



H3C S6812/S6813 Series

Data Center Switches

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New H3C Technologies Co., Limited

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 in-port and out-port 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 RFP). 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) | 440×360×43.6mm | 440×360×43.6 mm | 440×360×43.6 mm | 440×360×43.6 mm |
| 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 Dual AC: 35W | Single AC: 29W Dual AC: 36W | Single AC: 38W Dual AC: 46W | Single AC: 36W Dual AC: 44W |
| Typical power consumption | Single AC: 131W Dual AC: 134W | Single AC: 163W Dual AC: 162W | Single AC: 143W Dual AC: 145W | Single AC: 77W Dual AC: 176W |
| Maximum heat consumption (BTU/hour) | Single AC: 447 Dual AC: 457 | Single AC: 556 Dual AC: 553 | Single AC: 488 Dual AC: 495 | Single AC: 263 Dual AC: 601 |
| MTBF(day) | 63.4 | 60.8 | 63.4 | 60.8 |
| MTTR(hour) | 1 | 1 | 1 | 1 |
| Operating temperature | 0°C to 45°C (32°F to 113°F) | | | |
| 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 | |
| SDN | H3C SeerEngine-DC(exclude S6812) |
| 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 |
| | 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 |
| | PBR |



| Item | Specification |
|---|---|
| IPv6 routing | RIPng |
| | 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 |
| Reliability | 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. |
| | Traffic shaping |
| | LACP |
| | STP/RSTP/MSTP protocol, PVST compatible |
| | STP Root Guard and BPDU Guard |
| | RRPP and ERPS |
| | Ethernet OAM |
| | Smartlink |
| | DLDP |
| BFD for OSPF/OSPFv3, BGP/BGP4, IS-IS/IS-ISv6, PIM/IPM for IPv6 and Static route | |
| VRRP and VRRPE | |



| Item | Specification |
|-------------------------------|--|
| Telemetry | gRPC |
| | ERSPAN |
| | iNQA |
| | Packet Capture |
| Configuration and maintenance | 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 |
| EMC | PKI |
| | Boot ROM access control (password recovery) |
| | RMON |
| | 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

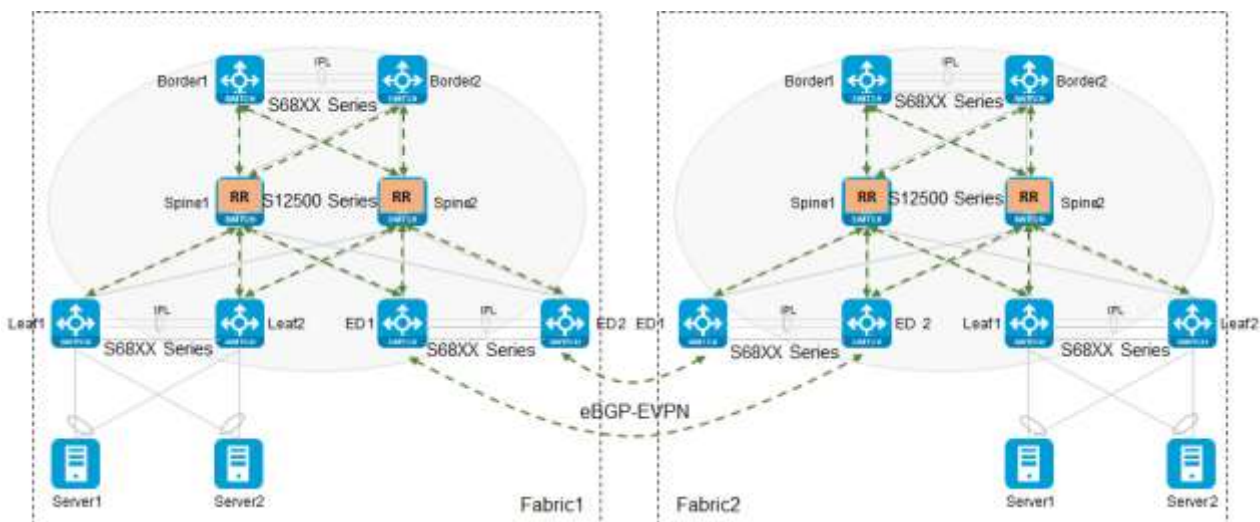
| Item | Description | S6812 | S6813 |
|-------------------------|-----------------------------------|---------------|-----------|
| Virtualization | IRF2.0 stack | 9 | 9 |
| | M-LAG device number | 2 | 2 |
| | ED group | 8 | 8 |
| ACL | max number of ingress ACLs | 2K | 4K |
| | max number of ingress Car | up to 1K | up to 1K |
| | max number of ingress Counter | up to 1K | up to 1K |
| | max number of egress ACLs | 256 | 512 |
| | max number of egress Car | up to 256 | up to 512 |
| | max number of egress Counter | up to 256 | up to 512 |
| Forwarding table | Jumbo frame length(byte) | 10000 | 10000 |
| | Mirroring group | 7 | 7 |
| | PBR policy | 50 | 50 |
| | PBR node | 64 | 64 |
| | max number of MACs 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 |
| Interface | 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 |

Performance and scalability

| | Description | S6812 | S6813 |
|---------------------|------------------------------|-------|-------|
| Performance | RIB | 64K | 64K |
| | MSTP instance | 64 | 64 |
| | 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 |
| Power | |
| 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) |
| Fan | |
| LSPM1FANSA-SN | H3C Fan Module with Power to Port Airflow |
| LSPM1FANSB-SN | H3C Fan Module with Port to Power Airflow |
| Transceiver | |
| 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 |
|----------------------|---|
| Transceiver | |
| 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) |
| Cable | |
| 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) |



The Leader in Digital Solutions

New H3C Technologies Co., Limited

Beijing Headquarters
 Tower 1, LSH Center, 8 Guangshun South Street, Chaoyang District, Beijing, China
 Zip: 100102
 Hangzhou Headquarters
 No.466 Changhe Road, Binjiang District, Hangzhou, Zhejiang, China
 Zip: 310052
 Tel: +86-571-86760000

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Item

Specification