Huawei CloudEngine S6780-H Series Switches Datasheet

Huawei CloudEngine S6780-H series switches are next-generation GE to 400GE FPICs designed for high-end campus networks.

Introduction

Huawei CloudEngine S6780-H series switches are next-generation enterprise-class flebible card switches that offer high performance, high reliability, cloud management, and intelligent operations and maintenance (O&M). They build on an industry-leading software and hardware platform and are purpose-built with security, IoT, and cloud in mind. With these traits, CloudEngine S6780-H can be widely used in enterprise campuses, colleges/universities, data centers, and other scenarios.

CloudEngine S6780-H series switches offer GE/10GE/25GE/40GE/100GE/400GE port types and cards, flexibly adapting to diversified network bandwidth requirements. They also support cloud management and implement cloud-managed network services throughout the full lifecycle from planning, deployment, monitoring, experience visibility, and fault rectification, all the way to network optimization, greatly simplifying network management.

CloudEngine S6780-H series switches support free mobility, enables consistent user experience no matter the user location or IP address, fully meeting enterprises' demands for mobile offices.

CloudEngine S6780-H series switches support VXLAN to implement network virtualization, achieving multi-purpose networks and multi-network convergence for greatly improved network capacity and utilization. As such, CloudEngine S6780-H series switches are an ideal choice for building next-generation IoT converged networks in terms of cost, flexibility, and scalability.

Product Overview

Models and Appearances

The following models are available in CloudEngine S6780-H series switches.

Appearance	Description
 CloudEngine S6780-H4Z	• Supports four half-width flexible cards and flexible combinations of seven types of cards: 24 x 1000M/10GBASE-T ports, 2 x 100GE QSFP28 24 x GE/2.5G/10GE SFP+，2 x 40/100GE QSFP28 24 x GE/2.5G/10GE/25GE SFP28，2 x 40/100GE QSFP28 10 x 40/100GE QSFP28 16 x 40GE QSFP 16 x 40/100GE QSFP28 8 x GE/2.5G/10GE/25GE SFP28，4x 400GE QSFP-DD • 1+1 power backup

Appearance	Description
	• Forwarding performance: 2400 Mpps • Switching capacity: 14.4Tbps /16Tbps

Fan Module

The following table lists the fan module on CloudEngine S6780-H series switches.

Fan Module	Technical Specifications	Applied Switch Model
 FAN-180E-B	• Dimensions (W x D x H): 82 mm x 169.3 mm x 82 mm • Number of fans: One counter-rotating fan, with two fan blades • Weight: 0.846 kg (1.87 lb) • Maximum power consumption: 86 W • Maximum fan speed: 13200RPM (Front), 11340RPM (Rear) • Maximum airflow: 180 CFM • Hot swap: Supported	• CloudEngine S6780-H4Z

Power Supply

The following table lists the power supplies on CloudEngine S6780-H series 100GE.

Power Module	Technical Specifications	Applied Switch Model


PAC600S12-PB
	• Dimensions (H x W x D): 40 mm x 66 mm x 215 mm (1.6 in. x 2.6 in. x 8.5 in.)
	• Weight: 1 kg (2.2 lb)
	• Rated input voltage range:
	  – 100 V AC to 240 V AC, 50/60 Hz
	  – 240 V DC
	• Maximum input voltage range:
	  – 90 V AC to 290 V AC, 45 Hz to 65 Hz
	  – 190 V DC to 290 V DC
	• Maximum input current:
	  – 100 V AC to 240 V AC: 8 A
	  – 240 V DC: 4 A
	• Maximum output current: 50 A
	• Rated output voltage: 12 V
	• Maximum output power: 600 W
	• Hot swap: Supported
		• CloudEngine S6780-H4Z


PAC1K2S12-PB
	• Dimensions (H x W x D): 39.6 mm x 66 mm x 215 mm
	• Weight: 0.84 kg
	• Rated input voltage range:
	  – 200V AC～240V AC；50/60Hz
	  – 100V AC～130V AC；50/60Hz
	  – 240V DC
	• Maximum input voltage range:
		• CloudEngine S6780-H4Z

Power Module	Technical Specifications	Applied Switch Model
	– AC：90V AC～290V AC；45Hz～65Hz – HVDC：190V DC～290V DC • Maximum input current: – 100V AC～130V AC：10A – 200V AC～240V AC：8A – 240V DC：8A • Maximum output current: 100 A • Maximum output power: 1200 W • Hot swap: Supported	
 PDC1K2S12-CE	• Dimensions (H x W x D): 40 mm x 66 mm x 215 mm (1.6 in. x 2.6 in. x 8.5 in.) • Weight: 1.5 kg (3.31 lb) • Rated input voltage range: -48 V DC to -60 V DC • Maximum input voltage range: -38.4 V DC to -72 V DC • Maximum input current: 38 A • Maximum output current: 83.3 A • Maximum output power: 1200 W • Hot swap: Supported	• CloudEngine S6780-H4Z
 PAC2K2S12-PB	• Dimensions (H x W x D): 39.6 mm x 66 mm x 215 mm • Weight: 1 kg (2.20 lb) • Rated input voltage range: 100 V AC to 240 V AC, 50 Hz/60 Hz 240 V DC • Maximum input voltage range: AC: 90 V AC to 290 V AC; 45 Hz to 65 Hz High-voltage DC: 190 V DC to 290 V DC • Maximum input current: 100 V AC to 240 V AC: 10 A 240 V DC: 10 A • Maximum output current: 100 V AC to 130 V AC: 75 A 200 V AC to 220 V AC: 150 A 220 V AC to 240 V AC: 166.7 A 240 V DC: 166.7 A • Maximum output power: 100 V AC to 130 V AC: 900 W 200 V AC to 220 V AC: 1800 W 220 V AC to 240 V AC: 2000 W 240 V DC: 2000 W • Hot swap: Supported	• CloudEngine S6780-H4Z

Power Module	Technical Specifications	Applied Switch Model
 PDC2K2S12-CE	• Dimensions (H x W x D): 39.6 mm x 66.0 mm x 215 mm (1.56 in. x 2.6 in. x 8.46 in.) • Weight: 1.2 kg (2.65 lb) • Rated input voltage range: – +48 V DC – -48 V DC to -60 V DC • Maximum input voltage range: – +40 V DC to +57 V DC – -38.4 V DC to -72 V DC • Maximum input current: 63 A • Rated output voltage: 12.15 V • Rated output power: 1200 W • Hot swap: Supported	• CloudEngine S6780-H4Z

The S6780-H uses pluggable power modules. It can be configured with a single power module or double power modules for 1+1 power redundancy.

Product Features and Highlights

High-density Access, Providing Superior Capacity

- 8*25GE+4*400GE card (XSIC-D12B000): provides 8*25GE SFP28 ports and 4*400GE QSFP-DD ports. 25GE ports support 10GE/GE, 400GE ports support 100GE/40GE and 1-to-4 split (4*100GE).
- 16*100GE Card (XSIC-C16H000): provides 16*100GE QSFP28 ports, 100GE ports support 40GE, and support one-to-four split (4*25G/4*10G).
- 10*100GE card (XSIC-C10H000): provides 10*100GE QSFP28 ports, 100GE ports support 40GE, and support one-to-four split (4*25G/4*10G).
- 16*40GE Card (XSIC-L16Q000): provides 16*40GE QSFP ports, 40GE ports support one-to-four split (4*10G).
- 24*25GE+2*100GE card (XSIC-Y26B000): provides 24*25GE SFP28 ports and 2*100GE QSFP28 ports. 25GE ports support 10GE/GE, 100GE ports support 40GE and one-to-four splitting (4x25G/4x10G).
- 24*10GE+2*100GE card (XSIS-X26B000): provides 24*10GE SFP+ ports and 2*100GE QSFP28 ports. 10GE ports support GE, 100GE ports support 40GE and one-to-four splitting (4x25G/4x10G).

Note: For details about port split restrictions, check Interface Description in the product documentation.

Wired and Wireless Convergence

- By integrating WLAN AC capabilities, CloudEngine S6780-H eliminates the need to purchase additional WLAN AC hardware. CloudEngine S6780-H can manage up to 1K APs.
- CloudEngine S6780-H supports the unified user management function that authenticates both wired and wireless users, ensuring a consistent user experience no matter whether they are connected to the network through wired or wireless access devices. CloudEngine S6780-H supports various authentication methods, including 802.1X, MAC address authentication, and is capable of managing users based on user groups, domains, and time ranges. These functions intuitively control user and service management and enable the transformation from data switching-centered management to service experience-centered management.

Note: The CloudEngine S6780-H series switches can manage 16 APs by default . You can purchase licenses for more AP management on demand.

Enable Networks to be More Agile for Services

- Built-in high-speed and flexible processor chips, with their flexible packet processing and traffic control capabilities, CloudEngine S6780-H series switches are close to services, meeting current and future challenges, and helping customers build scalable networks.

- CloudEngine S6780-H series switches support fully customizing the forwarding mode, forwarding behavior, and search algorithm of traffic. New services are implemented through microcode programming. Customers do not need to replace new hardware and new services can be rolled out within six months.
- CloudEngine S6780-H series switches provide open interfaces and user-defined forwarding processes to meet customized service requirements of enterprises. Enterprises can use multi-layer open interfaces to develop new protocols and functions independently. They can also hand over their requirements to vendors and jointly develop them to build an enterprise-dedicated campus network.

Delivering Abundant Services More Agilely

- With the unified user management function, the CloudEngine S6780-H series switches authenticates both wired and wireless users, ensuring a consistent user experience no matter whether they are connected to the network through wired or wireless access devices. The unified user management function supports various authentication methods, including 802.1x, MAC address, and is capable of managing users based on user groups, domains, and time ranges. These functions visualize user and service management and boost the transformation from device-centric management to user experience-centric management.
- The CloudEngine S6780-H series switches provide excellent quality of service(QoS) capabilities and supports queue scheduling and congestion control algorithms. Additionally, it adopts innovative priority queuing and multi-level scheduling mechanisms to implement fine-grained scheduling of data flows, meeting service quality requirements of different user terminals and services.

Fine-Grained Network Management and Visualized Fault Diagnosis

- In-situ Flow Information Telemetry (IFIT) is an in-band Operations, Administration, and Maintenance (OAM) measurement technology that uses service packets to measure real performance indicators of an IP network, such as the packet loss rate and delay. IFIT can significantly improve the timeliness and effectiveness of network O&M, thereby promoting the development of intelligent O&M.
- Three IFIT modes are available: application-level quality measurement, tunnel-level quality measurement, and native-IP IFIT measurement. Currently, CloudEngine S6780-H series switches support native-IP IFIT measurement only. By providing in-band measurement capabilities, CloudEngine S6780-H series switches can monitor indicators such as the delay and packet loss rate of service flows in real time. CloudEngine S6780-H series switches also offer visualized O&M capabilities to centrally manage and control networks and graphically display performance data. Designed with IFIT capabilities featuring high measurement precision and easy deployment, CloudEngine S6780-H series switches are ideal for constructing an intelligent O&M system and stand out with future-proof scalability.

Flexible Ethernet Networking

- In addition to traditional Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), and Multiple Spanning Tree Protocol (MSTP), the CloudEngine S6780-H series switches support Huawei-developed Smart Ethernet Protection (SEP) technology and the latest Ethernet Ring Protection Switching (ERPS) standard. SEP is a ring protection protocol specific to the Ethernet link layer, and applies to various ring network topologies, such as open ring topology, closed ring topology, and cascading ring topology. This protocol is reliable, easy to maintain, and implements fast service switching within 50 ms. ERPS is defined in ITU-T G.8032. It implements millisecond-level protection switching based on traditional Ethernet MAC and bridging functions.
- CloudEngine S6780-H series switches support Smart Link and Virtual Router Redundancy Protocol (VRRP), which implement backup of uplinks. One CloudEngine S6780-H series switch can connect to multiple core switches through multiple links, significantly improving reliability of aggregation devices.

Mature IPv6 Features

- The CloudEngine S6780-H series swithes are developed based on the mature, stable VRP and supports IPv4/IPv6 dual stacks, IPv6 routing protocols (RIPng, OSPFv3, BGP4+, and IS-IS for IPv6). With these IPv6 features, the CloudEngine S6780-H can be deployed on a pure IPv4 network, a pure IPv6 network, or a shared IPv4/IPv6 network, helping achieve IPv4-to-IPv6 transition.

Intelligent Stack (iStack)

- CloudEngine S6780-H series switches support the iStack function that combines multiple switches into a logical switch. Member switches in a stack implement redundancy backup to improve device reliability and use inter-device link aggregation to improve link reliability. iStack provides high network scalability. You can increase a stack's ports, bandwidth, and processing capability by simply adding member switches. iStack also simplifies device configuration and management. After a stack is set

up, multiple physical switches can be virtualized into one logical device. You can log in to any member switch in the stack to manage all the member switches in it.

Cloud-based Management

- The Huawei cloud management platform allows users to configure, monitor, and inspect switches on the cloud, reducing on-site deployment and O&M manpower costs and decreasing network OPEX.

VXLAN Features

- VXLAN is used to construct a Unified Virtual Fabric (UVF). As such, multiple service networks or tenant networks can be deployed on the same physical network, and service and tenant networks are isolated from each other. This capability truly achieves 'one network for multiple purposes'. The resulting benefits include enabling data transmission of different services or customers, reducing the network construction costs, and improving network resource utilization.
- This series switches are VXLAN-capable and allow centralized and distributed VXLAN gateway deployment modes. These switches also support the BGP EVPN protocol for dynamically establishing VXLAN tunnels and can be configured using NETCONF/YANG.

Link Layer Security

- CloudEngine S6780-H models support MACsec. MACsec protects transmitted Ethernet data frames through identity authentication, data encryption, integrity check, and anti-replay protection, reducing the risks of information leakage and malicious network attacks. With MACsec, these switch models are able to address strict information security requirements of customers in industries such as government and finance.

Open Programmability System(OPS)

- Open Programmability System (OPS) is an open programmable system based on the Python language. IT administrators can program the O&M functions of a switch through Python scripts to quickly innovate functions and implement intelligent O&M.

Intelligent O&M

- This series switches provides telemetry technology to collect device data in real time and send the data to Huawei campus network analyzer(iMaster NCE-CampusInsight). The CampusInsight analyzes network data based on the intelligent fault identification algorithm, accurately displays the real-time network status, effectively demarcates and locates faults in a timely manner, and identifies network problems that affect user experience, accurately guaranteeing user experience.

Intelligent Upgrade

- Switches support the intelligent upgrade feature. Specifically, switches obtain the version upgrade path and download the newest version for upgrade from the Huawei Online Upgrade Platform (HOUP). The entire upgrade process is highly automated and achieves one-click upgrade. In addition, preloading the version is supported, which greatly shortens the upgrade time and service interruption time.
- The intelligent upgrade feature greatly simplifies device upgrade operations and makes it possible for the customer to upgrade the version independently. This greatly reduces the customer's maintenance costs. In addition, the upgrade policies on the HOUP platform standardize the upgrade operations, which greatly reduces the risk of upgrade failures.

Product Specifications

The following table describes the functions and features available on the CloudEngine S6780-H series switches.

Functions and Features

Category	Service Features
User management	Unified user management
	802.1X, MAC, Portal, HACA authentication
	Traffic- and duration-based accounting

Category	Service Features
	User authorization based on user groups, domains, and time ranges
MAC	Automatic MAC address learning and aging
	512K MAC entries (MAX)
	Static, dynamic, and blackhole MAC address entries
	Source MAC address filtering
	MAC address learning limiting based on ports and VLANs
VLAN	4K VLANs
	Access mode, Trunk mode and Hybrid mode
	Default VLAN
	QinQ and enhanced selective QinQ
	VLAN Stacking, VLAN mapping
	Dynamic VLAN assignment based on MAC addresses
ARP	ARP Snooping
DHCP	DHCPv4 Client/Relay/Server, DHCPv4 Snooping
	DHCPv6 Client/Relay/Server, DHCPv6 Snooping
IP routing	IPv4 dynamic routing protocols such as RIP, OSPF, IS-IS, and BGP
	IPv6 dynamic routing protocols such as RIPng, OSPFv3, ISISv6, and BGP4+
	Routing Policy, Policy-Based Routing
	VRF
Segment Routing	SRv6 BE (L3 EVPN)
	BGP EVPN
	SRv6 configuration through NETCONF
Multicast	IGMPv1/v2/v3 and IGMP v1/v2/v3 Snooping
	PIM-DM, PIM-SM, PIM-SSM, PIMv6
	Fast-leave mechanism
	Multicast traffic control
	Multicast querier
	Multicast protocol packet suppression
MPLS	MPLS-LDP
	MPLS-L3VPN
	MPLS Qos
	MPLS TE
VXLAN	Centralized gateway
	Distributed gateway

Category	Service Features
	BGP-EVPN
	Configures VXLANs through NETCONF
QoS	Traffic classification based on Layer 2 headers, Layer 3 protocols, Layer 4 protocols, and 802.1p priority
	Actions such as ACL, Committed Access Rate (CAR), re-marking, and scheduling
	Queuing algorithms, such as PQ, DRR, WDRR, and PQ+DRR, PQ+WDRR
	Congestion avoidance mechanisms such as WRED and tail drop
	Traffic shaping
	Eight queues on each interface
	Network Slicing
Native-IP IFIT	Marks the real service packets to obtain real-time count of dropped packets and packet loss ratio
	The statistical period can be modified
	Two-way frame delay measurement
Ethernet loop protection	STP (IEEE 802.1d), RSTP (IEEE 802.1w), and MSTP (IEEE 802.1s).
	BPDU protection, root protection, and loop protection
	G.8032 Ethernet Ring Protection Switching (ERPS)
	Smart Ethernet Protection(SEP)
Reliability	M-LAG
	Service interface-based stacking
	Maximum number of stacked devices
	Stack bandwidth (Bidirectional)
	Link Aggregation Control Protocol (LACP) and E-Trunk
	Virtual Router Redundancy Protocol (VRRP) and Bidirectional Forwarding Detection (BFD) for VRRP
	BFD for BGP/IS-IS/OSPF/static routes
	Eth-OAM 802.1ag(CFM)
	Smartlink
	LLDP
	LBDT
	Y.1731
System management	iStack, Maximum number: 9
	Console terminal service
	Telnet/IPv6 Telnet terminal service
	SSH v1.5
	SSH v2.0

Category	Service Features
	SNMP v1/v2c/v3
	FTP、TFTP、SFTP
	BootROM upgrade and remote in-service upgrade
	Hot patch
	User operation logs
	Open Programmability System (OPS)
	Streaming Telemetry
	GVRP, LNP, VCMP
	iPCA, NetStream, NQA, Telemetry
	WebMaster Management
Security and management	NAC
	RADIUS and HWTACACS authentication for login users
	MACsec
	Command line authority control based on user levels, preventing unauthorized users from using command configurations
	Defense against DoS attacks, Transmission Control Protocol (TCP) SYN Flood attacks, User Datagram Protocol (UDP) Flood attacks, broadcast storms, and heavy traffic attacks
	IPv6 RA Guard
	CPU hardware queues to implement hierarchical scheduling and protection for protocol packets on the control plane
	Remote Network Monitoring (RMON)
	Secure boot
	Port mirroring
	ND snooping
Wireless management (integrated WLAN AC): Basic WLAN services	2.4G & 5G load balancing
	5G-prior access
Wireless management (integrated WLAN AC): AP management	Total number of managed APs: 1K
	An IPv4 network between an AP and a WLAN AC
	AP blacklist
	AP whitelist
	Sets the AP access control mode
	AP configuration and management
	AP LLDP topology awareness
Wireless management (integrated WLAN AC):	User roaming within a WLAN AC
	AP-based user location

Category	Service Features
Wireless user management	802.1X authentication
	MAC address authentication
	Portal authentication
Wireless management (integrated WLAN AC): CAPWAP	Direct data forwarding on L2/L3 networks
	Tunnel-based data forwarding on L2/L3 networks
	CAPWAP tunnel encryption
Wireless management (integrated WLAN AC): RF management	802.11a/b/g/n
	802.11ac wave1/wave2
	802.11ax
	Sets RF interference monitoring and avoidance
	Detects co-channel interference, adjacent interference, and interference from other devices and STAs
	Automatically selects channels and power when APs go online
	Dynamic power and channel optimization
Wireless management (integrated WLAN AC): WLAN QoS	Rate limiting of upstream and downstream traffic on the air interface based on the VAP
	Rate limiting of upstream and downstream traffic on the air interface based on users
	CAR for WLAN users
Interoperability	Interoperable with VBST (compatible with PVST/PVST+/RPVST)

NOTE

This content is applicable only to regions outside mainland China. Huawei reserves the right to interpret this content.

Hardware Specifications

The following table lists hardware specifications of the CloudEngine S6780-H series 100GE switches.

Item		CloudEngine S6780-H4Z
Physical specifications	Chassis dimensions (H x W x D, mm)	88.1 mm x 442.0 mm x 600.0 mm (3.47 in. x 17.40 in. x 23.62 in.)
	Chassis height	2U
	Chassis weight (full configuration weight, including weight of packaging materials)	21.3 kg (46.96 lb), including two power filler panels, without power modules, cards, and card filler panels 24.02 kg (52.95 lb), including four card filler panels and two power filler panels, without power modules and cards
Management port	ETH management port	Supported
	Console port (RJ45)	Supported
	USB port	USB 2.0
CPU	Frequency	2 GHz
	Cores	16
Memory	Memory (RAM)	8GB

Item		CloudEngine S6780-H4Z
	Flash	Physical space: 4GB
Power supply system	Power supply type	• 600 W AC (pluggable) • 1200 W AC (pluggable) • 1200 W DC (pluggable) • 2000 W AC (pluggable) • 2200 W DC (pluggable)
	Rated voltage range	• AC input: 100 V AC to 240 V AC; 50/60 Hz • High-voltage DC input: 240 V DC • DC input: –48 V DC to –60 V DC
	Maximum voltage range	• AC input: 90 V AC to 290 V AC; 45–65 Hz • High-voltage DC input: 190 V DC to 290 V DC • DC input: -38.4 V DC to -72 V DC
	Maximum input current	The current specifications are related to the pluggable power module. For details, see Pluggable Power Modules.
	Typical power consumption	Configured with four XSIC-C16H000 cards: 940 W Configured with four XSIC-L16Q000 cards: 724 W Configured with four XSIC-C10H000 cards: 508 W Configured with four XSIC-D12B000 cards: 621 W Configured with four XSIC-Y26B000 cards: 423 W Configured with four XSIC-X26B000 cards: 366 W
	Maximum power consumption	Configured with four XSIC-C16H000 cards: - 1306 W (two 2000 W AC power modules, 220 V input) Configured with four XSIC-L16Q000 cards: - 1138 W (two 1200 W AC power modules, 110 V input) Configured with four XSIC-C10H000 cards: - 832 W (two 1200 W AC power modules, 110 V input) Configured with four XSIC-D12B000 cards: - 1078 W (two 1200 W AC power modules, 110 V input) Configured with four XSIC-Y26B000 cards: - 796 W (two 1200 W AC power modules, 110 V input) Configured with four XSIC-X26B000 cards: - 788 W (two 1200 W AC power modules, 110 V input)
Heat dissipation system	Heat dissipation mode	Air cooling for heat dissipation, intelligent fan speed adjustment
	Number of fan modules	3
	Airflow	Air intake from left, front, and right and air exhaust from rear
Environment parameters	Long-term operating temperature	–5°C to +45°C (23°F to 113°F) at an altitude of 0 to 1800 m (0 to 5906 ft.) When the QSFP-100G-ZR4 or QSFP-DD-400G-LR8 optical modules are configured, the operating temperature ranges from –5°C to +40°C (23°F to 104°F).

Item		CloudEngine S6780-H4Z
		NOTE When the altitude is 1800–5000 m (5906–16404 ft.), the highest operating temperature reduces by 1°C (1.8°F) every time the altitude increases by 220 m (722 ft.). Devices cannot start when the temperature is lower than 0°C (32°F).
	Storage temperature	–40°C to +70°C (–40°F to +158°F)
	Relative humidity	5% to 95%, noncondensing
	Operating altitude	0-5000 m
	Noise under normal temperature (sound power)	86.1 dB(A)
	Noise under high temperature (sound power)	102.4 dB(A)
	Noise under normal temperature (sound pressure)	74.1 dB(A)
	Surge protection specification (power port)	• Configured with AC power modules: ±6 kV in differential mode and ±6 kV in common mode • Configured with DC power modules: ±2 kV in differential mode and ±4 kV in common mode
Reliability	MTBF (year)[2]	48.4
	MTTR (hour)	2
	Availability	> 0.99999
Certification		• EMC certification • Safety certification • Manufacturing certification **NOTE** For details about certifications, see the section Safety and Regulatory Compliance.

NOTE

1: The power consumption under different load conditions is calculated according to the ATIS standard. Additionally.

2: The reliability parameter values are calculated based on the typical configuration of the device. The parameter values vary according to the modules configured by the customer.

Licensing

Licensing

This series switches supports both the traditional feature-based licensing mode and the latest Huawei IDN One Software (N1 mode for short) licensing mode. The N1 mode is ideal for deploying Huawei CloudCampus Solution in the on-premises scenario, as it greatly enhances the customer experiences in purchasing and upgrading software services with simplicity.

Software Package Features in N1 Mode

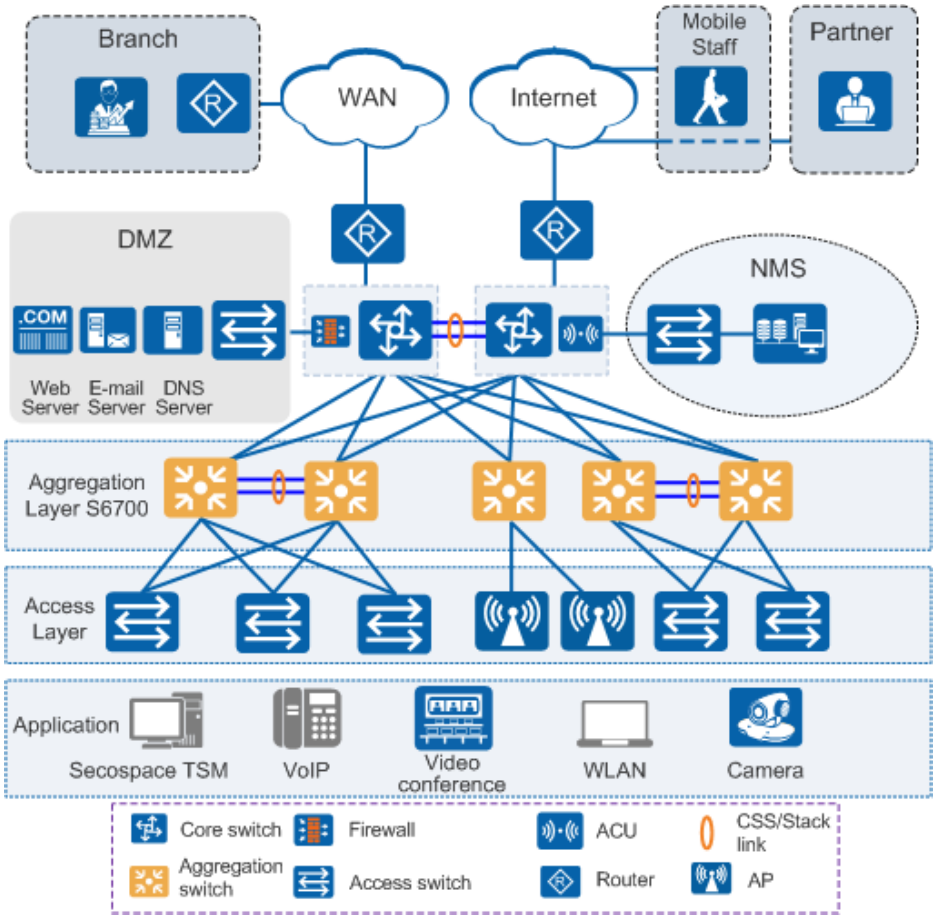
Switch Functions	N1 Basic Software	N1 Foundation Software Package	N1 Advanced Software Package

Switch Functions	N1 Basic Software	N1 Foundation Software Package	N1 Advanced Software Package
Basic network functions: Layer 2 functions, IPv4, IPv6, and others Note: For details, see the Service Features	√	√	√
Basic network automation based on the iMaster NCE-Campus: • NE management: Device management, topology management and discovery • User access authentication	×	√	√
Advanced network automation and intelligent O&M: VXLAN, Free Mobility, IPCA, CampusInsight basic functions	×	×	√

Networking and Applications

Large-scale Enterprise Campus Network

CloudEngine S6780-H series 100GE switches can be deployed at the aggregation layer of a large-scale enterprise campus network, creating a highly reliable, scalable, and manageable enterprise campus network.



Product Accessories

Optical Modules and Fibers

40GE/100GE QSFP28 ports support optical modules and cables

- QSFP+ optical module
- QSFP28 optical module
- 1 m, 3 m, and 5 m QSFP+ to QSFP+ high-speed copper cables
- 10 m QSFP+ to QSFP+ AOC cable
- 1 m QSFP28 to QSFP28 high-speed copper cable
- 10 m QSFP28 to QSFP28 AOC cable

Stack Cables

CloudEngine S6780-H series switches support service port stacking. The applicable stack cables are as follows:

Port Supporting Stacking	Stack Cable	Rate of a Single Port
100GE QSFP28 Ethernet optical port	• All QSFP+ optical modules supported by the device and the matching optical fibers • 1 m, 3 m, and 5 m QSFP+ to QSFP+ high-speed cables • 10 m QSFP+ to QSFP+ AOC cable (Note: The preceding cables can be used only after the port rate decreases.)	40 Gbit/s
	• All QSFP28 optical modules supported by the device and the matching optical fibers • 1 m and 3 m QSFP28 to QSFP28 high-speed cables • 10 m QSFP28 to QSFP28 AOC cable • 2 m QSFP28 dedicated stack cable (zero-configuration stacking supported from V600R023C00)	100 Gbit/

Safety and Regulatory Compliance

The following table lists the safety and regulatory compliance of the CloudEngine S6780-H series 100GE switches.

Certification Category	Description
Safety	• IEC 60950-1 and all country deviations • EN 60950-1 • UL 60950-1 • CAN/CSA 22.2 No.60950-1 • GB 4943
Electromagnetic Compatibility (EMC)	• EMI • FCC CFR47 Part 15 Class A • EN55022 Class A • CISPR 22 Class A • EN61000-3-2/IEC-1000-3-2, Power line harmonics

Certification Category	Description
	• EN61000-4-3/IEC-1000-4-3, Radiated immunity • EN61000-4-2/IEC-1000-4-2, ESD • EN61000-4-4/IEC-1000-4-4, EFT • EN61000-4-5/IEC-1000-4-5, Surge Signal Port • EN61000-4-6/IEC-1000-4-6, Low frequency conducted immunity • EN61000-4-11/IEC-1000-4-11, Voltage dips and sags • EN61000-4-29/IEC61000-4-29, Voltage dips and sags • EMC Directive 89/336/EEC • EMC Directive 2004/108/EC • VCCI V-3 Class A • ICES-003 Class A • AS/NZS CISPR 22 Class A • CNS 13438 Class A • GB9254 Class A

NOTE

- EMC: electromagnetic compatibility
- CISPR: International Special Committee on Radio Interference
- EN: European Standard
- ETSI: European Telecommunications Standards Institute
- CFR: Code of Federal Regulations
- FCC: Federal Communication Commission
- IEC: International Electrotechnical Commission
- AS/NZS: Australian/New Zealand Standard
- VCCI: Voluntary Control Council for Interference
- UL: Underwriters Laboratories
- CSA: Canadian Standards Association
- IEEE: Institute of Electrical and Electronics Engineers

MIB and Standards Compliance

Supported MIBs

Category	MIB
Public MIB	• BRIDGE-MIB • DISMAN-NSLOOKUP-MIB • DISMAN-PING-MIB • DISMAN-TRACEROUTE-MIB • ENTITY-MIB • EtherLike-MIB • IF-MIB • IP-FORWARD-MIB • IPv6-MIB • LAG-MIB • LLDP-EXT-DOT1-MIB

Category	MIB
	• LLDP-EXT-DOT3-MIB • LLDP-MIB • NOTIFICATION-LOG-MIB • NQA-MIB • OSPF-TRAP-MIB • P-BRIDGE-MIB • Q-BRIDGE-MIB • RFC1213-MIB • RIPv2-MIB • RMON2-MIB • RMON-MIB • SAVI-MIB • SNMP-FRAMEWORK-MIB • SNMP-MPD-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMP-USER-BASED-SM-MIB • SNMPv2-MIB • TCP-MIB • UDP-MIB
Huawei-proprietary MIB	• HUAWEI-AAA-MIB • HUAWEI-ACL-MIB • HUAWEI-ALARM-MIB • HUAWEI-ALARM-RELIABILITY-MIB • HUAWEI-BASE-TRAP-MIB • HUAWEI-BRAS-RADIUS-MIB • HUAWEI-BRAS-SRVCFG-EAP-MIB • HUAWEI-BRAS-SRVCFG-STATICUSER-MIB • HUAWEI-CBQOS-MIB • HUAWEI-CDP-COMPLIANCE-MIB • HUAWEI-CONFIG-MAN-MIB • HUAWEI-CPU-MIB • HUAWEI-DAD-TRAP-MIB • HUAWEI-DC-MIB • HUAWEI-DATASYNC-MIB • HUAWEI-DEVICE-MIB • HUAWEI-DHCPR-MIB • HUAWEI-DHCPS-MIB • HUAWEI-DHCP-SNOOPING-MIB • HUAWEI-DIE-MIB • HUAWEI-DNS-MIB • HUAWEI-DLDP-MIB • HUAWEI-ELMI-MIB • HUAWEI-ERPS-MIB

Category	MIB
	• HUAWEI-ERRORDOWN-MIB • HUAWEI-ENERGYMNGT-MIB • HUAWEI-EASY-OPERATION-MIB • HUAWEI-ENTITY-EXTENT-MIB • HUAWEI-ENTITY-TRAP-MIB • HUAWEI-ETHARP-MIB • HUAWEI-ETHOAM-MIB • HUAWEI-FLASH-MAN-MIB • HUAWEI-FWD-RES-TRAP-MIB • HUAWEI-GARP-APP-MIB • HUAWEI-GTSM-MIB • HUAWEI-HGMP-MIB • HUAWEI-HWTACACS-MIB • HUAWEI-IF-EXT-MIB • HUAWEI-INFOCENTER-MIB • HUAWEI-IPPOOL-MIB • HUAWEI-IPV6-MIB • HUAWEI-ISOLATE-MIB • HUAWEI-L2IF-MIB • HUAWEI-L2MAM-MIB • HUAWEI-L2VLAN-MIB • HUAWEI_LDT-MIB • HUAWEI-LLDP-MIB • HUAWEI-MAC-AUTHEN-MIB • HUAWEI-MEMORY-MIB • HUAWEI-MFF-MIB • HUAWEI-MFLP-MIB • HUAWEI-MSTP-MIB • HUAWEI-MULTICAST-MIB • HUAWEI-NAP-MIB • HUAWEI-NTPV3-MIB • HUAWEI-PERFORMANCE-MIB • HUAWEI-PORT-MIB • HUAWEI-PORTAL-MIB • HUAWEI-QINQ-MIB • HUAWEI-RIPv2-EXT-MIB • HUAWEI-RM-EXT-MIB • HUAWEI-RRPP-MIB • HUAWEI-SECURITY-MIB • HUAWEI-SEP-MIB • HUAWEI-SNMP-EXT-MIB • HUAWEI-SSH-MIB • HUAWEI-STACK-MIB • HUAWEI-SWITCH-L2MAM-EXT-MIB • HUAWEI-SWITCH-SRV-TRAP-MIB

Category	MIB
	• HUAWEI-SYS-MAN-MIB • HUAWEI-TCP-MIB • HUAWEI-TFTPC-MIB • HUAWEI-TRNG-MIB • HUAWEI-XQOS-MIB

NOTE

For more information about MIBs supported by CloudEngine S6780-H series 100GE switches, visit:
https://support.huawei.com/enterprise/en/switches/s6700-pid-6691593?category=reference-guides

Standards Compliance

The following table lists the standards that CloudEngine S6780-H series 100GE switches comply with.

Standard Organization	Standard or Protocol
IETF	• RFC 768 User Datagram Protocol (UDP) • RFC 792 Internet Control Message Protocol (ICMP) • RFC 793 Transmission Control Protocol (TCP) • RFC 826 Ethernet Address Resolution Protocol (ARP) • RFC 854 Telnet Protocol Specification • RFC 951 Bootstrap Protocol (BOOTP) • RFC 959 File Transfer Protocol (FTP) • RFC 1058 Routing Information Protocol (RIP) • RFC 1112 Host extensions for IP multicasting • RFC 1157 A Simple Network Management Protocol (SNMP) • RFC 1256 ICMP Router Discovery • RFC 1305 Network Time Protocol Version 3 (NTP) • RFC 1349 Internet Protocol (IP) • RFC 1493 Definitions of Managed Objects for Bridges • RFC 1542 Clarifications and Extensions for the Bootstrap Protocol • RFC 1643 Ethernet Interface MIB • RFC 1757 Remote Network Monitoring (RMON) • RFC 1901 Introduction to Community-based SNMPv2 • RFC 1902-1907 SNMP v2 • RFC 1981 Path MTU Discovery for IP version 6 • RFC 2131 Dynamic Host Configuration Protocol (DHCP) • RFC 2328 OSPF Version 2 • RFC 2453 RIP Version 2 • RFC 2460 Internet Protocol, Version 6 Specification (IPv6) • RFC 2461 Neighbor Discovery for IP Version 6 (IPv6) • RFC 2462 IPv6 Stateless Address Auto configuration • RFC 2463 Internet Control Message Protocol for IPv6 (ICMPv6) • RFC 2474 Differentiated Services Field (DS Field) • RFC 2475 An Architecture for Differentiated Services • RFC 2740 OSPF for IPv6 (OSPFv3) • RFC 2863 The Interfaces Group MIB

Standard Organization	Standard or Protocol
	• RFC 2597 Assured Forwarding PHB Group • RFC 2598 An Expedited Forwarding PHB • RFC 2571 SNMP Management Frameworks • RFC 2865 Remote Authentication Dial In User Service (RADIUS) • RFC 3046 DHCP Option82/Relay • RFC 3376 Internet Group Management Protocol, Version 3 (IGMPv3) • RFC 3513 IP Version 6 Addressing Architecture • RFC 3579 RADIUS Support For EAP • RFC 4271 A Border Gateway Protocol 4 (BGP-4) • RFC 4760 Multiprotocol Extensions for BGP-4 • draft-grant-tacacs-02 TACACS+ • RFC5340 OSPF for IPv6 • RFC 5798 Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6 • RFC 6241 Network Configuration Protocol (NETCONF) • RFC 6020 YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF) • RFC 7348 Virtual eXtensible Local Area Network (VXLAN): A Framework for Overlaying Virtualized Layer 2 Networks over Layer 3 Networks • RFC 8365 A Network Virtualization Overlay Solution Using Ethernet VPN (EVPN)
IEEE	• IEEE 802.1D Media Access Control (MAC) Bridges • IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering • IEEE 802.1Q Virtual Bridged Local Area Networks • IEEE 802.1ad Provider Bridges • IEEE 802.2 Logical Link Control • IEEE Std 802.3 CSMA/CD • IEEE Std 802.3ab 1000BASE-T specification • IEEE Std 802.3ad Aggregation of Multiple Link Segments • IEEE Std 802.3ae 10GE WEN/LAN Standard • IEEE Std 802.3x Full Duplex and flow control • IEEE Std 802.3z Gigabit Ethernet Standard • IEEE 802.1ax/IEEE802.3ad Link Aggregation • IEEE 802.3ah Ethernet in the First Mile. • IEEE 802.1ag Connectivity Fault Management • IEEE 802.1ab Link Layer Discovery Protocol • IEEE 802.1D Spanning Tree Protocol • IEEE 802.1w Rapid Spanning Tree Protocol • IEEE 802.1s Multiple Spanning Tree Protocol • IEEE 802.1x Port based network access control protocol • IEEE 802.3az Automatic power adjustment on Ethernet interfaces • IEEE 802.3ad Port Trunk, LACP
ITU	• ITU SG13 Y.17ethoam • ITU SG13 QoS control Ethernet-Based IP Access • ITU-T Y.1731 ETH OAM performance monitor

Standard Organization	Standard or Protocol
ISO	• ISO 10589 IS-IS Routing Protocol
MEF	• MEF 2 Requirements and Framework for Ethernet Service Protection • MEF 9 Abstract Test Suite for Ethernet Services at the UNI • MEF 10.2 Ethernet Services Attributes Phase 2 • MEF 11 UNI Requirements and Framework • MEF 13 UNI Type 1 Implementation Agreement • MEF 15 Requirements for Management of Metro Ethernet Phase 1 Network Elements • MEF 17 Service OAM Framework and Requirements • MEF 20 UNI Type 2 Implementation Agreement • MEF 23 Class of Service Phase 1 Implementation Agreement • Xmodem XMODEM/YMODEM Protocol Reference

NOTE

The listed standards and protocols are fully or partially supported by Huawei switches. For details, visit http://e.huawei.com/en or contact your local Huawei sales office.

Ordering Information

The following table lists ordering information of CloudEngine S6780-H series 100GE switches.

Model	Product Description
CloudEngine S6780-H4Z	S6780-H4Z mainframe (4*subcard slots, without power module)
PAC600S12-PB	600W AC power module
PAC1K2S12-PB	1200W AC power module
PDC1K2S12-CE	1200W DC power module
PAC2KS12-PB	2000W AC power module
PDC2K2S12-PB	2200W DC power module
FAN-180E-B	Fan Box (B, Fan Panel Side Exhaust)

100GE interface card		Version
XSIC-C16H000	XSIC-C16H000 (Interface card with 16*100GE QSFP28 ports)	V600R24C00 or later versions
XSIC-C10H000	XSIC-C10H000 (Interface card with 10*100GE QSFP28 ports)	V600R24C00 or later versions

40GE interface card		Version
XSIC-L16Q000	XSIC-L16Q000 (Interface card with 16*40GE QSFP ports)	V600R24C00 or later versions

25GE interface card		Version
XSIC-D12B000	XSIC-D12B000 (Interface card with 8*25GE SFP28 ports and 4*400GE QSFP-DD ports)	V600R24C00 or later versions
XSIC-Y26B000	XSIC-Y26B000 (Interface card with 24*25GE SFP28 ports and 2*100GE QSFP28 ports)	V600R24C00 or later versions

10GE Optical interface card		Version
XSIC-X26B000	XSIC-X26B000 (Interface card with 24*10GE SFP+ ports and 2*100GE QSFP28 ports)	V600R24C00 or later versions

10GE Electrical interface card		Version
XSIC-M26B000	XSIC-M26B000 (Interface card with 24*1000M/10GBASE-T ports and 2*100GE QSFP28 ports)	V600R24C10 or later versions

License	Product Description
L-MLIC-S67H	S67XX-H Series Basic SW,Per Device
N1-S67H-F-Lic	N1-CloudCampus,Foundation,S67XX-H Series,Per Device
N1-S67H-F-SnS	N1-CloudCampus,Foundation,S67XX-H Series,SnS,Per Device
N1-S67H-A-Lic	N1-CloudCampus,Advanced,S67XX-H Series,Per Device
N1-S67H-A-SnS	N1-CloudCampus,Advanced,S67XX-H Series,SnS,Per Device
N1-S67H-FToA-Lic	N1-Upgrade-Foundation to Advanced,S67XX-H,Per Device
N1-S67H-FToA-SnS	N1-Upgrade-Foundation to Advanced,S67XX-H,SnS,Per Device
N1-AM-30-Lic	N1-CloudCampus, Add-On Package, Access Management, Per 30 Endpoints
N1-AM-30-SnS1Y	N1-CloudCampus, Add-On Package, Access Management, Software Subscription and Support, Per 30 Endpoints, 1 Year
N1-EPNP-30-Lic	N1-CloudCampus, Add-On Package, Endpoints Plug and Play, Per 30 Endpoints
N1-EPNP-30-SnS1Y	N1-CloudCampus, Add-On Package, Endpoints Plug and Play, Software Subscription and Support, Per 30 Endpoints, 1 Year
N1-APP-X7FSwitch	N1-CloudCampus, Add-On Package, Intelligent Application Analysis, X7 Series Fixed Switch, Per Device
N1-APP-X7FSwitch-SnS1Y	N1-CloudCampus, Add-On Package, Intelligent Application Analysis, X7 Series Fixed Switch, Software Subscription and Support, Per Device, 1 Year

More Information

For more information about the Huawei Campus Switches, visit http://e.huawei.com or contact us in the following ways:

- Global service hotline: http://e.huawei.com/en/service-hotline

- Logging in to the Huawei Enterprise technical support website: http://support.huawei.com/enterprise/
- Sending an email to the customer service mailbox: support_e@huawei. com

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