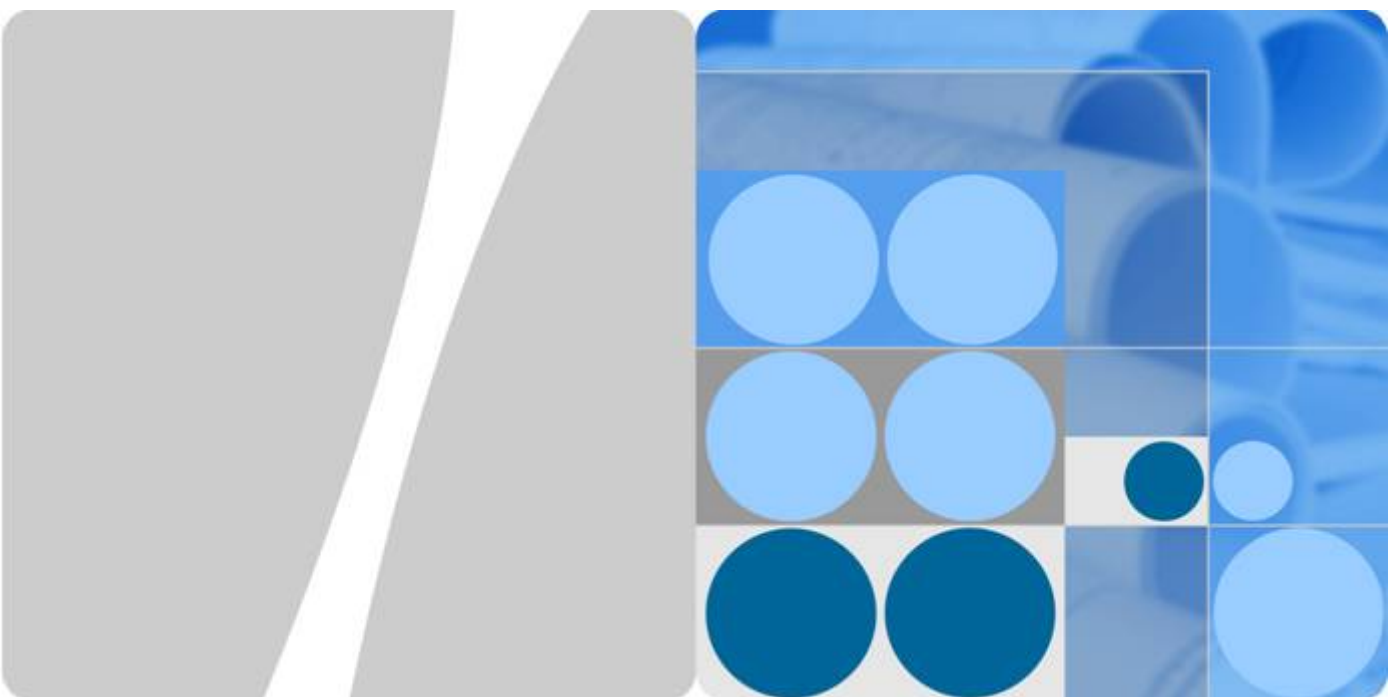




S6700 Series Ethernet Switches

Product Description

Issue **03**
Date **2014-03-20**

Copyright © Huawei Technologies Co., Ltd. 2014. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: <http://enterprise.huawei.com>

About This Document

Intended Audience

This document describes the positioning, characteristics, architecture, link features, service features, application scenarios, operation and maintenance functions, and technical specifications of the switch.

This document helps you understand the characteristics and features of the switch.

This document is intended for:

- Network planning engineers
- Hardware installation engineers
- Commissioning engineers
- Data configuration engineers
- On-site maintenance engineers
- Network monitoring engineers
- System maintenance engineers

Statement

The device provides the mirroring function for network monitoring and fault management, during which communication data may be collected. Huawei alone is unable to collect or save the content of users' communications. It is suggested that you activate the functions based on the applicable laws and regulations in terms of purpose and scope of usage. You are obligated to take considerable measures to ensure that the content of users' communications is fully protected when the content is being used and saved.

The device provides the NetStream function for network traffic statistics collection and advertisement, during which data of users may be used. You are obligated to take considerable measures, in compliance with the laws of the countries concerned and the user privacy policies of your company, to ensure that the data of users is fully protected.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Updates between document issues are cumulative. Therefore, the latest document version contains all updates made to previous versions.

Changes in Issue 03 (2014-03-20)

The third commercial release has the following updates:

The documentation is modified according to updates in product features.

Changes in Issue 02 (2013-07-25)

The second commercial release has the following updates:

The documentation is modified according to updates in product features.

Changes in Issue 01 (2013-05-30)

Initial commercial release.

Contents

About This Document.....	ii
1 Mapping Between the S6700 Series Switches and Software Versions.....	1
2 Product Overview.....	2
2.1 Product Positioning.....	3
2.2 Product Characteristics.....	3
3 Application Scenarios.....	6
3.1 Application of the S6700 in a Data Center.....	7
3.2 Application of the S6700 on a Large-scale Enterprise Campus Network.....	8
4 Hardware Architecture.....	10
4.1 Appearance and Structure.....	11
4.1.1 S6700-EI.....	11
4.2 Hardware Modules.....	13
4.2.1 SCU.....	13
4.2.2 Power Supply.....	14
4.2.3 Fan Modules.....	15
4.2.4 Optical Module Attributes.....	15
5 Product Performance.....	20
5.1 Product Features.....	21
5.2 Performance Specifications.....	28
6 Technical Specifications.....	31
6.1 Specifications.....	32
6.1.1 S6700-EI.....	32

1 Mapping Between the S6700 Series Switches and Software Versions

Figure 1-1 shows S6700 version evolution.

Figure 1-1 S6700 version evolution

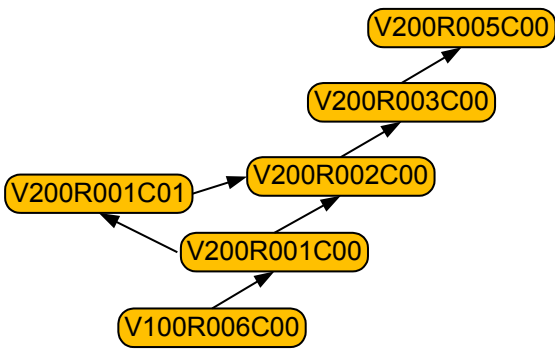


Table 1-1 lists the mapping between S6700 series switches and software versions.

Table 1-1 Mapping between the S6700 chassis and software versions

Series	Model	Available Version
S6700	S6700-24-EI	V100R006C00 and later versions
	S6700-48-EI	V100R006C00 and later versions

 NOTE

Unless otherwise specified, this document describes matching hardware and software performance of the switch in the latest version.

2 Product Overview

About This Chapter

[2.1 Product Positioning](#)

[2.2 Product Characteristics](#)

2.1 Product Positioning

The S6700 series ethernet switches (S6700 for short) are next-generation 10G box switches. The S6700 can function as an access switch in an Internet data center (IDC) or a core switch on a campus network.

The S6700 has industry-leading performance and provides up to 24 or 48 line-speed 10GE ports. It can be used in a data center to provide 10 Gbit/s access to servers or function as a core switch on a campus network to provide 10 Gbit/s traffic aggregation. In addition, the S6700 provides a wide variety of services, comprehensive security policies, and various QoS features to help customers build scalable, manageable, reliable, and secure data centers.

2.2 Product Characteristics

Large-capacity, High-density 10 Gbit/s Access

To provide sufficient bandwidth for users, many servers use 10G network adapters, especially servers in data centers. The S6700 can be used in data centers to provide high forwarding performance and 10GE ports.

The S6700 has the highest density of 10GE ports and largest switching capacity among counterpart switches. Each S6700 provides a maximum of 48 line-speed 10GE ports. Ports of the S6700 support 1GE access and 10GE access and can identify optical module types, minimizing the return on investment and allowing users to deploy service flexibly.

The S6700 has a large buffering capacity and uses advanced buffer scheduling mechanism to ensure non-block transmission of high traffic volume in data centers.

Comprehensive Security Control Policies

The S6700 provides multiple security measures to defend against Denial of Service (DoS) attacks, and attacks against networks or users. DoS attacks include SYN, Land, Smurf, and ICMP Flood attacks. Attacks to networks refer to STP BPDU/root attacks. Attacks to users include bogus DHCP server attacks, man-in-the-middle attacks, IP/MAC spoofing attacks, DHCP request flood attacks, and DoS attacks by changing the CHADDR field of packets. DHCP snooping discards invalid packets that do not match any binding entries, such as ARP spoofing packets and IP spoofing packets. This prevents man-in-the-middle attacks that hackers initiate by using ARP packets. The interface connected to a DHCP server can be configured as a trusted interface to protect the system against bogus DHCP server attacks.

The S6700 supports strict ARP learning. This feature prevents ARP spoofing attackers from exhausting ARP entries so that users can connect to the Internet normally. It also provides IP source check to prevent DoS attacks caused by MAC address spoofing, IP address spoofing, and MAC/IP spoofing. URPF provided by the S6700 reversely checks packet transmission path to authenticate packets, which can protect the network against source address spoofing attacks.

The S6700 supports centralized MAC address authentication and 802.1x authentication. It authenticates users based on static or dynamic user binding information such as the user name, IP address, MAC address, VLAN ID, interface number, and flag indicating whether antivirus software is installed. VLANs, QoS policies, and ACLs can be applied to users dynamically. The

S6700 can limit the number of MAC addresses learned on an interface to prevent attackers from exhausting MAC address entries by using bogus source MAC addresses. This function minimizes packet flooding that occurs when MAC addresses of users cannot be found in the MAC address table.

Comprehensive Reliability Mechanisms

The S6700 supports redundant power supplies. Users can choose a single power supply or use two power supplies to ensure device reliability. With two swappable fans, the S6700 has a longer MTBF time than counterpart switches. The S6700 supports MSTP multi-process that enhances the existing STP, RSTP, and MSTP implementation. This function increases the number of MSTIs supported on a network. It also supports enhanced Ethernet reliability technologies such as Smart Link and RRPP, which implement millisecond-level protection switchover and ensure network reliability. Smart Link and RRPP both support multi-instance to implement load balancing among links, improving bandwidth use efficiency.

The S6700 supports enhanced trunk (E-Trunk). A CE can be dual-homed to two PEs through Eth-Trunk links. This implements inter-device link aggregation and link load balancing, and greatly improves reliability of access devices.

The S6700 supports the Smart Ethernet Protection (SEP) protocol, a ring network protocol applied to the link layer of an Ethernet network. SEP can be used on open ring networks and provides fast switchover within 50 ms. SEP features simplicity, high reliability, high switchover performance, convenient maintenance, and flexible topology and enables users to manage and plan networks conveniently.

The S6700 supports G.8032, also called Ethernet Ring Protection Switch (ERPS). ERPS is based on traditional Ethernet MAC and bridging functions. It uses the mature Ethernet OAM and Ring Automatic Protection Switching (Ring APS or R-APS) technologies to implement fast protection switching on Ethernet. ERPS supports multiple services and provides flexible networking, reducing the OPEX and CAPEX. The S6700 supports VRRP. Two S6700s can form a VRRP group to ensure nonstop and reliable communication. Multiple equal-cost routes to an upstream device can be configured on the S6700 to provide route redundancy. When an active route is unreachable, traffic is switched to a backup route.

Various QoS Control Mechanisms

The S6700 implements complex traffic classification based on packet information such as the 5-tuple, IP preference, ToS, DSCP, IP protocol type, ICMP type, TCP source port, VLAN ID, Ethernet protocol type, and CoS. ACLs can be applied to inbound or outbound direction to filter packets. The S6700 supports a flow-based two-rate three-color CAR. Each port supports eight priority queues, multiple queue scheduling algorithms such as WRR, DRR, PQ, WRR+PQ, and DRR+PQ, and congestion avoidance algorithm WRED. All of these ensure the quality of voice, video, and data services.

High Scalability

The S6700 supports the iStack function that allows switches far from each other to form a stack. A port of the S6700 can be configured as a stack port using a command for flexible stack deployment. The distance between stacked switches is further increased when the switches are connected with optical fibers. Compared with a single device, intelligent stacking features powerful expansibility, reliability, and performance. New member switches can be added to a stack without interrupting services when the system capacity needs to be increased or a member

switch fails. Compared with stacking of chassis-shaped switches, the iStack function can increase system capacity and port density without restricted by the hardware structure. Multiple devices in a stack can be considered as one logical device. These switches can be managed using a single IP address, which greatly reduces system expansion, operation, and maintenance costs.

Convenient management

The S6700 supports automatic configuration, plug-and-play, deployment using a USB flash drive, and batch remote upgrade. These capabilities simplify device management and maintenance and reduce maintenance costs. The S6700 supports SNMPv1/v2c/v3 and provides flexible methods for managing devices. You can manage the S6700 using the CLI, Web NMS, Telnet. The NQA function helps users with network planning and upgrades. In addition, the S6700 supports NTP, SSH v2, HWTACACS, RMON, log hosts, and port-based traffic statistics. The S6700 supports GVRP, which dynamically distributes, registers, and propagates VLAN attributes to reduce the manual configuration workloads of network administrators and ensure correct VLAN configuration.

The S6700 supports MUX VLAN. MUX VLAN isolates Layer 2 traffic between interfaces in a VLAN. Interfaces in a subordinate separate VLAN can communicate with interfaces in the principal VLAN but cannot communicate with each other. This function prevents communication between network devices connected to certain interfaces or interface groups but allows the devices to communicate with the default gateway. MUX VLAN is usually used on an enterprise intranet to isolate user interfaces from each other but allow them to communicate with server interfaces.

The S6700 supports BFD, which provides millisecond-level fault detection for protocols such as OSPF, IS-IS, VRRP, and PIM to improve network reliability. Complying with IEEE 802.3ah and 802.1ag, the S6700 supports point-to-point Ethernet fault management and can detect faults in the last mile of an Ethernet link to users. Ethernet OAM improves the Ethernet network management and maintenance capabilities and ensures a stable network.

Various IPv6 Features

The S6700 supports IPv4/IPv6 dual stack and can migrate from an IPv4 network to an IPv6 network. The S6700 hardware supports IPv4/IPv6 dual stack and IPv6 over IPv4 tunnels (including manual tunnels, 6to4 tunnels, and ISATAP tunnels). The S6700 can be deployed on IPv4 networks, IPv6 networks, or networks that run both IPv4 and IPv6. This makes networking flexible and enables a network to migrate from IPv4 to IPv6.

The S6700 supports various IPv6 routing protocols including RIPng and OSPFv3. It uses the IPv6 Neighbor Discovery Protocol (NDP) to manage packets exchanged between neighbors. It also provides the Path MTU Discovery (PMTU) mechanism to select a proper MTU on the path from the source to the destination, optimizing network resources and obtaining the maximum throughput.

3 Application Scenarios

About This Chapter

[3.1 Application of the S6700 in a Data Center](#)

This section describes the position of the S6700 in a data center.

[3.2 Application of the S6700 on a Large-scale Enterprise Campus Network](#)

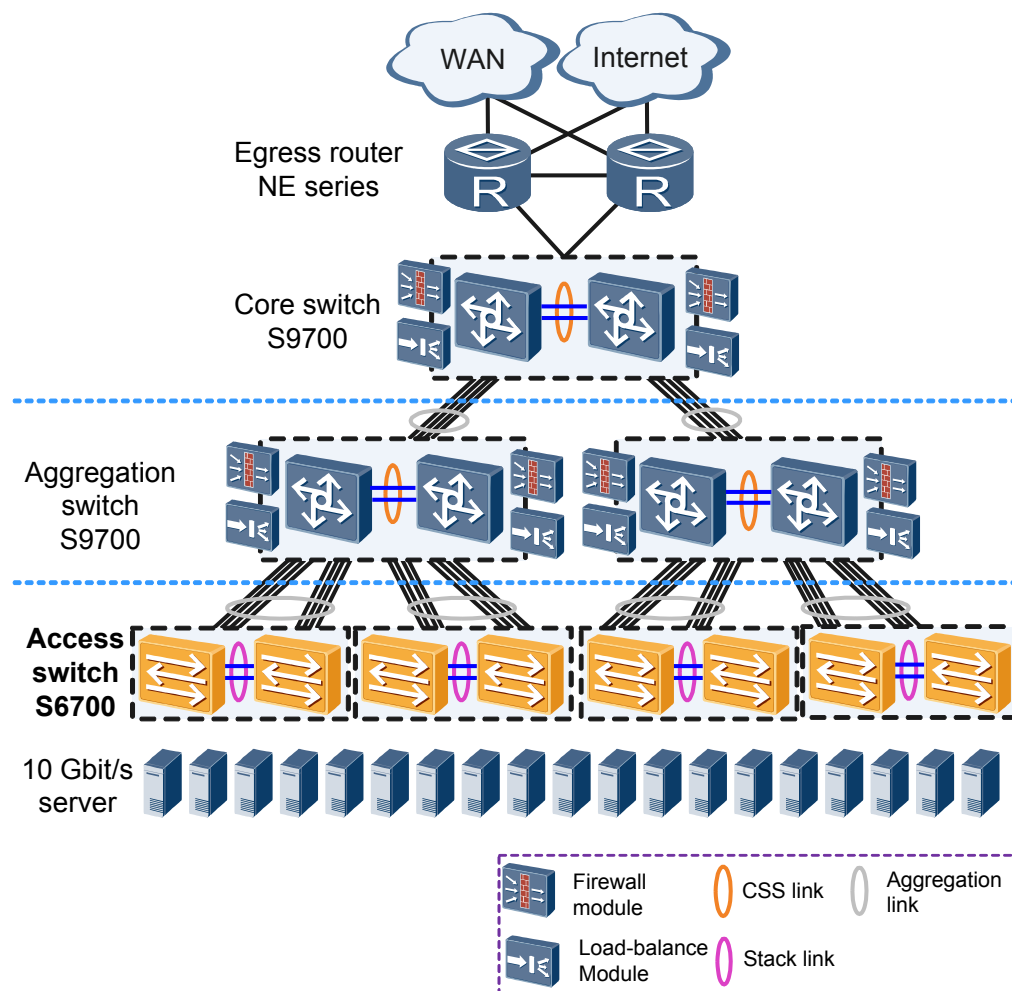
This section describes the application of the S6700 on a large-scale enterprise campus network.

3.1 Application of the S6700 in a Data Center

This section describes the position of the S6700 in a data center.

The S6700 is deployed at the access layer of an enterprise campus network, helping an enterprise build a virtualized, highly reliable, non-blocking, and green data center network.

Figure 3-1 Position of the S6700 in a data center



As shown in **Figure 3-1**, on a data center network, NE routers function as the egress routers; S9700s function as core and aggregation switches to ensure network security and implement load balancing by using firewall and load balance service cards.

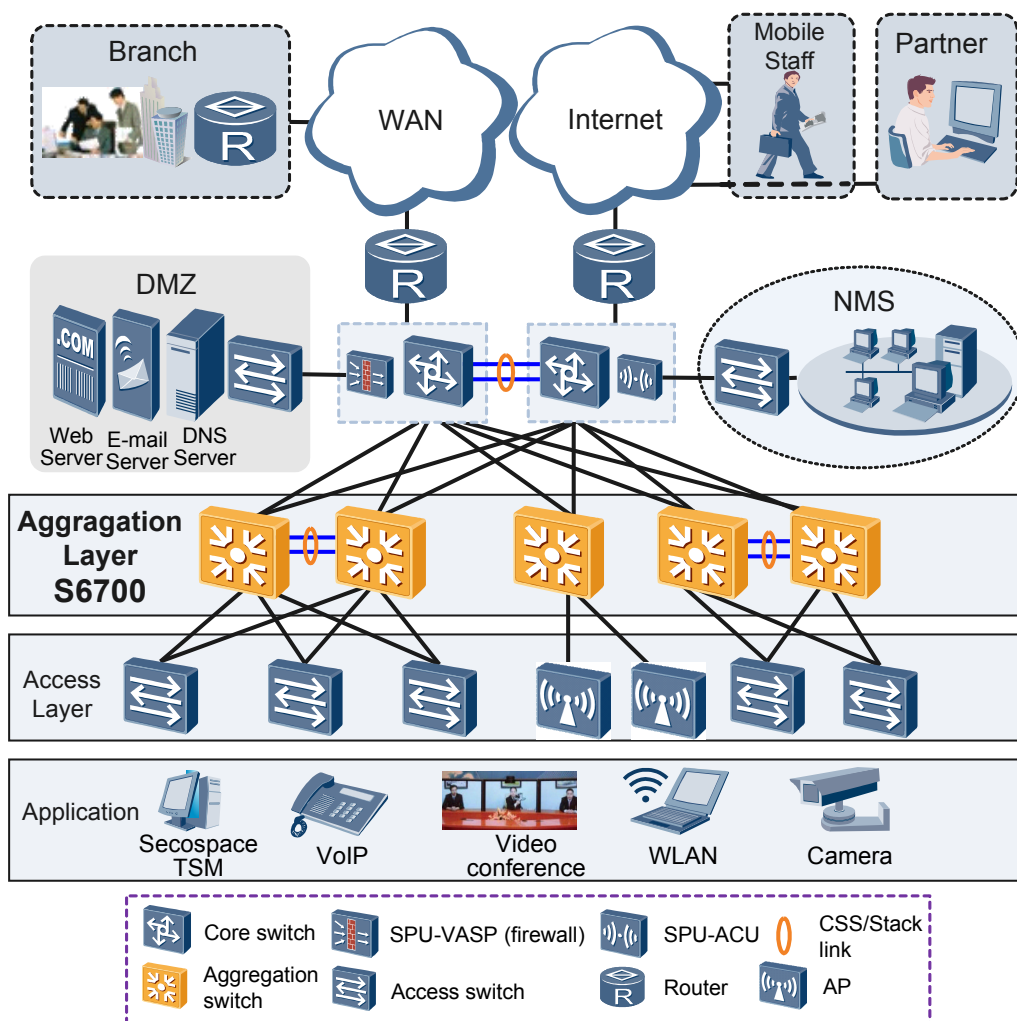
S6700s function as access switches to provide 10 Gbit/s access. The S6700 uses iStack to ensure high reliability. When a switch is faulty, the other switch takes over services on the faulty switch. Eth-Trunk is used to achieve link-level reliability. Reliability protocols such as STP and VRRP are not required, configuration and maintenance are simplified, and configuration errors are reduced.

3.2 Application of the S6700 on a Large-scale Enterprise Campus Network

This section describes the application of the S6700 on a large-scale enterprise campus network.

As shown in [Figure 3-2](#), the S6700 is deployed at the aggregation layer of a large-scale enterprise campus network, helping you built a highly reliable, scalable, and manageable enterprise campus network.

Figure 3-2 Position of the S6700 on an enterprise campus network



On an enterprise network or campus network, the S6700s connect to access switches through 100M/1000M interfaces, provide high performance and large switching capacity, and connect to core switches through 10GE optical interfaces. The network provides 10 Gbit/s rate for the backbone layer and 100 Mbit/s access rate for terminals, meeting requirements for high bandwidth and multi-service.

The S6700 provides SEP and RRPP to implement millisecond-level protection switching. S6700s form a stack system by using iStack technology to implement the distributed forwarding structure and fast fault recovery. The stack system increases the number of user interfaces and improves packet processing capability. The iStack-enabled S6700s can be managed in a uniform manner to facilitate network management and maintenance.

4 Hardware Architecture

About This Chapter

[4.1 Appearance and Structure](#)

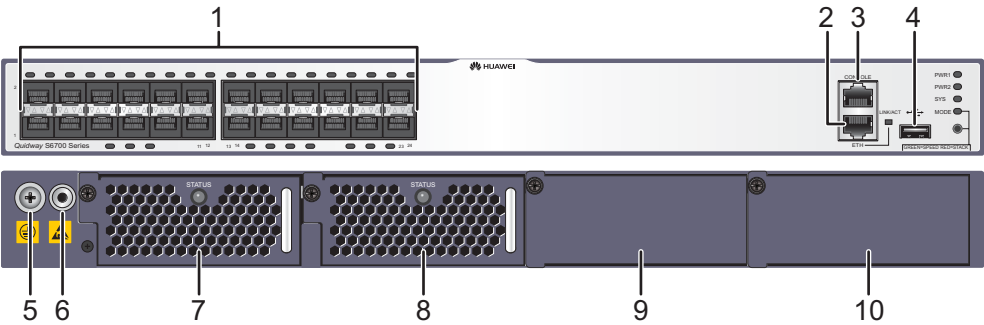
[4.2 Hardware Modules](#)

4.1 Appearance and Structure

4.1.1 S6700-EI

S6700-24-EI

Figure 4-1 Appearance of the S6700-24-EI

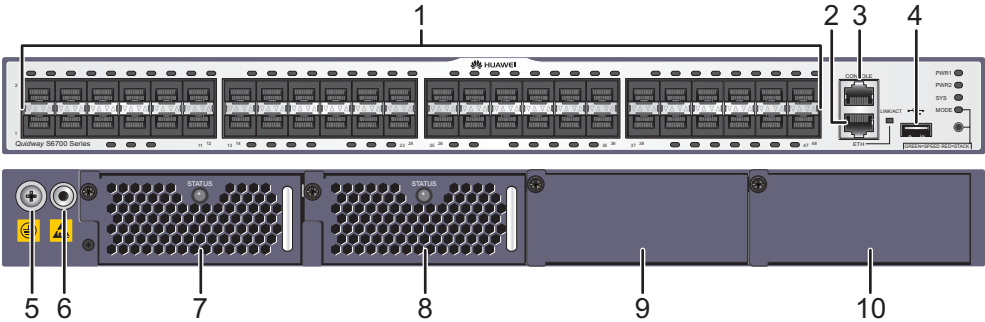


1	Twenty-four 10GE SFP+ Ethernet optical ports Applicable modules and cables: ● GE optical module ● GE-CWDM optical module ● GE SFP copper module (applicable in V200R001C01 and later versions) ● 10GE SFP+ optical module ● 10GE-CWDM optical module (applicable in V200R005C00 version) ● 1 m, 3 m SFP+ copper cables ● 10 m SFP+ copper cable (applicable in V200R001C00 and later versions) ● 3 m, 10 m AOC cables (applicable in V200R003C00 and later versions)	2	One ETH management port
3	One console port	4	One USB port
5	Ground screw NOTE It is used with a ground cable.	6	ESD jack NOTE When you install or maintain a switch, wear an ESD wrist strap and insert the other end of the ESD wrist strap into this ESD jack.

7	Fan module slot 2 NOTE Available fans: CX7E1FANA Fan Module	8	Fan module slot 1 NOTE Available fans: CX7E1FANA Fan Module
9	Power module slot 2 NOTE Available power modules: ● 500 W AC Power Module ● 500 W DC Power Module	10	Power module slot 1 NOTE Available power modules: ● 500 W AC Power Module ● 500 W DC Power Module

S6700-48-EI

Figure 4-2 Appearance of the S6700-48-EI



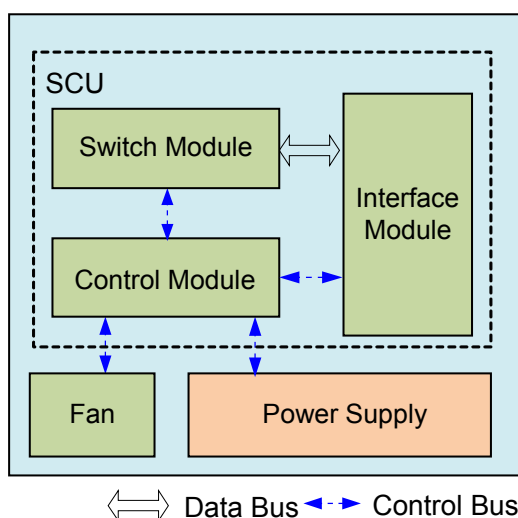
1	Forty-eight 10GE SFP+ Ethernet optical ports Applicable modules and cables: ● GE optical module ● GE-CWDM optical module ● GE SFP copper module (applicable in V200R001C01 and later versions) ● 10GE SFP+ optical module ● 10GE-CWDM optical module (applicable in V200R005C00 version) ● 1 m, 3 m SFP+ copper cables ● 10 m SFP+ copper cable (applicable in V200R001C00 and later versions) ● 3 m, 10 m AOC cables (applicable in V200R003C00 and later versions)	2	One ETH management port
3	One console port	4	One USB port

5	Ground screw NOTE It is used with a ground cable.	6	ESD jack NOTE When you install or maintain a switch, wear an ESD wrist strap and insert the other end of the ESD wrist strap into this ESD jack.
7	Fan module slot 2 NOTE Available fans: CX7E1FANA Fan Module	8	Fan module slot 1 NOTE Available fans: CX7E1FANA Fan Module
9	Power module slot 2 NOTE Available power modules: ● 500 W AC Power Module ● 500 W DC Power Module	10	Power module slot 1 NOTE Available power modules: ● 500 W AC Power Module ● 500 W DC Power Module

4.2 Hardware Modules

Figure 4-3 shows the logical structure of hardware modules of the switch.

Figure 4-3 Logical structure of hardware modules



Hardware modules of the S6700 refer to the SCU (Switch Control Unit), power supply, and fan.

4.2.1 SCU

The SCU is fixed on the S6700. Each S6700 has one SCU.

The SCU is responsible for packet switching and device management. It integrates multiple functional modules, namely, the main control module, switching module, and interface module.

Main Control Module

The main control module implements the following functions:

- Processing protocols
- Functioning as an agent of the user to manage the system and monitor the system performance according to instructions of the user, and report the running status of the device to the user
- Monitoring and maintaining the interface module and switching module on the SCU.

Switching Module

The switching module, also called the switching fabric, is responsible for packet exchange, multicast replication, QoS scheduling, and access control on the interface module of the SCU.

The switching module adopts high performance ASIC chips to implement line-speed forwarding and fast switching of data with different priorities.

Interface Module

The interface module provides Ethernet interfaces for accessing Ethernet services.

4.2.2 Power Supply

Table 4-1 lists power supplies supported by the S6700.

Table 4-1 Power supplies supported by the S6700

Device Series	Device Model	Power Supply Configuration	Supporting PoE	Supporting Hot Swapping of Power Modules
S6700-EI	S6700-24-EI	1+1 power supply backup (the backup power supply is optional)	N	Y
	S6700-48-EI	1+1 power supply backup (the backup power supply is optional)	N	Y

Table 4-2 lists hot swappable power modules supported by the S6700. In addition, the AC and DC power modules can be installed on the same device.

Table 4-2 Hot swappable power modules supported by the S6700

Device Series	Device Model	500 W AC	500 W DC
S6700-EI	S6700-24-EI	Y	Y
	S6700-48-EI	Y	Y

For details about S6700-EI power supply configuration, see *S6700 Hardware Description - Chassis - S6700-EI - Power Supply*.

4.2.3 Fan Modules

A fan module provides heat dissipation for the system. Fan modules work in intelligent or forcible mode.

In intelligent mode, fan modules start to operate only when the ambient temperature goes higher than a specified value.

In forcible mode, fan modules start to work as soon as the switch starts.

The S6700 provides the CX7E1FANA fan modules and uses the forcible mode. Fan modules are field-replaceable, which facilitates maintenance.

For details about fan modules supported by the S6700, see *S6700 Hardware Description - Fan Modules*.

4.2.4 Optical Module Attributes

Table 4-3 Attributes of GE optical modules

Model	Transmission Distance (km)	Standard	Fiber Type
eSFP-GE-SX-MM850	≤ 0.22	1000base-SX	- Fiber mode: multimode - Pattern bandwidth: 160 MHz*km - Core diameter: 62.5 μm - Connector type: LC
	≤ 0.275	1000base-SX	- Fiber mode: multimode (OM1) - Connector type: LC
	≤ 0.5	1000base-SX	- Fiber mode: multimode - Pattern bandwidth: 400 MHz*km - Core diameter: 50 μm - Connector type: LC
	≤ 0.55	1000base-SX	- Fiber mode: multimode (OM2) - Connector type: LC
	≤ 1	1000base-SX	- Fiber mode: multimode (OM3) - Connector type: LC
SFP-GE-LX-SM1310	≤ 10	1000base-LX/LH	- Fiber mode: single-mode - Connector type: LC

Model	Transmission Distance (km)	Standard	Fiber Type
S-SFP-GE-LH40-SM1310	≤ 40	1000base-LX/LH	
S-SFP-GE-LH40-SM1550	≤ 40	1000base-LX/LH	
S-SFP-GE-LH80-SM1550	≤ 80	1000base-ZX	
eSFP-GE-ZX100-SM1550	≤ 100	1000base-ZX	
SFP-GE-LX-SM1310-BIDI (Bidirectional optical module)	≤ 10	1000base-BX	
SFP-GE-LX-SM1490-BIDI (Bidirectional optical module)	≤ 10	1000base-BX	
LE2MGSC40DE0 (Bidirectional optical module)	≤ 40	1000base-BX	
LE2MGSC40ED0 (Bidirectional optical module)	≤ 40	1000base-BX	● Fiber mode: single-mode ● Connector type: SC
SFP-GE-BXU1-SC (Bidirectional optical module)	≤ 10	1000base-BX	

Table 4-4 Attributes of CWDM optical modules

Center Wavelength (nm), Model	1471, CWDM-SFPGE-1471	1491, CWDM-SFPGE-1491	1511, CWDM-SFPGE-1511	1531, CWDM-SFPGE-1531
	1551, CWDM-SFPGE-1551	1571, CWDM-SFPGE-1571	1591, CWDM-SFPGE-1591	1611, CWDM-SFPGE-1611
Specifications	Encapsulation type: eSFP			
	Transmission distance: ≤ 80 km			
	Fiber type: single-mode, LC			
	Standard: CWDM			
	Operating temperature: 0°C to 70°C			
	● Transmit power: 0 dBm to 5.0 dBm ● Receiver sensitivity: ≤ -28.0 dBm ● Overload optical power: -9.0 dBm ● Extinction ratio: ≥ 8.5 dB			

Table 4-5 Attributes of a GE SFP copper module

Model	Transmission Distance (km)	Connector Type	Standard
SFP-1000BaseT	≤ 0.1	RJ45	1000Base-T

Table 4-6 Attributes of 10GE SFP+ optical modules

Model	Transmission Distance (km)	Standard	Fiber Type
SFP-10G-USR	≤ 0.1	10Gbase-USR	● Fiber mode: multimode (OM3) ● Connector type: LC
OSXD22N00	≤ 0.1	10Gbase-LRM	● Fiber mode: multimode ● Pattern bandwidth: 400 MHz*km ● Core diameter: 50 μm ● Connector type: LC

Model	Transmission Distance (km)	Standard	Fiber Type
	≤ 0.22	10Gbase-LRM	- Fiber mode: multimode - Pattern bandwidth: 500 MHz*km - Core diameter: 62.5 μm - Connector type: LC
	≤ 0.22	10Gbase-LRM	- Fiber mode: multimode (OM1, OM2, OM3) - Connector type: LC
OMXD30000	≤ 0.026	10Gbase-SR	- Fiber mode: multimode - Pattern bandwidth: 160 MHz*km - Core diameter: 62.5 μm - Connector type: LC
	≤ 0.033	10Gbase-SR	- Fiber mode: multimode (OM1) - Connector type: LC
	≤ 0.066	10Gbase-SR	- Fiber mode: multimode - Pattern bandwidth: 400 MHz*km - Core diameter: 50 μm - Connector type: LC
	≤ 0.082	10Gbase-SR	- Fiber mode: multimode (OM2) - Connector type: LC
	≤ 0.3	10Gbase-SR	- Fiber mode: multimode (OM3) - Connector type: LC
	≤ 0.4	10Gbase-SR	- Fiber mode: multimode (OM4) - Connector type: LC
OSX010000	≤ 10	10Gbase-LR	- Fiber mode: single-mode - Connector type: LC
OSX040N01	≤ 40	10Gbase-ER	
SFP-10G-BXU1 (bidirectional single-mode fiber)	≤ 10	10GBase-BX	

Model	Transmission Distance (km)	Standard	Fiber Type
SFP-10G-BXD1 (bidirectional single-mode fiber)	≤ 10	10GBase-BX	
SFP-10G-ZR limiting	≤ 80	10Gbase-ZR	

 NOTE

For specifications of various optical modules, see "Optical Module" in the *S6700 Series Ethernet Switches Hardware Description*.

5 Product Performance

About This Chapter

[5.1 Product Features](#)

[5.2 Performance Specifications](#)

5.1 Product Features

Table 5-1 lists features supported by the S6700.

Table 5-1 Features supported by the S6700

Feature		Description
Ethernet features	Ethernet	Operating modes of full-duplex, half-duplex, and auto-negotiation
		Rates of an Ethernet interface: 1000 Mbit/s, 10 Gbit/s, and auto-negotiation
		Flow control on interfaces
		Jumbo frames
		Link aggregation
		Load balancing among links of a trunk
		Transparent transmission of Layer 2 protocol packets
		Device Link Detection Protocol (DLDP)
		Link Layer Discovery Protocol (LLDP)
		Link Layer Discovery Protocol-Media Endpoint Discovery (LLDP-MED)
		Interface isolation and forwarding restriction
		Broadcast storm suppression
	VLAN	Access modes of LNP (link type negotiation protocol), access, trunk, hybrid, and QinQ
		Default VLAN
		VLAN assignment based on interfaces, MAC addresses, protocols, and IP subnets
		VLAN assignment based on the following policies: ● MAC address + IP address ● MAC address + IP address + interface number ● DHCP policies
		VLAN stacking for untagged packets
		Super VLAN
		VLAN mapping
		Selective QinQ

Feature		Description
		MUX VLAN
		Voice VLAN
		Guest VLAN
	GVRP	Generic Attribute Registration Protocol (GARP)
		GARP VLAN Registration Protocol (GVRP)
	VCMP	VCMP (VLAN centralized management protocol)
	MAC	Automatic learning and aging of MAC addresses
		Static, dynamic, and blackhole MAC address entries
		Packet filtering based on source MAC addresses
		Interface-based MAC learning limiting
		Sticky MAC address entries
		MAC address flapping detection
		Configuring MAC address learning priorities for interfaces
		Port bridge
	ARP	Static and dynamic ARP entries
		RARP
		ARP in a VLAN
		Aging of ARP entries
		Proxy ARP
		Multi-port ARP for connecting to the NLB cluster server
Ethernet loop protection	MSTP	STP
		RSTP
		MSTP
		VBST
		BPDU protection, root protection, and loop protection
		TC-BPDU attack defense
		STP loop detection
	Loopback-detect	Loop detection on an interface
	SEP	Smart Ethernet Protection (SEP)

Feature		Description
	Smart Link	Smart Link
		Smart Link multi-instance
		Monitor Link
	RRPP	RRPP protective switchover
		Single RRPP ring, tangent RRPP ring, and intersecting RRPP ring
		Hybrid networking of RRPP rings and other ring networks
	ERPS	G.8032 v1/v2
		Single closed ring
		Subring
IPv4/IPv6 forwarding	IPv4 and unicast routes	Static IPv4 routes
		VRF
		DHCP client
		DHCP server
		DHCP relay
		DHCP policy VLAN
		URPF check
		Routing policies
		RIPv1/RIPv2
		OSPF
		BGP
		MBGP
		IS-IS
		PBR (redirection in a traffic policy)
	Multicast routing features	IGMPv1/v2/v3
		PIM-DM
		PIM-SM
		PIM-SSM
		MSDP
		Multicast routing policies

Feature		Description
		RPF
	IPv6 features	IPv6 protocol stack
		ND and ND snooping
		DHCPv6 snooping
		RIPng
		DHCPv6 server
		DHCPv6 relay
		OSPFv3
		BGP4+ & ISIS for IPv6
		VRRP6
		MLDv1 and MLDv2
		PIM-DM for IPv6
		PIM-SM for IPv6
		PIM-SSM for IPv6
	Transition technology	6 over 4 tunnel
Layer 2 multicast features	-	IGMPv1/v2/v3 snooping
		Fast leave
		IGMP proxy
		MLD snooping
		Interface-based multicast traffic suppression
		Inter-VLAN multicast replication
		Controllable multicast
MPLS&VPN	Basic MPLS functions	LDP
		Double MPLS labels
		Mapping from DSCP to EXP priorities in MPLS packets
		Mapping from 802.1p priorities to EXP priorities in MPLS packets
	MPLS TE	MPLS TE tunnel
		MPLS TE protection group

Feature		Description
	VPN	Multi-VPN-Instance CE (MCE)
		VLL in SVC, Martini, CCC, and Kompella modes
		VLL FRR
		VPLS
		MPLS L3VPN
Device reliability	BFD	Basic BFD functions
		BFD for static route/IS-IS/OSPF/BGP
		BFD for PIM
		BFD for VRRP
	Stacking	Service interface supporting the stacking function
Ethernet OAM	EFM OAM (802.3ah)	Automatic discovery
		Link fault detection
		Link fault troubleshooting
		Remote loopback
	Y.1731	Delay and variation measurement
QoS features	Traffic classifier	Traffic classification based on ACLs
		Traffic classification based on outer 802.1p priorities, inner VLAN IDs, outer VLAN IDs, source MAC addresses, and Ethernet types
		Traffic classification based on inner 802.1p priorities
	Traffic behavior	Access control after traffic classification
		Traffic policing based on traffic classification
		Re-marking based on traffic classification
		Associating traffic classifiers with traffic behaviors
	Traffic policing	Rate limit on inbound and outbound interfaces
	Traffic shaping	Traffic shaping on interfaces and queues
	Congestion avoidance	Weighted Random Early Detection (WRED)
		Tail drop

Feature		Description
	Congestion management	Queue mapping
		Priority Queuing (PQ)
		Deficit Round Robin (DRR)
		PQ+DRR
		Weighted Round Robin (WRR)
		PQ+WRR
Configuration and maintenance	Login and configuration management	Command line configuration
		Error message and help information in English and Chinese
		Login through console and Telnet terminals
		SSH1.5/SSH2
		Send function and data communication between terminal users
		Hierarchical user authority management and commands
		SNMP-based NMS management (eSight)
		Web page-based configuration and management
		Easy-Deploy (client)
		Easy-Deploy (commander)
		Easy deployment and maintenance
	File system	File system
		Directory and file management
		File upload and download through FTP, TFTP, SFTP, SCP, and FTPS
	Monitoring and maintenance	Hardware monitoring
		Reporting alarms on abnormal device temperature
		Second-time fault detection to prevent detection errors caused by instant interference
		Version matching check
		Information center and unified management over logs, alarms, and debugging information
		Electronic labels, and command line query and backup
		Virtual cable test (VCT)

Feature		Description
		User operation logs
		Detailed debugging information for network fault diagnosis
		Network test tools such as traceroute and ping commands
		Port mirroring, flow mirroring, and remote mirroring
		Energy saving
	Version upgrade	Device software loading and online software loading
		BootROM online upgrade
		Remote in-service upgrade
		In-service patching
Security	AAA	Local authentication and authorization
		RADIUS authentication, authorization, and accounting
		HWTACACS authentication, authorization, and accounting
	NAC	802.1x authentication
		MAC address authentication
		Portal authentication
		Hybrid authentication
	ARP security	ARP packet rate limiting based on source MAC addresses
		ARP packet rate limiting based on source IP addresses, interfaces, and VLANs, and global ARP packet rate limiting
		ARP anti-spoofing
		Association between ARP and STP
		ARP gateway anti-collision
		Dynamic ARP Inspection (DAI) and Static ARP Inspection (SAI)
		Egress ARP Inspection (EAI)
	IP security	ICMP attack defense
		IP source guard
	CPU attack defense	CPU attack defense
	MFF	MAC-Forced Forwarding (MFF)

Feature		Description
	DHCP snooping	DHCP snooping
		Option 82 function and dynamic rate limiting for DHCP packets
	Attack defense	Defense against flood attacks without IP payloads, attacks from IGMP null payload packets, LAND attacks, Smurf attacks, and attacks from packets with invalid TCP flag bits
		Defense against attacks from many fragments, attacks from many packets with offsets, attacks from repeated packet fragments, Tear Drop attacks, Syndrop attacks, NewTear attacks, Bonk attacks, Nesta attacks, Rose attacks, Fawx attacks, Ping of Death attacks, and Jolt attacks
		Defense against TCP SYN flood attacks, UDP flood attacks (including Fraggle attacks and UDP diagnosis port attacks), and ICMP flood attacks
Network management	-	Ping and traceroute
		NQA
		Network Time Protocol (NTP)
		sFlow
		SNMP v1/v2c/v3
		Standard MIB
		HTTP
		Hypertext Transfer Protocol Secure (HTTPS)
		Remote network monitoring (RMON)
		RMON2

5.2 Performance Specifications

Table 5-2 Performance specifications of the S6700

Attribute	Service Feature	Specifications
Ethernet	Maximum number of VLANs	4K
	Maximum number of link aggregation groups	64

Attribute	Service Feature	Specifications
	Maximum number of member interfaces in a link aggregation group	8
	Maximum number of static ARP entries in the system	8K
	Maximum number of dynamic ARP entries in the system	8K
QoS	Maximum number of outbound QoS queues on an interface	8
	CAR	8 kbit/s
ACL	ACLv4	Maximum number of IPv4 ACLs supported:inbound 1K; outbound 512
	ACLv6	Maximum number of IPv6 ACLs supported:inbound 512; outbound 256
MPLS	Maximum number of LSPs	4K
	Maximum number of LDP peers	64 local LDP peers and 128 remote LDP peers
L2VPN	Maximum number of VLL entries	1K
	Number of VSI entries	256
L3VPN	Maximum number of VRFs	127
IP unicast	Maximum number of IPv4 routing entries and IPv4 FIB entries	16K
	Maximum number of IPv6 routing entries and IPv6 FIB entries	8K
Multicast	Maximum number of static multicast routes	128
	Maximum number of L2 multicast forwarding entries	2K
	Maximum number of L3 multicast forwarding entries	2K
Reliability	BFD	Maximum number of BFD sessions: 128 Minimum fault detection time: 300 ms

Attribute	Service Feature	Specifications
	Ethernet OAM	● 802.3ah Fault detection time: 1s
	RRPP	● Maximum number of RRPP instances: 64 ● Maximum number of RRPP rings: 16 ● Maximum number of RRPP domains: 8 ● Maximum number of RRPP rings: 24 (16 in V200R002C00 and earlier versions) ● Maximum number of RRPP domains: 24 (8 in V200R002C00 and earlier versions)
	VRRP	● Maximum number of VRRP groups: 64 ● Maximum number of virtual IP addresses in each VRRP backup group: 16
	Smart Link	● Maximum number of instances: 64 ● Maximum number of Smart Link groups: 16
	MSTP	Maximum number of MSTIs: 64
	VBST	Number of protected VLANs on the device: 128
	SEP	Maximum number of segments: 16

6 Technical Specifications

About This Chapter

[6.1 Specifications](#)

6.1 Specifications



NOTE

6.1.1 S6700-EI

Table 6-1 lists specifications of the S6700.

Table 6-1 Specifications of the S6700

Item		Description
DDR memory		512 MB
Flash memory		64 MB
Mean time between failures (MTBF)		● S6700-24-EI: 34.54 years ● S6700-48-EI: 33.76 years
Mean time to repair (MTTR)		2 hours
Availability		> 0.99999
Surge protection	Service port protection	-
	Power supply protection	● AC: ± 2 kV in differential mode; ± 4 kV in common mode ● DC: ± 1 kV in differential mode; ± 2 kV in common mode
Dimensions (W x D x H)		442.0 mm x 420.0 mm x 43.6 mm
Weight	Fully loaded	≤ 8.5 kg
	Empty loaded	≤ 5 kg
Stack port		10GE SFP+ port (A maximum of eight 10GE SFP+ ports is supported.)
Maximum stack bandwidth (bidirectional)		160 Gbit/s
RPS		Not supported
PoE		Not supported

Item		Description
Input DC voltage	Rated input voltage range	-48 V DC to -60 V DC
	Maximum voltage range	-38.4 V DC to -72 V DC
Input AC voltage	Rated input voltage range	100 V AC to 240 V AC, 50/60 Hz
	Maximum voltage range	90 V AC to 264 V AC; 47 Hz to 63 Hz
Maximum power (fully loaded)		● S6700-24-EI: 153.6 W ● S6700-48-EI: 240 W
Temperature	Operating temperature	-5°C to +50°C (at 0 m to 1800 m altitude) NOTE ● If using 40km SFP+ optical module, the operating temperature of S6700 is between -5°C and 45°C. ● When the altitude is between 1800 m and 5000 m, the highest operating temperature reduces 1°C every time the altitude increases 220 m.
	Storage temperature	-40°C to +70°C
Noise under normal temperature (27°C, sound power)		Less than 55 dBA
Relative humidity		5% RH to 95% RH, noncondensing
Operating altitude		0 m to 5000 m

Item	Description
EMC	● CISPR22 Class B ● CISPR24 ● EN55022 Class B ● EN50024 ● ETSI EN 300 386 Class B ● CFR 47 FCC Part 15 Class A ● ICES 003 Class B ● AS/NZS CISPR22 Class B ● VCCI Class B ● IEC61000-6-2 ● IEC61000-6-4 ● IEC61000-4-2 ● ITU-T K 20 ● ITU-T K 21 ● ITU-T K 44
Environmental standard	● RoHS ● REACH ● WEEE
Security	● IEC 60950-1 ● EN 60950-1/A11/A12 ● UL 60950-1 ● CSA C22.2 No 60950-1 ● AS/NZS 60950.1
Laser safety	● IEC60825-1 ● IEC60825-2 ● EN60825-1 ● EN60825-2