250V, 10A,Black	04051080	CC13SA300	PM angle male	C13 straight female	3 m

Description	Part Number	Model	Connector X1	Connector X2	Cable length
Power cord,BS546 250V2.5A, 2m,PD-IAM,H03VV H2-F-0.75mm^2(2C),C7SF, 250V, 2.5A,Black	04051081	C0C7OT200	PD-I angle male	C7 straight female	2 m
Power cord, 2m,IRAM2063 Straight Male,H05VVH2-F 2*0.75^2(2C),C7 Straight Female, 250V, 2.5A,BLACK	04051997	-	IRAM2063 straight male	C7 straight female	2 m
Power cord,Taiwan AC 125V11A, 3.0m,PBSM ,HVCTF 3*1.25mm2 ,C13SF, 125V, 11A,Black, BSMI	04052137	CC13TW300	PB straight male	C13 straight female	3 m
Power cord,Taiwan AC 125V7A, 2.0m,PASM ,VCTFK2*0.75mm2(2C),C7SF, 125V, 7A,Black,BSMI	04052138	-	PA straight male	C7 straight female	2 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power cord,AC Power Cable 250V2.5A, 2.0m,C14S M,H05VVH 2- F-0.75mm^ 2(2C),C7SF, 250V, 2.5A,Black, Non- standard AC power cable	04052181	-	C14 straight male	C7 straight female	2 m
Power Cords Cable,Euro pe AC 250V10A, 1.8m,C14S M,H05VV- F- 3*1.00^2,C 13SF,PDU Cable	0405G019	CC13EU18 0	C14 straight male	C13 straight female	1.8 m
Power Cords Cable,Sout h Africa AC Power 250V2.5A, 2m,PDAM, H03VVH2- F-0.75^2(2 C),C7SF	0405G025	C0C7SA200	PD angle male	C7 straight female	2 m
Power Cords Cable,Kore a AC Power 250V10A, 3m,PFSM,H 05VV-F 3*1.0^2(3C),C13SF,Bla ck	0405G028	CC13KO30 0	PF straight male	C13 straight female	3 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cords Cable,Nort h America AC Power 250V10A, 1.8m,C14S M,SJT 18AWG(3C),C13SF,PD U Cable	0405G029	IDS2PWRC BL0A	C14 straight male	C13 straight female	1.8 m
Power Cords Cable,Japa n AC Power 250V12A, 1.8m,C14S M,HVCTF 1.25^2(3C) ,C13SF,PDU Cable	0405G02D	IDS2PWRC BL09	C14 straight male	C13 straight female	1.8 m
Power Cords Cable,Austr alia AC Power 250V10A, 1.8m,C14S M,H05VV- F-1.0^2(3C),C13SF,PD U Cable	0405G02F	IDS2PWRC BL08	C14 straight male	C13 straight female	1.8 m
Power Cords Cable,Kore a AC Power 250V10A, 1.8m,C14S M,H05VV- F-1.0^2(3C),C13SF,PD U Cable	0405G02H	IDS2PWRC BL07	C14 straight male	C13 straight female	1.8 m

Descriptio n	Part Number	Model	Connector X1	Connector X2	Cable length
Power Cords Cable,Den mark AC Power 250V10A, 3m,PKSM, H05VV- F-3*1.0^2(3C),C13SF, Black	0405G02K	CC13DE30 0	PK straight male	C13 straight female	3 m
Power Cable,Brazil AC Power Cable 250V10A, 3.0m,PNS M ,H05VV- F-1.0mm^ 2(3C),C13S F,Black	04150258	CC13BR300	PN straight male	C13 straight female	3 m

NOTICE

You must connect the AC power cable in compliance with local standards and requirements.

NOTE

- The cable with the C13 straight female X2 connector and non-C14 straight male X1 connector applies to non-desktop-mounted scenarios.
- The cable with the C13 straight female X2 connector and C14 straight male X1 connector applies to non-desktop models in PDU installation scenarios.

3.7.3 DC Power Cable

3.7.3.1 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 the USG.

● The other end is connected to an external power source.

Appearance and Structure

The DC power cables include the RTN cable, and NEG (-48 V) cable. Both the RTN and NEG (-48 V) power cables consist of the terminal blocks and cables, as shown in **Figure 3-155**.

Figure 3-155 Appearance of the DC power cable
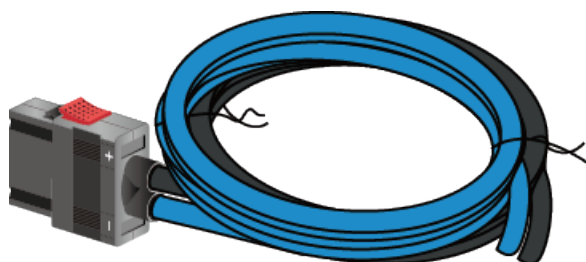
Cable Type	Color
NEG cable	Blue
RTN cable	Black

The USG provides cord end terminals and OT terminals. You can select one of them based on the actual condition.

Figure 3-156 shows the appearance of the cord end terminal.

Figure 3-156 Appearance of the cord end terminal
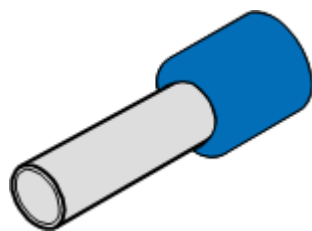
Figure 3-157 shows the appearance of the OT terminal without a cable.

Figure 3-157 Appearance of the OT terminal

Technical Specifications

Table 3-275 Technical specifications of the DC Power Cable

Description	Part Number	Model	Connector X1	Connector X2	Cable length	Bend radius
Power Cable, 3m, 12AWG,PS2F, 12UL1015B +12UL1015BL, 2*T4^2GY	04150695	DCWIREA-3M	14190215: PS2F	14170114: 2*T4^2GY	3 m	24 mm
Power Cable, 3m, 10mm^2, Blue&Black,Power Connector,-48/-60 VDC,50A, 2*H07Z-KUL3386-10mm^2, OT10-6	04153734	IPOT6-63000	14191638: power connector-2--48/-60VDC-50A-female	14170016: OT6-10	3 m	35 mm

3.7.4 Optical Fiber

3.7.4.1 Optical Fiber

Connection

Optical fibers are used for carrying signals on Gigabit networks or networks with higher packet rates. An optical fiber is a carrier of optical signals and transmits optical signals over a short distance. An optical fiber is connected as follows:

- One end is connected to the optical port on the USG through the corresponding optical module.

- The other end is connected to the optical port on the peer device.

Select optical modules and fibers based on peer device interfaces.

> **NOTICE**
>
> You are advised to use Huawei optical modules. Optical modules from other vendors may cause incompatibility issues and lead to faults on the USG.

When using optical modules and optical fibers, pay attention to the following to ensure proper communication between devices:

- Use single-mode and multi-mode optical fibers as required.
- Tx (sending) of the local device corresponds to Rx (receiving) of the peer device.
- The wavelengths of the optical modules on both ends must be the same.
- Do not overbend optical fibers. The bend radius must not be shorter than 40 mm.

> ⚠ **CAUTION**
>
> To avoid eye injuries, do not look straight at the optical transmit interface of the laser or the optical connector.

Appearance and Structure

Optical fibers are classified into single-mode and multi-mode optical fibers. Single-mode optical fibers are used for long-distance transmission whereas multi-mode optical fibers are used for short-distance transmission. Indoor single-mode optical fibers usually have a yellow jacket, as shown in **Figure 3-158**. The jacket of the LC/PC-LC/PC multi-mode optical fiber is orange, as shown in **Figure 3-159**, and that of the MPO/PC-MPO/PC multi-mode optical fiber is cyan, as shown in **Figure 3-160**. Optical fibers are not delivered with the USG. Purchase optical fibers separately as required.

Figure 3-158 Appearance of the LC/PC-LC/PC single-mode optical fiber

Figure 3-159 Appearance of the LC/PC-LC/PC multi-mode optical fiber

Figure 3-160 Appearance of the MPO/PC-MPO/PC multi-mode optical fiber

NOTICE

- To ensure the normal transmission of optical signals, do not use single-mode optical fibers to connect multi-mode optical modules, nor multi-mode optical fibers to connect single-mode optical modules.
- To connect extension optical fibers, purchase LC/PC-LC/PC adapters.

Optical fibers have multiple types of connectors. Common connectors types include LC/PC, SC/PC, FC/PC and MPO/PC.

- LC/PC connector

The procedure for inserting and removing LC/PC connectors is as follows:

– Insert and remove the connector along the axis without rotating the connector.

– When you insert the fiber, carefully insert the fiber head into the optical interface on the interface board.

– To remove the optical fiber, squeeze the pinch on the fiber connector, gently push on the fiber connector, and then pull it out.

● SC/PC connector
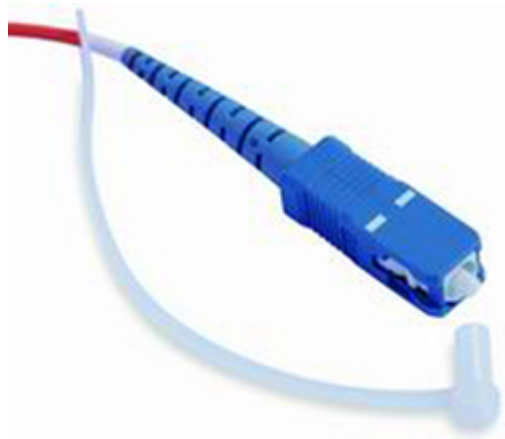
The procedure for inserting and removing SC/PC connectors is as follows:

– Insert and remove the connector along the axis without rotating the connector.

– When you insert the fiber, carefully insert the fiber head into the optical interface on the interface board.

– To remove the optical fiber, gently push on the fiber connector, and then pull out the connector.

● FC/PC connector

The procedure for inserting and removing FC/PC connectors is as follows:

– When you insert an optical fiber, aim the FC/PC connector at the optical interface on the interface board to avoid damaging the inner layer of the

optical interface. Then insert the fiber into the optical interface, rotate the outer screw jacket clockwise, and then fasten the optical connector.

– To remove an optical fiber, rotate the outer screw jacket counterclockwise on the optical interface until the screw loosens. Then gently pull out the optical fiber.

● MPO/PC optical fiber connector

Note the following points when removing and inserting an MPO/PC fiber connector:

– When inserting the connector, hold the shell labeled "PUSH" and feed the male connector into the female connector until you hear a clicking sound. The male and female connectors are securely installed.

– To disassemble the connector, hold the shell labeled "PULL" and remove the male connector.

There are four types of optical fibers for the USG: LC/PC-LC/PC, LC/PC-SC/PC, LC/PC-FC/PC, and MPO/PC-MPO/PC, which are based on the types of connectors on both ends of the fibers, as listed in **Table 3-276**.

Table 3-276 Common optical fiber types

Type	Transmission Mode	Connector	
		On the USG	On the peer device
LC/PC-LC/PC	Single-mode/ Multi-mode	LC/PC	LC/PC
LC/PC-SC/PC			SC/PC
LC/PC-FC/PC			FC/PC
MPO/PC-MPO/PC	Multi-mode	MPO/PC	MPO/PC

Technical Specifications

Table 3-277 Technical specifications of the Optical Fiber

Descripti on	Part Number	Model	Connect or X1	Connect or X2	Cable length	Bend radius
Patch Cord,SC/ PC,SC/ PC,Single -mode, 5m,G. 652D, 3mm	1413009 8	SS-OP-D- SC-S-5	SC/PC	SC/PC	5 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Single -mode, 5m,G. 652D, 2mm	1413019 3	SS-OP- LC-SC- S-5	LC/PC	SC/PC	5 m	30 mm
Patch Cord,LC/ PC-LC/ PC,Single mode,G. 652D, 2mm,5m	1413019 5	SS-OP-D- LC-S-5	LC/PC	LC/PC	5 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Single -mode, 10m,G. 652D, 2mm	1413019 6	SS-OP- LC-SC- S-10	LC/PC	SC/PC	10 m	30 mm
Patch Cord,LC/ PC,FC/ PC,Single -mode, 10m,G. 652D, 2mm	1413019 7	SS-OP- LC-FC- S-10	LC/PC	FC/PC	10 m	30 mm

Descripti on	Part Number	Model	Connect or X1	Connect or X2	Cable length	Bend radius
Patch Cord,LC/ PC,LC/ PC,Single -mode, 10m,G. 652D, 2mm	1413019 9	SS-OP-D-LC-S-10	LC/PC	LC/PC	10 m	30 mm
Patch Cord,LC/ PC,FC/ PC,Multi-mode, 10m,A1b, 2mm	1413022 1	SS-OP-LC-FC-M-10	LC/PC	FC/PC	10 m	30 mm
Patch Cord,LC/ PC,LC/ PC,Multi-mode, 10m,A1B, 2mm	1413022 2	SS-OP-D-LC-M-10	LC/PC	LC/PC	10 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Multi-mode, 10m,A1b, 2mm	1413022 3	SS-OP-LC-SC-M-10	LC/PC	SC/PC	10 m	30 mm
Optical adapter-LC/PC-LC/PC-Blue-Shell:Plas tic-Sleeve:Zir conia-Square	1413024 8	QW1P0FI BER06	LC/PC	LC/PC	-	-

Descripti on	Part Number	Model	Connect or X1	Connect or X2	Cable length	Bend radius
Patch Cord,LC/ PC,LC/ PC,Single -mode, 20m,G. 652D, 2mm	1413025 1	SS-OP-D- LC-S-20	LC/PC	LC/PC	20 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Multi- mode, 30m,A1b, 2mm	1413027 5	SS-OP- LC-SC- M-30	LC/PC	SC/PC	30 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Single -mode, 30m,G. 652D, 2mm	1413027 6	SS-OP- LC-SC- S-30	LC/PC	SC/PC	30 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Multi- mode, 20m,A1b, 2mm	1413027 9	SS-OP- LC-SC- M-20	LC/PC	SC/PC	20 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Single -mode, 20m,G. 652D, 2mm	1413028 0	SS-OP- LC-SC- S-20	LC/PC	SC/PC	20 m	30 mm
Patch Cord,LC/ PC,LC/ PC,Multi- mode, 20m,A1b, 2mm	1413029 5	SS-OP-D- LC-M-20	LC/PC	LC/PC	20 m	30 mm

Descripti on	Part Number	Model	Connect or X1	Connect or X2	Cable length	Bend radius
Patch Cord,LC/ PC,LC/ PC,Multi-mode, 5m,A1b, 2mm	1413029 6	SS-OP-D-LC-M-5	LC/PC	LC/PC	5 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Multi-mode, 50m,A1b, 2mm	1413031 1	SS-OP-LC-SC-M-50	LC/PC	SC/PC	50 m	30 mm
Patch Cord,LC/ PC,SC/ PC,Single -mode, 50m,G. 652D, 2mm	1413031 2	SS-OP-LC-SC-S-50	LC/PC	SC/PC	50 m	30 mm
Patch Cord,LC/ PC,LC/ PC,Single -mode, 6m,G. 652D, 2mm	1413036 0	SS-OP-D-LC-S-6	LC/PC	LC/PC	6 m	30 mm

Descripti on	Part Number	Model	Connect or X1	Connect or X2	Cable length	Bend radius
Optical Cable Parts,MP O/ PC,MPO/ PC,MULTI -MODE, 2m,8 CORES, 0m/ 0m,GJFH -8A1A. 2(OM3), 3.5MM,L SZH, 43MM SHORT MPO,BE NDING INSENSIT IVE	1413082 3	F00MPM P01	MPO/PC	MPO/PC	2 m	18 mm
Optical Cable Parts,MP O/ PC,MPO/ PC,Multi mode(O M3,Bendi ng Insensitiv e),30m,8 Cores, 0m/ 0m,GJFH 8A1a, 3.5mm,L SZH, 42mm Short MPO,Ind oor	1413082 3-002	FMMM0 3001	MPO/PC	MPO/PC	30 m	17.5 mm

Descripti on	Part Number	Model	Connect or X1	Connect or X2	Cable length	Bend radius
Optical Cable Parts,MP O/ PC,MPO/ PC,Multi mode(O M3,Bendi ng Insensitiv e),100m, 8 Cores, 0m/ 0m,GJFH 8A1a, 3.5mm,L SZH, 42mm Short MPO,Ind oor	1413082 3-003	FMMM1 0001	MPO/PC	MPO/PC	100 m	17.5 mm
Optical Cable Parts,MP O/ PC,MPO/ PC,MULTI -MODE, 15m,8 CORES, 0m/ 0m,GJFH -8A1A. 2(OM3), 3.5MM,L SZH, 60mm MPO,Ben ding insensitiv e	1413092 3	SS-OP-D- MPO12- M-15	MPO/PC	MPO/PC	15 m	18 mm

Description	Part Number	Model	Connector X1	Connector X2	Cable length	Bend radius
Optical Cable Parts,MPO/PC,MPO/PC,Multi-mode, 10m,8 cores,GJFH-8A1a.3(OM4), 3.5mm, 0mm,LSZH,Bending Insensitive	14134486	MPO12-MPO12-M4-10	MPO/PC	MPO/PC	10 m	17.5 mm

3.7.5 Antenna

3.7.5.1 LTE Whip Antenna

Connection

The LTE whip antenna is directly connected to the LTE antenna port of the device.

Appearance and Structure

Figure 3-161 Appearance of the LTE Whip Antenna

 NOTE

An LTE whip antenna is delivered with a router or card that provides the LTE function. It is used on an LTE antenna interface to provide LTE access.

Technical Specifications

Table 3-278 Technical specifications of the LTE Whip Antenna

Descri ption	Part Numb er	Model	Conne ctor X1	Frequ ency bands suppo rted	Maxi mum gain	Standi ng wave	Polari zation	Direct ion
Isotrop ic Anten na, 698M Hz~96 0MHz/ 1420M Hz~26 90MH z, 2.1dB i(max) (698-9 60/21 10-21 70MH z)/ 4.6dB i(max) (1710- 1990/ 2500- 2690M Hz),ve rtical, Omni, 5W,SM A-J,No Bracke t	27011 207	TN-70 2701- 1B1	SMA-J	- 698 MHz to 960 MHz - 1710 MHz to 2690 MHz	- 2dBi - 4.5dBi	2.5	Vertica l	Omnid irectio nal

3.7.6 Console Cable

Appearance and Structure

Figure 3-162 shows the appearance of a console cable.

Figure 3-162 Console cable appearance

Figure 3-163 shows the structure of a console cable.

Figure 3-163 Console cable structure
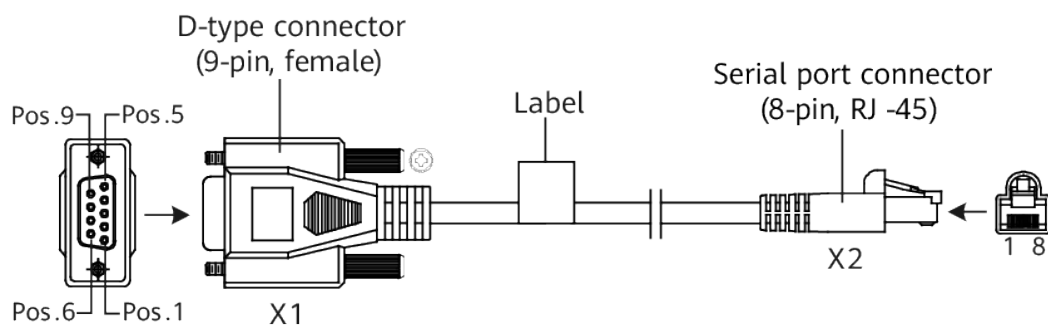
Pin Assignments

Table 3-279 lists the pin assignments of console cable connectors.

Table 3-279 Pin assignments of console cable connectors

Connector	X1 (DB9)	X2 (RJ45)
Pin assignment	2	3

Connector	X1 (DB9)	X2 (RJ45)
	3	6
	5	5

Connection

A console cable connects the console port of a switch to the serial port of a console, enabling users to commission or locally maintain the device. A shielded cable or an unshielded cable can be used according to the onsite situation.

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

- The 8-pin RJ45 connector is connected to the console port of the switch.
- The DB9 female connector is connected to a maintenance terminal, such as a computer.

3.7.7 Ethernet Cable

Types of Ethernet Cables

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

- Straight-through cable: **Table 3-280** lists the pin assignments of the RJ45 connectors on the two ends of a straight-through cable.
- Crossover cable: **Table 3-281** lists the pin assignments of the RJ45 connectors on the two ends of a crossover cable.

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 3-164 and **Figure 3-165** show the appearance of an Ethernet cable.

Figure 3-164 Ethernet cable appearance (1)

Figure 3-165 Ethernet cable appearance (2)

Figure 3-166 shows the structure of an Ethernet cable.

Figure 3-166 Ethernet cable structure
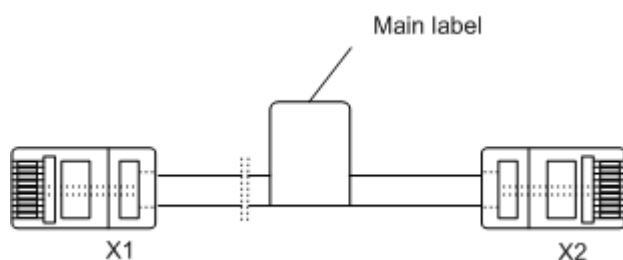
Pin Assignments

Table 3-280 lists the pin assignments of a straight-through cable.

Table 3-280 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
6	Green	6
7	White and brown	7
8	Brown	8

Table 3-281 lists the pin assignments of a crossover cable.

Table 3-281 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

X1 Pin	Wire Color	X2 Pin
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 management.

- 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 3-282 describes the supported cabling types for a 10GBASE-T Ethernet electrical port.

Table 3-282 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	Not supported	Not supported	Not supported
Type	Class F	Class Ea	Class Ea			
Maximum transmission distance	100 m	100 m	100 m			

Item	Category 7 STP	Category 6A STP	Category 6A F/UTP	Category 6A U/UTP	Category 6 STP	Category 6 UTP
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.				

☐ **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 3-283**. Bundle cables loosely, as shown in **Figure 3-167**.

  - You are advised to add no more than 12 cables in a bundle. A bundle cannot have more than 24 cables.

Table 3-283 Intervals between cable ties

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

Figure 3-167 Method to bundle cables
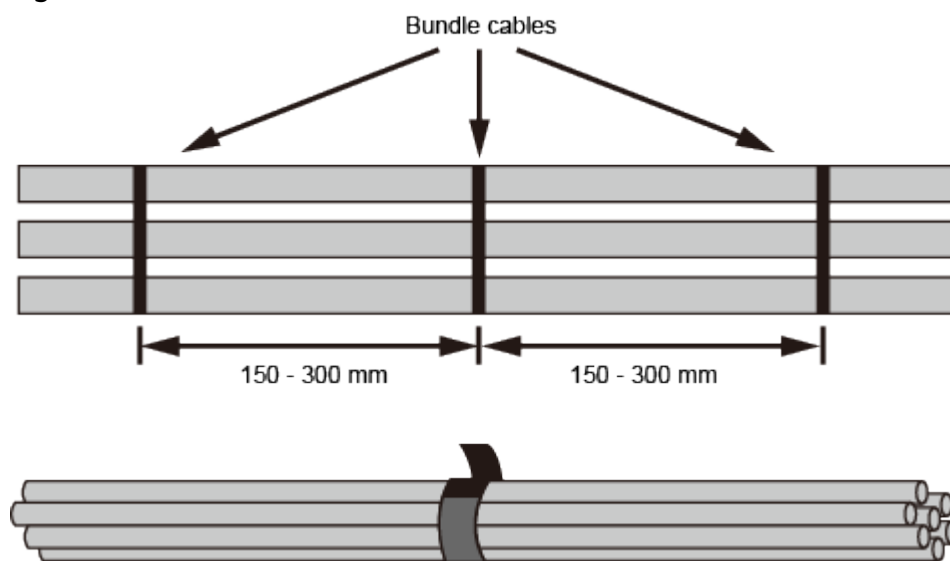
4 Hardware Installation

This chapter describes hardware installation procedures and precautions.

4.1 Installation Procedure

This section describes the installation procedure of the USG.

procedure and precaution for unpacking and checking the products before installation has started.

Figure 4-1 shows the USG devices installation procedure.

Figure 4-1 Installation flowchart
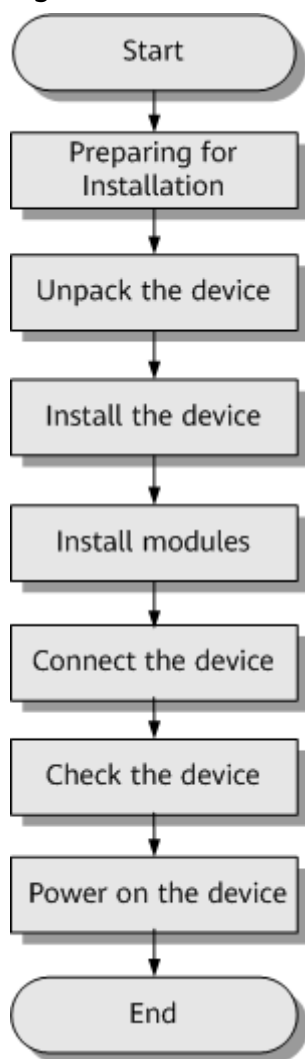
4.2 Installation Preparation

This section describes the safety precautions that you must observe and the tools that must be prepared before you install the USG.

4.2.1 Precautions

This section describes the precautions that you must observe before installing the USG. Misoperation may cause personal injury or damage to the USG.

📖 **NOTE**

This section describes common precautions related to installation. For more precautions, see *Safety and Regulatory Compliance Information*.

Safety Precautions

To ensure your own personal safety and to help protect your device from damage, observe the safety warnings on device labels and in the operation manual.

Information marked **NOTICE**, **CAUTION**, **WARNING**, and **DANGER** in the operation manual is not exhaustive, but supplements safety precautions.

Local Laws and Regulations

Comply with local laws and regulations while performing operations on the device. All safety precautions in the operation manual only supplement local safety regulations.

Basic Installation Requirements

Requirements for Huawei installation and maintenance personnel before they can perform related operations are as follows:

- Only qualified and trained engineers can install, operate, and maintain Huawei equipment.
- Only qualified professionals can remove safety facilities and troubleshoot Huawei equipment.
- Only authorized or certified personnel can replace Huawei components (including software).
- Installation and maintenance personnel must report all faults and errors that may cause safety issues to the person in charge.

Personal Safety Warnings

- Do not operate or cable the device during electrical storms.
- To avoid electric shock, do not connect the safety extra-low voltage (SELV) terminal to the telephone-network voltage (TNV) terminal.
- To avoid possible eye damage, do not look into the optical cable outlet without eye protection.
- Wear an antistatic suit, ESD gloves, and ESD wrist strap and remove any jewelry and watches before entering the equipment room to avoid possible electrical shock or injury.
- In the event of fire, evacuate the equipment room and nearby areas and pull the fire alarm or call your local emergency number.

Device Security Precautions

- Fix the device on the ground or other secure places, such as against the wall or on the mounting shelf.
- Do not block the air vent when the device is running.
- Tighten the screws with proper tools when installing the panels.
- Remove all plastic packing materials from the equipment room after the installation is complete.

4.2.2 Installation Environment Check

Before you install a USG, verify that the installation environment meets requirements to ensure the normal running and extended life time of the USG.

Table 4-1 lists installation environment check items.

Table 4-1 Installation environment checklist

Check Item	Requirement	Compliance
Ventilation and heat dissipation	Complies with requirements in **Device Position**.	□ Y □ N □ N/A
Stability		□ Y □ N □ N/A
Grounding		□ Y □ N □ N/A
Temperature	Complies with requirements in **Humidity, Temperature, and Cleanness**.	□ Y □ N □ N/A
Relative humidity		□ Y □ N □ N/A
Cleanness		□ Y □ N □ N/A
Electrostatic discharging	Complies with requirements in **ESD Requirements**.	□ Y □ N □ N/A
Surge protection	Complies with requirements in **Lightning Protection and Grounding**.	□ Y □ N □ N/A
Power supply facility	Complies with requirements in **Power Supply**.	□ Y □ N □ N/A
Electromagnetic shielding	Complies with requirements in **Electromagnetic Protection**.	□ Y □ N □ N/A

4.2.3 Instruments Required for the Installation

This section describes the instruments and meters for installing the USG.

Table 4-2 lists the required instruments and meters for USG installation.

Table 4-2 Required instruments and meters

Category	Instrument/Meter
Measuring and lineation instruments	• Ruler: used to measure length. • Marker: used to indicate specific lengths with drawn lines.
Fastening tools	• Flat-head screwdriver: used to fasten small screws and bolts. • Phillips screwdriver: used to fasten small screws and bolts.

Category	Instrument/Meter
Drilling tools	• Hammer drill: used to drill mounting holes during wall-mounting. • Vacuum cleaner: used to remove dust and debris produced while drilling holes. • Hammer: used to drive the hollow wall anchors into mounting holes.
Pliers	• Needle-nose pliers: used to hold small fittings and twist fine wires in a narrow workplace. • Diagonal cutting pliers: used to cut insulated sleeves and tie wraps.
Auxiliary tools	• Knife: used to peel the insulated sleeve from the cable. • Ladder: used to access overhead cabling.
Special tools	• Wire stripper: used to peel the insulated sleeve of the communication cable. • RJ-45 crimping tool: used to crimp RJ-45 cables for telephony and Ethernet applications. • Crimping tool: used to crimp the metal sleeve at the ends of coaxial cables. • Floating nut mounting bar: used to install floating nuts to the mounting bars of the cabinet. • ESD gloves: used to protect the device from being damaged by static electricity. • ESD wrist strip: used to protect the device from being damaged by static electricity. • Protective gloves: used to shield hands from being injury by sharp objects.
Meters	• Network cable tester: used to test whether a network cable is connected and check the connection sequence in a network cable. • Optical power meter: used to test the optical power. • Optical attenuator: used to measure optical attenuation. • Multimeter: used to test insulation within the cabinet, cable connections, and electric performance specifications of the device, such as the voltage, current, and resistance. • Ground resistance tester: used to measure the ground resistance. • Configuration terminal (A common PC is also applicable).

4.3 Installing a Desktop Device

This chapter provides the cabinet-mounting, workbench-mounting, wall-mounting, and cable connection methods of the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL.

4.3.1 Mounting a Device to a Specified Location

The USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL can be mounted in a 19-inch standard cabinet. When no cabinet is available, install the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL on a workbench or a wall.

4.3.1.1 Mounting a Device in a Cabinet

The USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL can be mounted in a 19-inch standard cabinet using mounting ears.

Precautions

Before installing the USG, check the following items:

- Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the USG is rusted or soggy. Then, investigate causes and contact the supplier.
- The cabinet is stable.
- The position for the USG in the cabinet is well arranged.
- Ensure that the USG is 1 U of clearance from any devices above and below and 150 mm of clearance from any devices on the right or left.
- The device to be installed is staged near the cabinet for convenience.

You can place either end of the USG chassis towards the front door of the cabinet. In this manual, the front panel of the USG is towards the front door of the cabinet.

Tools and Accessories

- Phillips screwdriver
- Floating nuts and matching screws
- Floating mounting bar
- Mounting ears and matching screw (purchased separately, BOM numbers: 21240477)
- Holding plate and matching screw (purchased separately, BOM numbers: 21243646)

Procedure

Step 1 Install mounting ears on the chassis.

Use a Phillips screwdriver to fix the mounting ears to both sides of the chassis with M4 screws, as shown in **Figure 4-2**.

Figure 4-2 Installing the mounting ears on the chassis
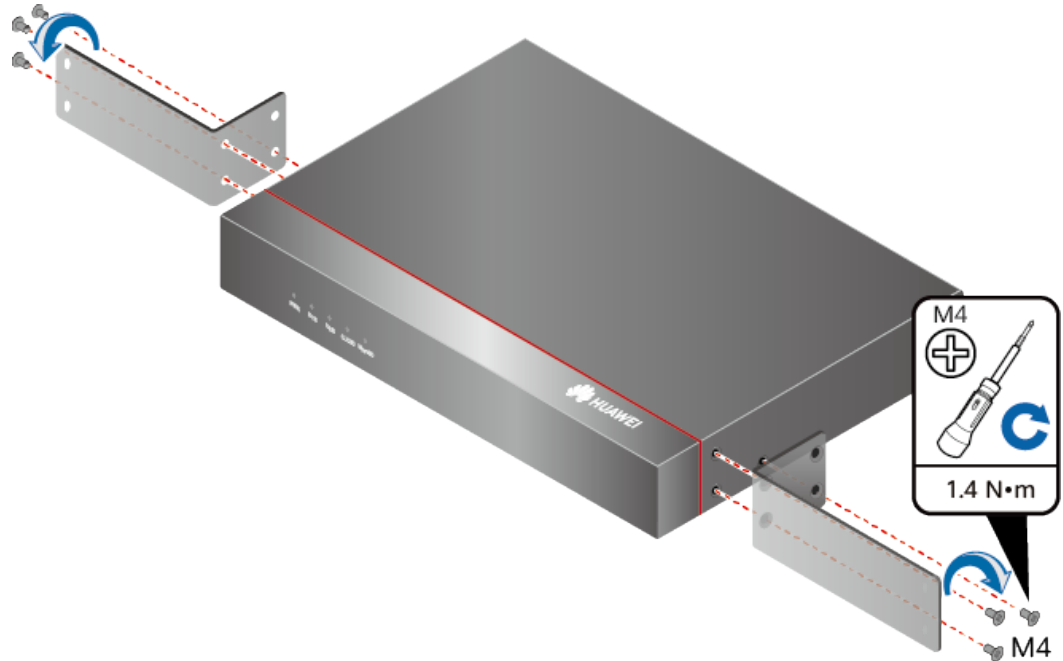
NOTE

If the tray installation mode is used, skip this step.

Step 2 Install floating nuts.

Figure 4-3 illustrates the positions of floating nuts.

Figure 4-3 Positions of floating nuts
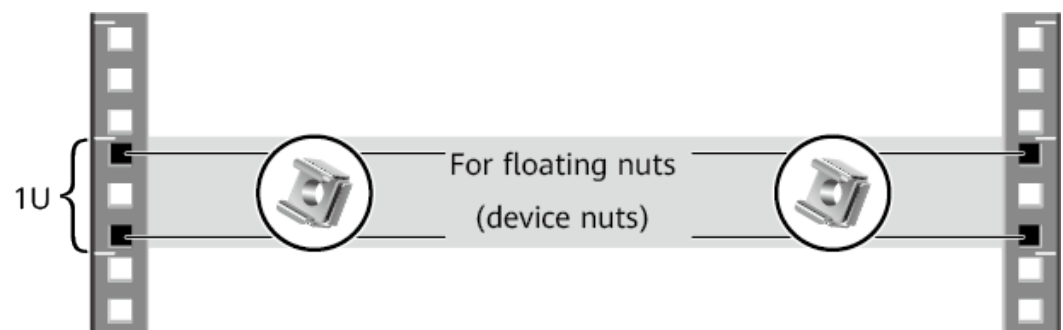
Use M6 screws to fix the floating nuts at the positions specified in **Figure 4-3**, as shown in **Figure 4-4**.

Figure 4-4 Installing floating nuts
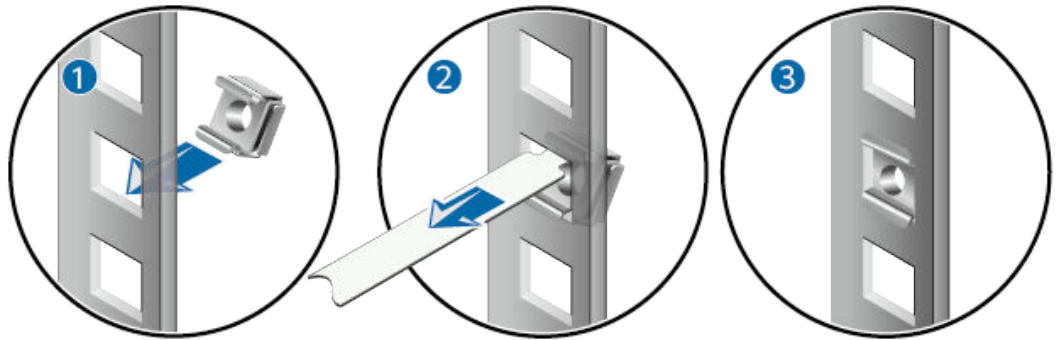
Step 3   (Optional) Install the device to a tray. For details, see the installation guide delivered with the tray.

Step 4   Mount the USG in the cabinet.

    1.   Lift the USG and move it to the cabinet.

    2.   Use a Phillips screwdriver to install M6 screws and fix the USG into the cabinet through mounting ears, as shown in **Figure 4-5**.

Figure 4-5 Mounting the USG in a cabinet
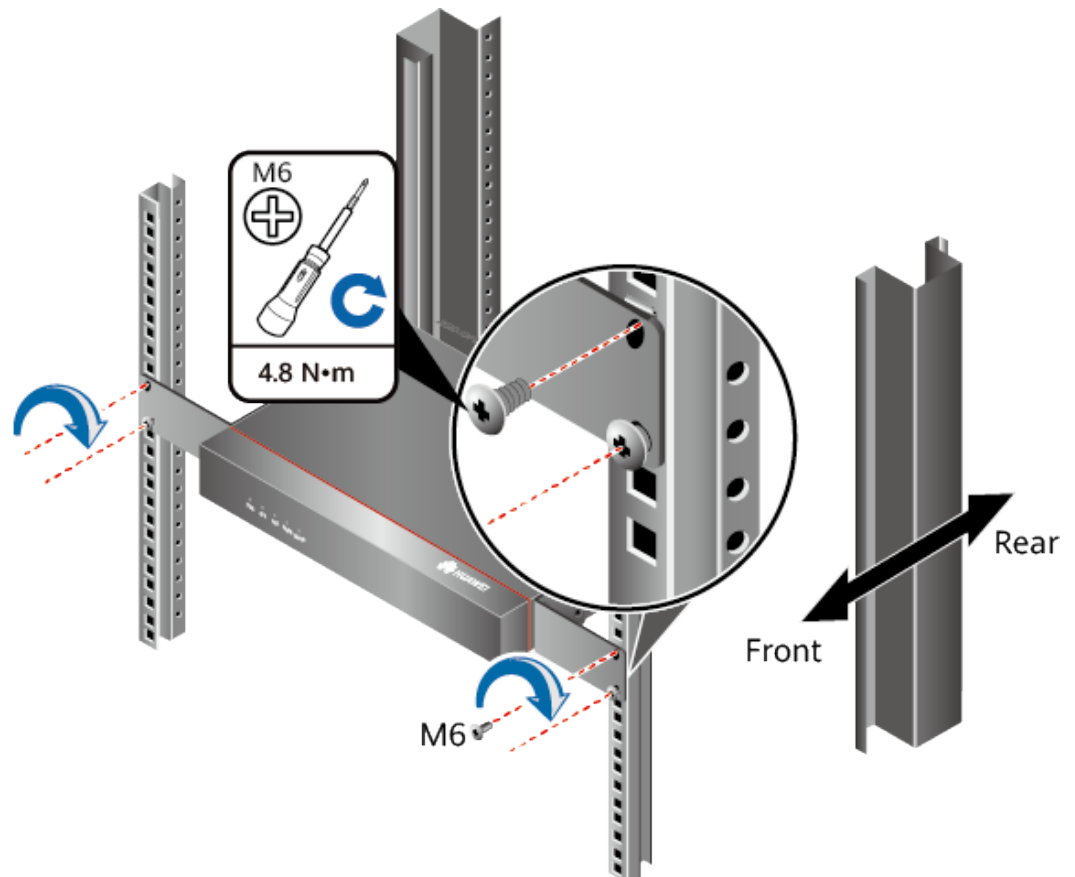
----End

Follow-up Procedure

Perform the following checks after the installation:

- Ensure that the USG is placed securely inside the cabinet.
- Ensure that the exhaust of the USG is not blocked by other objects.

4.3.1.2 Mounting a Device on a Workbench

If you do not have a cabinet, you can mount the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL on a workbench.

Precautions

Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the USG is rusted or soggy. Then, investigate causes and contact the supplier.

The workbench must be:
- Reliably grounded.
- Clean, firm, and securely installed.

Accessories

Four rubber feet

Procedure

Step 1 Fix the rubber feet to the round notches at the bottom of the USG.

☐ **NOTE**

Install foot pads at the bottom of the USG to ensure smooth contact between the USG and the workbench and avoid friction between the surface of the USG and the workbench.

Step 2 Place the USG on the workbench.

Figure 4-6 Placing the USG with rubber feet on a workbench
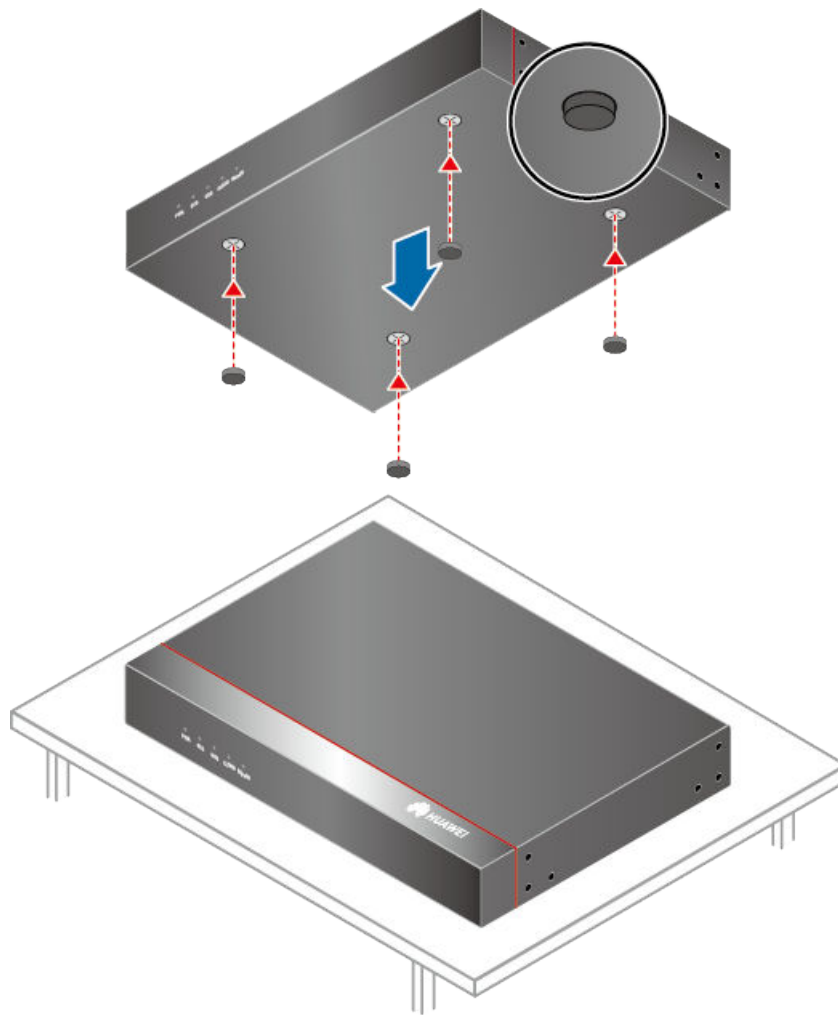
----End

Follow-up Procedure

Verify the following after the installation:

- The USG is securely placed on the workbench.
- No object blocks the exhaust of the USG, and there is at least 10 cm of distance between the USG and surrounding devices.
- There are no heavy objects on the USG.

4.3.1.3 Mounting a Device Against a Wall

When no cabinet is available, you can mount the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL on a wall. The customer must have expansion screws for wall-mounting.

Precautions

Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the USG is rusted or soggy. Then, investigate causes and contact the supplier.

Tools and Accessories

- Ruler
- Marker
- Hammer drill
- Vacuum cleaner
- Hammer
- Phillips screwdriver
- Mounting ears and matching screw (purchased separately, BOM numbers: 21240477)

Procedure

Step 1 Fix mounting ears to both sides of the panel with ports using M4 screws.

Figure 4-7 Installing the mounting ears on the chassis
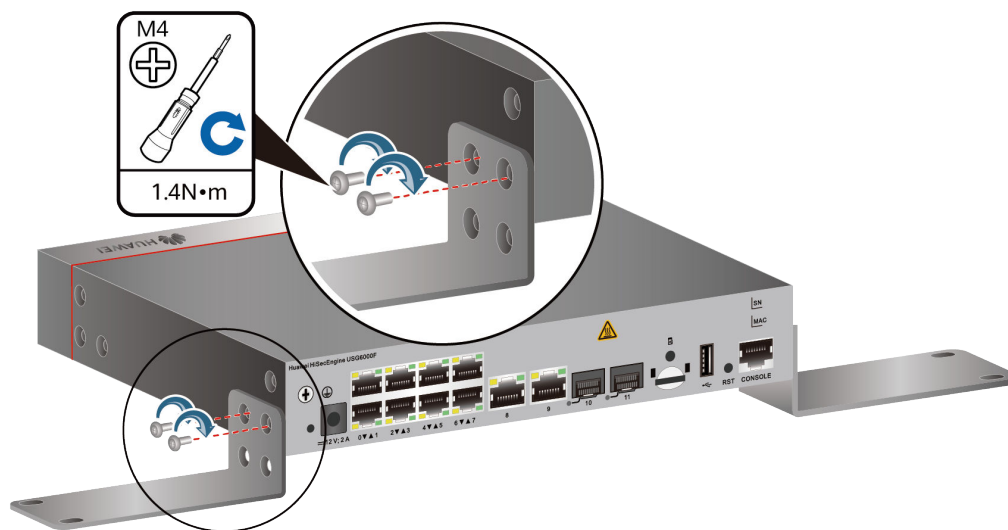
Step 2 Determine the locations of four mounting holes on the wall using a ruler and mark the mounting holes with a marker.

    📖 **NOTE**

- The wall must be a bearing wall. Otherwise, the wall is not suitable for wall-mounting.
- Ensure that the height of mounting holes is proper so that the indicators are easy to view.

Figure 4-8 Spacing between mounting holes
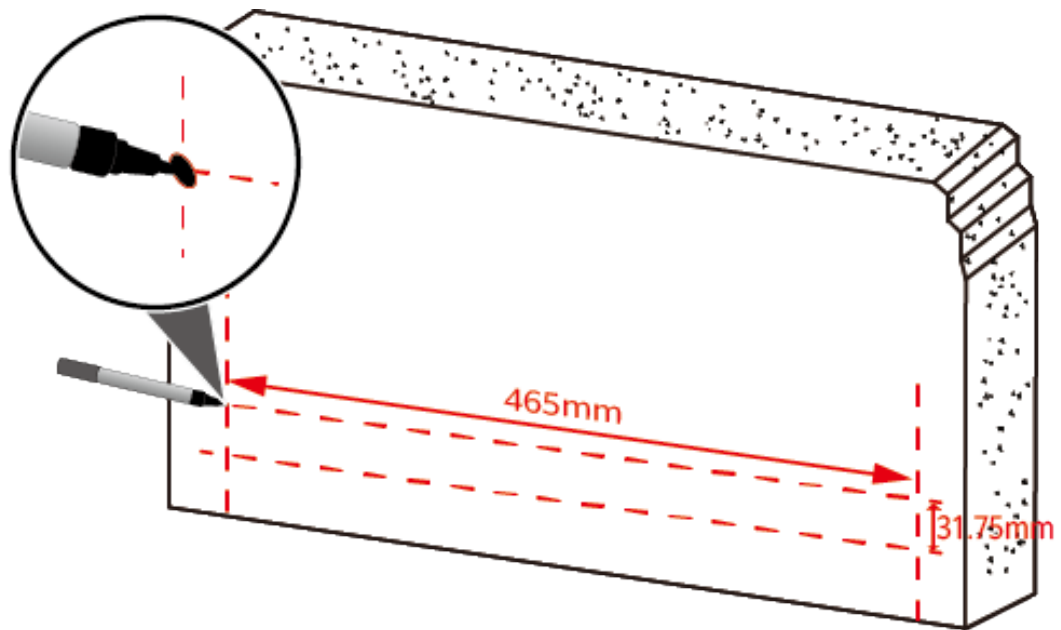
Step 3 Drill holes and install expansion bolts.

NOTICE

Ensure that the expansion bolts are secure and reliable. Otherwise, the tension after cables are connected may cause the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL to fall.

1. Use a ф8 drill bit to drill holes in the marked positions.
2. Insert expansion bolts into the holes and screw the nuts to fasten the expansion bolts.
3. Remove the nut, flat washer, and spring washer.

Figure 4-9 Drilling holes and installing expansion bolts
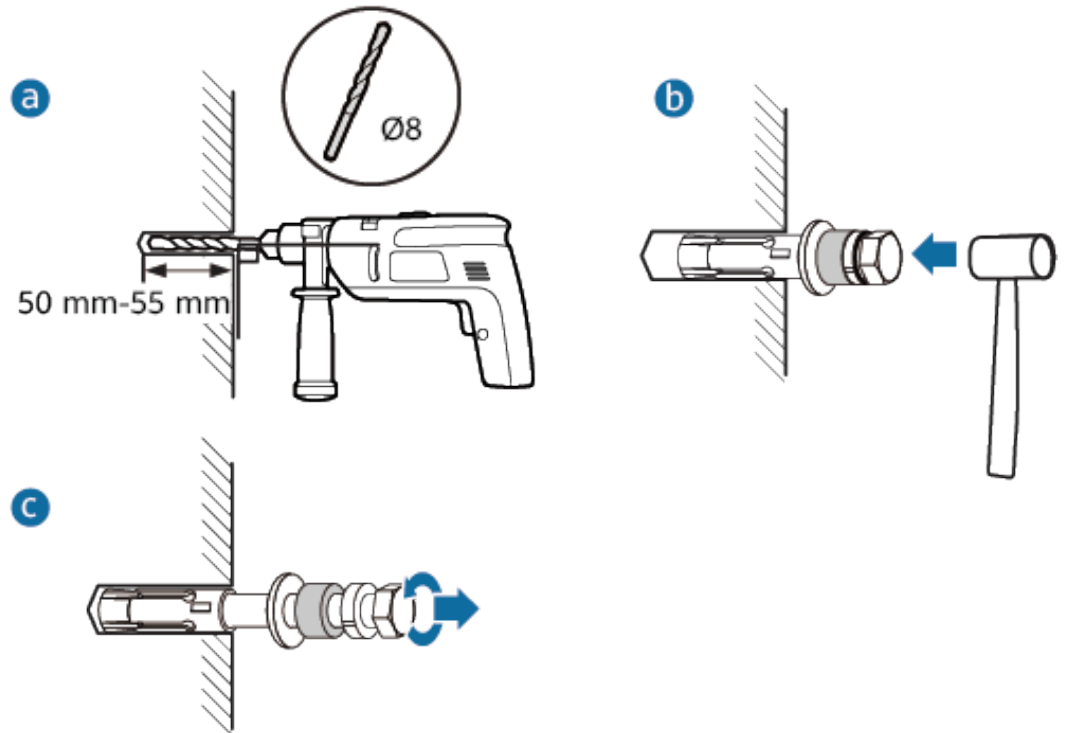
Step 4　Secure the USG on the wall and fasten the flat washers, spring washers, and nuts in order.

　　📖 **NOTE**

　　　The USG supports upward mounting and downward mounting. To prevent water from entering into ports and causing device damage, you are advised to mount the USG with ports facing downward.

Figure 4-10 Mounting the USG on a wall

----End
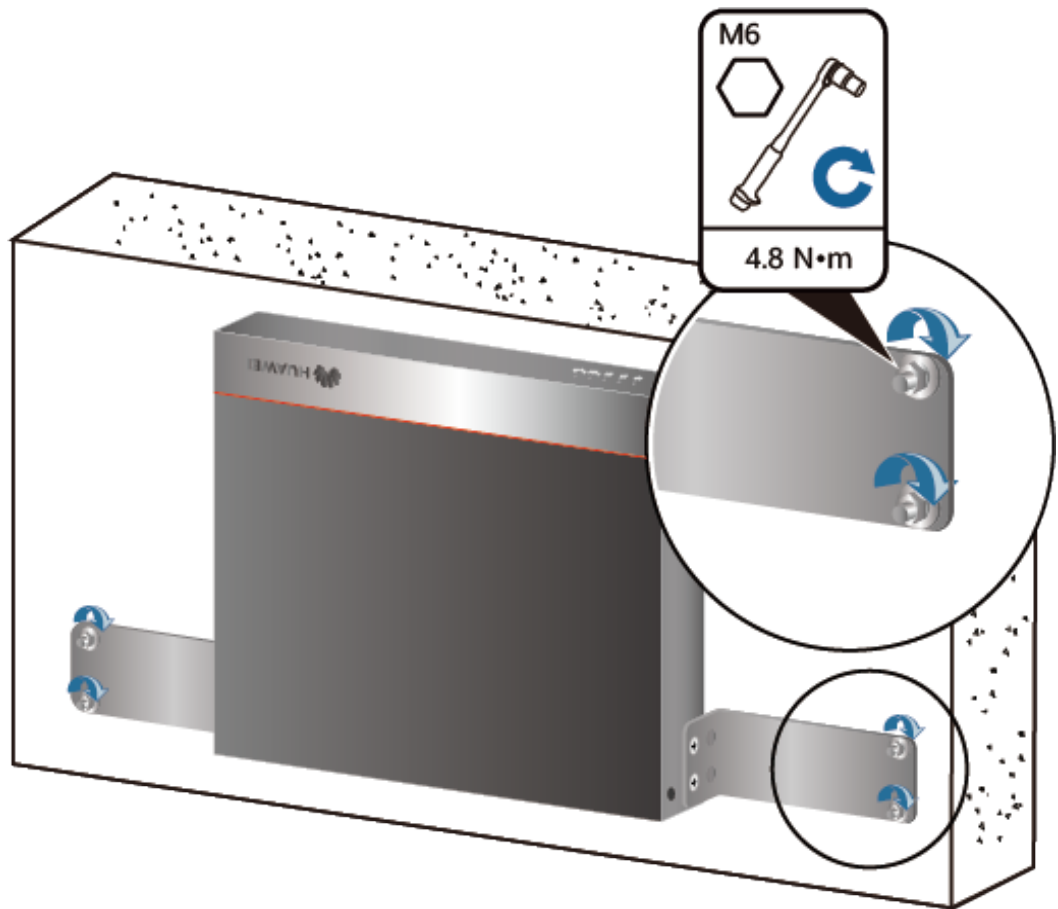
Follow-up Procedure

After wall-mounting is complete, verify that:

- The USG is securely fixed on the wall.
- A clearance of 10 cm is maintained around the USG and the air flow is not blocked.

4.3.2 Connecting a PGND Cable

Connecting the PGND cable of a USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL correctly is a key measure of surge protection and resistance to interference. Before using the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL, correctly connect the PGND cable. Otherwise, the USG may be damaged.

Precautions

The USG has been installed inside a cabinet.

Tools

- Phillips screwdriver
- Multimeter

Procedure

Step 1 Loosen and remove the screw of the ground terminal on the USG rear panel.

Step 2 Connect the OT terminal at one end of the PGND cable to the connection hole of the USG with the conducting wire upward, and tighten the M4 screw, as shown in A of **Figure 4-11**, and tighten the M4 screw. The tightening torque is 1.4 N·m.

Figure 4-11 Installing the OT terminal
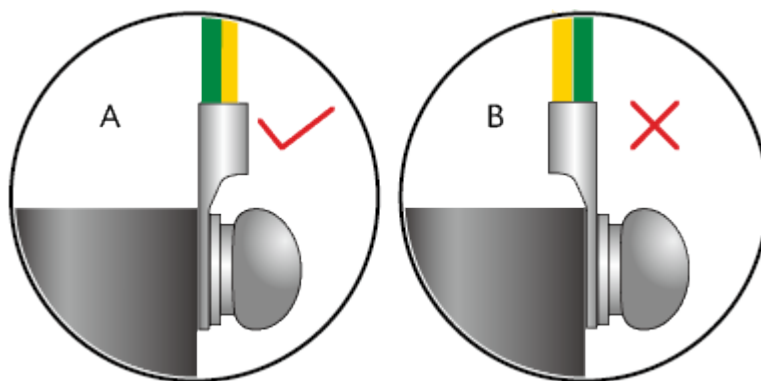
Step 3 Connect the M6 end of the PGND cable to the ground terminal of the cabinet, workbench, or wall. The tightening torque of the M6 screw is 4.8 N·m.

Figure 4-12 Connecting a PGND cable
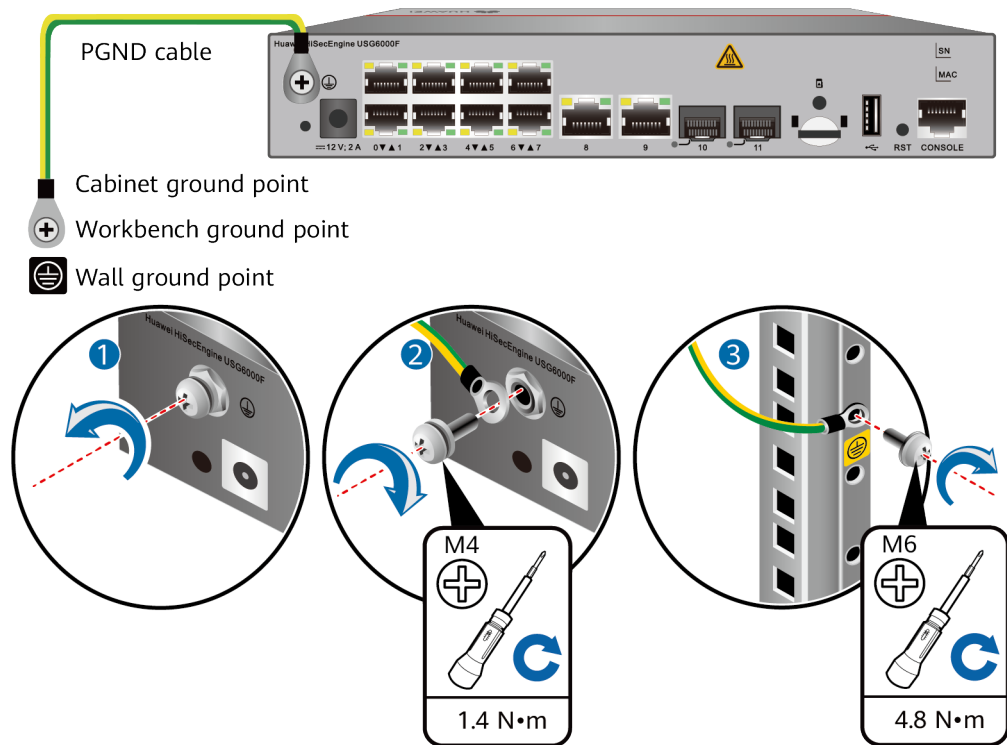
NOTICE

The OT terminal may rotate and result in device damage. Make sure that it is independent of the adjacent metal mechanical part or other terminals.

----End

Follow-up Procedure

Verify the following after the cabling is complete:

● The PGND cable is securely connected to the ground terminal.

● The electrical resistance between the ground terminal and ground point is less than 0.1 ohm on a multimeter.

4.3.3 Installing Antennas

The USG6510F-DL, USG6530F-DL provides an internal LTE module to provide the LTE access function. The LTE access functions require antennas. This section describes how to install the antennas.

Context

> **NOTICE**
>
> - Do not install the antennas when the USG is powered on to prevent USG or antenna damage.
> - The LTE antenna is quite long. You need to fasten it with cable ties during cabling.

📖 **NOTE**

The LTE whip antenna is delivered with the router installation accessory package.

Procedure

Step 1 Determine the interfaces for installing the antennas. The interfaces with the "LTE-DIV" and "LTE-MAIN" silkscreens are the interfaces for installing the LTE antenna.

Step 2 Install the antennas.

1. Take off the protective cap of the antenna connector.

2. Install the antenna into the antenna connector of the USG.

3. Adjust the direction of the antenna. In different scenarios, the directions of the antennas are different. When the USG is installed in a cabinet on the workstation, the antenna should be vertical to the floor. When the USG is mounted to a wall, the antenna should be vertical to the wall.

----End
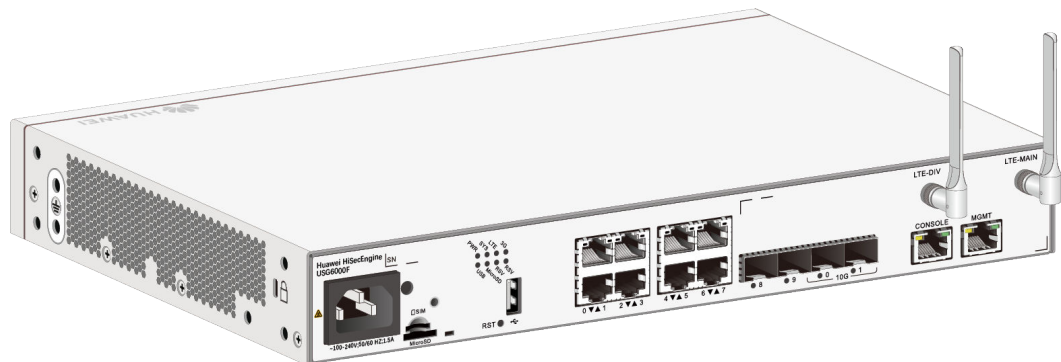
Follow-up Procedure

After the antennas are installed, do as follows:

- Before the USG is powered on: Check whether the cables and connectors are free of damage or breakage and are connected properly.

- After the USG is powered on: Run the **display cellular** command in any view to check the **Current RSSI** value. If the value is greater than -75 dbm, the signal is good. Otherwise, adjust the antennas.

4.3.4 Installing a Micro SD Card

This section describes how to install a micro SD card for the first time to avoid damages.

Precautions

- Micro SD cards are optional and are not delivered with the device. If required, purchase the micro SD card (part number: 06010308) from Huawei. The micro SD card model is SDSDQAE-064G, the capacity is 64 GB, and dimensions (H x W x D) are 1 mm x 15 mm x 11 mm (0.04 in. x 0.59 in. x 0.43 in.).

- The micro SD card can be installed no matter the device is powered off or the device is running. The installation methods are the same. In this section, the micro SD card is installed when the device is powered off.

- To replace the micro SD card when the USG is powered on, you must run the **disk offline** command in the system view first. After the system displays a message indicating that the micro SD card is offline, remove the micro SD card. Otherwise, the micro SD card might be damaged, and the data may be lost. For details, see **Replacing a Micro SD Card**.

- Make sure that you have worn an ESD wrist strap and the strap is well grounded before you hold the micro SD card. Otherwise, the micro SD card may be damaged.

Tools

- Phillips screwdriver
- ESD wrist strap

Procedure

Step 1 Determine the slot (the slot with a "micro SD" mark on the rear panel) for installing the micro SD card.

Step 2 Install the micro SD card and anti-theft board.

> **NOTE**
>
> - Note that the micro SD card must be installed with the face with words upwards.
> - Do not use too much force; otherwise the micro SD or micro SD card slot might be damaged.

1. Insert the micro SD along the guide rail to the micro SD card slot.
2. When you hear a click, the micro SD card is in position.
3. Hook the locating hook on the anti-theft board to the locating hole of the rear panel and tighten the captive screw on the anti-theft board.

Figure 4-13 Installing the micro SD card and anti-theft board

　　　　　----End
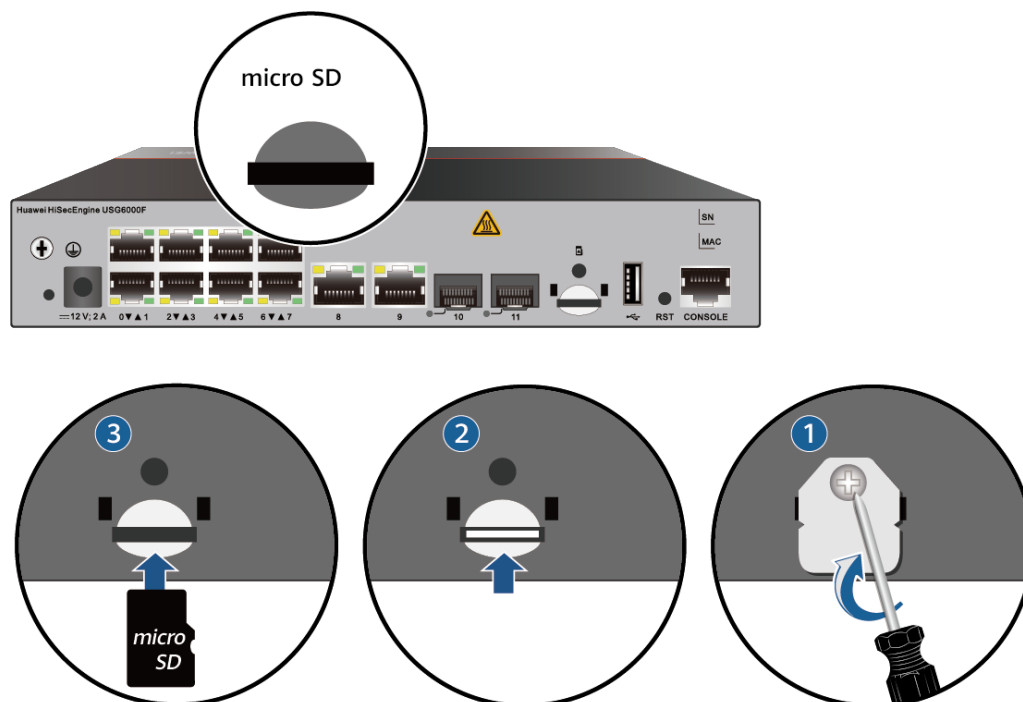
Follow-up Procedure

After the micro SD card is installed, power on the USG and run the **display device disk** command in diagnostic view to check the micro SD card installation and file system mounting status. If **Present** is Present , **Power** is On and **Register** is Registered, the micro SD card is working properly.

- If **Present** is Absent, re-install the micro SD card and try again. If **Present** remains the same, the USG may fail to identify the micro SD card. You are advised to use another micro SD card.

- If **Register** is UnRegistered, the micro SD card format might not be **ext4.** You need to run the **format disk partition** command in the system view to format the micro SD card.

4.3.5 Installing a SIM Card

Precautions

The USG6510F-DL, USG6530F-DL provides an internal LTE module which provides the LTE access function. To use the LTE access function, install the SIM card as instructed.

- The USG6510F-DL, USG6530F-DL supports standard Nano SIM cards. Exercise caution when you remove and insert the SIM card.

- The USG6510F-DL, USG6530F-DL supports 4G LTE, 3G UMTS, and 2G GSM SIM cards. You need to purchase the corresponding SIM card.

NOTICE

- SIM cards are not hot swappable. Therefore, do not install the SIM card when the USG is powered on. Otherwise, the SIM card may be damaged or the function may become invalid.
- Make sure that you have worn an ESD wrist strap and the strap is well grounded before you hold the SIM card. Otherwise, the SIM card may be damaged.

Tools

- Phillips screwdriver
- ESD wrist strap

Procedure

Step 1 Determine the slot (the slot with a $\square$SIM silkscreen on the rear panel) for installing the SIM card.

Step 2 Install the SIM card and anti-theft board.

NOTE

- Keep the notch on the SIM card in the same direction as the notch marked on the left of the SIM card slot.
- Do not use too much force; otherwise the SIM card or SIM card slot might be damaged.
- The anti-theft board is delivered with the device and can be used to protect both the micro SD card and SIM card. If both the micro SD card and SIM card need to be installed, you are advised to install both the cards before installing the anti-theft board.

1. Insert the SIM card along the guide rail to the SIM card slot.
2. When you hear a click, the SIM card is in position.
3. Hook the locating hook on the anti-theft board to the locating hole of the rear panel and tighten the captive screw on the anti-theft board.

Figure 4-14 Installing the SIM card and anti-theft board

----End
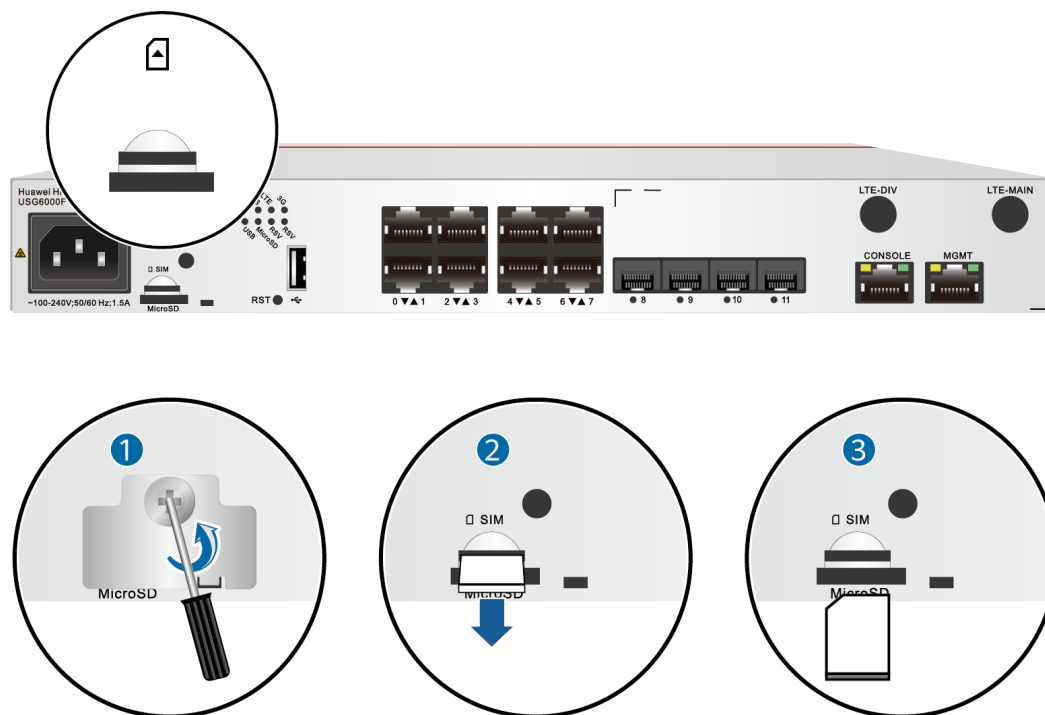
Follow-up Procedure

After the SIM card is installed and the USG is powered on, run the **display cellular** command in any view to check the SIM card status. If **SIM Status** in the command output is **Normal**, the SIM card is working properly and has been identified by the USG.

4.3.6 Connecting a Console Cable

After connecting a PC to the console port of a USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL with a console cable, you can use the terminal emulation program on the PC to access the command configuration interface of the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL.

Precautions

Before connecting a console cable, perform the following operations:

● Check preparations.

A PC is ready, a USG has been installed, and the ports to be connected are planned.

● Prepare cable labels.

Before cable connection, labels must be prepared for the cable.

> **NOTICE**
>
> ● Make sure that the PC and the USG are connected to the same ground point. Otherwise, the console port of the USG may be damaged.
>
> ● Pay attention to port numbering and make sure that the cable is connected to the correct port, preventing damage to ports or the device.

Tools

Console cable (prepared by the user)

Procedure

Step 1 Before connecting a console cable, attach temporary labels to both ends of the cable for identification.

Step 2 Connect the RJ45 connector of the console cable to the console port (RJ45) of the USG.

Step 3 Connect the DB9 connector of the console cable to the COM port of the management PC.

Figure 4-15 Connecting a console cable to the USG
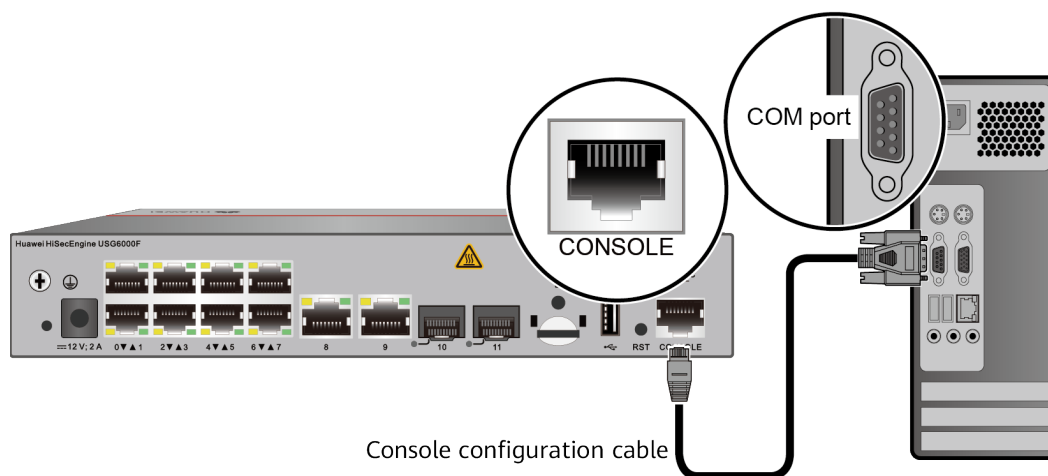
Step 4 Remove the temporary labels and attach labels 2 cm away from connectors at both ends of the console cable.

----End

Follow-up Procedure

After the cable connection is complete, verify that:

● The labels at both ends of a cable are correct, clear, neat, and facing the same direction.

● Cables and connectors are free of damage or breakage and are connected properly.

For details on the console login, refer to the Configuration Guide.

4.3.7 Connecting an Ethernet Cable

Based on the network plan, you can connect one end of an Ethernet cable to the Ethernet port of a USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL and the other end to the Ethernet port of the peer device.

Context

Before connecting the Ethernet cable, perform the following operations:

● Check construction conditions.

The peer device has been installed in the equipment room, and the port to which the Ethernet cable is to be connected has been determined.

● Check the cabling route.

The engineering document should specify the cabling route from the cabinet to the peer device in the equipment room, and the length of the cable is calculated based on the cabling path.

● Label the cable.

The cable must be labeled before being connected to the devices.

> **NOTICE**
>
> ● Only shielded cables are supported on the USG.
> ● Before connecting a cable, note the label on the port and make sure that the cable is inserted into the correct port. Otherwise, the port module or the device might be damaged.

Procedure

Step 1 If multiple network cables need to be connected, attach temporary labels to both ends of each cable for identification.

Step 2 Connect one end of an Ethernet cable to the Ethernet port of the USG and the other end to the Ethernet port of the peer device based on the network plan.

Figure 4-16 Connecting an Ethernet cable
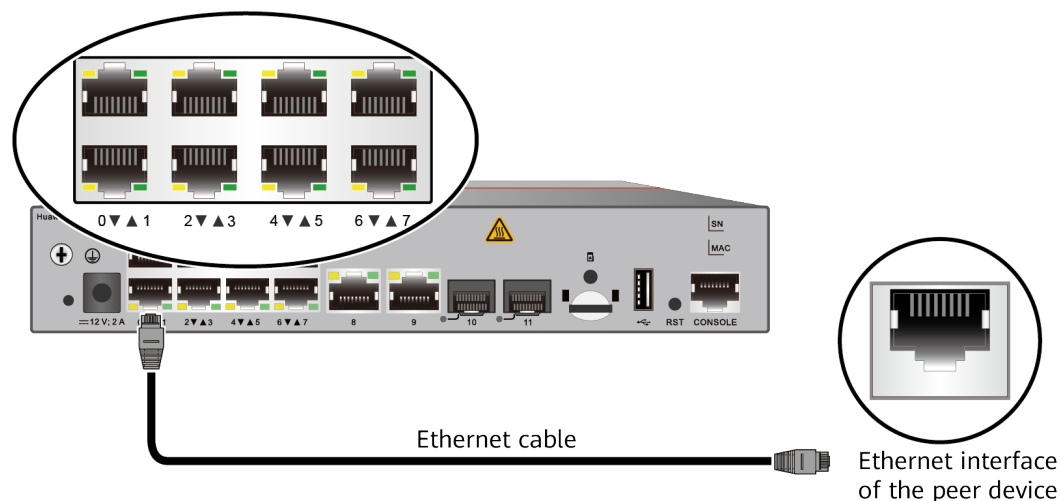
Step 3　Lay out the Ethernet cable along a cabinet and route the cable through the cable hole for the signal cables at the top (overhead cabling) or bottom (underfloor cabling) of the cabinet.

Step 4　Remove the temporary labels and attach labels (2 cm away from connectors) at both ends of the Ethernet cable.

----End

Follow-up Procedure

Verify the following after the installation:

- The labels at both ends of the cable are correct, clear, neat, and facing the same direction.
- The cables and connectors are free of any damage or breakage and are connected properly and reliably.

4.3.8 Installing Optical Transceivers and Connecting Optical Fibers

This section describes how to install optical transceivers on the SFP or SFP+ ports and connect them to the ports of the peer device using optical fibers according to the network plan.

Context

The USG supports both 1 Gbit/s optical modules. The optical modules at both ends are the same, including the optical fiber type (single-mode or multi-mode), optical fiber connector type (LC/PC, SC/PC, FC/PC, or MPO/PC-MPO/PC), and transmission rate. If different optical modules are used at the two ends, the communication may fail.

NOTICE

Huawei optical modules are recommended. The optical modules from other vendors may cause faults on the USG due to incompatibility.

⚠ **CAUTION**

Do not look into the optical interface of the optical module or the optical fiber connector without eye protection.

Before connecting optical fiber cables, read the following precautions:

- Do not overbend optical fibers, and the radius should not be shorter than 40 mm.
- Do not bundle the optical fibers too tight. Otherwise, the transmission performance of the optical fibers and the communication between devices might be adversely affected.

Before connecting optical ensure the following:

- The optical module has been installed.

Procedure

Step 1 Insert an optical transceiver into the SFP or SFP+ port of the USG.

Step 2 Remove the dust cap from the optical transceiver.

📖 **NOTE**

> Set aside the dust cap properly for future use. After optical fiber are disconnected for maintenance, use the dust cap to prevent the optical transceiver from dust.

Step 3 Before connecting an optical fiber, attach temporary labels to both ends of the optical fiber for identification.

Step 4 Remove protective caps from optical fiber connectors, insert optical fibers into the optical transceiver, and connect the fiber to the peer device.

📖 **NOTE**

> Ensure that the Tx and Rx ports are correctly connected.

Ensure that the TX and RX ports on one end of the optical fiber cable are connected to the RX and TX ports (respectively) on the other end.

Figure 4-17 Installing optical transceivers and connecting optical fibers

Optical fiber

Optical interface
of the peer device

Step 5 Repeat **Step 1** to **Step 4** to install all optical transceivers and connect all optical fibers.

----End

Follow-up Procedure

After you power on the USG, check the connection by observing the optical port indicator. If the indicator is on or blinks, the link is connected or data is being transmitted. If the indicator is off, the link is disconnected. Possible causes for the disconnection are as follows:

- The optical fiber is improperly inserted. Pull out the optical fiber and re-insert it.
- The RX and TX optical ports are inserted reversely. Pull out the optical fibers, change their position, and re-insert them.
- The optical module is damaged or the optical fiber is broken. Replace the optical module or the optical fiber.

4.3.9 Connecting a Power Adapter

A power adapter can be used to supply power for a USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL. Prepare an AC power cable to connect the power connector and the power source of the equipment room.

Context

Before connecting a power connector, ensure that the power source of the equipment room meets the input requirements of the USG power module.

Procedure

Step 1 Ensure that the PGND cable is properly grounded.

Step 2 Insert a cable-retention clip into the jack next to the power socket.

Step 3 Connect a power adapter.

1. Plug the C7 plug of the AC power cable into the C14 socket of the power adapter.

2. Insert the tuning fork plug connector of the power adapter into the power socket on the USG rear panel and adjust the cable-retention clip to an appropriate position.

3. Use a cable-retention clip to bundle the cable of the power adapter and adjust the cable-retention clip to fasten the cable.

4. Plug the other end of the AC power cable to the AC power socket or the output of the AC power supply device.

    ☐ **NOTE**

    The USG does not have any power switch. The power supply switch determines the power-on and power-off of the USG.

Figure 4-18 Connecting a power adapter to the (USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL)
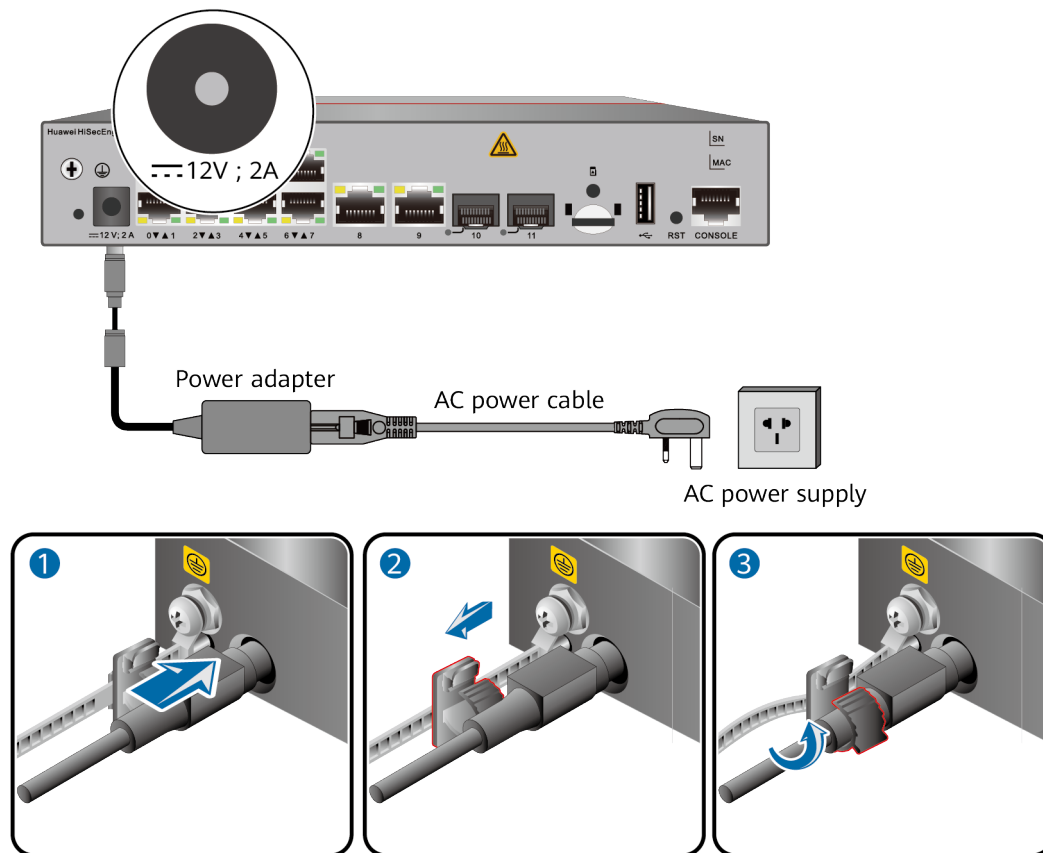
----**End**

Follow-up Procedure

Verify the following after the connection is complete:

- The power cable is firmly connected to the power supply socket.
- If multiple USGs are deployed, the power cables of each USG are correctly labeled for distinction.

4.3.10 Powering On or Off the

This section describes how to power on or off the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL. To ensure the normal start and security of the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL, strictly follow the operation guide to power on or off the USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL.

Context

Before you power on the USG, ensure that:

- The power cable and PGND cable are properly connected.
- The power switch in the equipment room is easy to locate so that you can power off devices in the case of accidents.

Procedure

- Power on the USG.

  The USG starts after the switch of the power supply device is turned on.

  You can identify the USG status based on indicators on the front panel. Indicators shown in **Figure 4-19** indicate that the USG is running normally.

  Figure 4-19 Indicators when the USG runs normally
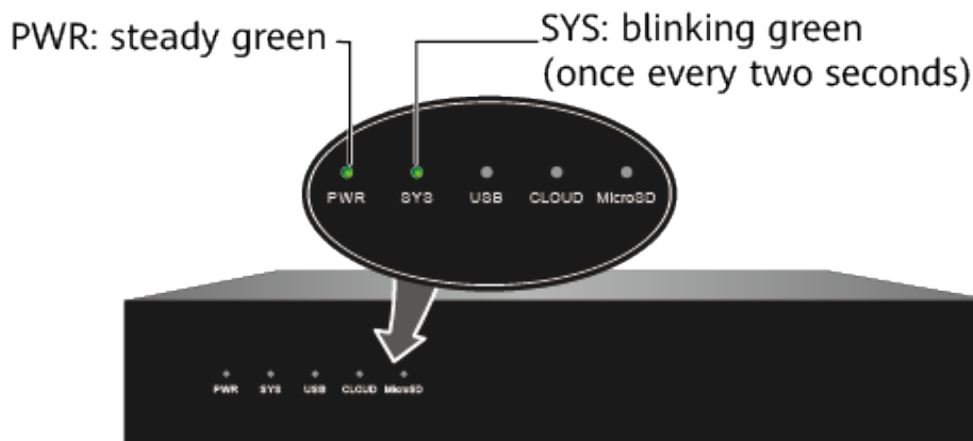
- Power off the USG.

  > **NOTICE**
  >
  > Before powering off the USG, ensure that configuration data is saved. Otherwise, the configuration data may be lost.

  If the USG will be administratively shut down for a long time, turn off the power switch. After powering off the USG, set it aside properly according to storage requirements.

  ----End

Follow-up Procedure

After the USG is powered on, you can log in to the configuration page for management and maintenance. For details, refer to the Configuration Guide.

4.4 Installing a 420 mm Deep Device

This chapter provides the cabinet-mounting, component installation, and cable connection methods of the USG6525F, USG6555F, USG6565F, USG6585F, USG6615F, USG6625F, USG6635F, USG6655F, USG6685F series.

4.4.1 Mounting a Device to a Specified Location

4.4.1.1 Mounting a Device in a Cabinet
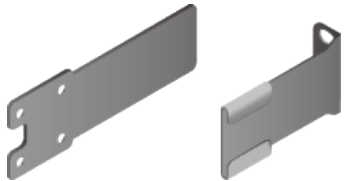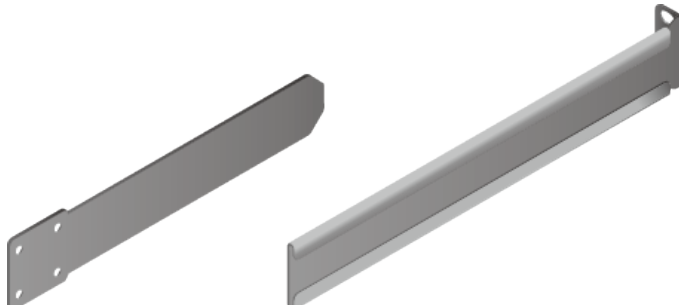
Install the USG to the cabinet through the expandable rear mounting ears or adjustable guide rails.
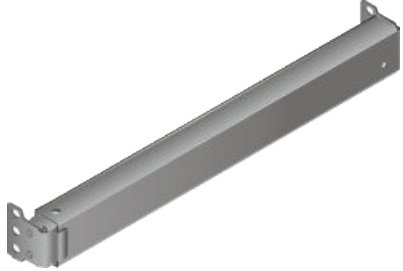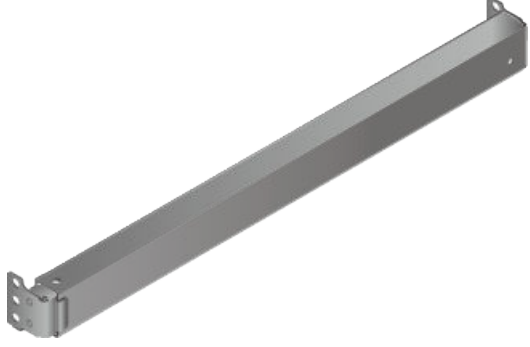
Precautions

Before installing the USG, check the following items:

- Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the is rusted or soggy. Then, investigate causes and contact the supplier.

- The cabinet is stable.

- Before installing the expandable rear mounting ears or adjustable guide rails on the USG, adjust the distance between the front and rear angle gauges (rack mounting rails/vertical columns) to satisfy the installation requirements. The specific scope of application is as follows:

Table 4-3 Expandable rear mounting ears and adjustable guide rails

Distance Between the Front and Rear Mounting Bars and Cabinet Type	Expandable Rear Mounting Ears and Adjustable Guide Rails
Expandable rear mounting ears (BOM number: 21240492) - Distance between the front and rear mounting bars: 310 mm to 538 mm - Cabinet depth: 600 mm to 800 mm	
Expandable rear mounting ears (BOM number: 21240537) - Distance between the front and rear mounting bars: 638 mm to 835 mm - Cabinet depth: 1000 mm to 1200 mm	

Distance Between the Front and Rear Mounting Bars and Cabinet Type	Expandable Rear Mounting Ears and Adjustable Guide Rails
Adjustable guide rails (BOM number: 21242247) ● Distance between the front and rear mounting bars: 370 mm to 585 mm ● Cabinet depth: 600 mm to 800 mm	
Adjustable guide rails (BOM number: 21242246) ● Distance between the front and rear mounting bars: 500 mm to 850 mm ● Cabinet depth: 1000 mm to 1200 mm	

- The position for the USG in the cabinet is well arranged. Ensure that the USG is 1 U of clearance from any devices above and below and 150 mm of clearance from any devices on the right or left.
- The USG to be installed is staged near the cabinet for convenience.
- In the front view, the air flow of the USG is front to rear. If the USG and a device whose air flow is rear to front must be mounted in the same cabinet, maintain certain spacing between them to prevent hot air recirculation.

You can place either end of the USG chassis towards the front door of the cabinet. In this manual, the front panel of the USG is towards the front door of the cabinet.

☐ NOTE

The method of installing expandable rear mounting ears (BOM number: 21240492) is the same as that of installing expandable rear mounting ears (BOM number: 21240537). The following uses the expandable rear mounting ears (BOM number: 21240492) as examples.

Tools and Accessories

- Phillips screwdriver
- Floating nuts and matching screws

- Floating mounting bar

- Front mounting ears and corresponding screws

- Expandable rear mounting ears and corresponding screws (purchased separately, BOM numbers: 21240492 and 21240537)

- Adjustable guide rails and matching screws (purchased separately, BOM numbers: 21242247 and 21242246)

Procedure
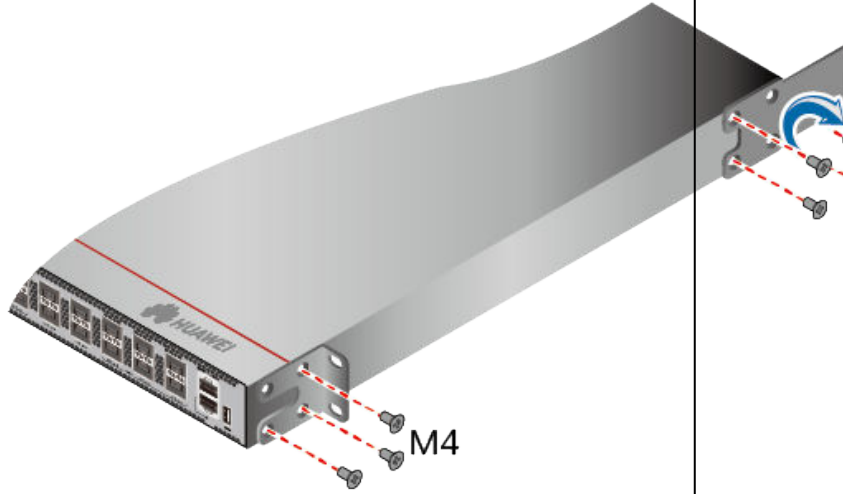
Step 1 Install mounting ears on the chassis.
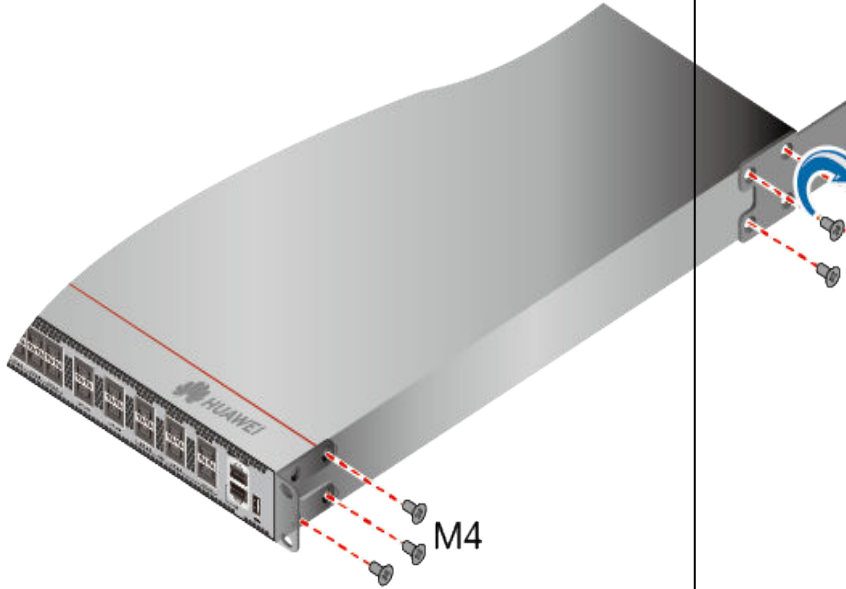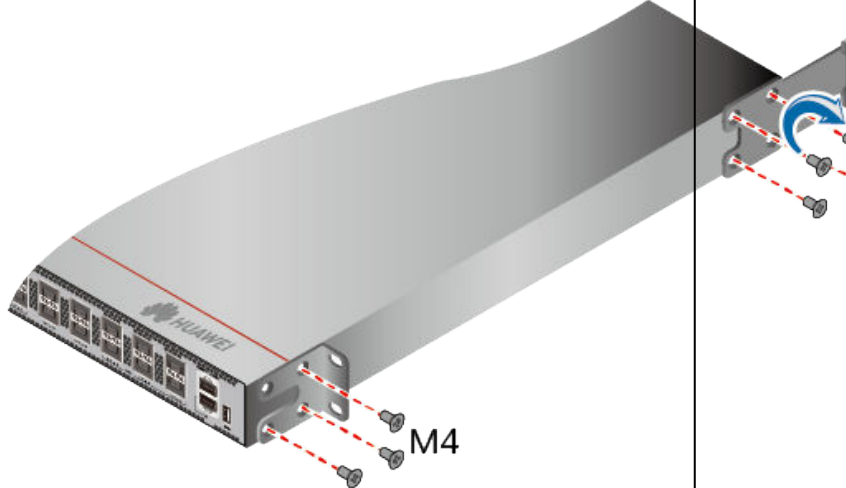
Use a Phillips screwdriver to fix the mounting ears to both sides of the chassis with M4 screws. The maximum torque is 1.4 N m. For details about how to install the mounting ears, see the installation methods in **Table 4-4**.
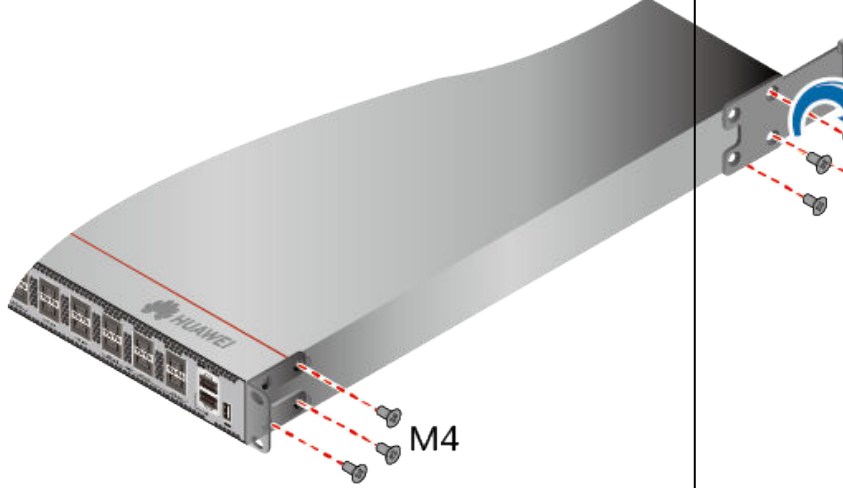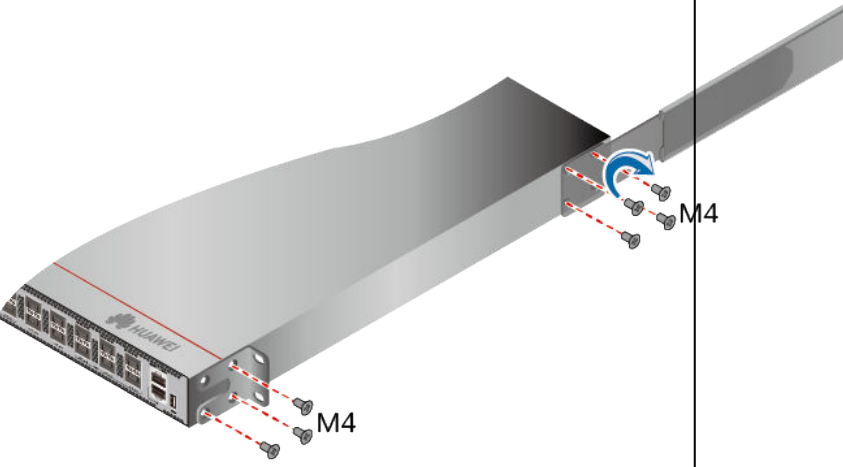
📖 NOTE
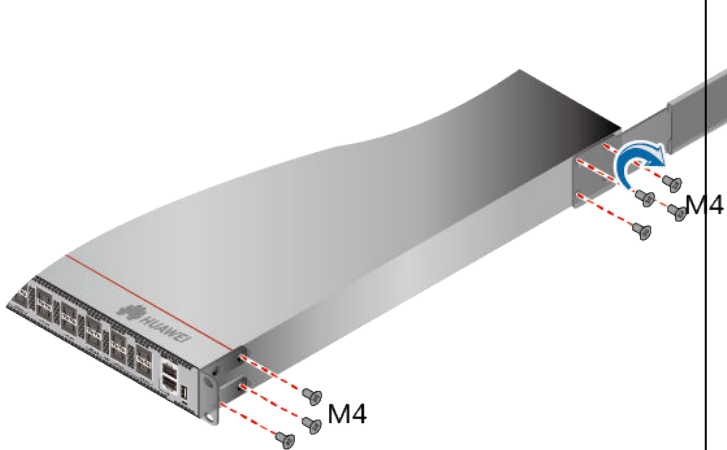
- The front mounting brackets, rear mounting brackets, and rear mounting bracket guide rails must be installed on both sides of the USG. **Table 4-4** shows the installation on one side. Install them on the other side in the same way.

- To ensure sufficient cabling space, reserve at least 130 mm of vertical distance from the USG's port side to the interior side of the cabinet door.

- After the installation is complete, the rear mounting brackets and rear mounting bracket guide rails will not block cables routed from the ports or touch the cabinet door.

Table 4-4 Installation of front and rear mounting ears

Distance Between Front and Rear Mounting Rails	Installation of Front Mounting Brackets, Rear Mounting Brackets, and Rear Mounting Bracket Guide Rails
310 mm to 351 mm	

Distance Between Front and Rear Mounting Rails	Installation of Front Mounting Brackets, Rear Mounting Brackets, and Rear Mounting Bracket Guide Rails
369 mm to 410 mm	
438 mm to 479 mm	

Distance Between Front and Rear Mounting Rails	Installation of Front Mounting Brackets, Rear Mounting Brackets, and Rear Mounting Bracket Guide Rails
497 mm to 538 mm	
638 mm to 696 mm	

Distance Between Front and Rear Mounting Rails	Installation of Front Mounting Brackets, Rear Mounting Brackets, and Rear Mounting Bracket Guide Rails
697 mm to 835 mm	

Step 2 Install floating nuts and cabinet guide rails.

1. Determine the positions for installing the guide rails and floating nuts, as shown in **Figure 4-20**.

NOTICE

Install the two guide rails at the same height to ensure that the device is level.

Figure 4-20 Positions of floating nuts
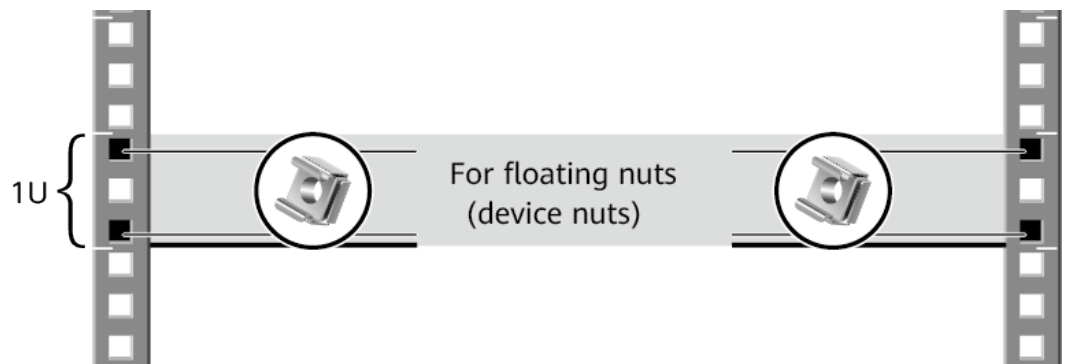
2. Install the floating nuts that match M6 screws at the positions marked in **Figure 4-20**. **Figure 4-21** illustrates how to install a floating nut.

Figure 4-21 Installing floating nuts
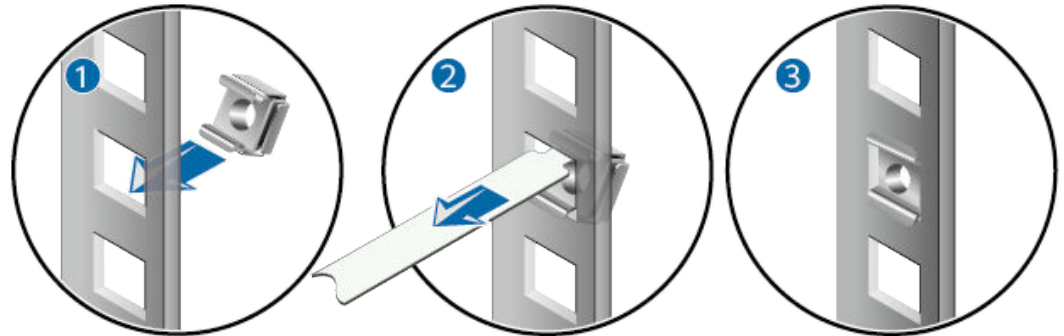
3. Install guide rails in the correct direction. Identify the left and right guide rails, and the front and rear ends of each guide rail.

   Fix expandable rear mounting ears and adjustable guide rails (at the positions marked in **Figure 4-20**) to the left and right of the cabinet with M6 screws, as shown in **Figure 4-22**.

Figure 4-22 Installing guide rails
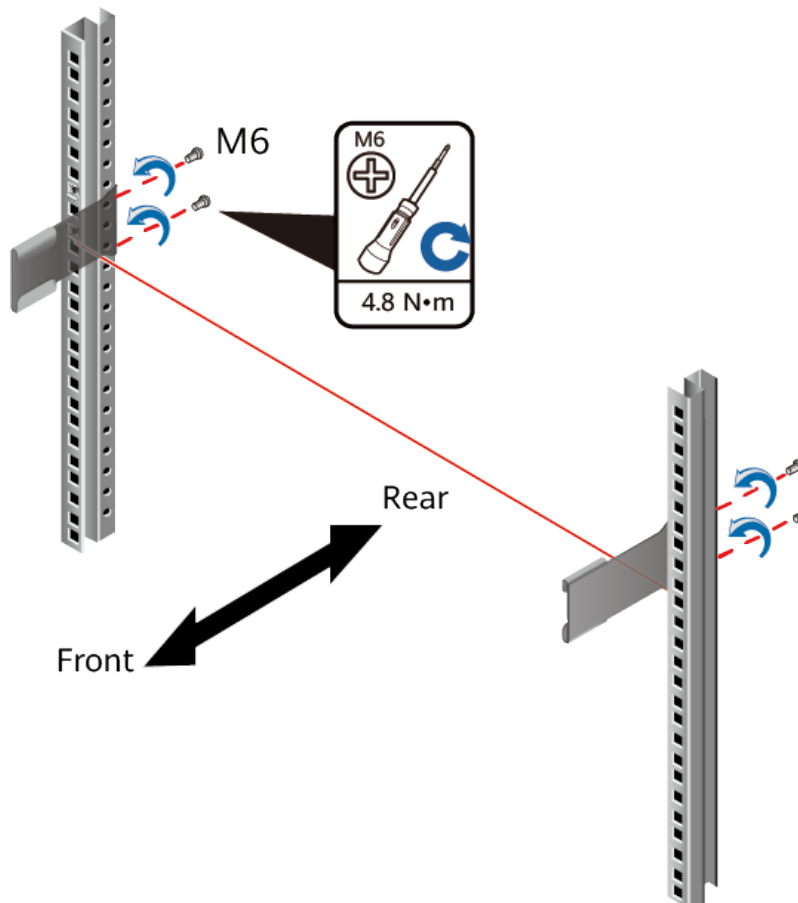
4. (Optional) Install adjustable guide rails (BOM numbers: 21242247 and 21242246). For details, see the installation guide delivered with the adjustable guide rails.

Step 3 Mount the USG in the cabinet.

1. Hold the bottom of the USG with both hands and move the USG into the cabinet. Align the rear mounting ears with the rear mounting ear guide rails and slowly slide the USG along the guide rails.

2. Place the device on the guide rails, slowly push it into the cabinet, and then tighten screws with the Phillips screwdriver to secure the device.Insert the device into the rear mounting ear guide rails and slide it into the cabinet.

3. Use M6 screws to fix the mounting ears of the USG to the mounting rack, as shown in **Figure 4-23**.

Figure 4-23 Mounting the USG in a cabinet
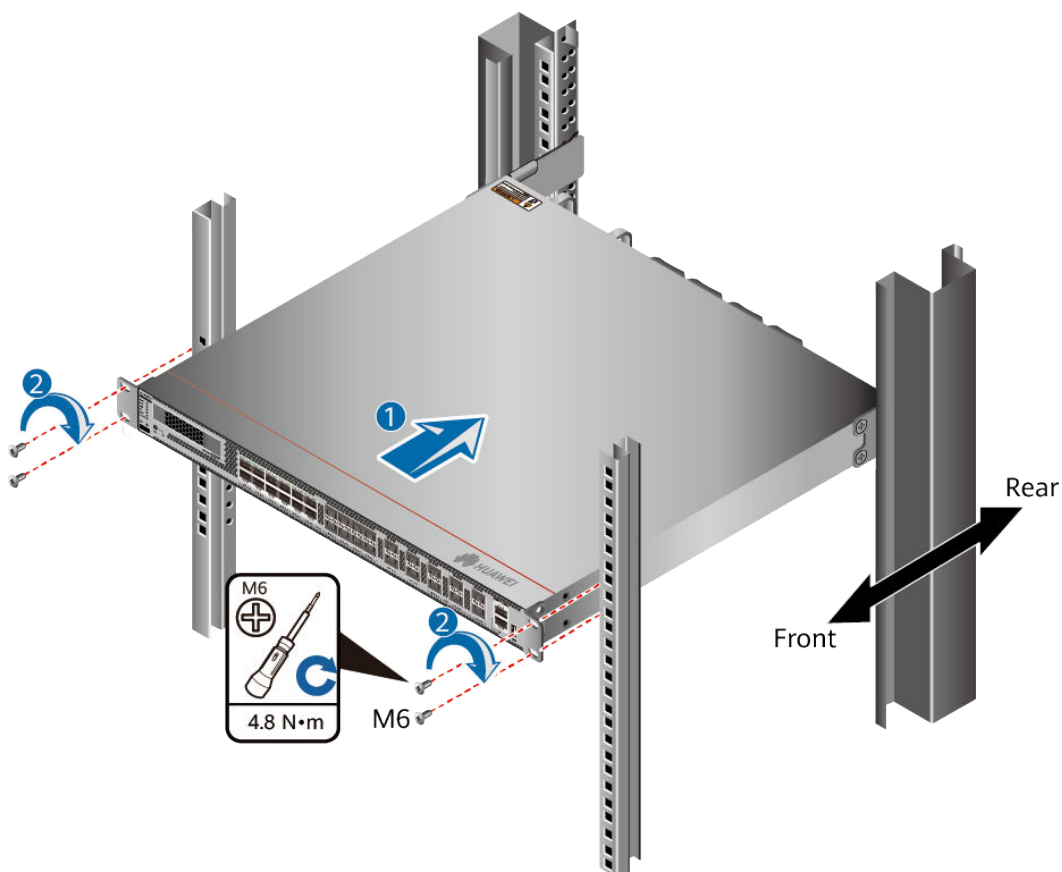
----End

Follow-up Procedure

Perform the following checks after the installation:

●   Ensure that the USG is placed securely inside the cabinet.

●   Ensure that the exhaust of the USG is not blocked by other objects.

4.4.1.2 Mounting a Device on a Workbench

If you do not have a cabinet, you can mount the USG6525F, USG6555F, USG6565F, USG6585F on a workbench.

Precautions

Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the USG is rusted or soggy. Then, investigate causes and contact the supplier.

The workbench must be:

- Reliably grounded.
- Clean, firm, and securely installed.

Accessories

Four rubber feet

Procedure

Step 1 Fix the rubber feet to the round notches at the bottom of the USG.

☐ NOTE

Install foot pads at the bottom of the USG to ensure smooth contact between the USG and the workbench and avoid friction between the surface of the USG and the workbench.

Step 2 Place the USG on the workbench.

Figure 4-24 Placing the USG with rubber feet on a workbench
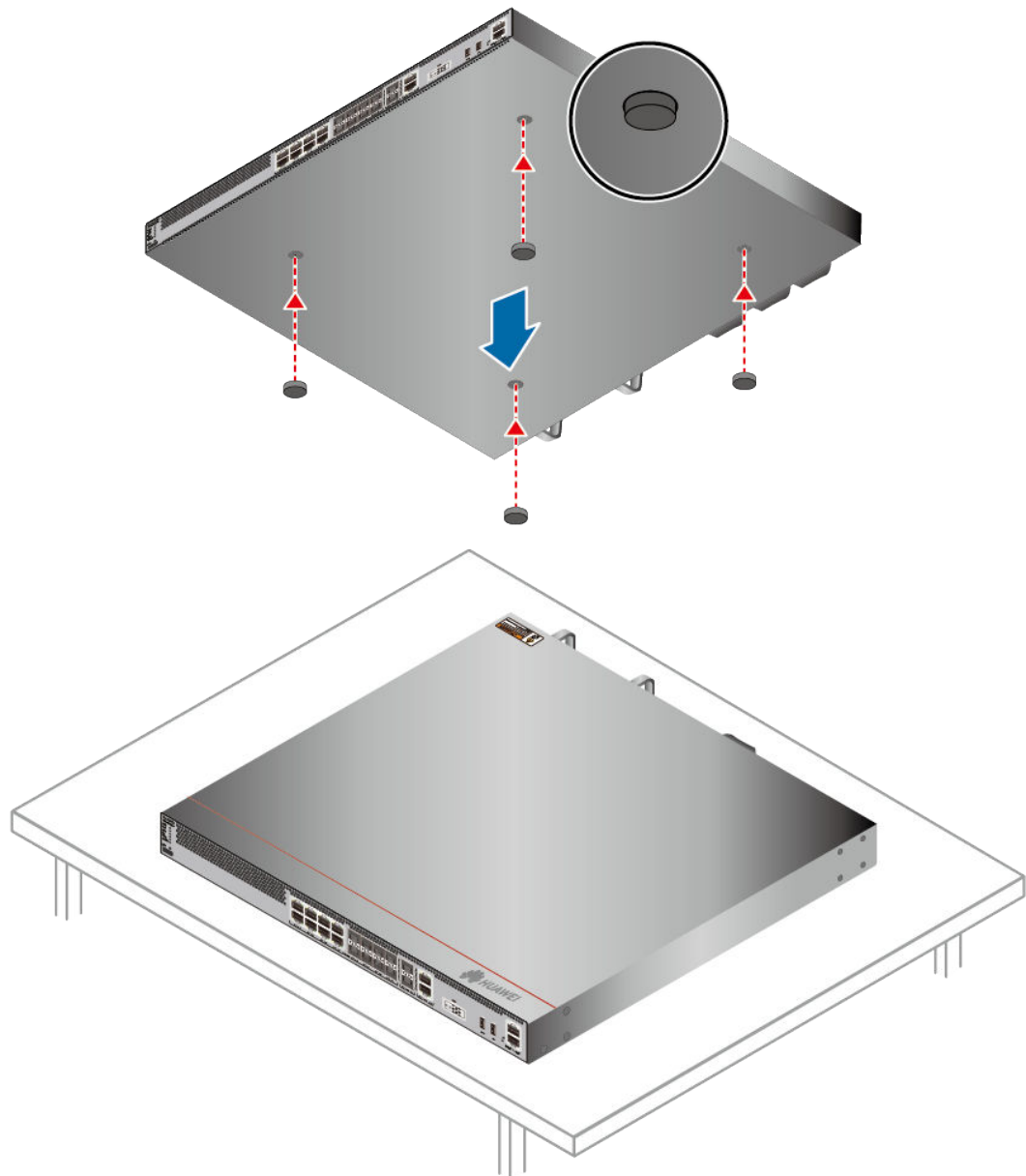
----End

Follow-up Procedure

Verify the following after the installation:

- The USG is securely placed on the workbench.
- No object blocks the exhaust of the USG, and there is at least 10 cm of distance between the USG and surrounding devices.
- There are no heavy objects on the USG.

4.4.2 Installing Other Parts

This section describes the optical bypass card and hard disk installation methods of the USG.

4.4.2.1 Installing a SIC Card

This section describes how to install a SIC card and avoid any damage.

Precautions

Check the SIC Card as follows:

- Check whether the SIC card models match the labels on the packing boxes.
- Check whether the SIC card are damaged or have loose components.
- If the SIC card models are not the same as that labeled on the packing boxes, the card is damaged, or certain components are loosened, contact Huawei technical support engineers.

NOTICE

- Cover all the vacant slots with filler panels to ensure good electromagnetic shielding and heat dissipation.
- When installing a SIC card, ensure that ejector levers of the card are at the bottom to avoid incorrect card installation. Incorrect card installation will damage the connector at the rear of the card.
- If the connector of the SIC card has collided with the slot or other objects, ask Huawei professionals whether the card can still be installed. Installing a SIC card with distorted connector may cause damage to the device.
- If you feel resistance or find the card inclined during the installation, pull the card out and push it into the slot again. Do not force the card into the slot as doing this may damage the connectors on the card and the backplane.
- Before you hold SIC card, make sure that you are wearing an ESD wrist strap and that the strap is well grounded to protect the expansion cards.

Tools

- Phillips screwdriver
- ESD wrist strap

Procedure

Step 1 Wear an ESD wrist strap. Ensure that the ESD wrist strap is grounded and in a close contact with your wrist.

Step 2 Remove the filler panel from from the slot where a SIC card is to be installed.

Step 3 Determine the slot in which a SIC card is to be installed and note the slot number. For details, see the slot numbers on the back panel of the USG.

Step 4 Install a SIC card, as shown in **Figure 4-25**.

1. Loosen screws on the filler panel of a slot and remove the filler panel.
2. Open the ejector lever on a SIC card and push the SIC card along the guide rails of the slot until the ejector lever touches the back panel.

3. Push the ejector lever inward until the SIC card is well seated into the slot, and tighten screws on both sides of the SIC card.

Figure 4-25 Installing a SIC card

----**End**
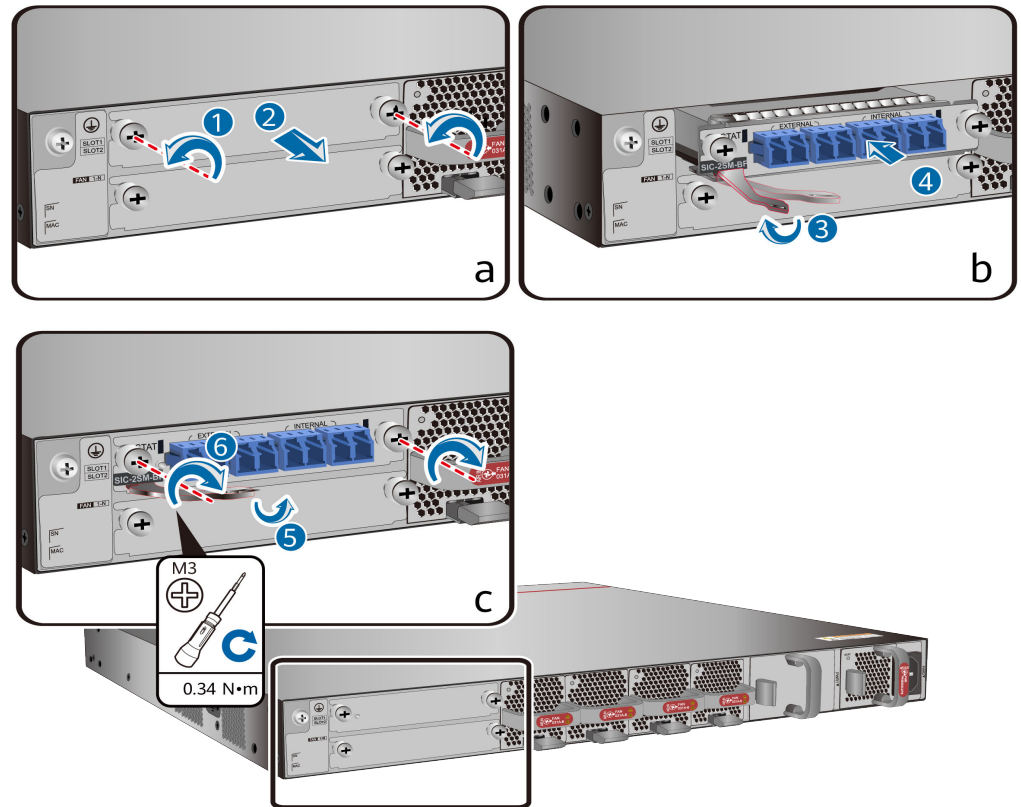
Follow-up Procedure

Check the following items after the installation is complete:

- The SIC card is reliably inserted into the slot, and the blots are tightened.
- Filler panels are inserted in vacant slots. You must insert filler panels in the vacant slots on the USG to prevent dust and ensure heat dissipation.
- After the USG device is powered on, check the running status of the indicator on the SIC card. If the indicator is green, the SIC card is powered on. If the indicator is red, the SIC card has a fault that affects services and cannot be automatically rectified (critical hardware alarm).

4.4.2.2 Installing a Hard Disk

This section describes how to install a hard disk units for the first time to avoid hard disk damage.

Precautions

Precautions for the use of hard disks

- Use Huawei hard disks. The system cannot recognize the hard disks provided by other vendors.

- Wear an ESD wrist strap to protect the USG and hard disks from electrostatic damage.

- Hold the two side surfaces of a hard disk, do not touch the PCB board or squeeze the hard disk, and do not vibrate, bump, or stack hard disks.

- For mapping relationships between the USG and hard disks, see **Hardware Overview**.

Tool

ESD bag

Installing The Hard Disk (USG6525F, USG6555F, USG6565F, USG6585F)

Step 1 Remove the baffle plate from the hard disk slot.

Step 2 Hold the handlers of the hard disk and push the hard disk along the guide rails till the hard disk aligns with the panel of the USG.

Step 3 Press the hard disk handler inwardly to restore the module.

Figure 4-26 Installing the hard disk (USG6525F, USG6555F, USG6565F, USG6585F)
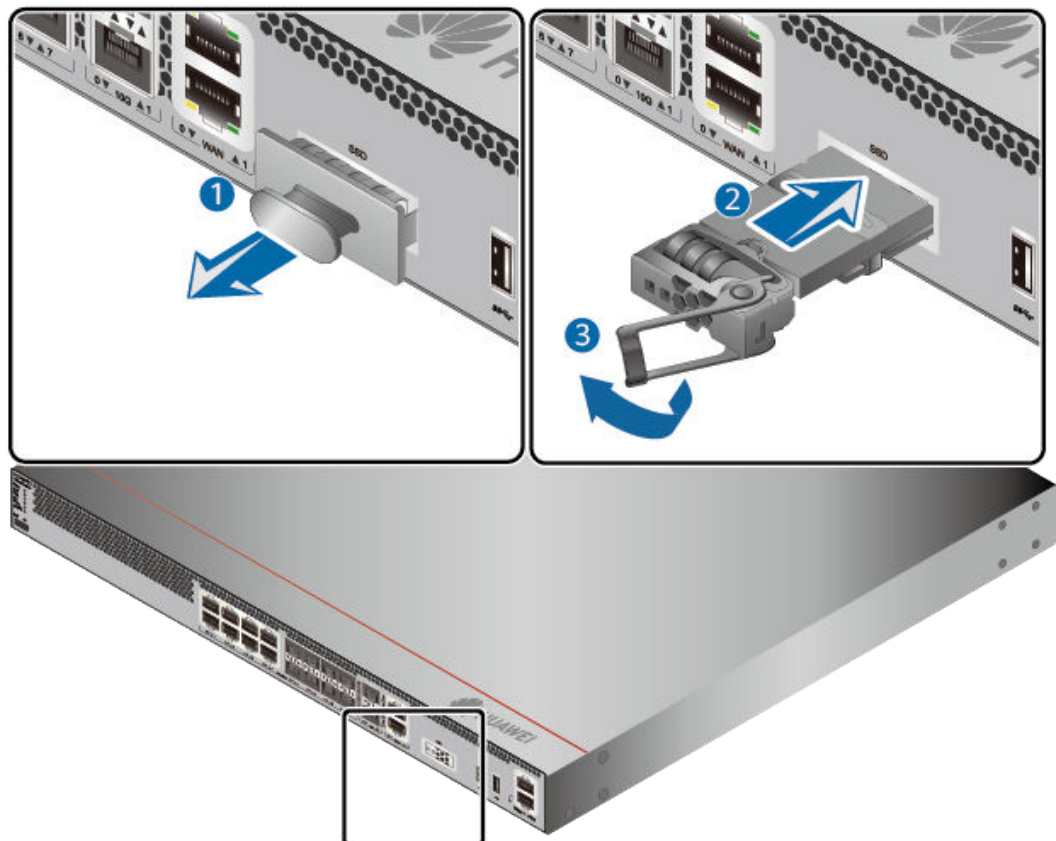
Step 4 After the installation is complete, perform the following operations:

📖 **NOTE**

> Operations after the USG power-on must be performed after all installation tasks are complete.

- Before the USG is powered on, ensure that the hard disk is correctly installed.
- After the USG is powered on, run the **display device disk** command in the diagnostic view to check whether the Present value is Present.

----End

Installing The Hard Disk (USG6615F, USG6625F, USG6635F, USG6655F, USG6685F)

Step 1 Remove the filler panel from a hard disk slot.

Figure 4-27 Removing the filler panel from a hard disk slot (USG6615F, USG6625F, USG6635F, USG6655F, USG6685F)
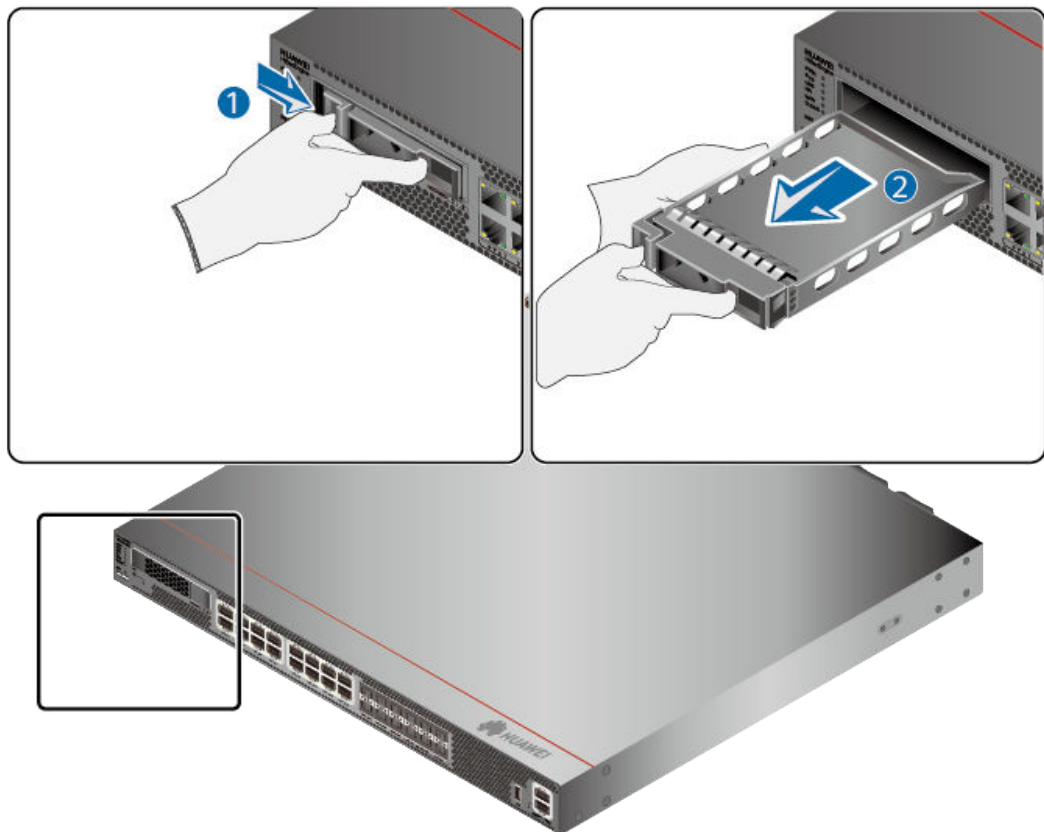
Step 2 Pull the ejector lever on the hard disk holder, keep it in pulled-out state, and push the hard disk holder with two hands along the guide rails of the slot till the front surface of the hard disk holder touches the USG panel.

Figure 4-28 Installing a hard disk (USG6615F, USG6625F, USG6635F, USG6655F, USG6685F)
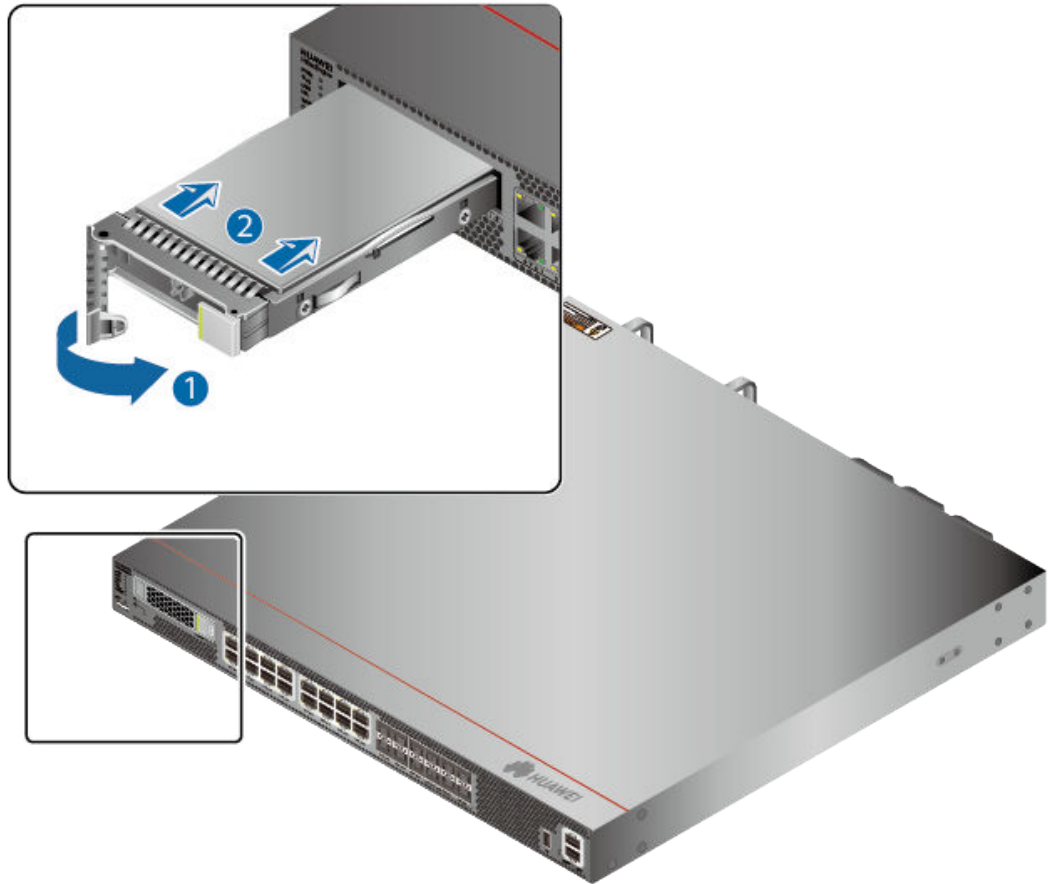
Step 3 After the ejector lever of the hard disk is fastened to the chassis, close the hard disk ejector lever.

Step 4 After the installation is complete, perform the following operations:

☐ **NOTE**

Operations after the USG power-on must be performed after all installation tasks are complete.

● Before the USG is powered on, ensure that the hard disk is correctly installed.

● After the USG is powered on, run the **display device disk** command in the diagnostic view to check whether the Present value is Present.

----End

4.4.3 Connecting a Device

This section describes the methods and precautions for connecting the PGND cable, configuration cables, Ethernet cables, optical modules, optical fibers, and power cables of the USG.

4.4.3.1 Connecting a PGND Cable

Connecting the PGND cable of a USG correctly is a key measure of surge protection and resistance to interference. Before using the USG, correctly connect the PGND cable. Otherwise, the may be damaged.

Prerequisites

The USG has been installed inside a cabinet.

Tools

- Phillips screwdriver
- Multimeter

Procedure

Step 1 Loosen and remove the screw of the ground terminal on the USG rear panel.

Step 2 Connect the 90° right angle OT terminal at one end of the PGND cable to the connection hole of the USG, with the conducting wire upward, and tighten the M4 screw. The tightening torque is 1.4 N·m.

Step 3 Connect the M6 end of the PGND cable to the ground terminal of the cabinet. The tightening torque of the M6 screw is 4.8 N·m.

Figure 4-29 Connecting a PGND cable
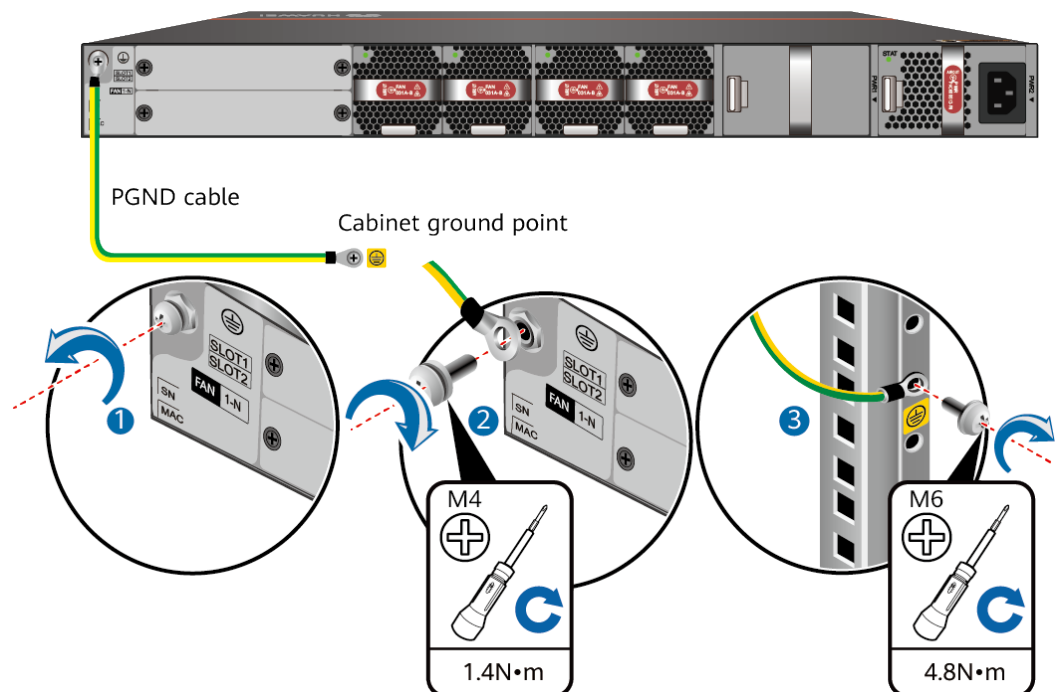
> **NOTICE**
>
> The OT terminal may rotate and result in device damage. Make sure that it is independent of the adjacent metal mechanical part or other terminals.

----End

Follow-up Procedure

Verify the following after the cabling is complete:

- The PGND cable is securely connected to the ground terminal.
- The electrical resistance between the ground terminal and ground point is less than 0.1 ohm on a multimeter.

4.4.3.2 Connecting a Console Cable

After connecting a PC to the console port of a USG with a console cable, you can use the terminal emulation program on the PC to access the command configuration interface of the USG.

Prerequisites

Before connecting a console cable, perform the following operations:

- Check preparations.

  A PC is ready, a USG has been installed, and the ports to be connected are planned.

- Prepare cable labels.

  Before cable connection, labels must be prepared for the cable.

> **NOTICE**
>
> - Make sure that the PC and the USG are connected to the same ground point. Otherwise, the console port of the USG may be damaged.
> - Pay attention to port numbering and make sure that the cable is connected to the correct port, preventing damage to ports or the device.

Tools

Console cable (prepared by the user)

Procedure

Step 1 Before connecting a console cable, attach temporary labels to both ends of the cable for identification.

Step 2 Connect the RJ45 connector of the console cable to the console port (RJ45) of the USG.

Step 3 Connect the DB9 connector of the console cable to the COM port of the management PC.

Figure 4-30 Connecting a console cable to the USG
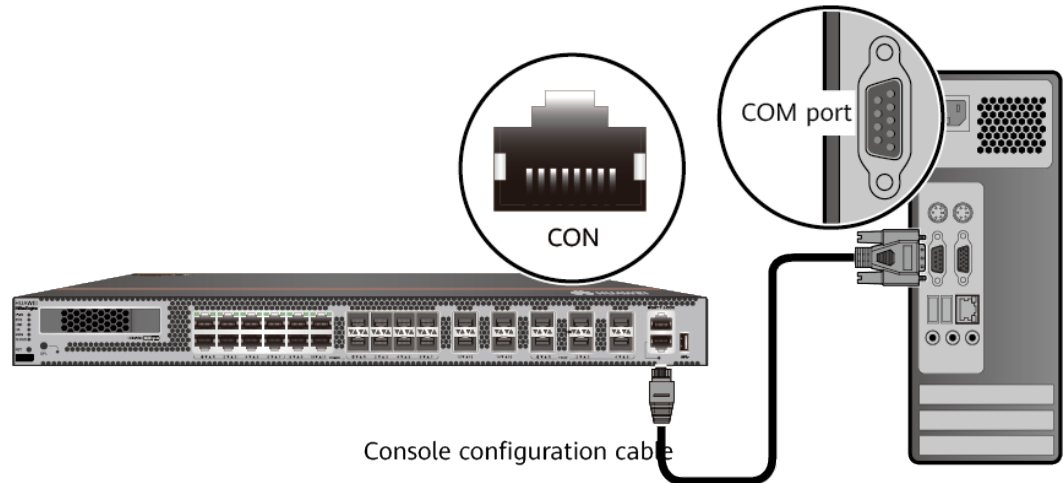
Step 4 Remove the temporary labels and attach labels (2 cm away from the connectors) at both ends of the console cable.

----End

Follow-up Procedure

After the cable connection is complete, verify that:

- The labels at both ends of a cable are correct, clear, neat, and facing the same direction.
- Cables and connectors are free of damage or breakage and are connected properly.

For details on the console login, refer to the Configuration Guide.

4.4.3.3 Connecting an Ethernet Cable

Based on the network plan, you can connect one end of an Ethernet cable to the Ethernet port of a USG and the other end to the Ethernet port of the peer device.

Prerequisites

Before connecting the Ethernet cable, perform the following operations:

- Check construction conditions.

  The peer device has been installed in the equipment room, and the port to which the Ethernet cable is to be connected has been determined.
- Check the cabling route.

  The engineering document should specify the cabling route from the cabinet to the peer device in the equipment room, and the length of the cable is calculated based on the cabling path.

- Label the cable.

  The cable must be labeled before being connected to the devices.

NOTICE

- Only shielded cables are supported on the USG.
- Before connecting a cable, note the label on the port and make sure that the cable is inserted into the correct port. Otherwise, the port module or the device might be damaged.

Procedure

Step 1 If multiple network cables need to be connected, attach temporary labels to both ends of each cable for identification.

Step 2 Connect one end of an Ethernet cable to the Ethernet port of a USG and the other end to the Ethernet port of the peer device based on the network plan.

Figure 4-31 Connecting an Ethernet cable
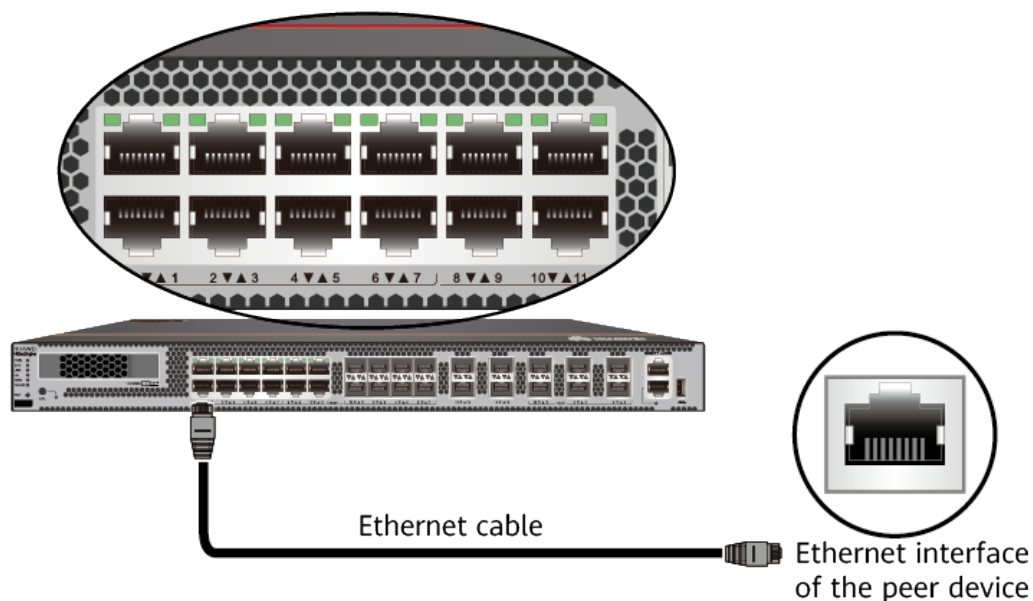
Step 3 Lay out the Ethernet cable along a cabinet and route the cable through the cable hole for the signal cables at the top (overhead cabling) or bottom (underfloor cabling) of the cabinet.

Step 4 Remove the temporary labels and attach labels (2 cm away from the connectors) at both ends of the Ethernet cable.

----End

Follow-up Procedure

Verify the following after the installation:

- The labels at both ends of the cable are correct, clear, neat, and facing the same direction.
- The cables and connectors are free of any damage or breakage and are connected properly and reliably.

4.4.3.4 Connecting the Optical Transceiver and Optical Fiber

This section describes how to install optical transceivers on the GE , 10GE optical ports of the USG and connect them to the ports of the peer device using optical fibers according to the network plan.

The USG supports both 1 Gbit/s , 10 Gbit/s optical modules. The optical modules at both ends are the same, including the optical fiber type (single-mode or multi-mode), optical fiber connector type (LC/PC, SC/PC, FC/PC, or MPO/PC-MPO/PC), and transmission rate. If different optical modules are used at the two ends, the communication may fail.

> **NOTICE**
>
> Huawei optical modules are recommended. The optical modules from other vendors may cause faults on the USG due to incompatibility.

> **⚠ CAUTION**
>
> Do not look into the optical interface of the optical module or the optical fiber connector without eye protection.

Precautions

Before connecting optical fiber cables, read the following precautions:

- Do not overbend optical fibers, and the radius should not be shorter than 40 mm.
- Do not bundle the optical fibers too tight. Otherwise, the transmission performance of the optical fibers and the communication between devices might be adversely affected.
- The optical module has been installed.

Procedure

Step 1 Insert an optical transceiver into the GE , 10GE optical port of the USG.

Step 2 Remove the dust cap from the optical transceiver.

> **📖 NOTE**
>
> Set aside the dust cap properly for future use. After optical fiber are disconnected for maintenance, use the dust cap to prevent the optical transceiver from dust.

Step 3 Before connecting an optical fiber, attach temporary labels to both ends of the optical fiber for identification.

Step 4 Remove protective caps from optical fiber connectors, insert optical fibers into the optical transceiver, and connect the fiber to the peer device.

📖 **NOTE**

Ensure that the Tx and Rx ports are correctly connected.

Ensure that the TX and RX ports on one end of the optical fiber cable are connected to the RX and TX ports (respectively) on the other end.

Figure 4-32 Installing optical transceivers and connecting optical fibers

Step 5 Repeat **Step 1** to **Step 4** to install all optical transceivers and connect all optical fibers.

----End

Follow-up Procedure

After you power on the USG, check the connection by observing the optical port indicator. If the indicator is on or blinks, the link is connected or data is being transmitted. If the indicator is off, the link is disconnected. Possible causes for the disconnection are as follows:

- The optical fiber is improperly inserted. Pull out the optical fiber and re-insert it.
- The RX and TX optical ports are inserted reversely. Pull out the optical fibers, change their position, and re-insert them.
- The optical module is damaged or the optical fiber is broken. Replace the optical module or the optical fiber.

4.4.3.5 (Optional)Connecting Upstream and Downstream Devices Through an Optical Bypass Card

This section describes how to connect the upstream and downstream devices of the USG device through its optical bypass card.

Prerequisites

- Optical modules have been installed on the optical interfaces of the USG device and its upstream and downstream devices.
- An optical bypass card has been properly installed on the USG device. For details about how to install an optical bypass card, see **Installing an Expansion Card**.

Context

When the USG device with an optical bypass card installed encounters a fault or power outage, the upstream and downstream devices of the USG device will directly connect to each other through the two EXTERNAL interfaces on the optical bypass card. In this way, traffic will bypass the USG device and be forwarded between the upstream and downstream devices, ensuring service continuity.

Precautions

Attach labels to both ends of each optical fiber and number the labels.

NOTICE

The optical bypass card supports only single-mode optical fibers with LC connectors.

Procedure

Step 1 Wear an ESD wrist strap. Ensure that the ESD wrist strap is grounded and in a close contact with your wrist.

Step 2 Remove the rubber plugs from the optical bypass card interfaces.

Step 3 Insert one end of two optical fibers into the INTERNAL interfaces of the bypass optical card, and insert the other end into the optical modules of the optical interfaces on the front panel of the USG device.

Step 4 Insert one end of two optical fibers into the EXTERNAL interfaces of the optical bypass card, and insert the other end to the optical modules of the USG device's upstream and downstream devices, respectively.

Step 5 For other configuration of the optical bypass card, refer to the *Configuration Guide*.

Figure 4-33 Connecting an optical fiber to the optical bypass card

☐ **NOTE**

The optical bypass card provides four interfaces, including two EXTERNAL interfaces and two INTERNAL interfaces. When the bypass link is in the bypass state, EXTERNAL interface 0 and INTERNAL interface 2 form a link, and EXTERNAL interface 1 and INTERNAL interface 3 form another link. When the bypass link is in the non-bypass state, two EXTERNAL interfaces are directly connected to form a link.

----End

Follow-up Procedure

After you power on the USG, check the connection by observing the optical port indicator. If the indicator is on or blinks, the link is connected or data is being transmitted. If the indicator is off, the link is disconnected. Possible causes for the disconnection are as follows:

- The optical fiber is improperly inserted. Pull out the optical fiber and re-insert it.

- The RX and TX optical ports are inserted reversely. Pull out the optical fibers, change their position, and re-insert them.

- The optical fiber is broken. Replace the optical fiber.

- Check whether the optical interfaces are mutually exclusive. If so, change to use another optical optical interface.

- The interface modes at the two ends of an optical fiber are inconsistent. Check whether the interface mode of the peer device is auto-negotiation. If the interface mode is forcible, change it to auto-negotiation because the interface mode of the local device is auto-negotiation by default.

4.4.3.6 (Optional)Connecting Upstream and Downstream Devices Through an Electrical Bypass Card

This section describes how to connect the upstream and downstream devices of the USG device through its electrical bypass card.

Prerequisites

An electrical bypass card has been properly installed on the USG device. For details about how to install an electrical bypass card, see **Installing a SIC Card**.

Context

When the USG device with an electrical bypass card installed encounters a fault or power outage, the upstream and downstream devices of the USG device will directly connect to each other through the two BYPASS interfaces on the electrical bypass card. In this way, traffic will bypass the USG device and be forwarded between the upstream and downstream devices, ensuring service continuity.

Precautions

Attach labels to both ends of each electrical fiber and number the labels.

NOTICE

The electrical bypass card supports only single-mode electrical fibers with LC connectors.

Procedure

Step 1 Wear an ESD wrist strap. Ensure that the ESD wrist strap is grounded and in a close contact with your wrist.

Step 2 Interfaces 0 and 1 and interfaces 2 and 3 on an electrical bypass card form two bypass interface pairs to support the electrical bypass function. Supports single-wire or dual-wire connection. Connect a network cable to interface 0 of the electrical bypass card. Connect the end of the network cable to the electrical interface of the upstream device of the USG. Insert a network cable into interface 1 of the electrical bypass card. Connect the end of the network cable to the electrical interface of the downstream device of the USG. You can also insert a network cable into port 2 of the electrical bypass card. The end of the network cable is connected to the electrical interface of the upstream device of the USG. Insert a network cable into port 3 of the electrical bypass card, and connect the end of the network cable to the electrical interface of the downstream device of the USG.

Step 3 For other configuration of the electrical bypass card, refer to the *Configuration Guide*.

Figure 4-34 Connecting an ethernet cable to the electrical bypass card
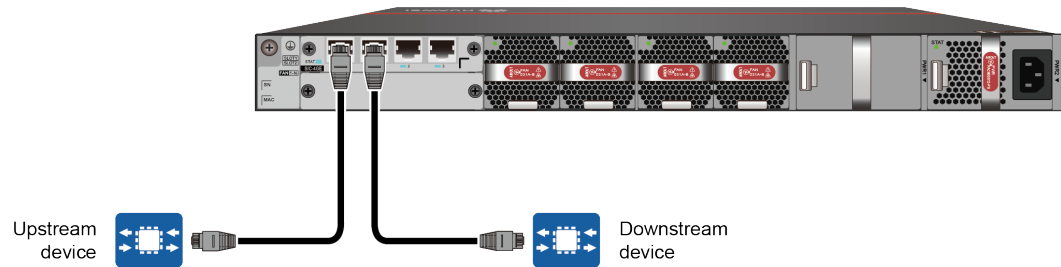
 NOTE

> The electrical bypass card provides four interfaces, including two Bypass0 interfaces and two Bypass1 interfaces. When the bypass link is in the working loop, bypass interface 0 and bypass interface 1 form one link, and bypass interface 2 and bypass interface 3 form another link. When the bypass link is in the protection loop, two bypass ports are directly connected to form a link.

----End

Follow-up Procedure

After you power on the USG, check the connection by observing the electrical port indicator. If the indicator is on or blinks, the link is connected or data is being transmitted. If the indicator is off, the link is disconnected. Possible causes for the disconnection are as follows:

● The electrical fiber is improperly inserted. Pull out the electrical fiber and re-insert it.

● The RX and TX electrical ports are inserted reversely. Pull out the electrical fibers, change their position, and re-insert them.

● The electrical fiber is broken. Replace the electrical fiber.

● Check whether the electrical interfaces are mutually exclusive. If so, change to use another electrical electrical interface.

● The interface modes at the two ends of an electrical fiber are inconsistent. Check whether the interface mode of the peer device is auto-negotiation. If the interface mode is forcible, change it to auto-negotiation because the interface mode of the local device is auto-negotiation by default.

4.4.3.7 Connecting Power Cables

Follow the operation guide to connect power cables from the power module of the USG6525F, USG6555F, USG6565F, USG6585F, USG6615F, USG6625F, USG6635F, USG6655F, USG6685F to the output of the power supply device.

4.4.3.7.1 Connecting AC Power Cables

By default, the USG6525F, USG6555F, USG6565F, USG6585F, USG6615F, USG6625F comes with one AC power module. However, two AC power modules are supported. Each AC power module requires an AC power cable. When two AC power modules are used, connect power cables to both AC power modules.

Prerequisites

Before connecting the power cables, ensure that the AC power supply in the equipment room meets the input requirements of the USG.

⚠ **DANGER**

Do not connect or disconnect the power cables when the USG is powered on.

Procedure

Step 1 Ensure that the PGND cable is adequately grounded.

Step 2 Connect AC power cables to AC power modules.

📖 **NOTE**

When two power modules are used, connect them to different power sources to improve availability.

1. Plug one end of the C13 power cable to the power socket of the USG power module.

2. Plug the other end of the power cable to the AC power socket or the output of the AC power supply device.

Figure 4-35 Connecting AC power cables(USG6525F, USG6555F, USG6565F, USG6585F, USG6615F, USG6625F)
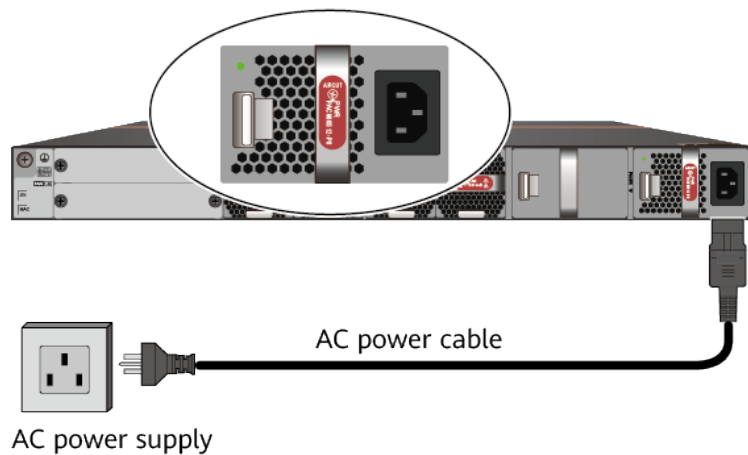
Figure 4-36 Connecting AC power cables(USG6635F, USG6655F, USG6685F)
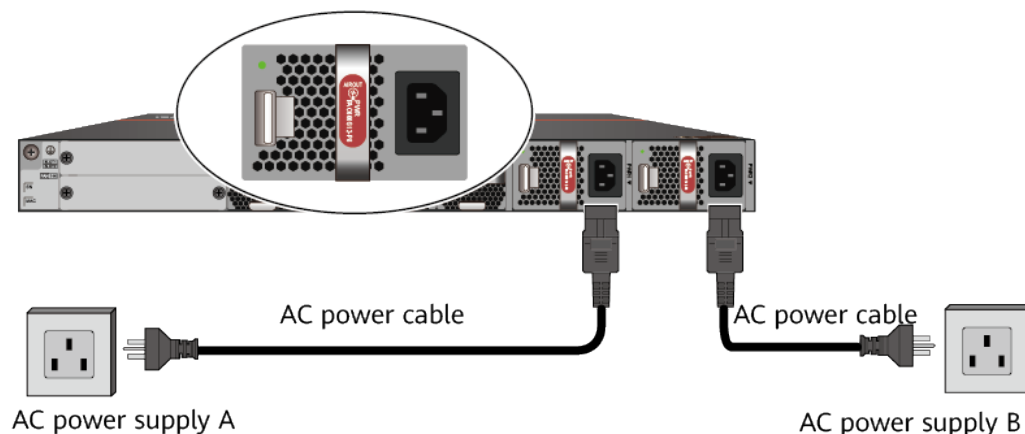
AC power cable

AC power cable

AC power supply A

AC power supply B

----End

Follow-up Procedure

Verify the following after the connection is complete:

● The power cable is firmly connected to the power supply socket.
● If multiple USGs are deployed, the power cables of each USG are correctly labeled for distinction.

4.4.3.7.2 Connecting DC Power Cables

By default, the USG6525F, USG6565F comes with one DC power module. However, two DC power modules are supported. The USG6635F, USG6715F comes with two DC power module. Each DC power module requires an NEG power cable and an RTN power cable. Connect power cables to both DC power modules.

Context

Before connecting power cables, ensure that the DC power supply in the equipment room meets the input requirements of the USG.

⚠️ **DANGER**

Do not connect or disconnect the power cables when the USG is powered on.

Procedure

Step 1 Ensure that the PGND cable is adequately grounded.

Step 2 Connect DC power cables to DC power modules.

NOTICE

- Note the labels on the DC power cables to avoid misoperations.
- To improve availability, connect two power modules to different power sources.

1. Plug the connector end of the DC power cable to the DC power module.
2. Connect the other end of the DC power cable to the output of the power supply device in the equipment room.

Figure 4-37 Connecting DC power cables (USG6525F, USG6565F)
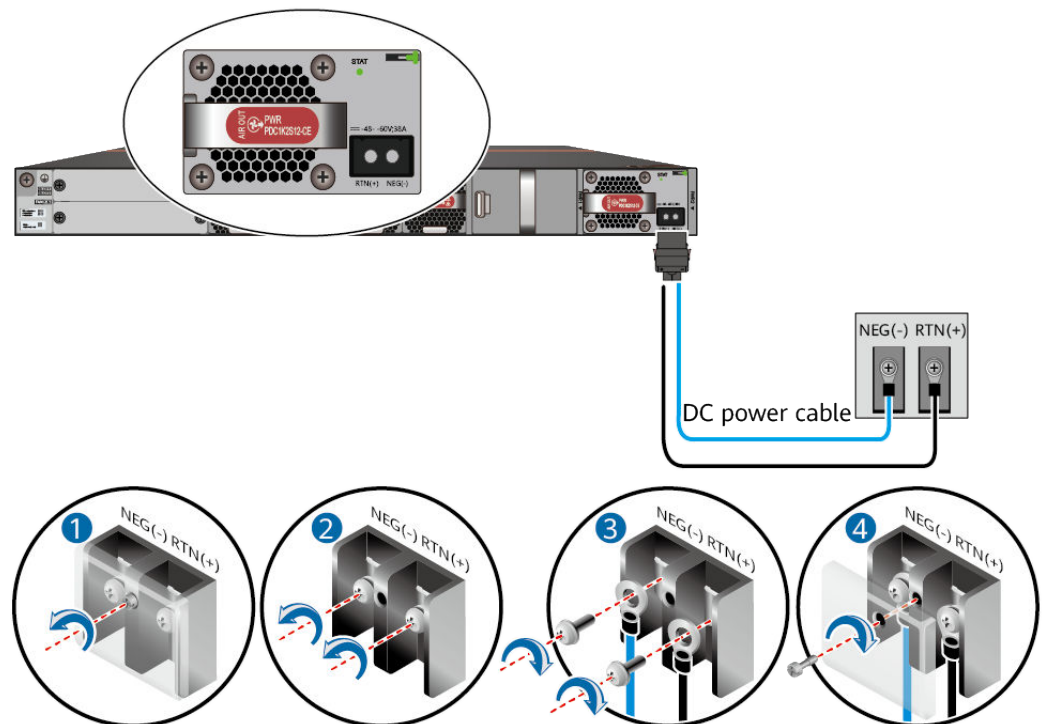
Figure 4-38 Connecting DC power cables (USG6635F, USG6715F)
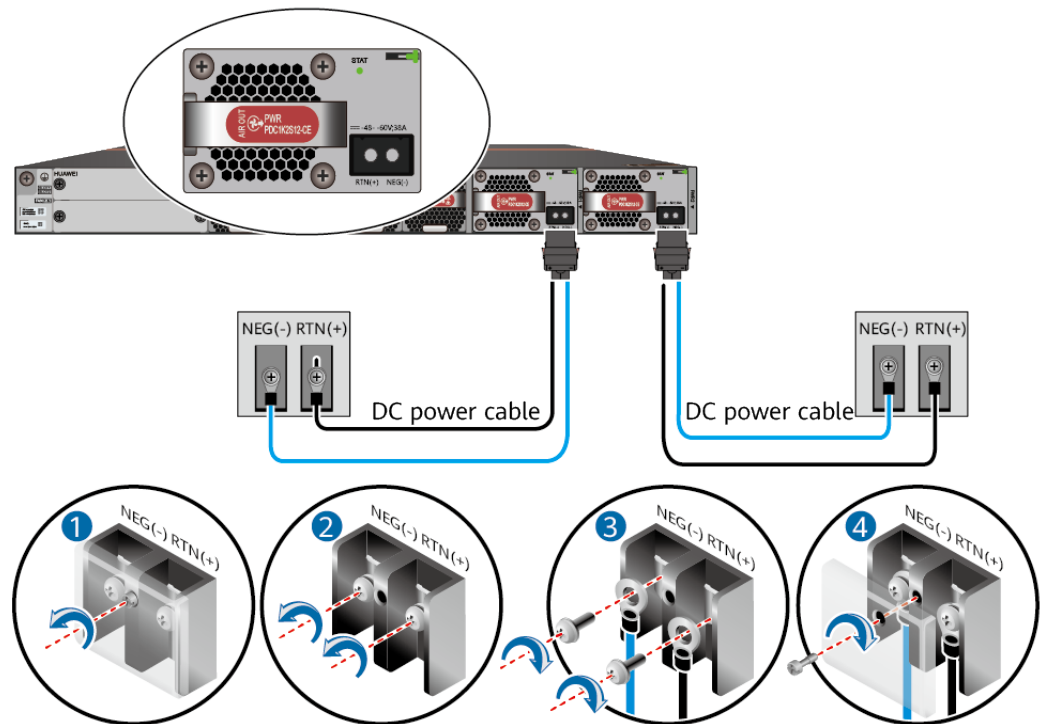
----**End**

Follow-up Procedure

Verify the following after the connection is complete:

- The power cables are correctly and firmly connected to the power supply device.
- If multiple USGs are deployed, the power cables of each USG are correctly labeled for distinction.

4.4.4 Powering On or Off the Device

This section describes how to power on or off the USG. To ensure the normal start and security of the USG, strictly follow the operation guide to power on or off the USG.

Prerequisites

Before you power on the USG, ensure that:

- The power cable and PGND cable are properly connected.
- The power switch in the equipment room is easy to locate so that you can power off devices in the case of accidents.

Procedure

- Power on the USG.

Turn on the switch of the power supply device. The USG starts.

You can identify the USG status based on indicators on the front and rear panels. Indicators shown in **Figure 4-39** indicate that the USG runs normally.

Figure 4-39 Indicators when the USG runs normally

- Power off the USG.

NOTICE

Before powering off the USG, ensure that configuration data is saved. Otherwise, the configuration data may be lost.

If the USG will be administratively shut down for a long time, turn off the power switch. After powering off the USG, set it aside properly according to storage requirements.

⚠ CAUTION

If the USG has hard disks, do not power off the USG by removing the power cable or switching off the power supply to prevent data loss and hard disk damage. You must run the **disk offline** command in the system view first and wait for about 30 seconds. After the system prompts you with a message indicating that hard disks have stopped, turn off the power switch of the USG.

----End

Follow-up Procedure

After the USG is powered on, you can log in to the configuration page for management and maintenance. For details, refer to the Configuration Guide.

4.5 Installing a 600 mm Deep Device

This chapter provides the cabinet-mounting, hard disk installation, and cable connection methods of the USG6710F, USG6715F, USG6725F series.

4.5.1 Mounting a Device in a Cabinet
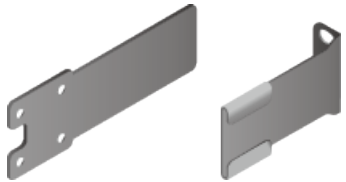
Install the USG6710F, USG6715F, USG6725F to the 19-inch standard cabinet through the expandable rear mounting ears.
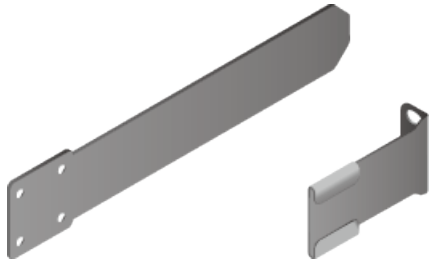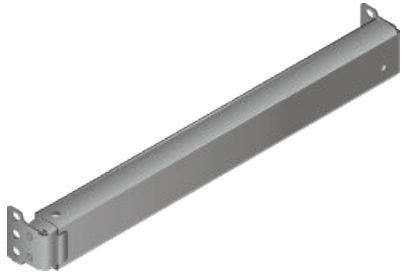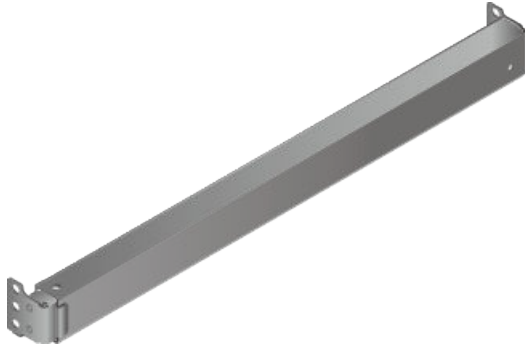
Precautions

Before installing the USG, check the following items:

- Before unpacking the carton, ensure that the packing carton is intact and not damaged or soaked. Stop unpacking if the USG is rusted or soggy. Then, investigate causes and contact the supplier.
- The cabinet is stable.
- Before installing the expandable rear mounting ears on the USG6710F, USG6715F, USG6725F, adjust the distance between the front and rear angle gauges (rack mounting rails/vertical columns) to satisfy the installation requirements. The specific scope of application is as follows:

Table 4-5 Expandable rear mounting ears and adjustable guide rails

Distance Between the Front and Rear Mounting Bars and Cabinet Type	Expandable Rear Mounting Ears and Adjustable Guide Rails
Expandable rear mounting ears (BOM number: 21240492) - Distance between the front and rear mounting bars: 310 mm to 538 mm - Cabinet depth: 800 mm	

Distance Between the Front and Rear Mounting Bars and Cabinet Type	Expandable Rear Mounting Ears and Adjustable Guide Rails
Expandable rear mounting ears (BOM number: 21240538) ● Distance between the front and rear mounting bars: 493 mm to 815 mm ● Cabinet depth: 1000 mm to 1200 mm	
Adjustable guide rails (BOM number: 21242247) ● Distance between the front and rear mounting bars: 370 mm to 585 mm ● Cabinet depth: 800 mm	
Adjustable guide rails (BOM number: 21242246) ● Distance between the front and rear mounting bars: 500 mm to 850 mm ● Cabinet depth: 1000 mm to 1200 mm	

● The position for the USG in the cabinet is well arranged. Ensure that the USG is 1 U of clearance from any devices above and below and 150 mm of clearance from any devices on the right or left.

● The USG to be installed is staged near the cabinet for convenience.

● In the front view, the air flow of the USG is front to rear. If the USG and a device whose air flow is rear to front must be mounted in the same cabinet, maintain certain spacing between them to prevent hot air recirculation.

You can place either end of the USG chassis towards the front door of the cabinet. In this manual, the front panel of the USG is towards the front door of the cabinet.

> The method of installing expandable rear mounting ears (BOM number: 21240492) is the same as that of installing expandable rear mounting ears (BOM number: 21240538). The following uses the expandable rear mounting ears (BOM number: 21240492) as examples.

Tools and Accessories

- Phillips screwdriver
- Floating nuts and matching screws
- Floating mounting bar
- Front mounting ears and corresponding screws
- Expandable rear mounting ears and corresponding screws (purchased separately, BOM numbers: 21240492 and 21240538)
- Adjustable guide rails and matching screws (purchased separately, BOM numbers: 21242247 and 21242246)

Procedure

Step 1 Install mounting ears on the chassis.

Use a Phillips screwdriver to fix the mounting ears to both sides of the chassis with M4 screws. For details about how to install the mounting ears, see the installation methods in **Figure 4-40**.

Figure 4-40 Installation of front and rear mounting ears
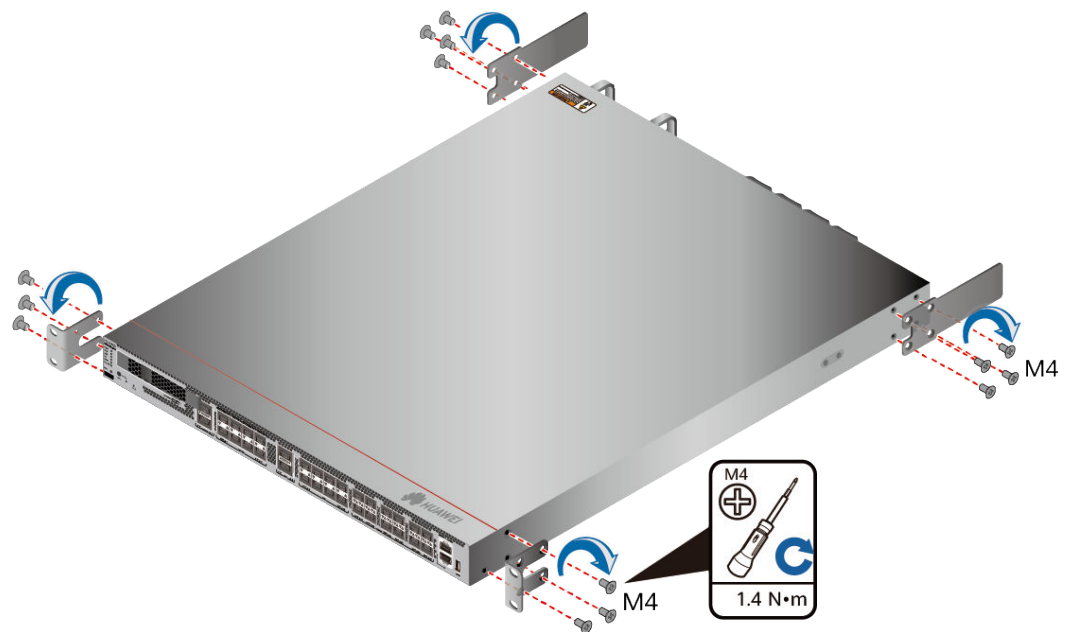
Step 2 Install floating nuts and cabinet guide rails.

1. Determine the positions for installing the guide rails and floating nuts, as shown in **Figure 4-41**.

> **NOTICE**
>
> Install the two guide rails at the same height to ensure that the device is level.

Figure 4-41 Positions of floating nuts
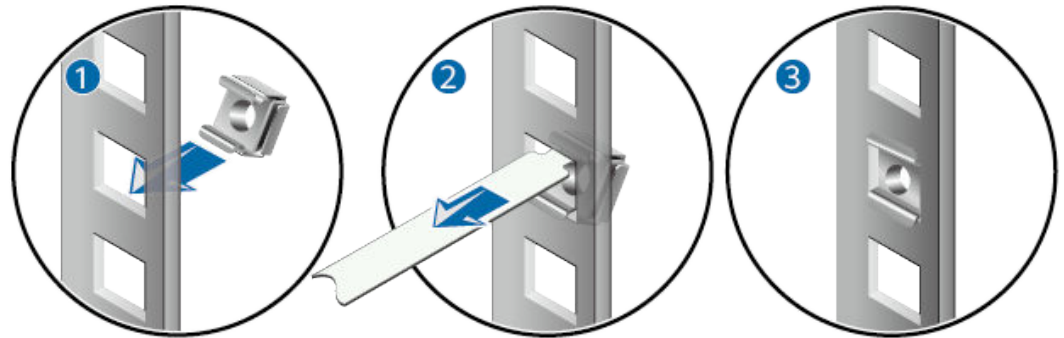
2. Install the floating nuts that match M6 screws at the positions marked in **Figure 4-41**. **Figure 4-42** illustrates how to install a floating nut.

Figure 4-42 Installing floating nuts
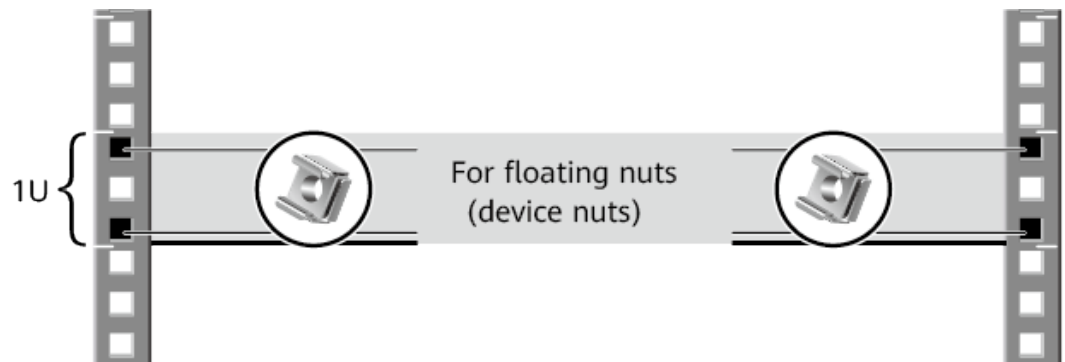
3. Install guide rails in the correct direction. Identify the left and right guide rails, and the front and rear ends of each guide rail.

    Fix expandable rear mounting ears and adjustable guide rails (at the positions marked in **Figure 4-41**) to the left and right of the cabinet with M6 screws, as shown in **Figure 4-43**.

Figure 4-43 Installing guide rails
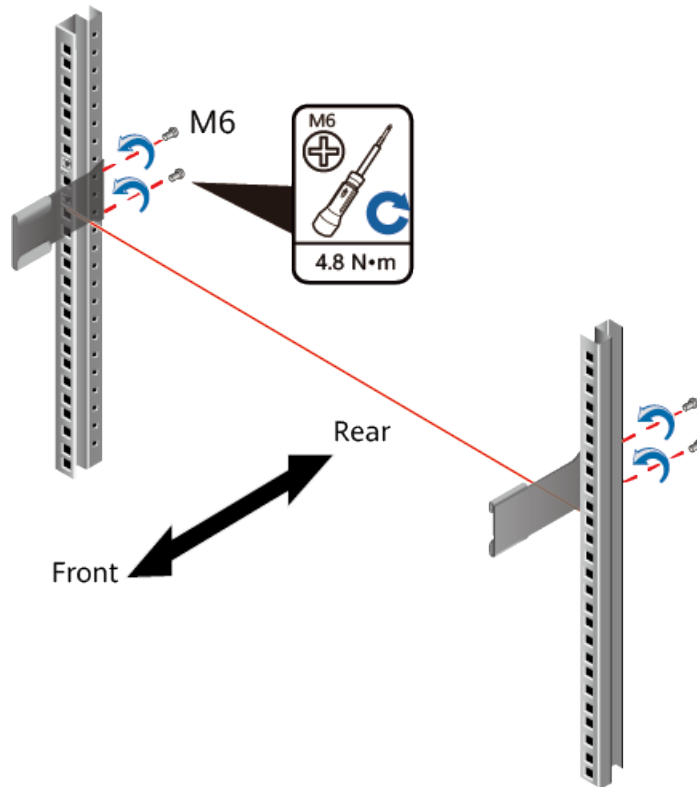
4.   (Optional) Install adjustable guide rails (BOM numbers: 21242247 and 21242246). For details, see the installation guide delivered with the adjustable guide rails.

Step 3 Mount the USG in the cabinet.

1.   Hold the bottom of the USG with both hands and move the USG into the cabinet. Align the rear mounting ears with the rear mounting ear guide rails and slowly slide the USG along the guide rails.

2.   Use M6 screws to fix the mounting ears of the USG to the mounting rack, as shown in **Figure 4-44**.

Figure 4-44 Mounting the USG in a cabinet
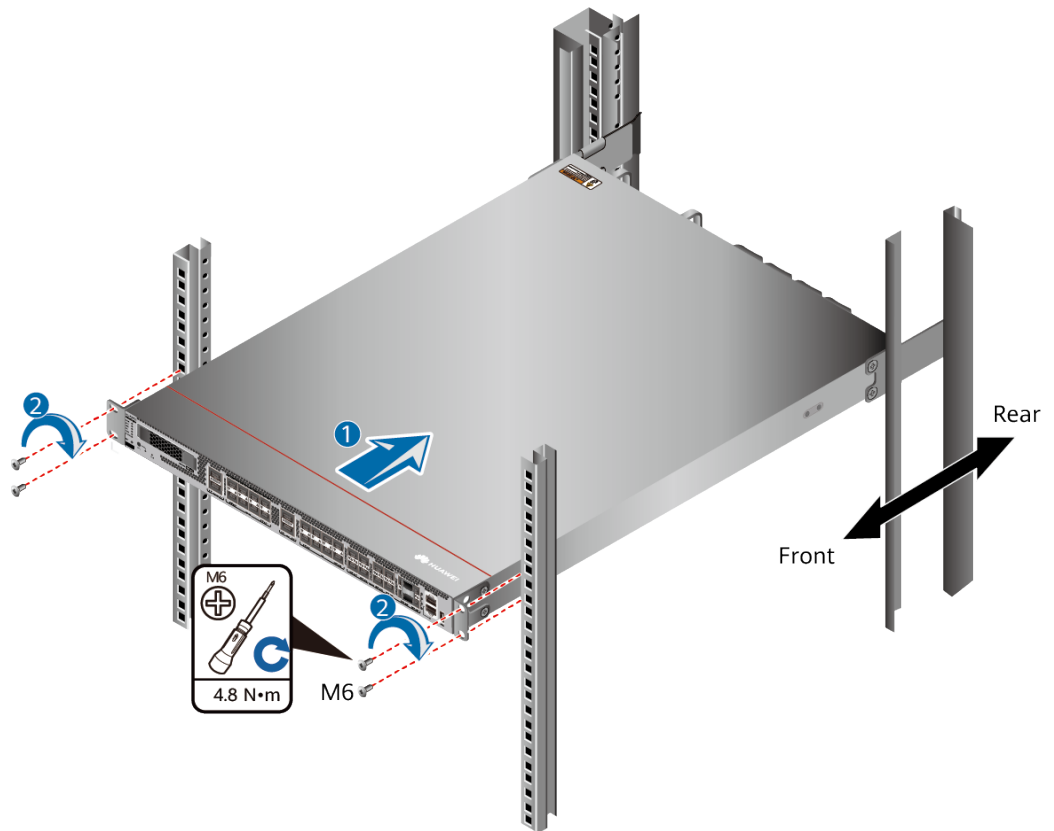
----End

Follow-up Procedure

Perform the following checks after the installation:

- Ensure that the USG is placed securely inside the cabinet.
- Ensure that the exhaust of the USG is not blocked by other objects.

4.5.2 Installing a Hard Disk

This section describes how to install a hard disk units for the first time to avoid hard disk damage.

Precautions

Precautions for the use of hard disks:

- Use Huawei hard disks. The system cannot recognize the hard disks provided by other vendors.
- Wear an ESD wrist strap to protect the USG and hard disks from electrostatic damage.
- Hold the two side surfaces of a hard disk, do not touch the PCB board or squeeze the hard disk, and do not vibrate, bump, or stack hard disks.
- For mapping relationships between the USG and hard disks, see **Hardware Overview**.

Tool

    ESD bag

Procedure

    Step 1 Remove the filler panel from a hard disk slot.

        Figure 4-45 Removing the filler panel from a hard disk slot
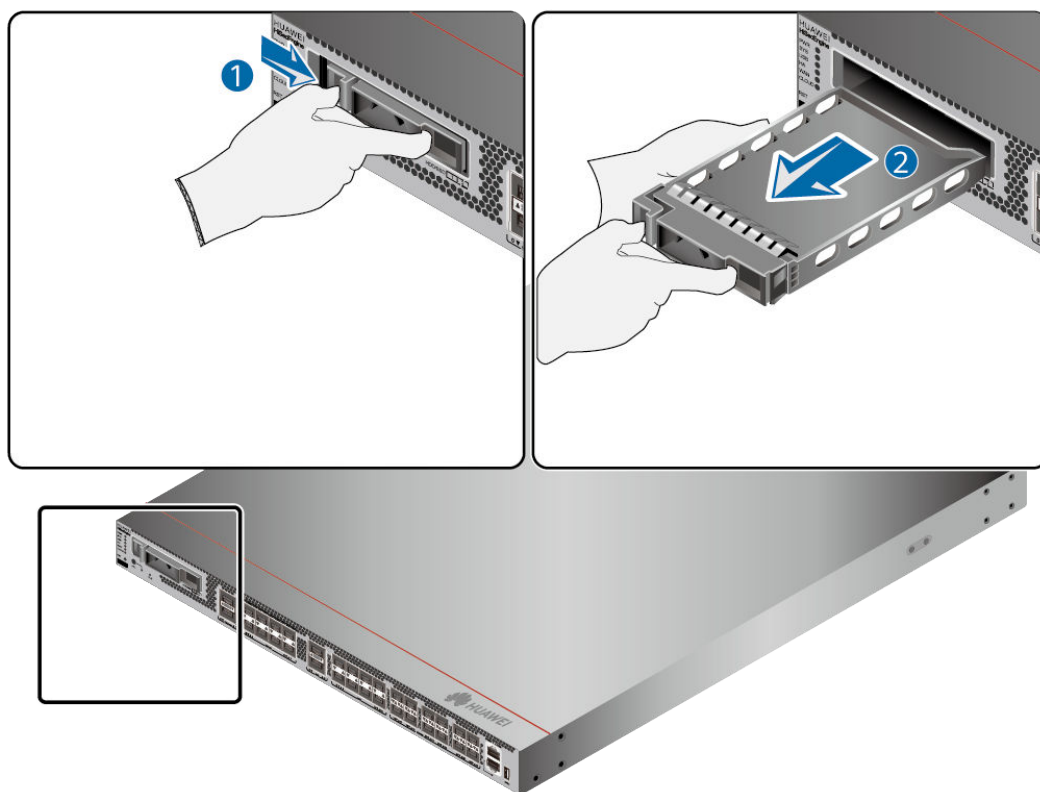
    Step 2 Pull the ejector lever on the hard disk holder and keep it in pulled-out state and push the hard disk holder along the guide rails of the slot till the front surface of the hard disk holder touches the USG panel.

Figure 4-46 Installing a hard disk
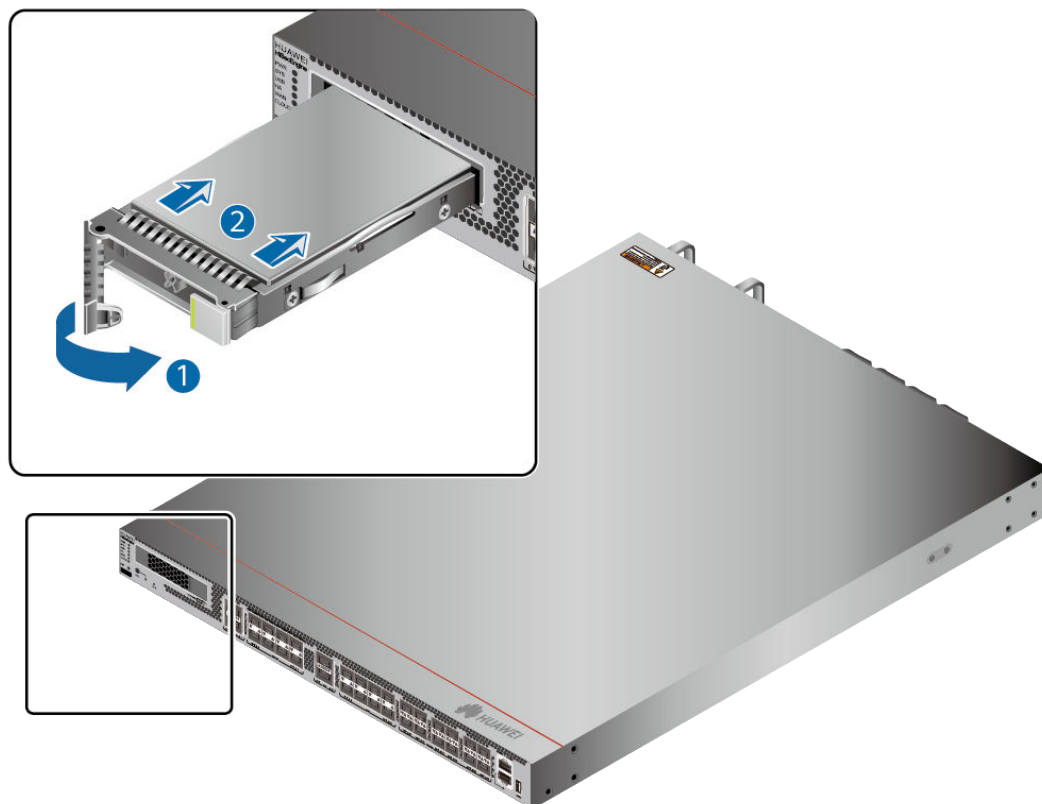
Step 3 After the ejector lever of the hard disk is fastened to the chassis, close the hard disk ejector lever.

----End

Follow-up Procedure

After the installation is complete, perform the following operations:

☐ **NOTE**

Operations after the USG power-on must be performed after all installation tasks are complete.

- Before the USG is powered on, ensure that the hard disk is correctly installed.
- After the USG is powered on, run the **display device disk** command in the diagnostic view to check the status and information about the hard disk.

4.5.3 Connecting a Device

This section describes the methods and precautions for connecting the PGND cable, configuration cables, optical modules, optical fibers, and power cables of the USG.

4.5.3.1 Connecting a PGND Cable

Connecting the PGND cable of a USG6710F, USG6715F, USG6725F correctly is a key measure of surge protection and resistance to interference. Before using the

USG6710F, USG6715F, USG6725F, correctly connect the PGND cable. Otherwise, the USG may be damaged.

Precautions

The USG has been installed inside a cabinet.

Tools

- Phillips screwdriver
- Multimeter

Procedure

Step 1 Loosen and remove the screw of the ground terminal on the lower right of the USG rear panel.

Step 2 Connect the OT terminal at one end of the PGND cable to the connection hole of the USG, with the conducting wire upward, as shown in A of **Figure 4-47**, and tighten the M4 screw. The tightening torque is 1.4 N·m.

Figure 4-47 Installing the OT terminal
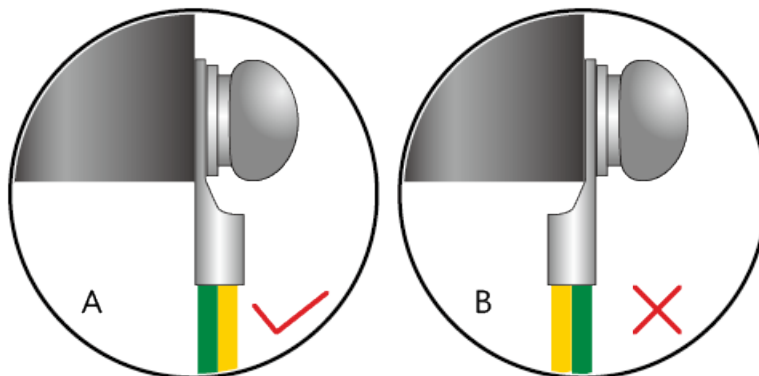
Step 3 Connect the M6 end of the PGND cable to the ground terminal of the cabinet, workbench, or wall. The tightening torque of the M6 screw is 4.8 N·m.

Figure 4-48 Connecting a PGND cable
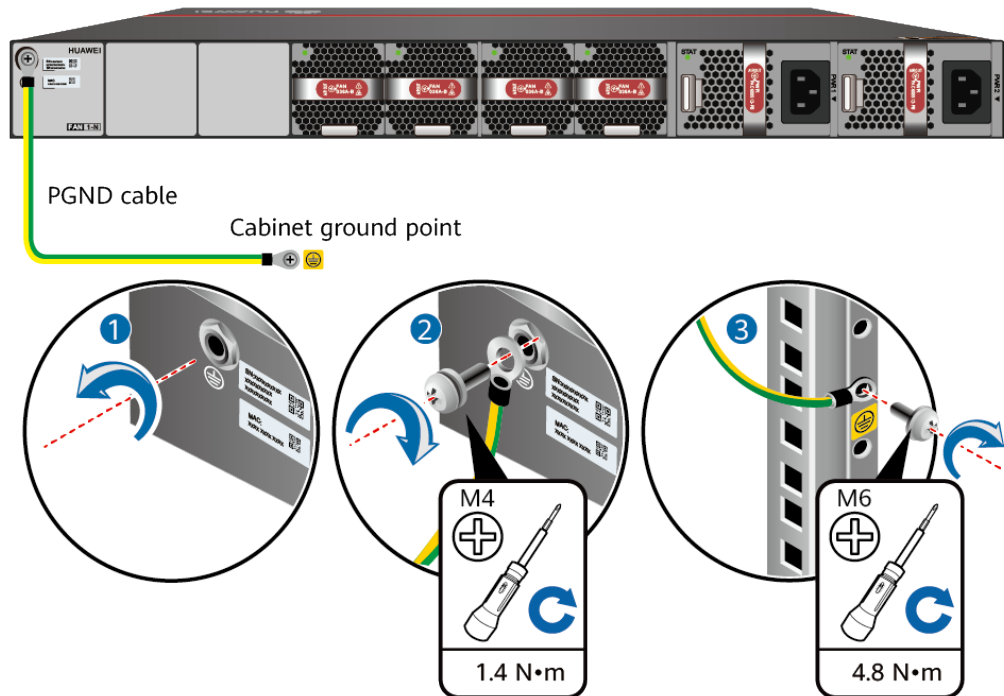
> **NOTE**
>
> In the dual-OT scenario, connect the ground terminal on the side panel of the USG.

Figure 4-49 Connecting the ground terminal in the dual-OT scenario
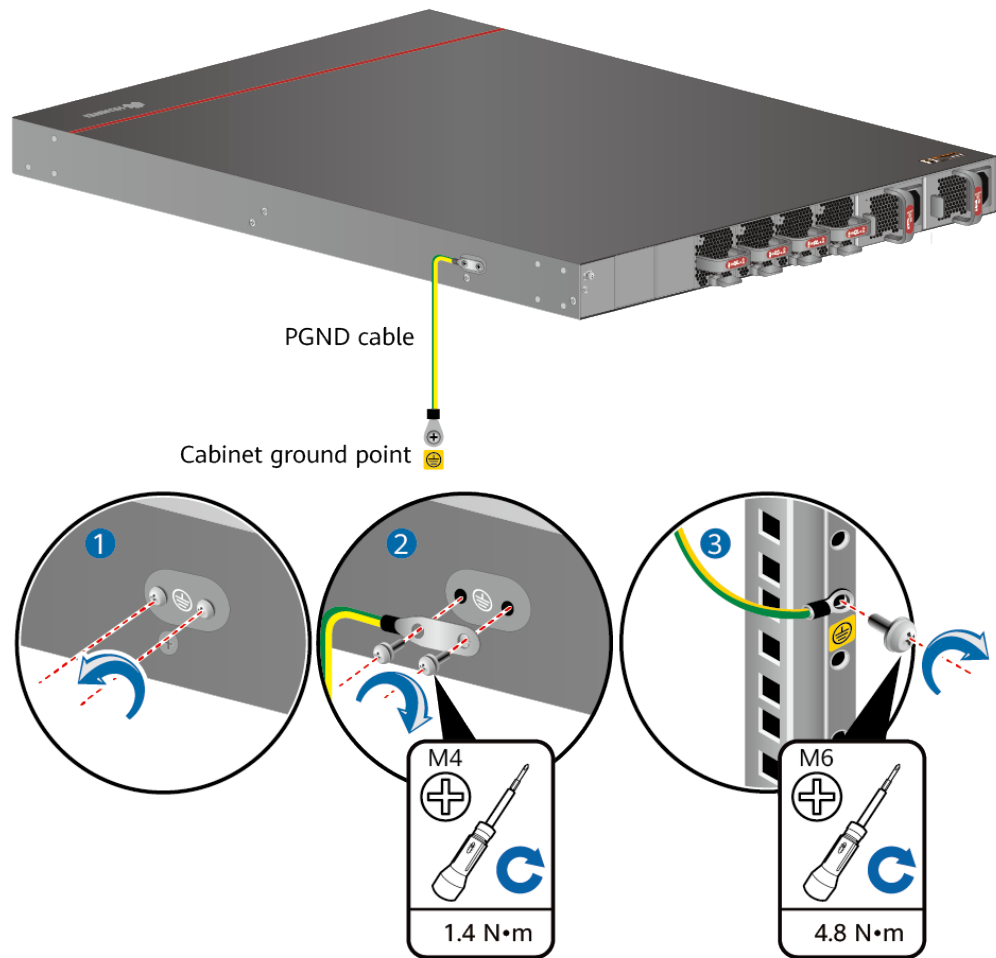
NOTICE

The OT terminal may rotate and result in device damage. Make sure that it is independent of the adjacent metal mechanical part or other terminals.

----End

Follow-up Procedure

Verify the following after the cabling is complete:

- The PGND cable is securely connected to the ground terminal.
- The electrical resistance between the ground terminal and ground point is less than 0.1 ohm on a multimeter.

4.5.3.2 Connecting a Console Cable

After connecting a PC to the console port of a USG with a console cable, you can use the terminal emulation program on the PC to access the command configuration interface of the USG.

Prerequisites

Before connecting a console cable, perform the following operations:

● Check preparations.

A PC is ready, a USG has been installed, and the ports to be connected are planned.

● Prepare cable labels.

Before cable connection, labels must be prepared for the cable.

📖 **NOTE**

● Make sure that the PC and the USG are connected to the same ground point. Otherwise, the console port of the USG may be damaged.

● Pay attention to port numbering and make sure that the cable is connected to the correct port, preventing damage to ports or the device.

Tools

Console cable (prepared by the user)

Procedure

Step 1 Before connecting a console cable, attach temporary labels to both ends of the cable for identification.

Step 2 Connect the RJ45 connector of the console cable to the console port (RJ45) of the USG.

Step 3 Connect the DB9 connector of the console cable to the COM port of the management PC.

Figure 4-50 Connecting a console cable to the USG
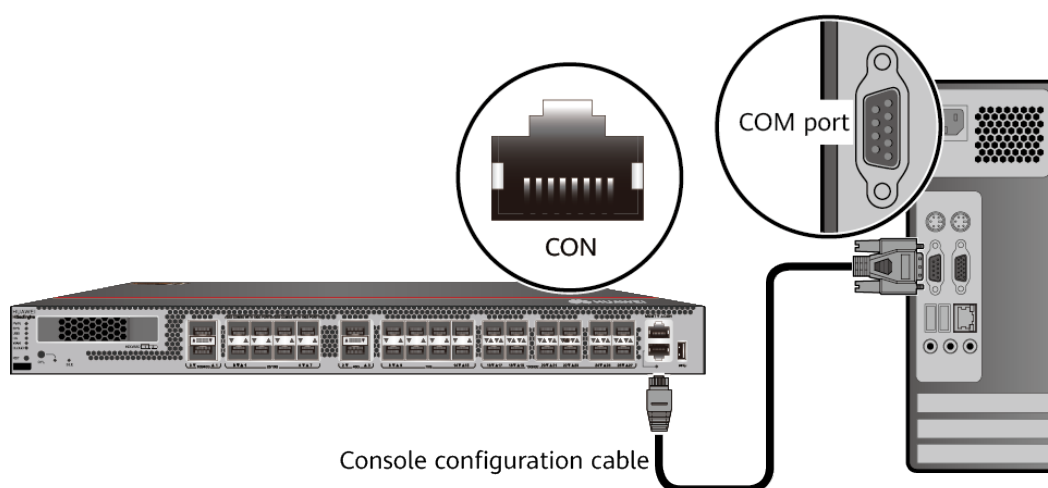
Step 4 Remove the temporary labels and attach labels (2 cm away from the connectors) at both ends of the console cable.

----End

Follow-up Procedure

After the cable connection is complete, verify that:

- The labels at both ends of a cable are correct, clear, neat, and facing the same direction.
- Cables and connectors are free of damage or breakage and are connected properly.

For details on the console login, refer to the Configuration Guide.

4.5.3.3 Connecting the Optical Transceiver and Optical Fiber

This section describes how to install optical transceivers on the GE, 10GE, 25GE or 100GE optical ports of the USG and connect them to the ports of the peer device using optical fibers according to the network plan.

Context

The USG6710F, USG6715F, USG6725F supports 1 Gbit/s, 10 Gbit/s, 25 Gbit/s, 40 Gbit/s, 100 Gbit/s optical modules. The optical modules at both ends are the same, including the optical fiber type (single-mode or multi-mode), optical fiber connector type (LC/PC, SC/PC, FC/PC, or MPO/PC-MPO/PC), and transmission rate. If different optical modules are used at the two ends, the communication may fail.

> **NOTICE**
>
> Huawei optical modules are recommended. The optical modules from other vendors may cause faults on the USG due to incompatibility.

> ⚠ **CAUTION**
>
> Do not look into the optical interface of the optical module or the optical fiber connector without eye protection.

Before connecting optical fiber cables, read the following precautions:

- Do not overbend optical fibers, and the radius should not be shorter than 40 mm.
- Do not bundle the optical fibers too tight. Otherwise, the transmission performance of the optical fibers and the communication between devices might be adversely affected.

Before connecting optical ensure the following:

- The optical module has been installed.

Procedure

Step 1 Insert an optical transceiver into the GE or 10GE, or 25GE, or 40GE, or 100GE optical port of the USG.

Step 2 Remove the dust cap from the optical transceiver.

📖 **NOTE**

> Set aside the dust cap properly for future use. After optical fiber are disconnected for maintenance, use the dust cap to prevent the optical transceiver from dust.

Step 3 Before connecting an optical fiber, attach temporary labels to both ends of the optical fiber for identification.

Step 4 Remove protective caps from optical fiber connectors, insert optical fibers into the optical transceiver, and connect the fiber to the peer device.

📖 **NOTE**

> Ensure that the Tx and Rx ports are correctly connected.

Ensure that the TX and RX ports on one end of the optical fiber cable are connected to the RX and TX ports (respectively) on the other end.

Figure 4-51 Installing optical transceivers and connecting optical fibers

Step 5 Repeat **Step 1** to **Step 4** to install all optical transceivers and connect all optical fibers.

----End

Follow-up Procedure

After you power on the USG, check the connection by observing the optical port indicator. If the indicator is on or blinks, the link is connected or data is being transmitted. If the indicator is off, the link is disconnected. Possible causes for the disconnection are as follows:

● The optical fiber is improperly inserted. Pull out the optical fiber and re-insert it.

● The RX and TX optical ports are inserted reversely. Pull out the optical fibers, change their position, and re-insert them.

● The optical module is damaged or the optical fiber is broken. Replace the optical module or the optical fiber.

4.5.3.4 Connecting Power Cables

Follow the operation guide to connect power cables from the power module of the USG6710F, USG6715F, USG6725F to the output of the power supply device.

4.5.3.4.1 Connecting AC Power Cables

The USG6710F, USG6715F, USG6725F comes with two AC power module. Each AC power module requires an AC power cable. When two AC power modules are used, connect power cables to both AC power modules.

Context

Before connecting the power cables, ensure that the AC power supply in the equipment room meets the input requirements of the USG.

⚠ **DANGER**

Do not connect or disconnect the power cables when the USG is powered on.

Procedure

Step 1 Ensure that the PGND cable is adequately grounded.

Step 2 Connect AC power cables to AC power modules.

📖 **NOTE**

When two power modules are used, connect them to different power sources to improve availability.

1. Plug one end of the C13 power cable to the power socket of the USG power module and adjust the cable-retention clip to an appropriate position.

2. Use a velcro strap to bundle the power cable onto the handle of the power module.

3. Connect the other end of the power cable to the external power supply system.

    –   If the external power supply is AC, plug the other end of the power cable to the AC power socket or the output of the AC power supply device.

    Figure 4-52 Connecting AC power cables
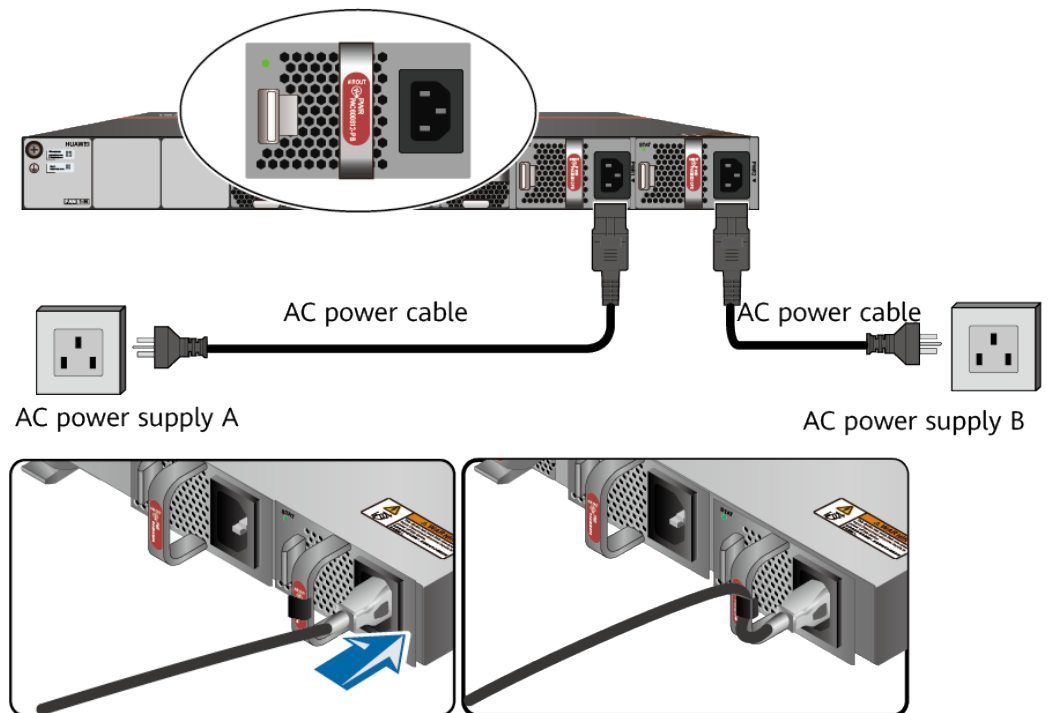
    –   If a 240 V high-voltage DC PDU is used, directly connect the straight male connector to the PDU.

    –   If a 240 V high-voltage DC power distribution box is used, make OT or cord end terminals for the cable. Cut the straight male connector off and crimp OT or cord end terminals on the bare wires. Connect the brown wire to a negative terminal on the DC power distribution box, the blue 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.

    ----End

Follow-up Procedure

Verify the following after the connection is complete:

●   The power cable is firmly connected to the power supply socket.

●   If multiple USGs are deployed, the power cables of each USG are correctly labeled for distinction.

4.5.3.4.2 Connecting DC Power Cables

The USG6715F come with two DC power module. Each DC power module requires an NEG power cable and an RTN power cable. Connect power cables to both DC power modules.

Context

Before connecting power cables, ensure that the DC power supply in the equipment room meets the input requirements of the USG.

⚠ **DANGER**

Do not connect or disconnect the power cables when the USG is powered on.

Procedure

Step 1 Ensure that the PGND cable is adequately grounded.

Step 2 Connect DC power cables to DC power modules.

NOTICE

- Note the labels on the DC power cables to avoid misoperations.
- To improve availability, connect two power modules to different power sources.

1. Plug the connector end of the DC power cable to the DC power module.
2. Connect the other end of the DC power cable to the output of the power supply device in the equipment room.

Figure 4-53 Connecting DC power cables
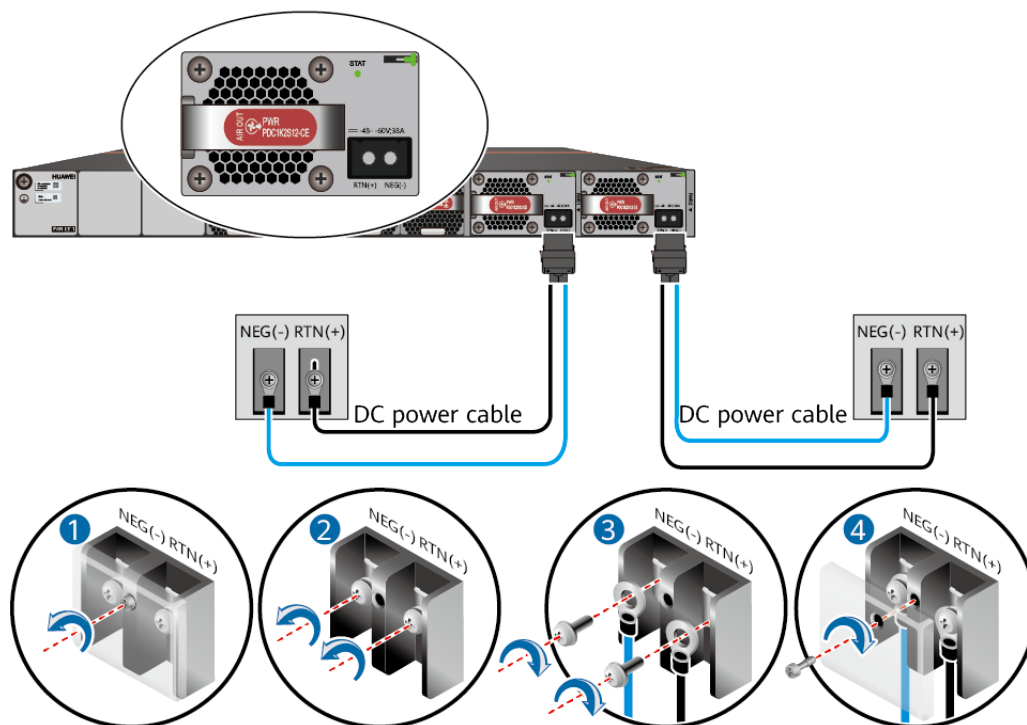
----End

Follow-up Procedure

Verify the following after the connection is complete:

- The power cables are correctly and firmly connected to the power supply device.
- If multiple USGs are deployed, the power cables of each USG are correctly labeled for distinction.

4.5.4 Powering On or Off the Device

This section describes how to power on or off the USG. To ensure the normal start and security of the USG, strictly follow the operation guide to power on or off the USG.

Prerequisites

Before you power on the USG, ensure that:

- The power cable and PGND cable are properly connected.
- The power switch in the equipment room is easy to locate so that you can power off devices in the case of accidents.

Procedure

- Power on the USG.

Turn on the switch of the power supply device. The USG starts.

You can identify the USG status based on indicators on the front and rear panels. Indicators shown in **Figure 4-54** indicate that the USG runs normally.

Figure 4-54 Indicators when the USG runs normally

- Power off the USG.

NOTICE

Before powering off the USG, ensure that configuration data is saved. Otherwise, the configuration data may be lost.

If the USG will be administratively shut down for a long time, turn off the power switch. After powering off the USG, set it aside properly according to storage requirements.

⚠ CAUTION

If the USG has hard disks, do not power off the USG by removing the power cable or switching off the power supply to prevent data loss and hard disk damage. You must run the **disk offline** command in the system view first and wait for about 30 seconds. After the system prompts you with a message indicating that hard disks have stopped, turn off the power switch of the USG.

----End

Follow-up Procedure

After the USG is powered on, you can log in to the configuration page for management and maintenance. For details, refer to the Configuration Guide.

5 Maintaining a Device

The power modules, fan modules, expansion cards, and hard disks of the USG are replaceable. You can replace them as instructed.

5.1 Replacing a Power Module

This section describes how to replace a faulty power module.

Context

When two power modules are installed on the USG, one of them is hot swappable. Pay attention to the following items during hot swapping:

- Power off the power module to be replaced.
- Do not power off the other power module during the replacement.
- Do not touch the other power module either by body or by tools, preventing human injury or device short circuit.
- Do not install DC power modules and AC power modules on the same device.

Replacing the Power Module

Step 1 Determine the location of the power module to be replaced and attack a replacement label on the panel to identify the power module.

Step 2 Disconnect the power supply device from the power module to be replaced.

Step 3 Wear an ESD wrist strap.

Step 4 Remove the power cable connected to the power module.

Refer to the following instructions to remove the power cables:

- To remove the AC power cable:

  a. Press the baffle on the cable retention clip and remove the cable retention clip from the AC power cable. (Skip this step if the power module does not have any cable retention clip.)

  b. Pull out the power cable from the socket on the power module.

- To remove the DC power cable:

  a.   Remove the fastening screws from the OT terminals of the DC power cable.

  b.   Pull out the power cable from the socket on the power module.

Step 5 Replace the power module.

1.   Press the cable retention clip of the power module to the right, hold the front panel of the power module, and pull out the power module.

   📖 **NOTE**

   When replacing a DC power module, push the locking button leftwards, hold the handle of the power module, and pull out the power module. Perform operations according to the actual situation.

2.   Note down the cause and time of the replacement as well as the bar code of the replaced power module and then put away the replaced power module.

3.   Take the new power module from the packing box and check whether its model is the same as the replaced one.

4.   Gently push the new power module into the chassis along the power slot. After the latch on the power module is tightened, pull the power module gently to check whether it can be removed.

5.   Connect the power cable to the socket on the new power module. For details, see Connecting AC Power Cables (for a 420 mm Deep Device) or **Connecting Power Cables (for a 600 mm Deep Device)**.

Figure 5-1 Replace the power module
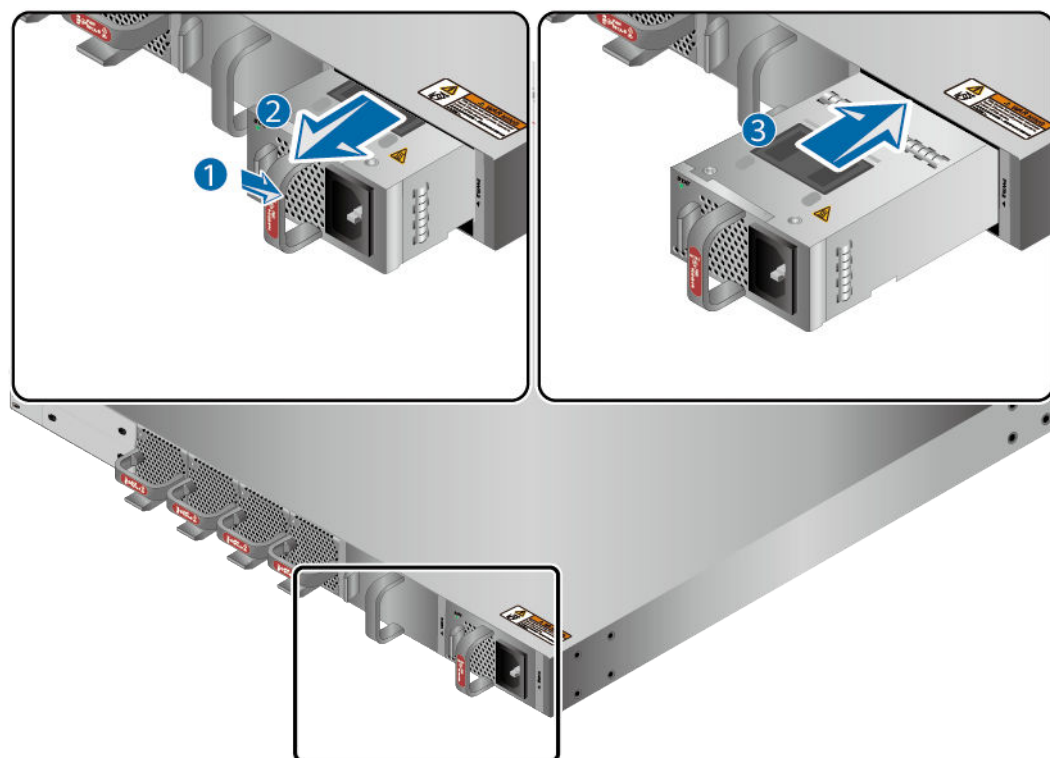
6. Switch on the power supply device. If the STATUS indicator on the new power module of the USG6000F is steady green, the power module works properly.

----End

Follow-up Procedure

After replacing the power module, collect all tools. If the replaced power module is faulty, fill in the **Repair Transmission Sheet** and send the faulty module with the Repair Transmission Sheet to the equipment supplier or the specified repair service provider.

5.2 Replacing a Fan Module

If the only fan of the USG fails, replace the fan module immediately. Otherwise, heat dissipation of the device is affected. If the USG has two or more fans and two or more fans fail, replace the faulty fan modules immediately. Otherwise, heat dissipation of the device is affected.

Context

The fan module of the USG is hot swappable. Therefore, when the fan module is faulty, you can replace the fan module without powering the USG off.

> **NOTICE**
>
> To prevent USG overheating, replace the fan module within 1 minute.

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Remove the faulty fan module.

Press upwards the fan module latch, hold the handle of the fan module, and pull out part of the fan module. After the fan stops rotating, slowly pull out the fan module from the chassis.

Step 3 Install a new fan module.

Hold the handler of the fan module with one hand and the bottom of the fan module with the other hand, insert the fan module along the guide rail of the fan slot until the back of the fan module gets in good contact with the chassis backplane. After the latch on the power module is tightened, pull the fan module gently to check whether it can be removed.

Figure 5-2 Replacing the fan module
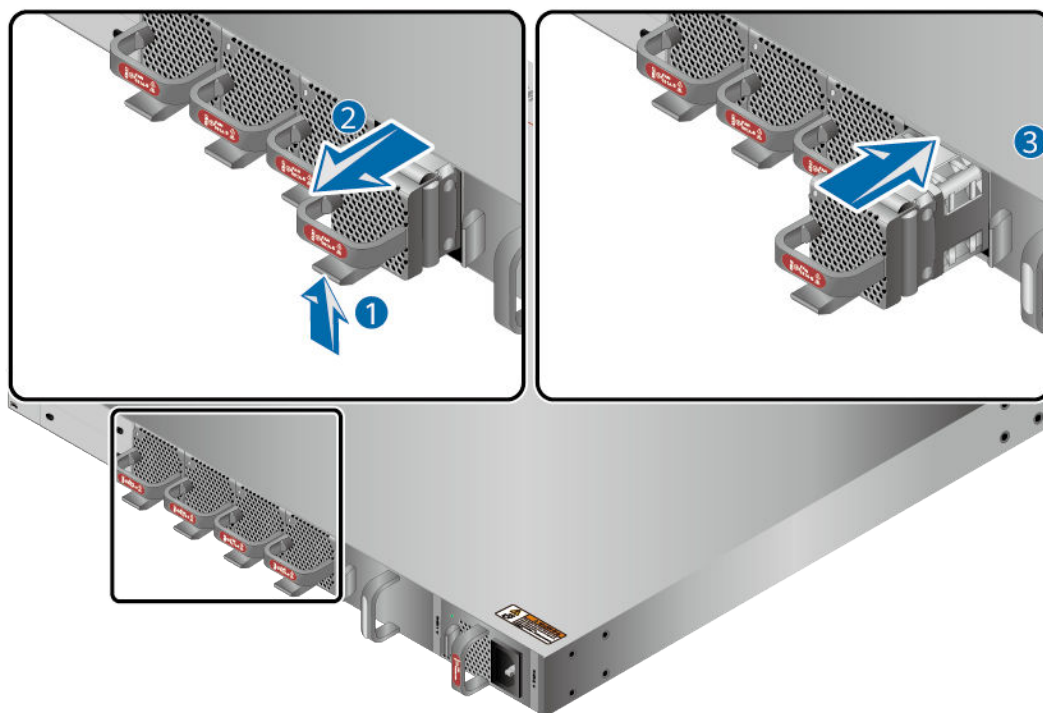
Step 4 Check the FAN STATUS indicator on the panel. If the indicator is blinking green every two seconds (0.5 Hz), the new fan module works properly.

----End

Follow-up Procedure

After replacing the fan module, collect all tools. If the replaced fan module is faulty, fill in the **Repair Transmission Sheet** and send the faulty module with the Repair Transmission Sheet to the equipment supplier or the specified repair service provider.

5.3 Replacing a SIC Card

This section describes how to replace the SIC cards to add ports or functions, or rectify the faults caused by damaged SIC cards.

Precautions

- When the SIC card is in bypass state, Replacing SIC cards interrupts services. You are advised to perform the replacement during off-peak hours.
- Wear the ESD wrist strap while working on the USG to avoid possible damages to the USG and SIC cards.

Tools

- Phillips screwdriver
- ESD wrist strap

- ESD bag

Procedure

Step 1 Check the location of the SIC card to be replaced.

Step 2 Record the interface on the SIC card to which the optical fiber is connected, and remove the optical fiber. Install a dustproof cap on the interface and arrange the optical fiber.

Step 3 Remove the SIC card.

    1. Loose the captive screws on both sides of the SIC card and open the levers outwards.

    2. Pull the SIC card along the guide rail until it is completely detached from the slot. **Figure1 Removing the SIC card** show how to remove the SIC card.

Figure 5-3 Removing the SIC card
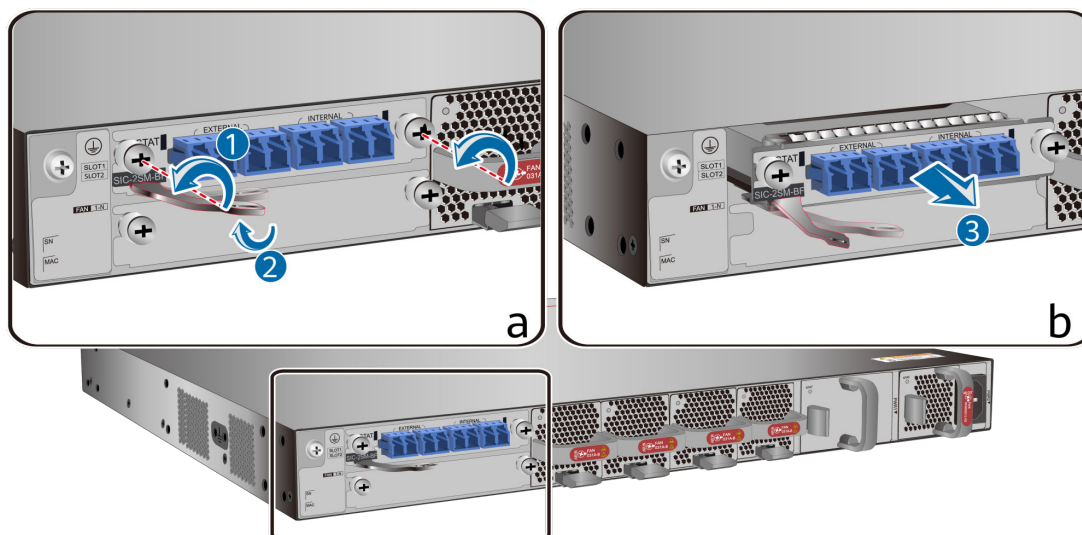
    3. Place the removed SIC card into an ESD bag.

Step 4 Install the SIC card.

For details about installation, see **Installing a SIC Card**.

Step 5 Reconnect the fibers to proper ports based on the connections disconnected previously.

For details about installation, see **Connecting the Optical Transceiver and Optical Fiber**.

----End

Follow-up Procedure

After replacing the SIC card, collect all tools. If the replaced SIC card is faulty, fill in the **Repair Transmission Sheet** and send the faulty module with the Repair Transmission Sheet to the equipment supplier or the specified repair service provider.

5.4 Replacing the Hard Disk

This section describes how to replace the hard disk as well as the precautions.

Precautions

Precautions for using the hard disks

- Use hard disks purchased from Huawei. Otherwise, the system may not identify them.
- Powering off the USG interrupts services. Install or replace the hard disks during off-peak hours.
- Wear the ESD wrist strap while working on the USG to avoid possible damages to the USG and hard disks.
- While holding a hard disk, do not touch the PCB board or squeeze the disk. Carry only one hard disk at a time. Do not vibrate, crash, or pile multiple hard disks up.
- Put the hard disks inside ESD bags when they are not used.
- For mapping relationships between the USG and hard disks, see **Hardware Overview**.

Tools

ESD bag

Replacing the Hard Disk (USG6525F, USG6555F, USG6565F, USG6585F)

If a hard disk is faulty (for example, a hard disk failure log is generated on the USG), you can replace the hard disk. The hard disk can be replaced no matter when the USG is powered on or off. If the is powered off, skip **Step 1** and do not run the **disk offline** command. The following procedure guides you through hard disk replacement while the USG is powered on:

**Step 1** Ensure that all configurations are saved.

Step 2 Run the **disk offline** command in the system view. Wait about 30 seconds until the system indicates that the hard disk stops working and then remove the hard disk to be replaced.

> 📖 **NOTE**
>
> If you remove and insert a hard disk without running the **disk offline** command first, the hard disk may be damaged, data in the hard disk may be lost, or the system may stop responding to services.

1. Use the handler to pull the hard disk out of the slot.
2. Put the replaced hard disk into an ESD bag.

Figure 5-4 Removing the hard disk (USG6525F, USG6555F, USG6565F, USG6585F)
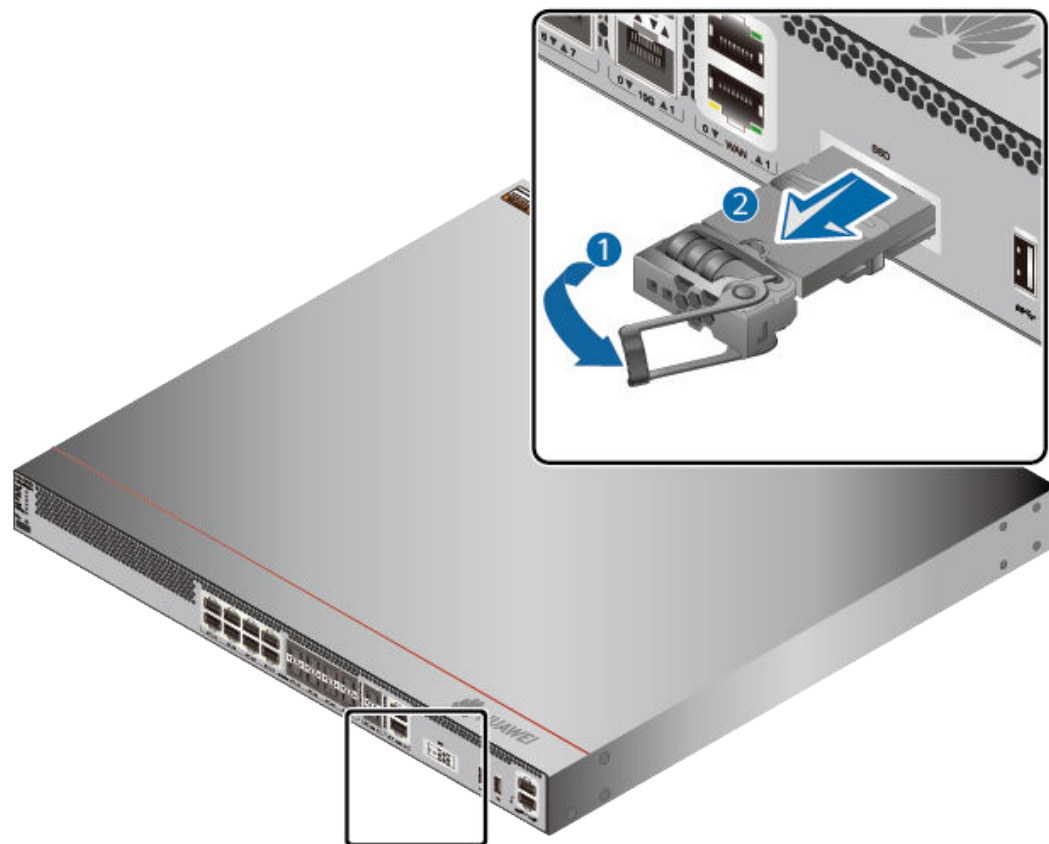
Step 3 Install the new hard disk, see **Installing a Hard Disk**.

Step 4 Run the **disk online** command in the system view and then the **display device disk** command. Check the basic status and information of the hard disk.

----End

Replacing the Hard Disk

If a hard disk is faulty (for example, a hard disk failure log is generated on the USG), you can replace the hard disk. The hard disk can be replaced no matter when the USG is powered on or off. If the USG is powered off, skip **Step 1** and do not run the **disk offline** command or press the **OFL** button. The following procedure guides you through hard disk replacement while the USG is powered on:

Step 1 Ensure that all configurations are saved.

Step 2 Run the **disk offline** command in the user view. Wait about 30 seconds until the system indicates that the hard disk stops working and then remove the hard disk to be replaced. Press and hold the **OFL** button for about four seconds until the **OFL** indicator is on. Then remove the hard disk unit to be replaced.

☐ **NOTE**

If you remove and insert a hard disk without running the **disk offline** command or press the **OFL** button first, the hard disk may be damaged, data in the hard disk may be lost, or the system may stop responding to services.

1. Press the button on the right of the hard disk tray to eject the handler.
2. Use the handler to pull the hard disk out of the slot.
3. Put the replaced hard disk into an ESD bag.

Figure 5-5 Removing the hard disk
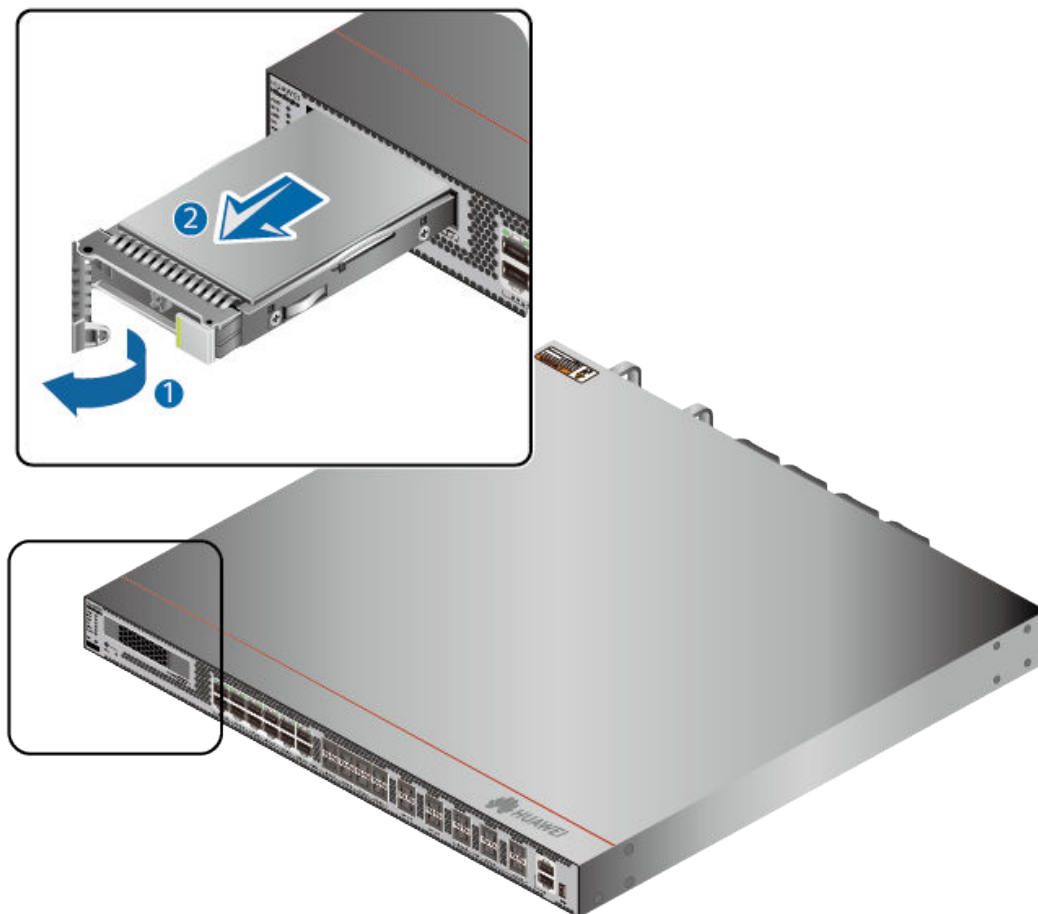
Step 3 Install the new hard disk, see **Hardware Installation**.

Step 4 Run the **disk online** command in the user view, and then run the **display device disk** command in the diagnostic view to check the status and information about the hard disk.

----End

Follow-up Procedure

After replacing the hard disk, collect all tools. If the replaced hard disk is faulty, fill in the **Repair Transmission Sheet** and send the faulty module with the Repair Transmission Sheet to the equipment supplier or the specified repair service provider.

5.5 Replacing a Micro SD Card (USG6510F-D, USG6530F-D, USG6510F-DL, USG6530F-DL)

This section describes how to replace the micro SD card and the precautions.

Precautions

If the micro SD card has one of the following conditions, replace the micro SD card:

- The micro SD card is damaged. That is, the USG generates the micro SD card damage alarm: ENTEXT_1.3.6.1.4.1.2011.5.25.31.2.0.16 hwEntityExtDiskDamaged.

- The micro SD card is full. That is, the USG generates the micro SD card full alarm: ENTEXT_1.3.6.1.4.1.2011.5.25.31.2.0.17 hwEntityExtDiskFull.

Read the precautions on using the micro SD card:

- Micro SD cards are optional and are not delivered with the device. If required, purchase the micro SD card (part number: 06010308) from Huawei. The micro SD card model is SDSDQAE-064G, the capacity is 64 GB, and dimensions (H x W x D) are 1 mm x 15 mm x 11 mm (0.04 in. x 0.59 in. x 0.43 in.).

- Make sure that you have worn an ESD wrist strap and the strap is well grounded before you hold the micro SD card. Otherwise, the micro SD card may be damaged.

The micro SD card can be replaced no matter when the USG is powered on or off. If the USG is powered off, skip the **disk offline** command. The following procedure guides you through micro SD card replacement while the USG is powered on.

Tools

- Phillips screwdriver
- ESD wrist strap

Procedure

Step 1 Ensure that all configurations are saved.

Step 2 In the system view, run the **disk offline** command. When the system displays a message indicating that the SD card is offline, remove the micro SD card to be replaced.

> 📖 **NOTE**
>
> - Before replacing a micro SD card, run the **disk offline** command to prevent micro SD card damage and data loss.
> - Do not use too much force; otherwise the micro SD or micro SD card slot might be damaged.

1. Loosen the screws on the anti-theft board and remove the anti-theft board.

2. Press the micro SD card along the guide rail to loosen the internal card clip. Then the micro SD card is ejected from the slot. You can then remove the micro SD card.

3.   Place the replaced micro SD card properly.

Figure 5-6 Removing a micro SD card
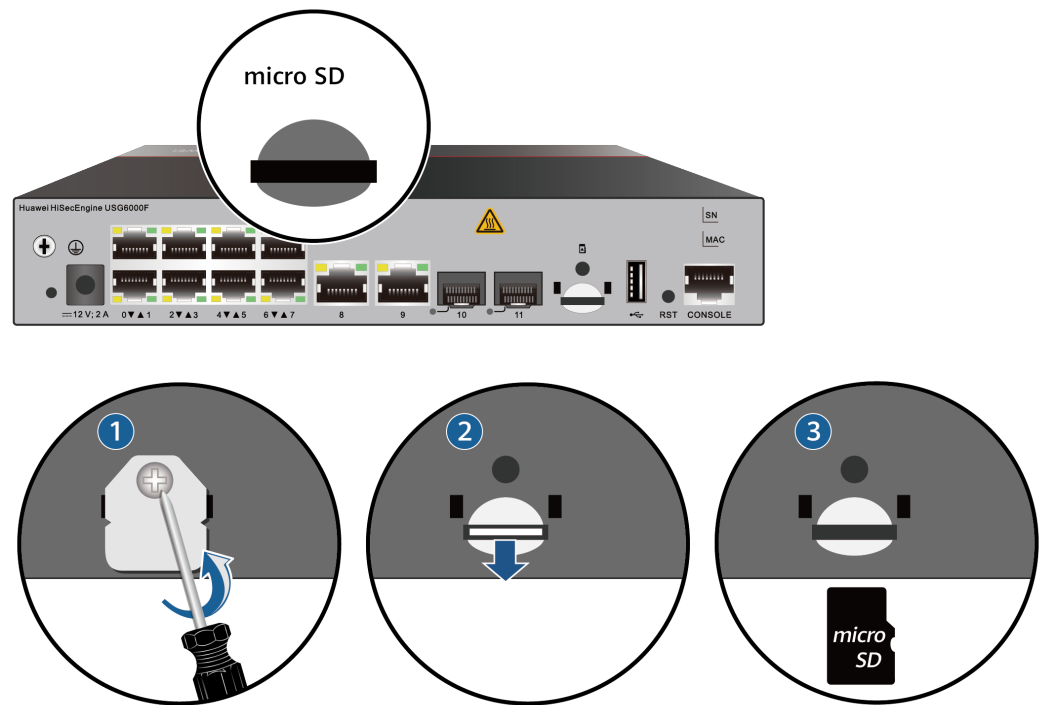
Step 3 Install the new micro SD card and anti-theft board.

◯ NOTE

- Note that the USG6510F-D, USG6530F-D micro SD card must be installed with the face with words upwards.Note that the USG6510F-DL, USG6530F-DL micro SD card must be installed with the words with face upwards.
- Do not use too much force; otherwise the micro SD or micro SD card slot might be damaged.

1.   Insert the micro SD along the guide rail to the micro SD card slot.

2.   When you hear a click, the micro SD card is in position.

3.   Hook the locating hook on the anti-theft board to the locating hole of the rear panel and tighten the captive screw on the anti-theft board.

Figure 5-7 Installing the new micro SD card and anti-theft board
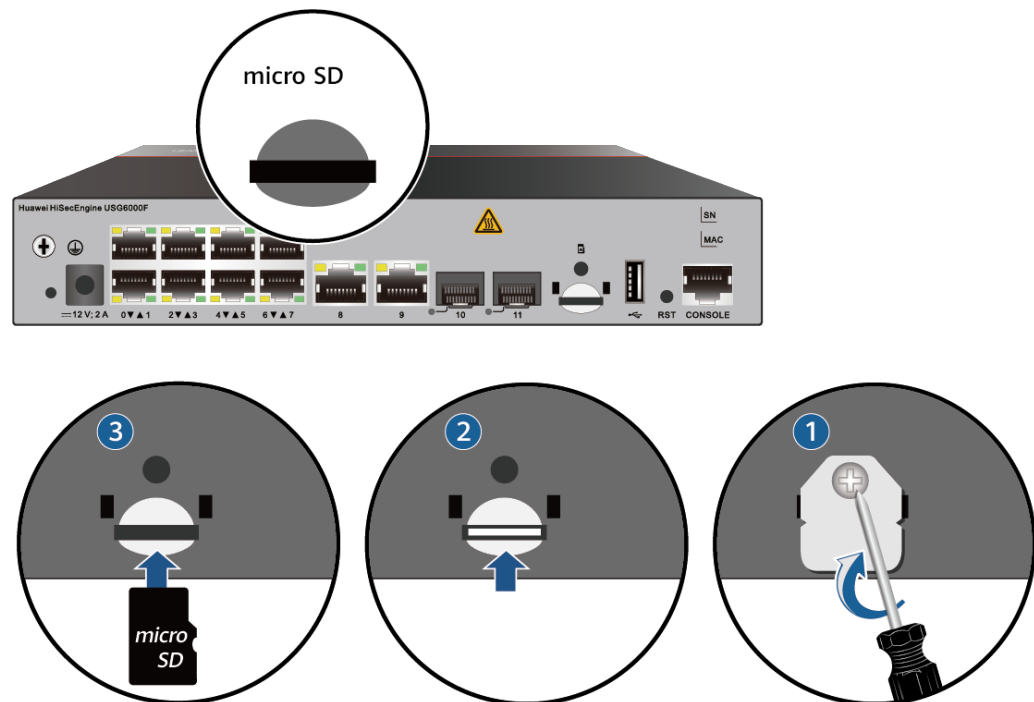
Step 4 In diagnostic view, run the **display device disk** command to check the micro SD card installation and file system mounting status. In the command output, **Present** should be Present, **Power** should be On, and **Register** should be Registered.

- If **Present** is Absent, re-install the micro SD card and try again. If **SD Card Physical State** remains the same, the USG may fail to identify the micro SD card. You are advised to use another micro SD card.

- If **Register** is UnRegistered, the micro SD card format might not be **ext4.** You need to run the **format disk partition** command in the system view to format the micro SD card.

----End

Follow-up Procedure

After replacing the micro SD card, collect all tools. If the replaced micro SD card is faulty, fill in the **Repair Transmission Sheet** and send the faulty module with the Repair Transmission Sheet to the equipment supplier or the specified repair service provider.

5.6 Replacing a SIM Card (USG6510F-DL, USG6530F-DL)

Precautions

If the SIM card is damaged or needs to be replaced with a SIM card with different standards, follow the instructions in this section.

- The USG6510F-DL, USG6530F-DL supports standard Nano SIM cards. Exercise caution when you remove and insert the SIM card.

- The USG6510F-DL, USG6530F-DL supports 4G FDD LTE/TDD LTE, 3G TD-SCDMA/WCDMA, and 2G GSM SIM cards. You need to purchase the corresponding SIM card.

NOTICE

- SIM cards are not hot swappable. Therefore, do not install the SIM card when the USG is powered on. Otherwise, the SIM card may be damaged or the function may become invalid.

- Replacing the SIM card may cause LTE access failure and interrupt the service in the LTE uplink. Therefore, replace the SIM card during off-peak hours.

- Make sure that you have worn an ESD wrist strap and the strap is well grounded before you hold the SIM card. Otherwise, the SIM card may be damaged.

Tools

- Phillips screwdriver
- ESD wrist strap

Procedure

Step 1 Ensure that all configurations are saved.

Step 2 The USG does not have a power switch. Select either of the following methods to power off the USG:

- Disconnect the power adapter of the USG from the power supply equipment.

- Power off the power supply equipment.

**Step 3** Remove the SIM card to be replaced.

NOTE

Do not use too much force; otherwise the SIM card or SIM card slot might be damaged.

1. Loosen the screws on the anti-theft board and remove the anti-theft board.

2. Press the SIM card along the guide rail to loosen the internal card clip. Then the SIM card is ejected from the slot. You can then remove the SIM card.

3. Place the replaced SIM card properly.

Figure 5-8 Removing a SIM card
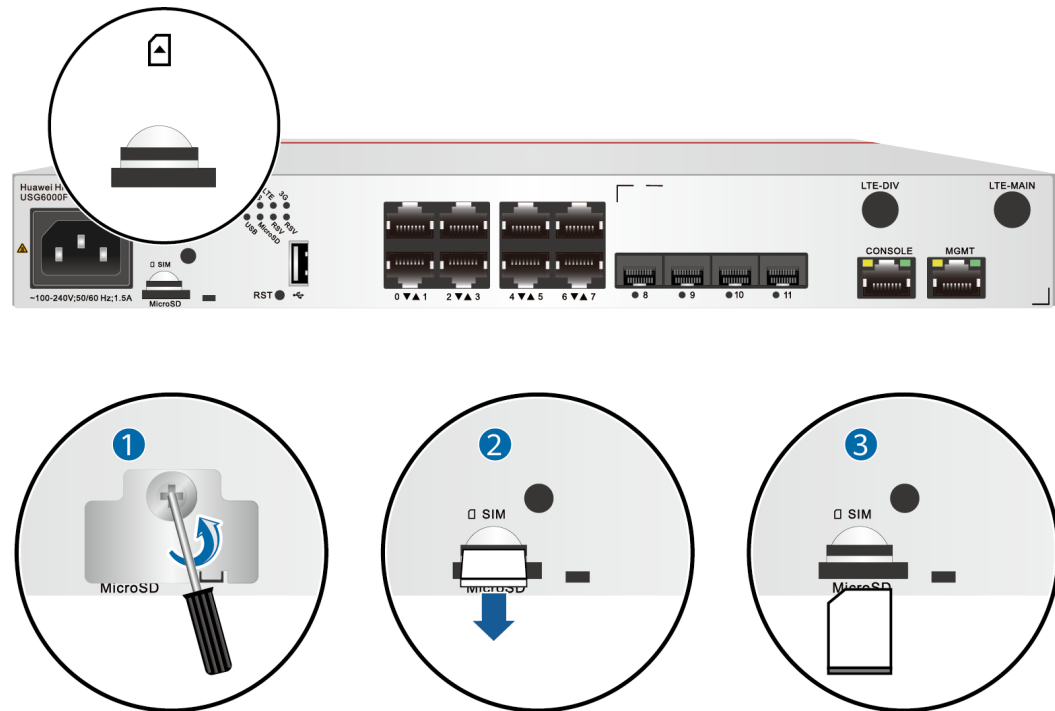
Step 4 Install the new SIM card and anti-theft board.

📖 NOTE

- Keep the notch on the SIM card in the same direction as the notch marked on the left of the SIM card slot.

- Do not use too much force; otherwise the SIM card or SIM card slot might be damaged.

- The anti-theft board is delivered with the device and can be used to protect both the micro SD card and SIM card. If both the micro SD card and SIM card need to be installed, you are advised to install both the cards before installing the anti-theft board.

1. Insert the SIM card along the guide rail to the SIM card slot.

2. When you hear a click, the SIM card is in position.

3. Hook the locating hook on the anti-theft board to the locating hole of the rear panel and tighten the captive screw on the anti-theft board.

Figure 5-9 Installing the new SIM card and anti-theft board

----End
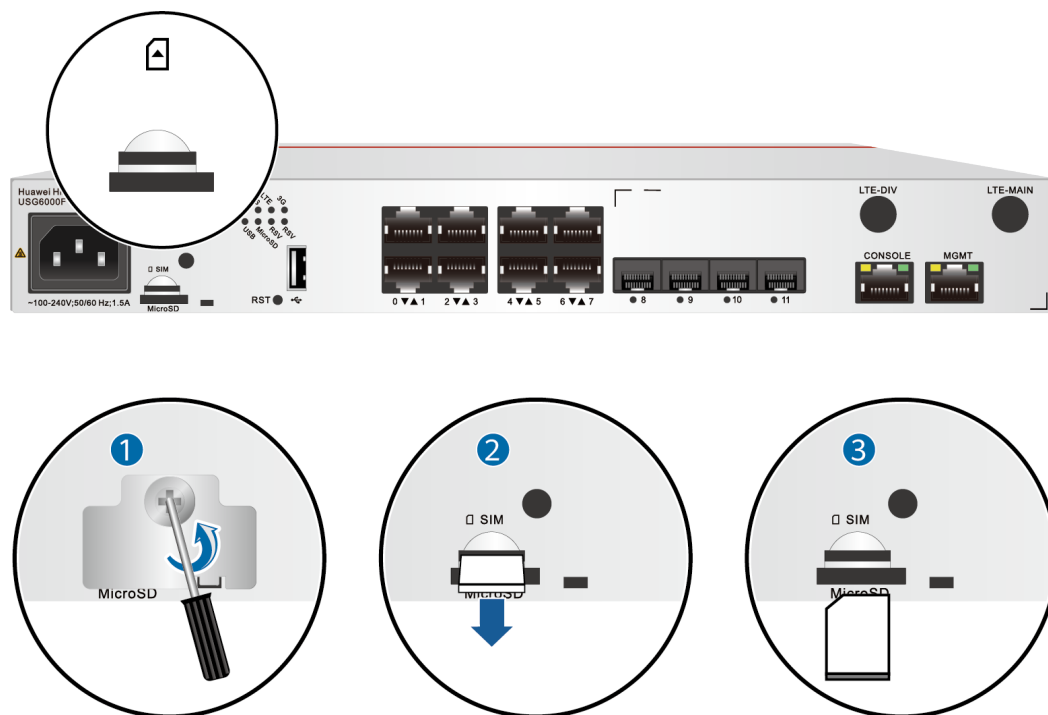
Follow-up Procedure

Power on the and start the .After the is started, run the **display cellular** command in any view to check the SIM card status. If **SIM Status** in the command output is **Normal**, the SIM card is working properly and has been identified by the USG.

6 Appendix

This section describes the requirements for the USG installation environment and **Fault Tag** template.

6.1 Quick Reference Tables of Power Cables

AC Power Cables for the Power Adapters Directly Connected to the Socket

Table 6-1 AC power cables for the power adapters directly connected to the socket

Part Number	Description	Image
0404 3491	External Power Cable, Power Cable 250V2.5A,2m, 2X0.75mm^2,Black,PASM, 227IEC53-0.75^2(2C)-I,C7SF	
0404 4216	Power cord,Europe AC Power 250V2,2.0m,PCSM, (H03VVH2F-0.5^2(2C)),C7SF,black	

Part Number	Description	Image
0404 4496	Power Cords Cable,Japan AC Power 125V7A, 2.0m,PASM,VCTFK-0.75^2(2C), C7SF,Black	
0404 4497	Power Cable,America AC Power Cable 125V7A, 2.0m,PASM, 18NISPT-1(2C),C7SF,Black	
0404 5094	Power Cords Cable,India AC Power 250V2.5A,2.0m,PC-IISM,IS 694-0.75^2(2C),C7S, 250V,2.5A,Black	
0405 0956	Power Cord Cable,Brazil AC Power Cable,250V2.5A,2m,PC-IIISM,H05VVH2-F 2*0.75^2(2C),C7SF,250V, 2.5A,Black	

Part Number	Description	Image
0405 1081	Power cord,BS546 250V2.5A, 2m,PD-IAM,H03VVH2-F-0.75mm^2(2C),C7SF,250V, 2.5A,Black	
0405 1997	Power cord,2m,IRAM2063 Straight Male,H05VVH2-F 2*0.75^2(2C),C7 Straight Female,250V,2.5A,BLACK	
0405 G025	Power Cords Cable,South Africa AC Power 250V2.5A, 2m,PDAM,H03VVH2-F-0.75^2(2C),C7SF	

AC Power Cables for the Power Modules Directly Connected to the Socket

Table 6-2 AC power cables for the power modules directly connected to the socket

Part Number	Description	Image
0402 0728	Power Cable,America AC Power Cable,125V10A, 3.0m,PBSM, 18SJT(3C),C13SF,Black	
0404 0887	Power Cable,Japan AC Power Cable 125V12A, 3.0m,PBSM,HVCTF-1.25mm^2(3C),C13SF,Black	
0404 0888	Power Cords Cable,Australia AC Power Cable,250V 10A, 3.0m,PISM,H05VV-F-1.0mm^2(3C),C13SF,Black	

Part Number	Description	Image
0404 0889	Power cord,BS546 250V10A, 3.0m,PM-IAM,H05VV-F-1.5mm^2(3C),C13SF,250V, 10A,Black	
0404 0890	Power Cable,Britain AC Power Cable 250V10A, 3.0m,PGAM ,H05VV-F-1.0mm^2(3C),C13SF,Black	
0404 1056	Power cord,Europe AC Power Cable,250V10A,3.0m,PFSM, (H05VVF 1.0^2(3C)),C13SF, 250V,10A,BLack	

Part Number	Description	Image
0404 1117	Power Cable,Britain AC Power Cable 250V10A, 3.0m,PGAM ,H05VV-F-1.0mm^2(3C),C13AF-L,Black	
0404 1120	Power Cable,Italy AC Power Cable 250V10A, 3.0m,PLSM,H05VV-F-1.0mm^2(3C),C13SF,Black	
0404 2697	Power Cords Cable,China AC Power 250V10A,10.0m,PISM, 227IEC53-1.0^2(3C),C13SF,Black	

Part Number	Description	Image
0404 2699	Power Cords Cable,China AC Power 250V10A,20.0m,PISM, 227IEC53-1.0^2(3C),C13SF,Black	
0404 7785	Power Cords Cable,Argentina AC Power 250V10A, 3.0m,PISM,H05VV-F-1.0mm^2(3C),C13SF,Black	
0405 0139	Power Cords Cable,China AC Power Cable,250V10A, 3m,PISM, 227IEC53-1.0^2(3C),C13SF,Black	
0405 0206	Power Cable,China AC Power Cable 250V10A,1.0m,PISM, 227IEC53(RVV)1.0mm^2(3C),C13SF,Black	
0405 0517	Power Cable,China AC Power Cable 250V10A,2.0m,PISM, 227IEC53(RVV)1.0mm^2(3C),C13SF,Black	

Part Number	Description	Image
0405 0955	Power Cords Cable,China AC Power,250V10A,1.5m,PISM, 227IEC53(RVV)1.0mm^2(3C),C 13SF,250V,10A,Black	
0405 1035	Power cord,India AC Power 250V6A,3m,PM-IIAM,IS 694-1.0^2(3C),C13 SF,250V, 6A,Black	
0405 1080	Power cord,South Africa AC Power 250V10A, 3m,PMAM,H05VV- F-1.0mm^2(3C),C13SF,250V, 10A,Black	

Part Number	Description	Image
0405 G028	Power Cords Cable,Korea AC Power 250V10A, 3m,PFSM,H05VV-F 3*1.0^2(3C),C13SF,Black	
0405 G02K	Power Cords Cable,Denmark AC Power 250V10A, 3m,PKSM,H05VV-F-3*1.0^2(3C),C13SF,Black	

AC Power Cables for the Power Modules Directly Connected to the PDU

Table 6-3 AC power cables for the power modules directly connected to the PDU

Part Number	Description	Image
0405 0188	Power Cords Cable,China AC Power 250V10A,1.5m,C14SM, 227IEC53(RVV)1.0mm^2(3C),C 13SF,PDU Cable	
0405 0846	Power cord,China AC Power Cable,250V10A,3.0m,C14SM, (227IEC53-1.0^2(3C)),C13SF, 250V,10A,Black,PDU Cable	
0405 0847	Power cord,China AC Power Cable,250V10A,6.0m,C14SM, (227IEC53-1.0^2(3C)),C13SF, 250V,10A,Black,PDU Cable	

Part Number	Description	Image
0405 G019	Power Cords Cable,Europe AC 250V10A,1.8m,C14SM,H05VV-F- 3*1.00^2,C13SF,PDU Cable	
0405 G029	Power Cords Cable,North America AC Power 250V10A, 1.8m,C14SM,SJT 18AWG(3C),C13SF,PDU Cable	
0405 G02D	Power Cords Cable,Japan AC Power 250V12A, 1.8m,C14SM,HVCTF 1.25^2(3C),C13SF,PDU Cable	

Part Number	Description	Image
0405 G02F	Power Cords Cable,Australia AC Power 250V10A, 1.8m,C14SM,H05VV-F-1.0^2(3C),C13SF,PDU Cable	
0405 G02H	Power Cords Cable,Korea AC Power 250V10A, 1.8m,C14SM,H05VV-F-1.0^2(3C),C13SF,PDU Cable	

DC Power Cables

Table 6-4 DC power cables

Part Number	Description	Image
0415 2883	Power Cable,3m,4^2mm,PS2F, (H07Z-K-4^2B+H07Z-K-4^2BL),2*T4^2GY	

6.2 Requirements for Installation Environment

This section describes the requirements for the USG installation environment, such as the device position, humidity and temperature, cleanness, antistatic measures, lightning protection measures, power supply, and anti-magnetic measures.

6.2.1 Device Position

This section describes the USG position requirements to ensure its security.

Table 6-5 lists the requirements for the device position.

Table 6-5 Device position requirements

Item	Requirement
Ventilation and heat dissipation	- To ensure good heat dissipation, keep the air vent of the device at least 150 mm away from other devices. - Ensure that the ventilation and heat dissipation system is available at the position where the device is to be installed.
Stability	The cabinet or mounting table must be firm enough to support the weight of the device and its accessories.
Grounding	Ensure that the chassis or mounting table is properly grounded.

6.2.2 Humidity, Temperature, and Cleanness

This section describes the requirements for the humidity, temperature, and cleanness of the equipment room. To ensure the stability and life cycle of the USG and its components, check that the equipment room meets the requirements.

Ensure that there is no explosive, conductive, magnetic, or corrosive dust or debris in the equipment room. Dust that settle on the device may cause electrostatic adsorption, resulting in poor contact of the metal socket connectors and metal contacts. This shortens the life cycle of the device and causes faults.

In addition to dust and debris, toxic gases, such as SO_2, H_2S, and NH_3 must be cleaned out of the equipment room.

Table 6-6 Requirements for humidity, temperature, and cleanness in the equipment room

Item	Description					
Cleanne ss	Dust particl e	Maximum diameter (μm)	0.05	1	3	5

Item	Description								
		Maximum density (number of dust particles per cubic meter)	1.4×10^7	7×10^5		2.4×10^5		1.3×10^5	
	Noxious gas density	Gas	SO_2	H_2S	Cl_2	HCl	HF	NH_3	O_3 NO_2
		Average (mg/m^3)	0.3	0.1	0.1	0.1	0.01	1.0	0.05 0.5
		Maximum (mg/m^3)	1.0	0.5	0.3	0.5	0.03	3.0	0.1 1.0
Humidity and temperature	Temperature	Long-term operating temperature	• Without hard disk: 0 °C to 45 °C • With hard disk(s): 5 °C to 40 °C						
		Short-term operating temperature	• Without hard disk: -5 °C to 55 °C • With hard disk(s): 5 °C to 40 °C						
	Operating humidity		• Without hard disk: 5% RH to 95% RH, non-condensing • With hard disk(s): 5% RH to 90% RH, non-condensing						
	Storage humidity		• Without hard disk: 5% RH to 95% RH, non-condensing • With hard disk(s): 5% RH to 90% RH, non-condensing						

To meet the requirements listed in **Table 6-6**, take the following measures in the equipment room:

- Install a permanent temperature controller regardless of the climate conditions.
- In dry regions, use humidifiers or regularly mop the floor to ensure proper humidity in the equipment room.
- In regions with high humidity, use dehumidifiers.
- Use dust-free materials for the floor, walls, and ceilings.
- Screen exterior doors and windows. The external windows of the equipment room should be sealed for anti-dust purposes.
- Clean the equipment room and air filters on the devices once every three months.

- Wear the ESD uniform, ESD gloves, and ESD shoes before entering the equipment room.

- Locate the equipment room far away from areas with dense corrosive gases, such as chemical plants.

- The air intake vent of the equipment room must not face any pollution source.

- Place batteries in a different room from the devices.

- Invite professionals to measure the temperature, humidity, and other factors periodically.

6.2.3 ESD Requirements

This section describes the ESD requirements. Ensure that the equipment room meets these requirements because static electricity may damage the USG components and cause the USG to malfunction.

The absolute value of the static voltage must be less than 1000 V. To meet the requirement, take the following measures in the equipment room:

- Provide operators with ESD protection training.

- Adjust the humidity to reduce the impact of static electricity.

- Install an ESD floor in the equipment room.

- Wear an antistatic suit, ESD gloves, and antistatic shoes before entering the equipment room.

- Use ESD tools, such as ESD wrist straps, ESD tweezers, and extractors.

- All the conductors in the equipment room, including computer terminals, must be properly grounded. Set up an antistatic workbench.

- Electrostatic sources, such as non-ESD plastic bags, non-ESD foam, and rubber objects must be kept at least 30 cm away from ESD-sensitive components and boards.

To protect the USG boards from damage caused by static electricity discharge, take the following measures:

- Ensure that the USG is properly grounded according to the grounding requirements.

- Wear an ESD wrist strap before performing any operations on the USG.

- Ensure proper contact between the metal buckle of the ESD wrist strap and the operator's skin. Ensure that the other end of the ESD wrist strap is already connected to the ESD jack on the USG, as shown in **Figure 6-1**. In addition, wearing ESD gloves is recommended.

Figure 6-1 Wearing an ESD wrist strap properly
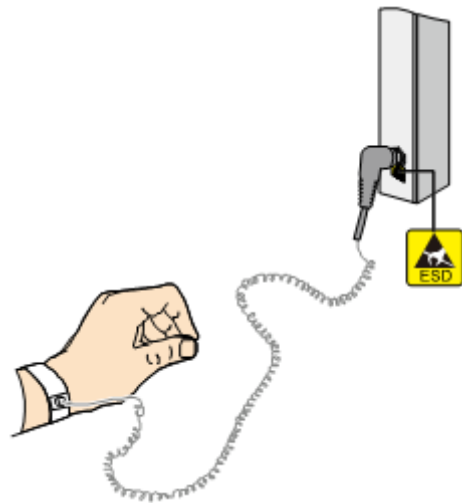
- Ensure that the ESD wrist strap works properly and its resistance ranges from 0.75 Mohm to 10 Mohm. Generally, the service life of an ESD wrist strap is two years. If the ESD wrist strap resistance does not meet the requirement within its service life, replace it with a new one.
- Avoid contact between the boards and clothes because the ESD wrist strap cannot protect operators from the static electricity caused by this type of contact.
- Use an anti-static pad when replacing boards or chips. In addition to wearing the ESD wrist strap, use ESD tweezers and extractors when inserting and removing boards and chips. Do not touch chips and their pins with bare hands.
- Keep all boards and components in ESD bags until they are to be installed. Place temporarily demounted boards and components on the anti-static pad or other effective antistatic materials. Do not use non-ESD materials, such as foam, plastic bags, and paper bags to wrap or make contact with the boards.
- Wear an ESD wrist strap before working on board terminals. Discharge cables and terminal protection jackets using either contact discharge or air discharge before connecting them to device terminals.
- Save board packing materials, such as plastic boxes and ESD bags, for future use.

6.2.4 Lightning Protection and Grounding

This section describes the lightning protection and grounding requirements. Ensure that the equipment room meets the requirements because lightning is one of the major factors that causes damage to the USG.

Lightning Protection and Grounding lists the lightning protection and grounding requirements.

Table 6-7 Lightning protection and grounding requirements

Item	Requirement
Civil construction of the equipment room	The equipment room should be built of reinforced concrete. The equipment room should be equipped with lightning protection devices, such as a lightning arrester. The lightning protection ground for the equipment room (the grounding of the lightning arrester) should share the same grounding conductor with the protection ground of the equipment room.
AC power system (TN-S power supply recommended)	A dedicated transformer should be used at a communications station. Power cables that are connected to the communications station should be buried with metal jackets or insulated jackets passing through steel pipes. Both sides of the metal jackets or steel pipes are connected to the nearest ground bar. The length of the buried power cables should be no less than 15 meters. The three phase lines at the low-voltage side of the AC transformer at the communications station should each be installed with a closed zinc-oxide lightning arrester for grounding. The enclosure of the transformer, AC zero wire of the low-voltage side of the transformer, and the metal outer protector of the power cable connected to the transformer enclosure must be connected to the nearest grounding post.
Incoming power cables	AC and DC power cables should not be led into or out of the communications station through overhead lines. After low-voltage power cables are led into the equipment room, in the AC voltage regulator and AC power distribution box (PDB), install a lightning arrester for power cables and connect the lightning arrester to the nearest grounding post. If the equipment room is located in an urban area, the AC power system of the equipment room should have a lightning protection unit with a nominal discharge current of no less than 20 kA. If the equipment room is located in a suburban area that is classified as a medium or high level lightning zone, install a lightning protection unit with a nominal discharge current of greater than 60 kA. If the equipment room is located in a mountainous area that is classified as a high-level lightning zone or in an isolated building in an urban area, install a lightning protection unit with a nominal discharge current of greater than 100 kA. The ground cable of the lightning arrester used for the power supply must be shorter than one meter.

Item	Requirement
DC distribution grounding	The DC working ground of the communications station (the positive pole of the -48 V DC power supply or the negative pole of the 24 V DC power supply) should be led in from the nearest indoor main earthing conductor.
	The device that supplies power to the communications station should provide the DC working ground that connects from the collective ground cable of the building (or from the protection ground bar in the equipment room) to the power supply.
Equipotential bonding	The communications devices and auxiliary facilities in the equipment room must be properly grounded. These devices and facilities include mobile base transceiver stations (BTSs), transmission devices, switching devices, power supply, and distribution frames. All the devices in the communications station should be grounded to the same ground busbar. All devices in the equipment room should be grounded to the same protection ground bar in the equipment room.
	A ground grid must be shared by the working grounds and protection grounds of all devices in the equipment room.
	The cable tray, iron suspension racks, racks, chassis, metal ventilation pipes, and metal doors and windows must be grounded.
Common grounding requirements	The neutral of the AC power cables must not be connected to the protection ground of any communications device in the equipment room.
	Do not install switches or fuses on the ground cables.
	Ground cables should be as short and straight as possible and should not be coiled.
Grounding resistance	Less than 1 Ohm
	The upper end of the ground body must be no less than 0.7 m from the ground. In cold regions, the ground body should be buried under the frozen soil layer.
	Measure the grounding resistance periodically to ensure that the grounding works properly.
Signal cable layout	No overhead signal cable should exist in the communications station. Signal cables should be led into the station from underground.
	The communications cables led into or out of the communication station should be protected with metal sheaths or laid out in metal pipes.
	The ground cable of a lightning arrester should be as short as possible. The unused wire pairs in the cables should be grounded in the equipment room.

Item	Requirement
Collective ground cable	The main earthing conductor can be a cable grounding ring or busbar.
	Do not use aluminum materials as ground cables. Avoid electrochemical corrosion when different types of metals are interconnected.
	Generally, a copper busbar with a cross-sectional area of no less than 120 mm^2 or galvanized steel with the same resistance is used as the main earthing conductor. The main earthing conductor must be insulated from the reinforcing steel bar in the building.
Grounding lead-in cable	The grounding lead-in cable must be no longer than 30 m. The grounding lead-in cable should use galvanized steel with a cross-sectional area of 40 mm x 4 mm or 50 mm x 5 mm.

6.2.5 Power Supply

Normal power supply is the prerequisite for proper running of the USG. This section describes the requirements for power supply.

Basic AC Power Supply

The AC power supply system that consists of mains, uninterruptible power supply (UPS), and self-provided generators should supply power in centralized mode. The power supply system should meet the needs of the communications station, and its cabling should be as simple as possible to facilitate operation and maintenance. The low-voltage AC power supply system should use 3-phase 5-wire or 1-phase 3-wire for power supply. Table 6-8 lists the low-voltage AC nominal voltage and frequency.

Table 6-8 AC voltage and frequency

Nominal Voltage	Rated Frequency
110/127/220 (V)	50Hz/60Hz

In common cases, the UPS serves as the backup power supply for network products. The backup power supply must be the same as the mains in phases, and the duration for the switchover between the UPS and the mains should be less than 10 ms. Otherwise, the device might restart or be reset. Each device must have an independent AC surge protector. The capacity of the surge protector for the power distribution room must be greater than the sum of the operating current and fault current on the devices to be powered. The DC power supply system must be able to safely withstand the maximum load of the device, regardless of whether the device is in working or standby state. The wire type and gauge of each outlet of the power distribution panel must be able to withstand

the maximum power load of the devices. The specifications for the AC power supply voltage of all communications and power supply devices are as follows:

- Communications devices must be equipped with AC power supply with the rated voltage ranging from +5% to -10%.

- Communications power supply devices and key constructions must be equipped with AC power supply with the rated voltage ranging from +10% to -15%.

- The frequency of the AC power current ranges from +4% to -4%, and the sinusoidal distortion rate of voltage waveform must be 5% or less.

The self-provided generator sets in the communications station must be automatic in activation, deactivation, and replenishment, be equipped with remote signaling, remote measurement, and remote control, and provide standard interfaces and communications protocols.

The power cables used for AC and DC power distribution should comply with the following specifications:

- The AC neutral for communications purposes must be a conductive wire that has the same cross section as the phase cable.

- The selection of the DC power feeder depends on the long-term load. If the cross-sectional area is greater than 95 mm^2, use the rigid busbar. If the short-term load differs greatly from long-term load, lay out the cables by stages.

- The DC and AC conducting wires must be fire resistant and the wiring must comply with the *Class A Fire Resistance Design Norm for High-Rise Civil Buildings* (GB50045-95). The low-voltage power distribution facilities must comply with the *Low-Voltage Power Distribution Facilities and Wiring Design Norm* (GB50054-95)

In addition, the basic AC power supply system should meet the following requirements:

- Use voltage regulating or stabilization facilities to restrict the voltage fluctuation within a reasonable scale if:
  - The communications devices are powered by mains, and the voltage exceeds the rated voltage by +5% to -10% or the allowed voltage range.
  - The communications devices are not powered directly by the mains and the voltage of the mains exceeds the rated voltage by +10% to -15% or the AC voltage range allowed by the DC power supply device.

- Use the UPS or inverter power supply system if the communication load requires non-interruptible and non-transient AC power supply.

- Equip the site with the electric generator set to ensure normal communication in case of mains failure. The capacity of the generator set is greater than or equal to 1.5 to 2 times the capacity of the UPS.

- A UPS usually has only one batter set. Connect two or more UPSs in parallel or series for redundancy. If the inverter or UPS is used, configure the inverter or UPS that provides the maximum amount of power as the active one, and configure another inverter or UPS as the standby.

Basic DC Power Supply

Ensure the reliability of the DC power supply system at the communications site. Deploy the power supply device as close as possible to the communications

devices so as to shorten the power feeder and lower the circuit voltage drop between the battery port and device port to less than 3.2 V, thereby reducing installation costs and power consumption.

Use two or more independent power supply systems if the communication volume is large or if more than two switching systems are deployed at the site.

For large communications hubs, deploy an independent power supply system on each floor, each providing power for the communications equipment room on this floor. Medium-sized communications stations can be centrally powered by a power room or storage battery room, or powered in a decentralized manner. For small-sized communications stations, the power supply system can be deployed in the same equipment room as the communications devices, but you must take appropriate measures to ensure that the corrosive gases discharged by the batteries in the equipment room do not corrode the circuit boards of communications devices.

Table 6-9 lists the DC power supply specifications.

Table 6-9 DC power supply specifications

Item	Specifications
Voltage fluctuation range allowed for the -48 V input end	-48 V to -60 V
Surge current tolerance capability in DC power supply	At least 1.5 times higher than load rated current capability
Regulated voltage precision	The regulated voltage precision is less than or equal to 1% when the AC input voltage fluctuates between 85% and 110% of the rated voltage, the load current varies between 5% and 100% of the rated current, and the output voltage of the rectifier is any fixed value in the -46.0 V to -56.4 V range.
On/Off overshoot magnitude	Within the 95% to 105% range of the DC rated voltage value
Peak-to-peak noise voltage	Less than or equal to 200 mV
Dynamic response	The recovery time should be less than 200 ms, and the overshoot must be within the 95% to 105% range of the DC voltage set value.

The following are suggestions for the basic DC power supply system:

- Decentralized power supply is recommended. Use multiple DC power supply systems and multiple power sources.
- Use a standard-compliant DC power supply. The output voltage of the communications power supply must be in the voltage range of the device to be powered.

- Improve the reliability of the AC power supply system to properly reduce the battery capacity. When it is difficult to improve the reliability of the AC power supply system at a small communications station, properly increase the battery capacity.

- The total capacity configuration of the high-frequency switch rectifier should match the communications load power and battery charging power. Rectifier modules should use a redundancy configuration. If the number of active modules is less than or equal to 10, one standby module should be deployed. If the number of active modules is greater than 10, one standby module should be deployed for every 10 active modules.

- Storage batteries should be installed in two or multiple sets. The total capacity depends on the duration in which the storage battery sets independently supply power to the load. For most communications stations, storage battery sets should supply power for at least one hour.

6.2.6 Electromagnetic Protection

This section describes the electromagnetic protection requirements. Check that the equipment room meets these requirements so as to ensure the normal running of the USG.

Possible interference sources are as follows:

- Capacitive coupling

- Inductance coupling

- Electromagnetic radiation

- Common impedance (including the PGND system) coupling

To reduce as much interference as possible, complete the following steps:

- Take effective measures to avoid possible power grid interference to the power supply system.

- Do not use the power line ground or lightning protection ground as the working ground of the device, and leave as much space as possible between the working ground of the device and the power line ground or lightning protection ground.

- Ensure that no high-power radio transmitter, radar transmitter, or high-frequency high-current device is deployed nearby.

- Take electromagnetic protection measures if necessary.

6.3 Fault Tag

*Customer name:	
Address:	
Contact person:	
Tel.:	Fax:
Category*: □ RMA □ Return □ Analysis	

BOM Code	Product Description	Bar Code*	Fault Occurring Date*	Description of the Fault Phenomena*	Category No.*	Software Version*

Reasons for Repairing (Category No.):

Category No. includes the following eight types:

F001 - Wear out damaged (◊ In warranty Period ◊ Out of warranty period)

F002 - Deployment damaged

F003 - Intransit damaged

F004 - Version upgrade

F005 - Batch replace

F007 - Overdue spare parts inspecting

F008 - Others

F011 - Running circumstance change

Note:

● For optical interface cards returned, the optical interfaces should be covered with protection caps.

● In general, the analysis card will not be returned to you. If you have any special requirements, please contact Huawei.

● One **Fault Tag** should be adapted in one return category, such as RMA/Return/Analysis.

● The items marked with "*" are the mandatory fields that you must fill in.