Overview

HPE FlexFabric 5950 Switch Series

Models

HPE FlexFabric 5950 32QSFP28 Switch	JH321A
HPE FlexFabric 5950 48SFP28 8QSFP28 Switch	JH402A
HPE FlexFabric 5950 4-slot Switch	JH404A

Key features

- Cut-through with ultra-low-latency and wire speed
- VXLAN VTEP OVSDB support for virtualized environments
- High-density 100GbE/40GbE/25GbE/10GbE spine/ToR connectivity
- IPv6 support with full L2 and L3 features

Product overview

The HPE FlexFabric 5950 Switch Series is a family of high-density, ultra-low-latency, top-of-rack (ToR) switches that is part of the Hewlett Packard Enterprise (HPE) FlexNetwork architecture's HPE FlexFabric solution.

Ideally suited for deployment at the aggregation or server access layer of large enterprise data centers, the HPE 5950 Switch Series is also powerful enough for deployment at the core layer of medium-sized enterprises.

With the increase in virtualized applications and server-to-server traffic, customers now require spine and ToR switch innovations that will meet their needs for higher-performance server connectivity, convergence of Ethernet and storage traffic, the capability to handle virtual environments, and ultra-low-latency all in a single device- the HPE FlexFabric 5950 Switch Series.

Features and benefits

Quality of Service (QoS)

- **Powerful QoS features**
  - **Flexible queue scheduling**

Overview

including Strict Priority (SP), WRR, WDRR, WFQ, SP+WRR, SP+WDRR, SP+WFQ, Configurable Buffer, Time range, Queue Shaping, CAR with 8kbps granularity.

- **Packet filtering and remarking:**
  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.

Data center optimized

- **Flexible high port density**
  the HPE FlexFabric 5950 Switch Series enables scaling of the server edge with 100GbE, 40GbE, 25GbE and 10GbE spine and ToR deployments to new heights with a high-density 32-port fixed port switch in a 1RU design.
- **High-performance switching**
  cut-through and nonblocking architecture delivers low latency (~1 microsecond for 100GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wire-speed packet forwarding
- **Higher scalability**
  Hewlett Packard Enterprise (HPE) Intelligent Resilient Fabric (IRF) technology simplifies the architecture of server access networks; up to ten HPE 5950 switches can be combined to deliver unmatched scalability of virtualized access layer switches and flatter two-tier networks using IRF, which reduces cost and complexity
- **Advanced modular operating system**
  Comware v7 software's modular design and multiple processes bring native high stability, independent process monitoring, and restart; the OS also allows individual software modules to be upgraded for higher availability and supports enhanced serviceability functions like hitless software upgrades with IRF-based ISSU
- **Reversible airflow**
  enhanced for data center hot-cold aisle deployment with reversible airflow—for either front-to-back or back-to-front airflow
- **Redundant fans and power supplies**
  Internal redundant and hot-pluggable power supplies and dual fan trays enhance reliability and availability
- **Lower OPEX and greener data center**
  provide reversible airflow and advanced chassis power management
- **Data Center Bridging (DCB) protocols**
  provides support for IEEE 802.1Qbb Priority Flow Control (PFC), Data Center Bridging Exchange (DCBX), IEEE 802.1Qaz Enhanced Transmission Selection (ETS), Explicit Congestion Notification (ECN) for converged FCoE, iSCSI and RoCE environments.
- **Jumbo frames**
  with frame sizes of up to 9,416 bytes on 100GbE ports, allows high-performance remote backup and disaster-recovery services to be enabled
- **VXLAN hardware support**
  VXLAN Layer 2 gateway support for up to 4k tunnels
- **Dynamic VXLAN configuration**
  OVSDB support for dynamic VXLAN configuration

Manageability

- **Full-featured console**
  provides complete control of the switch with a familiar CLI
- **Troubleshooting**
  - **Ingress and egress port monitoring**
    enable network problem solving
  - **Traceroute and ping**
    enable testing of network connectivity
- **Multiple configuration files**
  allow multiple configuration files to be stored to a flash image
- **sFlow (RFC 3176)**
  provides wire-speed traffic accounting and monitoring

Overview

- **SNMP v1, v2c and v3**
  facilitate centralized discovery, monitoring, and secure management of networking devices
- **Out-of-band interface**
  isolates management traffic from user data plane traffic for complete isolation and total reachability, no matter what happens in the data plane
- **Remote configuration and management**
  delivered through a secure command-line interface (CLI) over Telnet and SSH; Role-Based Access Control (RBAC) provides multiple levels of access; Configuration Rollback and multiple configurations on the flash provide ease of operation; remote visibility is provided with sFlow and SNMP v1/v2/v3, and is fully supported in HPE Intelligent Management Center (IMC)
- **ISSU and hot patching**
  provides hitless software upgrades with IRF-based In Services Software Upgrade (ISSU) and hitless patching of the modular operating system
- **NTP Support**
  synchronize timekeeping among distributed time servers and clients; Support for Network Time Protocol (NTP).

Resiliency and high availability

- **Hewlett Packard Enterprise (HPE) Intelligent Resilient Fabric (IRF) technology**
  enables an HPE FlexFabric to deliver resilient, scalable, and secured data center networks for physical and virtualized environments; groups up to ten HPE 5950 switches in an IRF configuration, allowing them to be configured and managed as a single switch with a single IP address; simplifies ToR deployment and management, reducing data center deployment and operating expenses
- **IEEE 802.1w Rapid Convergence Spanning Tree Protocol**
  increases network uptime through faster recovery from failed links
- **IEEE 802.1s Multiple Spanning Tree**
  provides high link availability in multiple VLAN environments by allowing multiple spanning trees
- **Virtual Router Redundancy Protocol (VRRP)**
  allows groups of two routers to dynamically back each other up to create highly available routed environments
- **Hitless patch upgrades**
  allows patches and new service features to be installed without restarting the equipment, increasing network uptime and facilitating maintenance
- **Ultrafast protocol convergence (< 50 ms) with standard-based failure detection—Bidirectional Forwarding Detection (BFD**
  enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF
- **Device Link Detection Protocol (DLDP)**
  monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, preventing loops in STP-based networks
- **Graceful restart**
  allows routers to indicate to others their capability to maintain a routing table during a temporary shutdown and significantly reduces convergence times upon recovery; supports OSPF, BGP, and IS-IS

Layer 2 switching

- **Address Resolution Protocol (ARP)**
  supports static, dynamic, and reverse ARP and ARP proxy
- **IEEE 802.3x Flow Control**
  provides intelligent congestion management via PAUSE frames
- **Ethernet Link Aggregation**
  provides IEEE 802.3ad Link Aggregation of up to 256 groups of 32 ports; support for LACP, LACP Local Forwarding First, and LACP Short-time provides a fast, resilient environment that is ideal for the data center
- **Spanning Tree Protocol (STP)**
  supports STP (IEEE 802.1D), Rapid STP (RSTP, IEEE 802.1w), and Multiple STP (MSTP, IEEE 802.1s)
- **VLAN support**

Overview

provides support for 4,096 VLANs based on port

- **IGMP support**
  provides support for IGMP Snooping, Fast-Leave, and Group-Policy; IPv6 IGMP Snooping provides Layer 2 optimization of multicast traffic
- **DHCP support at Layer 2**
  provides full DHCP Snooping support for DHCP Snooping Option 82, DHCP Relay Option 82, DHCP Snooping Trust, and DHCP Snooping Item Backup

Layer 3 services

- **Address Resolution Protocol (ARP)**
  determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network
- **Dynamic Host Configuration Protocol (DHCP)**
  simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets
- **Operations, administration and maintenance (OAM) support**
  provides support for Connectivity Fault Management (IEEE 802.1AG) and Ethernet in the First Mile (IEEE 802.3AH); provides additional monitoring that can be used for fast fault detection and recovery

Layer 3 routing

- **Virtual Router Redundancy Protocol (VRRP) and VRRP Extended**
  allow quick failover of router ports
- **Policy-based routing**
  makes routing decisions based on policies set by the network administrator
- **Equal-Cost Multipath (ECMP)**
  enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth
- **Layer 3 IPv4 routing**
  provides routing of IPv4 at media speed; supports static routes, RIP and RIPv2, OSPF, BGP, and IS-IS
- **Open shortest path first (OSPF)**
  delivers faster convergence; uses this link-state routing Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Border Gateway Protocol 4 (BGP-4)**
  delivers an implementation of the Exterior Gateway Protocol (EGP) utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; scales to very large networks
- **Intermediate system to intermediate system (IS-IS)**
  uses a path vector Interior Gateway Protocol (IGP), which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (Integrated IS-IS)
- **Static IPv6 routing**
  provides simple manually configured IPv6 routing
- **Dual IP stack**
  maintains separate stacks for IPv4 and IPv6 to ease the transition from an IPv4-only network to an IPv6-only network design
- **Routing Information Protocol next generation (RIPng)**
  extends RIPv2 to support IPv6 addressing
- **OSPFv3**
  provides OSPF support for IPv6
- **BGP+**
  extends BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing
- **IS-IS for IPv6**
  extends IS-IS to support IPv6 addressing
- **IPv6 tunneling**

Overview

allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; is an important element for the transition from IPv4 to IPv6

- **Policy routing**
  allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies
- **Bidirectional Forwarding Detection (BFD)**
  enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF
- **Multicast Routing PIM Dense and Sparse modes**
  provides robust support of multicast protocols
- **Layer 3 IPv6 routing**
  provides routing of IPv6 at media speed; supports static routing, RIPng, OSPFv3, BGP4+ for IPv6, and IS-ISv6

Additional information

- **Green IT and power**
  improves energy efficiency through the use of the latest advances in silicon development; shuts off unused ports and utilizes variable-speed fans, reducing energy costs

Management

- **USB support**
  - **File copy**
    allows users to copy switch files to and from a USB flash drive
- **Multiple configuration files**
  stores easily to the flash image
- **SNMPv1, v2c, and v3**
  facilitate centralized discovery, monitoring, and secure management of networking devices
- **Out-of-band interface**
  isolates management traffic from user data plane traffic for complete isolation and total reachability, no matter what happens in the data plane
- **Port mirroring**
  enables traffic on a port to be simultaneously sent to a network analyzer for monitoring
- **Remote configuration and management**
  is available through a command-line interface (CLI)
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP)**
  advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications
- **sFlow (RFC 3176)**
  provides scalable ASIC-based wirespeed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes
- **Command authorization**
  leverages RADIUS to link a custom list of CLI commands to an individual network administrator's login; an audit trail documents activity
- **Dual flash images**
  provides independent primary and secondary operating system files for backup while upgrading
- **Command-line interface (CLI)**
  provides a secure, easy-to-use CLI for configuring the module via SSH or a switch console; provides direct real-time session visibility
- **Logging**
  provides local and remote logging of events via SNMP (v2c and v3) and syslog; provides log throttling and log filtering to reduce the number of log events generated
- **Management interface control**

Overview

provides management access through a modem port and terminal interface, as well as in-band and out-of-band Ethernet ports; provides access through terminal interface, Telnet, or secure shell (SSH)

- **Industry-standard CLI with a hierarchical structure**
  reduces training time and expenses, and increases productivity in multivendor installations
- **Management security**
  restricts access to critical configuration commands; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local and remote syslog capabilities allow logging of all access
- **Information center**
  provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **Network management**
  HPE Intelligent Management Center (IMC) centrally configures, updates, monitors, and troubleshoots
- **Remote intelligent mirroring**
  mirrors ingress/egress ACL-selected traffic from a switch port or VLAN to a local or remote switch port anywhere on the network

Security

- **Access control lists (ACLs)**
  provide IP Layer 3 filtering based on source/destination IP address/subnet and source/destination TCP/UDP port number
- **RADIUS/TACACS+**
  eases switch management security administration by using a password authentication server
- **Secure shell**
  encrypts all transmitted data for secure remote CLI access over IP networks
- **IEEE 802.1X and RADIUS network logins**
  controls port-based access for authentication and accountability
- **Port security**
  allows access only to specified MAC addresses, which can be learned or specified by the administrator

Convergence

- **LLDP-MED (Media Endpoint Discovery)**
  defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to configure automatically network devices such as IP phones

Warranty and support

- **1-year warranty**
  see **http://www.hpe.com/networking/warrantysummary** for warranty and support information included with your product purchase.
- **Software releases**
  to find software for your product, refer to **http://www.hpe.com/networking/support**; for details on the software releases available with your product purchase, refer to **http://www.hpe.com/networking/warrantysummary**

Configuration

Build To Order: BTO is a standalone unit with no integration. BTO products ship standalone are not part of a CTO or Rack-Shippable solution.

Standard Switch Enclosures

HPE FlexFabric 5950 32QSFP28 Switch — JH321A
- 32 QSFP28\QSFP+ ports (min=0 \ max=32)
- Must select min 1 Power Supply
- Must select min 6 Fan Trays
- 1U - Height

See Configuration
NOTE: 1, 2, 3

HPE FlexFabric 5950 48SFP28 8QSFP28 Switch — JH402A
- 48 SFP28 ports (min=0 \ max=48)
- 8 QSFP28 ports (min=0 \ max=8)
- 2 100M/1G SFP management ports (min=0 \ max 2)
- Must select min 1 Power Supply
- Must select min 5 Fan Trays
- 1U - Height

See Configuration
NOTE: 1, 2, 3, 4, 5, 6

HPE FlexFabric 5950 4-slot Switch — JH404A
- 2 100M/1G SFP management ports (min=0 \ max 2)
- 4 port expansion module slots
- Must select min 2 Power Supply
- Must select min 2 Fan Trays
- 2U - Height

See Configuration
NOTE: 6

Configuration Rules:

Note 1 The following 40G Transceivers install into this switch:

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

Note 2 The following 10G Transceivers install into this Switch:

HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A

Configuration

HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A

Note 3 The following QSFP28 Transceivers install into this switch:

HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	JL273A
HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	JL282A
HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A

Note 4 The following SFP28 Transceivers install into this switch's QSFP+ Ports: (Use BTO only when adding to switch)

HPE X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
HPE X240 25G SFP28 to SFP28 1m Direct Attach Copper Cable	JL294A
HPE X240 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL295A
HPE X240 25G SFP28 to SFP28 5m Direct Attach Copper Cable	JL296A

Note 5 The following Transceivers install into this switch's SFP+ Ports: (Use BTO only when adding to switch)

HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C

Note 6 The following Transceivers install into this switch's Management (SFP) Ports: (Use BTO only when adding to switch)

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP RJ45 T Transceiver	JD089B

Box Level Integration CTO Models

CTO Solution Sku

HPE 59xx Configure to order Switch Solution JG505A

- SSP trigger sku

Configuration

CTO Switch Chassis

HPE FlexFabric 5950 32QSFP28 Switch — JH321A

- 32 QSFP28\QSFP+ ports (min=0 \ max=32)
- Must select min 1 Power Supply
- Must select min 6 Fan Trays
- 1U - Height

See Configuration
NOTE: 1, 2, 3, 5

Configuration Rules:

Note 1 The following 40G Transceivers install into this switch:

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

Note 2 The following 10G Transceivers install into this Switch:

HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A
HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A

Note 3 The following QSFP28 Transceivers install into this switch:

HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	JL273A
HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	JL282A
HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A

Note 5 If the Switch Chassis is to be Box Level Factory Integrated (CTO), Then the #0D1 is required on the Switch Chassis and integrated to the JG505A – HPE 59xx Configure to order Switch Solution. (Min 1/Max 1 Router per SSP)

Rack Level Integration CTO Models

Configuration

CTO Switch Chassis

HPE FlexFabric 5950 32QSFP28 Switch — JH321A
- 32 QSFP28\QSFP+ ports (min=0 \ max=32)
- Must select min 1 Power Supply
- Must select min 6 Fan Trays
- 1U – Height

See Configuration
NOTE: 1, 2, 3, 11

HPE FlexFabric 5950 48SFP28 8QSFP28 Switch — JH402A
- 48 SFP28 ports (min=0 \ max=48)
- 8 QSFP28 ports (min=0 \ max=8)
- 2 100M/1G SFP management ports (min=0 \ max 2)
- Must select min 1 Power Supply
- Must select min 5 Fan Trays
- 1U - Height

See Configuration
NOTE: 1, 2, 3, 4, 5, 6

HPE FlexFabric 5950 4-slot Switch — JH404A
- 2 100M/1G SFP management ports (min=0 \ max 2)
- 4 port expansion module slots
- Must select min 2 Power Supply
- Must select min 2 Fan Trays
- 2U - Height

See Configuration
NOTE: 6

Configuration Rules:

Note 1 The following 40G Transceivers install into this switch:

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

Note 2 The following 10G Transceivers install into this Switch:

HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A
HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A

Note 3 The following QSFP28 Transceivers install into this switch:

HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A

Configuration

HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	JL273A
HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	JL282A
HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A

Note 4 The following SFP28 Transceivers install into this switch's QSFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
HPE X240 25G SFP28 to SFP28 1m Direct Attach Copper Cable	JL294A
HPE X240 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL295A
HPE X240 25G SFP28 to SFP28 5m Direct Attach Copper Cable	JL296A

Note 5 The following Transceivers install into this switch's SFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C

Note 6 The following Transceivers install into this switch's Management (SFP) Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP RJ45 T Transceiver	JD089B

Note 11 If HPE CTO Switch Chassis is selected for Rack Level Integration, Then the Switch needs to integrate (with #0D1) to the Rack.

Enter the following menu selections as integrated to the CTO Model X server above if order is factory built.

Switch Options

Modules

(JH404A) System (std 0 // max 4) User Selection (min 0 // max 4)

HPE 5950 16-port QSFP+ Module • 16 QSFP+ ports (min=0 \ max=16)	JH405A See Configuration **NOTE:** 2, 8

Configuration

HPE 5950 8-port QSFP28 Module • 8 QSFP+/QSFP28 ports (min=0 \ max=8)	JH406A See Configuration **NOTE:** 2, 8, 9
HPE FlexFabric 5950 24-port SFP28 and 2-port QSFP28 Module • 24 SFP+/SFP28 ports (min=0 \ max=24) • 2 QSFP+/QSFP28 ports (min=0 \ max=2)	JH450A See Configuration **NOTE:** 1, 2, 7, 8, 9, 10
HPE 5930 24-port SFP+ and 2-port QSFP+ Module • 24 SFP/SFP+ ports (min=0 \ max=24) • 2 QSFP+ ports (min=0 \ max=2)	JH180A See Configuration **NOTE:** 1, 2, 3, 6, 7, 8
HPE 5930 24-port SFP+ and 2-port QSFP+ with MACsec Module • 24 SFP/SFP+ ports (min=0 \ max=24) • 2 QSFP+ ports (min=0 \ max=2)	JH181A See Configuration **NOTE:** 1, 2, 3, 5, 6, 7, 8
HPE 5930 24-port 10GBASE-T and 2-port QSFP+ with MACsec Module • 24 1/10GBase-T ports • 2 QSFP+ ports (min=0 \ max=2)	JH182A See Configuration **NOTE:** 2, 6, 8
HPE 5930 8-port QSFP+ Module • 8 QSFP+ ports (min=0 \ max=8)	JH183A See Configuration **NOTE:** 2, 6, 8
HPE 5930 24-port Converged Port and 2-port QSFP+ Module • 24 Converged SFP/SFP+/FC ports (min=0 \ max=24) • 2 QSFP+ ports (min=0 \ max=2)	JH184A See Configuration **NOTE:** 1, 2, 3, 5, 6, 8

Configuration Rules:

Note 1 The following Transceivers install into this Module's SFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C

Note 2 The following 40G Transceivers install into this Module's QSFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A

Configuration

HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Note 3 The following Transceivers install into this Module's SFP Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP RJ45 T Transceiver	JD089B

Note 5 The following Transceivers install into this Module's SFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X130 10G SFP+ LC LRM Transceiver	JD093B

Note 7 The following 10G Transceivers install into this Module's SFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A
HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A

Note 8 The following 40G Transceivers install into this Module's QSFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

Note 9 The following 100G Transceivers install into this Module's QSFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	JL273A
HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	JL282A
HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A

Note 10 The following SFP28 Transceivers install into this Module's QSFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable

HPE X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
HPE X240 25G SFP28 to SFP28 1m Direct Attach Copper Cable	JL294A
HPE X240 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL295A
HPE X240 25G SFP28 to SFP28 5m Direct Attach Copper Cable	JL296A

Transceivers

Configuration

SFP Transceivers

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP RJ45 T Transceiver	JD089B

SFP+ Transceivers

HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A
HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A
HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C

SFP28 Transceivers

HPE X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
HPE X240 25G SFP28 to SFP28 1m Direct Attach Copper Cable	JL294A
HPE X240 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL295A
HPE X240 25G SFP28 to SFP28 5m Direct Attach Copper Cable	JL296A

QSFP+ Transceivers

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

QSFP28 Transceivers

Configuration

HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	JL273A
HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	JL282A
HPE X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A

Cables

Multi-Mode Cables

HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A

MPO Cables

HPE Multi Fiber Push On to 4 x Lucent Connector 5m Cable	K2Q46A
HPE Multi Fiber Push On to 4 x Lucent Connector 15m Cable	K2Q47A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 fiber 10m Cable	QK729A
HPE Premier Flex MPO/MPO Multi-mode OM4 8 fiber 50m Cable	QK731A
HPE Premier Flex MPO/MPO OM4 100m (12ft) Cable	H6Z30A

Internal Power Supplies

For JH321A System (std 0 // max 2) User Selection (min 1 // max 2) per switch
For JH402A System (std 0 // max 2) User Selection (min 1 // max 2) per switch
For JH404A System (std 0 // max 4) User Selection (min 2 // max 4) per switch

HPE 58x0AF 650W AC Power Supply • includes 1 x c13, 300w	JC680A See Configuration **NOTE:** 1, 2
PDU Cable NA/MX/TW/JP • C15 PDU Jumper Cord (NA/MX/TW/JP)	JC680A#B2B

Configuration

PDU Cable ROW — JC680A#B2C
- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord — JC680A#B2E
- HPE 2.3M C13 to NEMA L6-20P Power Cord(J9936A)

No Power Cord — JC680A#AC3
- No Localized Power Cord Selected

HP 58x0AF 650W DC Power Supply — JC681A
- includes 1 x c13, 300w

See Configuration
NOTE: 1

HPE FlexFabric Switch 650W 48V Hot Plug NEBS-compliant DC Power Supply — JH336A
- includes 1 x c13, 300w

See Configuration
NOTE: 1

Configuration Rules:

Note 1 If 2 power supplies are selected they must be the same Sku number.

Note 2 Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) . (See Localization Menu)
REMARK: When Switches/Routers are Factory Racked, Then #B2B, or #B2C should be the Defaulted Power Cable option on the Switches/Routers.

Remarks:

Drop down under power supply should offer the following options and results:
Switch/Router to PDU Power Cord - #B2B in NA, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)
Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)
No Localized Power Cord Selected - #AC3 Option

Switch Options

Fan Trays

For JH321A System (std 0 // max 6) User Selection (min 6 // max 6) per switch
For JH402A System (std 0 // max 5) User Selection (min 5 // max 5) per switch
For JH404A System (std 0 // max 2) User Selection (min 2 // max 2) per switch

HPE X711 Front (Port Side) to Back (Power Side) Airflow High Volume 2 Fan Tray — JH388A

See Configuration
NOTE: 1, 2

HPE X712 Back (Power Side) to Front (Port Side) Airflow High Volume 2 Fan Tray — JH389A

Configuration

	See Configuration **NOTE:** 1, 2
HPE 5930 4-slot Back (Power Side) to Front (Port Side) Airflow Fan Tray	JH185A See Configuration **NOTE:** 1, 3
HPE 5930 4-slot Front (Port Side) to Back (Power Side) Airflow Fan Tray	JH186A See Configuration **NOTE:** 1, 3

Configuration Rules:

Note 1 Fan Trays cannot be mixed in the same switch enclosure

Note 2 This fan tray is only supported on JH321A, JH402A

Note 3 This fan tray is only supported on JH404A

Remarks:

Watson Blue Text:
If there is any empty space below the switch in a rack when using Back to Front Fan Trays, JG553A, the rack will receive an Air Plenum kit that takes up 1U of additional space in the rack. The Air Plenum kit is not required on fully configured racks. This only applies for CTO Rack Level Integration. The Air Plenum Kit is a non-saleable SKU, and is brought in automatically for CTO Factory Rack Level Integration.

Technical Specifications

HPE FlexFabric 5950 32QSFP28 Switch (JH321A)

I/O ports and slots	32 QSFP28 100GbE ports 2 SFP+ 1/10GbE ports	
Additional ports and slots	1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 USB 2.0	
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	6 fan tray slots The customer must order fan trays, as fan trays are not included with the switch. This system requires same-direction airflow fan trays to function properly. The system should not be operated with only five fan trays for more than 24 hours. The system should not be operated without a fan tray for more than two minutes. The system should not be operated outside of the temperature range of 32°F (0°C) to 113°F (45°C). Failure to comply with these operating requirements may void the product warranty.	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 1.72(h) in (44.00 x 54.00 x 4.36 cm)
	Weight	37.48 lb (17 kg) shipping weight
	Full configuration weight	33.07 lb (15 kg)
Memory and processor	1 GB flash; Packet buffer size: 16 MB, 4 GB SDRAM	
Performance	**10 Gbps Latency**	< 1 µs (64-byte packets)
	Throughput	up to 2796 Mpps
	Routing/Switching capacity	3200 Gbps
	Routing table size	128000 entries (IPv4), 64000 entries (IPv6)
	MAC address table size	136000 entries
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Acoustic	Low-speed fan: 62.8 dB, High-speed fan: 78.2 dB
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	955/1689 BTU/hr (1007.53/1781.9 kJ/hr)
	Voltage	90 - 264 VAC, rated -40 to -75 VDC, rated (depending on power supply chosen)
	Maximum power rating	495 W
	Idle power	280 W
	Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	UL 60950-1; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance	
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; AS/NZS CISPR 22 Class A; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)	

Technical Specifications

Immunity	**Generic**	ETSI EN 300 386 V1.3.3
	EN	EN 55024:1998+ A1:2001 + A2:2003
	ESD	EN 61000-4-2; IEC 61000-4-2
	Radiated	EN 61000-4-3; IEC 61000-4-3
	EFT/Burst	EN 61000-4-4; IEC 61000-4-4
	Surge	EN 61000-4-5; IEC 61000-4-5
	Conducted	EN 61000-4-6; IEC 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8; EN 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11; IEC 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management	IMC - Intelligent Management Center; command-line interface; out-of-band management; SNMP Manager; Telnet; FTP	
Notes	The customer must order a power supply, as the device does not come with one. At least one JC680A or JC681A is required.	
Services	Refer to the Hewlett Packard Enterprise website at **http://www.hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

HPE FlexFabric 5950 48SFP28 8QSFP28 Switch (JH402A)

I/O ports and slots	48 SFP28 25GbE ports; Ports 1 – 48; PHY-less	
	8 QSFP28 100GbE ports; PHY-less	
	2 SFP+ 1/10GbE ports (IEEE 802.3ae Type 10GBASE-ER); PHY-les, IEEE 802.3ae Type 10GBASE-LR, IEEE 802.3ae Type 10GBASE-SR, IEEE 802.3z Type 1000BASE-SX, IEEE 802.3z Type 1000BASE-LX)	
Additional ports and slots	1 RJ-45 serial console port	
	1 RJ-45 out-of-band management port	
	1 SFP out-of-band management port	
	1 USB 2.0	
	1 Mini USB 2.0 console port	
Power supplies	2 power supply slots	
	1 minimum power supply required (ordered separately)	
Fan tray	6 fan tray slots	
	The customer must order fan trays, as fan trays are not included with the switch. This system requires same-direction airflow fan trays to function properly. The system should not be operated with only five fan trays for more than 24 hours. The system should not be operated without a fan tray for more than two minutes. The system should not be operated outside of the temperature range of 32°F (0°C) to 113°F (45°C). Failure to comply with these operating requirements may void the product warranty.	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 1.72(h) in (44.00 x 54.00 x 4.36 cm)
	Weight	37.48 lb (17 kg) shipping weight
	Full configuration weight	33.07 lb (15 kg)
Memory and processor	1 GB flash; Packet buffer size: 16 MB, 4 GB SDRAM	
Performance	**10 Gbps Latency**	< 1 µs (64-byte packets)
	Throughput	up to 2796 Mpps

Technical Specifications

	Routing/Switching capacity	3200 Gbps
	Routing table size	128000 entries (IPv4), 64000 entries (IPv6)
	MAC address table size	136000 entries
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Acoustic	Low-speed fan: 62.8 dB, High-speed fan: 78.2 dB
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	955/1689 BTU/hr (1007.53/1781.9 kJ/hr)
	Voltage	90 - 264 VAC, rated -40 to -75 VDC, rated (depending on power supply chosen)
	Maximum power rating	495 W
	Idle power	280 W
	Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	UL 60950-1; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance	
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; AS/NZS CISPR 22 Class A; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)	
Immunity	**Generic**	ETSI EN 300 386 V1.3.3
	EN	EN 55024:1998+ A1:2001 + A2:2003
	ESD	EN 61000-4-2; IEC 61000-4-2
	Radiated	EN 61000-4-3; IEC 61000-4-3
	EFT/Burst	EN 61000-4-4; IEC 61000-4-4
	Surge	EN 61000-4-5; IEC 61000-4-5
	Conducted	EN 61000-4-6; IEC 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8; EN 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11; IEC 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management	IMC - Intelligent Management Center; Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP	
Notes	The customer must order a power supply, as the device does not come with one. At least one JC680A or JC681A is required	
Services	Refer to the Hewlett Packard Enterprise website at **http://www.hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

HPE FlexFabric 5950 4-slot Switch (JH404A)

Technical Specifications

I/O ports and slots	4 module slots 2 SFP+ 1/10GbE ports (IEEE 802.3ae Type 10GBASE-ER); PHY-les, IEEE 802.3ae Type 10GBASE-LR, IEEE 802.3ae Type 10GBASE-SR, IEEE 802.3z Type 1000BASE-SX, IEEE 802.3z Type 1000BASE-LX) Supports a maximum of 32 100GbE ports or 96 10GbE ports or 64 40GbE ports or 96 Converged ports, or a combination	
Additional ports and slots	1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 SFP out-of-band management port 1 USB 2.0 1 Mini USB 2.0	
Power supplies	4 power supply slots 2 minimum power supplies required (ordered separately)	
Fan tray	2 fan tray slots The customer must order fan trays, as fan trays are not included with the switch. This system requires two same-direction airflow fan trays to function properly. The system should not be operated with only one fan tray for more than 24 hours. The system should not be operated without a fan tray for more than two minutes. The system should not be operated outside of the temperature range of 32°F (0°C) to 113°F (45°C). Failure to comply with these operating requirements may void the product warranty.	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 3.47(h) in (44.00 x 66.0 x 8.81 cm) (2U height)
	Weight	66.14 lb (30 kg) shipping weight
	Full configuration weight	59.52 lb (27 kg)
Memory and processor	1 GB flash; Packet buffer size: 16 MB, 4 GB SDRAM	
Performance	**10 Gbps Latency**	< 1 µs (64-byte packets)
	Throughput	up to 2796 Mpps
	Routing/Switching capacity	3.2 Tbps
	Routing table size	128000 entries (IPv4), 64000 entries (IPv6)
	MAC address table size	136000 entries
Reliability	**MTBF (years)**	35.8
	MTTR (hours)	1
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 90%, noncondensing
	Acoustic	Low-speed fan: 59.8 dB, High-speed fan: 74.4 dB
Electrical characteristics	**Frequency**	50/60 Hz
	Voltage	90 - 264 VAC, rated -40 to -75 VDC, rated (depending on power supply chosen)
	Maximum power rating	888 W
	Idle power	139 W
	Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	UL 60950-1; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-	

Technical Specifications

	Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance	
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; AS/NZS CISPR 22 Class A; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)	
Immunity	**Generic**	ETSI EN 300 386 V1.3.3
	EN	EN 55024:1998+ A1:2001 + A2:2003
	ESD	EN 61000-4-2; IEC 61000-4-2
	Radiated	EN 61000-4-3; IEC 61000-4-3
	EFT/Burst	EN 61000-4-4; IEC 61000-4-4
	Surge	EN 61000-4-5; IEC 61000-4-5
	Conducted	EN 61000-4-6; IEC 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8; EN 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11; IEC 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management	IMC - Intelligent Management Center; Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP	
Notes	The customer must order a power supply, as the device does not come with one. At least one JC680A or JC681A is required	
Services	Refer to the Hewlett Packard Enterprise website at **http://www.hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

Standards and protocols (applies to all products in series)

BGP
RFC 1163 Border Gateway Protocol (BGP)
RFC 1771 BGPv4
RFC 1997 BGP Communities Attribute
RFC 2918 Route Refresh Capability
RFC 3392 Capabilities Advertisement with BGP-4
RFC 4271 A Border Gateway Protocol 4 (BGP-4)
RFC 4360 BGP Extended Communities Attribute
RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
RFC 4760 Multiprotocol Extensions for BGP-4

Device management
RFC 1157 SNMPv1/v2c
RFC 1305 NTPv3
RFC 1591 DNS (client)
RFC 1902 (SNMPv2)
RFC 1908 (SNMP v1/2 Coexistence)
RFC 2573 (SNMPv3 Applications)
RFC 2576 (Coexistence between SNMP V1, V2, V3)
RFC 2819 RMON
Multiple Configuration Files
Multiple Software Images
SSHv1/SSHv2 Secure Shell
RFC 4252 The Secure Shell (SSH) Authentication Protocol
RFC 4253 The Secure Shell (SSH) Transport Layer Protocol
RFC 4254 The Secure Shell (SSH) Connection Protocol
RFC 4292 IP Forwarding Table MIB
RFC 4293 Management Information Base for the Internet Protocol (IP)
RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs)
RFC 4419 Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol
RFC 4594 Configuration Guidelines for DiffServ Service Classes
RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised)
RFC 4604 Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast
RFC 4607 Source-Specific Multicast for IP
RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6
RFC 5340 OSPF for IPv6

Technical Specifications

TACACS/TACACS+

General protocols
IEEE 802.1ad Q-in-Q
IEEE 802.1AX-2008 Link Aggregation
IEEE 802.1D MAC Bridges
IEEE 802.1p Priority
IEEE 802.1Q VLANs
IEEE 802.1s Multiple Spanning Trees
IEEE 802.1w Rapid Reconfiguration of Spanning Tree
IEEE 802.3ad Link Aggregation Control Protocol (LACP)
IEEE 802.3ae 10-Gigabit Ethernet
IEEE 802.3ag Ethernet OAM
IEEE 802.3ah Ethernet in First Mile over Point to Point Fiber – EFMF
IEEE 802.3x Flow Control
RFC 768 UDP
RFC 783 TFTP Protocol (revision 2)
RFC 791 IP
RFC 792 ICMP
RFC 793 TCP
RFC 826 ARP
RFC 854 TELNET
RFC 856 TELNET
RFC 868 Time Protocol
RFC 896 Congestion Control in IP/TCP Internetworks
RFC 950 Internet Standard Subnetting Procedure
RFC 1027 Proxy ARP
RFC 1058 RIPv1
RFC 1091 Telnet Terminal-Type Option
RFC 1141 Incremental updating of the Internet checksum
RFC 1142 OSI IS-IS Intra-domain Routing Protocol
RFC 1191 Path MTU discovery
RFC 1213 Management Information Base for Network Management of TCP/IP-based internets
RFC 1253 (OSPF v2)
RFC 1531 Dynamic Host Configuration Protocol
RFC 1533 DHCP Options and BOOTP Vendor Extensions
RFC 1534 DHCP/BOOTP Interoperation
RFC 1541 DHCP
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
RFC 1591 DNS (client only)
RFC 1624 Incremental Internet Checksum
RFC 1723 RIP v2
RFC 1812 IPv4 Routing
RFC 2030 Simple Network Time Protocol (SNTP) v4
RFC 2131 DHCP
RFC 2236 IGMP Snooping
RFC 2338 VRRP
RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification
RFC2929 RADIUS Support DS for Radius

IPv6
RFC 2080 RIPng for IPv6
RFC 2460 IPv6 Specification
RFC 2461 IPv6 Neighbor Discovery
RFC 2462 IPv6 Stateless Address Auto-configuration
RFC 2463 ICMPv6
RFC 2464 Transmission of IPv6 over Ethernet Networks
RFC 2473 Generic Packet Tunneling in IPv6
RFC 2545 Use of MP-BGP-4 for IPv6
RFC 2563 ICMPv6
RFC 2711 IPv6 Router Alert Option
RFC 2740 OSPFv3 for IPv6
RFC 2767 Dual stacks IPv46 & IPv6
RFC 3315 DHCPv6 (client and relay)
RFC 3484 Default Address Selection for IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
RFC 4291 IP Version 6 Addressing Architecture
RFC 4443 ICMPv6
RFC 4552 Authentication/Confidentiality for OSPFv3
RFC 4862 IPv6 Stateless Address Auto-configuration
RFC 5095 Deprecation of Type 0 Routing Headers in IPv6

MIBs
RFC 1213 MIB II
RFC 1907 SNMPv2 MIB
RFC 2571 SNMP Framework MIB
RFC 2572 SNMP-MPD MIB
RFC 2573 SNMP-Notification MIB
RFC 2573 SNMP-Target MIB
RFC 2574 SNMP USM MIB
RFC 2737 Entity MIB (Version 2)
RFC 3414 SNMP-User based-SM MIB
RFC 3415 SNMP-View based-ACM MIB
LLDP-EXT-DOT1-MIB
LLDP-EXT-DOT3-MIB
LLDP-MIB

Network management
RFC 2580 Conformance Statements for SMIv2
RFC 3164 BSD syslog Protocol

OSPF
RFC 1587 OSPF NSSA

Technical Specifications

RFC 2453 RIPv2
RFC 2581 TCP Congestion Control
RFC 2644 Directed Broadcast Control
RFC 2767 Dual Stacks IPv4 & IPv6
RFC 2865 Remote Authentication Dial In User Service (RADIUS)
RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 2890 Key and Sequence Number Extensions to GRE
RFC 3046 DHCP Relay Agent Information Option
RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks
RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
RFC 3413 Simple Network Management Protocol (SNMP) Applications
RFC 3416 Protocol Operations for SNMP
RFC 3417 Transport Mappings for the Simple Network Management Protocol (SNMP)
RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)
RFC 3768 Virtual Router Redundancy Protocol (VRRP)
RFC 4250 The Secure Shell (SSH) Protocol Assigned Numbers
RFC 4251 The Secure Shell (SSH) Protocol Architecture
RFC 2328 OSPFv2
RFC 3101 OSPF NSSA
RFC 3137 OSPF Stub Router Advertisement
RFC 3623 Graceful OSPF Restart
RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)
RFC 4811 OSPF Out-of-Band LSDB Resynchronization
RFC 4812 OSPF Restart Signaling
RFC 4813 OSPF Link-Local Signaling

QoS/CoS

IEEE 802.1p (CoS)
RFC 2475 DiffServ Architecture
RFC 2597 DiffServ Assured Forwarding (AF)
RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior)
RFC 3260 New Terminology and Clarifications for DiffServ

Security

RFC 1321 The MD5 Message-Digest Algorithm
RFC 2818 HTTP Over TLS
RFC 6192 Partial Support - Protecting the Router Control Plane
Access Control Lists (ACLs)
SSHv2 Secure Shell

Accessories

HPE FlexFabric 5950 Switch Series accessories

Transceivers

HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	JL273A
HPE X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
HPE X240 25G SFP28 to SFP28 1m Direct Attach Copper Cable	JL294A
HPE X240 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL295A
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP RJ45 T Transceiver	JD089B

Power Supply

HPE 58x0AF 650W AC Power Supply	JC680A
HP 58x0AF 650W DC Power Supply	JC681A

Fan Tray

HPE X711 Front (Port Side) to Back (Power Side) Airflow High Volume 2 Fan Tray	JH388A
HPE X712 Back (Power Side) to Front (Port Side) Airflow High Volume 2 Fan Tray	JH389A

Summary of Changes

Date	Version History	Action	Description of Change
09-Jan-2017	From Version 5 to 6	Added	SKUs added: JL293A, JH420A
05-Dec-2016	From Version 4 to 5	Added	Models added: JH402A; JH404A SKUs added: JH405A; JH406A; JH450A; JL294A; JL295A
05-Sep-2016	From Version 3 to 4	Added	SKUs added: JL273A
		Changed	Configuration section updated
01-Aug-2016	From Version 2 to 3	Added	SKUs added: JL271A, JL272A, JL274A, JL275A, JL276A, JL277A, JL278A, JL287A, JL288A, JL289A, JL290A, JL291A, JL292A, JL250A, JL286A
10-Jun-2016	From Version 1 to 2	Changed	Minor edits on Technical Specifications
06-Jun-2016	Version 1	Creation	Document creation

Summary of Changes

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