

### Overview

## HPE Altoline 6960 Switch Series



### Models

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch

JL279A

HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch

JL280A

### Key features

- High 100GbE port density and low latency for demanding applications
- Choice of network operating systems, including Cumulus Networks Linux NOS, and Pica8 NOS
- Open-networking and disaggregated solution for customer choice
- VXLAN for efficient network virtualization overlay solutions
- Support for Big Switch Network's Big Cloud Fabric and Big Monitoring Fabric solutions

### Product overview

The HPE Altoline 6960 Switch Series are top-of-rack (TOR) or spine switches for high-performance data centers. In a compact 1RU form factor, the switch provides line-rate L2 and L3 switching across up to 32 x QSFP28 ports, supporting 25GbE server connections as a ToR switch, or 100GbE spine interconnects as a spine switch.

The 32 fixed QSFP28 ports support up to 32 x 100GbE connections.

The HPE Altoline 6960 Switch Series are bare-metal switches loaded with the Open Network Install Environment (ONIE), which supports the installation of compatible independent switch OS offerings.

### Overview

## Features and benefits

### Data center optimized

- **Flexible high port density**  
the HPE Altoline 6960 Switch Series enables scaling of the server edge with 100GbE spine and ToR deployments to new heights with high-density 32-port solutions delivered in a 1RU design. Up to 32 100GbE QSFP28 ports can also be configured as four 25GbE ports by using a 100GbE-to-25GbE splitter cable providing up to 128 25GbE ports.
- **High-performance switching**  
cut-through and nonblocking architecture delivers low latency (600 - 720 nanosecond for 100GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wire-speed packet forwarding
- **Hot/cold aisle support**  
Models available with front-to-back (port-to-power) or back-to-front (power-to-port) airflow
- **Redundant fans and power supplies**  
1+1 internal redundant and hot-pluggable power supplies and N+1 redundant fan trays enhance reliability and availability
- **VXLAN hardware support**  
supports VXLAN VTEP overlay technologies

### Manageability

- **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
- **ONIE bootloader**  
switch is loaded with Open Network Install Environment (ONIE) software installer
- **Intel x86 CPU**  
provides high performance support of widely available, industry standard software and utilities

### Layer 2 switching

- **VLAN support**  
provides support for 4,096 VLAN IDs

### Additional information

- **Low power consumption**  
typical operation uses just 267W of AC power

### 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.

#### Router Chassis

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch	JL279A
<ul style="list-style-type: none"> <li>• 32 QSFP+\QSFP28 40\100GbE ports (min=0 \ max=32 QSFP+\QSFP28 Transceivers) Each Switch:</li> <li>• 2 Power Supplies Standard (min=2 \ max=2)</li> <li>• 6 Front to Back Fan Trays Standard (min=6\ max=6)</li> <li>• 1U - Height</li> </ul>	See Configuration <b>NOTE: 1, 4, 6</b>
PDU Cable NA/MEX/TW/JP	JL279A#B2B
<ul style="list-style-type: none"> <li>• C13 PDU Jumper Cord (NA/MEX/TW/JP)</li> </ul>	
PDU Cable NA/MEX/TW/JP	JL279A#B2C
<ul style="list-style-type: none"> <li>• C13 PDU Jumper Cord (ROW)</li> </ul>	
High Volt Switch/Router to Wall Power Cord	JL279A#B2E
<ul style="list-style-type: none"> <li>• HPE 2.3M C13 to NEMA L6-20P Power Cord(J9936A)</li> </ul>	
No Power Cord	JL279A#AC3
<ul style="list-style-type: none"> <li>• No Localized Power Cord Selected</li> </ul>	
HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch	JL280A
<ul style="list-style-type: none"> <li>• 32 QSFP+\QSFP28 40\100GbE ports (min=0 \ max=32 QSFP+\QSFP28 Transceivers) Each Switch:</li> <li>• 2 Power Supplies Standard (min=2 \ max=2)</li> <li>• 6 Back to Front Fan Trays Standard (min=6\ max=6)</li> <li>• 1U - Height</li> </ul>	See Configuration <b>NOTE: 1, 4, 6</b>
PDU Cable NA/MEX/TW/JP	JL280A#B2B
<ul style="list-style-type: none"> <li>• C13 PDU Jumper Cord (NA/MEX/TW/JP)</li> </ul>	
PDU Cable NA/MEX/TW/JP	JL280A#B2C
<ul style="list-style-type: none"> <li>• C13 PDU Jumper Cord (ROW)</li> </ul>	
High Volt Switch/Router to Wall Power Cord	JL280A#B2E
<ul style="list-style-type: none"> <li>• HPE 2.3M C13 to NEMA L6-20P Power Cord(J9936A)</li> </ul>	
No Power Cord	JL280A#AC3
<ul style="list-style-type: none"> <li>• No Localized Power Cord Selected</li> </ul>	

#### Configuration Rules:

### Configuration

**Note 1** Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) or #B2E. (See Localization Menu)

**Note 4** The following 40G Transceivers install into this Switch: (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
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 6** 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 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

## Rack Level Integration CTO Models

### CTO Switch Chassis

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch

- 32 QSFP+ \ QSFP28 40 \ 100GbE ports (min=0 \ max=32 QSFP+ \ QSFP28 Transceivers) Each Switch:
- 2 Power Supplies Standard (min=2 \ max=2)
- 6 Front to Back Fan Trays Standard (min=6 \ max=6)
- 1U - Height

JL279A  
See  
Configuration  
**NOTE: 1, 4, 6**

PDU Cable NA/MEX/TW/JP

- C13 PDU Jumper Cord (NA/MEX/TW/JP)

JL279A#B2B

### Configuration

PDU Cable NA/MEX/TW/JP	JL279A#B2C
<ul style="list-style-type: none"> <li>C13 PDU Jumper Cord (ROW)</li> </ul>	
High Volt Switch/Router to Wall Power Cord	JL279A#B2E
<ul style="list-style-type: none"> <li>HPE 2.3M C13 to NEMA L6-20P Power Cord(J9936A)</li> </ul>	
No Power Cord	JL279A#AC3
<ul style="list-style-type: none"> <li>No Localized Power Cord Selected</li> </ul>	
HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch	JL280A
<ul style="list-style-type: none"> <li>32 QSFP+\QSFP28 40\100GbE ports (min=0 \ max=32 QSFP+\QSFP28 Transceivers) Each Switch:</li> <li>2 Power Supplies Standard (min=2 \ max=2)</li> <li>6 Back to Front Fan Trays Standard (min=6\ max=6)</li> <li>1U - Height</li> </ul>	See Configuration <b>NOTE: 1, 4, 6</b>
PDU Cable NA/MEX/TW/JP	JL280A#B2B
<ul style="list-style-type: none"> <li>C13 PDU Jumper Cord (NA/MEX/TW/JP)</li> </ul>	
PDU Cable NA/MEX/TW/JP	JL280A#B2C
<ul style="list-style-type: none"> <li>C13 PDU Jumper Cord (ROW)</li> </ul>	
High Volt Switch/Router to Wall Power Cord	JL280A#B2E
<ul style="list-style-type: none"> <li>HPE 2.3M C13 to NEMA L6-20P Power Cord(J9936A)</li> </ul>	
No Power Cord	JL280A#AC3
<ul style="list-style-type: none"> <li>No Localized Power Cord Selected</li> </ul>	

### Configuration Rules:

**Note 1** Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) or #B2E. (See Localization Menu)

**Note 4** The following 40G Transceivers install into this Switch: (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
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

## Configuration

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 6** 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 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

## Transceivers

**SFP Transceivers**

HPE X120 1G SFP RJ45 T Transceiver	JD089B
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A

**SFP+ Transceivers**

HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE X130 10G SFP+ LC SR Data Center Transceiver	JL437A
HPE X130 10G SFP+ LC LR Data Center Transceiver	JL439A
HPE X130 10G SFP+ LC LH 80km Transceiver	JG915A

**QSFP+ Transceivers**

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A

**QSFP28 Transceivers**

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

**Cables**

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

### Configuration

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 FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
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
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

### Switch Enclosure Options

#### Rackmount Kits

System (std 0 // max 1) User Selection (min 0 // max 1)

HPE Altoline Gen2 Rackmount Kit	JL198A See Configuration <b>NOTE: 1, 3</b>
HPE Altoline Gen3 Rackmount Kit	JL228A See Configuration <b>NOTE: 2, 3</b>

#### Configuration Rules:

**Note 1** This rack mount kit is only supported on the following switches:

HPE Altoline 6920 48XG 6QSFP+ x86 ONIE AC Front-to-Back Switch	JL167A
HPE Altoline 6920 48XG 6QSFP+ x86 ONIE AC Back-to-Front Switch	JL168A
HPE Altoline 6921 48XGT 6QSFP+ x86 ONIE AC Front-to-Back Switch	JL315A
HPE Altoline 6921 48XGT 6QSFP+ x86 ONIE AC Back-to-Front Switch	JL316A
HPE Altoline 6921 48SFP+ 6QSFP+ x86 ONIE AC Front-to-Back Switch	JL317A
HPE Altoline 6921 48SFP+ 6QSFP+ x86 ONIE AC Back-to-Front Switch	JL318A

### Configuration

HPE Altoline 6940 32QSFP+ x86 ONIE AC Front-to-Back Switch	JL165A
HPE Altoline 6940 32QSFP+ x86 ONIE AC Back-to-Front Switch	JL166A
HPE Altoline 6941 32QSFP+ x86 ONIE AC Front-to-Back Switch	JL313A
HPE Altoline 6941 32QSFP+ x86 ONIE AC Back-to-Front Switch	JL314A
HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch	JL279A
HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch	JL280A

**Note 2** This rack mount kit is only supported on the following switches:

HPE Altoline 6900 48G 4XG 2QSFP ARM ONIE AC Switch	JL223A
HPE Altoline 6900 48G 4XG 2QSFP ARM ONIE AC Back-to-Front Switch	JL473A
HPE Altoline 6900 48G 4XG 2QSFP ARM ONIE DC Front-to-Back Switch	JL474A
HPE Altoline 6900 48G 4XG 2QSFP ARM ONIE DC Back-to-Front Switch	JL475A

**Note 3** If a switch is ordered and factory racked, then this rackmount must be #0D1



### Technical Specifications

#### HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch (JL279A)

<b>I/O ports and slots</b>	32 QSFP28 100GbE ports	
<b>Additional ports and slots</b>	1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 USB 2.0	
<b>Power supplies</b>	2 power supply slots 1 minimum power supply required includes: 2 x PSUs ()	
<b>Fan tray</b>	5 fan tray slots Switch comes with five (5) fan trays (port to power airflow)	
<b>Physical characteristics</b>	<b>Dimensions</b>	17.26(w) x 20.28(d) x 1.73(h) in (43.84 x 51.50 x 4.4 cm)
	<b>Weight</b>	18.52 lb (8.4 kg)
<b>Memory and processor</b>	Intel Rangely C2538 4-core @ 2.4 GHz, 8 GB DDR3 SDRAM; storage: mSATA: 32G; Packet buffer size: 12 MB, 8 GB NAND flash	
<b>Performance</b>	<b>Routing/Switching capacity</b>	3.2 Tbps
	<b>MAC address table size</b>	8000 entries
	<b>Environment</b>	
	<b>Operating temperature</b>	32°F to 113°F (0°C to 45°C)
	<b>Operating relative humidity</b>	5% to 95%, noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Altitude</b>	up to 10,000 ft (3 km)
	<b>Acoustic</b>	Power: 62 dB
<b>Electrical characteristics</b>	<b>Frequency</b>	50/60 Hz
	<b>Voltage</b>	90 - 264 VAC, rated
	<b>Maximum power rating</b>	315 W
	<b>Idle power</b>	267 W
	<b>Notes</b>	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. PSU Efficiency: Up to 93% for AC PSUs
<b>Safety</b>	cUL Certified; EN 60950; EN 55022 Class A; VCCI Class A; ROHS Compliance; FCC Class A: Regulations for Radio Frequency Devices for Electromagnetic Compliance; UL	
<b>Emissions</b>	FCC part 15 Class A; EN 55022 Class A; VCCI	

### Technical Specifications

<b>Immunity</b>	<b>ESD</b>	32°F to 113°F (0°C to 45°C)
	<b>EFT/Burst</b>	IEC 68-2-14
<b>Management</b>	Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP	
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> 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 Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch (JL280A)

<b>I/O ports and slots</b>	32 QSFP28 100GbE ports	
<b>Additional ports and slots</b>	1 RJ-45 serial console port	
	1 RJ-45 out-of-band management port	
	1 USB 2.0	
<b>Power supplies</b>	2 power supply slots	
	1 minimum power supply required includes: 2 x PSUs ( )	
<b>Fan tray</b>	5 fan tray slots	
	Switch comes with five (5) fan trays (power to port airflow)	
<b>Physical characteristics</b>	<b>Dimensions</b>	17.26(w) x 20.28(d) x 1.73(h) in (43.84 x 51.50 x 4.4 cm)
	<b>Weight</b>	18.52 lb (8.4 kg)
<b>Memory and processor</b>	Intel Rangely C2538 4-core @ 2.4 GHz, 8 GB DDR3 SDRAM; storage: mSATA: 32GB; Packet buffer size: 12 MB, 8 GB NAND flash	
<b>Performance</b>	<b>Routing/Switching capacity</b>	3.2 Tbps
	<b>MAC address table size</b>	8000 entries
	<b>Environment</b>	
	<b>Operating temperature</b>	32°F to 104°F (0°C to 40°C)
	<b>Operating relative humidity</b>	5% to 95%, noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Altitude</b>	up to 10,000 ft (3 km)
	<b>Acoustic</b>	Power: 62 dB
<b>Electrical characteristics</b>	<b>Frequency</b>	50/60 Hz
	<b>Voltage</b>	90 - 264 VAC, rated
	<b>Maximum power rating</b>	315 W
	<b>Idle power</b>	267 W
	<b>Notes</b>	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.

### Technical Specifications

PSU Efficiency: Up to 93% for AC PSUs

<b>Safety</b>	cUL Certified; EN 60950; EN 55022 Class A; VCCI Class A; ROHS Compliance; FCC Class A: Regulations for Radio Frequency Devices for Electromagnetic Compliance; UL
<b>Emissions</b>	FCC part 15 Class A; EN 55022 Class A; VCCI
<b>Immunity</b>	<b>ESD</b> EN 60950 <b>EFT/Burst</b> IEC 68-2-14
<b>Management</b>	Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> 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.

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### Summary of Changes

Date	Version History	Action	Description of Change:
05-Mar-2018	Version 9	Changed	Key features updated
05-Feb-2018	Version 8	Changed	Configuration section updated.
18-Apr-2017	Version 7	Added	Transceivers added on the Configuration section: JL437A, JL439A
01-Aug-2016	Version 6	Changed	Several updates on Configuration section including the addition of the #AC3 Option
17-June-2016	Version 5	Changed	Edits made on Configuration and Technical Specifications, Product image added.
06-May-2016	Version 4	Changes	Minor edits on Technical Specifications
15-Apr-2016	Version 3	Changed	SKU descriptions updated (Accessories), Configuration section updated.
08-Apr-2016	Version 2	Changed	Voltage on Technical Specifications
31-Mar-2016	Version 1	Created	Document creation



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