

# H3C S6812/S6813 Series

## Data Center Switches

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# H3C S6812/S6813 Series Data Center Switches

## Product overview

H3C S6812/S6813 high-density intelligent switch series is developed for data centers and cloud computing networks. It provides powerful hardware forwarding capacity and abundant data center features. The switch supports modular power modules and fan trays. By using different fan trays, the switch can provide field changeable airflows.

The switch is perfectly matched for high density 10GE, it can also operate as a TOR access switch on an overlay or integrated network.

The S6812/S6813 switch series has four models:

- S6812-24X6C: The switch provides 24 × 10G SFP Plus ports, 6 × 100G QSFP28 ports
- S6812-48X6C: The switch provides 48 × 10G SFP Plus ports, 6 × 100G QSFP28 ports
- S6813-24X6C: The switch provides 24 × 10G SFP Plus ports, 6 × 100G QSFP28 ports
- S6813-48X6C: The switch provides 48 × 10G SFP Plus ports, 6 × 100G QSFP28 ports



S6812-24X6C Front view



S6812-48X6C Front view



S6813-24X6C Front view



S6813-48X6C Front view

## Features and Benefits

### Flexible Port Combinations

- With the rapid growth of data center virtualization deployment, commercial deployment of 10 Gigabit servers and high-bandwidth applications, there are more and more demands for 100GE, 40GE, and 10 Gigabit networks. H3C S6813-48X6C and S6812-48X6C can support 48 10G ports and 6 100GE QSFP28 ports. S6813-

24X6C and S6812-24X6C can support 24 10G ports and 6 100GE QSFP28 ports.

## IRF2 (Second Generation Intelligent Resilience Architecture)

- Facing the application requirements of the unified switching architecture of the data center, the series switches support the IRF2 technology, which virtualizes multiple devices into one logical.
- The equipment has strong advantages in scalability, reliability, distributed and availability.
- IRF2 not only can achieve a long-distance intelligent elastic architecture within a rack, across racks, and even across regions.

## Abundant Data Center Features

The switch supports abundant data center features, including:

- H3C S681X series switches supports VXLAN (Virtual Extensible LAN), which provides two major benefits, higher scalability of Layer 2 segmentation and better utilization of available network paths.
- H3C S681X series switches supports MP-BGP EVPN (Multiprotocol Border Gateway Protocol Ethernet Virtual Private Network) which can run as VXLAN control plane to simplify VXLAN configuration.
- H3C S681X series switches support Priority-based Flow Control (PFC), Enhanced Transmission Selection (ETS) and Data Center Bridging eXchange (DCBX). These features ensure low latency and zero packet loss for FC storage, RDMA applications and high-speed computing services.

## H3C Distributed Resilient Network Interconnection (DRNI)

- H3C S681X series switches support DRNI(M-LAG), which enables links of multiple switches to aggregate into one to implement device-level link backup. DRNI is applicable to servers dual-homed to a pair of access devices for node redundancy.
- Streamlined topology: DRNI simplifies the network topology and spanning tree configuration by virtualizing two physical devices into one logical device.
- Independent upgrading: The DR member devices can be upgraded independently one by one to minimize the impact on traffic forwarding.
- High availability: The DR system uses a keepalive link to detect multi-active collision to ensure that only one member device forwards traffic after a DR system splits.

## Flexible programmability

- The switch uses industry-leading programmable switching chips that allow users to define the forwarding logic as needed.
- Users can develop new features that meet the evolving trend of their networks through simple software updates.

## RoCE (RDMA over Converged Ethernet)

- Remote Direct Memory Access (RDMA) directly transmits the user application data to the storage space of the servers, and uses the network to fast transmit the data from the local system to the storage of the remote system. RDMA eliminates multiple data copying and context switching operations during the transmission process, and reduces the CPU load.

- RoCE supports RDMA on standard Ethernet infrastructures. H3C S681X series switches support RoCE and can be used to build a lossless Ethernet network to ensure zero packet loss.
- RoCE include the following key features , include PFC(Priority based Flow Control), ECN(Explicit Congestion Notification), DCBX(Data Center Bridging Capability Exchange Protocol), ETS(Enhanced Transmission Selection).

### Powerful SDN capacity

- H3C S681X series switches adopt the next-generation chip with more flexible Openflow FlowTable, more resources and accurate ACL matching, which greatly improves the software-defined network (SDN) capabilities and meet the demand of data center SDN network.
- H3C S6813 series switches can interconnect with H3C SeerEngine-DC Controller through standard protocols such as OVSDB, Netconf and SNMP to implement network automatic deployment and configuration.

### Comprehensive security control policies

- H3C S681X series switches supports AAA, RADIUS and user account based authentication, IP, MAC, VLAN, port-based user identification, dynamic and static binding; when working with the H3C iMC platform, it can conduct real time management, instant diagnosis and crackdown on illicit network behavior.
- H3C S681X series switches supports enhanced ACL control logic, which enables an enormous amount of inbound and outbound ACL, and delegate VLAN based ACL. This simplifies user deployment process and avoids ACL resource wastage. S681X series switches can also take advantage of Unicast Reverse Path Forwarding (Unicast RPF). When the device receives a packet, it will perform the reverse check to verify the source address from which the packets are supposedly originated, and will drop the packet if such path doesn' t exist. This can effectively prevent the source address spoofing in the network.

### Flexible choice of airflow

- To cope with data center cooling aisle design, the H3C S681X series switches comes with flexible airflow design, which features bi-cooling aisles in the front and back. Users may also choose the direction of airflow (from front to back or vice versa) by selecting a different fan tray.

### Excellent manageability

The switch improves system management through the following ways:

- Provides multiple management interfaces, including the serial console port, mini USB console port, USB port, two out-of-band management ports, and two SFP ports. The SFP ports can be used as in-band management port through which encapsulated sampling packets are sent to the controller or other management devices for deep analysis.
- Supports multiple access methods, including SNMPv1/v2c/v3, Telnet, SSH 2.0, SSL, and FTP.
- Supports standard NETCONF APIs that allow users to configure and manage the switch, enhancing the compatibility with third-party applications.



## Hardware Specification

Item	S6812-24X6C	S6812-48X6C	S6813-24X6C	S6813-48X6C
Dimensions (H × W × D)	44 × 440 × 360 mm (1.72 × 17.32 × 14.17 in)			
Weight	≤ 5.5 kg (12.13 lb)	≤ 6 kg (13.23 lb)	≤ 6 kg (13.23 lb)	≤ 6.5 kg (14.34 lb)
Serial console port	1	1	1	1
Out-of-band management port	1	1	1	1
SFP+ port	24	48	24	48
QSFP28 port	6	6	6	6
CPU	2000MHz@4Core			
Flash/ SDRAM	1GB/4GB			
Latency	<1μs			
Switching capacity	1680G	2160G	1680G	2160G
Forwarding capacity	600M	600M	705M	1050M
Buffer	10M	10M	12M	12M
AC-input voltage	90v AC to 264v AC			
Power module slot	2	2	2	2
Fan tray slot	3 Hot-swappable fans, fan speed adjustable and wind invertible			
Air flow direction	Front to rear or rear to front	Air flow direction	Front to rear or rear to front	Air flow direction
Static power consumption	Single AC : 29W	Single AC : 29W	Single AC : 38W	Single AC : 36W
	Dual AC : 35W	Dual AC : 36W	Dual AC : 46W	Dual AC : 44W
Typical power consumption	Single AC : 131W	Single AC : 163W	Single AC : 143W	Single AC : 77W
	Dual AC : 134W	Dual AC : 162W	Dual AC : 145W	Dual AC : 176W
Maximum heat consumption (BTU/hour)	Single AC : 447	Single AC : 556	Single AC : 488	Single AC : 263
	Dual AC : 457	Dual AC : 553	Dual AC : 495	Dual AC : 601
MTBF(years)	63.4	60.8	63.4	60.8
MTTR(hour)	1	1	1	1
Operating temperature	-5°C ~ 45°C (When using transceiver modules with maximum transmission distance < 80km) -5°C ~ 50°C(normal operating temperature)			
Operating humidity (noncondensing)	5% to 95%			

## Software Specification

Item	Feature description
Device Virtualization	IRF2.0
	M-LAG(DRNI)
	S-MLAG
Network Virtualization	BGP-EVPN
	VxLAN
	EVPN ES
VxLAN	L2 VxLAN gateway
	L3 VxLAN gateway
	Distributed VxLAN gateway
	Centralized VxLAN gateway
	EVPN VxLAN
	manual configured VxLAN
	IPv4 VxLAN tunnel
IPv6 VxLAN tunnel	
Lossless network	PFC and ECN
	DCBX
	RDMA and ROCE
	ECN overlay
Programmability	Openflow1.3
	Netconf
	Ansible
	Python//TCL/Restful API to realize DevOps automated operation and maintenance
Traffic analysis	Openflow1.3
	Sflow
VLAN	Port-based VLANs
	Mac-based VLAN ,Subnet-based VLAN and Protocol VLAN
	VLAN mapping
	QinQ
	Selective QinQ
	MVRP(Multiple VLAN Registration Protocol)
	Super VLAN
PVLAN	
MAC address	Dynamic learning and aging of mac address entries
	Dynamic,static and blackhole entries
	Mac address limiting on ports
IPv4 routing	RIP(Routing Information Protocol) v1/2
	OSPF (Open Shortest Path First) v1/v2
	ISIS(Intermediate System to Intermediate system)
	BGP (Border Gateway Protocol)
	Routing policy
	VRRP
IPv6 routing	PBR
	RIPng



Item	Specification
IPv6 routing	OSPFv3
	IPv6 ISIS
	BGP4+
	Routing policy
	VRRP
	PBR
MPLS/VPLS	Support L3 MPLS VPN
	Support L2 VPN: VLL (Martini, Kompella)
	Support VPLS, VLL
	Support P/PE function
	Support LDP protocol
	Support MCE
Multicast	Support MPLS OAM
	IGMP snooping
	MLD snooping
	IPv4 and IPv6 multicast VLAN
	IPv4 and IPv6 PIM snooping
	IGMP and MLD
QOS	PIM and IPv6 PIM
	MSDP
	Flexible queue scheduling algorithms based on port and queue, including strict priority (SP), Weighted Deficit Round Robin (WDRR), Weighted Fair Queuing (WFQ), SP + WDRR, and SP + WFQ.
	Traffic shaping
	Packet filtering at L2 (Layer 2) through L4 (Layer 4); flow classification based on source MAC address, destination MAC address, source IP (IPv4/IPv6) address, destination IP (IPv4/IPv6) address, port, protocol, and VLAN to apply qos policy,including mirroring,redirection,priority remark etc.
	Committed access rate (CAR)
	Account by packet and byte
	COPP
	Weighted Random Early Detection (WRED) and tail drop
	Flexible queue scheduling algorithms based on port and queue, including strict priority (SP), Weighted Deficit Round Robin (WDRR), Weighted Fair Queuing (WFQ), SP + WDRR, and SP + WFQ.
Reliability	Storm control
	LACP
	STP/RSTP/MSTP protocol, PVST compatible
	STP Root Guard and BPDU Guard
	RRPP and ERPS
	Ethernet OAM
	Smartlink
	DLDP
Telemetry	BFD for OSPF/OSPFv3, BGP/BGP4, IS-IS/IS-ISv6, PIM/IPM for IPv6 and Static route
	VRRP and VRRPE
	gRPC
	ERSPAN



Item	Specification
Configuration and maintenance	iNQA
	Packet Capture
	Console telnet and SSH terminals
	SNMPv1/v2/v3
	ZTP
	System log
	File upload and download via FTP/TFTP
	BootRom update and remote update
	NQA
	ping,tracert
	VxLAN ping and VxLAN tracert
	NTP
	PTP(1588v2)
	GIR Graceful Insertion and Removal
Security and management	Micro-Segmentation
	Hierarchical management and password protection of users
	Authentication methods,including AAA,RADIUS and HWTACACS
	Support DDos, ARP attack and ICMP attack function
	IP-MAC-port binding and IP Source Guard
	SSH 2.0
	HTTPS
	SSL
	PKI
	Boot ROM access control (password recovery)
RMON	
EMC	FCC Part 15 Subpart B CLASS A
	ICES-003 CLASS A
	VCCI CLASS A
	CISPR 32 CLASS A
	EN 55032 CLASS A
	AS/NZS CISPR32 CLASS A
	CISPR 24
	EN 55024
	EN 61000-3-2
	EN 61000-3-3
	ETSI EN 300 386
	GB/T 9254
	YD/T 993
IEEE Standard	802.3x/802.3ad/802.3AH/802.1P/802.1Q/802.1X/802.1D/802.1w/802.1s/802.1AG 802.1x/802.1Qbb/802.1az/802.1Qaz
Safety	UL 60950-1
	CAN/CSA C22.2 No 60950-1
	IEC 60950-1
	EN 60950-1
	AS/NZS 60950-1
	FDA 21 CFR Subchapter J GB 4943.1





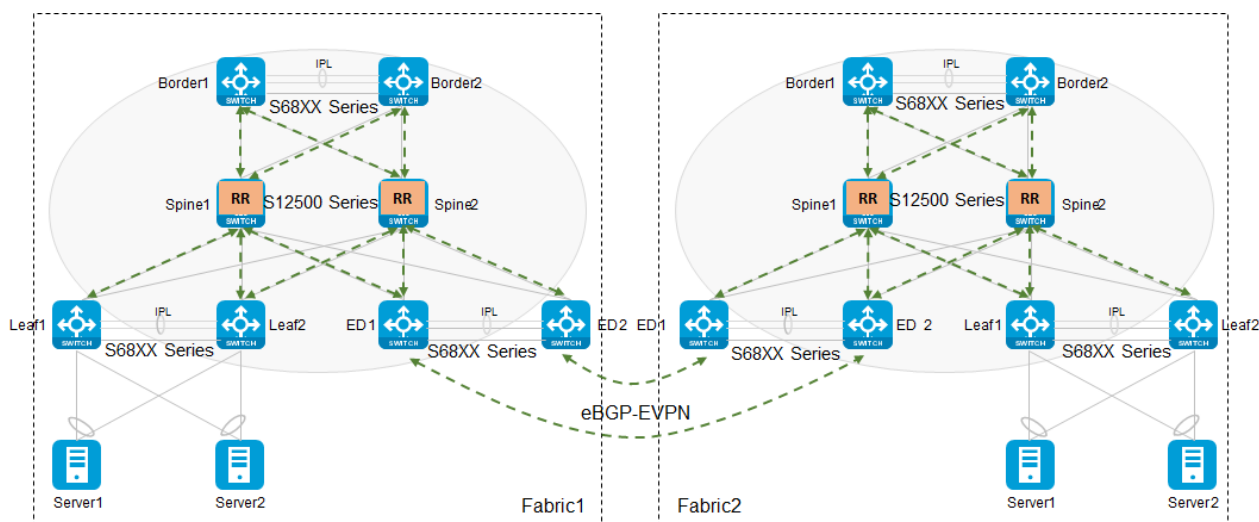
## Performance and scalability

Item	Description	S6812	S6813	
<b>Virtualization</b>	IRF2.0 stack	9	9	
	M-LAG device number	2	2	
	ED group	8	8	
<b>ACL</b>	max number of ingress ACL	2K	4K	
	max number of ingress Car	up to 1K	up to 1K	
	max number of ingress Counter	up to 1K	up to 1K	
	max number of egress ACL	256	512	
	max number of egress Car	up to 256	up to 512	
	max number of egress Counter	up to 256	up to 512	
<b>Forwarding table</b>	Jumbo frame length(byte)	10000	10000	
	Mirroring group	7	7	
	PBR policy	50	50	
	PBR node	64	64	
	max number of MAC per switch	128K	256K	
	max number of ARP entries IPv4	up to 64K - 1	128K - 1	
	max ND table size for IPv6	up to 42K	up to 85K	
	max number of unicast routes IPv4	up to 64K	128K	
	max number of unicast routes IPv6	up to 32K	64K	
	IPv4 I2 multicast group	4000	4000	
	IPv4 I3 multicast group	4000	4000	
	IPv4 multicast routing	4000	4000	
	IPv6 I2 multicast group	2000	2000	
	IPv6 I3 multicast group	2000	2000	
	IPv6 multicast routing	2000	2000	
	LAGG group	128	128	
	LAGG member per group	32	32	
	ECMP group	up to 512	up to 512	
	ECMP member per group	2-128	2-128	
	VRF	1023	1023	
	<b>Interface</b>	Loopback interface number	128	128
		L3 sub interface number	500	500
SVI interface number		1K	1K	
VxLAN AC number		2K	4K	
VxLAN VSI number		1K	2K	
VxLAN tunnel number		896	1K	
VSI interface number		512	512	
IPv4 tunnel number		240	480	
IPv6 tunnel number		240	480	
VLAN number		4094	4094	
<b>Performance</b>		RIB	64K	64K
	MSTP instance	64	64	

Item	Description	S6812	S6813
Performance	PVST instance	128	128
	PVST logical port number	1000	1000
	VRRP VRID	255	255
	VRRP group	256	256
	NQA group	32	32
Static table	static mac-address	1K	1K
	static multicast mac-address	128	128
	static ARP	2K	2K
	static ND	2K	2K
	static IPv4 routing table	4K	4K
	static IPv6 routing table	4K	4K

## Data Center Application

The typical data center application is an EVPN-VxLAN design, S12500G-AF or S12500X-AF switches work as spine or spine/border, S68XX series work as leaf and border or ED. From this design, the users can get a non-blocking large L2 system.





Order information

PID	Description
LS-6812-24X6C	H3C S6812-24X6C L3 Ethernet Switch with 24 SFP Plus Ports and 6 QSFP28 Ports,Without Power Supplies
LS-6813-24X6C	H3C S6813-24X6C L3 Ethernet Switch with 24 SFP Plus Ports and 6 QSFP28 Ports,Without Power Supplies
LS-6812-48X6C	H3C S6812-48X6C L3 Ethernet Switch with 48 SFP Plus Ports and 6 QSFP28 Ports,Without Power Supplies
LS-6813-48X6C	H3C S6813-48X6C L3 Ethernet Switch with 48 SFP Plus Ports and 6 QSFP28 Ports,Without Power Supplies
<b>Power</b>	
PSR180-12A-B	180W Asset-Manageable AC Power Supply(Port to Power Airflow)
PSR180-12A-F	180W Asset-Manageable AC Power Supply(Power to Port Airflow)
<b>Fan</b>	
LSPM1FANSA-SN	H3C Fan Module with Power to Port Airflow
LSPM1FANSB-SN	H3C Fan Module with Port to Power Airflow
<b>Transceiver</b>	
SFP-GE-LH80-SM1550	1000BASE-LH80 SFP Transceiver, Single Mode (1550nm, 80km, LC)
SFP-GE-LX-SM1310-A	1000BASE-LX SFP Transceiver, Single Mode (1310nm, 10km, LC)
SFP-GE-LH40-SM1310	1000BASE-LH40 SFP Transceiver, Single Mode (1310nm, 40km, LC)
SFP-GE-LH100-SM1550	1000BASE-LH100 SFP Transceiver, Single Mode (1550nm, 100km, LC)
SFP-GE-LH40-SM1550	1000BASE-LH40 SFP Transceiver, Single Mode (1550nm, 40km, LC)
SFP-GE-SX-MM850-A	1000BASE-SX SFP Transceiver, Multi-Mode (850nm, 550m, LC)
SFP-GE-LX-SM1310-BIDI	1000BASE-LX BIDI SFP Transceiver, Single Mode (TX1310/RX1490, 10km, LC)
SFP-GE-LX-SM1490-BIDI	1000BASE-LX BIDI SFP Transceiver, Single Mode (TX1490/RX1310, 10km, LC)
SFP-GE-T	SFP GE Copper Interface Transceiver Module (100m,RJ45)
SFP-XG-LX-SM1310	SFP+ Module(1310nm,10km,LC)
SFP-XG-LH40-SM1550	SFP+ Module(1550nm,40km,LC)
SFP-XG-LH80-SM1550	SFP+ Module(1550nm,80km,LC)
SFP-XG-SX-MM850-E	SFP+ Module(850nm,300m,LC)
SFP-XG-LX-SM1310-E	SFP+ Module(1310nm,10km,LC)
SFP-XG-SX-MM850-A	SFP+ Module(850nm,300m,LC)
QSFP-100G-LR4-WDM1300	100G QSFP28 Optical Transceiver Module(1310nm,10km,LR4,WDM,LC)
QSFP-100G-LR4L-WDM1300	100G QSFP28 Optical Transceiver Module (1310nm,2km,LR4L,CWDM4,LC)
QSFP-100G-ER4L-WDM1300	100G QSFP28 Optical Transceiver Module (1310nm,40km,ER4L,WDM,LC)
QSFP-100G-PSM4-SM1310	100G QSFP28 Optical Transceiver Module (1310nm,500m,PSM4,MPO/APC)
QSFP-100G-SR4-MM850	100G QSFP28 Optical Transceiver Module (850nm,100m OM4,SR4,MPO)



PID	Description
<b>Transceiver</b>	
QSFP-40G-LR4-WDM1300	QSFP+ 40GBASE Optical Transceiver Module (1310nm,10km,LR4,LC)
QSFP-40G-ER4-WDM1300	QSFP+ 40GBASE Optical Transceiver Module (1310nm,40km,ER4,LC)
QSFP-40G-SR4-MM850	QSFP+ 40GBASE Optical Transceiver Module (850nm,100m,SR4,Support 40G to 4*10G)
QSFP-40G-CSR4-MM850	QSFP+ 40GBASE Optical Transceiver Module (850nm,300m,CSR4,Support 40G to 4*10G)
<b>Cable</b>	
SFP-XG-D-AOC-10M	SFP+ to SFP+ 10m Active Optical Cable
SFP-XG-D-AOC-20M	SFP+ to SFP+ 20m Active Optical Cable
SFP-XG-D-AOC-7M	SFP+ to SFP+ 7m Active Optical Cable
LSWM1STK	SFP+ Cable 0.65m
LSWM2STK	SFP+ Cable 1.2m
LSWM3STK	SFP+ Cable 3m
LSTM1STK	SFP+ Cable 5m
QSFP-100G-D-AOC-10M	100G QSFP28 to 100G QSFP28 10m Active Optical Cable
QSFP-100G-D-CAB-1M	100G QSFP28 to 100G QSFP28 1m Passive Cable
QSFP-100G-D-AOC-20M	100G QSFP28 to 100G QSFP28 20m Active Optical Cable
QSFP-100G-D-CAB-3M	100G QSFP28 to 100G QSFP28 3m Passive Cable
QSFP-100G-D-CAB-5M	100G QSFP28 to 100G QSFP28 5m Passive Cable
QSFP-100G-D-AOC-7M	100G QSFP28 to 100G QSFP28 7m Active Optical Cable
LSWM1QSTK0	40G QSFP+ Cable 1m
LSWM1QSTK1	40G QSFP+ Cable 3m
LSWM1QSTK2	40G QSFP+ Cable 5m
QSFP-40G-D-AOC-10M	40G QSFP+ to 40G QSFP+ 10m Active Optical Cable
QSFP-40G-D-AOC-20M	40G QSFP+ to 40G QSFP+ 20m Active Optical Cable
QSFP-40G-D-AOC-7M	40G QSFP+ to 40G QSFP+ 7m Active Optical Cable
LSWM1QSTK3	40G QSFP+ to 4x10G SFP+ Cable 1m
LSWM1QSTK4	40G QSFP+ to 4x10G SFP+ Cable 3m
LSWM1QSTK5	40G QSFP+ to 4x10G SFP+ Cable 5m
SFP-STACK-Kit	SFP Stacking Cable (150cm,including two 1000BASE-T SFP module and one stacking cable)

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Item

Specification