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Concesión Aeropuerto Internacional Arturo Merino Benítez de Santiago

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TERMINAL T1 – SISTEMA DE CORRIENTES DEBILES – ESPECIFICACIONES TECNICAS – PID de Redes T1

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DESCRIPCIÓN DE LOS CAMBIOS

PÁRRAFO MODIFICADO	DESCRIPCIÓN DEL CAMBIO

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1. ACRÓNIMOS

ACRÓNIMO	SIGNIFICADO
AirportNet	Intranet del Aeropuerto
AMB	Arturo Merino Benítez
AVSEC	Seguridad Aeroportuaria
AWG	Calibre de Alambre Estadounidense
BHS	Sistema de Gestión de Equipajes
BML	Capa de Gestión de Negocio
BSS	Sistema de Soporte a Negocio
CCAA	Sistema control de accesos
CCMS	Sistema de Control de Instalaciones Electromecánicas
CCO	Sala o Centro de Control de Operaciones
CCTV	Círculo Cerrado de Televisión
CPP	Check Point Poniente
CPO	Check Point Oriente
CUTE	Uso Común de Equipamiento de Terminal
dB	Decibelio
EIA	Asociación “Energy Information Administration”
EML	Capa de Gestión de Elemento
ETSI	Asociación “European Telecommunications Standards Institute”
FIDS	Sistema de Información
GbE	Gigabit Ethernet
HD	Alta Definición
HSRP	Protocolo de Router en Hot Standby
IDC	Conectores por Desplazamiento de Aislante
IEC	Asociación “International Electrotechnical Commission”
IEEE	Asociación “Institute of Electrical and Electronics Engineers”
IP	Protocolo de Internet
ISO	Asociación “International Organization for Standardization”
ITP	Par Trenzado Industrial
ITU	Unidad Internacional de Telecomunicaciones
KVA	Kilovoltiamperios
LAN	Red de Área Local
LSZH	Bajas emisiones de humo, cero halógenos
Mbps	Megabits por segundo
MSTP	Protocolo Spanning Tree Multiple
NML	Capa de gestión de Red
NTP	Protocolo de Tiempo de Red
NVR	Grabador de Video de Red
OSI	Interconexión de Sistema Abierto
PAS	Sistema de Megafonía
PBX	Central de Telefonía Privada
PdI	Policía de Investigación
PLC	Controlador Lógico Programable
PoE	Corriente a través de Ethernet
PTE	Planta Térmica
PTZ	Movimiento horizontal, vertical y zoom
QoS	Clase o Calidad de Servicio
RFC	Normas de TCP/IP

ACRÓNIMO	SIGNIFICADO
RJ45	Conector de cables de par trenzado
RMS	Red Multiservicio
RSTP	Protocolo Spanning Tree Rápido
SAI	Sistema de Alimentación Ininterrumpida
SCADA	Supervisión, Control y Adquisición de Datos
SCL	Aeropuerto Arturo Merino Benítez de Santiago de Chile
SEL	Subestación Eléctrica
SFP	Transceptor de factor de forma pequeño conectable
SML	Capa de Gestión de Servicio
SNMP	Protocolo de Gestión de Red Simple
SRP	Protocolo de reserva de flujo
STP	Protocolo Spanning Tree
T1	Terminal A
T1M/T2A	Terminal 1, Espigón A
T2	Terminal 2
T2C	Terminal 2, Espigón C
T2D	Terminal 2, Espigón D
T2E	Terminal 2, Espigón E
T2F	Terminal 2, Espigón F
T2M	Terminal 2, Bloque de Edificio Central
TIA	Asociación “Telecommunications Industry Association”
TMN	Red de Gestión de telecomunicaciones
UL	Asociación “Underwriters Laboratories”
UPS	Sistema de Alimentación Ininterrumpida
UTP	Par Trenzado no Apantallado
VLAN	Red de Área Local Virtual
VoIP	Voz sobre IP
VRRP	Protocolo de Redundancia de Router Virtual
WLAN	Red de Área Local Inalámbrica

2. OBJETIVO DEL DOCUMENTO

El presente documento tiene por objeto describir las especificaciones técnicas de los elementos de corrientes débiles a emplear en la modificación del sistema de telecomunicaciones e informática de los servicios de Redes de Voz, Datos, Radio Frecuencia, Telefonía y CCTV para la Dirección General de Aeronáutica Civil.

3. ALCANCE GENERAL DEL DOCUMENTO

El contenido de este documento es aplicable a la Terminal T1M del Proyecto PID Redes T1 del Arturo Merino Benítez de Santiago de Chile (SCL).

Los sistemas de corrientes débiles instalados en esté edificio, y cuyas especificaciones técnicas se encuentran recogidas en este documento, son:

- Sistema de Cableado estructurado
- Sistema de Radiofrecuencia.
- Sistema de CCTV.
- Sistema Telefónico.
- Canalizaciones

Dentro del documento se tendrán en cuenta:

- Zona de Remodelación: Zona especificada en el alcance del proyecto de Arquitectura Funcional cuya intervención implica el diseño ARQ y MEP según norma vigente. En estas zonas no se actualizará a norma vigente elementos de ARQ, instalaciones MEP, o estructuras existentes que no sean parte del PID.
- Zona de Intervención: Zonas necesarias de intervenir para la ejecución de Zonas de Remodelación. En las Zonas de Intervención se realizará desmontaje y montaje de elementos ARQ y/o MEP los cuales no son de alcance PID sin embargo necesarios de desmontar para ejecución del PID, por lo anterior los elementos ARQ y/o MEP a desmontar y que no son alcance PID no serán actualizados a norma vigente.

4. NORMATIVAS DE REFERENCIA

A continuación, se presenta el conjunto de las principales normas técnicas consideradas para los sistemas de corrientes débiles:

- Pliegos Técnicos Normativos RIC, Resolución exenta N° 33.877 30/12/2020 S.E.C.
- TIA/EIA-568-C.0 – Generic Telecommunications Cabling for Customer Premises, February 2009
- TIA/EIA-568-C.0-1 – Generic Telecommunications Cabling for Customer Premises- Addendum 1, Updated References for Balanced Twisted-Pair, September 2010
- TIA/EIA-568-C.1 – Commercial Building Telecommunications Cabling Standard, February 2009
- TIA/EIA-568-C.1-2 – Commercial Building Telecommunications Cabling Standard- Addendum 2, General Updates, November 2011
- TIA/EIA-568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards, August 2009
- TIA/EIA-568-C.3 – Optical Fiber Cabling Components Standard, June 2008
- TIA/EIA-862 – Building Automation Systems Cabling for Commercial Buildings, April 11, 2002
- TIA/EIA-569-B – Commercial Building Standard for Telecommunications Pathways and Spaces, October 2004.

- TIA/EIA-569-B-1 – Commercial Building Standard for Telecommunications Pathways and Spaces Addendum 1 – Temperature and Humidity Requirements for Telecommunications Spaces, May 2009.
- TIA/EIA-606-A – Administration Standard for Commercial Telecommunications Infrastructures, June 21, 2002
- TIA/EIA-758-A – Customer-owned Outside Plant Telecommunications Infrastructure Standard, May 2005
- TIA/EIA-492AAAC – Especificaciones Detalladas para Fibra Multimodo de Índice Gradual Optimizada para Láser en primera ventana (850 nm) con núcleo de 50 micras y recubrimiento de 125 micras.
- Underwriters Laboratories (UL®) Cable Certification and Follow Up Program.
- UL Testing Bulletin.
- ISO/IEC IS 11801 Information technology – Generic cabling for customer premises
- ISO/IEC IS 14763-1 Information technology – Implementation and operation of customer premises – Part 1: Administration
- ISO/IEC IS 14763-2 Information technology – Implementation and operation of customer premises – Part 2: Planning and installation
- IEC 61935-1 Generic cabling systems – Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801 – Part 1: Installed cabling

5. SISTEMA DE CABLEADO ESTRUCTURADO

5.1 OBJETIVO DEL CAPÍTULO

Se presentan a continuación las especificaciones técnicas que deben cumplir los elementos a emplear en la modificación del sistema de telecomunicaciones e informática de los servicios de Redes de Voz, Datos, Radio Frecuencia, Telefonía y CCTV para la Dirección General de Aeronáutica Civil dentro del Aeropuerto Arturo Merino Benítez.

5.2 CABLEADO

El sistema utilizará cables de cobre de par trenzado F/UTP categoría 6A para la Red Administrativa, para la Red de Seguridad se usará cableado UTP Cat 6A. Todas las terminaciones de cables cumplirán las prestaciones de canal de los estándares de la categoría elegida y se verificará este cumplimiento.

5.2.1 PRESTACIONES DEL CABLEADO DE COBRE

La solución de cableado propuesta será considerada en cuanto a prestaciones como un sistema en su conjunto, en lugar de considerar individualmente las prestaciones de cada uno de sus componentes. Este es un parámetro de medida más útil al tener en cuenta la combinación de los componentes requeridos para llevar la señal desde la roseta hasta el armario de interconexión, de esta manera se garantiza la correcta transmisión de los datos en dicho medio.

Todos los canales de comunicaciones de cobre del Sistema de Cableado para la Red Administrativa serán de Clase EA/Categoría 6A.

Todos los canales de comunicaciones de cobre del Sistema de Cableado para la Red Seguridad serán de Clase S/FTP Categoría 6A

Para asegurar el cumplimiento de la Categoría/Clase y poder certificar la instalación, el equipamiento para realizar dicha certificación evalúa un rango dentro de un umbral que respeta el estándar, garantizando el

aprovechar el máximo de las características físicas ofrecidas de los materiales instalados, de esta forma hablando de cableado se podrá garantizar ancho de banda disponible, velocidad y duración de la instalación.

Este punto hace referencia a la especificación de Categoría 6A utilizada en esta sección. El contratista deberá mencionar este punto cuando sea necesario.

No es demasiado conocido el hecho de que las normas de cableado imponen a la longitud del canal, no sólo un máximo de 90 m, sino también un mínimo de 15 m para evitar los efectos de la energía reflejada.

Habitualmente, este requisito se cumple dejando una tolerancia en los enlaces menores de 15 m hasta alcanzar dicha distancia. Sin embargo, este procedimiento no siempre es fácil de realizar y, en algunos casos, como las conexiones en la sala de servidores, es casi imposible. Por tanto, se requiere que el sistema de cableado estructurado propuesto esté diseñado y fabricado para evitar esta restricción de distancia mínima, es decir, que garantice prestaciones de Categoría 6A en cualquier conexión, por corta que sea.

5.2.2 PRESTACIONES DEL CABLEADO DE FIBRA ÓPTICA MONOMODO

Se utilizará fibra óptica monomodo OS1 o superior para las uniones de los enlaces directos de fibra entre la Nueva Sala Técnica Principal y los recintos que tienen Rack proyectado a la red administrativa, para acceso a dispositivo final.

Para la red de seguridad se utilizará una mezcla entre fibras SM y MM, despliegue se hará según distancias lineales del tendido.

Se utilizará fibra SM OS1 o superior. La fibra monomodo se conectará a las bandejas de fibra mediante conectores hembra LC.

El cable de fibra óptica utilizado deberá satisfacer las prestaciones garantizadas indicadas en la siguiente sección, cuando se usa junto con el resto de los componentes:

- La fibra debe cumplir con los métodos de medida EIA/TIA-455 e IEC 60793 para los parámetros requeridos. Asimismo, debe cumplir la norma G.652.D
- La fibra monomodo debe operar en el rango completo de longitudes de onda desde 1280 nm a 1625 nm, sin el pico de agua (de alta atenuación) a 1400 nm, ampliando en más del 60% el rango de longitudes de onda convencionales operativas de las fibras monomodo.
- Igualmente debe permitir el uso de 16 canales CWDM (Coarse Wave Division Multiplexing) y 400 canales DWDM (Dense Wave Division Multiplexing). Todas las fibras deben llevar un código de colores para facilitar su identificación individual.
- Las fibras llevarán un recubrimiento que asegure la persistencia del color, minimice las pérdidas por micro curvaturas y facilite el manejo. La cubierta se podrá retirar mecánicamente.

Parámetros ópticos	Fibra no cableada	Fibra cableada
Atenuación a 1310 nm	≤ 0,35 dB/Km	≤ 0,37 dB/Km
Atenuación a 1383 nm	≤ 0,35 dB/Km	≤ 0,37 dB/Km
Atenuación a 1550 nm	≤ 0,21 dB/Km	≤ 0,24 dB/Km
Atenuación a 1625 nm	≤ 0,23 dB/Km	
Atenuación en 1285-1625 nm		≤ 0,40 dB/Km

Parámetros ópticos	Fibra no cableada	Fibra cableada
Punto de discontinuidad máxima en 1310 y 1550 nm		≤ 0,05 dB
Longitud de onda de corte	1100 - 1320 nm	≤ 1260 nm
Punto de dispersión cero		1300-1324 nm
Pendiente de dispersión cero		≤ 0,090 ps/nm2.Km
Dispersión cromática en 1285 -1330 nm		≤ 3,5 ps/nm.Km
Dispersión cromática en 1550 nm		≤ 18,0 ps/nm.Km
Dispersión cromática en 1625 nm		≤ 22,0 ps/nm.Km
PMD fibra individual		≤ 0,15 ps/√Km
PMDq (Q=0,01%, N=20)		≤ 0,08 ps/√Km

Parámetros ópticos de la Fibra Monomodo.

Parámetros geométricos	
Diámetro de campo modal 1310 nm	9,20 ± 0,40 µm
Diámetro de campo modal 1550 nm	10,40 ± 0,50 µm
Error concentricidad núcleo/cladding	≤ 0,4 µm
Diámetro cladding	125,0 ± 0,50 µm
Error concentricidad coating/cladding	≤ 12 µm
No circularidad coating	≤ 10 %
Diámetro coating (coloreado)	250 ± 15 µm

Parámetros Geométricos de la Fibra Monomodo.

La fibra multimodo se conectará a las bandejas de fibra mediante conectores SC/LC y deberá cumplir con las siguientes características mínimas:

- El canal de fibra de 50/125 µm debe soportar la transmisión serie en un solo canal, tanto en enlaces de troncal de edificio como de campus, hasta 10 Gb/s y hasta una distancia de 300 metros con 5 conectores LC.
- El canal de fibra de 50/125 µm debe ser retrocompatible con aplicaciones antiguas como: Ethernet, Token Ring, FDDI, Fast Ethernet y ATM para distancias interiores a los edificios, y debe asegurar la sencillez de la migración desde 10Mb/s a 10 Gb/s empleando la tecnología disponible.
- El canal debe soportar las aplicaciones de 10 Gb/s en primera ventana (850 nm) que usan VCSELs, así como las aplicaciones LED de baja tasa de transmisión de los sistemas antiguos.
- La fibra de 50 µm debe estar optimizada para limitar el retardo en modo diferencial (DMD) de manera que se evite la dispersión de los pulsos a 10 Gb/s.
- Las fibras se fabricarán con recubrimiento doble de acrilato para asegurar la protección y la retención del color.
- Tanto el cable de fibra óptica de 50 µm, los conectores de 50 µm, los jumper de 50 µm y los paneles deben provenir del mismo fabricante.
- La fibra cumplirá o superará las siguientes normas: TIA/EIA-492AAAC, TIA/EIA-568-C, ANSI-FDDI, IEEE 802, y los estándares industriales aprobados para componentes.

- El fabricante garantizará el canal de 10 Gb/s formado por cable, componentes y aplicaciones durante un periodo mínimo de 15 años.

En las dos siguientes tablas se encuentran las prestaciones y características de la fibra OM4:

Propiedades de la Fibra	
Diámetro Núcleo	50±2.5
No circularidad del núcleo:	<5%
Excentricidad Núcleo/Revestimiento:	<1.5 μm
Apertura Numérica:	0.200 ± 0.015
Diámetro del Revestimiento:	125 μm ± 1 μm
No circularidad del Revestimiento:	<1.0%
Diámetro de Recubrimiento:	250 μm ± 15 μm
Diámetro de Buffer:	900 μm ± 50μm
Atenuaciones Máximas de la Fibra:	3.0 dB/km a 850 nm 1.0 dB/km a 1300 nm
Mínimo Ancho de Banda fibras :	1500/500 MHz a 850/1300 nm (overfilled bandwidth) 2000/500 MHz a 850/1300 nm (laser bandwidth)
Mínimo Ancho de Banda fibras +:	3500/500 MHz a 850/1300 nm (overfilled bandwidth) 4700/500 MHz a 850/1300 nm (laser bandwidth)

Propiedades de la Fibra Multimodo

5.2.3 TIPOS DE COMPORTAMIENTOS DEL CABLE CONTRA EL FUEGO

La elección de los materiales para el cableado puede afectar en gran medida la forma en que se propague un incendio a través de un edificio, el tipo de humo y gases emitidos y la velocidad de diseminación de las llamas y el humo.

Se consideran tres tipos de comportamiento de un cable contra el fuego:

- Resistente al Fuego: si sigue funcionando durante y después de un fuego prolongado, suponiendo que la magnitud del fuego sea suficiente para destruir los materiales orgánicos de la zona.
- No Propagador de la Llama: si supera los límites fijados por la normativa para la propagación vertical de la llama (IEC 332-1). Básicamente es la normativa que cumplen todos los cables, incluidos los de PVC.
- No Propagador del Incendio: si supera las pruebas de no propagación del fuego establecidas por la norma (IEC 332-3). Adicionalmente, se incorpora la letra "C" cuando el cable es apantallado.

Se consideran que un cable esta Libres de Halógenos si presentan un pH igual o superior a 4,3 y generar unas cantidades CO y de ClH inferiores a 0,5%.

El utilizar cable plenum (ignífugo), el minimizar las penetraciones a través de los muros cortafuegos y el utilizar elementos ignífugos cuando la penetración es inevitable puede reducir y aminorar la diseminación del humo y de las llamas. Generalmente es el humo, más que las llamas, lo que resulta letal.

Todo el cableado de comunicaciones utilizado en el edificio será con cubierta ignífuga o LSZH, cumpliendo con las especificaciones contenidas en las leyes locales. También cumplirá con las características referentes a normativa de incendios referentes al ámbito en el que se instale. El fabricante debe proporcionar certificados de laboratorios independientes que garanticen su cumplimiento.

5.3 PATCH CORD

5.3.1 PATCH CORD UTP

Se deben proporcionar los patch cord correctos para cada puerto de los repartidores y las áreas de trabajo. Los patch cord de cobre serán de tipo F/UTP categoría 6A con conectores macho RJ45, y deben cumplir las siguientes condiciones:

- Todos los patch cord deben cumplir las especificaciones EIA/TIA-568-C, IS11801 y EN50173 (sección de cableado horizontal).
- Deben estar equipados con un conector modular en cada extremo y estar de acuerdo con las longitudes especificadas en los planos detallados del diseño.
- El cordaje estará formado por conductores sólidos de cobre, galga 23 AWG, trenzados en pares, de manera que cumpla los requisitos de la categoría 6A (TIA/EIA-568-C, IS11801). Se recomienda que estos patch cord dispongan de cubierta doble para mejorar las prestaciones de diafonía exógena.
- Los patch cord serán estrictamente UTP; no se admitirán patch cord con pantallas flotantes.
- Los 8 hilos conductores de cobre serán los únicos elementos metálicos longitudinales de los patch cord. No se admitirán conductores adicionales, cualesquiera que sean las supuestas funciones de dichos elementos adicionales.
- El latiguillo debe tener un diseño que impida una inversión accidental de la polaridad o la división de pares, así como cumplir las características eléctricas UL Verified para EIA/TIA-568-C, y las certificaciones ISO 9001/14001 del fabricante.
- Es imprescindible y requisito para la certificación posterior de la instalación que todos los patch cord hayan sido manufacturados y verificados en fábrica para garantizar su fiabilidad y sus prestaciones.
- Los patch cord de cobre deben satisfacer las prestaciones mínimas garantizadas de la sección “Prestaciones de Cableado de Cobre de Categoría 6A”, cuando se usan en una configuración de canal de caso peor (100 metros con patch cord y punto de consolidación) junto con el resto de las componentes.

Adicionalmente debe aportarse:

- Certificaciones ISO 9001/14001 del fabricante
- Cumplimiento de Prestaciones Eléctricas UL Verified

5.3.2 JUMPER DE FIBRA

Se proporcionarán jumpers de fibra para la interconexión entre las bandejas de fibra y los switches de la red. Los jumpers constarán de un conector macho LC por un lado (lado que se conecta a las bandejas de fibra) y un conector macho LC por el otro (lado que se conecta a los switches).

El jumper de fibra óptica debe ser del mismo tipo y fabricante que el cable de fibra óptica instalado, e igualmente debe satisfacer las prestaciones mínimas garantizadas de la sección “Prestaciones del Cableado de Fibra Óptica Monomodo”, cuando se usa junto con el resto de las componentes. No se admitirán jumper de fibra manufacturados en obra.

Los jumpers de fibra monomodo estarán compuestos por fibra óptica de índice gradual, con recubrimiento tipo buffer, las fibras estarán protegidas por una hilatura aramídica y una cubierta LSZH retardante al fuego.

Los jumpers deben cumplir con las siguientes características:

Pérdidas por acoplamiento del conector ST o SC

$\mu = 0.3 \text{ dB}$, $\sigma = 0.2 \text{ dB}$

Pérdidas por acoplamiento del conector LC	$\mu = 0.1 \text{ dB}, \sigma = 0.1 \text{ dB}$
Resistencia del cable	220 N mínimo
Repetición de las conexiones	0.20 dB cambio máximo por 100 reconexiones

Característica de conector F.O SM

Además, los jumpers de fibra deben cumplir con unas características mínimas particulares diferentes si son multimodo o monomodo. Si son monomodo deben cumplir con:

Atenuaciones Máximas	0.7 dB/km a 1300 nm 0.7 dB/km a 1383 nm (+3nm) 0.7 dB/km a 1550 nm
Diámetro Dúplex	1.6 x 3.3 mm o 3.0 x 5.9 mm
Pérdidas máximas de inserción	LC: <0.25 dB ST: <0.50 dB SC: <0.50 dB
Pérdidas medias de inserción	LC: 0.10 dB ST: 0.30 dB SC: 0.30 dB
Temperatura de funcionamiento	- 40°C a 75°C.
Pérdidas de Retorno mínimas	LC: 0.55 dB ST: 0.50 dB SC: 0.50 dB

Características conectores F.O Monomodo

Si son multimodo deben cumplir con:

Mínimo Ancho de banda	3500/500 MHz a 850/1300 nm (ancho de banda en saturación) 4700/500 MHz a 850/1300 nm (ancho de banda láser)
Atenuaciones Máximas:	3.0 dB/km a 850 nm 1.0 dB/km a 1300 nm
Diámetro Dúplex	1.6 ± .05 mm x 3.7 ± 0.1mm
LC. Pérdidas de inserción	Media: 0.1 dB, varianza: 0.1 dB
LC. Pérdidas por reconexión (máx)	0.2 dB por 500 reconexiones
Pérdidas de Retorno mínimas	-20 dB

Tabla N°8 Características Patch Cord de Fibra Multimodo

PANELES DE PARCHEO RJ-45

Todas las tomas de usuario se conectarán a la parte posterior de los paneles de parcheo mediante el cableado horizontal.

El sistema de interconexión formado por los paneles de parcheo tendrá las siguientes características:

- El panel tendrá 24 puertos RJ45 en la parte frontal y Conectores por Desplazamiento de Aislante (IDC) en la parte posterior.
- El panel se montará en rack estándar de 19".
- El panel será modular y se resaltarán las características adicionales. Dispondrá de módulos de 6 puertos que se podrán sustituir individualmente.
- El panel de 24 puertos tendrá 4.45 cm (1 U) de altura.
- Las bocas modulares tendrán un ciclo de vida mínimo de 750 inserciones/extracciones.

- El panel debe satisfacer las prestaciones mínimas garantizadas de la sección “Prestaciones de Cableado de Cobre de Categoría 6A”, cuando se usan en una configuración de canal de caso peor (100 metros con patch cord y punto de consolidación) junto con el resto de los componentes.
- El panel tendrá un clip (terminador) por puerto, para encaminar el cable en la parte posterior hacia los contactos IDC, que facilitará la instalación y garantizará terminaciones firmes y homogéneas.
- El panel dispondrá de un guía de cables en la parte posterior en forma de U para cada 6 cables.

5.4 BANDEJAS DE FIBRA

Se utilizarán bandejas de fibra para la terminación de las fibras ópticas. Las fibras ópticas se conectarán a las bandejas mediante conectores tipo LC.

El sistema de interconexión formado por las bandejas de fibra tendrá las siguientes características:

- El panel se montará en rack estándar de 19" y tendrá 4.45 cm (1 U) de altura.
- Permitirá la inserción de casetes de fibra de manera modular.
- Tendrán espacio interno para los organizadores de empalmes y podrán admitir módulos preconectados con conectores MPO, biseles para terminación directa, casetes que contengan pigtails, etc.
- El panel aceptará al menos 4 casetes de fibra óptica con acopladores LC (12 fibras), SC o ST (6 fibras); estos módulos contarán con soportes traseros para recoger el exceso de cable de fibra. Los módulos de distribución de fibra óptica permitirán el acceso frontal o posterior y se montarán y extraerán sin ayuda de herramientas.
- Debe satisfacer las prestaciones mínimas garantizadas de las secciones “Prestaciones del Cableado de Fibra Óptica Monomodo” y “Prestaciones del Cableado de Fibra Óptica Multimodo”, según sea el caso, cuando se usa junto con el resto de los componentes.

5.5 TOMAS DE USUARIO

Las tomas de usuario o rosetas de comunicaciones consistirán en cajas con uno o dos módulos de 8 pines para conectores hembra RJ-45 según propiedades del resto del tendido del cable.. Los cables debe terminar en paneles de parcheo en la sala técnica correspondiente.

Deben cumplir y superar las especificaciones contenidas en la Sección de Cableado Horizontal de las normas TIA/EIA-568-C, IS11801, EN50173 referentes a la Categoría 6A.

A menos que se especifique en los planos o en este documento, todas las tomas de comunicaciones colocadas en la pared con cable de cobre de 23 AWG cumplirán las siguientes condiciones:

- Conectores modulares de 8-posiciones/8-conductores.
- El armado de conectores se realizará bajo el estándar T568B
- Conexión por desplazamiento del aislante (IDC).
- Soporte universal para aplicaciones de múltiples fabricantes, que acepten conectores modulares tipo RJ-45.
- Tapas ciegas en los emplazamientos donde no se utilicen los módulos.

Adicionalmente debe aportarse:

- Certificaciones ISO 9001/14001 del fabricante
- Clasificación UL de canal de la solución completa sobre prestaciones eléctricas de Categoría 6A.

La toma de telecomunicaciones debe satisfacer las prestaciones mínimas garantizadas de la sección “Prestaciones de Cableado de Cobre de Categoría 6A”, cuando se usan en una configuración de canal de caso peor (100 metros con patch cord y punto de consolidación) junto con el resto de los componentes.

5.6 CAJAS DE DERIVACIÓN DE FIBRAS OPTICAS

Se instalarán cajas de derivación de fibras ocultas en el techo, en las bandejas de cables de corrientes débiles o sobre carriles DIN, si los hubiera. Estas cajas de derivación se situarán próximas a los Switches, con el fin de darles conectividad. Los jumpers de fibra óptica se conectarán a las cajas de derivación mediante conectores tipo LC.

5.7 ARMARIOS TIPO RACK

Las salas técnicas deben estar equipadas con armarios tipo rack que albergarán los switches, paneles de parcheo, bandejas de fibra y otros equipos relacionados con los sistemas de corrientes débiles. El armario tipo rack debe estar diseñado de forma que cumpla los requisitos de hardware de conexión que incluyen gran cantidad de cables de entrada y sistemas PBX de distribución. El hardware instalado debe disponer de ordenadores horizontales y verticales para permitir las conexiones cruzadas.

Los armarios tipo rack deben ser el del estándar de 19”, además deben instalarse en un soporte aislado y utilizar elementos de sujeción de material no conductor para asegurar el rack al suelo, pared o techo, donde sean instalados y deben estar conectados a la barra de tierra.

Para albergar la gran densidad de conexiones de red se utilizarán preferiblemente armarios cerrados. La ventaja de éstos respecto a los armarios abiertos es la posibilidad de cerrarlo con llave, incrementando la seguridad del sistema.

Los armarios cerrados deberán ser metálicos de acero y con acabado en polvo epoxy negro de alta resistencia. Para albergar los equipos del sistema de cableado estructurado, las dimensiones de los armarios a utilizar en el proyecto serán de 12U, 24U y/o 42 U de altura, 800 mm de ancho, y 800 mm de profundidad.

Las características requeridas son:

- Armarios rack de 12U, 24U y/o 42U, de acero de al menos 2.0 mm de espesor.
- Soporte de para armarios tipo rack de 12 UR o soportes ETSI
- Optimizados para proteger el cableado y los patch cord
- Puerta trasera de acero color negro, de al menos 0.7 mm de espesor.
- Puerta frontal con vidrio templado de seguridad de 4 mm y marco metálico de acero de al menos 0.7 mm de espesor y llave.
- Los paneles laterales serán de acero de al menos 0.7 mm color negro.
- La parte superior del armario será de al menos 0.9 mm de acero sólido color negro, con al menos 3 entradas para cables. Dos estarán ubicadas en los laterales y una en la parte posterior.
- Para los casos de armarios tipo racks a instalar a piso, tendrán 4 pies ajustables.
- Tendrán un kit de ventiladores.
- Cumplimiento de IEC 297-2, DIN 41494 Parte 7, DIN 41491 Parte 1, EN 60950, VDE 0100.
- La apertura de la puerta se podrá realizar tanto desde la derecha como desde la izquierda del armario.
- Los armarios de 800 mm de ancho deberán incorporar dos columnas frontales verticales (una de cada lado del armario) para el paso y gestión de cables, con capacidad de hasta 370 cables categoría 6A (185 cables en cada columna).
- Puertas laterales de fácil manejo para montar y desmontar.

- Acceso de cables por la parte superior e inferior.
- Todos los productos se fabricarán de acuerdo con la norma ISO-9002 y serán diseñados y desarrollados según norma ISO-9001.
- Posibilidad de accesorios: los tornillos necesarios, ruedas, zócalos, etc.

5.8 SWITCHES

Para los Switches Core de la Red de Seguridad como para Red Administrativa, se instalarán Switches con las siguientes características:

- PU redundantes.
- Puerto para Módulos Stacking.
- Dispositivos con características y licencias Layer 3.
- Módulos SFP.
- Transceivers SFP para realizar conexiones de Fibra Optica.

Característica	Valor
Unidades de Poder	2 power supply slots
I/O Puertos y Slots	12-24 SFP Ports 1000/10000 SFP+ ports; Duplex: 100BASE-TX: half or full; 1000BASE-T
Posibilidad de POE	NO
Seguridad	EN 60950/IEC 60950; UL 60950; UL 60950-1; CAN/CSA 22.2 No. 60950; EN 60825; CSA 22.2 60950-1; EN62479:2010; EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013; EN 62368-1, Ed. 2; IEC 60950-1:2005 Ed.2; Am 1:2009+A2:2013; IEC 60825:2007; EN60850-1:2007 / IEC 60825-1: 2007 Class1 Class 1 Laser Products / Laser Klasse 1; UL 62368-1 Ed.2
Apilamiento	Si
Temperatura de Operación	32°F to 113°F (0°C to 45°C)
Humedad Relativa de Operación	15% to 95% @ 104°F (40°C), noncondensing

Características básicas Switches Core

Para los Switches de Acceso para la Red de Seguridad como para la Red Administrativa, se instalarán Switches con las siguientes características:

- Dispositivos con características/licencias Layer 2 y enrutamiento Layer 3
- Módulos SFP para enlaces troncales.
- Puertos POE para poder suministrar electricidad a dispositivos que tengan dicha necesidad.
- Puertos para Módulos Stacking.
- Transceivers SFP para realizar conexiones de Fibra Optica.

Característica	Valor
I/O Puertos/Slots	24-48 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 4 SFP+ 1/10GbE ports
Temperatura de Operación	32°F to 113°F (0°C to 45°C); up to 5,000 Feet, 0°C to 40°C (32°F to 104°F) up to 10,000 Feet
Humedad relativa para operación	15% to 95% @ 104°F (40°C), noncondensing
Voltaje	100 - 127 / 200 - 240 VAC, rated
POE	SI
Características básicas Switches Acceso	

6. SISTEMA RF

6.1 OBJETO DEL CAPÍTULO

Se presentan a continuación las especificaciones técnicas que deben cumplir los elementos del Sistema RF a instalar en el Edificio T1M emplazado en el proyecto PID de Redes TI.

6.2 BASES RF

La remodelación del edificio T1M considera a nivel del Sistema de Radiofrecuencias la migración de las bases existentes, ubicando dichas bases en las nuevas dependencias del nivel 2 de la terminal, reemplazando los cables de conexión hasta las antenas externas y considerando estratégicamente las distancias debido a las limitaciones al respecto que contiene dicha tecnología.

Prestaciones de Bases RF a Migrar:

- Identificación de llamada PTT-ID.

- Alerta de Llamadas.
- Emisión de Señal de Emergencia.
- Monitoreo de Sistema.
- Zonificación.
- Rastreo con Doble Prioridad.
- Bloqueo de Canal Ocupado.
- Limitador de Tiempo de Transmisión.
- Eliminación de Canal no Deseado.
- Troncalizar Zonas y configuración de grupos de conversación.

Característica	Valor
Transmisión	6 A a 25 W / 9 A a 45 W (VHF) / 40 W (UHF) / 45W a 500 W
Espaciamiento de Canal	12.5 / 20 / 25 kHz
Estabilidad de Frecuencia	VHF / UHF: ±2.5 ppm Banda Baja: ±5 ppm
Potencia de Salida RF	1 - 500W
Limitación de Modulación	±2.5 @ 12.5 kHz / ±4.0 @ 20 kHz (VHF / UHF)
Características Bases RF	

6.3 ANTENAS RE

Se utilizan para propagar las señales emitidas desde las Bases RF.

Se usarán antenas VHF/FM que deben tener las siguientes características.

Característica	Valor
Frecuencia	140 - 180 Mhz
Bobina	No
Longitud antena	50 - 120 CM
Impedancia	50 Ohm
Ganancia	3-12dBi
Potencia Max	50-300 W
Difusión	Omnidireccional
Caracteristicas Antenas RF	

6.4 CABLE BASE - RF

Para el sistema RF se utiliza cableado HELIAX, el uso de este cable permitirá menor perdida de potencia y flexibilidad al momento de ubicar las antenas, la ventaja de utilizar este tipo de cables es que combina materiales de alta conductividad con dieléctricos con una baja atenuación de señal, sumado a la forma del conductor interno que facilita su instalación.

Característica	Valor
Impedancia	50 +- 1
Frecuencia Maxima	8.8 Ghz
Interior Conductor	Cobre con revestimiento de Aluminio
Inductancia μ H/ft (m)	0.058 (0.19)
Capacitancia pF/ft (m)	23.1 (75.8)
Características Cable Heliax	

7. **SISTEMA CCTV**

7.1 OBJETO DEL CAPÍTULO

Se presentan a continuación las especificaciones técnicas que deben cumplir los elementos del sistema de CCTV del proyecto PID de Redes T1.

El sistema actualmente instalado es un híbrido entre cámaras analógicas e IP, van a ser reemplazadas por cámaras IP POE, las actualmente instaladas deben ser desmontadas y el cable F/UTP categoría 6A removido hasta los límites de la zona a remodelar.

Para la conexión de este sistema, la conexión de estas será desde la cámara hasta la sala técnica o gabinete remoto más cercano indicado, con cable F/UTP categoría 6A.

El Concentrador con su Storage y Servidor que van a registrar las grabaciones estarán ubicados en la Nueva Sala Principal (2T1MLT077).

Como el desarrollo es 100% IP, no es necesaria la implementación de Rack con concentradores en la nueva sala de vigilancia, por lo que la conexión cliente – servidor será mediante la Red informática implementada.

7.2 CÁMARAS

Las cámaras representan el punto inicial en el proceso de video vigilancia. Ellas capturan las imágenes, las digitalizan y comprimen utilizando diferentes formatos, según configuración deseada. Esta compresión reduce la cantidad de datos que debe ser enviada a través de la red, lo que resulta en un ahorro del ancho de banda requerido. Las imágenes son enviadas a través de la red de servicios IP DGAC del aeropuerto a su grabador correspondiente.

7.2.1 CÁMARAS FIJAS

Las cámaras fijas son aquellas que tienen un campo de visión fijo y no pueden moverse. Este tipo de cámaras tendrán una lente varifocal 2,8mm – 13.5mm.

Las características que, como mínimo, deben cumplir las cámaras son:

Característica	Valor
Tamaño de Sensor	1/2.7" (CCD o CMOS)
Resolución máxima	2592 (H) x 1944 (V)
Modos de funcionamiento	Día/noche
Lente Varifocal	2,7 – 13.5 mm
Sensibilidad	0.005 lux@F1.5(Color, 30 IRE) 0.0005 lux@F1.5(B/W, 30 IRE) 0 lux (Illuminator on)
Relación Señal/Ruido	>56dB
Tipos de codificación	H.265; H.264; H.264H; H.264B; MJPEG (Only supported by the sub stream)
Velocidad de imágenes	Main stream: 2592 x 1944@(1–20 fps)/2688 x 1520@(1–25/30 fps) sub stream: 704 x 576@(1–25 fps)/704 x 480@(1–30 fps)
Número mínimo de flujos simultáneos	2
Comunicación	TCP/IP
Conectividad	RJ-45 (10/100 Base-T)
Conectores	RJ45
Compatibilidad	ONVIF
Tipos de alimentación	PoE, 220Vac, 12Vdc
Grado de protección	IP67
Temperatura de funcionamiento	-40 °C to +60 °C (-40 °F to +140 °F)
Humedad	≤95%

Características de cámaras fijas.

7.3 CONCENTRADOR

El concentrador actúa como núcleo de gestión, control y monitoreo del sistema CCTV, las cámaras IP funcionan standalone sin necesidad de un concentrador, lo que realiza el concentrador es enlazarse con las cámaras IP mediante la infraestructura de red, de esta forma mantiene conexión simultáneamente con las cámaras configuradas, mediante esta conexión se pueden realizar las siguientes tareas:

- Establecer conectividad para captura de registros fotográficos y gestión de Storage donde se almacenan dichos registros.
- Escanea la red para detectar nuevas cámaras integrables al sistema.
- Permite realizar configuraciones globales para todas las cámaras.
- Creación de grupos de visualización según áreas de interés.
- Los Discos para utilizar serán equivalente técnico o superior a 10TB SATA SKYHAWK SEAGATE
- Configuración de Rutinas medidas por IA para detecciones específicas según configuración realizada.
- Gestión de usuarios con acceso a la plataforma como clientes, para poder realizar visualización simultanea de canales en clientes simultáneos.
- Control y monitoreo de discos.
- Arreglos RAID para garantizar continuidad de servicio.

- Capacidad de almacenar un mínimo de 180 días continuos de grabación.

Característica	Valor
HDD slot	48
Interface	Interface SSD/SAS/SATA
RAID	Network RAID N+M; K, N + M ≤ 16, M ≥ K, N ∈ [1, 16], M ∈ [1, 4]
Data network interface	2-6, 1000M Ethernet interface (8 × GbE or 4 × 10GbE is extendable)
Processor	2 Xeon 64-bit 6-core processors
Power supply (rated)	Redundant 2 + 1, ≤ 1600 W
Hot-swapping	Supported

Características Concentrador a Instalar

7.4 SERVIDOR

Como parte del requerimiento se solicitan 2 servidores para implementar a futuro algún sistema de monitoreo extra o inteligencia no integrados en el sistema nativo del concentrador a adquirir, por lo que se llegó a dicha consideración, el servidor solicitado tendrá las siguientes características:

- Soportar Virtualización de Infraestructura.
- Soportar Array de discos en las diferentes tecnologías de RAID.
- Tener varias interfaces Ethernet para tener HA a nivel de Redes.
- Poseer fuentes redundantes para evitar caídas de servicio

Característica	Valor
HDD slot	4, 3.5" Hot-Plug HD
Interface de Red	On-Board Broadcom 5720 Dual Port 1GBE LOM Network RAID, N + M, N, N + M ≤ 10, M ≤ N, N ∈ [1, 15], M ∈ [1, 4], K ∈ [1, 4]
Controladora RAID	
RAM	8GB Memory, 2666MT/s, DDR4 ECC UDIMM
Processor	Intel® Xeon® E-2124, 3.3 GHz, 8M Cache, 4C/4T turbo (71W)
Power supply (rated)	2 PU Redundant
Hot-swapping	Supported
Tamaño	1U

Características Servidor Monitoreo DGAC

8. SISTEMA TELEFONICO

8.1 OBJETIVO DEL CAPITULO

Se presentan a continuación las especificaciones técnicas que deben cumplir los elementos a emplear en la modificación del sistema de telecomunicaciones e informática de los servicios de Redes de Voz, Datos, Radio Frecuencia, Telefonía y CCTV para la Dirección General de Aeronáutica Civil dentro del Aeropuerto Arturo Merino Benítez.

8.2 CENTRAL PBX

La actual Plataforma telefónica de la red DGAC emplazada en el Aeropuerto AMB, Santiago, es una solución de telefonía basada en un servidor de comunicaciones Alcatel IP, OmniPCX Enterprise, con redundancia en cpu's y de Arquitectura Hardware Crystal, posee un Plan de numeración interno cerrado a 4 dígitos en una red de tipo mesh o malla; lo que implica que posee total conectividad con TODOS los nodos distribuidos (centrales telefónicas) a lo largo del país, por tanto: presentan a continuación las especificaciones técnicas que deben cumplir los elementos del Sistema Telefónico a instalar en el Edificio T1M del aeropuerto Arturo Merino Benítez de Santiago de Chile.

- Capacidad de integración a nivel de protocolos, difusión y auditoría.
- Gestión de llamadas a nivel de supervisión de llamadas, grupos de llamadas y llamadas por nombres.
- Capacidad de supervisión de enlaces públicos centralizados, enlaces privados Interlink y rutas ABC.
- Capacidad de supervisión de estado de Anexos.

8.3 TELEFONOS

Teléfonos IP:

Son los teléfonos que van a funcionar sobre protocolo TCP/IP, las características que van a tener son:

- Aprovisionamiento SIP mínimo 4 Lineas.
- Audio HD / Posibilidad de Handset/Hands-free.
- 2 Puertos Ethernet 10/100 con posibilidad de configurar Vlans y realizar bridge con otro dispositivo a conectar vía Ethernet.
- Posibilidad de configuración Hot Line.
- Posibilidad de configuración Hot desking.
- Do-Not-Disturb

Teléfonos Analógicos:

Son los teléfonos que van a funcionar sobre tecnología RTC, las características que van a tener son:

- Indicador visual de llamada entrante.
- 1 melodía.
- Volumen de melodía ajustable.
- Rellamada de últimos números marcados.
- Tecla "Secreto"
- Tecla R.

Característica	Valor
Numeración	FV/DC
Tiempo de flashing	100ms, 300ms, 600ms
Conexión	RJ11
Dimensiones	mm (largo x profundidad x altura): 193 x 184 x 72
Características teléfonos análogos	

9. CANALIZACIONES

9.1 OBJETO DEL CAPÍTULO

Se presentan a continuación las especificaciones técnicas que deben cumplir los elementos del Sistema de canalizaciones a instalar en el PID de Redes T1M del Aeropuerto Arturo Merino Benítez de Santiago de Chile.

9.2 BANDEJAS METÁLICAS

Las bandejas metálicas en el edificio T1M serán de tipo perforada y se instalarán en techo. Irán puestas a tierra de acuerdo con las recomendaciones de la normativa EIA/TIA-607-A. La tierra será única, tanto para el sistema de comunicaciones como para el sistema eléctrico.

Estarán fabricadas con acero laminado en frío o acero galvanizado con una resistencia mínima a tracción de 31 kg/mm² y un límite elástico mínimo de 20 kg/mm². Asimismo, estarán recubiertas por un galvanizado caliente con un espesor mínimo de Zn de 45 µm.

El dimensionamiento de las bandejas metálicas se realizará en base a 7,5 mm de diámetro por cada cable de F/UTP categoría 6A o por cada cable de fibra óptica a la que dé servicio dicha canalización. En general, las bandejas metálicas se dimensionarán para llenar como máximo un 50% de su capacidad, dejando el 50% restante para futuras ampliaciones, facilidad de cambios o movimientos, etc.

Máxima cantidad de cables F/UTP categoría 6A por bandejaBandeja de 100mm de alto

Dimensión en mm (l x a)	Máximo número de cables
100x100	150
200x100	300
300x100	450
400x100	600
500x100	750
600x100	900

Cantidad de cables según dimensiones de bandeja.

En ningún caso tendrán las bandejas metálicas una altura superior a 10 cm para de esta forma evitar el aplastamiento de los cables por sobrepeso.

Siempre se seguirán las siguientes recomendaciones para instalar las canalizaciones que albergarán los cables de comunicaciones:

- La instalación de las bandejas metálicas tendrá en cuenta los radios mínimos de curvatura que deben adoptar los cables de corrientes débiles, tanto de cobre como de fibra óptica. En general, estos radios de curvatura serán de 25 mm como mínimo para cables de cobre de Cat6A y 50 mm para cables de FO de planta interna.
- Cuando se instalen en el techo, se dejará una distancia libre de obstáculos entre la parte superior de la bandeja y el techo de al menos 10 cm.
- Una vez terminado el proceso de tendido de cables en las bandejas, se efectuara el cierre de ellos colocando las tapas de bandejas

A continuación, se muestran unas imágenes de las bandejas tipo a instalar:



DETALLE DE BANDEJA PERFORADA.

9.3 DUCTOS

La misión de los ductos es la de acomodar al cableado con el fin de protegerlo. Es por ello por lo que se utilizarán ductos de distintos tipos en función de donde se instalen:

- Conductos de PVC flexible corrugado y no propagador de la llama: en techo falso o en zonas no expuestas en general. Las dimensiones podrán ser de $\frac{1}{2}$ ", $\frac{3}{4}$ " o 1" de diámetro.
- Ductos metálicos EMT: En recintos interiores, embutido en tabique o a la vista sobre cielo falso. Las dimensiones podrán ser $\frac{1}{2}$ ", $\frac{3}{4}$ " o 1" de diámetro.
- Cañería de acero galvanizado C.A.G.: En canalizaciones exteriores al edificio. Las dimensiones podrán ser $\frac{1}{2}$ ", $\frac{3}{4}$ " o 1" de diámetro.

Todos estos tipos de ductos cumplirán las siguientes recomendaciones:

- Curvaturas de hasta 90°.
- Dispondrán de cajas de registro al menos cada 30 metros o cuando los ductos realicen como máximo dos giros de 90°. Además, las cajas de registro no se utilizarán como elementos de cambio de dirección de dichos ductos, sino que dichos giros se realizarán antes de la caja de registro
- No debe superar el 40% del diámetro usando 2 cables.
- Los registros deben tener una longitud superior a 12 veces el diámetro del ducto mayor que recoja.
- La sección más pequeña que se debe usar es 20mm de diámetro.
- Radio de curvatura:
 - Si la canalización es de menos de 50 mm de diámetro, debe ser como mínimo 6 veces el diámetro de la canalización para cobre y 10 veces para fibra.

- Si la canalización es de más de 50 mm de diámetro, el radio de curvatura debe ser como mínimo 10 veces el diámetro de la canalización.

En la siguiente tabla se contemplan las dimensiones mínimas de los ductos de acuerdo con el número máximo de cables que albergarán. Las tomas de usuario o rosetas de cada planta irán conectadas a los switches de acceso a la red IP a través de los paneles de parcheo ubicados en las salas técnicas. Para el subsistema de cableado horizontal, serán necesarios tantos cables como tomas de usuario o rosetas. En la siguiente tabla se puede dimensionar la canalización de acuerdo con el número de cables necesarios y el tamaño de ducto elegido.

Tamaño del ducto (pulgadas)	Máximo Nº de Cables UTP Cat6A por ducto
½"	1
¾"	2
1"	3
1 ½"	7
2"	13
2 ½"	20
3"	29

Cantidad de cables según dimensiones de tubería.

En cualquier caso, es necesario replantear sobre el terreno los recorridos que efectuarán los cables a través de cada una de las plantas y a lo largo de cada una de las plantas asegurándose que en ningún caso se sobrepasan los 90 metros de recorrido total desde la sala técnica hasta la toma de usuario más alejada de esa misma planta.

A continuación, se muestran unas imágenes de los distintos tipos de ductos que se instalarán para alojar los cables de corrientes débiles:



DETALLE DE DUCTO DE PVC FLEXIBLE



DETALLE DE DUCTO METÁLICO EMT

10. FICHAS TECNICAS

ARUBA Compatible J9151E-FL Quick Spec:

Part Number:	J9151E-FL J9151E-EXT-FL J9151E-IND-FL
Form Factor:	SFP+
TX Wavelength:	1310nm
Reach:	10km
Cable Type:	SMF
Rate Category:	10GBase
Interface Type:	LR
DDM:	Yes
Connector Type:	Dual-LC
Power Budget:	6.00 dB
TX Power Min/Max:	-8.00 to 0.50
RX Power Min/Max:	-14.00 to -3.0



ARUBA Compatible J9151E-FL Features

- Operating Data Rate up to 10.3Gbps
- 1310nm DFB-LD Transmitter
- Single 3.3V Power Supply and TTL Logic Interface
- Hot Pluggable
- Compliant with MSA SFP+
- Compliant with IEEE 802.3ae 10GBASE-LR
- Compliant with IEEE 802.3ae 10GBASE-LW
- Compliant with SFF-8472
- RoHS 6 Compliant
- Operating Case Temperature:
 - Standard: 0°C to +70 °C
 - Extended -5°C to +85 °C
 - Industrial -40°C to +85 °C

ARUBA Compatible J9151E-FL Applications

- 10GBASE-LR at 10.3125Gbps
- 10GBASE-LW at 9.953Gbps
- Other Optical Links

ARUBA Compatible J9151E-FL Electrical Characteristics (Condition: Ta=TOP)

Parameter	Symbol	Min.	Typ	Max.	Unit	Notes
CML Inputs(Differential)	Vin	150		1200	mV p-p	AC coupled inputs
Supply Current	ICC			300	mA	
Input Impedance (Differential)	Zin	85	100	115	ohm	Rin > 100 kohm @ DC
Tx_Disable Input Voltage – Low	VIL	0		0.8	V	
Tx_Disable Input Voltage – High	VIH	2.0		3.45	V	
Tx_Fault Output Voltage – Low	VOL	0		0.5	V	
Tx_Fault Output Voltage – High	VOH	2.0		Vcc+0.3	V	
CML Outputs (Differential)	Vout	350		700	mV pp	AC coupled outputs
Output Impedance (Differential)	Zout	85	100	115	ohms	
Rx_LOS Output Voltage- Low	VOL	0		0.5	V	
Rx_LOS Output Voltage- High	VOH	2.5			V	

ARUBA Compatible J9151E-FL Optical Characteristics (Condition: Ta=TOP)

TX						
Parameter	Symbol	Min	Typ	Max	Unit	
Data Rate		-	10.3	-	Gb/s	
9µm Core Diameter SMF			10		Km	
Centre wavelength	λ_c	1270	1310	1355	nm	
Output Spectral Width(-20dB)	$\Delta\lambda$	-	-	1	nm	
Average Output Power	P_{out}	-8	-	+0.5	dBm	
Extinction Ratio	ER	3.5	-	-	dB	
Average Power of OFF Transmitter				-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Input Differential Impedance	Zin	90	100	110	Ω	
TX Disable	Disable		2.0		Vcc+0.3	V
	Enable		0		0.8	
TX Fault	Fault		2.0		Vcc+0.3	V
	Normal		0		0.8	
TX Disable Assert Time	t_{off}			10	us	

RX						
Parameter		Symbol	Min	Typ	Max	Unit
Center Wavelength		λ_c	1260		1565	nm
Receive Sensitivity		P_{in}	-	-	-14	dBm
Maximum Input Power		P_{MAX}	-3	0	-	dBm
Signal Detect Threshold-Assertion:		SD_{HIGH}	-	-	-15	dBm
Signal Detect Threshold-Deassertion:		SD_{LOW}	-25	-	-	dBm
Output Differential Impedance		P_{in}	90	100	110	Ω
Receiver Overload		P_{max}	0.5			dBm
Optical Return Loss		ORL			-12	dB
LOS	High	2.0			$V_{cc}+0.3$	V
	Low	0			0.8	

Parameter		Symbol	Min	Max	Unit
Storage Temperature		T_{ST}	-40	+85	°C
Operating Temperature (Com)		T_{IP}	0	+70	°C
Operating Temperature (Ext)			-40	+85	
Input Voltage		T_{cc}	0	5	V

ARUBA Compatible J9151E-FL Recommend Operation Environment

Parameter		Symbol	Min	Typ	Max	Unit
Supply Voltage		V_{cc}	+3.15	3.3	+3.45	V
Operating Temperature		T_{OP}	0	-	+70	°C
Operating Temperature			-40	-	+85	

Licensing

The following U.S. patents are licensed by Aruba to FluxLight, Inc.:

U.S. Patent Nos: 7,184,668, 7,079,775, 6,957,021, 7,058,310, 6,952,531, 7,162,160, 7,050,720

Cisco 25GBASE SFP28 Modules

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Product overview

The Cisco® 25GBASE SFP28 (Small Form-Factor Pluggable) portfolio offers customers a wide variety of high-density and low-power 25 Gigabit Ethernet connectivity options for data center and high-performance computing networks applications. The 25G Modules are based on SFP28 form factor.



25G Direct Attached Cables (DAC)



25G Active Optical Cables (AOC)



25G Short Reach (SR) Module



10/25G Cisco Short Reach (CSR) Module



10/25G Long Reach (LR) Module



10/25G Long Reach (LR) Industrial Temperature Module



SFP-10/25G-BXD-I



SFP-10/25G-BXU-I



SFP-25G-ER-I

Features and benefits of Cisco 25G Modules

- Interoperable with other IEEE-compliant 25G interfaces where applicable
- Certified and tested on Cisco SFP28 ports for superior performance, quality, and reliability
- High-speed connectivity compliant to IEEE 802.3by and IEEE 802.3cc

Table 1. Cisco 25G Portfolio

Product	Descriptions
SFP-H25G-CU1M	25GBASE-CR1 Copper Cable 1-meter
SFP-H25G-CU1.5M	25GBASE-CR1 Copper Cable 1.5-meter
SFP-H25G-CU2M	25GBASE-CR1 Copper Cable 2-meter
SFP-H25G-CU2.5M	25GBASE-CR1 Copper Cable 2.5-meter
SFP-H25G-CU3M	25GBASE-CR1 Copper Cable 3-meter
SFP-H25G-CU4M	25GBASE-CR1 Copper Cable 4-meter
SFP-H25G-CU5M	25GBASE-CR1 Copper Cable 5-meter
SFP-25G-AOC1M	25GBASE-AOC Active Optical Cable 1-meter
SFP-25G-AOC2M	25GBASE-AOC Active Optical Cable 2-meter
SFP-25G-AOC3M	25GBASE-AOC Active Optical Cable 3-meter
SFP-25G-AOC4M	25GBASE-AOC Active Optical Cable 4-meter
SFP-25G-AOC5M	25GBASE-AOC Active Optical Cable 5-meter
SFP-25G-AOC7M	25GBASE-AOC Active Optical Cable 7-meter
SFP-25G-AOC10M	25GBASE-AOC Active Optical Cable 10-meter
SFP-25G-SR-S	25GBASE-SR SFP28 Module for MMF
SFP-25G-SL	25GBASE-SL SFP28 Module for MMF
SFP-10/25G-CSR-S	10/25GBASE-CSR SFP28 Module for MMF
SFP-10/25G-LR-S	10/25GBASE-LR SFP28 Module for SMF
SFP-10/25G-LR-I	10/25GBASE-LR SFP28, Industrial Temperature Module for SMF
SFP-10/25G-BXD-I	10GBASE-LR, 10GBASE-BR10, 25GBASE-BR10 SFP28, Bidirectional, Industrial Temp Module for SMF
SFP-10/25G-BXU-I	10GBASE-LR, 10GBASE-BR10, 25GBASE-BR10 SFP28, Bidirectional, Industrial Temp Module for SMF
SFP-25G-ER-I	25GBASE-ER, SFP28 Industrial Temperature Module for SMF

Cisco SFP-25G copper cables

Cisco SFP28 to SFP28 copper direct-attach 25GBASE-CR1 cables are suitable for very short links and offer a highly cost-effective way to establish a 25-Gigabit link between SFP28 ports of Cisco switches within racks and across adjacent racks. Cisco offers passive copper cables in lengths of x= 1, 1.5, 2, 2.5, 3, 4 and 5 meters.

1m, 1.5m, and 2m cables do not require FEC on the host ports; 2.5m and 3m cables require BASE-R FEC (also known as FC-FEC) on the host ports; 4m and 5m cables require RS-FEC on the host ports.

Cisco SFP-25G active optical cables

Cisco SFP28 to SFP28 Active Optical Cables are direct-attach fiber assemblies with SFP connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. Cisco offers Active Optical Cables in lengths of 1, 2, 3, 4, 5, 7, and 10 meters.

AOC cable require BASE-R FEC, or RS-FEC on the host ports.

Cisco SFP-25G-SR-S

The Cisco 25GBASE-SR Module supports a link length of 70/100m on OM3/4 MMF.

This module requires RS-FEC on the host ports.

Cisco SFP-25G-SL

The Cisco 25GBASE-SL Module supports a link length of 20/30m on OM3/4 MMF.

The Cisco SFP-25G-SL (Short Link) module requires RS-FEC on the host ports

Cisco SFP-10/25G-CSR-S

The Cisco 10/25GBASE-CSR Module supports a link length of up to 300/400m over OM3/4 at 10G, and up to 300/400m over OM3/4 at 25G*. It also supports link lengths of 82m over OM2 at 10G, and up to 70m over OM2 at 25G.

This module requires RS-FEC on the host port for full reach operation at 25G. Using BASE-R FEC the module can support 70/100m over OM3/4 and with-out FEC it can support 30/50m over OM3/4 at 25G*. For 10G operation FEC is not required.

*Depends upon fiber quality.

Cisco SFP-10/25G-LR-S

The Cisco 10/25GBASE-LR Module supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF) G.652 at both 10G and 25G.

This module requires RS-FEC on the host ports for operation at 25G.

Cisco SFP-10/25G-LR-I

The Cisco 10/25GBASE-LR Module supports a link length of 10 kilometers on standard Single-Mode Fiber (SMF) G.652 at both 10G and 25G. The module requires RS-FEC on the host ports for full reach operation at 25G. This module has an industrial temperature range. This module also supports CPRI datarates options 7, 8, 9 and 10.

In some applications using BASE-R FEC the module can support 3.5km and without FEC it can support 1.5km, depending on fiber quality.

Cisco SFP-10/25G-BXD-I and SFP-10/25G-BXU-I (single-fiber bidirectional applications)

The Cisco 10GBASE-LR/10GBASE-BR/25GBASE-BR Module supports a link length of 10 kilometers on a single strand of standard Single-Mode Fiber (SMF) G.652 at both 10G and 25G. A SFP-10/25G-BXD-I device is always connected to a SFP-10/25G-BXU-I device with a single strand of standard SMF. The communication over a single strand of fiber is achieved by separating the transmission wavelength of the two devices. SFP-10/25G-BXD-I transmits at 1330nm channel and receives at 1270nm signal. The SFP-10/25G-BXU-I transmits at a 1270nm wavelength and receives a 1330nm signal.

The module requires RS-FEC on the host ports for full reach operation at 25G. This module has an industrial temperature range. This module also supports CPRI datarates options 7, 8, 9 and 10.

In some applications using BASE-R FEC the module can support 3.5km and without FEC it can support 1.5km, depending on fiber quality.

Cisco SFP-25G-ER-I

The Cisco 25GBASE-ER Module supports a link length of 40 kilometers on standard Single-Mode Fiber (SMF) G.652 at 25G.

The module requires RS-FEC on the host ports for full reach operation at 25G. This module has an industrial temperature range.

Technical specifications

Platform support

Cisco 25G transceivers are supported on Cisco switches. For more details, refer to the document "[Transceiver Module Group \(TMG\) Compatibility Matrix](#)".

Connectors and cabling

Refer to Table 2 for cabling specifications for each 25G product.

Table 2. 25G Port cabling specifications

SFP-25G	Cable Type	Cable Distance	Max Power Consumption (W)	Pull Tab /Bail Latch Color
SFP-H25G-CU1M	Direct-attach copper cable assembly	1m	1/10	Beige
SFP-H25G-CU1.5M		1.5m		Black
SFP-H25G-CU2M		2m		Brown
SFP-H25G-CU2.5M		2.5m		Yellow
SFP-H25G-CU3M		3m		Orange
SFP-H25G-CU4M		4m		Green
SFP-H25G-CU5M		5m		Gray

SFP-25G	Cable Type	Cable Distance	Max Power Consumption (W)	Pull Tab /Bail Latch Color
SFP-25G-AOC1M	Active Optical Cable assembly	1m	1	Beige
SFP-25G-AOC2M		2m		Brown
SFP-25G-AOC3M		3m		Orange
SFP-25G-AOC4M		4m		Green
SFP-25G-AOC5M		5m		Gray
SFP-25G-AOC7M		7m		Blue
SFP-25G-AOC10M		10m		Red
SFP-25G-SR-S	MMF	70/100m (OM3/OM4)	1.2	Beige
SFP-25G-SL	MMF	20/30m (OM3/OM4)	1.2	Purple
SFP-10/25G-CSR-S	MMF	300/400m (OM3/OM4)*	1.2	Peach
SFP-10/25G-LR-S	SMF	10km	1.3	Blue
SFP-10/25G-LR-I	SMF	10km**	1.3	Blue
SFP-10/25G-BXD-I	SMF	10km***	1.5W	Violet
SFP-10/25G-BXU-I	SMF	10km***	1.5W	Blue
SFP-25G-ER-I	SMF	40km****	1.5W	Red

*Depending upon fiber quality.

**Links up to 15km reach are supported as engineered links as long as channel insertion loss is <9.3dB and RS-FEC is required

***Links up to 15km reach are supported as engineered links as long as channel insertion loss is <8dB and RS-FEC is required

****Links greater than 30km reach are considered engineered links

Table 3. SFP28 port cabling specifications

SFP-25G	Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth	Cable Distance
SFP-25G-SR-S	850	MMF	50.0	2000 (OM3)	70m
				4700 (OM4)	100m
				4700 (OM5)	100m
SFP-25G-SL	850	MMF	50.0	2000 (OM3)	20m
				4700 (OM4)	30m
				4700 (OM5)	30m
SFP-10/25G-CSR-S	850	MMF	50.0	500 (OM2)	70m (25G) 82m (10G)
				2000 (OM3)	300m*
				4700 (OM4)	400m*
				4700 (OM5)	400m
SFP-10/25G-LR-S	1310	SMF	G.652	-	10km
SFP-10/25G-LR-I	1310	SMF	G.652	-	10km**
SFP-10/25G-BXD-I	1330	SMF	G.652	-	10km***
SFP-10/25G-BXU-I	1270	SMF	G.652	-	10km***
SFP-25G-ER-I	1310	SMF	G.652	-	40km****

**Links up to 15km reach are supported as engineered links as long as channel insertion loss is <9.3dB and RS-FEC is required

***Links up to 15km reach are supported as engineered links as long as channel insertion loss is <8dB and RS-FEC is required

****Links greater than 30km reach are considered engineered links

Table 4. Optical transmit and receive specifications

Product	Type	Transmit Power (dBm)		Receive Power (dBm)		Link Budget (dB)	Reach (km)
		Maximum	Minimum	Maximum	Minimum		
SFP-25G-SR-S	25GBASE-SR 850nm MMF	+2.4	-8.4	+2.4	-10.3	840	to 860
SFP-25G-SL	25GBASE-SL 850nm MMF	+2.4	-8.4	+2.4	-10.3	840	to 860
SFP-10/25G-CSR-S**	10G	+2.4	-7.3	+2.4	-9.9	840	to 860
	25G	+2.4	-6	+2.4	-8.7	840	to 860

Product	Type	Transmit Power (dBm)*				
		Maximum	Minimum	Maximum	Minimum	
SFP-10/25G-LR-S	10G	+0.5	-8.2	+0.5	-14.4	1260
	25G	+2.0	-7.0	+2.0	-13.3	1295
SFP-10/25G-LR-I	10G	+0.5	-6.7	+0.5	-15.9	1260
	25G	+2.0	-5.5	+2.0	-14.8	1295
SFP-10/25G-BXD-I	10G	+0.5	-8.2	+0.5	-16.2	1320 1260
	25G	+2.0	-7.0	+2.0	-15.0	1320 1260
SFP-10/25G-BXU-I	10G	+0.5	-8.2	+0.5	-16.2	1260 1320
	25G	+2.0	-7.0	+2.0	-15.0	1260 1320
SFP-25G-ER-I	25G	+6.0	-3.0	-4.0	-21.0	5 to 1310

*Transmitter and receiver power is in average, unless specified.

**The launch power shall be the lesser of the class 1 safety limit or the maximum receive power. Class 1 laser requirements are defined by IEC 60825-1: 2001.

***The SFP-10/25G-CSR-S when interoperating with IEEE 10G-SR may overload the receiver, see the Cisco Optics to Optics interoperability matrix for details. <https://tmgmatrix.cisco.com/iop>

Connectors: Dual LC/PC connector (**SFP-25G-SR-S**, **SFP-10/25G-CSR-S** **SFP-10/25G-LR-S**, **SFP-10/25G-LR-I** and **SFP-25G-ER-I**).

Fiber Channel over Ethernet: The 25G DAC's (SFP-H25G-CUxxM), AOC's (SFP-25G-AOCxxM) and transceivers (SFP-25G-SR-S, SFP-10/25G-CSR-S and SFP-10/25G-LR-S) support FCoE with the appropriate host s/w support.

Note: Only connections with patch cords with PC or UPC connectors are supported. Patch cords with APC connectors are not supported. All cables and cable assemblies used must be compliant with the standards specified in the standards section.

Environmental conditions

Operating temperature range:

- Commercial temperature range: 0 to 70°C (32 to 158°F)
- Industrial temperature range: -40 to 85°C (-40 to 185°F)
- Storage temperature range: -40 to 85°C (-40 to 185°F)

Warranty

- Standard warranty: 5 years
- Expedited replacement available via a Cisco SMARTnet® Service support contract

Product sustainability

Table 5. Product sustainability

Sustainability Topic	Reference	
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging	WEEE Compliance
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
	Countries and Regions Supported	Regulatory Compliance
Power	Power (Including Pluggable)	Power Consumption
Material	Product packaging weight and materials	Contact: environment@cisco.com

Ordering information

Table 6 provides the ordering information for Cisco 25G cables and transceivers.

Table 6. Ordering information

Description	Product Number
25GBASE-CR1 SFP28 Passive Copper Cable, 1-meter	SFP-H25G-CU1M
25GBASE-CR1 SFP28 Passive Copper Cable 1.5-meter	SFP-H25G-CU1.5M
25GBASE-CR1 SFP28 Passive Copper Cable, 2-meter	SFP-H25G-CU2M
25GBASE-CR1 SFP28 Passive Copper Cable 2.5-meter	SFP-H25G-CU2.5M
25GBASE-CR1 SFP28 Passive Copper Cable, 3-meter	SFP-H25G-CU3M
25GBASE-CR1 SFP28 Passive Copper Cable 4-meter	SFP-H25G-CU4M
25GBASE-CR1 SFP28 Passive Copper Cable, 5-meter	SFP-H25G-CU5M
25GBASE-AOC SFP28 Active Optical Cable, 1-meter	SFP-25G-AOC1M
25GBASE-AOC SFP28 Active Optical Cable, 2-meter	SFP-25G-AOC2M
25GBASE-AOC SFP28 Active Optical Cable, 3-meter	SFP-25G-AOC3M
25GBASE-AOC SFP28 Active Optical Cable 4-meter	SFP-25G-AOC4M
25GBASE-AOC SFP28 Active Optical Cable, 5-meter	SFP-25G-AOC5M
25GBASE-AOC SFP28 Active Optical Cable, 7-meter	SFP-25G-AOC7M
25GBASE-AOC SFP28 Active Optical Cable, 10-meter	SFP-25G-AOC10M
25GBASE-SR SFP28 Module for MMF	SFP-25G-SR-S
25GBASE-SL SFP28 Module for MMF	SFP-25G-SL
10/25GBASE-CSR SFP28 Module for MMF	SFP-10/25G-CSR-S
10/25GBASE-LR SFP28 Module for SMF	SFP-10/25G-LR-S
10/25GBASE-LR SFP28 Module for SMF, Industrial Temp	SFP-10/25G-LR-I
10/25GBASE-BR SFP28 Bidi module for SMF, Industrial Temp, Downstream	SFP-10/25G-BXD-I
10/25GBASE-BR SFP28 Bidi module for SMF, Industrial Temp, Upstream	SFP-10/25G-BXU-I
25GBASE-ER SFP28 Module for SMF, Industrial Temp	SFP-25G-ER-I

Regulatory and standards compliance

Standards:

- SFF-8402: SFP+ 28 Gb/s 1x Pluggable Transceiver Solution (SFP28) - Rev 1.0 March 30, 2014
- SFF-8472: Diagnostic Monitoring Interface for Optical Transceivers - Rev 12 August 29, 2014
- IEEE 802.3™- 2015 IEEE Standard for Ethernet
- IEEE P802.3by™ - 2016 Amendment 2: Media Access Control Parameters, Physical Layers, and Management Parameters for 25 Gb/s Operation
- IEEE P802.3cc™ - 2017 Amendment 11: Physical Layer and Management Parameters for Serial 25 Gb/s Ethernet Operation Over Single-Mode Fiber
- RoHS 6

Safety:

- Laser Class 1 21CFR-1040 LN#50 7/2001
- Laser Class 1 IEC60825-1
- Cable jacket of SFP copper modules is UL E116441 Compliant
- SFP copper cables are ELV Compliant

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Additional information

For more information about Cisco 25GBASE SFP28 optics and copper modules, contact your sales representative or visit <https://www.cisco.com/c/en/us/products/interfaces-modules/25-gigabit-modules/index.html>.

Document history

Table 7. Document history

New or Revised Topic	Described In	Date
Updated to include new transceivers, SFP-10/25G-BXD-I, SFP-10/25G-BXU-I, SFP-25G-ER-I	Ordering Information	Jul. 1, 2021
Addition of SFP-25G-SL	Table 1	

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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Cisco 100GBASE QSFP-100G Modules

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Product overview

The Cisco 100GBASE Quad Small Form-Factor Pluggable (QSFP) portfolio offers customers a wide variety of high-density and low-power 100 Gigabit Ethernet connectivity options for data center, high-performance computing networks, enterprise core and distribution layers, and service provider applications. The QSFP-100G modules are our latest generation of 100G transceiver modules solution based on a QSFP form factor. (See Figure 1)



Figure 1.
QSFP-100G Optical modules

Features and benefits of Cisco QSFP modules

- Hot-swappable input/output device that plugs into a 100G Gigabit Ethernet Cisco QSFP port
- Interoperable with other IEEE-compliant 100GBASE interfaces where applicable
- Certified and tested on Cisco QSFP-100G ports for superior performance, quality, and reliability
- High-speed electrical interface compliant to IEEE 802.3bm

Table 1 describes the Cisco QSFP-100G portfolio.

Table 1. Cisco QSFP-100G Portfolio

Product	Description	Connector Type
QSFP-100G-SR4-S	100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF	MPO-12 (12 fibers)
QSFP-100G-SL4	100GBASE QSFP Short Link Transceivers, 30M reach over OM4 MMF	MPO-12 (12 fibers)
QSFP-40/100-SRBD	100G and 40GBASE SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF	LC
QSFP-100G-SR1.2	100G SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF	LC
QSFP-100G-PSM4-S	100GBASE PSM4 QSFP Transceiver, MPO, 500m over SMF	MPO-12 (12 fibers)
QSFP-100G-DR-S	100GBASE DR QSFP Transceiver, 500m over SMF	LC
QSFP-100G-FR-S	100GBASE FR QSFP Transceiver, 2km over SMF	LC
QSFP-100G-CWDM4-S	100GBASE CWDM4 QSFP Transceiver, LC, 2km over SMF	LC
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10–60C	LC

Product	Description	Connector Type
QSFP-100G-LR-S	100GBASE LR QSFP Transceiver, 10km over SMF	LC
QSFP-100G-LR4-S	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF	LC
QSFP-100G-LR4-I	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF, I-Temp	LC
QSFP-100G-ERL-S	100GBASE ER-Lite QSFP Transceiver, 25km over SMF	LC
QSFP-100G-ER4L-S	100GBASE QSFP Transceiver, 25–40KM reach over SMF, Duplex LC	LC
QSFP-100G-4W40-I	100GBASE 4W40 Transceiver, 40km SMF, duplex, LC, I-Temp	LC
QSFP-100G-ZR4-S	100GBASE QSFP Transceiver, 80KM# reach over SMF, Duplex LC	LC
QSFP-100G-CU (1M, 1.5M, 2M, 2.5M, 3M, 5M)	100GBASE-CR4 Passive Copper Cable	
QSFP-4SFP25G-CU (1M, 1.5M, 2M, 2.5M, 3M, 5M)	100GBASE QSFP to 4xSFP25G Passive Copper Splitter Cables	
QSFP-100G-AOC (1M, 2M, 3M, 5M, 7M, 10M, 15M, 20M, 25M, 30M)	100GBASE QSFP Active Optical Cables	
CVR-QSFP28-SFP25G	100G to SFP25G Adapter	

depends upon fiber and connector loss

Cisco QSFP-100G-SR4-S

The Cisco 100GBASE-SR4-S QSFP Module supports link lengths of up to 70m over OM3 and 100m over OM4 Multimode Fiber with MPO connectors. It primarily enables high-bandwidth 100G optical links over 12-fiber parallel fiber terminated with MPO multifiber connectors. QSFP-100G-SR4-S supports 100GBase Ethernet rate.

Cisco QSFP-100G-SL4

The Cisco 100GBASE-SL4 Short Link QSFP Module supports link lengths of up to 20m over OM3 and 30m over OM4 Multimode Fiber with MPO connectors. It primarily enables high-bandwidth 100G optical links over 12-fiber parallel fiber terminated with MPO multifiber connectors. QSFP-100G-SL supports 100GBase Ethernet rate.

Cisco QSFP-100G-SR1.2

The Cisco QSFP 100-Gb SR1.2 Bi-Directional (BiDi) transceiver is a pluggable optical transceiver with a duplex LC connector interface for short-reach data communication and interconnect applications using Multi-Mode Fiber (MMF).

The Cisco QSFP 100-Gbps SR1.2 BiDi transceiver supports link lengths of 70, 100 and 150 meters on laser-optimized OM3, OM4 and OM5 multimode fibers. The Cisco QSFP 100-Gbps SR1.2 BiDi offers customers a compelling solution that enables reuse of their existing 10/40 or 100Gb duplex MMF infrastructure for migration to 400 Gigabit Ethernet connectivity.

The Cisco QSFP 100-Gbps SR1.2 BiDi transceiver supports connectivity to 400 Gbps in a 4 x 100G breakout mode.

Each Cisco QSFP 100-Gbps SR1.2 BiDi transceiver consists of two transmit and receive channels in the 832–918 nanometer wavelength range, enabling an aggregated 100-Gbps link over a two-strand multimode fiber connection.

Cisco QSFP-40/100G-SRBD

The Cisco QSFP 40/100 Gb dual-rate Bi-Directional (BiDi) transceiver is a pluggable optical transceiver with a duplex LC connector interface for short-reach data communication and interconnect applications using Multi-Mode Fiber (MMF). It offers customers a compelling solution that enables reuse of their existing 10 Gb duplex MMF infrastructure for migration to either 40 or 100 Gigabit Ethernet connectivity.

In 40-Gbps mode, the Cisco QSFP 40/100-Gbps BiDi transceiver supports link lengths of 100 and 150 meters on laser-optimized OM3 and OM4 multimode fibers, respectively. In 100-Gbps mode, it supports 70 and 100 meters on OM3 and OM4, respectively.

Each Cisco QSFP 40/100-Gbps BiDi transceiver consists of two transmit and receive channels in the 832–918 nanometer wavelength range, enabling an aggregated 40 or 100-Gbps link over a two-strand multimode fiber connection.

Table 2. Link loss budget for QSFP-40/100-SRBD and QSFP-100G-SR1.2

Mode	MMF Type	Reach (meters)	Total Loss Budget (dB)	BER
40G***	OM3	100	1.9*	1e-15***
	OM4	150	1.5**	1e-12
100G	OM3	70	1.9*	1e-12
	OM4	100	1.9*	1e-12
	OM5	150	1.9*	1e-12

* Includes 1.5dB connector loss

** Includes 1.0dB connector loss

*** In 40G mode, QSFP-40/100-SRBD has 0.7 decibel incremental margin (in addition to 1.9 decibel total loss budget shown in the table), which can be allocated to connector losses in the link for OM3 fiber for applications when a link BER of 1E-12 is sufficient. Cisco recommends that this margin be allocated to connector losses. Care should be taken to not exceed 120 meters in fiber link distance with the OM3 fiber

**** Does not include QSFP-100G-SR1.2 which is 100G only

Cisco QSFP-100G-PSM4-S

The Cisco QSFP-100G-PSM4-S Module supports link lengths of up to 500 meters over SMF with MPO connectors. The 100 Gigabit Ethernet signal is carried over 12-fiber parallel fiber terminated with MPO multifiber connectors.

Cisco QSFP-100G-DR-S

The Cisco QSFP-100G-DR-S Module supports link lengths of up to 500 m over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using onboard PAM4 modulation and FEC. QSFP-100G-DR-S interoperates with 400G transceivers that comply with IEEE 400GBASE-DR4, such as Cisco's QSFP-400G-DR4-S, via fiber break-out cables.

Cisco QSFP-100G-FR-S

The Cisco QSFP-100G-FR-S Module supports link lengths of up to 2 km over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using onboard PAM4 modulation and FEC. QSFP-100G-FR-S can also be used in applications meant for IEEE 100GBASE-DR, such as interoperability with IEEE 400GBASE-DR4 via fiber break-out cables.

Cisco QSFP-100G-CWDM4-S

The Cisco QSFP-100G-CWDM4-S Module supports link lengths of up to 2 km over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device.

Cisco QSFP-100G-SM-SR

The Cisco QSFP-100G-SM-SR QSFP module supports link lengths of up to 2 kilometers over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. The operating temperature range is from +10 to +60°C with an optical link budget of 4.2 decibels. This 4.2-decibel link budget offers the ability to support the loss from patch panels in the link in a data center environment. QSFP 100G SM-SR is interoperable with QSFP-100G-CWDM4-S.

Cisco QSFP-100G-LR-S

The Cisco QSFP-100G-LR-S Module supports link lengths of up to 10 km over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using onboard PAM4 modulation and FEC.

Cisco QSFP-100G-LR4-S

The Cisco QSFP100 LR4 Module supports link lengths of up to 10km over a standard pair of G.652 single-mode fiber with duplex LC connectors. It complies with the IEEE 100GBASE-LR4 specification, which does not employ the use of FEC. QSFP-100G-LR4-S supports 100GBase Ethernet rate.

Cisco QSFP-100G-LR4-I

The Cisco QSFP100 LR4 industrial temperature Module supports link lengths of upto 10km over a standard pair of G.652 single-mode fiber with duplex LC connectors. It complies with the IEEE 100GBASE-LR4 specification, which does not employ the use of FEC. QSFP-100G-LR4-I supports 100GBase Ethernet rate within an industrial temperature range.

Cisco QSFP-100G-ERL-S

The Cisco QSFP-100G-ERL-S Module supports link lengths of up to 25 km over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over a single wavelength using onboard PAM4 modulation and FEC. It complies with the 100G LR1-20 standard and interoperates with other transceivers meeting that standard up to 20km.

Cisco QSFP-100G-ER4L-S

The Cisco QSFP100 ER4-Lite supports link lengths of up to 40km over a standard pair of G.652 single-mode fiber with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. Full 40km reach requires the use of FEC on the host platform. Without FEC, the reach is 30km. The QSFP100 ER4-Lite provides backward compatibility with Cisco's CPAK ER4-Lite, whose reach is up to 25km, and with IEEE 100GBASE-ER4 standardized transceivers, such as Cisco's CFP 100G ER4, up to 30km. It also interoperates with Cisco's QSFP100 and CPAK IEEE 100GBASE-LR4 modules up to 10km.

Cisco QSFP-100G-4W40-I

The Cisco QSFP100 4W40-I supports link lengths of up to 40km over a standard pair of G.652 single-mode fiber with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. Full 40km reach requires the use of FEC on the host platform. Without FEC, the reach is 30km. The QSFP100 4W40-I provides backward compatibility with Cisco's CPAK ER4-Lite, whose reach is up to 25km, and with IEEE 100GBASE-ER4 standardized transceivers, such as Cisco's CFP 100G ER4, up to 30km. It also interoperates with Cisco's QSFP100 and CPAK IEEE 100GBASE-LR4 modules up to 10km. The Cisco QSFP100 4W40-I supports industrial temperature range.

Cisco QSFP-100G-ZR4-S

The Cisco QSFP100 ZR4 supports link lengths of up to 80km[#] over a standard pair of G.652 single-mode fiber with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. The module requires the use of FEC on the host platform.

[#] depends upon fiber and connector loss

Table 3. Interoperability matrix for QSFP-100G-ER4L-S

Interoperability matrix	QSFP-100G-ZR4-S	QSFP-100G-ER4L-S with host FEC	CFP-100G-ER4 CFP2-100G-ER4 (IEEE 100GBASE-ER4)	QSFP-100G-ER4L-S (no FEC)	QSFP-100G-ER4F	CPAK-100G-ER4L	CPAK-100G-LR4 QSFP-100G-LR4-S QSFP-100G-LR4-I
QSFP-100G-ZR4-S	80km						
QSFP-100G-ER4L-S with host FEC	40km***	40km					
QSFP-100G-4W40-I with host FEC							
CFP-100G-ER4 CFP2-100G-ER4 (IEEE 100GBASE-ER4)	X	X	40km				

Interoperability matrix	QSFP-100G-ZR4-S	QSFP-100G-ER4L-S with host FEC	CFP-100G-ER4 CFP2-100G-ER4 (IEEE 100GBASE-ER4)	QSFP-100G-ER4L-S (no FEC)	QSFP-100G-ER4F	CPAK-100G-ER4L	CPAK-100G-LR4 QSFP-100G-LR4-S QSFP-100G-LR4-I
QSFP-100G-ER4L-S (no FEC)	40km requires FEC ***	x	30km	30km			
QSFP-100G-4W40-I (no FEC)							
CPAK-100G-ER4L**	x	x	25km	25km*	25km	25km	
CPAK-100G-ER4F	40km***				40km		
CPAK-100G-LR4	10km***	x	10km	10km		10km	10km
QSFP-100G-LR4-S							
QSFP-100G-LR4-I							

* Maximum connector insertion loss 1.5dB

** QSFP-100G-ER4L-S interoperating with CPAK-100G-ER4L is considered an engineered link

*** May require attenuators

Cisco QSFP-100G-CUxM

Cisco QSFP to QSFP copper direct-attach 100GBASE-CR4 cables (Figure 3) are suitable for very short links and offer a cost-effective way to establish a 100-Gigabit link between QSFP-100G ports of Cisco switches within racks and across adjacent racks. Cisco currently offers passive copper cables in lengths of x=1, 1.5, 2, 2.5, 3 and 5 meters.



Figure 2.
QSFP-100G-CU1M cables

Cisco QSFP-4SFP25G-CUxM

Cisco QSFP-100G to four SFP-25G copper direct-attach breakout cables (Figure 2) are suitable for very short links and offer a cost-effective way to connect within racks and across adjacent racks. These breakout cables connect to a 100G QSFP port of a Cisco switch on one end and to four 25G SFP ports of a Cisco switch/server on the other end. Cisco currently offers passive cables in lengths of $x=1, 1.5, 2, 2.5, 3$ and 5 meters.



Figure 3.

QSFP-4SFP25G-CUxM cables

Cisco QSFP-100G-AOCxM

Cisco QSFP-100G to QSFP-100G AOC cables (Figure 4) are suitable for short distances and offer a flexible way to connect within racks and across racks. Active optical cables are much thinner and lighter than copper cables, which makes cable management easier. AOCs enable efficient system airflow, which is critical in high-density racks. Cisco currently offers active optical cables in lengths of $x=1, 2, 3, 5, 7, 10, 15, 20, 25$, and 30 meters.



Figure 4.

QSFP-100G-AOC3M cables

Cisco QSFP28 to SFP28 Adapter Module

The Cisco QSFP28 to SFP28 Adapter (QSA) Module offers 25, 10 and 1 Gigabit Ethernet Connectivity for QSFP 100G ports. The adapter gives customers flexibility to upgrade to 100GE platforms while maintaining connectivity to lower speed endpoints. The Cisco QSA Module converts a QSFP28 port to an SFP28, SFP+ or SFP port. This flexibility allows customers a cost-effective transition to high density 100G platforms, while maintaining low speed connectivity on select ports.



Figure 5.

CVR-QSFP28-SFP25G Adapter

Technical specifications

Platform support

Cisco QSFP modules are supported on Cisco switches and routers. For more details, refer to the [Cisco 100 Gigabit Ethernet Transceiver Modules Compatibility Matrix](#).

Connectors and cabling

Refer to Table 4 for connector type information and cabling specifications for each QSFP product.

Note: Except for QSFP-100G-PSM4-S, only connections with patch cords with PC or Ultra-Physical Contact (UPC) connectors are supported. QSFP-100G-PSM4-S requires patch cords with Angled Physical Contact (APC) MPO connectors. All cables and cable assemblies used must be compliant with the standards specified in the standards section of this data sheet.

Table 4. QSFP Port cabling specifications

Cisco QSFP	Nominal Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz·km) [†]	Cable Distance	Power Consumption (W)	Pull Tab Color
QSFP-100G-SR4-S	850	MMF	50.0	2000 (OM3)	70m	3.5	Beige
			50.0	4700 (OM4)	100m		
				4700 (OM5)	150m		
QSFP-100G-SL4	850	MMF	50.0	2000 (OM3)	20m	2.5	Purple
			50.0	4700 (OM4)	30m		
				4700 (OM5)	30m		
QSFP-100G-SR1.2	855, 908	MMF	50.0	2000 (OM3)	70m	3.9	Gray
			50.0	4700 (OM4)	100m		
				4700 (OM5)	150m		

Cisco QSFP Product Comparison Chart								
Cisco QSFP	Nominal Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz·km) ^{*1}	Cable Distance	Power Consumption (W)	Pull Tab Color	
QSFP-40/100-SRBD	855, 908	MMF	50.0	2000 (OM3)	70m	3.5	Gray	
			50.0	4700 (OM4)	100m			
				4700 (OM5)	150m			
QSFP-100G-PSM4-S	1310	SMF	G.652	–	500m	3.5	Orange	
QSFP-100G-DR-S	1310	SMF	G.652	–	500m	4.3	Orange	
QSFP-100G-FR-S	1310	SMF	G.652	–	2km	4.3	Green	
QSFP-100G-CWDM4-S	1271, 1291, 1311, 1331	SMF	G.652	–	2km	3.5	Green	
QSFP-100G-SM-SR	1271, 1291, 1311, 1331	SMF	G.652	–	2km	3.5	Green	
QSFP-100G-LR-S	1310	SMF	G.652	–	10km	4.0	Blue	
QSFP-100G-LR4-S	1295, 1300, 1304, 1309	SMF	G.652	–	10km	4.0	Blue	
QSFP-100G-LR4-I	1295, 1300, 1304, 1309	SMF	G.652	–	10km	4.0	Blue	
QSFP-100G-ERL-S	1310	SMF	G.652	–	25km	4.0	Purple	
QSFP-100G-ER4L-S	1295, 1300, 1304, 1309	SMF	G.652	–	40km (with host FEC) 30km (without host FEC)	4.5	Red	
QSFP-100G-4W40-I	1295, 1300, 1304, 1309	SMF	G.652	–	40km (with host FEC) 30km (without host FEC)	4.5	Red	
QSFP-100G-ZR4-S	1295, 1300, 1304, 1309	SMF ^{*3}	G.652	–	80km ^{*2}	5.5	Black	
QSFP-100G-CU1M	–	Direct-attach copper cable assembly	–	–	1m	1.5 per end	Beige	
QSFP-100G-CU1.5M	–		–	–	1.5m		Beige	
QSFP-100G-CU2M	–		–	–	2m		Brown	
QSFP-100G-CU2.5M	–		–	–	2.5m		Brown	
QSFP-100G-CU3M	–		–	–	3m		Orange	
QSFP-100G-CU5M	–		–	–	5m		Gray	

Cisco QSFP	Nominal Wavelength (nm)	Cable Type	Core Size (Microns)	Modal Bandwidth (MHz·km) ^{*1}	Cable Distance	Power Consumption (W)	Pull Tab Color
QSFP-4SFP25G-CU1M	–	Active optical cable assembly	–	–	1m	3.5 per end	Beige
Q-4SFP25G-CU1.5M	–		–	–	1.5m		Beige
QSFP-4SFP25G-CU2M	–		–	–	2m		Brown
Q-4SFP25G-CU2.5M	–		–	–	2.5m		Brown
QSFP-4SFP25G-CU3M	–		–	–	3m		Orange
QSFP-4SFP25G-CU5M	–		–	–	5m		Gray
QSFP-100G-AOC1M	–		–	–	1m		Beige
QSFP-100G-AOC2M	–		–	–	2m		Brown
QSFP-100G-AOC3M	–		–	–	3m		Orange
QSFP-100G-AOC5M	–		–	–	5m		Gray
QSFP-100G-AOC7M	–		–	–	7m	1.5W without module, total max power with module 4W	Blue
QSFP-100G-AOC10M	–		–	–	10m		Red
QSFP-100G-AOC15M	–		–	–	15m		Black
QSFP-100G-AOC20M	–		–	–	20m		Green
QSFP-100G-AOC25M	–		–	–	25m		Green
QSFP-100G-AOC30M	–		–	–	30m		Green
CVR-QSFP28-SFP25G							Gray

^{*1} Specified at transmission wavelength. For QSFP-40/100-SRBD, Modal Bandwidth is specified at 850nm

^{*2} Maximum reach of 80 km (engineered Link) with 29dB link loss. Fiber attenuation of 0.35dB/km (instead of 0.43dB/km worst case) with 1dB connectors loss (instead of 1.6dB).

^{*3} Dispersion tolerance: -225, +75 ps/nm

Table 5 shows the key optical characteristics for the Cisco QSFP modules.

Table 5. Optical characteristics

Product	Descriptions	Transmit Power (dBm) per lane ^{*2}				Maximum	Minimum	Maximum	Minimum	Number of lanes	Wavelength Range (nm)
		Maximum	Minimum	Maximum	Minimum						
QSFP-100G-SR4-S	100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF	+2.4	-8.4	+2.4	-10.3	8	40 to 860				
QSFP-100G-SL4	100GBASE SL4 QSFP Transceiver, MPO, 30m over OM4 MMF	+2.4	-8.4	+2.4	-10.3	8	40 to 860				
QSFP-100G-SR1.2	100GBase SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF	+4 (100G)	-6 (100G)	4 (100G)	-7.9(100G)	8	55, 908				
QSFP-40/100G-SRBD	100G and 40GBASE SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF	+4 (100G) +5 (40G)	-6 (100G) -4 (40G)	4 (100G) 5 (40G)	-7.9(100G) -6 (40G)	8	55, 908				
QSFP-100G-PSM4-S	100GBASE PSM4 QSFP Transceiver, MPO, 500m over SMF	+2.0	-9.4	+2	-12.66	1	295 to 1325				
QSFP-100G-DR-S	100GBASE DR QSFP Transceiver, 500m over SMF	4	-2.9	4	-5.9	1	304.5 to 1317.5				
QSFP-100G-FR-S	100GBASE FR QSFP Transceiver, 2km over SMF	4	-3.1	4	-7.1	1	304.5 to 1317.5				
QSFP-100G-CWDM4-S	100GBASE CWDM4 QSFP Transceiver, LC, 2km over SMF	+2.5	-6.5	+2.5	-11.5	F	our lanes: 1271, 1291, 1311, 1331				
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10–60C	+2.5	-6.9	+2.5	-11.1	F	our lanes: 1271, 1291, 1311, 1331				
QSFP-100G-LR-S	100GBASE LR QSFP Transceiver, 10km over SMF	4.5	-1.4	4.5	-7.7	1	304.5 to 1317.5				
QSFP-100G-ERL-S	100GBASE ER-Lite QSFP Transceiver, 25km over SMF	6.6	-0.2	6.6	-10.5	1	304.5 to 1317.5				
QSFP-100G-LR4-S	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF	+4.5	-4.3	4.5	-10.6	F	our lanes: 1295, 1300, 1304, 1309				
QSFP-100G-LR4-I	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF, I-Temp	+4.5	-4.3	4.5	-10.6	F	our lanes: 1295, 1300, 1304, 1309				

Product	Descriptions	Transmit Power (dBm) per lane ²				F	our lanes: 1295, 300, 1304, 1309
		Maximum	Minimum	Maximum	Minimum		
QSFP-100G-ER4L-S ^{*4}	100GBASE QSFP Transceiver, 25–40KM reach over SMF, Duplex LC	+6.5 ^{*5}	-2.5 ^{*5}	-3.5 ^{*5}	-20.5 ^{*5} (with FEC) -17 ^{*5} (without FEC)	1	
QSFP-100G-4W40-I	100GBASE QSFP Transceiver, 25–40KM reach over SMF, Duplex LC, I-Temp	+6.5	-2.5	-3.5 ^{*5}	-20.5 ^{*5} (with FEC) -16 (without FEC)	1	
QSFP-100G-ZR4-S	100GBASE QSFP Transceiver, 80 km reach over SMF, Duplex LC	+7	+2	-4.5	-27	1	

^{*2} Transmitter and receiver power is average optical power, unless specified

^{*3} Optical power at RX is informative only. A received power within this range is required but does not ensure operation

^{*4} Minimum channel insertion loss is 6.4dB for QSFP-100G-ER4L-S

^{*5} V01 of QSFP-100G-ER4L-S allows Tx Power range with +4.5 (Max) to -2.9 (Min) and Rx Power range with -4.9 (Max) to -19.9 (Min)

Table 6 shows the cable breakout location from the 100G side.

Table 6. 100G to 25G cable breakout location

Product ID	Breakout Location (from 100G end)
QSFP-4SFP25-CU1M	0.33m
QSFP-4SFP25-CU2M	0.66m
QSFP-4SFP25-CU3M	1m
QSFP-4SFP25-CU4M	1.5m
QSFP-4SFP25-CU5M	2m

Table 7 shows the cable specifications for bend radius and diameter

Table 7. 100G cable specifications (diameter, bend radius)

Cisco P/N	Description	Diameter	BendRadius
QSFP-100G-AOC1M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 1M	3.5	30
QSFP-100G-AOC2M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 2M	3.5	30
QSFP-100G-AOC3M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 3M	3.5	30
QSFP-100G-AOC5M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 5M	3.5	30
QSFP-100G-AOC7M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 7M	3.5	30
QSFP-100G-AOC10M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 10M	3.5	30
QSFP-100G-AOC15M=	100GBASE QSFP ACTIVE OPTICAL CABLE, 15M	3.5	30
QSFP-100G-CU1M	100GBASE-CR4 Passive Copper Cable, 1m	7	50
QSFP-100G-CU2M	100GBASE-CR4 Passive Copper Cable, 2m	7	50
QSFP-100G-CU3M	100GBASE-CR4 Passive Copper Cable, 3m	7	50
QSFP-100G-CU5M	100GBASE-CR4 Passive Copper Cable, 5m	9	70

Dimensions

Maximum outer dimensions for the QSFP connector module are (H x W x D) 13.5 x 18.4 x 72.4 mm.

Cisco QSFP connector modules typically weigh 100 grams or less.

Environmental conditions

Operating temperature range:

- Commercial temperature range: 0 to 70°C (32 to 158°F). Exceptions are
 - QSFP-100G-SM-SR: +10 to 60°C (50 to 140°F)
 - QSFP-100G-SR1.2: +10 to 60°C (50 to 140°F)
 - QSFP-40/100-SRBD:
 - 100G: +10C to +60C
 - 40G: +10C to +70C
- Storage temperature range: -40 to 85°C (-40 to 185°F)
- Industrial temperature range: -40 to 85°C (-40 to 185°F)

Warranty

- Standard warranty: 5 years
- Expedited replacement available via a Cisco SMARTnet Service support contract

Ordering information

Table 8 provides the ordering information for Cisco QSFP 100G modules and related cables.

Table 8. Ordering information

Description	Product Number
QSFP Optics Modules	
Cisco 100GBASE-SR4 QSFP Transceiver, MPO-12, 100m over OM4 MMF	QSFP-100G-SR4-S
Cisco 100GBASE-SL4 QSFP Transceiver, MPO-12, 30m over OM4 MMF	QSFP-100G-SL4
Cisco 100GBASE SR-BIDI QSFP Transceiver, LC, 100m OM4 MMF	QSFP-100G-SR1.2
Cisco 100G and 40G SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF	QSFP-40/100-SRBD
Cisco 100G PSM4 QSFP Transceiver, MPO-12, 500m over SMF	QSFP-100G-PSM4-S
Cisco 100GBASE-DR1 QSFP Transceiver, 500m over SMF	QSFP-100G-DR-S
Cisco 100GBASE-FR QSFP Transceiver, 2km over SMF	QSFP-100G-FR-S
Cisco 100G CWDM4 QSFP Transceiver, LC, 2km over SMF	QSFP-100G-CWDM4-S
Cisco 100G CWDM4 Lite QSFP Transceiver, 2km over SMF, 10-60C	QSFP-100G-SM-SR
Cisco 100GBASE-LR QSFP Transceiver, 10km over SMF	QSFP-100G-LR-S
Cisco 100GBASE-LR4 QSFP Transceiver, LC, 10km over SMF	QSFP-100G-LR4-S
Cisco 100GBASE-LR4 QSFP I-Temp Transceiver, LC, 10km over SMF	QSFP-100G-LR4-I
Cisco 100GBASE-ER-Lite QSFP Transceiver, 25km over SMF	QSFP-100G-ERL-S
Cisco 100G ER4-Lite QSFP Transceiver, 40KM reach over SMF, Duplex LC	QSFP-100G-ER4L-S
Cisco 100G WDM-40 QSFP Transceiver, 40KM reach over SMF, Duplex LC	QSFP-100G-4W40-I
Cisco 100GBASE-ZR4 QSFP Transceiver, 80KM reach over SMF, Duplex LC	QSFP-100G-ZR4-S

Description	Product Number
QSFP Direct-Attach Copper Modules	
Cisco 100GBASE-CR4 QSFP Passive Copper Cable, 1-meter	QSFP-100G-CU1M
Cisco 100GBASE-CR4 QSFP Passive Copper Cable, 1.5-meter	QSFP-100G-CU1.5M
Cisco 100GBASE-CR4 QSFP Passive Copper Cable, 2-meter	QSFP-100G-CU2M
Cisco 100GBASE-CR4 QSFP Passive Copper Cable, 2.5-meter	QSFP-100G-CU2.5M
Cisco 100GBASE-CR4 QSFP Passive Copper Cable, 3-meter	QSFP-100G-CU3M
Cisco 100GBASE-CR4 QSFP Passive Copper Cable, 5-meter	QSFP-100G-CU5M
Cisco 100G QSFP to 4xSFP25G Passive Copper Splitter Cable, 1-meter	QSFP-4SFP25G-CU1M
Cisco 100G QSFP to 4xSFP25G Passive Copper Splitter Cable, 1.5-meter	Q-4SFP25G-CU1.5M
Cisco 100G QSFP to 4xSFP25G Passive Copper Splitter Cable, 2-meter	QSFP-4SFP25G-CU2M
Cisco 100G QSFP to 4xSFP25G Passive Copper Splitter Cable, 2.5-meter	Q-4SFP25G-CU2.5M
Cisco 100G QSFP to 4xSFP25G Passive Copper Splitter Cable, 3-meter	QSFP-4SFP25G-CU3M
Cisco 100G QSFP to 4xSFP25G Passive Copper Splitter Cable, 5-meter	QSFP-4SFP25G-CU5M
Cisco 100G QSFP Active Optical Cable, 1-meter	QSFP-100G-AOC1M
Cisco 100G QSFP Active Optical Cable, 2-meter	QSFP-100G-AOC2M
Cisco 100G QSFP Active Optical Cable, 3-meter	QSFP-100G-AOC3M
Cisco 100G QSFP Active Optical Cable, 5-meter	QSFP-100G-AOC5M
Cisco 100G QSFP Active Optical Cable, 7-meter	QSFP-100G-AOC7M
Cisco 100G QSFP Active Optical Cable, 10-meter	QSFP-100G-AOC10M
Cisco 100G QSFP Active Optical Cable, 15-meter	QSFP-100G-AOC15M
Cisco 100G QSFP Active Optical Cable, 20-meter	QSFP-100G-AOC20M
Cisco 100G QSFP Active Optical Cable, 25-meter	QSFP-100G-AOC25M
Cisco 100G QSFP Active Optical Cable, 30-meter	QSFP-100G-AOC30M
Cisco 100G QSFP to SFP25G Adapter	CVR-QSFP28-SFP25G

Product sustainability

Information about Cisco's Environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability [reporting](#).

Table 9. Cisco environmental sustainability information

Sustainability Topic	Reference
General	Information on product-material-content laws and regulations
	Information on electronic waste laws and regulations, including our products, batteries and packaging
	Information on product takeback and reuse program
	Sustainability Inquiries Contact: csr_inquiries@cisco.com
Power	SFP Port cabling specifications
Material	Product packaging weight and materials Contact: environment@cisco.com

Regulatory and Standards compliance

Standards

- SFF-8665: QSFP+ 28 Gb/s 4X Pluggable Transceiver Solution (QSFP28) – Rev 1.8 May 10, 2013
- SFF-8636: Common Management Interface – DRAFT Rev 1.9 May 12, 2014
- 802.3-2012 IEEE Standard for Ethernet
- IEEE 802.3ba Amendment of IEEE Std 802.3-2012
- IEEE 802.3bm Amendment of IEEE Std 802.3-2012 (D3.1, 1st August 2014)
- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- GR-468-CORE: Generic Requirements for Optoelectronic Devices Used in Telecommunications Equipment
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- RoHS 6

Safety

- Cable jacket of QSFP copper modules is UL E116441 Compliant
- QSFP copper cables are ELV compliant
- Modules are compliant with Laser Class 1 as defined in IEC 60825-1, IEC 60825-2 and Comply with 21 CFR 1040.10 and 1040.11

Table 10. Laser Class for the QSFP-100G Optical modules

Product	Laser Class
Cisco QSFP-100G-SR4-S	1
Cisco QSFP-100G-SL4	1
Cisco QSFP-100G-SR1.2	1M
Cisco QSFP-40/100-SRBD	1M
Cisco QSFP-100G-PSM4-S	1
Cisco QSFP-100G-DR-S	1
Cisco QSFP-100G-FR-S	1
Cisco QSFP-100G-CWDM4-S	1
Cisco QSFP-100G-SM-SR	1
Cisco QSFP-100G-LR-S	1
Cisco QSFP-100G-LR4-S	1
Cisco QSFP-100G-LR4-I	1
Cisco QSFP-100G-ERL-S	1
Cisco QSFP-100G-ER4L-S	1
QSFP-100G-4W40-I	1
Cisco QSFP-100G-ZR4-S	1

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. [Learn more.](#)

Additional information

For more information about Cisco 100GBASE QSFP optics and copper modules, contact your sales representative or visit

https://www.cisco.com/en/US/products/hw/modules/ps5455/prod_module_series_home.html.

Document history

New or Revised Topic	Described In	Date
Added QSFP-100G-4W40-I and QSFP-100G-LR4-I and Corresponding product details.	Table 1	April 27, 2021

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at <https://www.cisco.com/go/offices>.

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DATA SHEET

ARUBA CX 6300 SWITCH SERIES

PRODUCT OVERVIEW

The Aruba CX 6300 Switch Series is a modern, flexible and intelligent family of stackable switches ideal for enterprise network access, aggregation, core and data center top of rack (ToR) deployments. Created for game-changing operational efficiency with built-in security and resiliency, the 6300 switches provide the foundation for high-performance networks supporting IoT, mobile and cloud applications.

Built from the ground up with a combination of cutting-edge hardware, software and analytics and automation tools, the stackable 6300 switches are part of the Aruba CX switching portfolio, designed for today's enterprise campus, branch and data center networks. By combining a modern, fully programmable OS with the Aruba Network Analytics Engine, the 6300 switches provide industry leading monitoring and troubleshooting capabilities for the access layer.

A powerful Aruba Gen7 ASIC architecture delivers performance and robust feature support with flexible programmability for tomorrow's applications. The Aruba Virtual Stacking Framework (VSF) allows for stacking of up to 10 switches, providing scale and simplified management. This flexible series has built-in wirespeed 1/10/25/50GbE¹ uplinks and supports high density IEEE 802.3bt high power PoE. HPE Smart Rate multi-gigabit Ethernet paves the way for high speed access points and IoT devices by delivering fast connectivity and high power PoE using existing cabling. Modular models offer redundancy and PoE customization with hot-swappable power supplies and fans. Back-to-front airflow available in switch bundle for hot-cold aisle top-of-rack (TOR) and out-of-band-management (OOBM) data center deployments.

Aruba Dynamic Segmentation extends Aruba's foundational wireless role-based policy capability to Aruba wired switches. What this means is that the same security, user experience and simplified IT management can be enjoyed throughout the network. Regardless of how users and IoT devices connect, consistent policies are enforced across wired and wireless networks, keeping traffic secure and separate.



KEY BENEFITS

- Stackable Layer 3 switches with BGP, EVPN, VXLAN, VRF, and OSPF with robust security and QoS
- High performance 880 Gbps system switching capacity, 660 MPPS of system throughput and up to 200 Gbps stacking bandwidth
- Compact 1U switches with full density HPE Smart Rate (1G/2.5G/5G/10GbE) multi-gigabit, up to 90W PoE (Class 8) and 10G LRM SFP+ available on select models
- Power-to-port switch bundle with back-to-front airflow ideal for data center 1GbE ToR and OOBM deployments
- Built-in high speed 1/10/25/50GbE uplinks¹
- 50GbE connectivity with 50GbE DACs¹
- Intelligent monitoring, visibility, and remediation with Aruba Network Analytics Engine
- Manage via single pane of glass with Aruba Central across wired, wireless, and WAN
- Aruba NetEdit support for automated configuration and verification
- Aruba Dynamic Segmentation enables secure and simple access for users and IoT

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



PRODUCT DIFFERENTIATORS

AOS-CX - a modern operating system

The Aruba CX 6300 Switch Series is based on AOS-CX, a modern, database-driven operating system that automates and simplifies many critical and complex network tasks. A built-in time series database enables customers and developers to utilize software scripts for historical troubleshooting, as well as analysis of past trends. This helps predict and avoid future problems due to scale, security, and performance bottlenecks. AOS-CX operating system features are organized into Aruba CX Foundation and Aruba CX Advanced software licenses.

Every Aruba CX switch includes an active, embedded AOS-CX Foundation license at no additional cost with the option to upgrade to an Aruba CX Advanced license.

The CX Foundation license has everything needed to deploy, connect, and troubleshoot an enterprise network, including:

- Aruba Network Analytics Engine (NAE)
- Dynamic Segmentation
- Switch Stacking
- High Availability and Resiliency
- Quality of Service (QoS)
- Layer 2 Switching
- Layer 3 Services and Routing
- IP Multicast
- Network Security
- Support for Aruba NetEdit

The Aruba CX Advanced license includes Aruba CX Edge Insights, offering deep visibility with application recognition, identification, and flow capture from layer 4 to layer 7.

For more information on the CX Advanced License, read the [Aruba CX Switch License Ordering Guide](#).

Because AOS-CX is built on a modular Linux architecture with a stateful database, our operating system provides the following unique capabilities:

- Easy access to all network state information allows unique visibility and analytics
- REST APIs and Python scripting for fine-grained programmability of network tasks
- A micro-services architecture that enables full integration with other workflow systems and services
- Continuous telemetry data with WebSocket subscriptions for event driven automation

- Continual state synchronization that provides superior fault tolerance and high availability
- All software processes communicate with the database rather than each other, ensuring near real-time state and resiliency and allowing individual software modules to be independently upgraded for higher availability

Aruba Central - unified single pane of glass management

Aruba Central is an AI-powered solution that simplifies IT operations, improves agility, and reduces costs by unifying management of all network infrastructure. Built for enterprise-grade resiliency and security, while simple enough for smaller businesses with limited IT staff, Aruba Central is your single point of visibility and control that spans the entire network --from branch to data center, wired and wireless LAN to WAN.

Available as a cloud-based or on-premises solution, Aruba Central is designed to simplify day zero through day two operations with streamlined workflows for tasks such as virtual switch stack creation, automated monitoring using AI-powered insights and NAE, as well as a unified view of all devices and users, both wired and wireless. Comprehensive switch management capabilities include configuration, on-boarding, monitoring, troubleshooting, and reporting.

An Aruba Central Advanced license expands these capabilities with premium security and AIOps, including the Aruba Central NetConductor Fabric Wizard and Policy Manager to enable dynamic segmentation and distributed enforcement at a global scale.

With the Aruba Central Advanced license there is no need to purchase a CX Advanced license. This streamlines operational efficiency, reducing the need for your IT team to keep track of multiple licenses, active terms, and renewal dates. For more information on Aruba Central licensing, see the [Aruba Central SaaS Subscription Ordering Guide](#).

Aruba Network Analytics Engine - advanced monitoring and diagnostics

For enhanced visibility and troubleshooting, Aruba's Network Analytics Engine (NAE) automatically monitors and analyzes events that can impact network health. Advanced telemetry and automation provide the ability to easily identify and troubleshoot network, system, application and security related issues easily, through the use of python agents, CLI-based agents, CLI-based agents and REST APIs



The Time Series Database (TSDB) stores configuration and operational state data, making it available to quickly resolve network issues. The data may also be used to analyze trends, identify anomalies and predict future capacity requirements.

Aruba Central uses NAE and agents to deliver switch monitoring, analytics, and enhanced troubleshooting for wired assurance. Aruba NetEdit and third-party tools such as ServiceNow and Slack provide the intelligence to integrate NAE alerts into IT service management processes, speeding problem resolution.

Aruba NetEdit - automated switch configuration and management

The Aruba CX portfolio empowers IT teams to orchestrate multiple switch configuration changes for smooth end-to-end service rollouts. Aruba NetEdit introduces automation that allows for rapid network-wide changes, and ensures policy conformance post network updates. Intelligent capabilities include search, edit, validation (including conformance checking), deployment and audit features. Capabilities include:

- Centralized configuration with validation for consistency and compliance
- Time savings via simultaneous viewing and editing of multiple configurations
- Customized validation tests for corporate compliance and network change analysis
- Automated large-scale configuration deployment without programming
- Network health and topology visibility via Aruba NAE integration

Note: A separate software license is required to use Aruba NetEdit.

Aruba CX Mobile App – true deployment convenience

An easy to use mobile app simplifies connecting and managing Aruba CX 6300 switches for any size project. Switch information can also be imported into Aruba NetEdit for simplified configuration management and to continuously validate the conformance of configurations anywhere in the network. The Aruba CX Mobile App is available for download.

Aruba ASICs - programmable innovation

Based on over 30 years of continuous investment, Aruba's ASICs create the basis for innovative and agile software feature advancements, unparalleled performance and deep visibility. These programmable ASICs are purpose-built to allow for a tighter integration of switch hardware and software within campus and data center architectures to optimize performance and capacity. Virtual Output Queuing (VOQ) isolates congestion, prevents Head of Line Blocking (HOLB) and allows full line rate on outgoing (egress) ports. Flexible ASIC resources enable Aruba's NAE solution to inspect all data, which allows for industry-leading analytics capabilities. The Aruba CX 6300 is based on the Aruba Gen7 ASIC architecture.

Aruba Dynamic Segmentation – campus and branch fabric

The Aruba Dynamic Segmentation solution enables seamless mobility, consistent policy enforcement, and automated configurations for wired and wireless clients across networks of all sizes. It unifies role-based access and policy enforcement across LAN, WLAN, and SD-WAN networks with centralized policy definition and dedicated enforcement points, ensuring that users and devices can only communicate with destinations consistent with their role - keeping traffic secure and separate. Dynamic Segmentation is based on establishing least privilege access to IT resources by segmenting traffic based on identity, a fundamental concept of both Zero Trust and SASE frameworks where trust is based on roles and policies, not on where and how a user or device connects.

This innovation begins with colorless ports and role-based micro-segmentation technologies. Colorless ports allow wired clients to connect to any switch port, with the configuration automated using RADIUS-based access control. This eliminates the need for manual on-boarding of clients, including IoT devices, onto the network.

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



Role-based micro-segmentation delivers benefits of reduced subnet and VLAN sprawl, simplified policy definition, and scalable policy enforcement by introducing the concept of client user roles. Independent of network constructs such as VLANs and VRFs, clients can be grouped into a user role based on their identity, allowing the colorless ports technology to be extended to the centralized overlay fabric, as clients are on-boarded with automatic tunnel creation based on the associated user roles policy. The user roles policy offers the choice between micro-segmentation using centralized and unified policy enforcement for wireless and wired traffic with Layer 7 stateful firewall on gateways or a distributed approach with a Layer 4 role-role ACL on switches.

Dynamic Segmentation provides scale and flexibility in network design by allowing the stretching of VLANs and subnets across the entire network with an EVPN/VXLAN-based distributed overlay fabric. Fabric overlays use VXLAN or VXLAN-GBP tunnels on the data plane and provide the option of a Multi-Protocol BGP EVPN control plane for large deployments, or a static Layer 2 control plane for simplified deployments.

Mobility and IoT performance

The Aruba CX 6300 Switch Series uses a fully distributed architecture that utilizes the Aruba Gen7 ASICs. This ensures that our switches offer very low latency, increased packet buffering, and adaptive power consumption. All switching and routing are wire-speed to meet the demands of bandwidth-intensive applications today and in the future. Each switch includes the following:

- Up to 880 Gbps in non-blocking bandwidth and up to 660 Mpps for forwarding
- 1/10/25/50GbE uplinks¹ and large TCAM sizes ideal for mobility and IoT deployments in large campuses with several thousand clients
- Selectable queue configurations that allow for increased performance by defining a number of queues and associated memory buffering to best meet the requirements of network applications

VSF Stacking - scale and simplicity

The Aruba Virtual Switching Framework (VSF) allows you to quickly grow your network using high performance front plane stacking. Additional features include:

- Support for up to 10 switches (or members) in a stack via chain or ring topology
- Flexibility to create stacks that span longer distances such as hundreds of meters across campuses to kilometres between sites using long-range 10GbE/25GbE transceivers
- Flexibility to mix both modular and fixed Aruba 6300 models within a single stack to meet your deployment requirements
- Simplified configuration and management as the switches act as a single chassis when stacked
- Support for enhanced software upgrades for VSF stacked 6300 switches
- The Aruba CX Mobile app provides support for a validated stack deployment that ensure that all stack links and uplinks are connected properly

An Aruba CX 6300 switch for any enterprise environment

Whether in the branch office or a small to large enterprise environment, you can choose from 24 and 48 port 1U models. Each switch includes four high-speed built-in uplinks that auto-negotiate from 1GbE, 10GbE to 50GbE¹ to deliver non-blocking performance. Fixed format (F) models include built-in power supplies. The modular (M) models have rear slots for hot swappable power supplies that allow you to customize your PoE requirements, and its fans are field replaceable. Additional highlights:

- Compact 1U models support:
 - 24 and 48 ports of HPE Smart Rate Multi-gigabit Ethernet IEEE 802.3bz (100M²/1GbE/2.5GbE/5GbE/10GbE) supporting high power IEEE 802.3bt Class 6 (60W) to Class 8 (90W)
 - High density 24 port SFP+ model which is ideal for aggregation
 - 1/10/25/50GbE uplink¹ port connectivity
- HPE Smart Rate Multi-Gigabit (IEEE 802.3bz) Ethernet supports high speed wireless access points
- For deployments that need higher port and PoE density, the 6300 supports up to 90W of PoE in a 48-port switch for a total of 2880W of PoE

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.

² 100M use on Smart Rate ports is limited to full-duplex only. For 100M half-duplex support, use 1G ports on other models.



- Industry standard IEEE 802.3bt High Power PoE support (Class 8) provides up to 90W to support of the latest IoT devices and APs. PoE support for IEEE 802.3at Power over Ethernet (PoE+) provides up to 30W per port as well as any IEEE 802.3af-compliant end device
- Support for pre-standard PoE detection provides power to legacy PoE devices
- High availability with always-on PoE that supplies PoE power even during scheduled reboots and firmware upgrades
- Quick PoE supplies PoE power to powered devices as soon as the switch is plugged into AC power so device can initialize at same time as switch OS boots up.
- Support for Energy Efficient Ethernet IEEE 802.3az reduces power consumption during periods of low network traffic.
- Support for top-of-rack (ToR) and out-of-band management (OOBM) data center deployments with CX 6300M Power-to-port bundle that delivers required power-to-port (back to front) airflow.
- Auto-MDIX provides automatic adjustments for straight-through or crossover cables on all 10M/100M/1G, and Smart Rate ports
- Unsupported Transceiver Mode (UTM) allows to insert and enable all unsupported 1/10/25/50GbE transceivers and cables. Note that there is no warranty nor support for the transceiver/cable when this feature is used
- IPv6 capabilities include:
 - IPv6 host enables switches to be managed in an IPv6 network
 - Dual stack (IPv4 and IPv6) transitions from IPv4 to IPv6, supporting connectivity for both protocols
 - MLD snooping forwards IPv6 multicast traffic to the appropriate interface
 - IPv6 ACL/QoS supports ACL and QoS for IPv6 network traffic
 - IPv6 routing supports Static and OSPFv3 protocols
 - Security provides RA guard, DHCPv6 protection, dynamic IPv6 lockdown, ND snooping, IPv6 Destination Guard, IPv6 DHCP Guard, and IPv6 Router Advertisement Guard
- Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes
- Packet storm protection against broadcast and multicast storms with user-defined thresholds

- Smart link enables simple, fast converging link redundancy and load balancing with dual uplinks avoiding Spanning Tree complexities

CX 6300M bundle for data centers

The CX 6300M 48 port power-to-port switch bundle serves as a top of rack (ToR) switch for 1GbE servers and also as a 1GbE out-of-band management (OOBM) switch for data centers server racks. Features include:

- Power-to-port bundle (JL762A) includes 48 port 1GbE switch with 2 x Fan Trays (JL761A) and 1 x power supply (JL760A)
- Back (power-side) to front (1GbE port side) airflow
- 1/10/25/50GbE¹ SFP uplinks

High availability and resiliency

To ensure a high degree of up-time we offer high availability and multicast features needed for a full Layer 3 deployment at access and aggregation such as PBR, BFD, MSDP, BSR, and IP SLA without the need for software licenses. This includes:

- Hot Swappable Power Supplies available in the 6300 "M" models
 - Provides N+1 and N+N redundancy for high reliability in the event of power line or supply failures
 - Optional secondary power supplies to increase the total available PoE power
 - Fixed power supplies in 6300 "F" models
- Bidirectional Forward Detection (BFD) enables sub-second failure detection for rapid routing protocol re-balancing, supporting both IPV4 and IPV6 networks
- Virtual Router Redundancy Protocol (VRRP) allows groups of two routers to dynamically create highly available routed environments in IPV4 and IPV6 networks
- Uni-directional Link Detection (UDLD) to monitor link connectivity and shut down ports at both ends if uni-directional traffic is detected, preventing loops in STP-based networks
- IEEE 802.3ad LACP supports up to 256 LAGs, each with up to 8 links per LAG; and provides support for static or dynamic groups and a user-selectable hashing algorithm
- IEEE 802.1s Multiple Spanning Tree provides high link availability in VLAN environments where multiple spanning trees are required; and legacy support for IEEE 802.1d and IEEE 802.1w

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



- IEEE 802.3ad link-aggregation-control protocol (LACP) and port trunking support static and dynamic trunks where each trunk supports up to eight links (ports) per static trunk
- Support for Microsoft Network Load Balancer (NLB) for server applications
- Ethernet Ring Protection Switching (ERPS) supports rapid protection and recovery in a ring topology
- Hot-Patching support for standalone CX 6300 and for 6300 with VSF Stacking

Quality of Service (QoS) features

To support congestion actions and traffic prioritization, the Aruba CX 6300 Series includes the following:

- Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR)
- Traffic prioritization (IEEE 802.1p) for real-time classification into 8 priority levels that are mapped to 8 queues
- Layer 4 prioritization based on TCP/UDP port numbers
- Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ
- Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums
- Transmission rates of egressing frames can be limited on a per-queue basis using Egress Queue Shaping (EQS)
- Large buffers for graceful congestion management

Simplified configuration and management

In addition to Aruba Central, the Aruba CX Mobile App, Aruba NetEdit and Aruba Network Analytics Engine, the 6300 series offers the following:

- Built-in programmable and easy to use REST API interface
- Simple day zero provisioning
- Scalable ASIC-based wire speed network monitoring and accounting with no impact on network performance; network operators can gather a variety of network statistics and information for capacity planning and real-time network monitoring purposes
- Management interface control enables or disables each of the following depending on security preferences, console port, or reset button
- Industry-standard CLI with a hierarchical structure for reduced training time and expense. Delivers increased productivity in multivendor environments

- Management security restricts access to critical configuration commands, provides multiple privilege levels with password protection and local and remote syslog capabilities allow logging of all access
- SNMP v2c/v3 provides SNMP read and trap support of industry standard Management Information Base (MIB), and private extensions
- SNMP support includes: Write Set Speed and Duplex, Write Port Security, Write POE Priority, Write Config Mgmt, SNMP-Read single OID for average CPU and memory, SNMP MIB View
- SNMP Trap include: Transceiver Traps (insertion/removal), SNMP Trap, SNMP MIB-SNMB Authentication, SNMPv2 MIB, Port Sec MIB-Port Sec, Config MIB-Running Config Change, Config MIB, AAA Server MIB, AAA Server State
- Remote monitoring (RMON) with standard SNMP to monitor essential network functions. Supports events, alarms, history, and statistics groups as well as a private alarm extension group; RMON, and sFlow provide advanced monitoring and reporting capabilities for statistics, history, alarms and events
- IP Flow Information Export (IPFix) enables client flow information collection to enhance visibility
- Simplifies configuration while onboarding switches with Zero Touch Provisioning by using Dynamic Border Gateway Protocol (BGP) peering to establish a peer group of switches within an IP range
- Provides insights on latency, failures, and error events through Aruba Central for enhanced visibility during client onboarding
- TFTP and SFTP support offers different mechanisms for configuration updates; trivial FTP (TFTP) allows bidirectional transfers over a TCP/ IP network; Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security
- Debug and sampler utility supports ping and traceroute for IPv4 and IPv6
- Network Time Protocol (NTP) synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so the devices can provide diverse applications based on the consistent time
- 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



- Dual flash images provides independent primary and secondary operating system files for backup while upgrading
- Assignment of descriptive names to ports for easy identification
- Multiple configuration files can be stored to a flash image
- Ingress and egress port monitoring enable more efficient network problem solving
- Unidirectional link detection (UDLD) monitors the link between two switches and blocks the ports on both ends of the link if the link goes down at any point between the two devices
- IP SLA for Voice monitors quality of voice traffic using the UDP Jitter and UDP Jitter for VoIP tests
- Precision Time Protocol (PTP) allows for precise clock synchronization across distributed network switches as defined in IEEE 1588. Transparent Clock (PTP-TC) and Boundary Clock (PTP-BC) are needed for time critical applications like smart grid power automation, financial systems and more. Boundary Clock makes use of 2-Step time stamping mode.

Layer 2 Switching

The following layer 2 services are supported:

- VLAN support and tagging for IEEE 802.1Q (4094 VLAN IDs)
- Jumbo packet support improves the performance of large data transfers; supports frame size of up to 9198 bytes
- IEEE 802.1v protocol VLANs isolate select non-IPv4 protocols automatically into their own VLANs
- Rapid Per-VLAN Spanning Tree(RPVST+) allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+
- MVRP allows automatic learning and dynamic assignment of VLANs
- VXLAN encapsulation (tunnelling) protocol for overlay network that enables a more scalable virtual network deployment
- Bridge Protocol Data Unit (BPDU) tunnelling Transmits STP BPUDUs transparently, allowing correct tree calculations across service providers, WANs, or MANs
- Port mirroring duplicates port traffic (ingress and egress) to a monitoring port; supports 4 mirroring groups
- STP supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)

- Internet Group Management Protocol (IGMP) Controls and manages the flooding of multicast packets in a Layer 2 network
- IPv4 Multicast in VXLAN/EVPN Overlay support allows PIM-SM/IGMP snooping in the VXLAN Overlay
- IPv6 VXLAN/EVPN Overlay support, allows IPv6 traffic over the VXLAN overlay
- VXLAN ARP/ND suppression allows minimization of ARP and ND traffic flooding within individual VXLAN segments, thus optimizing the VXLAN network
- QinQ support to improve the VLAN utilization by adding another 802.1Q tag to tagged packets

Layer 3 Services

The following layer 3 services are supported:

- Bidirectional Forwarding Detection (BFD) enables link connectivity monitoring and reduces network convergence time for static route, OSPFv2 and VRRP
- User Datagram Protocol (UDP) helper function allows UDP broadcasts to be directed across router interfaces to specific IP unicast or subnet broadcast addresses and prevents server spoofing for UDP services such as DHCP
- Loopback interface address defines an address in Open Shortest Path First (OSPF), improving diagnostic capability
- Route maps provide more control during route redistribution; allow filtering and altering of route metrics
- 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; DHCP Relay enables DHCP operation across subnets
- DHCP server centralizes and reduces the cost of IPv4 address management
- Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server
- mDNS (Multicast Domain Name System) Gateway enables discovery of mDNS groups across L3 boundaries
- Generic Routing Encapsulation (GRE) enables tunneling traffic from site to site over a Layer 3 path



- Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility
- IP sub-interface is a virtual interface created by dividing physical interface into multiple logical interfaces tagged using different VLAN-IDs. A physical interface can be a regular physical, Split port or LAG L3 interface. A sub-interface is used for many use-cases such as VRF-lite interconnection and inter-vlan routing (router on-a-stick)

Layer 3 Routing

The following layer 3 routing services are supported:

- Border Gateway Protocol (BGP) provides IPv4 and IPv6 routing, which is scalable, robust, and flexible
- 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 with graceful restart capability
- Equal-Cost Multipath (ECMP) enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth
- Multi-protocol BGP (MP-BGP) enables sharing of IPv6 routes using BGP and connections to BGP peers using IPv6
- Routing Information Protocol version 2 (RIPv2) provides an easy to configure routing protocol for small networks as while RIPvng provides support for small IPv6 networks
- Open shortest path first (OSPF) delivers faster convergence; uses link-state routing Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery.
- OSPF provides OSPFv2 for IPv4 routing and OSPFv3 for IPv6 routing
- Static IP routing provides manually configured routing; includes ECMP capability
- Policy-based routing uses a classifier to select traffic that can be forwarded based on policy set by the network administrator
- Static IPv4 and IPv6 routing provides simple manually configured IPv4 and IPv6 routes

- IP performance optimization provides a set of tools to improve the performance of IPv4 networks; includes directed broadcasts, customization of TCP parameters, support of ICMP error packets, and extensive display capabilities
- 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

Visibility

Customers can choose to upgrade the active, embedded CX Foundation license to the term based CX Advanced license to unlock the following benefits for their business:

- Delivers deep visibility with Aruba CX Edge Insights for application recognition, identification, and flow capture from layer 4 to layer 7. CX Edge Insights enables granular datapoint collection with search, sort and reporting as well as the ability to recognize 22 categories and more than 3700 applications

Security

The Aruba CX 6300 Switch Series come with an integrated trusted platform module (TPM) for platform integrity. This ensures the boot process started from a trusted combination of Aruba AOS-CX switches. Other security features include:

- AOS-CX uses FIPS 140-2 validated cryptography for protection of sensitive information
- Access control list (ACL) support for both IPv4 and IPv6; allows for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header
- ACLs also provide filtering based on the IP field, source/ destination IP address/subnet, and source/ destination TCP/UDP port number on a per-VLAN or per-port basis
- Enrollment over Secure Transport (EST) enables secure certificate enrollment, allowing for easier enterprise management of PKI
- Remote Authentication Dial-In User Service (RADIUS)
- Terminal Access Controller Access-Control System (TACACS+) delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security



- Management access security for both on- and off-box authentication for administrative access. RADIUS or TACACS+ can be used to provide encrypted user authentication. Additionally, TACACS+ can also provide admin authorization services
- Control Plane Policing sets rate limit on control protocols to protect CPU overload from DOS attacks
- Supports multiple user authentication methods. Uses an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server to authenticate in accordance with industry standards
- Web based authentication using Captive Portal on ClearPass is supported for use cases such as Guest Access and for devices that don't support 802.1x or MAC Auth.
- Supports MAC-based client authentication
- Concurrent IEEE 802.1X, Web, and MAC authentication schemes per switch port accepts up to 32 sessions of IEEE 802.1X, Web, and MAC authentications
- DHCP protection blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- Secure management access delivers secure encryption of all access methods (CLI, GUI, or MIB) through SSHv2, SSL, and/or SNMPv3
- Switch CPU protection provides automatic protection against malicious network traffic trying to shut down the switch
- ICMP throttling defeats ICMP denial-of-service attacks by enabling any switch port to automatically throttle ICMP traffic
- Identity-driven ACL enables implementation of a highly granular and flexible access security policy and VLAN assignment specific to each authenticated network user
- STP BPDU port protection blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks
- Dynamic IP lockdown works with DHCP protection to block traffic from unauthorized hosts, preventing IP source address spoofing
- Dynamic ARP protection blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data
- STP root guard protects the root bridge from malicious attacks or configuration mistakes
- Port security allows access only to specified MAC addresses, which can be learned or specified by the administrator
- MAC address lockout prevents particular configured MAC addresses from connecting to the network
- Source-port filtering allows only specified ports to communicate with each other
- Secure shell encrypts all transmitted data for secure remote CLI access over IP networks
- Secure Sockets Layer (SSL) encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch
- Secure FTP allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file
- Critical Authentication Role ensures that important infrastructure devices such as IP phones are allowed network access even in the absence of a RADIUS server
- MAC Pinning allows non-chatty legacy devices to stay authenticated by pinning client MAC addresses to the port until the clients logoff or get disconnected
- Security banner displays a customized security policy when users log in to the switch
- RadSec enables RADIUS authentication and accounting data to be passed safely and reliably across insecure networks
- Private VLAN (PVLAN) provides traffic isolation between users on the same VLAN; typically a switch port can only communicate with other ports in the same community and/or an uplink port, regardless of VLAN ID or destination MAC address. This extends network security by restricting peer-peer communication to prevent variety of malicious attacks.
- Auto VLAN Creation automates VLAN creation on access switches for authenticated clients.
- DHCP smart relay allows the DHCP relay agent to use secondary IP addresses when the DHCP server does not reply the DHCP-OFFER message
- IEEE 802.1AE MACsec provides switch-to-switch and switch-to-host security on a link between two ports using standard encryption and authentication, available on uplink and downlink ports

Multicast

- IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN
- Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; support MLD v1 and v2



- Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode (SM), Source-Specific Multicast (SSM), and Dense Mode (DM) for both IPv4 and IPv6
- Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3
- Multicast Service Discovery Protocol (MSDP) efficiently routes multicast traffic through core networks
- MSDP for Anycast RP is an intra-domain feature that provides redundancy and load-sharing capabilities

Convergence

- IP multicast routing includes PIM Sparse, Source-Specific Multicast (SSM), and Dense modes to route IP multicast traffic
- IP multicast snooping (data-driven IGMP) prevents flooding of IP multicast traffic
- Protocol Independent Multicast for IPv6 supports one-to-many and many-to-many media casting use cases such as IPTV over IPv6 networks
- LLDP-MED (Media Endpoint Discovery) defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- PoE allocations supports multiple methods (allocation by usage or class, with LLDP and LLDP-MED) to allocate PoE power for more efficient power management and energy savings.
- Auto VLAN configuration for voice RADIUS VLAN uses a standard RADIUS attribute and LLDP-MED to automatically configure a VLAN for IP phones
- CDPv2 uses CDPv2 to configure legacy IP phones

Additional information

- Green initiative support for RoHS (EN 50581:2012) and WEEE regulations
- All CX 6300 switches are TAA compliant

Customer first, customer last support

When your network is important to your business, then your business needs the backing of Aruba Support Services. Partner with Aruba product experts to increase your team productivity, keep pace with technology advances, software releases, and obtain break-fix support.

Foundation Care for Aruba support services include priority access to Aruba Technical Assistance Center(TAC) engineers 24x7x365, flexible hardware and onsite support options, and total coverage for Aruba products. Aruba switches with assigned Aruba Central subscriptions benefit with option for additional hardware support only.

Aruba Pro Care adds fast access to senior Aruba TAC engineers, who are assigned as a single point of contact for case management, reducing the time spent addressing and resolving issues.

For complete details on Foundation Care and Aruba Pro Care, please visit: <https://www.arubanetworks.com/supportservices/>

Warranty, services and support

- Limited Lifetime Warranty, see <https://www.arubanetworks.com/support-services/product-warranties/> for warranty and support information included with your product purchase
- For more detailed information on Aruba AOS-CX software release and features, please visit the [AOS-CX Switch Software Documentation Portal](#)
- Explore and compare switch features for each platform and software release on the [Aruba Switch Feature Navigator](#)
- For Software Releases and Documentation, refer to <https://asp.arubanetworks.com/downloads>
- For support and services information, visit <https://www.arubanetworks.com/support-services/arubacare/>



SPECIFICATIONS

	Aruba 6300M 24p HPE Smart Rate 1G/2.5G/5G/10G Class6 PoE and 2p 50G and 2p 25G Switch (R8S89A)	Aruba 6300M 48p HPE Smart Rate 1G/2.5G/5G Class8 PoE and 2p 50G and 2p 25G Switch (R8S90A)	Aruba 6300M 48SR5 12p Class8 PoE and 36p Class6 PoE HPE Smart Rate 1G/2.5G/5G and 2p 50G and 2p 10G LRM support Switch (R8S91A)	Aruba 6300M 24p SFP+ LRM support and 2p 50G and 2p 25G MACsec Switch (R8S92A)
Description	24x ports SmartRate 100M ² /1G/2.5G/5G/10G BaseT Class 6 PoE ports supporting up to 60W per port (MACsec) 2x 10G/25G/50G ¹ SFP ports 2x 10G/25G SFP ports (MACsec) Supports PoE Standards IEEE 802.3af, 802.3at and 802.3bt (up to 60W) 1x USB-C Console Port 1x RJ Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	48x ports SmartRate 100M ² /1G/2.5G/5G BaseT Class 8 PoE ports supporting up to 90W per port (MACsec) 2x 10G/25G/50G ¹ SFP ports 2x 10G/25G SFP ports (MACsec) Supports PoE Standards IEEE 802.3af, 802.3at and 802.3bt (up to 90W) 1x USB-C Console Port 1x RJ Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	48x ports SmartRate 100M ² /1G/2.5G/5G BaseT Class 8 PoE ports supporting up to 90W per port on ports 1-12, and up to 60W per port on ports 13-48 (MACsec) 2x 10G/25G/50G ¹ SFP ports 2x 1G/10G SFP ports (LRM + MACsec) Supports PoE Standards IEEE 802.3af, 802.3at and 802.3bt (up to 90W) 1x USB-C Console Port 1x RJ Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	24x 1G/10G SFP+ ports (LRM + MACsec) 2x 10G/25G/50G ¹ SFP ports 2x 10G/25G SFP ports (MACsec) 1x USB-C Console Port 1x RJ Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App
Power supplies	2 field-replaceable, hotswappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL086A JL087A JL670A JL758A Max PoE Power: 2880W	2 field-replaceable, hotswappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL086A JL087A JL670A JL758A Max PoE Power: 2880W	2 field-replaceable, hotswappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL086A JL087A JL670A JL758A Max PoE Power: 2880W	2 field-replaceable, hotswappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL085A JL757APSU
Fans	Switch has two fan tray slots and comes with two fan trays installed. <ul style="list-style-type: none">• Min 2 fan trays required.• Fan trays are field replaceable and hotswappable.• Each fan tray contains two fans.	Switch has two fan tray slots and comes with two fan trays installed. <ul style="list-style-type: none">• Min 2 fan trays required.• Fan trays are field replaceable and hotswappable.• Each fan tray contains two fans.	Switch has two fan tray slots and comes with two fan trays installed. <ul style="list-style-type: none">• Min 2 fan trays required.• Fan trays are field replaceable and hotswappable.• Each fan tray contains two fans.	Switch has two fan tray slots and comes with two fan trays installed. <ul style="list-style-type: none">• Min 2 fan trays required.• Fan trays are field replaceable and hotswappable.• Each fan tray contains two fans.
Physical characteristics				
Dimensions	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")
Configuration Weight	5.26 kg (11.60 lbs)	5.48 kg (12.08 lbs)	5.47 kg (12.06 lbs)	4.85 kg (10.70 lbs)
Additional Specifications				
CPU	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz
Memory and Flash	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.

²100M use on Smart Rate ports is limited to full-duplex only. For 100M half-duplex support, use 1G ports on other models.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24p HPE Smart Rate 1G/2.5G/5G/10G CL6 PoE and 2p 50G and 2p 25G Switch (R8S89A)	Aruba 6300M 48p HPE Smart Rate 1G/2.5G/5G CL8 PoE and 2p 50G and 2p 25G Switch (R8S90A)	Aruba 6300M 12p Class8 PoE and 36p Class6 PoE HPE Smart Rate 1G/2.5G/5G and 2p 50G and 2p 10G Switch (R8S91A)	Aruba 6300M 24p SFP+ LRM support and 2p 50G and 2p 25G MACsec Switch (R8S92A)
Additional Specifications (continued)				
Packet Buffer	16 MB	16 MB	16 MB	16 MB
Performance				
System Switching Capacity	880 Gbps	880 Gbps	880 Gbps	880 Gbps
System Throughput Capacity	660 Mpps	660 Mpps	660 Mpps	660 Mpps
Model Switching Capacity	780 Gbps	780 Gbps	720 Gbps	780 Gbps
Model Throughput Capacity	580 Mpps	580 Mpps	535 Mpps	580 Mpps
Average Latency (LIFO-64-bytes packets)	1Gbps: 4.24μSec 10Gbps: 1.50μSec 25Gbps: 2.91μSec 50Gbps ¹ : 3.49μSec			
Stack Size	10 members	10 members	10 members	10 members
Max Stacking Distance	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers
Stacking Bandwidth	200 Gbps	200 Gbps	200 Gbps	200 Gbps
Switched Virtual Interfaces (dual stack)	1,024	1,024	1,024	1,024
IPv4 Host Table (ARP)	49,152	49,152	49,152	49,152
IPv6 Host Table (ND)	49,152	49,152	49,152	49,152
IPv4 Unicast Routes	61,000	61,000	61,000	61,000
IPv6 Unicast Routes	61,000	61,000	61,000	61,000
IPv4 Multicast Routes	8,192	8,192	8,192	8,192
IPv6 Multicast Routes	8,192	8,192	8,192	8,192
MAC Table Capacity	32,768	32,768	32,768	32,768
IGMP Groups	8,192	8,192	8,192	8,192
MLD Groups	8,192	8,192	8,192	8,192
IPv4/IPv6/MAC ACL Entries (ingress)	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480
IPv4/IPv6/MAC ACL Entries (egress)	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192
VRF	256	256	256	256
Environment				
Operating Temperature	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ² of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ² of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ² of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ² of time.

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.

² No more than 96 consecutive hours and no more than 360 hours total (15 days) in 1 year.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24p HPE Smart Rate 1G/2.5G/5G/10G CL6 PoE and 2p 50G and 2p 25G Switch (R8S89A)	Aruba 6300M 48p HPE Smart Rate 1G/2.5G/5G CL8 PoE and 2p 50G and 2p 25G Switch (R8S90A)	Aruba 6300M 12p Class8 PoE and 36p Class6 PoE HPE Smart Rate 1G/2.5G/5G and 2p 50G and 2p 10G Switch (R8S91A)	Aruba 6300M 24p SFP+ LRM support and 2p 50G and 2p 25G MACsec Switch (R8S92A)
Environment (continued)				
Operating Temperature (continued)				55C excursion not supported when 10G LRM/LR/ER inserted
Operating Relative Humidity	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing
Non-Operating	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft
Non-Operating Storage Relative Humidity	5% to 95% @ 149°F (65°C) non-condensing	5% to 95% @ 149°F (65°C) non-condensing	5% to 95% @ 149°F (65°C) non-condensing	5% to 95% @ 149°F (65°C) non-condensing
Max Operating Altitude	10,000 feet (3.04 km) Max	10,000 feet (3.04 km) Max	10,000 feet (3.04 km) Max	10,000 feet (3.04 km) Max
Max Non-Operating Altitude	15,000 feet (4.6 km) Max	15,000 feet (4.6 km) Max	15,000 feet (4.6 km) Max	15,000 feet (4.6 km) Max
Acoustic	Sound Power, LWAd = 4.9 Bel Sound Pressure, LpAm (Bystander) = 33.0 dB	Sound Power, LWAd = 5.0 Bel Sound Pressure, LpAm (Bystander) = 33.4 dB	Sound Power, LWAd = 4.9 Bel Sound Pressure, LpAm (Bystander) = 32.6 dB	Sound Power, LWAd = 4.6 Bel Sound Pressure, LpAm (Bystander) = 30.1 dB
Primary Airflow	Front and side to back	Front and side to back	Front and side to back	Front and side to back
Electrical Characteristics				
Frequency	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
AC Voltage	JL670APSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V	JL670APSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V	JL670APSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V	JL085A PSU: 100V-240V
Current (for voltages listed above)	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A	JL085A PSU: 3A/1.2A
Power Consumption (230VAC)	With JL086A PSU: Idle: 90W 100% Traffic Rate: 143W With JL087A PSU: Idle: 90W 100% Traffic Rate: 140W With JL670A PSU: Idle: 101W 100% Traffic Rate: 152W	With JL086A PSU: Idle: 104W 100% Traffic Rate: 173W With JL087A PSU: Idle: 104W 100% Traffic Rate: 173W With JL670A PSU: Idle: 115W 100% Traffic Rate: 184W	With JL086A PSU: Idle: 104W 100% Traffic Rate: 168W With JL087A PSU: Idle: 104W 100% Traffic Rate: 168W With JL670A PSU: 98 Idle: 113W 100% Traffic Rate: 179W	Idle: 87W 100% Traffic Rate: 131W



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24p HPE Smart Rate 1G/2.5G/5G/10G CL6 PoE and 2p 50G and 2p 25G Switch (R8S89A)	Aruba 6300M 48p HPE Smart Rate 1G/2.5G/5G CL8 PoE and 2p 50G and 2p 25G Switch (R8S90A)	Aruba 6300M 12p Class8 PoE and 36p Class6 PoE HPE Smart Rate 1G/2.5G/5G and 2p 50G and 2p 10G Switch (R8S91A)	Aruba 6300M 24p SFP+ LRM support and 2p 50G and 2p 25G MACsec Switch (R8S92A)
Safety				
Include US, Canada, Europe, Worldwide	Europe: EN 62368-1:2014 +A11:2017 2nd Ed. EN 62368-1:2020 +A11:2020 3rd Ed. UK: BS EN 62368-1:2014 + A11:2017 2nd Ed BS EN 62368-1:2020 + A11:2020 3rd Ed US/Canada: UL 62368-1 2nd Ed. CAN/CSA-C22.2 No. 62368-1-14 2nd Ed. Worldwide: IEC 60950-1:2005 + Am1:2009 + Am2:2013 w/all known National Deviations IEC 62368-1:2014 2nd Ed. w/all known National Deviations IEC 62368-1:2018 3rd Ed. w/all known National Deviations "	Europe: EN 62368-1:2014 +A11:2017 2nd Ed. EN 62368-1:2020 +A11:2020 3rd Ed. UK: BS EN 62368-1:2014 + A11:2017 2nd Ed BS EN 62368-1:2020 + A11:2020 3rd Ed US/Canada: UL 62368-1 2nd Ed. CAN/CSA-C22.2 No. 62368-1-14 2nd Ed. Worldwide: IEC 60950-1:2005 + Am1:2009 + Am2:2013 w/all known National Deviations IEC 62368-1:2014 2nd Ed. w/all known National Deviations IEC 62368-1:2018 3rd Ed. w/all known National Deviations "	Europe: EN 62368-1:2014 +A11:2017 2nd Ed. EN 62368-1:2020 +A11:2020 3rd Ed. UK: BS EN 62368-1:2014 + A11:2017 2nd Ed BS EN 62368-1:2020 + A11:2020 3rd Ed US/Canada: UL 62368-1 2nd Ed. CAN/CSA-C22.2 No. 62368-1-14 2nd Ed. Worldwide: IEC 60950-1:2005 + Am1:2009 + Am2:2013 w/all known National Deviations IEC 62368-1:2014 2nd Ed. w/all known National Deviations IEC 62368-1:2018 3rd Ed. w/all known National Deviations "	Europe: EN 62368-1:2014 +A11:2017 2nd Ed. EN 62368-1:2020 +A11:2020 3rd Ed. UK: BS EN 62368-1:2014 + A11:2017 2nd Ed BS EN 62368-1:2020 + A11:2020 3rd Ed US/Canada: UL 62368-1 2nd Ed. CAN/CSA-C22.2 No. 62368-1-14 2nd Ed. Worldwide: IEC 60950-1:2005 + Am1:2009 + Am2:2013 w/all known National Deviations IEC 62368-1:2014 2nd Ed. w/all known National Deviations IEC 62368-1:2018 3rd Ed. w/all known National Deviations "
Emissions				
Include US, Canada, Europe, Worldwide	Europe: EN 55032:2015 +A11:2020, Class A EN 55035:2017 +A11:2020 EN 61000-3-2:2014, Class A EN 61000-3-3:2013 US/Canada: FCC CFR47 Part 15:2014, Class A ICES-003 Class A Worldwide: VCCI Class A CISPR 32 Class A CISPR 35:2016	Europe: EN 55032:2015 +A11:2020, Class A EN 55035:2017 +A11:2020 EN 61000-3-2:2014, Class A EN 61000-3-3:2013 US/Canada: FCC CFR47 Part 15:2014, Class A ICES-003 Class A Worldwide: VCCI Class A CISPR 32 Class A CISPR 35:2016	Europe: EN 55032:2015 +A11:2020, Class A EN 55035:2017 +A11:2020 EN 61000-3-2:2014, Class A EN 61000-3-3:2013 US/Canada: FCC CFR47 Part 15:2014, Class A ICES-003 Class A Worldwide: VCCI Class A CISPR 32 Class A CISPR 35:2016	Europe: EN 55032:2015 +A11:2020, Class A EN 55035:2017 +A11:2020 EN 61000-3-2:2014, Class A EN 61000-3-3:2013 US/Canada: FCC CFR47 Part 15:2014, Class A ICES-003 Class A Worldwide: VCCI Class A CISPR 32 Class A CISPR 35:2016
Lasers				
Include US, Canada, Europe, Worldwide	EN 60825-1:2014 / IEC 60825-1:2014 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2014 / IEC 60825-1:2014 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2014 / IEC 60825-1:2014 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2014 / IEC 60825-1:2014 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24p HPE Smart Rate 1G/2.5G/5G/10G CL6 PoE and 2p 50G and 2p 25G Switch (R8S89A)	Aruba 6300M 48p HPE Smart Rate 1G/2.5G/5G CL8 PoE and 2p 50G and 2p 25G Switch (R8S90A)	Aruba 6300M 12p Class8 PoE and 36p Class6 PoE HPE Smart Rate 1G/2.5G/5G and 2p 50G and 2p 10G Switch (R8S91A)	Aruba 6300M 24p SFP+ LRM support and 2p 50G and 2p 25G MACsec Switch (R8S92A)
Immunity				
Generic	CISPR35	CISPR35	CISPR35	CISPR35
EN	EN 55035:2017	EN 55035:2017	EN 55035:2017	EN 55035:2017
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6
Power Frequency Magnetic Field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage Dips and Interruptions	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11
Harmonics	IEC 61000-3-2, EN 61000-3-2			
Flicker	IEC 61000-3-3, EN 61000-3-3			
Mounting and Enclosure				
	Mounts in an EIA standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL662A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Switch (JL663A)	Aruba 6300M 24-port 1GbE and 4-port SFP56 Switch (JL664A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Power-to-Port 2 Fan Trays 1 PSU Bundle (JL762A)
Description	<p>24x ports 10/100/1000 BaseT PoE+ ports supporting up to 30W per port</p> <p>4x 1G/10G/25G/50G¹ SFP ports</p> <p>Supports PoE Standards IEEE 802.3af, 802.3at</p> <p>1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App</p>	<p>48x ports 10/100/1000 BaseT ports</p> <p>4x 1G/10G/25G/50G¹ SFP ports</p> <p>1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App</p>	<p>24x ports 10/100/1000 BaseT ports</p> <p>4x 1G/10G/25G/50G¹ SFP ports</p> <p>1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App</p>	<p>48x ports 10/100/1000 BaseT ports</p> <p>4x 1G/10G/25G/50G¹ SFP ports</p> <p>1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with AOS-CX Mobile App</p>
Power supplies	<p>2 field-replaceable, hot-swappable power supply slots</p> <p>1 minimum power supply required (ordered separately)</p> <p>Supported PSUs JL086A JL087A JL670A</p> <p>Max PoE Power: 720W</p>	<p>2 field-replaceable, hot-swappable power supply slots</p> <p>1 minimum power supply required (ordered separately)</p> <p>Supports JL085A PSU</p>	<p>2 field-replaceable, hot-swappable power supply slots</p> <p>1 minimum power supply required (ordered separately)</p> <p>Supports JL085A PSU</p>	<p>2 Field-replaceable, hot-swappable power-supply slots and comes with 1 Pwr2Prt power-supply pre-installed</p> <p>Additonal Pwr2Prt power-supply can be ordered separately</p> <p>Supports JL760A Pwr2Prt power-supply only</p>
Fans	<p>Switch has two fan tray slots and comes with one fan tray installed.</p> <ul style="list-style-type: none"> Min 1 fan tray required. Optional second fan tray ordered separately. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. 	<p>Switch has two fan tray slots and comes with one fan tray installed.</p> <ul style="list-style-type: none"> Min 1 fan tray required. Optional second fan tray ordered separately. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. 	<p>Switch has two fan tray slots and comes with one fan tray installed.</p> <ul style="list-style-type: none"> Min 1 fan tray required. Optional second fan tray ordered separately. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. 	<p>Switch has two fan tray slots and comes with two fan trays installed.</p> <ul style="list-style-type: none"> Min 2 fan trays required. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. Supports JL761A Pwr2Prt Fan Tray only.
Physical characteristics				
Dimensions	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm (W) 44.2 cm (D) 38.5 cm (1.73" x 17.4" x 15.2")
Configuration Weight	5.55 kg (12.23 lbs)	5.51 kg (12.14 lbs)	5.43 kg (11.97 lbs)	1PSU: 5.7 kg (12.5 lbs) 2PSU: 6.27kg (13.8 lbs)
Additional Specifications				
CPU	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz
Memory and Flash	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GBytes DDR4 32 GBytes eMMC
Packet Buffer	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory	8 MB Shared Packet Buffer Memory

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL662A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Switch (JL663A)	Aruba 6300M 24-port 1GbE and 4-port SFP56 Switch (JL664A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Power-to-Port 2 Fan Trays 1 PSU Bundle (JL762A)
Performance				
System Switching Capacity	880 Gbps	880 Gbps	880 Gbps	880 Gbps
System Throughput Capacity	660 Mpps	660 Mpps	660 Mpps	660 Mpps
Model Switching Capacity	448 Gbps	496 Gbps	448 Gbps	496 Gbps
Model Throughput Capacity	334 Mpps	369 Mpps	334 Mpps	369 Mpps
Average Latency (LIFO-64-bytes packets)	1Gbps: 2.28µSec 10Gbps: 1.46µSec 25Gbps: 1.90µSec 50Gbps ¹ : 3.49µSec	1Gbps: 2.28µSec 10Gbps: 1.46µSec 25Gbps: 1.90µSec 50Gbps ¹ : 3.49µSec	1Gbps: 2.28µSec 10Gbps: 1.46µSec 25Gbps: 1.90µSec 50Gbps ¹ : 3.49µSec	1Gbps: 2.28µSec 10Gbps: 1.46µSec 25Gbps: 1.90µSec 50Gbps ¹ : 3.49µSec
Stack Size	10 members	10 members	10 members	10 members
Max. Stacking Distance	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers
Stacking Bandwidth	200 Gbps	200 Gbps	200 Gbps	200 Gbps
Switched Virtual Interfaces (dual stack)	1,024	1,024	1,024	1,024
IPv4 Host Table (ARP)	49,152	49,152	49,152	49,152
IPv6 Host Table (ND)	49,152	49,152	49,152	49,152
IPv4 Unicast Routes	61,000	61,000	61,000	61,000
IPv6 Unicast Routes	61,000	61,000	61,000	61,000
IPv4 Multicast Routes	8,192	8,192	8,192	8,192
IPv6 Multicast Routes	8,192	8,192	8,192	8,192
MAC Table Capacity	32,768	32,768	32,768	32,768
IGMP Groups	8,192	8,192	8,192	8,192
MLD Groups	8,192	8,192	8,192	8,192
IPv4/IPv6/MAC ACL Entries (ingress)	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480
IPv4/IPv6/MAC ACL Entries (egress)	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192
VRF	256	256	256	256
Environment				
Operating Temperature	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft Can support excursion to 131°F (55°C) for short periods ¹ of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft Can support excursion to 131°F (55°C) for short periods ¹ of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft Can support excursion to 131°F (55°C) for short periods ¹ of time.	32°F to 113°F (0°C to 45°C) upto 5000 ft derate -1°C for every 1000 ft from 5000 ft to 10000 ft
Operating Relative Humidity	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing
Non-Operating	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15000 ft
Non-Operating Storage relative humidity	5% to 95% @ 149°F (65°C) non-condensing	5% to 95% @ 149°F (65°C) non-condensing	5% to 95% @ 149°F (65°C) non-condensing	5% to 95% @ 149°F (65°C) non-condensing

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL662A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Switch (JL663A)	Aruba 6300M 24-port 1GbE and 4-port SFP56 Switch (JL664A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Power-to-Port 2 Fan Trays 1 PSU Bundle (JL762A)
Environment (continued)				
Max Operating Altitude	10,000 feet (3.04 km) Max	10,000 feet (3.04 km) Max	10,000 feet (3.04 km) Max	10000 feet (3.04 km) Max
Max non-operating Altitude	15,000 feet (4.6 km) Max	15,000 feet (4.6 km) Max	15,000 feet (4.6 km) Max	15000 feet (4.6 km) Max
Acoustic	Sound Power, $L_{WAd} = 4.7$ Bel Sound Pressure, L_{pAm} (Bystander) = 29.4 dB	Sound Power, $L_{WAd} = 4.6$ Bel Sound Pressure, L_{pAm} (Bystander) = 28.7 dB	Sound Power, $L_{WAd} = 4.6$ Bel Sound Pressure, L_{pAm} (Bystander) = 28.6 dB	Sound Power, $L_{WAd} = 5.0$ Bel Sound Pressure, L_{pAm} (Bystander) = 32.5 dB with 1 x JL760A PSU
Primary Airflow	Front and side to back	Front and side to back	Front and side to back	Back to Front and Side
Electrical Characteristics				
Frequency	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
AC Voltage	JL670APSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V	JL085A PSU: 100V-240V	JL085A PSU: 100V-240V	JL760A PSU: 100V-240V
Current (for voltages listed above)	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A	JL085A PSU: 3A/1.2A	JL085A PSU: 3A/1.2A	JL760A PSU: 3A-1.2A
80plus.org certification	-	-	-	TBA for JL760APS.
Power Consumption (230VAC)	With JL086A PSU: Idle: 60W 100% Traffic Rate: 76W With JL087A PSU: Idle: 59W 100% Traffic Rate: 74W With JL670A PSU: Idle: 62W 100% Traffic Rate: 81W	Idle: 56W 100% Traffic Rate: 75W	Idle: 49W 100% Traffic Rate: 64W	Idle: 56W 100% Traffic Rate: 75W
Safety				
	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 EN 62368-1:2014 +A11:2017 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations IEC 62368-1:2014 2nd Ed. Taiwan: CNS-14336-1



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL662A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Switch (JL663A)	Aruba 6300M 24-port 1GbE and 4-port SFP56 Switch (JL664A)	Aruba 6300M 48-port 1GbE and 4-port SFP56 Power-to-Port 2 Fan Trays 1 PSU Bundle (JL762A)
Emissions				
	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55032:2015+AC:2016, Class A EN 55035:2017 EN 61000-3-2:2014 EN 61000-3-3:2013
	US: FCC part 15 Class A	US: FCC part 15 Class A	US: FCC part 15 Class A	US: FCC 47 CFR part 15B, Class A
	Canada: ICES-003 Class A	Canada: ICES-003 Class A	Canada: ICES-003 Class A	Canada: ICES-003 Class A
	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 32 Ed 2.0: 2015 + COR1:2016, Class A CISPR 35:2016
Lasers				
	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)
Immunity				
Generic	CISPR24/CISPR35	CISPR24/CISPR35	CISPR24/CISPR35	CISPR35
EN	EN 55024:2010 / EN 55035:2017	EN 55024:2010 / EN 55035:2017	EN 55024:2010 / EN 55035:2017	EN 55035:2017
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11
Harmonics	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2
Flicker	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3
Mounting and Enclosure				
	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.



SPECIFICATIONS

	Aruba 6300F 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL665A)	Aruba 6300F 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL666A)	Aruba 6300F 48-port 1GbE and 4-port SFP56 Switch (JL667A)	Aruba 6300F 24-port 1GbE and 4-port SFP56 Switch (JL668A)
Description	48x ports 10/100/1000BaseT PoE+ Ports supporting up to 30W per port 1G/10G/25G/50G ¹ SFP ports Supports PoE Standards IEEE 802.3af, 802.3at 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	24x ports 10/100/1000BaseT Ports supporting up to 30W per port 1G/10G/25G/50G ¹ SFP ports 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	48x ports 10/100/1000BaseT Ports 1G/10G/25G/50G ¹ SFP ports 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	24x ports 10/100/1000BaseT Ports 1G/10G/25G/50G ¹ SFP ports 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App
Power supplies	Internal (fixed) power supply (950W) Max PoE Power: 720W	Internal (fixed) power supply (950W) Max PoE Power: 370W	Internal (fixed) power supply (200W)	Internal (fixed) power supply (200W)
Fans	Fixed fans	Fixed fans	Fixed fans	Fixed fans
Physical characteristics				
Dimensions	(H) 4.39 cm x (W) 44.2 cm x (D) 32.7 cm (1.73" x 17.4" x 12.9")	(H) 4.39 cm x (W) 44.2 cm x (D) 32.7 cm (1.73" x 17.4" x 12.9")	(H) 4.39 cm x (W) 44.2 cm x (D) 32.7 cm (1.73" x 17.4" x 12.9")	(H) 4.39 cm x (W) 44.2 cm x (D) 32.7 cm (1.73" x 17.4" x 12.9")
Configuration Weight	5.10 kg (11.24 lbs)	4.95 kg (10.91 lbs)	4.46 kg (9.83 lbs)	4.36 kg (9.61 lbs)
Additional Specifications				
CPU	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz
Memory and Flash	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC
Packet Buffer	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



SPECIFICATIONS

	Aruba 6300F 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL665A)	Aruba 6300F 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL666A)	Aruba 6300F 48-port 1GbE and 4-port SFP56 Switch (JL667A)	Aruba 6300F 24-port 1GbE and 4-port SFP56 Switch (JL668A)
Performance				
System Switching Capacity	880 Gbps	880 Gbps	880 Gbps	880 Gbps
System Throughput Capacity	660 Mpps	660 Mpps	660 Mpps	660 Mpps
Model Switching Capacity	496 Gbps	448 Gbps	496 Gbps	448 Gbps
Model Throughput Capacity	369 Mpps	334 Mpps	369 Mpps	334 Mpps
Average Latency (LIFO-64-bytes packets)	1Gbps: 2.28µSec 10Gbps: 1.46µSec 25Gbps: 1.90µSec 50Gbps ¹ : 3.49µSec			
Stack Size	10 members	10 members	10 members	10 members
Max. Stacking Distance	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers
Stacking Bandwidth	200 Gbps	200 Gbps	200 Gbps	200 Gbps
Switched Virtual Interfaces (dual stack)	1,024	1,024	1,024	1,024
IPv4 Host Table (ARP)	49,152	49,152	49,152	49,152
IPv6 Host Table (ND)	49,152	49,152	49,152	49,152
IPv4 Unicast Routes	61,000	61,000	61,000	61,000
IPv6 Unicast Routes	61,000	61,000	61,000	61,000
IPv4 Multicast Routes	8,192	8,192	8,192	8,192
IPv6 Multicast Routes	8,192	8,192	8,192	8,192
MAC Table Capacity	32,768	32,768	32,768	32,768
IGMP Groups	8,192	8,192	8,192	8,192
MLD Groups	8,192	8,192	8,192	8,192
IPv4/IPv6/MAC ACL Entries (ingress)	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480
IPv4/IPv6/MAC ACL Entries (egress)	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192
VRF	256	256	256	256

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.



SPECIFICATIONS (CONTINUED)

	Aruba 6300F 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL665A)	Aruba 6300F 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL666A)	Aruba 6300F 48-port 1GbE and 4-port SFP56 Switch (JL667A)	Aruba 6300F 24-port 1GbE and 4-port SFP56 Switch (JL668A)
Environment				
Operating Temperature	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft Can support excursion to 131°F (55°C) for short periods ¹ of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ¹ of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ¹ of time.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ¹ of time.
Operating Relative Humidity	5% to 95% @ 104°F (40°C) non-condensing			
Non-Operating	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft
Non-Operating Storage relative humidity	5% to 95% @ 149°F (65°C) non-condensing			
Max Operating Altitude	10,000 feet (3.04 km) Max			
Max non-operating Altitude	15,000 feet (4.6 km) Max			
Acoustic	Sound Power, L _{WAd} = 5.2 Bel Sound Pressure, L _{pAm} (Bystander) = 34.9 dB	Sound Power, L _{WAd} = 5.0 Bel Sound Pressure, L _{pAm} (Bystander) = 32.3 dB	Sound Power, L _{WAd} = 4.9 Bel Sound Pressure, L _{pAm} (Bystander) = 31.5 dB	Sound Power, L _{WAd} = 4.9 Bel Sound Pressure, L _{pAm} (Bystander) = 31.6 dB
Primary Airflow	Front and side to back			
Electrical Characteristics				
Frequency	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
AC Voltage	Fixed PSU: 100V-120V/200V-240V	Fixed PSU: 100V-120V/200V-240V	Fixed PSU: 100V-120V/200V-240V	Fixed PSU: 100V-120V/200V-240V
Current (for voltages listed above)	Fixed PSU: 11A/6A	Fixed PSU: 11A/6A	Fixed PSU: 2.5A/1.4A	Fixed PSU: 2.5A/1.4A
80plus.org certification	-	-	-	-
Power Consumption (230VAC)	Idle: 63W 100% Traffic Rate: 86W	Idle: 52W 100% Traffic Rate: 67W	Idle: 52W 100% Traffic Rate: 74W	Idle: 49W 100% Traffic Rate: 63W
Safety				
	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations



SPECIFICATIONS (CONTINUED)

	Aruba 6300F 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL665A)	Aruba 6300F 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL666A)	Aruba 6300F 48-port 1GbE and 4-port SFP56 Switch (JL667A)	Aruba 6300F 24-port 1GbE and 4-port SFP56 Switch (JL668A)
Emissions				
	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013
	US: FCC part 15 Class A	US: FCC part 15 Class A	US: FCC part 15 Class A	US: FCC part 15 Class A
	Canada: ICES-003 Class A	Canada: ICES-003 Class A	Canada: ICES-003 Class A	Canada: ICES-003 Class A
	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010
Lasers				
	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)
Immunity				
Generic	CISPR24/CISPR35	CISPR24/CISPR35	CISPR24/CISPR35	CISPR24/CISPR35
EN	EN 55024:2010 / EN 55035:2017	EN 55024:2010 / EN 55035:2017	EN 55024:2010 / EN 55035:2017	EN 55024:2010 / EN 55035:2017
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11
Harmonics	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2
Flicker	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3
Mounting and Enclosure				
	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.



SPECIFICATIONS

	Aruba 6300M 24-port SFP+ and 4-port SFP56 Switch (JL658A)	Aruba 6300M 48-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL659A)	Aruba 6300M 24-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL660A)	Aruba 6300M 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL661A)
Description	24x 1G/10G SFP+ ports 4x 1G/10G/25G ¹ SFP ports 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	48x ports SmartRate 100M ² /1G/2.5G/5G BaseT Class 6 PoE ports supporting up to 60W per port 4x 1G/10G/25G ¹ SFP ports Supports PoE Standards IEEE 802.3af, 802.3at and 802.3bt (up to 60W) 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	24x ports Smart Rate 100M ² /1G/2.5G/5G BaseT Class 6 PoE ports supporting up to 60W per port 4x 1G/10G/25G ¹ SFP ports Supports PoE Standards IEEE 802.3af, 802.3at and 802.3bt (up to 60W) 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App	48x ports 10/100/1000 BaseT PoE+ ports supporting up to 30W per port 4x 1G/10G/25G ¹ SFP ports Supports PoE Standards IEEE 802.3af, 802.3at 1x USB-C Console Port 1x OOBM port 1x USB Type A Host port 1x Bluetooth dongle to be used with CX Mobile App
Power supplies	2 field-replaceable, hot-swappable power supply slots 1 minimum power supply required (ordered separately) Supports JL085A PSU	2 field-replaceable, hot-swappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL086A JL087A JL670A	2 field-replaceable, hot-swappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL086A JL087A JL670A	2 field-replaceable, hot-swappable power supply slots 1 minimum power supply required (ordered separately) Supported PSUs JL086A JL087A JL670A
Fans	Switch has two fan tray slots and comes with two fan trays installed. <ul style="list-style-type: none"> Min 2 fan trays required. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. 	Switch has two fan tray slots and comes with two fan trays installed. <ul style="list-style-type: none"> Min 2 fan trays required. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. 	Switch has two fan tray slots and comes with one fan tray installed. <ul style="list-style-type: none"> Min 1 fan tray required. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans. 	Switch has two fan tray slots and comes with one fan tray installed. <ul style="list-style-type: none"> Min 1 fan tray required. Fan trays are field replaceable and hot-swappable. Each fan tray contains two fans.
Physical characteristics				
Dimensions	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")	(H) 4.4 cm x (W) 44.2 cm x (D) 38.5 cm (1.73" x 17.4" x 15.2")
Configuration Weight	5.8 Kg (12.78 lbs)	6.71 kg (14.8 lbs)	6.06 (13.36 lbs)	5.72 kg (12.61 lbs)
Additional Specifications				
CPU	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz	Quad Core ARM Cortex™ A72 @ 1.8GHz
Memory and Flash	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC	8 GB DDR4 32 GB eMMC
Packet Buffer	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory	8 MB Packet Buffer Memory

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G transceiver capability enabled by future software release.
VSF stacking not supported on 1G ports.

² 100M use on Smart Rate ports is limited to full-duplex only. For 100M half-duplex support, use 1G ports on other models.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port SFP+ and 4-port SFP56 Switch (JL658A)	Aruba 6300M 48-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL659A)	Aruba 6300M 24-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL660A)	Aruba 6300M 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL661A)
Performance				
System Switching Capacity	880 Gbps	880 Gbps	880 Gbps	880 Gbps
System Throughput Capacity	660 Mpps	660 Mpps	660 Mpps	660 Mpps
Model Switching Capacity	880 Gbps	880 Gbps	640 Gbps	496 Gbps
Model Throughput Capacity	654 Mpps	654 Mpps	476 Mpps	369 Mpps
Average Latency (LIFO-64-bytes packets)	1Gbps: 1.99µSec 10Gbps: 1.49µSec 25Gbps: 2.85µSec 50Gbps ¹ : 2.82µSec	1Gbps: 4.24µSec 10Gbps: 1.50µSec 25Gbps: 2.91µSec 50Gbps ¹ : 3.49µSec	1Gbps: 4.24µSec 10Gbps: 1.50µSec 25Gbps: 2.91µSec 50Gbps ¹ : 3.49µSec	1Gbps: 2.28µSec 10Gbps: 1.46µSec 25Gbps: 1.90µSec 50Gbps ¹ : 3.49µSec
Stack Size	10 members	10 members	10 members	10 members
Max. Stacking Distance	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers	Up to 10 kms with long range transceivers
Stacking Bandwidth	200 Gbps	200 Gbps	200 Gbps	200 Gbps
Switched Virtual Interfaces (dual stack)	1,024	1,024	1,024	1,024
IPv4 Host Table (ARP)	49,152	49,152	49,152	49,152
IPv6 Host Table (ND)	49,152	49,152	49,152	49,152
IPv4 Unicast Routes	61,000	61,000	61,000	61,000
IPv6 Unicast Routes	61,000	61,000	61,000	61,000
IPv4 Multicast Routes	8,192	8,192	8,192	8,192
IPv6 Multicast Routes	8,192	8,192	8,192	8,192
MAC Table Capacity	32,768	32,768	32,768	32,768
IGMP Groups	8,192	8,192	8,192	8,192
MLD Groups	8,192	8,192	8,192	8,192
IPv4/IPv6/MAC ACL Entries (ingress)	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480	20,480/5,120/20,480
IPv4/IPv6/MAC ACL Entries (egress)	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192	8,192/2,048/8,192
VRF	256	256	256	256
Environment				
Operating Temperature	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ¹ of time. Operating temperature is reduced to 32°F (0°C) to 104°F (40°C) up to 5000ft when 10G SFP+ LR or ER Transceivers are installed.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ¹ of time. Requires two fan trays to support excursion.	32°F to 113°F (0°C to 45°C) up to 5,000 ft. Derate -1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft. Can support excursion to 131°F (55°C) for short periods ¹ of time.
Operating Relative Humidity	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing	5% to 95% @ 104°F (40°C) non-condensing

¹50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G transceiver capability enabled by future software release. VSF stacking not supported on 1G ports.



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port SFP+ and 4-port SFP56 Switch (JL658A)	Aruba 6300M 48-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL659A)	Aruba 6300M 24-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL660A)	Aruba 6300M 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL661A)
Environment (continued)				
Non-Operating	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft	-40°F to 158°F (-40°C to 70°C) up to 15,000 ft
Non-Operating Storage relative humidity	5% to 95% @ 149°F (65°C) non-condensing			
Max Operating Altitude	10,000 feet (3.04 km) Max			
Max non-operating Altitude	15,000 feet (4.6 km) Max			
Acoustic	Sound Power, $L_{WAd} = 4.9$ Bel Sound Pressure, L_{pAm} (Bystander) = 31.0 dB	Sound Power, $L_{WAd} = 4.8$ Bel Sound Pressure, L_{pAm} (Bystander) = 30.6 dB	Sound Power, $L_{WAd} = 5.2$ Bel Sound Pressure, L_{pAm} (Bystander) = 34.2 dB	Sound Power, $L_{WAd} = 4.7$ Bel Sound Pressure, L_{pAm} (Bystander) = 29.8 dB
Primary Airflow	Front and side to back			
Electrical Characteristics				
Frequency	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
AC Voltage	JL085A PSU: 100V-240V	JL670A PSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V	JL670A PSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V	JL670A PSU: 110V-120V/208V-240V JL086A PSU: 100V-240V JL087A PSU: 110V-240V
Current (for voltages listed above)	JL085A PSU: 3A/1.2A	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A	JL670A PSU: 11A/8A JL086A PSU: 8A/3.5A JL087A PSU: 12A/5A
Power Consumption (230VAC)	Idle: 51W 100% Traffic Rate: 85W	With JL086A PSU: Idle: 133W 100% Traffic Rate: 199W With JL087A PSU: Idle: 138W 100% Traffic Rate: 193W With JL670A PSU: Idle: 140W 100% Traffic Rate: 201W	With JL086A PSU: Idle: 93W 100% Traffic Rate: 137W With JL087A PSU: Idle: 91W 100% Traffic Rate: 131W With JL670A PSU: Idle: 98W 100% Traffic Rate: 139W	With JL086A PSU: Idle: 70W 100% Traffic Rate: 90W With JL087A PSU: Idle: 71W 100% Traffic Rate: 88W With JL670A PSU: Idle: 73W 100% Traffic Rate: 96W
Safety				
	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations	Europe: EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 + A2:2013 US: UL 60950-1 2nd Ed. Canada: CAN/CSA-C22.2 No. 60950-1-07 Worldwide: IEC 60950-1:2005 w/all known National Deviations



SPECIFICATIONS (CONTINUED)

	Aruba 6300M 24-port SFP+ and 4-port SFP56 Switch (JL658A)	Aruba 6300M 48-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL659A)	Aruba 6300M 24-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL660A)	Aruba 6300M 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL661A)
Emissions				
	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	Europe: EN 55022:2010, Class A EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013
	US: FCC part 15 Class A			
	Canada: ICES-003 Class A	Canada: ICES-003 Class A	Canada: ICES-003 Class A	Canada: ICES-003 Class A
	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010	Worldwide: VCCI Class A CISPR 22 Class A CISPR 32 Class A CISPR 24:2010
Lasers				
	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)	EN 60825-1:2007 / IEC 60825-1:2007 Class 1 Class 1 Laser Products / Laser Klasse 1 (Applicable for accessories - Optical Transceivers only)
Immunity				
Generic	CISPR24/CISPR35	CISPR24/CISPR35	CISPR24/CISPR35	CISPR24/CISPR35
EN	EN 55024:2010 / EN 55035:2017			
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11
Harmonics	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2	IEC 61000-3-2, EN 61000-3-2
Flicker	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3	IEC 61000-3-3, EN 61000-3-3
Mounting and Enclosure				
	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet. Horizontal surface mounting only. 2-post rack kit included.



STANDARDS AND PROTOCOLS

- ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)
- CPU DoS Protection
- Bootstrap Router (BSR) Mechanism for PIM, PIM WG
- draft-ietf-savi-mix
- IEEE 802.1AB-2005
- IEEE 802.1ak-2007
- 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 802.1t-2001
- IEEE 802.1v VLAN classification by Protocol and Port
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3ae 10-Gigabit Ethernet
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at Power over Ethernet
- IEEE 802.3bt Power over Ethernet
- IEEE 802.3az Energy Efficient Ethernet (EEE)
- IEEE 802.3x Flow Control
- IEEE 802.3z 1000BASE-X
- RFC 1122 Requirements for Internet Hosts - Communications Layers
 - RFC 1215 Convention for defining traps for use with the SNMP
 - RFC 1256 ICMP Router Discovery Messages
 - RFC 1350 TFTP Protocol (revision 2)
 - RFC 1393 Traceroute Using an IP Option
 - RFC 1403 BGP OSPF Interaction
 - RFC 1519 CIDR
 - RFC 1542 BOOTP Extensions
 - RFC 1583 OSPF Version 2
 - RFC 1591 Domain Name System Structure and Delegation
 - RFC 1657 Definitions of Managed Objects for BGP-4 using SMIv2
 - RFC 1772 Application of the Border Gateway Protocol in the Internet
 - RFC 1812 Requirements for IP Version 4 Router
 - RFC 1918 Address Allocation for Private Internet
 - RFC 1997 BGP Communities Attribute
 - RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing
- RFC 2131 DHCP
- RFC 2132 DHCP Options and BOOTP Vendor Extensions
- RFC 2236 IGMP
- RFC 2328 OSPF Version 2
- RFC 2375 IPv6 Multicast Address Assignments
- RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
- RFC 2401 Security Architecture for the Internet Protocol
- RFC 2402 IP Authentication Header
- RFC 2439 BGP Route Flap Damping
- RFC 2460 Internet Protocol, Version 6 (IPv6) Specification
- RFC 2464 Transmission of IPv6 over Ethernet Networks
- RFC 2545 Use of BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
- RFC 2576 (Coexistence between SNMP V1, V2, V3)
- RFC 2579 (SMIv2 Text Conventions)
- RFC 2580 (SMIv2 Conformance)
- RFC 2710 Multicast Listener Discovery (MLD) for IPv6
- RFC 2711 IPv6 Router Alert Option
- RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
- RFC 2918 Route Refresh Capability for BGP-4
- RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only)
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3019 MLDv1 MIB
- RFC 3046 DHCP Relay Agent Information Option
- RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
- RFC 3065 Autonomous System Confederation for BGP
- RFC 3068 An Anycast prefix for 6to4 Relay Route
- RFC 3137 OSPF Stub Router Advertisement sFlow
- RFC 3376 IGMPv3
- RFC 3416 (SNMP Protocol Operations v2)
- RFC 3417 (SNMP Transport Mappings)
- RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)
- RFC 3484 Default Address Selection for IPv6
- RFC 3509 Alternative Implementations of OSPF Area Border Routers
- RFC 3575 IANA Considerations for RADIUS
- RFC 3623 Graceful OSPF Restart
- RFC 3768 VRRP
- RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 3973 PIM Dense Mode
- RFC 4022 MIB for TCP



- RFC 4113 MIB for UDP
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 4251 The Secure Shell (SSH) Protocol
- RFC 4252 SSHv6 Authentication
- RFC 4253 SSHv6 Transport Layer
- RFC 4254 SSHv6 Connection
- RFC 4271 A Border Gateway Protocol 4 (BGP-4)
- RFC 4273 Definitions of Managed Objects for BGP-4
- RFC 4291 IP Version 6 Addressing Architecture
- RFC 4292 IP Forwarding Table MIB
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 4360 BGP Extended Communities Attribute
- RFC 4419 Key Exchange for SSH
- RFC 4443 ICMPv6
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
- RFC 4486 Subcodes for BGP Cease Notification Message
- RFC 4541 IGMP & MLD Snooping Switch
- RFC 4552 Authentication/Confidentiality for OSPFv3
- RFC 4601 PIM Sparse Mode
- RFC 4607 Source-Specific Multicast for IP
- RFC 4675 RADIUS VLAN & Priority
- RFC 4724 Graceful Restart Mechanism for BGP
- RFC 4760 Multiprotocol Extensions for BGP-4
- RFC 4861 IPv6 Neighbor Discovery
- RFC 4862 IPv6 Stateless Address Auto-configuration
- RFC 4940 IANA Considerations for OSPF
- RFC 5065 Autonomous System Confederation for BGP
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
- RFC 5187 OSPFv3 Graceful Restart
- RFC 5340 OSPFv3 for IPv6
- RFC 5424 Syslog Protocol
- RFC 5492 Capabilities Advertisement with BGP-4
- RFC 5519 Multicast Group Membership Discovery MIB (MLDv2 only)
- RFC 5701 IPv6 Address Specific BGP Extended Community Attribute
- RFC 5722 Handling of Overlapping IPv6 Fragments
- RFC 5798 VRRP (exclude Accept Mode and sub-sec timer)
- RFC 5880 Bidirectional Forwarding Detection
- RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification
- RFC 6620 FCFS SAVI
- RFC 6987 OSPF Stub Router Advertisement
- RFC 7047 The Open vSwitch Database Management Protocol
- RFC 7313 Enhanced Route Refresh Capability for BGP-4
- RFC 768 User Datagram Protocol
- RFC 783 TFTP Protocol (revision 2)
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 813 Window and Acknowledgement Strategy in TCP
- RFC 815 IP datagram reassembly algorithms
- RFC 8201 Path MTU Discovery for IP version 6
- RFC 826 ARP
- RFC 879 TCP maximum segment size and related topics
- RFC 896 Congestion control in IP/TCP internetworks
- RFC 917 Internet subnets
- RFC 919 Broadcasting Internet Datagrams
- RFC 922 Broadcasting Internet Datagrams in the Presence of Subnets (IP_BROAD)
- RFC 925 Multi-LAN address resolution
- RFC 951 BOOTP
- RFC 1027 Proxy ARP
- SNMPv1/v2c/v3
- RFC 4861 IPv6 Neighbor Discovery
- RFC 4862 IPv6 Stateless Address Auto-configuration
- ITU-T Rec G.8032/Y.1344 Mar. 2010
- RFC 1757 Remote Network Monitoring Management Information Base
- 2.5G/5GBASE-T (IEEE 802.3bz-2016), 2.5G/5G NBASE-T
- 10GBASE-T (IEEE 802.3an-2006)
- 25-Gigabit Ethernet (IEEE 802.3by-2016, 802.3cc-2017)
- 50-Gigabit Ethernet (IEEE 802.3cd-2018)
- RFC 3101 OSPF Not-so-stubby-area option
- RFC 4750 OSPFv2 MIB partial support no SetMIB

ARUBA CX 6300 SWITCHES AND ACCESSORIES

Switch Models

- Aruba 6300M 24p HPE Smart Rate 1G/2.5G/5G/10G Class6 PoE and 2p 50G and 2p 25G Switch (R8S89A)
- Aruba 6300M 48p HPE Smart Rate 1G/2.5G/5G Class8 PoE and 2p 50G and 2p 25G Switch (R8S90A)
- Aruba 6300M 48SR5 12p Class8 PoE and 36p Class6 PoE HPE Smart Rate 1G/2.5G/5G and 2p 50G and 2p 10G LRM support Switch (R8S91A)
- Aruba 6300M 24p SFP+ LRM support and 2p 50G and 2p 25G MACsec Switch (R8S92A)
- Aruba 6300M 24-port SFP+ and 4-port SFP56 Switch (JL658A)



- Aruba 6300M 48-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL659A)
- Aruba 6300M 24-port HPE Smart Rate 1/2.5/5GbE Class 6 PoE and 4-port SFP56 Switch (JL660A)
- Aruba 6300M 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL661A)
- Aruba 6300M 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL662A)
- Aruba 6300M 48-port 1GbE and 4-port SFP56 Switch (JL663A)
- Aruba 6300M 24-port 1GbE and 4-port SFP56 Switch (JL664A)
- Aruba 6300F 48-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL665A)
- Aruba 6300F 24-port 1GbE Class 4 PoE and 4-port SFP56 Switch (JL666A)
- Aruba 6300F 48-port 1GbE and 4-port SFP56 Switch (JL667A)
- Aruba 6300F 24-port 1GbE and 4-port SFP56 Switch (JL668A)
- Aruba 6300M 48-port 1GbE and 4-port SFP56 Power-to-Port 2 Fan Trays 1 PSU Bundle (JL762A)

Power Supplies

- Aruba X371 12VDC 250W 100-240VAC Power Supply (JL085A)
- Aruba X372 54VDC 680W 100-240VAC Power Supply (JL086A)
- Aruba X372 54VDC 1050W 110-240VAC Power Supply (JL087A)
- Aruba X372 54VDC 1600W 110-240VAC Power Supply (JL670A)
- Aruba X371 12VDC 250W 100-240VAC Power-to-Port Power Supply (JL760A)
- Aruba 6300M 250W 36-72VDC PSU (JL757A)
- Aruba 6300M 1050W 36-72VDC (JL758A)

Fan Tray

- Aruba X751 Front to Back Fan Tray (JL669B)
- Aruba 6300M Power-to-Port Fan Tray (JL761A)

Accessories

- HPE X410 1U Universal 4-post Rack Mount Kit (J9583A)
- Aruba X414 1U Universal 4-post Rack Mounting Kit (J9583B)
- Aruba USB-A to RJ45 PC-to-Switch Cable (R9G48A)
- Aruba USB-A to RJ45 PIN3TX-6RX Cable (R8Z87A)

- Aruba USB-A to USB-C CPC-to-Switch Cable (R9J32A)
- Aruba USB-C to USB-C CPC-to-Switch Cable (R9J33A)
- HPE Aruba Networking CX Switch Bluetooth Adapter (S1H23A)

Cables

- Aruba 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281D)
- Aruba 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283D)
- Aruba 25G SFP28 to SFP28 0.65m Direct Attach Copper Cable (JL487A)
- Aruba 25G SFP28 to SFP28 3m Direct Attach Copper Cable (JL488A)
- Aruba 25G SFP28 to SFP28 5m Direct Attach Copper Cable (JL489A)
- Aruba 50G SFP56 to SFP56 0.65m DAC Cable (R0M46A)¹
- Aruba 50G SFP56 to SFP56 3m DAC Cable (R0M47A)¹

Transceivers

- Aruba 100M SFPLCFX 2km MMF XCVR (J9054D)²
- Aruba 1G SFP LC SX 500m MMF Transceiver (J4858D)
- Aruba 1G SFP LC LX 10km SMF Transceiver (J4859D)
- Aruba 1G SFP LCLH 70km SMF Transceiver (J4860D)
- Aruba 1G SFP RJ45 T 100m Cat5e Transceiver (J8177D)
- Aruba 1G SFP LC SX 500m MMFTAA Transceiver (JL745A)
- Aruba 1G SFP LC LX 10km SMFTAA Transceiver (JL746A)
- Aruba 1G SFP RJ45 T 100m Cat5e TAA Transceiver (JL747A)
- Aruba 10G SFP+ LC SR 300m MMF Transceiver (J9150D)
- Aruba 10G SFP+ LC LRM 220m MMF Transceiver (J9152D)³
- Aruba 10G SFP+ LCLR 10km SMF Transceiver (J9151E)
- Aruba 10G SFP+ LCER 40km SMF Transceiver (J9153D)
- Aruba 10GBASE-T SFP+ RJ-45 30m Cat6A Transceiver (JL563B)
- Aruba 10G SFP+ LC SR 300m MMFTAA Transceiver (JL748A)
- Aruba 10G SFP+ LC LR 10km SMFTAA Transceiver (JL749A)
- Aruba 25G SFP28 LC SR 100m MMF Transceiver (JL484A)
- Aruba 25G SFP28 LC eSR 400m MMF Transceiver (JL485A)
- Aruba 25G SFP28 LC LR 10km SMF Transceiver (JL486A)
- Aruba 50G SFP56 LC SR 100m MMF XCVR (R0M48A)

¹ 50G capability is for use with 50G DACs for both interconnect and VSF stacking. 50G SR transceivers have been added with a minimum software of 10.09.1010. VSF stacking not supported on 1G ports.

² J9054D 100Mbps transceiver only supported in SFP+ ports on JL658A. 100Mbps transceivers are not supported in any SFP56 port on all models.

³ J9152D XCVR natively supported only in the R8S91A and R8S92A models



Software

- Aruba CX Mobile App <https://www.arubanetworks.com/products/networking/switches/cx-mobileapp/>
- Aruba NetEdit Single Node: 1 year (JL639AAE)
- Aruba NetEdit Single Node: 3 years (JL640AAE)

Aruba CX Advanced Licenses

- Aruba CX Soft 63xx Sw Adv 10y E-STU (S0T76AAE)
- Aruba CX Soft 63xx Sw Adv 1y E-STU (S0T77AAE)
- Aruba CX Soft 63xx Sw Adv 3y E-STU (S0T78AAE)
- Aruba CX Soft 63xx Sw Adv 5y E-STU (S0T79AAE)
- Aruba CX Soft 63xx Sw Adv 7y E-STU (S0T80AAE)

Aruba Central Foundation Licenses

- Aruba Central Switch 6300/38xx Foundation 1 year Subscription E-STU (Q9Y78AAE)
- Aruba Central Switch 6300/38xx Foundation 3 year Subscription E-STU (Q9Y79AAE)
- Aruba Central Switch 6300/38xx Foundation 5 year Subscription E-STU (Q9Y80AAE)
- Aruba Central Switch 6300/38xx Foundation 7 year Subscription E-STU (Q9Y81AAE)
- Aruba Central Switch 6300/38xx Foundation 10 year Subscription E-STU (R3K02AAE)
- Aruba Central On-Premises 63xx or 38xx Switch Foundation 1 year Subscription E-STU (R6U83AAE)
- Aruba Central On-Premises 63xx or 38xx Switch Foundation 3 year Subscription E-STU (R6U84AAE)
- Aruba Central On-Premises 63xx or 38xx Switch Foundation 5 year Subscription E-STU (R6U85AAE)
- Aruba Central On-Premises 63xx or 38xx Switch Foundation 7 year Subscription E-STU (R6U86AAE)
- Aruba Central On-Premises 63xx or 38xx Switch Foundation 10 year Subscription E-STU (R6U87AAE)

For details and complete listing of Aruba Central licensing options, please refer to the [Aruba Central Data Sheet](#).

Aruba Central Advanced Licenses

- Aruba Central 63xx or 38xx Switch Foundation 1 year Subscription E-STU (Q9Y78AAE)
- Aruba Central 63xx or 38xx Switch Foundation 3 year Subscription E-STU (Q9Y79AAE)
- Aruba Central 63xx or 38xx Switch Foundation 5 year Subscription E-STU (Q9Y80AAE)
- Aruba Central 63xx or 38xx Switch Foundation 7 year Subscription E-STU (Q9Y81AAE)
- Aruba Central 63xx or 38xx Switch Foundation 10 year Subscription E-STU (R3K02AAE)

Aruba Fabric Composer

- Aruba Fabric Composer Device Management Service Tier 3 Switch 1 year Subscription E-STU (R8D18AAE)
- Aruba Fabric Composer Device Management Service Tier 3 Switch 3 year Subscription E-STU (R8D19AAE)
- Aruba Fabric Composer Device Management Service Tier 3 Switch 5 year Subscription E-STU (R8D20AAE)

Support

- JL658A: 4 Hour Onsite 3 Year (HR4C9E)
- JL659A: 4 Hour Onsite 3 Year (HR4R3E)
- JL660A: 4 Hour Onsite 3 Year (HL5Z0E)
- JL661A: 4 Hour Onsite 3 Year (HR4Z8E)
- JL662A: 4 Hour Onsite 3 Year (HL6R3E)
- JL663A: 4 Hour Onsite 3 Year (HR5N2E)
- JL664A: 4 Hour Onsite 3 Year (HL7J3E)
- JL665A: 4 Hour Onsite 3 Year (HR5W0E)
- JL666A: 4 Hour Onsite 3 Year (HR6E5E)
- JL667A: 4 Hour Onsite 3 Year (HR6P0E)
- JL668A: 4 Hour Onsite 3 Year (HR6X5E)
- JL762A: 4 Hour Onsite 3 Year (HR5N2E)

For Aruba Central hardware only support, 24x7 TAC support, and many other support options, go to [Support Services](#) Central SKU lookup tool.

Módulo Transceptor SFP+ Compatible con J9150D de HPE - 10GBASE -SR - Multimodo de 10GbE - SFP+ Ethernet Gigabit 10Gb - LC - 300m - 850nm - HPE FlexFabric, 6120XG, 6120G DDM

ID del Producto: J9150D-ST



El modelo J9150D-ST es un módulo transceptor SFP+ por fibra óptica compatible con el modelo J9150D de HPE diseñado, programado y probado para su funcionamiento con routers y switches de la marca HPE®. Ofrece conectividad confiable a 10 GbE, a través de cable de fibra óptica, para redes compatibles con 10GBASE-SR, a una distancia máxima de hasta 300 m.

Especificaciones técnicas:

- Longitud de onda: 850 nm
- Máxima tasa de transferencia de datos: 10 Gbps
- Tipo: multimodo
- Tipo de conexión: Conector de LC
- Distancia máxima de transferencia: 300 m
- MTBF: 498,745,585 horas
- Consumo energético: < 1.3 W
- DDM ("Digital Diagnostics Monitoring", monitorización de diagnóstico digital): si

Este módulo SFP+ por fibra óptica admite el intercambio en caliente, lo cual facilita las actualizaciones y reemplazos, ya que minimiza las interrupciones de conexión en la red.

Todos los módulos transceptores SFP y SFP+ de StarTech.com están avalados por garantía de por vida

y soporte técnico multilingüe gratuito de por vida. StarTech.com ofrece una amplia gama de módulos SFP, así como cables de conexión directa con SFP, lo cual le ofrece tanto la funcionalidad, como la confiabilidad que necesita para garantizar un rendimiento de red confiable.

Certificaciones, Reportes y Compatibilidad



Aplicaciones

Características

- 100% COMPATIBLE CON HPE J9150D: Funciona con commutadores HPE como FlexFabric, 6120XG, 6120G y otros
- ESPECIFICACIONES TÉCNICAS: 10GBASE-SR | 10Gbps | Multimodo | Conector LC | 850nm | DDM ("Digital Diagnostic Monitoring", monitorización de diagnóstico digital) | Distancias de hasta 300 m
- PROBADO PARA COMPATIBILIDAD CON DISPOSITIVO OEM ANFITRIÓN: Intercambiable en caliente en enruteadores y commutadores HPE; la compatibilidad con DDM informa del estado del transceptor a la mayoría de las herramientas de gestión de red SNMP
- FUNCIONA CON CONMUTADORES COMPATIBLES CON MSA: También funciona con los modelos de commutador Ubiquiti, D-Link, Netgear, Supermicro, TP-Link y otras, las cuales admiten módulos no codificados
- LA ELECCIÓN DE LOS PROFESIONALES DE LA INFORMÁTICA: Diseñada y fabricada para los profesionales de informática, este módulo SFP está respaldado de por vida (vida útil del módulo, no del commutador de red), incluyendo asistencia técnica multilingüe gratuita de por vida 24/5

Hardware

Política de Garantía Lifetime

Compatible Brand HPE

Estándares Industriales IEEE 802.3ae 10GBASE-SR

Rendimiento

Tasa de Transferencia 10.31 Gbps
de Datos Máxima

Distancia Máxima de Transferencia	300 m (984 ft)
Tipo de Fibra	Multimodo
Longitud de Onda	850nm
Modo de Operación de Fibra	Full-Duplex
DDM	Sí
Redes Compatibles	10 Gbps
MTBF	498,745,585 hours
Consumo de Energía	< 1.3W

Características Físicas

Longitud del Producto	0.5 in [1.4 cm]
Ancho del Producto	2.3 in [5.8 cm]
Altura del Producto	0.5 in [1.4 cm]
Peso del Producto	0.7 oz [20 g]

Información de la Caja

Longitud de la Caja	4.5 in [11.5 cm]
Ancho de la Caja	3.5 in [9 cm]
Altura de la Caja	1.2 in [3.1 cm]
Peso (de la Caja) del Envío	1.8 oz [50 g]

Contenido de la Caja

Incluido en la Caja	1 - Transceptor SFP+
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* La apariencia y las especificaciones del producto están sujetas a cambios sin previo aviso.

Cisco Catalyst 9300 Series Switches

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Built to reimagine connection, reinforce security and redefine experience

Cisco Catalyst 9300 Series switches are Cisco's lead stackable enterprise access switching platform and as part of the Catalyst 9000 family, are built to transform your network to handle a hybrid world where the workplace is anywhere, endpoints could be anything, and applications are hosted all over the place.

The Catalyst 9300 Series, including the new Catalyst 9300X models, continues to shape the future with continued innovation that helps you reimagine connections, reinforce security and redefine the experience for your hybrid workforce big and small.

The many industry's first include:

- **Up to 1TB of stacking bandwidth:** With Stackwise-1T, Catalyst 9300 switches are the industry's highest-density stacking bandwidth solution with the most flexible uplink architecture
- **Flexible and dense uplink offerings** with 100G, 40G, 25G, Multigigabit, 10G, and 1G modular uplinks
- **Mixed Stacking with Backward Compatibility** - Stack your Catalyst 9300X fiber switches with Catalyst 9300 and Catalyst 9300X Multigigabit switches, bringing stackable high-speed fiber to the access
- **Highest Multigigabit Ports:** With standalone and Stackwise-1T, Catalyst 9300X models enable 48 mGig ports in standalone and 448 mGig ports with an 8-member stack
- **Highest 90W UPOE+ Density:** Enable your OT/IT needs with up to 36 ports of 90W UPOE+ for standalone or 288 ports of 90W UPOE+ with a 8-member stack.
- **StackPower with Backward Compatibility:** Enable power resiliency with higher power budgets in mixed Catalyst 9300 and Catalyst 9300X stack.
- **100G IPsec in hardware:** With the new 2.0sec UADP ASIC, the Catalyst 9300X comes with 100G line rate IPsec to enable various options for new edge connectivity
- **Secure Tunnel connectivity:** With the new edge, the C9300X enables secure connections to Secure Internet Gateway, Cloud Service Providers and Site to Site connectivity using IPsec tunnel with AES-256 Encryption and speeds up to 100G.
- **Enhanced Application Hosting:** With 2x capacity and additional RAM, QAT, and 2 x 10G AppGig Ports, multiple Cisco Signed performance savvy applications can be hosted on Catalyst 9300X
- **ThousandEyes Enabled:** End-to-end visualization of the path from campus/branch to clouds/DC with Cisco ThousandEyes Network and Application Synthetics (included with Cisco DNA Advantage licenses)
- **Investment Protection:** Catalyst 9300X redundant fans and power supplies, data stack and StackPower cables are backward compatible with the Catalyst 9300.

The Foundation of Software-Defined access

Advanced persistent security threats. The exponential growth of Internet of Things (IoT) devices. Mobility everywhere. Cloud adoption. All of these require a network fabric that integrates advanced hardware and software innovations to automate, secure, and simplify customer networks. The goal of this network fabric is to enable customer revenue growth by accelerating the rollout of business services.

The Cisco Digital Network Architecture (Cisco DNA) with Software-Defined Access (SD-Access) is the network fabric that powers business. It is an open and extensible, software-driven architecture that accelerates and simplifies your enterprise network operations. The programmable architecture frees your IT staff from time-consuming, repetitive network configuration tasks so they can focus instead on innovation that positively transforms your business. SD-Access enables policy-based automation from edge to cloud with foundational capabilities. These include:

- Simplified device deployment
- Unified management of wired and wireless networks
- Network virtualization and segmentation
- Group-based policies
- Context-based analytics

Cisco DNA Software

Cisco DNA Software offers a valuable and flexible way to buy software for the access, WAN, and data center domains. At each stage in the product lifecycle, Cisco DNA Software helps make buying, managing, and upgrading your network and infrastructure software easier. Cisco DNA Software provides:

- Flexible licensing models to smoothly distribute customers' software spending over time
- Investment protection for software purchases through software services-enabled license portability
- Access to updates, upgrades, and new technology from Cisco through Cisco Software Support Services (SWSS)
- Lower cost of entry with the new Cisco DNA Subscription for Switching model
- Access to end-to-end network visibility with Cisco Spaces and service assurance through Cisco ThousandEyes Network and Application Synthetics (included with Cisco DNA Advantage license)

Cisco DNA lets you manage your entire switching structure as a single, converged component. With one management system and one policy for wired and wireless networks, it offers an efficient way to provide more secure access.

Product overview: Features

Product highlights

- Highest wireless scale for Wi-Fi 6 and 802.11ac Wave 2 access points supported on a single switch with select models
- Catalyst 9300 and Catalyst 9300L/LM models are based on the Cisco UADP 2.0 Application-Specific Integrated Circuit (ASIC) with programmable pipeline and microengine capabilities, along with template-based, configurable allocation of Layer 2 and Layer 3 forwarding, Access Control Lists (ACLs), and Quality of Service (QoS) entries
- Catalyst 9300X models are based on UADP 2.0sec ASIC which adds line rate support for Crypto, including 100G hardware-based IPsec
- x86 CPU complex with 8-GB memory, and 16 GB of flash and external USB 3.0 SSD pluggable storage slot (delivering up to 240GB of storage with an option SSD drive) to host containers. C9300X models support 16GB of memory
- USB 2.0 slot to load system images and set configurations
- Up to 1 Tbps of local stackable switching bandwidth with Catalyst 9300X models
- Deeper buffer and higher scale model options for rich multi-media content delivery applications
- Flexible and dense uplink offerings with 100G, 40G, 25G, Multigigabit, 10G, and 1G as fixed or modular uplinks
- Easy transition from 40G to 100G and 10G to 25G with dual-rate optics
- Flexible downlink options with 25G, 10G and 1G Copper and Fiber as well as the densest Multigigabit links
- With a mix of Copper (1G up to 10G) and Fiber (1G up to 25G) supported in a single stack, multiple flexible deployment scenarios are enabled, including 2-Tier, 3-Tier and Hybrid architectures
- Leading PoE capabilities with up to 384 ports of PoE per stack, PoE+, and 288 ports high density IEEE 802.3bt - 90W UPOE+, and 60W Cisco UPOE
- Intelligent Power Management with Cisco StackPower technology, providing power stacking among members for power redundancy. Stackpower pools the power supplies across the stack to be used redundancy and supplemental power purposes
- Line-rate, hardware-based Flexible NetFlow (FNF), delivering flow collection of up to 128,000 flows with select models
- IPv6 support in hardware, providing wire-rate forwarding for IPv6 networks
- Dual-stack support for IPv4/IPv6 and dynamic hardware forwarding table allocations, for ease of IPv4-to-IPv6 migration
- Support for both static and dynamic NAT and Port Address Translation (PAT)
- IEEE 802.1ba AV Bridging (AVB) built in to provide a better audio and video experience through improved time synchronization and QoS

- Precision Time Protocol (PTP; IEEE 1588v2) provides accurate clock synchronization with sub-microsecond accuracy making it suitable for distribution and synchronization of time and frequency over network
- Cisco IOS XE, a modern operating system for the enterprise with support for model-driven programmability including NETCONF, RESTCONF, YANG, on-box Python scripting, streaming telemetry, container-based application hosting, and patching for critical bug fixes. The OS also has built-in defenses to protect against runtime attacks
- End-to-end visualization of the path from campus/branch to clouds/DC with Cisco ThousandEyes Network and Application Synthetics (included with Cisco DNA Advantage license)
- **SD-Access:** Cisco Catalyst 9300 Series switches form the foundational building block for SD-Access, Cisco's lead enterprise architecture:
 - Policy-based automation from edge to cloud
 - Simplified segmentation and micro-segmentation, with predictable performance and scalability
 - Automation through Cisco DNA Center
 - Policy handled through the Cisco Identity Services Engine (ISE)
 - Network assurance provided through the Cisco DNA Center
 - Faster launch of new business services and significantly improved issue resolution time
- Plug and Play (PnP) enabled: A simple, secure, unified, and integrated offering to ease new branch or campus device rollouts or updates to an existing network
- Advanced security
 - Encrypted Traffic Analytics (ETA): You benefit from the power of machine learning to identify and take actions toward threats or anomalies in your network, including malware detection in encrypted traffic (without decryption) and distributed anomaly detection
 - Support for AES-256 with the powerful MACsec 256-bit encryption algorithm available on all models
 - Trustworthy solutions: Hardware anchored Secure Boot and Secure Unique Device Identification (SUDI) support for Plug and Play, to verify the identity of the hardware and software

Platform details

Switch models and configurations

Table 1. Product Family Configurations

Models	Modular Uplinks and Speeds	Stacking Bandwidth Support	mGig Density	Cisco StackPower	HW-Based IPSEC	App-Hosting Capacity
Catalyst 9300X	10G, 25G, 40G, mGig and 100G	Stackwise-1T (480G when stacking with Catalyst 9300 model)	48x 10G	✓ (Larger Power Budget)	Up to 100G IPsec*	✓ (2x hosting resources over Catalyst 9300 models)
Catalyst 9300	10G, 25G, 40G and mGig	Stackwise-480	48x5G and 24x10G	✓	✗	✓
Catalyst 9300L /LM	✗	Stackwise-320	12x10G	✗	✗	✓

*Need to order HSEC Key for IPsec Feature.

The Cisco Catalyst 9300 Series is made up of nineteen modular uplink switch models and fourteen fixed uplink switch models.



Figure 1.
Cisco Catalyst 9300 Series switches

Table 2 lists port scale and power details for the Cisco Catalyst 9300 Series models.

Table 2. Cisco Catalyst 9300 Series switch configurations

Model	Total 10/100/1000, Multigigabit copper or SFP Fiber	Uplink Configuration	Default AC power supply
Modular uplink models			
C9300X-48HX	48 port Cisco UPOE+, 48x 10G Multigigabit (10G/5G/2.5G/1G/100M) with 90W UPOE+	Modular Uplinks	1100W AC
C9300X-48TX	48 port Data, 48x 10G Multigigabit (10G/5G/2.5G/1G/100M)	Modular Uplinks	715W AC
C9300X-48HXN	48 port Cisco UPOE+, 8x 10G Multigigabit (10G/5G/2.5G/1G/100M) + 40x 5G Multigigabit	Modular Uplinks	1100W AC

Model	Total 10/100/1000, Multigigabit copper or SFP Fiber	Uplink Configuration	Default AC power supply
	(5G/2.5G/1G/100M)		
C9300X-24HX	24 port Cisco UPOE+, 24x 10G Multigigabit (10G/5G/2.5G/1G/100M)	Modular Uplinks	1100W AC
C9300X-12Y	12 port 25G/10G/1G SFP28	Modular Uplinks	715W AC
C9300X-24Y	24 port 25G/10G/1G SFP28	Modular Uplinks	715W AC
C9300-24T	24 port Data	Modular Uplinks	350W AC
C9300-48T	48 port Data	Modular Uplinks	350W AC
C9300-24P	24 port PoE+	Modular Uplinks	715W AC
C9300-48P	48 port PoE+	Modular Uplinks	715W AC
C9300-24U	24 port Cisco UPOE	Modular Uplinks	1100W AC
C9300-48U	48 port Cisco UPOE	Modular Uplinks	1100W AC
C9300-24UX	24 port Multigigabit Cisco UPOE (10G/5G/2.5G/1G/100M)	Modular Uplinks	1100W AC
C9300-48UXM	48 port Cisco UPOE, 36 ports 100M/1G/2.5G + 12 ports Multigigabit (10G/5G/2.5G/1G/100M)	Modular Uplinks	1100W AC
C9300-48UN	48 port 5Gbps Multigigabit UPOE ports (5G/2.5G/1G/100M)	Modular Uplinks	1100W AC
C9300-24UB	24 port Cisco UPOE	Modular Uplinks	1100W AC
C9300-24UXB	24 port Multigigabit Cisco UPOE (10G/5G/2.5G/1G/100M)	Modular Uplinks	1100W AC
C9300-48UB	48 port Cisco UPOE	Modular Uplinks	1100W AC
C9300-24H	24 port Cisco UPOE+	Modular Uplinks	1100W AC
C9300-48H	48 Cisco UPOE+	Modular Uplinks	1100W AC
C9300-24S	24 1G SFP	Modular Uplinks	715W AC
C9300-48S	48 port 1G SFP	Modular Uplinks	715W AC

Model	Total 10/100/1000, Multigigabit copper or SFP Fiber	Uplink Configuration	Default AC power supply
Fixed uplink models			
C9300L-24T-4G	24 port Data	4x 1G fixed uplinks	350W AC
C9300L-24T-4X	24 port Data	4x 10G/1G fixed uplinks	350W AC
C9300L-48T-4G	48 port Data	4x 1G fixed uplinks	350W AC
C9300L-48T-4X	48 port Data	4x 10G/1G fixed uplinks	350W AC
C9300L-24P-4G	24 port PoE+	4x 1G fixed uplinks	715W AC
C9300L-24P-4X	24 port PoE+	4x 10G/1G fixed uplinks	715W AC
C9300L-48P-4G	48 port PoE+	4x 1G fixed uplinks	715W AC
C9300L-48P-4X	48 port PoE+	4x 10G/1G fixed uplinks	715W AC
C9300L-48PF-4G	48 port PoE+	4x 1G fixed uplinks	1100W AC
C9300L-48PF-4X	48 port PoE+	4x 10G/1G fixed uplinks	1100W AC
C9300L-24UXG-4X	24 port Cisco UPOE, 8 ports Multigigabit (10G/5G/2.5G/1G/100M) + 16 ports 1G (1G/100M/10M)	4x 10G/1G fixed uplinks	1100W AC
C9300L-24UXG-2Q	24 port Cisco UPOE, 8 ports Multigigabit (10G/5G/2.5G/1G/100M) + 16 ports 1G (1G/100M/10M)	2x 40G fixed uplinks	1100W AC
C9300L-48UXG-4X	48 port Cisco UPOE, 12 ports Multigigabit (10G/5G/2.5G/1G/100M) + 36 port 1G (1G/100M/10)	4x 10G/1G fixed uplinks	1100W AC
C9300L-48UXG-2Q	48 port Cisco UPOE, 12 port Multigigabit (10G/5G/2.5G/1G/100M) + 36 port 1G (1G/100M/10M)	2x 40G fixed uplinks	1100W AC
C9300LM-48UX-4Y	48 port Cisco UPOE, 8 port 10G Multigigabit (10G/5G/2.5G/1G/100M) + 40 port 1G (1G/100M/10M)	4x25G fixed uplinks	715W AC
C9300LM-48U-4Y	48 port 1G (1G/100M/10M) with Cisco UPOE	4x25G fixed uplinks	715W AC
C9300LM-24U-4Y	24 port 1G (1G/100M/10M) with Cisco UPOE	4x25G fixed uplinks	715W AC
C9300LM-48T-4Y	48 port 1G (1G/100M/10M) Data	4x25G fixed uplinks	715W AC

Cisco Catalyst 9300 Series switches (C9300X and C9300 SKUs) support optional network modules for uplink ports (Figure 2). These field-replaceable network modules with 25G and 40G speeds in the Cisco Catalyst 9300 Series enable greater architectural flexibility and infrastructure investment protection by allowing a nondisruptive migration from 10G to 25G and beyond. The default switch configuration does not include the network module. When you purchase the switch, you can choose from the network modules described in Table 2.

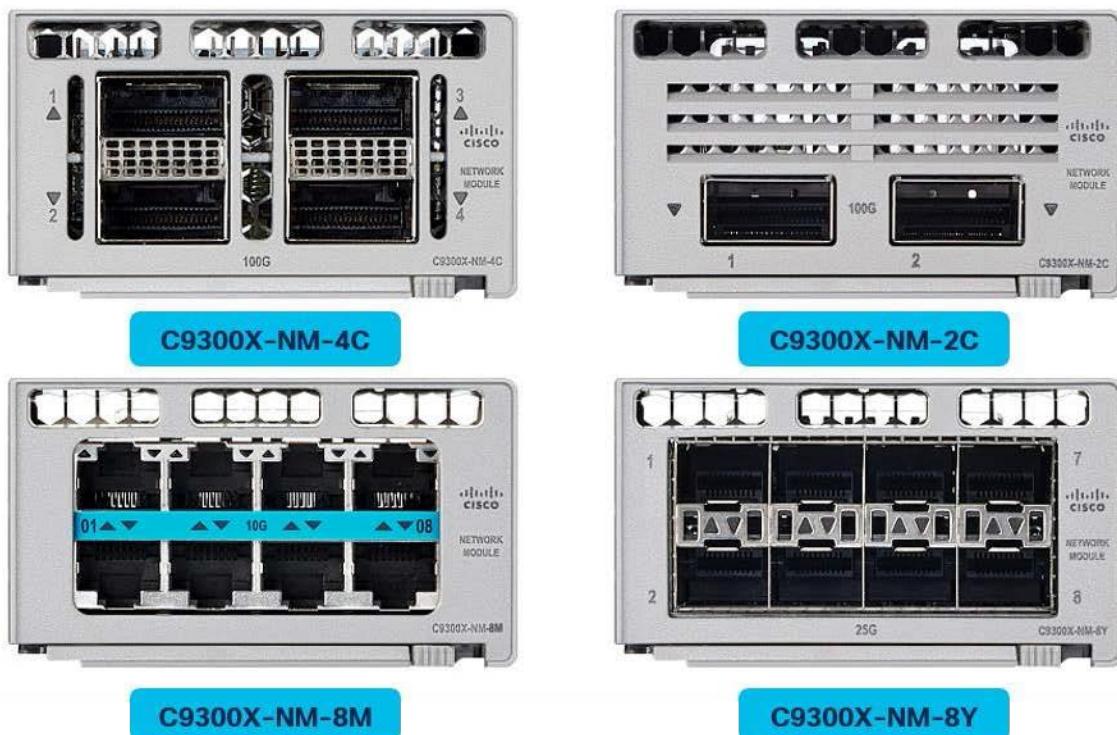


Figure 2.
Cisco Catalyst 9300X Network Modules



Figure 3.
Cisco Catalyst 9300 Series Network Modules

Table 3. Network module numbers and descriptions

Network module	Description
C9300X-NM-8M	Catalyst 9300X 8x 10G/1G Multigigabit Network Module
C9300X-NM-8Y	Catalyst 9300X 8x 25G/10G/1G Network Module
C9300X-NM-2C	Catalyst 9300X 2x 100G/40G Network Module
C9300X-NM-4C*	Catalyst 9300X 4x 100G/40G Network Module
C9300-NM-4G	Catalyst 9300 Series 4x 1G Network Module
C9300-NM-4M	Catalyst 9300 Series 4x Multigigabit Network Module
C9300-NM-8X	Catalyst 9300 Series 8x 10G/1G Network Module
C9300-NM-2Q	Catalyst 9300 Series 2x 40G Network Module
C9300-NM-2Y	Catalyst 9300 Series 2x 25G/10G/1G Network Module

*C9300X-NM-4C is compatible only with C9300X-48HX, C9300X-48TX and C9300X-24Y models

Please note: Catalyst 3850 and Catalyst 9300 network modules are supported on the Catalyst 9300 models. Catalyst 9300X network modules are only supported on the Catalyst 9300X models.

For additional details, please read our FAQs:

https://www.cisco.com/c/dam/en/us/products/collateral/switches/catalyst-9300-series-switches/nb-09-cat_9k-faq-cte-en.pdf.

Power supplies

Cisco Catalyst 9300 Series switches support dual redundant power supplies. The switches ship with one power supply by default, and the second power supply can be purchased when the switch is ordered or at a later time. If only one power supply is installed, it should always be in power supply bay #1. The switches also ship with three field-replaceable fans. Power Supplies are common across the Catalyst 9300 Series.



Figure 4.
Cisco Catalyst 9300 Series Dual Redundant power supplies

Table 4 lists the different power supplies available in these switches and available PoE power.

Table 4. Power supply models

Model	Primary power supply	Available PoE power	Available PoE power			
			With 350W Secondary PS	With 715W Secondary PS	With 1100W Secondary PS	With 1900W Secondary PS
C9300-24H	PWR-C1-1100WAC-P	830W	1180W	1545W*	1930W*	2160W
C9300-48H	PWR-C1-1100WAC-P	822W	1172W	1537W	1922W*	2722W
C9300-24H	PWR-C1-1900WAC-P	1630W	1980W	2160W	2160W	2160W
C9300-48H	PWR-C1-1900WAC-P	1622W	1972W	2337W	2722W	2880W

Model	Default power supply	Available PoE power	With 350W Secondary PS	With 715W Secondary PS	With 1100W Secondary PS
C9300X-48TX	PWR-C1-715WAC-P	No PoE	No PoE	No PoE	No PoE
C9300X-48HX	PWR-C1-1100WAC-P	590W	940W	1305W	1690W
C9300X-48HXN	PWR-C1-1100WAC-P	690W	1040W	1405W	1790W
C9300X-24HX	PWR-C1-1100WAC-P	735W	1085W	1450W	1835W
C9300X-12Y	PWR-C1-715WAC-P	No PoE	No PoE	No PoE	No PoE
C9300X-24Y	PWR-C1-715WAC-P	No PoE	No PoE	No PoE	No PoE
C9300-24T	PWR-C1-350WAC***	No PoE	No PoE	No PoE	No PoE
C9300-48T	PWR-C1-350WAC***	No PoE	No PoE	No PoE	No PoE
C9300-24P	PWR-C1-715WAC***	445W	720W*	720W*	720W*
C9300-48P	PWR-C1-715WAC***	437W	787W	1152W	1440W*
C9300-24U	PWR-C1-1100WAC	830W	1180W	1440W*	1440W*
C9300-48U	PWR-C1-1100WAC	822W	1172W	1537W	1800W**
C9300-24UX	PWR-C1-1100WAC-P	560W	910W	1275W	1440W*
C9300-48UXM	PWR-C1-1100WAC-P	490W	840W	1205W	1590W
C9300-48UN	PWR-C1-1100WAC-P	645W	995W	1360W	1745W
C9300-24UB	PWR-C1-1100WAC	830W	1180W	1440W*	1440W*
C9300-24UXB	PWR-C1-1100WAC-P	560W	910W	1275W	1440W*
C9300-48UB	PWR-C1-1100WAC	822W	1172W	1537W	1800W**

Model	Default power supply	Available PoE power	With 350W Secondary PS	With 715W Secondary PS	With 1100W Secondary PS
C9300-24S	PWR-C1-715WAC-P	No PoE	No PoE	No PoE	No PoE
C9300-48S	PWR-C1-715WAC-P	No PoE	No PoE	No PoE	No PoE
C9300L-24T-4G	PWR-C1-350WAC-P	No PoE	No PoE	No PoE	No PoE
C9300L-24T-4X	PWR-C1-350WAC-P	No PoE	No PoE	No PoE	No PoE
C9300L-48T-4G	PWR-C1-350WAC-P	No PoE	No PoE	No PoE	No PoE
C9300L-48T-4X	PWR-C1-350WAC-P	No PoE	No PoE	No PoE	No PoE
C9300L-24P-4G	PWR-C1-715WAC-P	505W	720W*	720W*	720W*
C9300L-24P-4X	PWR-C1-715WAC-P	505W	720W*	720W*	720W*
C9300L-48P-4G	PWR-C1-715WAC-P***	505W	855W	1220W	1440W*
C9300L-48P-4X	PWR-C1-715WAC-P***	505W	855W	1220W	1440W*
C9300L-48PF-4G	PWR-C1-1100WAC-P	890W	1240W	1440W	1440W*
C9300L-48PF-4X	PWR-C1-1100WAC-P	890W	1240W	1440W	1440W*
C9300L-24UXG-4X	PWR-C1-1100WAC-P	880W	1230W	1440W	1440W*
C9300L-24UXG-2Q	PWR-C1-1100WAC-P	722W	1072W	1440W	1440W*
C9300L-48UXG-4X	PWR-C1-1100WAC-P***	675W	1025W	1390W	1775W
C9300L-48UXG-2Q	PWR-C1-1100WAC-P***	675W	1025W	1390W	1775W

*Limited by port number and port rating (e.g. 24 PoE+ 30W ports = 720W)

**Limited by design

***Upgrade options for 715W and 1100W PSU are available

Stacking

Cisco Catalyst 9300 Series switch models are designed for stacking switches as a single virtual switch, enabling customers to have a single management plane and control plane for up to 448 access ports.



Figure 5.

Cisco Catalyst 9300 Series modular uplink models stack (C9300/C9300X SKUs) and fixed uplink models stack (C9300L SKUs)

Table 5 lists the supported stacking options.

Table 5. Supported stacking options

Model	Stacking support	Stacking bandwidth support	Optional Stacking hardware	Number of members	Supported stack members
C9300X SKUs	StackWise-1T	1 Tbps	StackWise cable	8	Stacks with other Catalyst 9300X models at StackWise-1T speeds with same license level Stacks with C9300 SKUs at StackWise-480 speeds with same license level
C9300 SKUs	StackWise-480	480 Gbps	StackWise Cable	8	Other C9300 SKUs with same license level C9300 higher scale SKUs only stack with other like higher scale models
C9300L SKUs	StackWise-320	320 Gbps	C9300L-STACK-KIT	8	Other C9300L SKUs with same license level

Mixed stacking between Catalyst 9300X and Catalyst 9300 models are supported at StackWise-480 speeds.

Mixed stacking between Catalyst 9300 and Catalyst 9300X and Catalyst 9300 higher scale models (C9300-24UB, C9300-24UXB, C9300-48UB) is **not supported**. You cannot stack fixed uplink models (C9300L SKUs) with modular uplink models (C9300 SKUs) or other Catalyst switches, e.g. Cisco Catalyst 3850 and 3650 Series. Any combination of Catalyst 9300 models can form a stack. Separately, any combination of Catalyst 9300L models can form a stack.

Catalyst 9300 higher scale SKUs (C9300-24UB, C9300-24UXB, C9300-48UB) need to be stacked with other higher scale models.

StackWise cables that are available to configure stacking with Catalyst 9300 Series modular uplink models (C9300X and C9300 SKUs) come in lengths of 0.5m, 1m and 3m.

The optional StackWise-320 kit for Catalyst 9300 Series fixed uplink models (C9300L SKUs) consists of two stack adapters and a stacking cable. The default stacking cable is 0.5 m, but options of 1m and 3m are also available. Table 6 lists the stacking accessories.

Table 6. Stacking accessories

Model	Description
STACK-T1-50CM	Data stack 50 cm (cable option with C9300 and C9300X SKUs)
STACK-T1-1M	Data stack 1m (cable option with C9300 and C9300X SKUs)
STACK-T1-3M	Data stack 3m (cable option with C9300 and C9300X SKUs)
C9300L-STACK-KIT	Stack kit for C9300L SKUs only: Two data stack adapters and one data stack cable
STACK-T3-50CM	Data stack 50cm cable (default cable with C9300L Stack Kit)
STACK-T3-1M	Data stack 1m cable (cable option with C9300L Stack Kit)
STACK T3-3M	Data stack 3m cable (cable option with C9300L Stack Kit)



Figure 6.
Cisco Catalyst 9300 Series fixed uplink models with optional stack kit

Fan

Cisco Catalyst 9300 Series switches also come with three field-replaceable fans and support (N+1) redundancy. Table 7 lists the fan module part number.

Table 7. Fan modules

Model	Description
FAN-T2=	Fan module

Performance and scalability

Performance and scalability metrics for the Cisco Catalyst 9300 Series are provided in Table 8.

Table 8. Performance specifications

Description	Catalyst 9300X modular uplink models	Catalyst 9300 modular uplink models	Catalyst 9300 higher scale, models	Catalyst 9300L fixed uplink models
Total number of MAC addresses	32,000	32,000	64,000	32,000
Total number of IPv4 routes (ARP plus learned routes)	39,000 (24,000 direct routes and 15,000 indirect routes)	32,000 (24,000 direct routes and 8000 indirect routes)	112,000 (48,000 direct routes and 64,000 indirect routes)	32,000 (24,000 direct routes and 8000 indirect routes)
IPv6 routing entries	19,500	16,000	56,000	16,000
Multicast routing scale	8,000	8,000	16,000	8,000
QoS scale entries	4,000	5,120	18,000	5,120
ACL scale entries	8,000	5,120	18,000	5,120
Packet buffer per SKU	16 MB buffer for 48-port 5G Multigigabit, 24-port 10G Multigigabit and 12-port Fiber 32 MB buffer for 48-port 10G Multigigabit and 24-port Fiber	16 MB buffer for 24- or 48-port Gigabit Ethernet models 32 MB buffer for 24 and 48-port Multigigabit	32 MB buffer for 24- and 48-port Gigabit Ethernet models 64 MB buffer for 24-port Multigigabit model (24UXB)	16 MB buffer for 24 and 48 port Gigabit Ethernet models
FNF entries	64,000 flows on 48-port 5G Multigigabit and 24-port 10G Multigigabit and 12-port Fiber 128,000 flows on 48-port 10G Multigigabit and 24-port Fiber	64,000 flow on 24- and 48-port Gigabit Ethernet models 128,000 flows on 24-port Multigigabit	128,000 flow on 24- and 48-port Gigabit Ethernet models 256,000 flows on 24-port Multigigabit	64,000 flow on 24-and 48-port Gigabit Ethernet models
DRAM	16 GB	8 GB	8 GB	8 GB
Flash	16 GB	16 GB	16 GB	16 GB
VLAN IDs	4094	4094	4094	4094
Total Switched Virtual Interfaces (SVIs)	1000	1000	1000	1000

Description	Catalyst 9300X modular uplink models	Catalyst 9300 modular uplink models	Catalyst 9300 higher scale, models	Catalyst 9300L fixed uplink models
Jumbo frames	9198 bytes	9198 bytes	9198 bytes	9198 bytes
Total routed ports per Catalyst 9300 Series stack	448	448	448	416

Table 9. Bandwidth specifications

SKU	Switching capacity	Switching capacity with stacking	Forwarding rate	Forwarding rate with stacking
C9300X-48TX	2,000 Gbps	3,000 Gbps	1488 Mpps	2232 Mpps
C9300X-48HX	2,000 Gbps	3,000 Gbps	1488 Mpps	2232 Mpps
C9300X-48HXN	2,000 Gbps	3,000 Gbps	1488 Mpps	2232 Mpps
C9300X-24HX	880 Gbps	1,880 Gbps	327.38 Mpps	1398.80 Mpps
C9300X-12Y	1,000 Gbps	2,000 Gbps	744.04 Mpps	1488 Mpps
C9300X-24Y	2,000 Gbps	3,000 Gbps	1488 Mpps	2232 Mpps
C9300-24T	208 Gbps	688 Gbps	154.76 Mpps	511.90 Mpps
C9300-48T	256 Gbps	736 Gbps	190.47 Mpps	547.62 Mpps
C9300-24P	208 Gbps	688 Gbps	154.76 Mpps	511.90 Mpps
C9300-48P	256 Gbps	736 Gbps	190.47 Mpps	547.62 Mpps
C9300-24U	208 Gbps	688 Gbps	154.76 Mpps	511.90 Mpps
C9300-48U	256 Gbps	736 Gbps	190.48 Mpps	547.62 Mpps
C9300-24UX	640 Gbps	1120 Gbps	476.19 Mpps	833.33 Mpps
C9300-48UXM	580 Gbps	1060 Gbps	431.54 Mpps	788.69 Mpps
C9300-48UN	640 Gbps	1120 Gbps	476.19 Mpps	833.33 Mpps
C9300-24UB	208 Gbps	688 Gbps	154.76 Mpps	511.90 Mpps
C9300-48UB	256 Gbps	736 Gbps	190.48 Mpps	547.62 Mpps
C9300-24UXB	640 Gbps	1120 Gbps	476.19 Mpps	833.33 Mpps
C9300-24H	208 Gbps	688 Gbps	154.76 Mpps	511.90 Mpps
C9300-48H	256 Gbps	736 Gbps	190.48 Mpps	547.62 Mpps

SKU	Switching capacity	Switching capacity with stacking	Forwarding rate	Forwarding rate with stacking
C9300-24S	208 Gbps	688 Gbps	154.76 Mpps	511.90 Mpps
C9300-48S	256 Gbps	736 Gbps	190.47 Mpps	547.62 Mpps
C9300X-12Y	1,000 Gbps	2,000 Gbps	744.04 Mpps	1488 Mpps
C9300X-24Y	2,000 Gbps	3,000 Gbps	1488 Mpps	2232 Mpps
C9300L-24T-4G	56 Gbps	376 Gbps	41.66 Mpps	279.76 Mpps
C9300L-24T-4X	128 Gbps	448 Gbps	95.23 Mpps	333.33 Mpps
C9300L-48T-4G	104 Gbps	424 Gbps	77.38 Mpps	315.48 Mpps
C9300L-48T-4X	176 Gbps	496 Gbps	130.95 Mpps	369.05 Mpps
C9300L-24P-4G	56 Gbps	376 Gbps	41.66 Mpps	279.76 Mpps
C9300L-24P-4X	128 Gbps	448 Gbps	95.23 Mpps	333.33 Mpps
C9300L-48P-4G	104 Gbps	424 Gbps	77.38 Mpps	315.48 Mpps
C9300L-48P-4X	176 Gbps	496 Gbps	130.95 Mpps	369.05 Mpps
C9300L-48PF-4G	104 Gbps	424 Gbps	77.38 Mpps	315.48 Mpps
C9300L-48PF-4X	176 Gbps	496 Gbps	130.95 Mpps	369.05 Mpps
C9300L-24UXG-4X	272 Gbps	592 Gbps	202.38 Mpps	440.47 Mpps
C9300L-24UXG-2Q	352 Gbps	672 Gbps	261.90 Mpps	500.00 Mpps
C9300L-48UXG-4X	392 Gbps	712 Gbps	291.66 Mpps	529.76 Mpps
C9300L-48UXG-2Q	472 Gbps	792 Gbps	351.19 Mpps	589.28 Mpps

All models are at wire-speed nonblocking performance for both IPv4 and IPv6. The forwarding rates in the table above are measured with 64 byte IPv4 packet sizes.

SD-Access architecture

What if you could give time back to IT? Provide network access in minutes for any user or device to any application - without compromise? SD-Access is the industry's first policy-based automation from network edge to cloud. Your foundation for your digital network, Cisco SD-Access. Built on the principles of the Cisco DNA, SD-Access provides end-to-end segmentation to keep user, device and application traffic separate without a redesign of the network. It automates user access policy so organizations can make sure the right policies are set for any user or device with any application across the network. This is accomplished with a single network fabric across LAN and WLAN which creates a consistent user experience anywhere without compromising on security.

There are many challenges today in managing the network to drive business outcomes. These limitations are due to manual configuration and fragmented tool offerings. SD-Access provides:

- A transformational management solution that reduces operational expenses and enhances business agility
- Consistent management of wired and wireless network provisioning and policy
- Automated network segmentation and group-based policy
- Contextual insights for fast issue resolution and capacity planning
- Open and programmable interfaces for integration with third-party solutions

For an overview of key use-cases SD-Access addresses, refer to [SD-Access Solution Overview](#).

Platform benefits

Cisco IOS XE opens a completely new paradigm in network configuration, operation, and monitoring through network automation. Cisco's automation solution is open, standards-based, and extensible across the entire lifecycle of a network device. The various automation mechanisms are outlined below.

- **Automated device provisioning** is the ability to automate the process of upgrading software images and installing configuration files on Cisco Catalyst switches when they are being deployed in the network for the first time. Cisco provides both turnkey solutions such as Plug and Play and off-the-shelf tools such as Zero-Touch Provisioning (ZTP) and Preboot Execution Environment (PXE) that enable an effortless and automated deployment.
- **API-driven configuration** is available with modern network switches such as the Cisco Catalyst 9300 Series. It supports a wide range of automation features and provides robust open APIs over NETCONF and RESTCONF and GNMI using YANG data models for external tools, both off-the-shelf and custom built, to automatically provision network resources.
- **Granular visibility** enables model-driven telemetry to stream data from a switch to a destination. The data to be streamed is identified through subscription to a data set in a YANG model. The subscribed data set is streamed to the destination at specified intervals. Additionally, Cisco IOS XE enables the push model. It provides near-real-time monitoring of the network, leading to quick detection and rectification of failures.
- **Seamless software upgrades and patching** supports OS resilience. Cisco IOS XE supports patching, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support lets you add patches without having to wait for the next maintenance release.

Security

- **Encrypted Traffic Analytics (ETA)** is a unique capability for identifying malware in encrypted traffic coming from the access layer. Since more and more traffic is becoming encrypted, the visibility this feature affords for threat detection is critical for keeping your network secure at different layers.
- **AES-256 MACsec encryption** is the IEEE 802.1AE standard for authenticating and encrypting packets between switches. The Cisco Catalyst 9300 Series switches support 256-bit and 128-bit Advanced Encryption Standard (AES), providing the most secure link encryption.
- **IPsec encryption** delivers secure end-to-end encrypted traffic between sites and connectivity to the Cloud. C9300X models support line rate IPsec up to 100 Gbps delivering uncompromised secure connectivity.
- **Trustworthy solutions built with Cisco Trust Anchor Technologies** provide a highly secure foundation for Cisco products. With the Catalyst 9300 Series, these technologies enable hardware and software authenticity assurance for supply chain trust and strong mitigation against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include:
 - **Image signing:** Cryptographically signed images provide assurance that the firmware, BIOS, and other software are authentic and unmodified. As the system boots, the system's software signatures are checked for integrity.
 - **Secure Boot:** Cisco Secure Boot technology anchors the boot sequence chain of trust to immutable hardware, mitigating threats against a system's foundational state and the software that is to be loaded, regardless of a user's privilege level. It provides layered protection against the persistence of illicitly modified firmware.
 - **Cisco Trust Anchor module:** A tamper-resistant, strong cryptographic, single-chip solution provides hardware authenticity assurance to uniquely identify the product so that its origin can be confirmed to Cisco. This provides assurance that the product is genuine.

Cloud Security

- **Umbrella DNS Integration:**

Small to midsize networks reliant on managed service providers can now host Cisco Umbrella agent directly on their Catalyst 9300 Series switches. This allows the business to easily customize their DNS filtering policies granularly at user or group level to prevent BYOD or IoT guest or corporate users from accessing malicious or inappropriate websites, without having to rely on the MSP to push the policies out. It also lets them optimize use of bandwidth by allowing direct cloud access for trusted apps. Requires Cisco DNA Advantage License and Umbrella License per device.

- **Cloud monitoring for Catalyst**

Cloud monitoring for Catalyst is a SaaS offered cloud-managed network controller and management dashboard.

Devices are centrally and securely managed from the cloud using a single web-based dashboard. This cloud-based intuitive architecture enables customers to save time, reduce operating costs and solve business problems quickly and efficiently.

Cloud monitoring for Catalyst is currently supported on Catalyst 9200 Series, Catalyst 9300 Series and Catalyst 9500 Series switches. ('Catalyst 9500X models currently not supported)

Service Assurance

- **Cisco ThousandEyes Integration:**

Deliver superior network and service experience for your users, employees and partners with groundbreaking observability from network to app. Cisco ThousandEyes network tests are now integrated into Cisco Catalyst 9300 Series switches with Cisco DNA Advantage licenses, giving you visibility beyond your campus perimeter so you solve issues faster. The Cisco ThousandEyes Network and Application Synthetics license is included by default upon the selection of a Cisco DNA Advantage option with a 3 year, 5 year or a 7 year subscription. Each Catalyst 9300 Cisco DNA Advantage subscription entitles the customer to run the equivalent of one Cisco ThousandEyes network or web test every 5 mins from a Cisco ThousandEyes enterprise agent (22 units per month), up to a maximum of 110,000 units per month of Cisco ThousandEyes test capacity per customer.

Resiliency and high availability

- **StackWise-1T:** Cisco Catalyst 9300 Series modular uplink models (C9300X SKUs) support the industry's highest back-panel stacking bandwidth solution (1Tbps) with StackWise-1T. Up to 8 Switches can be configured in a StackWise-1T with the special connector at the back of the switch using dedicated stack cables.
- **StackWise-480:** Cisco Catalyst 9300 Series modular uplink models (C9300 SKUs) support high-speed back-panel stacking bandwidth solution (480 Gbps) with StackWise-480. Up to 8 Switches can be configured in a StackWise-480 with the special connector at the back of the switch using dedicated stack cables.
- **StackWise-320:** Cisco Catalyst 9300 Series fixed uplink models (C9300L SKUs) support stacking bandwidth solution (320 Gbps) with StackWise-320. Up to 8 Switches can be optionally configured in a StackWise-320 with the special Stack Kit at the back of the switch using dedicated stack cables.
- **Cisco StackPower:** Cisco StackPower is an innovative power interconnect system that allows the power supplies in a stack to be shared as a common resource among all the switches. This allows you to simply add one extra power supply in any switch of the stack and either provide power redundancy for any of the stack members or simply add more power to the shared pool. Up to 4 switches can be configured in a StackPower stack with the special connector at the back of the switch. However, with the use of XPS-2200 appliance, up to 8 switches can be configured in the StackPower stack. **Cisco StackPower is only supported on the models with modular uplink stack - C9300 and C9300X SKUs. C9300X models support StackPower+ delivering more power over StackPower cables compared to C9300 models.**



Figure 7.
Cisco Catalyst 9300 Series StackPower

- **High availability:** The Catalyst 9300 Series supports high-availability features, including the following:
 - Cross-stack EtherChannel provides the ability to configure Cisco EtherChannel technology across different members of the stack for high resiliency.
 - **Flexlink+:** Flexlink+ allows the setting up of active and backup interfaces or port channels, which can provide Layer 2 failover redundancy without the use of Spanning Tree Protocol (STP).
 - **Extended Fast Software Upgrade** provides the ability to upgrade the platform software or to reload the system in under 30 seconds of traffic impact; both stand-alone and stack configurations.
 - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) provides rapid spanning tree convergence independent of spanning tree timers and also offers the benefit of Layer 2 load balancing and distributed processing.
 - Per-VLAN Rapid Spanning Tree (PVRST+) allows rapid spanning tree (IEEE 802.1w) reconvergence on a per-VLAN spanning tree basis, providing simpler configuration than MSTP. In both MSTP and PVRST+ modes, stacked units behave as a single spanning tree node.
 - Switch-port auto-recovery (“err-disable” recovery) automatically attempts to reactivate a link that is disabled because of a network error.
 - The Catalyst 9300 Series platform delivers the best NSF/SSO resiliency architecture in a stackable solution with sub-50-ms failover.
 - Always-On wireless network with stateful switchover when wireless functionality is enabled on stack of Catalyst 9300 Series switches.

Deep buffer Technology

Cisco Catalyst 9300 higher scale models have a deeper buffer to address the requirements of rich multi-media lossless content delivery and large routing tables in a fixed access solution with a wide range of uplink choices for deployment flexibility.

Flexible Netflow

- **Flexible NetFlow (FNF):** Cisco IOS Software FNF is the next generation in flow visibility technology. It enables optimization of the network infrastructure, reduces operation costs, and improves capacity planning and security incident detection with increased flexibility and scalability. The Catalyst 9300 Series is capable of up to 64,000 flow entries on 48-port, 24-port and 12-port models and up to 128,000 flow entries on Multigigabit models.

Application visibility and control

- **NBAR2:** Next-Generation Network-Based Application Recognition (NBAR2) enables advanced application classification techniques, accuracy with up to 1400 predefined and well-known application signatures and up to 150 encrypted applications on the Cisco Catalyst 9000 switches. The most popular applications included are Skype, Office 365, Microsoft Lync, Cisco WebEx, and Facebook, among many others that are predefined and easy to configure. NBAR2 provides the network administrator with an important tool to identify, control, and monitor end-user application usage while helping ensure a quality user experience and securing the network from malicious attacks. NBAR2 leverages FNF to report application performance and activities within the network to any supported NetFlow collector, such as Cisco Prime, Cisco Stealthwatch, or any compliant third-party tool.

QoS

- **Superior QoS:** The Cisco Catalyst 9300 Series offers Gigabit Ethernet speeds with intelligent services that keep traffic flowing smoothly, even at 10 times the normal network speed. Industry-leading mechanisms for cross-stack marking, classification, and scheduling deliver superior performance for data, voice, and video traffic at wire speed. Superior QoS includes granular wireless bandwidth management and fair sharing, 802.1p Class of Service (CoS) and Differentiated Services Code Point (DSCP) field classification, Shaped Round Robin (SRR) scheduling, Committed Information Rate (CIR), and eight egress queues per port.

Service discovery

- **Multicast DNS (mDNS) gateway:** This service discovery gateway capability facilitates sharing of services advertised using the Apple mDNS (Bonjour) protocol, such as printers, Apple TVs, and file services across the network. Additionally, the administrator can create policies defining which services can be seen and accessed by the users in the network. This capability facilitates a Bring-Your-Own-Device (BYOD) rollout.

Smart operation

- **WebUI:** WebUI is an embedded GUI-based device-management tool that provides the ability to provision the device, to simplify device deployment and manageability, and to enhance the user experience. It comes with the default image, so there is no need to enable anything or install any license on the device. You can use WebUI to build configurations, and to monitor and troubleshoot the device without having CLI expertise.
- **Efficient switch operation:** Cisco Catalyst 9300 Series switches provide optimum power saving with Energy Efficient Ethernet (EEE) on the RJ-45 ports and low-power operations for industry best-in-class power management and power consumption capabilities. The ports support reduced power modes so that ports not in use can move into a lower power utilization state. Other efficient switch operation features are as follows:
 - Per-port power consumption command allows customers to specify a maximum power setting on an individual port.
 - Per-port PoE power sensing measures actual power being drawn, enabling more intelligent control of powered devices. The PoE MIB provides proactive visibility into power usage and allows you to set different power-level thresholds.
- **RFID tags:** Catalyst 9300 Series switches have an embedded RFID tag that facilitates easy asset and inventory management using commercial RFID readers.
- **Blue beacon:** Catalyst 9300 Series switches support a blue beacon LED for easy identification of the switch being accessed.

Open standards based fabric

The Cisco Catalyst 9300 Series Switches support modern fabric technologies such as VXLAN with BGP-EVPN control plane, with open APIs. This technology provides the flexibility to build open standards based fabrics to secure infrastructure, users and data. This fabric architecture provides rich unicast and multicast protocol support to optimally route or bridge traffic as well as support for integrated campus services all of which can be automated via open APIs to effectively configure and monitor the network.

Programmability

Cisco IOS-XE provides open standards based APIs such as NETCONF, RESTCONF, gNMI to simplify provisioning and configuration, that allows network administrators to save time when provisioning new network devices and to prevent the human errors that often are a byproduct of manual configuration. Integrating Zero Touch Provisioning with various Devops toolkits allows network admins to drastically reduce the time and resources needed to onboard a device onto their network. The ability to collect real-time statistics through model driven telemetry through gRPC and gNMI allows administrator to integrate to many health monitoring tools to optimize their environments and to troubleshoot and provide alerts about any potential problems.

High-Performance IP routing

The Cisco Express Forwarding hardware routing architecture delivers extremely high-performance IP routing in Cisco Catalyst 9300 Series switches, based on:

- IP unicast routing protocols (including static, Routing Information Protocol Version 1 [RIPv1], RIPv2, RIPng, and Open Shortest Path First [OSPF], Routed Access) are supported for small network routing applications with the Network Essentials stack. Equal-cost routing facilitates Layer 3 load balancing and redundancy across the stack.
- Advanced IP unicast routing protocols (including Full [OSPF], Enhanced Interior Gateway Routing Protocol [EIGRP], Border Gateway Protocol Version 4 [BGPv4], and Intermediate System-to-Intermediate System Version 4 [IS-ISv4]) are supported for load balancing and for constructing scalable LANs. IPv6 routing (using OSPFv3 and BGPv6) is supported in hardware for maximum performance.
- Protocol-Independent Multicast (PIM) for IP multicast routing is supported, including PIM Sparse Mode (PIM SM), and Source-Specific Multicast (SSM).
- IPv6 addressing is supported on interfaces with appropriate show commands for monitoring and troubleshooting.

Audio Video Bridging (AVB)

Starting with Cisco IOS XE Software Release 16.8, the Cisco Catalyst 9300 Series supports the IEEE 802.1 AVB standard. This standard provided the means for highly reliable delivery of low-latency, time-synchronized audio and video streaming services through Layer 2 Ethernet networks. The standard also makes it easier to integrate new services and for AV equipment from different vendors to interoperate.

Benefits

- Improves quality of experience by lowering jitter and latency for time-synchronized delivery of high-quality AV.
- Provides scalability of applications across networked deployments, including expansive and complex AV infrastructure.
- Lowers Total Cost of Ownership (TCO) with reduced cabling (lowers CapEx) and no license fees (lowers OpEx).

For more details about AVB and specific models supported, check <https://www.cisco.com/go/avb>.

Multigigabit Ethernet technology: Cisco Multigigabit Ethernet technology allows you to achieve bandwidth speeds from 1 Gbps to 10 Gbps over traditional Category 5e/6 cabling or above. This technology addresses the need for exponential increases in bandwidth with the enormous growth of 802.11ac Wave 2, to be eclipsed by the growth of Wi-Fi 6 and new wireless applications without having to replace current cabling infrastructure.

Multiprotocol label switching (MPLS)

The Cisco Catalyst 9300 Series Switches support Multiprotocol label switching (MPLS) which combines the performance and capabilities of Layer 2 (data link layer) switching with the proven scalability of Layer 3 (network layer) routing. MPLS enables the explosive growth in network utilization while providing the opportunity to differentiate services without sacrificing the existing network infrastructure. MPLS support includes

- **MPLS L3 VPN:** An MPLS Virtual Private Network (VPN) consists of a set of sites that are interconnected by means of a Multiprotocol Label Switching (MPLS) provider core network. At each customer site, one or more customer edge (CE) devices attach to one or more provider edge (PE) devices.
- **VPLS:** VPLS (Virtual Private LAN Service) enables enterprises to link together their Ethernet-based LANs from multiple sites via the infrastructure provided by their service provider.
- **EoMPLS:** EoMPLS is a category of Any Transport over MPLS (AToM) to transport Layer 2 packets over an MPLS backbone.
- **MPLS over GRE:** L3VPN over GRE and VPLS over GRE, are supported to tunnel MPLS/VPLS packets over non-MPLS networks utilizing GRE tunneling

Power over ethernet leadership

Cisco Universal Power over Ethernet (Cisco UPOE and Cisco UPOE+): PoE removes the need for wall sockets to power each PoE-enabled device and eliminates the cost of additional electrical cabling and circuits that would otherwise be necessary in IP phone and WLAN deployments. Cisco UPOE extends the IEEE PoE+ standard to double the power per port to 60 watts. This facilitates delivery of network power to a broad range of devices requiring higher power, including virtual desktop terminals, IP turrets, compact switches, building management gateways, LED lights, wireless access points, and IP phones. Designed for smart building and IoT applications, Cisco Catalyst 9300 UPOE+ switches (delivering PoE power up to 90W) provide data and power over a single cable to power devices like wireless access points, digital signage, security cameras, thermal cameras with PTZ features, LED lighting fixtures and large display screens. UPOE+ offers reduced cabling and installation costs without need for permits, device daisy-chaining application that require higher power draw, real-time device information, centralized management and remote control, faster and flexible device installation where devices can be positioned in a practical location instead of proximity to the electrical outlets.

Catalyst 9300 Series modular uplink (C9300 and C9300X SKUs) models support Cisco UPOE+, Cisco UPOE, PoE+ and PoE, thereby addressing the largest range of network power needs.

Catalyst 9300 Series fixed uplink (C9300L SKUs) models support Cisco UPOE or PoE+ and PoE.

Tables 10 and 11 show the power supply combinations required for different PoE needs.

Table 10. Power supply requirements for Catalyst 9300 Series modular uplink PoE/PoE+ models (C9300-xxP SKUs)

	24-port PoE switch	48-port PoE switch
PoE on all ports (15.4W per port)	1 PWR-C1-715WAC/PWR-C1-715WAC-P/PWR-C1-715WDC	1 PWR-C1-1100WAC/PWR-C1-1100WAC-P or 2 PWR-C1-715WAC/PWR-C1-715WAC-P/PWR-C1-715WDC
PoE+ on all ports (30W per port)	1 PWR-C1-1100WAC/PWR-C1-1100WAC-P or 2 PWR-C1-715WAC/PWR-C1-715WAC-P/PWR-C1-715WDC	2 PWR-C1-1100WAC/PWR-C1-1100WAC-P or 1 PWR-C1-1100WAC/PWR-C1-1100WAC-P and 1 PWR-C1-715WAC/PWR-C1-715WAC-P/PWR-C1-715WDC

Table 11. Power supply requirements for Catalyst 9300 Series UPOE models (C9300-xxU/UB/UXM/UN, C9300L-xxUXG-xx SKUs)

	24-port Cisco UPOE switch	48-port Cisco UPOE switch	48 and 24-port Multigigabit Cisco UPOE switch*
Cisco UPOE (60W per port) & IEEE 802.3bt type3 on all ports (24-port switch) or up to 30 ports (48-port switch)	1 PWR-C1-1100WAC/PWR-C1-1100WAC-P and 1 PWR-C1-715WAC/PWR-C1-715WAC-P/PWR-C1-715WDC	2 PWR-C1-1100WAC/PWR-C1-1100WAC-P	2 PWR-C1-1100WAC/PWR-C1-1100WAC-P

Table 12. Power supply requirements for Catalyst 9300 Series UPOE+ models (C9300-xxH SKUs)

	24-port Cisco UPOE+ switch	48-port Cisco UPOE+ switch
Cisco UPOE+ (90W per port) & IEEE 802.3bt type4 on 21 ports (24-port and 48-port switch)	1 PWR-C1-1100WAC/PWR-C1-1100WAC-P and 1 PWR-C1-715WAC/PWR-C1-715WAC-P/PWR-C1-715WDC	2 PWR-C1-1100WAC/PWR-C1-1100WAC-P or 2 PWR-C1-1900WAC-P

Table 13. Power supply requirements for Catalyst 9300 Series fixed uplink PoE/PoE+ models (C9300L-xxP SKUs)

	24-port PoE switch	48-port PoE switch
PoE on all ports (15.4W per port)	1 PWR-C1-715WAC-P/PWR-C1-715WDC	1 PWR-C1-1100WAC-P or 2 PWR-C1-715WAC-P
PoE+ on all ports (30W per port)	1 PWR-C1-1100WAC-P or 2 PWR-C1-715WAC-P/PWR-C1-715WDC	2 PWR-C1-1100WAC-P or 1 PWR-C1-1100WAC-P and 1 PWR-C1-715WAC-P/PWR-C1-715WDC

- Perpetual PoE:** With Perpetual PoE, the PoE power is maintained during a switch reload. This is important for IoT endpoints such as PoE-powered lights, so that there is no disruption during switch reboot.
- Fast PoE:** When power is restored to a switch, PoE starts delivering power to endpoints without waiting for the operating system to fully load, thereby speeding up the time for the endpoint to start up.

*C9300-48UN, C9300-24UX, C9300-48UXM are available with PWR-C1-1100WAC-P Platinum-rated power supply. Platinum-rated power supplies are more efficient, lowering operating power costs

*PWR-C1-1100WAC-UP and PWR-C1-715WAC-UP Platinum-rated power supply upgrade options are available to upgrade the default AC power supply to 1100W or 715W

Software requirements

Cisco DNA Software for Access Switching is available for the Cisco Catalyst 9300 Series.

Cisco DNA Software for Access Switching offers comprehensive solutions for the enterprise campus and branch offices. Cisco DNA for Access Switching introduces a simpler and more economical way to deploy access, aggregation, and core switches across enterprise campus and branch locations.

The Cisco DNA Subscription for Switching offer delivers an unbound network on an open and extensible architecture to help you navigate the digital journey. This subscription offer simplifies the buying process and includes lower initiation costs and flexible terms. It includes: Cisco DNA Advantage with full Cisco DNA capabilities and SD-Access, bundled with ISE Base, ISE Plus, and StealthWatch.

For ordering information for Cisco DNA Software for the Cisco Catalyst 9300 Series, go to

<https://www.cisco.com/c/en/us/products/software/one-access/switching-part-numbers.html>.

Cisco Catalyst 9300 Series switches run on Cisco IOS XE 16.5.1a release or later with the following exceptions. Catalyst 9300 Series 1G fiber models (C9300-xxS SKUs) are supported on Cisco IOS XE 16.11.1a release or later. Catalyst 9300 Series fixed uplink models (C9300L SKUs) are supported on Cisco IOS XE 16.11.1b release or later. These software releases includes all the features listed earlier in the Platform Benefits section.

Licensing

Packaging

The Cisco Catalyst 9000 family of switches introduces a new and simplified licensing package in the form of base and add-on licenses.

- **The perpetual licensing** package includes the Network Essentials and Network Advantage licensing options that are tied to the hardware. Between them, the base licensing packages cover switching fundamentals, management automation, troubleshooting, and advanced switching features. These Network licenses are perpetual.

The subscription licensing package includes the Cisco DNA Essentials and Cisco DNA Advantage options. In addition to on-box capabilities, the features available with this package provide Cisco innovations on the switch, as well as on Cisco DNA Center. The Cisco DNA subscription licenses are mandatory at the time of configuration. With Cisco DNA software licenses, customers receive embedded SWSS - which covers 24x7x365 Cisco Technical Assistance Center (TAC) support, software release updates, advanced support analytics, and designated service management. This is valid only for the Cisco DNA software subscription stacks (Cisco DNA Essentials or Advantage).

Note: For full hardware support, including the perpetual network stack, customers will require Smart Net Total Care for 24x7x365 Cisco Technical Assistance Center (TAC) support, proactive security and product alerts, and product lifecycle management. An additional option for hardware support is Solution Support for your multivendor Cisco solution environment.

License consumption is easily determined by the package itself. While perpetual licenses are always permanent and without an expiration date, subscription licenses have to be purchased for a 3-, 5-, or 7-year term (and hence are also known as term-based licenses). Table 13 shows the combinations of perpetual and subscription licenses that must be purchased.

Table 14. Licensing combinations

	Cisco DNA Essentials	Cisco DNA Advantage
Network Essentials	Yes**	Yes**
Network Advantage	No*	Yes

*At the time of Cisco DNA license renewal, the Cisco DNA Essentials license can be purchased to be used with Network Advantage

**Network Advantage is inclusive of Network Essentials features.

Managing licenses with Smart Accounts: Creating Smart Accounts by using the Cisco Smart Software Manager (SSM) enables you to manage your software licenses from a centralized website. You can set up Cisco SSM to receive daily email alerts and to be notified of expiring subscription licenses that you want to renew.

You must order a Cisco DNA subscription term license in order to purchase a switch. When the license term expires, you can either renew the add-on license to continue using it or deactivate the add-on license and then reload the switch to continue operating with the base license capabilities.

Both the base and add-on licenses are also available for a 90-day evaluation period. An evaluation license is activated temporarily, without purchase. An expired evaluation license cannot be reactivated after reload.

Note: It is not required to deploy Cisco DNA Center just to use one of the above packages.

Introduction to Smart Licensing

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure – you control what users can access. With Smart Licensing you get:

- **Easy Activation:** Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).
- **Unified Management:** My Cisco Entitlements (MCE) provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License Flexibility:** Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To use Smart Licensing, you must first set up a Smart Account on Cisco Software Central (software.cisco.com).

For a more detailed overview on Cisco Licensing, go to cisco.com/go/licensingguide.

Table 15 shows the features included in the Cisco DNA Essentials and Advantage packages.

Table 15. Network Essentials and Advantage package features

Features	Network Essentials	Network Advantage
Switch fundamentals Layer 2, Routed Access (RIP, EIGRP Stub, OSPF - 1000 routes), PBR, PIM Stub Multicast (1000 routes), PVLAN, VRRP, PBR, CDP, QoS, FHS, 802.1X, MACsec-128, CoPP, SXP, IP SLA Responder, SSO	✓	✓
Advanced switch capabilities and scale BGP, EIGRP, HSRP, IS-IS, BSR, MSDP, PIM-BIDIR, IP SLA, OSPF	✗	✓
Network segmentation VRF, VXLAN, LISP, TrustSec, SGT, MPLS, mVPN	✗	✓
Automation NETCONF, RESTCONF, gRPC, YANG, PnP Agent, ZTP/Open PnP, GuestShell (On-Box Python)	✓	✓
Telemetry and visibility Model-driven telemetry, sampled NetFlow, SPAN, RSPAN	✓	✓
High availability and resiliency Nonstop Forwarding (NSF), Graceful Insertion and Removal (GIR), Extended Fast Software Upgrade (xFSU), Software Patching (CLI Based)	✗	✓
IOT integration AVB, PTP, CoAP	✗	✓
Security MACsec-256	✗	✓

Table 16. Cisco DNA Essentials and Advantage package features (add a section for other software support and add Prime, ISE and Stealthwatch support)

Features	Cisco DNA Essentials	Cisco DNA Advantage
Switch features		
Optimized network deployments Cisco DNA Service for Bonjour	✗	✓
Advanced telemetry and visibility Full Flexible NetFlow, EEM	✓	✓
Optimized telemetry and visibility ERSPAN, AVC (NBAR2), app hosting (in containers/VMs), Wireshark	✗	✓

Features	Cisco DNA Essentials	Cisco DNA Advantage
Advanced security Encrypted Traffic Analytics (ETA), IPSec	✗	✓
Cisco DNA Center features		
Day-0 network bring-up automation Cisco Network Plug-and-Play application, network settings, device credentials, LAN automation, host onboarding	✓	✓
Element management Discovery, inventory, topology, software image, licensing, and configuration management	✓	✓
Element management Patch management	✗	✓
Basic Assurance Health dashboards - Network, Client, Application; switch and wired client health monitoring	✓	✓
Cisco ThousandEyes Network and Application Synthetics Network performance metrics, dashboarding, visibility into app and service experience, end-to-end visibility across cloud and DC applications	✗	✓
SD-Access Policy-based automation and assurance for wired and wireless	✗	✓
Network assurance and analytics Global insights, trends, compliance, custom reports; switch 360, wired client 360; fabric and non-fabric insights; app health, app 360, app performance (loss, latency, jitter)	✗	✓

Specifications

Dimensions, Weight, Acoustic, Mean time between failures

The table below shows the dimensions, weights, acoustic and mean time between failures of all models of Cisco Catalyst 9300 Series switches.

Table 17. Model Dimensions, Weight, and Mean Time between failures metrics

General Specifications			
Dimensions (H x W x D) inches			
Model	Chassis only	W/ Default Power Supply	W/ 1100W Power Supply
C9300X-48HX	1.73 x 17.5 x 19	1.73 x 17.5 x 22.03	1.73 x 17.5 x 22.03
C9300X-48TX	1.73 x 17.5 x 19	1.73 x 17.5 x 20.56	1.73 x 17.5 x 22.03
C9300X-48HXN	1.73 x 17.5 x 17.57	1.73 x 17.5 x 20.63	1.73 x 17.5 x 20.63
C9300X-24HX	1.73 x 17.5 x 17.57	1.73 x 17.5 x 20.63	1.73 x 17.5 x 20.63
C9300X-12Y	1.73 x 17.5 x 16.1	1.73 x 17.5 x 17.6	1.73 x 17.5 x 19.2
C9300X-24Y	1.73 x 17.5 x 17.6	1.73 x 17.5 x 19.2	1.73 x 17.5 x 20.7
C9300-24T	1.73 x 17.5 x 16.1	1.73 x 17.5 x 17.7	1.73 x 17.5 x 19.2
C9300-24P	1.73 x 17.5 x 16.1	1.73 x 17.5 x 17.7	1.73 x 17.5 x 19.2
C9300-24U	1.73 x 17.5 x 16.1	1.73 x 17.5 x 19.2	1.73 x 17.5 x 19.2
C9300-24UX	1.73 x 17.5 x 17.1	1.73 x 17.5 x 20.2	1.73 x 17.5 x 20.2
C9300-24UB	1.73 x 17.5 x 16.1	1.73 x 17.5 x 19.2	1.73 x 17.5 x 19.2
C9300-24UXB	1.73 x 17.5 x 17.1	1.73 x 17.5 x 20.2	1.73 x 17.5 x 20.2
C9300-24H	1.73 x 17.5 x 16.1	1.73 x 17.5 x 19.2	1.73 x 17.5 x 19.2
C9300-48T	1.73 x 17.5 x 16.1	1.73 x 17.5 x 17.7	1.73 x 17.5 x 19.2
C9300-48P	1.73 x 17.5 x 16.1	1.73 x 17.5 x 17.7	1.73 x 17.5 x 19.2
C9300-48U	1.73 x 17.5 x 16.1	1.73 x 17.5 x 19.2	1.73 x 17.5 x 19.2
C9300-48UXM	1.73 x 17.5 x 19.1	1.73 x 17.5 x 22.2	1.73 x 17.5 x 22.2
C9300-48UN	1.73 x 17.5 x 19.1	1.73 x 17.5 x 22.2	1.73 x 17.5 x 22.2
C9300-48UB	1.73 x 17.5 x 16.1	1.73 x 17.5 x 19.2	1.73 x 17.5 x 19.2
C9300-48H	1.73 x 17.5 x 16.1	1.73 x 17.5 x 19.2	1.73 x 17.5 x 19.2

General Specifications			
C9300-24S	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2	1.73 X 17.5 X 20.7
C9300-48S	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2	1.73 X 17.5 X 20.7
C9300L-24T-4G	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-24T-4X	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-48T-4G	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-48T-4X	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-24P-4G	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-24P-4X	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-48P-4G	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
C9300L-48P-4X	1.73 X 17.5 X 16.1	1.73 X 17.5 X 17.7	1.73 X 17.5 X 19.2
Dimensions (H x W x D) Cms			
C9300X-48HX	4.4 x 44.5 x 48.3	4.4 x 44.5 x 56.0	4.4 x 44.5 x 56.0
C9300X-48TX	4.4 x 44.5 x 48.3	4.4 x 44.5 x 52.2	4.4 x 44.5 x 56.0
C9300X-48HXN	4.4 x 44.5 x 44.6	4.4 x 44.5 x 52.4	4.4 x 44.5 x 52.4
C9300X-24HX	4.4 x 44.5 x 44.6	4.4 x 44.5 x 52.4	4.4 x 44.5 x 52.4
C9300X-12Y	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.7	4.4 x 44.5 x 48.8
C9300X-24Y	4.4 x 44.5 x 44.7	4.4 x 44.5 x 48.8	4.4 x 44.5 x 52.6
C9300-24T	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300-24P	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300-24U	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300-24UX	4.4 x 44.5 x 43.4	4.4 x 44.5 x 51.3	4.4 x 44.5 x 51.3
C9300-24H	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300-48T	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300-48P	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300-48U	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300-48UXM	4.4 x 44.5 x 48.5	4.4 x 44.5 x 56.4	4.4 x 44.5 x 56.4
C9300-48UN	4.4 x 44.5 x 48.5	4.4 x 44.5 x 56.4	4.4 x 44.5 x 56.4

General Specifications			
C9300-48H	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300-24S	4.3 x 44.4 x 44.9	4.3 x 44.4 x 48.8	4.3 x 44.4 x 52.6
C9300-48S	4.3 x 44.4 x 44.9	4.3 x 44.4 x 48.8	4.3 x 44.4 x 52.6
C9300L-24T-4G	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-24T-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-48T-4G	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-48T-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-24P-4G	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-24P-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-48P-4G	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-48P-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 44.9	4.4 x 44.5 x 48.8
C9300L-48PF-4G	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300L-48PF-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300L-24UXG-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300L-24UXG-2Q	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300L-48UXG-4X	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
C9300L-48UXG-2Q	4.4 x 44.5 x 40.9	4.4 x 44.5 x 48.8	4.4 x 44.5 x 48.8
Weight (with default power supply)			
Model	Pounds	Kilograms	
C9300X-48HX	14.6	6.62	
C9300X-48TX	14.6	6.62	
C9300X-48HXN	14.2	6.44	
C9300X-24HX	13.8	6.25	
C9300X-12Y	15.0	6.80	
C9300X-24Y	16.2	7.35	
C9300-24T	16.03	7.27	
C9300-24P	16.33	7.4	

General Specifications		
C9300-24U	16.63	7.54
C9300-24UX	18.18	8.25
C9300-24UB	16.63	7.54
C9300-24UXB	18.18	8.25
C9300-24H	16.63	7.54
C9300-48T	16.43	7.45
C9300-48P	16.73	7.59
C9300-48U	17.03	7.72
C9300-48UXM	20.50	9.34
C9300-48UN	20.05	9.09
C9300-48UB	17.03	7.72
C9300-48H	17.03	7.72
C9300-24S	16.84	7.64
C9300-48S	17.32	7.86
C9300L-24T-4G	14.93	6.78
C9300L-24T-4X	14.93	6.78
C9300L-48T-4G	15.41	7.0
C9300L-48T-4X	15.41	7.0
C9300L-24P-4G	14.99	6.81
C9300L-24P-4X	14.99	6.81
C9300L-48P-4G	15.46	7.03
C9300L-48P-4X	15.46	7.03
C9300L-48PF-4G	15.48	7.03
C9300L-48PF-4X	15.48	7.03
C9300L-24UXG-4X	15.73	7.13
C9300L-24UXG-2Q	16.01	7.26
C9300L-48UXG-4X	16.86	7.65

General Specifications		
C9300L-48UXG-2Q	16.86	7.65
Mean Time Between Failures – MTBF (hours)		
C9300X-48HX	TBD	
C9300X-48TX	TBD	
C9300X-48HXN	TBD	
C9300X-24HX	TBD	
C9300X-12Y	265,650	
C9300X-24Y	249,350	
C9300-24T	314,790	
C9300-24P	299,000	
C9300-24U	238,410	
C9300-24UX	214,760	
C9300-24UB	354,300	
C9300-24UXB	288.520	
C9300-24H	238,410	
C9300-48T	305,870	
C9300-48P	277,770	
C9300-48U	227,410	
C9300-48UXM	202,160	
C9300-48UN	198,647	
C9300-48UB	337,170	
C9300-48H	227,410	
C9300-24S	284,130	
C9300-48S	281,920	
C9300L-24T-4G	395,800	
C9300L-24T-4X	387,700	
C9300L-48T-4G	387,860	

General Specifications	
C9300L-48T-4X	380,080
C9300L-24P-4G	346,940
C9300L-24P-4X	340,710
C9300L-48P-4G	314,140
C9300L-48P-4X	309,020
C9300L-48PF-4G	303,660
C9300L-48PF-4X	298,880
C9300L-24UXG-4X	332,640
C9300L-24UXG-2Q	291,670
C9300L-48UXG-4X	273,820
C9300L-48UXG-2Q	275,010
PWR-C1-350WAC-P	1,335,012 (ranges from 1.3M to 3.1M depending on temperature, input voltage and vendor)
PWR-C1-715WAC-P	1,054,881 (ranges from 1.05M to 2.6M depending on temperature, input voltage and vendor)
PWR-C1-1100WAC-P	1,217,904 (ranges from 1.2M to 2.8M depending on temperature, input voltage and vendor) (investigating an anomaly in MTBF data received from 1 Power Supply vendor - Artesyn)
PWR-C1-1900WAC-P	
PWR-C1-715WDC	1,812,103 (-48V input at 40C and vendor Delta)
C9300-NM-2Q	10,778,230
C9300-NM-2Y	7,568,820
C9300-NM-4G	8,953,570
C9300-NM-4M	10,549,060
C9300-NM-8X	7,151,930
C9300X-NM-8Y	
C9300X-NM-2C	
FAN-T2	4,521,330

General Specifications	
Environmental ranges	
Acoustic noise	With AC power supply (with 24 PoE+ ports loaded for C9300 SKUs) <ul style="list-style-type: none"> LpA: 45dB typical, 48 dB max LwA: 5.6B typical, 5.9B max
Measured per ISO 7779 and declared per ISO 9296	
Bystander positions operating to an ambient temperature of 25°C	With AC power supply (with half the number of PoE+ ports loaded for C9300L SKUs) <ul style="list-style-type: none"> LpA: 44dB typical, 47 dB max LwA: 5.5B typical, 5.8B max Typical: Noise emission for a typical configuration Maximum: Statistical maximum to account for variation in production

Connectors

Table 18 shows the supported connectors for the Cisco Catalyst 9300 Series.

Table 18. Connectors

Connectors and cabling	<ul style="list-style-type: none"> 1000BASE-T ports: RJ-45 connectors, 4-pair Cat 5E UTP cabling Multigigabit-T ports: RJ-45 connectors, 4-pair Cat 5E, Cat 6, Cat 6A UTP cabling 1000BASE-T SFP-based ports: RJ-45 connectors, 4-pair Cat 5E UTP cabling SFP transceivers: LC fiber connectors (single-mode or multimode fiber) SFP+ transceivers: LC fiber connectors (single-mode or multimode fiber) QSFP+ transceivers: MPO and LC fiber connectors (single-mode or multimode fiber) QSFP+ connector SFP+ connector Cisco StackWise stacking ports: copper-based Cisco StackWise cabling Cisco StackPower: Cisco proprietary power stacking cables Ethernet management port: RJ-45 connectors, 4-pair Cat 5 UTP cabling Management console port: RJ-45-to-DB9 cable for PC connections
Power connectors	<ul style="list-style-type: none"> Customers can provide power to a switch by using the internal power at the back of the switch Internal power supply connector: The internal power supply is an auto-ranging unit. It supports input voltages between 100 (115 for 1100WAC) and 240 VAC. Use the supplied AC power cord to connect the AC power connector to an AC power outlet

For the latest Cisco transceiver module compatibility information, refer to

<https://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html>.

Management and standards support

Table 19 shows management and standards support for the Cisco Catalyst 9300 Series.

Table 19. Management and standards support*

Description	Specification	
Management	BRIDGE-MIB CISCO-BRIDGE-EXT-MIB CISCO-BULK-FILE-MIB CISCO-CABLE-DIAG-MIB CISCO-CALLHOME-MIB CISCO-CEF-MIB CISCO-CIRCUIT-INTERFACE-MIB CISCO-CONFIG-COPY-MIB CISCO-CONFIG-MAN-MIB CISCO-DEVICE-LOCATION-MIB CISCO-DHCP-SNOOPING-MIB CISCO-EIGRP-MIB CISCO-EMBEDDED-EVENT-MGR-MIB CISCO-ENTITY-FRU-CONTROL-MIB CISCO-ENTITY-SENSOR-MIB CISCO-ENTITY-VENDORTYPE-OID-MIB CISCO-ERR-DISABLE-MIB CISCO-FLASH-MIB CISCO-FLOW-MONITOR-MIB CISCO-FTP-CLIENT-MIB CISCO-HSRP-EXT-MIB CISCO-HSRP-MIB CISCO-IETF-BFD-MIB CISCO-IETF-PPVPN-MPLS-VPN-MIB CISCO-IETF-PW-MPLS-MIB CISCO-IF-EXTENSION-MIB CISCO-IGMP-FILTER-MIB CISCO-IMAGE-LICENSE-MGMT-MIB CISCO-IMAGE-MIB CISCO-IP-CBR-METRICS-MIB CISCO-IP-STAT-MIB CISCO-IP-TAP-MIB CISCO-IP-URPF-MIB	CISCO-PORT-STORM-CONTROL-MIB CISCO-POWER-ETHERNET-EXT-MIB CISCO-PRIVATE-VLAN-MIB CISCO-PROCESS-MIB CISCO-PRODUCTS-MIB CISCO-RF-MIB CISCO-RTP-METRICS-MIB CISCO-RTTMON-ICMP-MIB CISCO-STACKWISE-MIB CISCO-STP-EXTENSIONS-MIB CISCO-SYSLOG-MIB CISCO-TCP-MIB CISCO-UDLDP-MIB CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB ENTITY-MIB HC-ALARM-MIB HC-RMON-MIB IEEE8023-LAG-MIB IF-MIB IP-FORWARD-MIB IP-MIB LLDP-EXT-MED-MIB LLDP-MIB MAU-MIB MPLS-L3VPN-STD-MIB MPLS-LSR-STD-MIB MPLS-VPN-MIB OLD-CISCO-CHASSIS-MIB OLD-CISCO-CPU-MIB OLD-CISCO-INTERFACES-MIB OLD-CISCO-IP-MIB OLD-CISCO-MEMORY-MIB OLD-CISCO-SYS-MIB

Description	Specification
	CISCO-IPSEC-FLOW-MONITOR-MIB CISCO-IPSEC-MIB CISCO-IPSEC-PROVISIONING-MIB CISCO-IPSLA-AUTOMEASURE-MIB CISCO-IPSLA-ECHO-MIB CISCO-IPSLA-JITTER-MIB CISCO-L2-CONTROL-MIB CISCO-L2L3-INTERFACE-CONFIG-MIB CISCO-LAG-MIB CISCO-LICENSE-MGMT-MIB CISCO-LOCAL-AUTH-USER-MIB CISCO-MAC-NOTIFICATION-MIB CISCO-MDI-METRICS-MIB CISCO-MEDIA-METRICS-MIB CISCO-MEMORY-POOL-MIB CISCO-MPLS-LSR-EXT-STD-MIB CISCO-NBAR-PROTOCOL-DISCOVERY-MIB CISCO-NHRP-EXT-MIB CISCO-NTP-MIB CISCO-PAGP-MIB CISCO-PORT-SECURITY-MIB
Standards	IEEE 802.1s IEEE 802.1w IEEE 802.1x IEEE 802.1x-Rev IEEE 802.3ad IEEE 802.3ae IEEE 802.3af IEEE 802.3at IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports IEEE 802.1D Spanning Tree Protocol IEEE 802.1p CoS prioritization IEEE 802.1Q VLAN IEEE 802.3 10BASE-T specification IEEE 802.3u 100BASE-TX specification IEEE 802.3ab 1000BASE-T specification IEEE 802.3z 1000BASE-X specification IEEE 802.3bz Multirate 2.5G/5G specification

Description	Specification
	IEEE 802.3an 10G BASE-T specification

Power supply specifications

Table 20 lists the power specifications for the Cisco Catalyst 9300 Series based on the kind of power supply used.

Table 20. Power specifications

Description	Specification			
	PWR-C1-1100WAC**	PWR-C1-715WAC**	PWR-C1-350WAC**	PWR-C1-715WDC
Power supply rated maximum	1100W	715W	350W	715W
Total output BTU (note: 1000 BTU/hr = 293W)	3793 BTU/hr, 1100W	2465 BTU/hr, 715W	1207 BTU/hr, 350W	2440 BTU/hr
Input-voltage range and frequency	115V to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	-36V to -72 VDC
Input current	12-6A	10-5A	4-2A	24-12A
Output ratings	-56V at 19.64A	-56V at 12.8A	-56V at 6.25A	-56V at 12.8A
Output holdup time	10 ms minimum at 100VAC	16.7 ms minimum at 100VAC	16.7 ms minimum at 100VAC	2 ms minimum at -48Vdc
Power-supply input receptacles	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)	IEC 320-C14 (IEC60320-C14)	Right angle barrier style terminal block
Power cord rating	15A	15A	10A	25A@100VDC
Physical specifications	(H x W x D): 1.58 x 3.25 x 13.7 in Weight: 3.1 lb (1.4 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.6 lb (1.2 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.3 lb (1.2 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.2 lb (1kg)

**These Power Supply options will not be available as options for purchase with C9300 in CCW starting Q2 FY21

Table 21. Power specifications - platinum rated power supplies

Description	Specification				
	*PWR-C1-1900WAC-P	*PWR-C1-1100WAC-P	*PWR-C1-715WAC-P	PWR-C1-350WAC-P	
Power supply rated maximum output power	1500W With 115V	1900W With 230 V	1100W	715W	350W
Total output BTU	5118 BTU/hr,	6483 BTU/hr,	3754 BTU/hr, 1100W	2440 BTU/hr, 715W	1194 BTU/hr, 350W

Description	Specification				
(note: 1000 BTU/hr = 293W)	with 115V	With 230V			
Input-voltage range and frequency	115V to 127 VAC, 50 to 60 Hz	200V to 240 VAC 55 to 60 Hz	115V to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz
Input current	16A maximum	12A maximum	12-6A	10-5A	4-2A
Output ratings	-56V at 26.78A	-56V at 33.92A	-56V at 19.64A	-56V at 12.8A	-56V at 6.25A
Output holdup time	20 ms minimum at 100VAC	20 ms minimum at 100VAC	20 ms minimum at 100VAC	20 ms minimum at 100VAC	20 ms minimum at 100VAC
Power-supply input receptacles	IEC 320-C22	IEC 320-C22	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)	IEC 320-C14 (IEC60320- C14)
Power cord rating	20A	16A	15A	15A	10A
Physical specifications	(H x W x D): 1.58 x 3.25 x 13.7 in Weight: xxx lb (x.x kg)	(H x W x D): 1.58 x 3.25 x 13.7 in Weight: 3.1 lb (1.4 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.6 lb (1.2 kg)	(H x W x D): 1.58 x 3.25 x 12.20 in Weight: 2.3 lb (1.2 kg)	1.58 x 3.25 x 13.7 in Weight: 2.3 lb (1.2 kg)
Operating temperature	<p>Normal operating temperature* and altitudes:</p> <ul style="list-style-type: none"> -5°C to +45°C, up to 5000 feet (1500m) -5°C to +40°C, up to 10,000 feet (3000m) -5°C to +35°C, up to 15,000 feet (5000m) <p>*Minimum ambient temperature for cold start is 32°F (0°C)</p> <p>Short-term* exceptional conditions:</p> <ul style="list-style-type: none"> -5°C to +50°C, up to 5000 feet (1500m) -5°C to +45°C, up to 10,000 feet (3000m) -5°C to +45°C, at sea level with single fan failure <p>*Not more than following in one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences</p>	<p>Normal operating temperature* and altitudes:</p> <ul style="list-style-type: none"> -5°C to +45°C, up to 5000 feet (1500m) -5°C to +40°C, up to 10,000 feet (3000m) <p>*Minimum ambient temperature for cold start is 32°F (0°C)</p> <p>Short-term* exceptional conditions:</p> <ul style="list-style-type: none"> -5°C to +50°C, up to 5000 feet (1500m) -5°C to +45°C, up to 10,000 feet (3000m) -5°C to +45°C, at sea level with single fan failure <p>*Not more than following in one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences</p>			

Description	Specification	
Storage temperature	40° to 158°F (-40° to 70°C)	-40° to 158°F (-40° to 70°C)
Relative humidity operating and nonoperating noncondensing	5% to 90% noncondensing	5% to 90% noncondensing
Altitude	10,000 ft. (3000 meters), up to 45°C	10,000 ft. (3000 meters), up to 45°C
EMI and EMC compliance	FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55032 Class A CISPR 32 Class A AS/NZS 3548 Class A BSMI Class A (AC input models only) VCCI Class A EN 55024, EN300386, EN 61000-3-2, EN 61000-3-3 EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6	FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55032 Class A CISPR 32 Class A AS/NZS 3548 Class A BSMI Class A (AC input models only) VCCI Class A EN 55024, EN300386, EN 61000-3-2, EN 61000-3-3 EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6
Safety compliance		
LED indicators	“AC OK”: Input power to the power supply is OK “PS OK”: Output power from the power supply is OK	“AC OK”: Input power to the power supply is OK “PS OK”: Output power from the power supply is OK

*PWR-C1-1900WAC-UP is available as an PSU upgrade option to 1900W primary PSU

*PWR-C1-1100WAC-UP is available as an PSU upgrade option to 1100W primary PSU

*PWR-C1-715WAC-UP is available as an PSU upgrade option to 715W primary PSU

Power consumption of standalone 9300 Series Switches

Table 22 shows the power consumption of standalone Cisco Catalyst 9300 Series Switches based on Alliance for Telecommunications Industry Solutions (ATIS) testing using Internet Mix (IMIX) distribution stream traffic, with input voltage of 115VAC at 60 Hz and no PoE loading. The values given are the maximum possible power consumption numbers under the respective test scenarios.

Table 22. Power Consumption of Standalone 9300 Series Switches (tested on IOS XE 16.5.1)

				Measured P(W)																
				Half port traffic				Full port traffic				Weighted average Pw	No link	PoE test (no traffic)				25%	50%	90%
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%							
C9300-24P	715W	Not Installed	115Vac	82.6	91.0	93.4	93.7	93.9	82.0	94.8	95.9	96.1	96.6	93.7	82.9	202.3	325.8	527.5	579.0	
			230Vac	81.6	89.8	92.2	92.4	92.6	81.7	93.7	94.6	94.7	95.2	92.6	82.3	199.0	318.2	510.6	559.9	
	C9300-NM-4G	115Vac	87.5	93.0	96.5	97.7	98.5	89.8	99.5	102.4	103.0	103.4	98.9	85.4	211.4	334.5	537.8	585.7		
		230Vac	86.1	91.3	94.4	95.8	96.6	88.9	98.5	101.5	101.9	102.4	97.9	84.6	207.9	328.0	520.3	568.2		
	C9300-NM-4M	115Vac	90.4	100.4	101.6	101.9	102.3	94.1	106.8	107.8	108.2	109.1	105.7	90.8	214.9	337.9	539.4	590.8		
		230Vac	89.4	99.1	100.3	100.5	100.7	92.8	106.1	106.5	106.9	107.8	104.9	89.6	211.0	329.7	522.2	571.0		
	C9300-NM-2Q	115Vac	88.1	98.6	99.5	99.6	99.9	91.1	104.4	105.2	105.6	106.5	103.3	88.4	212.2	335.2	536.2	586.5		
		230Vac	87.1	97.2	98.1	98.3	98.8	90.0	103.3	103.9	104.3	105.2	102.1	87.5	208.0	326.8	519.3	567.6		
	C9300-NM-8X	115Vac	90.0	99.4	101.0	101.2	101.6	94.2	107.1	107.9	108.3	109.2	106.0	88.7	215.3	339.6	541.4	591.3		
		230Vac	89.0	97.9	99.8	100.0	100.5	93.1	105.8	106.7	107.1	108.1	104.8	87.8	211.7	331.9	524.2	572.3		
C9300-24S	715W	C9300-NM-4G	115Vac	99.40	100.30	101.50	102.10	102.50	116.20	117.70	119.10	119.50	119.80	117.76	91.70					
			230Vac	98.00	98.90	99.70	100.60	101.60	114.40	115.80	116.70	117.20	117.70	115.85	90.90					
	C9300-NM-2Q	115Vac	101.90	104.80	105.30	105.40	106.10	117.60	120.50	121.10	121.70	123.10	120.47	85.40						
		230Vac	100.20	103.00	103.50	103.70	104.30	115.70	118.70	119.30	119.50	120.70	118.60	84.40						
	C9300-NM-8X	115Vac	104.60	107.40	108.30	108.50	109.10	121.30	124.10	124.80	125.40	126.40	124.05	85.90						
		230Vac	103.40	105.70	106.40	106.70	107.00	119.40	122.50	122.90	123.20	124.30	122.37	84.60						
	C9300-NM-4M	115Vac	99.15	101.80	102.50	102.70	103.30	116.60	119.70	120.30	121.00	122.20	119.64	82.10						
		230Vac	97.64	100.30	100.80	101.00	101.60	115.40	118.30	118.90	119.30	120.20	118.20	81.20						
	C9300-NM-2Y	115Vac	101.24	104.48	104.75	104.81	105.42	116.40	119.01	120.31	120.58	121.31	118.98	85.02						
		230Vac	99.17	102.36	102.63	102.85	103.57	114.10	117.42	118.00	118.46	119.62	117.31	83.03						

				Measured P(W)																	
				Half port traffic						Full port traffic						Weighted average Pw	No link	PoE test (no traffic)			
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%				
C9300-24T	350W	Not Installed	115Vac	77.7	86.1	89.1	89.5	89.7	77.5	91.0	91.7	91.9	92.5	89.8	78.1						
			230Vac	77.4	85.4	88.5	88.7	88.8	77.0	89.8	90.7	90.9	91.3	88.7	77.7						
		C9300-NM-4G	115Vac	82.5	88.4	92.1	93.3	94.1	85.9	96.0	98.9	99.7	100.0	95.4	81.2						
			230Vac	81.8	87.6	90.4	92.0	92.9	84.9	94.2	96.9	97.9	98.3	93.7	80.5						
		C9300-NM-4M	115Vac	86.4	96.3	98.0	98.2	98.7	90.2	103.7	104.5	104.9	105.9	102.6	87.0						
			230Vac	85.4	95.1	96.6	96.8	97.3	89.1	102.1	102.9	103.3	104.2	101.0	86.0						
		C9300-NM-2Q	115Vac	84.0	94.7	95.7	95.9	96.1	87.1	101.1	101.7	102.1	103.0	99.9	83.9						
			230Vac	83.2	93.6	94.4	94.6	95.1	86.2	99.2	100.1	100.5	101.4	98.1	83.2						
		C9300-NM-8X	115Vac	86.3	95.6	97.5	97.8	98.2	90.7	103.9	104.7	105.1	106.1	102.8	85.0						
			230Vac	85.4	94.5	96.2	96.4	97.0	89.7	102.2	103.2	103.6	104.5	101.2	84.3						
C9300-24U	1100W	Not Installed	115Vac	87.4	95.9	99.0	99.2	99.4	87.0	100.8	101.5	101.8	102.3	99.6	87.8	313.7	547.9	940.3	1041.4		
			230Vac	85.9	94.7	97.3	97.6	97.8	85.5	98.0	99.6	99.8	100.3	96.9	86.4	306.2	529.1	895.6	988.7		
		C9300-NM-4G	115Vac	92.2	97.8	101.2	102.7	103.6	95.4	105.2	108.3	109.0	109.4	104.6	94.4	321.0	554.0	943.5	1045.5		
			230Vac	90.6	96.1	99.4	100.9	101.7	93.7	103.4	106.4	107.2	107.6	102.8	93.2	313.5	536.6	901.5	994.6		
		C9300-NM-4M	115Vac	96.0	106.2	107.6	107.8	108.4	99.7	113.4	114.2	114.6	115.6	112.3	96.1	325.7	559.0	950.6	1053.0		
			230Vac	94.3	104.5	105.8	106.1	106.6	97.9	112.1	112.8	113.2	114.0	110.8	94.4	318.3	541.9	906.2	997.8		
		C9300-NM-2Q	115Vac	93.4	103.9	104.8	105.0	105.5	96.5	110.4	111.3	111.5	112.4	109.2	93.4	323.2	555.8	946.7	1048.6		
			230Vac	91.8	102.0	103.0	103.3	103.7	94.8	108.7	109.4	109.8	110.6	107.5	91.8	314.9	538.4	902.2	994.5		
		C9300-NM-8X	115Vac	95.8	105.4	107.3	107.6	108.1	100.2	114.0	114.8	115.2	116.2	112.8	94.4	324.4	557.7	946.6	1049.0		
			230Vac	94.0	103.0	105.1	105.4	106.0	98.4	112.0	113.1	113.5	114.5	110.9	93.2	317.8	541.8	907.7	999.1		

				Measured P(W)																			
				Half port traffic							Full port traffic							Weighted average Pw	No link	PoE test (no traffic)			
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%			25%	50%	90%	100%
C9300-24UB	1100W	Not Installed	115Vac	87.4	95.9	99.0	99.2	99.4	87.0	100.8	101.5	101.8	102.3	99.6	87.8	313.7	547.9	940.3	1041.4				
			230Vac	85.9	94.7	97.3	97.6	97.8	85.5	98.0	99.6	99.8	100.3	96.9	86.4	306.2	529.1	895.6	988.7				
	C9300-NM-4G	115Vac	92.2	97.8	101.2	102.7	103.6	95.4	105.2	108.3	109.0	109.4	104.6	94.4	321.0	554.0	943.5	1045.5					
			230Vac	90.6	96.1	99.4	100.9	101.7	93.7	103.4	106.4	107.2	107.6	102.8	93.2	313.5	536.6	901.5	994.6				
	C9300-NM-4M	115Vac	96.0	106.2	107.6	107.8	108.4	99.7	113.4	114.2	114.6	115.6	112.3	96.1	325.7	559.0	950.6	1053.0					
			230Vac	94.3	104.5	105.8	106.1	106.6	97.9	112.1	112.8	113.2	114.0	110.8	94.4	318.3	541.9	906.2	997.8				
	C9300-NM-2Q	115Vac	93.4	103.9	104.8	105.0	105.5	96.5	110.4	111.3	111.5	112.4	109.2	93.4	323.2	555.8	946.7	1048.6					
			230Vac	91.8	102.0	103.0	103.3	103.7	94.8	108.7	109.4	109.8	110.6	107.5	91.8	314.9	538.4	902.2	994.5				
	C9300-NM-8X	115Vac	95.8	105.4	107.3	107.6	108.1	100.2	114.0	114.8	115.2	116.2	112.8	94.4	324.4	557.7	946.6	1049.0					
			230Vac	94.0	103.0	105.1	105.4	106.0	98.4	112.0	113.1	113.5	114.5	110.9	93.2	317.8	541.8	907.7	999.1				
C9300-24UX	1100W	C9300-NM-8X	115Vac	188.0	195.7	196.8	197.4	198.9	208.8	224.6	227.0	228.6	232.0	223.8	168.6	364.2	521.6	784.3	851.4				
			230Vac	184.4	192.2	192.9	193.5	195.1	204.6	220.0	222.0	223.5	226.9	219.2	165.3	354.2	505.0	749.7	810.6				
C9300-24UXB	1100W	C9300-NM-8X	115Vac	188.0	195.7	196.8	197.4	198.9	208.8	224.6	227.0	228.6	232.0	223.8	168.6	364.2	521.6	784.3	851.4				
			230Vac	184.4	192.2	192.9	193.5	195.1	204.6	220.0	222.0	223.5	226.9	219.2	165.3	354.2	505.0	749.7	810.6				
C9300-24H	1100W	Not Installed	115Vac	87.4	95.9	99.0	99.2	99.4	87.0	100.8	101.5	101.8	102.3	99.6	87.8	313.7	547.9	940.3	1041.4				
			230Vac	85.9	94.7	97.3	97.6	97.8	85.5	98.0	99.6	99.8	100.3	96.9	86.4	306.2	529.1	895.6	988.7				
	C9300-NM-4G	115Vac	92.2	97.8	101.2	102.7	103.6	95.4	105.2	108.3	109.0	109.4	104.6	94.4	321.0	554.0	943.5	1045.5					
			230Vac	90.6	96.1	99.4	100.9	101.7	93.7	103.4	106.4	107.2	107.6	102.8	93.2	313.5	536.6	901.5	994.6				
	C9300-NM-4M	115Vac	96.0	106.2	107.6	107.8	108.4	99.7	113.4	114.2	114.6	115.6	112.3	96.1	325.7	559.0	950.6	1053.0					
			230Vac	94.3	104.5	105.8	106.1	106.6	97.9	112.1	112.8	113.2	114.0	110.8	94.4	318.3	541.9	906.2	997.8				
	C9300-NM-2Q	115Vac	93.4	103.9	104.8	105.0	105.5	96.5	110.4	111.3	111.5	112.4	109.2	93.4	323.2	555.8	946.7	1048.6					
			230Vac	91.8	102.0	103.0	103.3	103.7	94.8	108.7	109.4	109.8	110.6	107.5	91.8	314.9	538.4	902.2	994.5				
	C9300-NM-8X	115Vac	95.8	105.4	107.3	107.6	108.1	100.2	114.0	114.8	115.2	116.2	112.8	94.4	324.4	557.7	946.6	1049.0					
			230Vac	94.0	103.0	105.1	105.4	106.0	98.4	112.0	113.1	113.5	114.5	110.9	93.2	317.8	541.8	907.7	999.1				

				Measured P(W)																			
				Half port traffic							Full port traffic							Weighted average Pw	No link	PoE test (no traffic)			
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%			25%	50%	90%	100%
C9300-48P	715W	Not Installed	115Vac	90.5	103.2	104.5	104.7	105.2	89.9	104.9	107.8	109.2	110.2	103.9	91.3	206.1	324.1	514.4	563.2				
			230Vac	89.4	102.2	103.4	103.6	104.1	88.9	103.7	106.9	108.4	109.3	102.7	89.9	202.9	316.9	500.6	547.5				
		C9300-NM-4G	115Vac	95.3	103.5	106.2	108.1	108.8	98.0	112.1	114.9	115.9	116.2	111.1	94.3	215.0	332.6	523.4	572.1				
			230Vac	94.0	102.2	105.2	106.9	107.8	96.4	111.3	114.1	115.2	115.5	110.2	93.1	211.2	324.8	509.3	555.8				
		C9300-NM-4M	115Vac	98.7	111.5	112.3	112.7	113.5	101.5	119.7	120.5	121.2	122.8	118.2	99.2	219.1	336.5	528.8	576.6				
			230Vac	97.1	110.7	111.5	111.9	112.7	100.6	119.2	120.0	120.7	122.3	117.6	97.9	215.5	329.5	514.2	560.5				
		C9300-NM-2Q	115Vac	96.9	110.1	110.7	111.0	111.9	99.3	118.2	119.0	119.7	121.5	116.7	97.6	217.4	335.4	527.4	577.8				
			230Vac	95.6	109.2	109.7	110.1	111.0	98.1	117.5	118.2	119.0	120.6	115.8	96.0	213.0	326.9	511.9	558.8				
		C9300-NM-8X	115Vac	100.5	113.4	114.2	114.6	115.5	106.4	124.5	125.4	126.1	128.0	123.0	99.5	215.1	334.7	520.8	568.8				
			230Vac	99.4	112.8	113.5	113.9	114.9	105.3	124.0	124.9	125.6	127.4	122.5	98.4	212.3	327.4	507.4	553.1				
C9300-48S	715W	C9300-NM-4G	115Vac	116.30	117.00	118.40	119.10	119.60	149.40	151.10	152.20	152.90	153.50	151.17	93.50								
			230Vac	114.90	115.60	116.70	117.60	118.10	147.10	148.80	150.10	150.30	150.70	148.82	92.10								
		C9300-NM-2Q	115Vac	117.70	121.30	121.80	122.40	124.10	150.60	154.10	155.30	156.30	158.60	154.20	88.00								
			230Vac	116.40	119.70	120.20	120.80	122.10	147.70	151.20	152.70	153.80	156.10	151.34	87.60								
		C9300-NM-8X	115Vac	120.50	123.60	124.30	125.20	126.00	152.80	156.10	157.60	158.60	160.80	156.24	87.40								
			230Vac	119.00	121.90	122.90	123.40	124.40	150.20	153.90	154.90	155.80	158.30	153.97	88.90								
		C9300-NM-4M	115Vac	118.29	121.62	122.36	122.78	124.03	153.80	157.53	158.17	159.28	161.00	157.50	87.53								
			230Vac	117.15	120.62	120.89	121.30	122.35	150.20	153.61	154.60	155.58	157.86	153.69	86.48								
		C9300-NM-2Y	115Vac	114.30	119.20	119.70	120.30	121.50	144.40	152.00	152.80	153.10	156.10	151.65	85.80								
			230Vac	112.00	118.00	118.60	118.90	120.10	142.20	149.20	150.20	151.00	153.40	148.92	83.90								

				Measured P(W)																	
				Half port traffic						Full port traffic						Weighted average Pw	No link	PoE test (no traffic)			
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%				
C9300-48T	350W	Not Installed	115Vac	81.5	94.9	95.7	95.9	96.4	80.8	98.6	100.2	101.3	102.3	97.2	82.2						
			230Vac	80.5	93.7	94.6	94.8	95.3	80.1	97.3	99.5	99.9	100.8	96.0	81.5						
		C9300-NM-4G	115Vac	86.4	94.9	97.8	99.4	100.4	89.3	104.6	107.6	108.6	108.9	103.5	85.7						
			230Vac	85.3	93.8	96.6	98.4	99.1	88.2	103.4	106.2	106.9	107.2	102.3	84.8						
		C9300-NM-4M	115Vac	89.6	103.4	104.2	104.6	105.4	93.0	112.7	113.5	114.1	115.7	111.0	90.6						
			230Vac	89.0	102.0	102.8	103.1	103.9	91.9	111.0	111.8	112.4	114.0	109.4	89.3						
		C9300-NM-2Q	115Vac	88.3	102.4	102.9	103.3	104.2	91.0	110.5	111.3	112.1	113.9	108.9	88.6						
			230Vac	87.3	100.9	101.4	101.8	102.7	89.9	108.8	109.6	110.3	112.1	107.2	87.6						
		C9300-NM-8X	115Vac	92.1	105.2	106.1	106.5	107.4	98.6	117.6	118.4	119.1	120.9	116.0	91.0						
			230Vac	91.1	103.9	104.7	105.1	106.0	97.3	115.8	116.6	117.3	119.0	114.3	90.0						
C9300-48U	1100W	Not Installed	115Vac	96.0	110.2	110.9	111.2	111.7	95.6	112.5	114.3	115.9	116.9	111.3	97.0	315.1	544.0	925.9	1023.0		
			230Vac	94.8	108.5	109.2	109.4	109.9	94.2	110.0	112.5	114.1	115.0	108.9	95.6	308.6	529.4	889.9	978.8		
		C9300-NM-4G	115Vac	97.4	105.8	109.0	110.7	111.0	99.9	115.1	117.8	118.9	119.2	114.0	96.4	319.2	547.3	928.0	1026.3		
			230Vac	95.4	103.9	107.4	108.7	110.0	98.8	113.4	116.2	117.0	117.4	112.4	94.9	314.3	535.6	896.0	984.3		
		C9300-NM-4M	115Vac	104.4	118.5	119.0	119.5	120.1	107.4	126.8	127.6	128.3	130.0	125.2	104.9	326.2	556.0	938.6	1035.6		
			230Vac	102.8	116.0	117.1	117.5	118.2	106.4	124.8	125.5	126.2	127.7	123.2	103.6	320.4	541.4	903.0	991.6		
		C9300-NM-2Q	115Vac	102.9	117.2	117.6	118.0	119.0	104.8	123.8	124.6	125.3	127.0	122.2	102.5	324.1	552.4	934.4	1032.6		
			230Vac	101.2	114.9	115.5	115.9	117.0	103.9	123.0	123.7	124.4	126.1	121.4	101.7	316.9	537.9	898.2	988.3		
		C9300-NM-8X	115Vac	106.7	120.4	121.1	121.5	122.3	112.7	131.5	132.4	133.0	134.8	130.0	105.7	330.0	563.7	941.8	1043.4		
			230Vac	105.0	118.5	119.2	119.6	120.2	110.9	129.4	130.2	131.0	132.6	127.9	104.1	324.5	549.0	908.0	998.9		

				Measured P(W)																			
				Half port traffic							Full port traffic							Weighted average Pw	No link	PoE test (no traffic)			
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%			25%	50%	90%	100%
C9300-48H	1100W	Not Installed	115Vac	96.0	110.2	110.9	111.2	111.7	95.6	112.5	114.3	115.9	116.9	111.3	97.0	315.1	544.0	925.9	1023.0				
			230Vac	94.8	108.5	109.2	109.4	109.9	94.2	110.0	112.5	114.1	115.0	108.9	95.6	308.6	529.4	889.9	978.8				
		C9300-NM-4G	115Vac	97.4	105.8	109.0	110.7	111.0	99.9	115.1	117.8	118.9	119.2	114.0	96.4	319.2	547.3	928.0	1026.3				
			230Vac	95.4	103.9	107.4	108.7	110.0	98.8	113.4	116.2	117.0	117.4	112.4	94.9	314.3	535.6	896.0	984.3				
		C9300-NM-4M	115Vac	104.4	118.5	119.0	119.5	120.1	107.4	126.8	127.6	128.3	130.0	125.2	104.9	326.2	556.0	938.6	1035.6				
			230Vac	102.8	116.0	117.1	117.5	118.2	106.4	124.8	125.5	126.2	127.7	123.2	103.6	320.4	541.4	903.0	991.6				
		C9300-NM-2Q	115Vac	102.9	117.2	117.6	118.0	119.0	104.8	123.8	124.6	125.3	127.0	122.2	102.5	324.1	552.4	934.4	1032.6				
			230Vac	101.2	114.9	115.5	115.9	117.0	103.9	123.0	123.7	124.4	126.1	121.4	101.7	316.9	537.9	898.2	988.3				
		C9300-NM-8X	115Vac	106.7	120.4	121.1	121.5	122.3	112.7	131.5	132.4	133.0	134.8	130.0	105.7	330.0	563.7	941.8	1043.4				
			230Vac	105.0	118.5	119.2	119.6	120.2	110.9	129.4	130.2	131.0	132.6	127.9	104.1	324.5	549.0	908.0	998.9				
C9300-48UB	1100W	C9300-NM-8X	115Vac	106.7	120.4	121.1	121.5	122.3	112.7	131.5	132.4	133.0	134.8	130.0	105.7	330.0	563.7	941.8	1043.4				
C9300-48UN	1100W	C9300-NM-8X	115Vac	172.9	176.7	178.7	179.8	181.8	193.8	199.8	201.5	203.1	206.9	199.9	159.1	357.3	525.0	803.9	875.1				
			230Vac	171.2	174.8	176.8	178.1	179.9	191.7	197.8	199.4	201.0	204.7	197.9	157.9	351.5	512.1	777.0	843.8				
C9300-48UXM	1100W	C9300-NM-8X	115Vac	236.2	241.4	246.6	247.8	249.6	253.2	261.5	272.4	278.5	283.0	262.8	219.2	392.3	528.7	750.8	810.1				
			230Vac	232.2	237.4	242.5	243.7	245.6	249.0	256.7	267.6	272.9	277.2	258.0	215.7	382.8	515.2	728.0	784.7				
C9300L-24P-4G	715W	Integrated	115Vac	62.33	68.39	69.42	70.19	70.99	62.74	74.98	76.05	76.93	77.70	74.02	61.92	203.54	341.71	569.96	627.59				
			230Vac	60.91	67.07	68.18	68.91	69.68	61.32	73.88	74.99	75.84	76.58	72.89	60.60	199.69	334.16	552.06	606.54				
			115Vac	62.33	68.39	69.42	70.19	70.99	62.74	74.98	76.05	76.93	77.70	74.02	61.92	203.54	341.71	569.96	627.59				
			230Vac	60.91	67.07	68.18	68.91	69.68	61.32	73.88	74.99	75.84	76.58	72.89	60.60	199.69	334.16	552.06	606.54				
C9300L-24P-4X	715W	Integrated	115Vac	64.32	70.97	72.60	73.02	73.63	69.27	76.96	79.15	79.85	81.00	76.59	64.99	207.17	343.00	569.93	626.15				
			230Vac	64.09	69.90	71.75	72.28	72.92	67.80	76.12	78.34	78.78	79.91	75.67	63.70	203.04	336.39	553.25	607.02				
			115Vac	64.32	70.97	72.60	73.02	73.63	69.27	76.96	79.15	79.85	81.00	76.59	64.99	207.17	343.00	569.93	626.15				
			230Vac	64.09	69.90	71.75	72.28	72.92	67.80	76.12	78.34	78.78	79.91	75.67	63.70	203.04	336.39	553.25	607.02				

				Measured P(W)																			
				Half port traffic							Full port traffic							Weighted average Pw	No link	PoE test (no traffic)			
SKU	FEP	Uplink	Input	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%			25%	50%	90%	100%
C9300L-24T-4G	350W	Integrated	115Vac	57.75	63.72	64.67	65.37	66.09	58.39	69.87	70.92	71.74	72.37	68.97	57.30								
			230Vac	56.63	62.65	63.60	64.28	65.02	57.16	68.55	69.59	70.38	70.99	67.65	56.20								
			115Vac	57.75	63.72	64.67	65.37	66.09	58.39	69.87	70.92	71.74	72.37	68.97	57.3								
			230Vac	56.63	62.65	63.60	64.28	65.02	57.16	68.55	69.59	70.38	70.99	67.65	56.2								
C9300L-24T-4X	350W	Integrated	115Vac	58.69	65.61	67.13	67.54	68.03	59.12	71.55	73.49	74.06	75.14	70.66	58.13								
			230Vac	57.36	64.19	65.74	65.94	66.41	57.85	70.03	71.96	72.31	73.54	69.17	56.85								
			115Vac	58.69	65.61	67.13	67.54	68.03	59.12	71.55	73.49	74.06	75.14	70.66	58.13								
			230Vac	57.36	64.19	65.74	65.94	66.41	57.85	70.03	71.96	72.31	73.54	69.17	56.85								
C9300L-48P-4G	715W	Integrated	115Vac	69.21	77.07	78.03	78.82	79.86	70.06	86.76	87.97	88.97	90.01	85.41	68.42	213.65	351.15	575.52	632.46				
			230Vac	67.90	76.03	76.95	77.76	78.78	68.72	85.61	86.74	87.62	88.63	84.22	67.16	209.87	342.56	556.81	611.08				
			115Vac	69.21	77.07	78.03	78.82	79.86	70.06	86.76	87.97	88.94	90.01	85.41	68.42	213.65	351.15	575.52	632.46				
			230Vac	67.90	76.03	76.95	77.76	78.78	68.72	85.61	86.74	87.62	88.63	84.22	67.16	209.87	342.56	556.81	611.08				
C9300L-48P-4X	715W	Integrated	115Vac	68.05	78.83	80.51	80.97	81.98	69.18	90.03	91.95	92.67	94.13	88.35	68.50	203.00	337.40	559.30	616.70				
			230Vac	66.98	77.59	79.12	79.53	80.51	67.76	88.18	90.24	90.79	92.67	86.58	67.40	200.30	331.50	545.00	598.60				
			115Vac	68.05	78.83	80.51	80.97	81.98	69.18	90.03	91.95	92.67	94.13	88.35	68.50	203.0	337.4	559.3	616.7				
			230Vac	66.98	77.59	79.12	79.53	80.51	67.76	88.18	90.24	90.79	92.67	86.58	67.40	200.3	331.5	545.0	598.6				
C9300L-48PF-4G	1100W	Integrated	115Vac	70.41	79.73	81.33	81.58	82.62	71.36	90.17	91.32	92.11	93.00	88.57	69.35	314.03	558.56	973.60	1082.14				
			230Vac	68.66	77.95	78.87	79.64	80.56	69.59	87.79	88.87	89.73	90.72	86.27	67.84	306.85	541.37	928.90	1027.83				
C9300L-48PF-4X	1100W	Integrated	115Vac	69.68	80.51	82.08	82.50	83.37	71.08	91.01	93.09	94.17	96.27	89.54	69.35	310.72	552.92	965.47	1079.44				
			230Vac	68.14	78.81	80.34	80.71	81.61	69.11	88.83	90.73	91.38	93.06	87.28	67.38	305.26	539.36	924.23	1023.56				
C9300L-48T-4G	350W	Integrated	115Vac	60.32	69.53	70.41	71.16	72.00	61.57	79.62	80.62	81.44	82.32	78.083	59.47								
			230Vac	59.75	68.45	69.31	70.05	70.81	60.58	78.05	79.06	79.80	80.67	76.564	59.00								
			115Vac	60.32	69.53	70.41	71.16	72.00	61.57	79.62	80.62	81.44	82.32	78.083	59.47								
			230Vac	59.75	68.45	69.31	70.05	70.84	60.58	78.05	79.06	79.80	80.67	76.564	59.00								

				Measured P(W)															
SKU	FEP	Uplink	Input	Half port traffic					Full port traffic					Weighted average Pw	No link	PoE test (no traffic)			
				0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%			25%	50%	90%	100%
C9300L-48T-4X	350W	Integrated	115Vac	63.28	73.75	75.38	75.85	76.86	64.15	83.82	85.53	86.68	88.72	82.34	62.37				
			230Vac	61.91	72.22	73.73	74.13	75.06	62.82	82.21	84.17	84.97	86.77	80.73	60.97				
			115Vac	63.28	73.75	75.38	75.85	76.86	64.15	83.82	85.53	86.68	88.72	82.34	62.37				
			230Vac	61.91	72.22	73.73	74.13	75.06	62.82	82.21	84.17	84.97	86.77	80.73	60.97				

ATIS Testing - 100%				Measured P(W)															
				Half Port Traffic					Full Port Traffic					Weighted Average Pw	No Link	PoE Test (No Traffic)			
SKU	Archer FEP	Uplink	Input	0.01%/ EEE	10%	30%	50%	100%	0.01%/ EEE	10%	30%	50%	100%			25%	50%	90%	100%
C9300L-48UXG-4X	1100W	Integrated	115Vac	107.79	133.06	135.05	136.80	137.79	108.80	156.13	159.76	160.69	163.14	152.09	107.04	332.8	520.2	835.6	918.4
			230Vac	105.60	130.55	132.50	134.12	135.07	106.04	153.51	157.24	158.19	160.17	149.43	104.56	326.0	505.7	801.0	875.3
C9300L-24UXG-4X	1100W	Integrated	115Vac	70.90	87.08	88.80	89.32	90.30	71.26	103.11	105.06	105.80	107.58	100.37	70.87	335.16	579.52	996.96	1108.51
			230Vac	69.20	85.22	87.09	87.51	88.40	69.46	100.48	102.39	103.16	104.94	97.82	68.98	326.96	562.27	951.15	1049.47
C9300L-48UXG-2Q	1100W	Integrated	115Vac	111.73	138.34	140.48	141.17	143.22	112.35	162.30	164.13	165.51	168.68	157.94	111.10	335.47	521.76	835.04	919.11
			230Vac	109.53	135.16	137.16	137.89	139.68	110.21	158.42	161.05	162.32	165.66	154.32	108.86	328.17	507.54	801.77	876.22
C9300L-24UXG-2Q	1100W	Integrated	115Vac	104.07	121.70	122.67	123.44	125.05	104.41	139.04	140.97	142.77	145.33	136.20	103.78	325.38	526.58	861.27	949.66
			230Vac	100.88	118.72	119.46	120.13	122.11	101.16	135.91	137.68	139.26	143.13	133.15	100.52	317.08	510.67	829.62	909.10

Table 23. Power consumption of standalone 9300 Series Switches with platinum rated power supply (tested on Cisco IOS XE 16.8.1)

SKU	FEP	Uplink	Input	Measured P(W)															
				Half port traffic					Full port traffic					Weighted average Pw	No link	PoE test (no traffic)			
				0.01%/ EEE	10%	30%	50%	100%	0.01%/ EEE	10%	30%	50%	100%			25%	50%	90%	100%
C9300-24P	715W-P	C9300-NM-8X	115Vac	89.2	94.3	99	100.1	100.7	92	98.9	103.5	105.9	107.1	99	85.8	205.6	324.7	518.9	568.4
			230Vac	86.7	91.8	96.4	97.5	98	89.4	97.1	101.4	103.6	104.5	97	84.1	201.9	318.7	507.2	554.4

SKU	FEP	Uplink	Input	Measured P(W)										Weighted average Pw	No link	PoE test (no traffic)							
				Half port traffic					Full port traffic								25%		50%	90%	100%		
				0.01%/ EEE	10%	30%	50%	100%	0.01%/ EEE	10%	30%	50%	100%										
C9300-24T	350W-P	C9300-NM-8X	115Vac	83.1	88.2	92.9	94	94.5	85.8	92.9	97.2	99.6	100.4	92.9	80.5								
			230Vac	81.9	86.8	91.3	92.4	92.9	84.4	91.6	95.9	98.2	99	91.6	79.2								
C9300-24U	1100W-P	C9300-NM-8X	115Vac	90.5	95.9	100.5	101.6	102.1	93.3	100.6	104.9	107.2	108.1	100.6	87.9	319.9	549.5	935.3	1034.1				
			230Vac	88.1	93.1	97.7	98.8	99.4	92.8	98	102.4	104.6	105.5	98.2	85.4	313.4	535.5	899.7	990.3				
C9300-24UX	1100W-P	C9300-NM-8X	115Vac	186.8	191	194.9	197.1	198.9	209	215.4	227.2	230.1	233.1	216.6	165.3	367.5	522.1	776.1	842.3				
			230Vac	182.8	186.9	190.6	193	194.1	205	211.2	222.7	225.5	229.8	212.5	162.7	361.1	510.2	752.3	809.9				
C9300-24H	1100W-P	C9300-NM-8X	115Vac	90.5	95.9	100.5	101.6	102.1	93.3	100.6	104.9	107.2	108.1	100.6	87.9	319.9	549.5	935.3	1034.1				
			230Vac	88.1	93.1	97.7	98.8	99.4	92.8	98	102.4	104.6	105.5	98.2	85.4	313.4	535.5	899.7	990.3				
C9300-48P	715W-P	C9300-NM-8X	115Vac	99.1	105.5	110.8	111.3	112.4	99.6	112.5	118.2	120.1	122.2	112.2	94.7	214.7	336.1	521.5	569.4				
			230Vac	97.3	103.7	108.9	109.4	110.4	99	110.3	115.8	118.3	119.5	110.1	92.6	213.9	329.3	509.4	555				
C9300-48T	350W-P	C9300-NM-8X	115Vac	89.8	95.4	100.4	101.1	102	90.4	102.4	107.5	109.8	111.8	102.2	85.4								
			230Vac	88.7	94.5	99.4	100.1	101	88.7	101.2	106	108.1	109.9	100.8	83.9								
C9300-48U	1100W-P	C9300-NM-8X	115Vac	168.9	170.6	172.4	176.6	178.5	190.8	194	198.3	200.1	203.9	194.6	147.3	355.4	524.9	804.6	875.4				
			230Vac	165.7	167.3	169.2	169.9	171.5	186.5	189.6	193.9	195.7	199.8	190.3	145	348.8	511.7	777.7	844.9				
C9300-48UN	1100W-P	C9300-NM-8X	115Vac	172.9	176.7	178.7	179.8	181.8	193.8	199.8	201.5	203.1	206.9	199.9	159.1	357.3	525	803.9	875.1				
			230Vac	171.2	174.8	176.8	178.1	179.9	191.7	197.8	199.4	201	204.7	197.9	157.9	351.5	512.1	777	843.8				
C9300-48UXM	1100W-P	C9300-NM-8X	115Vac	241	248.1	254.8	256.4	258.9	260.1	269.4	281.6	286.5	291.6	270.7	225.1	394.8	531.4	755	809.5				
			230Vac	237.5	243.1	249	250.3	251.1	253.9	261.8	273.9	279.2	283.6	263.2	218.5	386.8	518.1	731.3	785.5				
C9300-48H	1100W-P	C9300-NM-8X	115Vac	168.9	170.6	172.4	176.6	178.5	190.8	194	198.3	200.1	203.9	194.6	147.3	355.4	524.9	804.6	875.4				
			230Vac	165.7	167.3	169.2	169.9	171.5	186.5	189.6	193.9	195.7	199.8	190.3	145	348.8	511.7	777.7	844.9				

SKU	FEP	Uplink	Input	Measured P(W)												Weighted average Pw	No link	PoE test (no traffic)				
				Half port traffic						Full port traffic									PoE test (no traffic)			
				0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%
C9300X-12Y	715W	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-12Y	715W	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-12Y	1100W	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-12Y	1100W	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-12Y	1900W	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-12Y	1900W	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-24Y	715W	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-24Y	715W	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-24Y	1100W	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-24Y	1100W	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-24Y	1900W	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-24Y	1900W	C9300X-NM-2C	115Vac																			
			230Vac																			

SKU	FEP	Uplink	Input	Measured P(W)												Weighted average Pw	No link	PoE test (no traffic)				
				Half port traffic						Full port traffic									PoE test (no traffic)			
				0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	0.01%/EEE	10%	30%	50%	100%	25%	50%	90%	100%
C9300X-12Y	715W-P	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-12Y	715W-P	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-12Y	1100W-P	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-12Y	1100W-P	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-24Y	715W-P	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-24Y	715W-P	C9300X-NM-2C	115Vac																			
			230Vac																			
C9300X-24Y	1100W-P	C9300X-NM-8Y	115Vac																			
			230Vac																			
C9300X-24Y	1100W-P	C9300X-NM-2C	115Vac																			
			230Vac																			

ATIS Testing -100%				Measured P(W)															
SKU	Archer FEP	Uplink	Input	Half port traffic					Full port traffic					Weighted average Pw	No link	PoE test (no traffic)			
				0.01% /EEE	10%	30%	50%	100%	0.01% /EEE	10%	30%	50%	100%			25%	50%	90%	100%
C9300-48H	1900W	C9300-NM-4G	115Vac	91.15	96.80	98.07	69.60	99.12	92.85	10.40	104.67	105.25	105.74	102.58	90.17	419.9	750.2	1296.2	1440.9
			230Vac	90.84	95.57	96.73	97.22	97.75	92.19	102.55	103.94	104.25	104.60	101.72	89.35	517.0	939.1	1637.6	1816.5
C9300-48H	1900W	C9300-NM-2Q	115Vac	93.15	100.87	101.21	101.56	102.40	94.69	108.16	108.96	109.71	111.58	107.16	91.53	420.7	749.8	1299.1	1441.8
			230Vac	92.27	99.91	100.35	100.64	101.53	93.81	106.72	107.52	108.35	110.41	105.80	90.66	516.0	940.1	1635.3	1814.6
C9300-48H	1900W	C9300-NM-8X	115Vac	94.48	102.47	102.94	103.46	104.43	97.27	110.25	110.92	111.75	113.79	109.30	92.43	422.9	751.3	1299.6	1441.6
			230Vac	94.02	101.23	101.69	102.10	103.08	96.24	108.89	109.65	110.53	112.55	108.00	91.44	519.2	943.8	1643.5	1821.3
C9300-48H	1900W	C9300-NM-4M	115Vac	94.02	101.47	102.50	102.61	103.41	96.78	109.46	110.25	110.98	112.77	108.53	91.43	421.8	749.9	1297.5	1440.1
			230Vac	93.08	100.78	101.16	101.45	102.31	95.92	108.19	108.96	109.73	111.46	107.29	90.29	518.5	940.8	1635.2	1810.3
C9300-48H	1900W	C9300-NM-2Y	115Vac	93.40	101.26	101.70	102.03	103.06	94.65	108.27	108.91	109.17	111.32	107.22	91.52	421.5	748.9	1295.7	1436.4
			230Vac	92.57	100.14	100.55	100.95	101.93	94.03	106.73	107.56	108.40	110.35	105.82	90.76	517.0	939.3	1635.0	1809.6
C9300-48H	1900W	Not Installed	115Vac	85.65	92.17	93.35	93.63	94.11	84.96	97.07	98.24	98.40	99.50	96.10	85.76	411.4	739.6	1288.7	1430.7
			230Vac	84.89	91.33	92.45	92.68	93.17	84.33	96.45	97.00	97.36	98.37	95.43	85.32	506.8	928.8	1621.9	1799.9
C9300-24H	1900W	Not Installed	115Vac	80.63	84.52	85.17	85.40	85.65	80.79	86.49	87.62	87.83	88.43	86.12	8041	407.5	741.3	1297.1	1438.1
			230Vac	79.55	83.21	84.70	84.91	85.25	79.70	86.09	87.13	87.36	87.94	85.63	79.39	503.6	931.8	1635.4	1810.3
C9300-24H	1900W	C9300-NM-4G	115Vac	86.38	88.78	89.98	90.51	91.09	87.24	94.12	95.57	96.06	96.63	93.68	85.58	415.5	741.6	1288.9	1433.7
			230Vac	85.98	88.27	89.66	90.6	90.77	86.81	93.47	74.72	95.17	95.73	93.03	84.94	511.5	938.2	1639.5	1818.1
C9300-24H	1900W	C9300-NM-2Q	115Vac	87.16	93.14	93.45	93.62	94.17	89.33	98.20	98.92	99.39	100.11	97.50	85.73	417.1	750.9	1304.4	1448.9
			230Vac	86.66	92.16	92.53	92.8	93.36	88.11	96.56	96.95	97.38	98.39	95.90	84.95	512.7	940.2	1641.6	1818.3
C9300-24H	1900W	C9300-NM-8X	115Vac	88.85	93.82	94.89	95.08	95.69	91.72	99.50	100.50	101.03	102.21	98.99	85.95	419.9	754.5	1307.5	1450.9
			230Vac	88.10	92.69	93.80	94.12	94.71	90.92	98.32	99.29	99.71	100.60	97.81	85.24	515.0	942.7	1644.3	1822.0
C9300-24H	1900W	C9300-NM-4M	115Vac	88.57	93.90	94.22	94.51	96.03	91.37	99.29	100.13	100.44	101.54	98.72	85.83	418.9	744.3	1298.3	1449.9
			230Vac	88.24	93.10	93.33	93.55	94.17	90.90	98.67	99.07	99.65	100.80	98.11	85.65	515.8	943.4	1644.0	1821.9
C9300-24H	1900W	C9300-NM-4M	115Vac	87.81	94.47	94.73	94.79	95.29	89.81	98.27	99.32	100.28	101.12	97.71	86.65	418.6	748.4	1311.1	1448.7
			230Vac	87.26	92.59	92.86	93.13	93.90	88.93	97.03	97.58	97.97	99.03	96.42	85.48	511.9	940.9	1642.0	1819.4

Safety and compliance

Table 24 lists the safety and compliance information for the Cisco Catalyst 9300 Series.

Table 24. Safety and compliance information

Description	Specification
Safety certifications	<ul style="list-style-type: none">• UL 60950-1• CAN/CSA-C222.2 No. 60950-1• EN 60950-1• IEC 60950-1• AS/NZS 60950.1• IEEE 802.3
Electromagnetic compatibility certifications	<ul style="list-style-type: none">• 47 CFR Part 15• EN 300 386 V1.6.1• EN 55032 Class A• CISPR 32 Class A• EN61000-3-2• EN61000-3-3• ICES-003 Class A• TCVN 7189 Class A• V-3 Class A• CISPR 35• EN 300 386• EN 55035• TCVN 7317• V-2/2015.04• V-3/2015.04• CNS13438• KN32• KN35 <p>Additional Certifications for C9300L SKUs:</p> <ul style="list-style-type: none">• QCVN 118:2018/BTTTT• VCCI-CISPR 32 Class A
Environmental	Reduction of Hazardous Substances (ROHS) 5

Warranty

Cisco enhanced limited lifetime hardware warranty

The Cisco Catalyst 9300 Series Switches come with a Cisco Enhanced Limited Lifetime hardware Warranty (E-LLW) that includes Next-Business-Day (NBD) delivery of replacement hardware where available and 90 days of 8x5 Cisco Technical Assistance Center (TAC) support.

Your formal warranty statement, including the warranty applicable to Cisco software, appears in the information packet that accompanies your Cisco product. We encourage you to review the warranty statement shipped with your specific product carefully before use.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

For further information about warranty terms, visit <https://www.cisco.com/go/warranty>. Table 23 provides information about the E-LLW.

Table 25. E-LLW details

Cisco E-LLW	
Devices covered	Applies to Cisco Catalyst 9300 Series Switches.
Warranty duration	As long as the original customer owns the product.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a replacement for NBD delivery, where available. Otherwise, a replacement will be shipped within 10 working days after receipt of the Return Materials Authorization (RMA) request. Actual delivery times might vary depending on customer location.
Effective date	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).
TAC support	Cisco will provide during business hours, 8 hours per day, 5 days per week, basic configuration, diagnosis, and troubleshooting of device-level problems for up to a 90-day period from the date of shipment of the originally purchased Cisco Catalyst 9300 Series product. This support does not include solution or network level support beyond the specific device under consideration.
Cisco.com access	Warranty allows guest access only to Cisco.com.

Product sustainability

Information about Cisco's environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability [reporting](#).

Sustainability Topic	Refer
General	Information on product-material-content laws and regulations
	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging
	WEEE Compliance
	Sustainability Inquiries
	Contact: csr_inquiries@cisco.com
Power	Information on product takeback and reuse program
	Cisco Takeback and Reuse Program
	Safety and compliance
	Table 23. Safety and compliance information
	Mean Time Between Failures - MTBF (hours)
	Table 16 Model Dimensions, Weight, and Mean Timebetween failures metrics
Material	Default AC power supply
	Table 1. Cisco Catalyst 9300 Series switch configurations
	Power supplies
	Table 3. Power supply models
	Table 19. Power specifications
	Table 20. Power specifications - platinum rated power supplies
Power	Fan
	Table 6. Fan modules
	Energy Efficient Ethernet
	Smart operation
	Power over ethernet (Cisco UPOE and UPOE+)
	Power over ethernet leadership
Material	Power connectors
	Table 17. Power connectors
	Power consumption (ATIS)
	Table 21. Power Consumption of Standalone 9300 Series Switches
	Table 22. Power consumption of Standalone 9300 Series Switches with platinum rated power supply
	Product packaging weight and materials
Material	Contact: environment@cisco.com
	Dimensions
	Table 16 Model Dimensions, Weight, and Mean Timebetween failures metrics.
	Weight
Material	Table 16 Model Dimensions, Weight, and Mean Timebetween failures metrics.
	Elimination of wet paint on plastic bezel
Material	2019 Cisco Corporate Social Responsibility Report , Pg. 19 Stepping up our work on circularity

Cisco Services

Cisco Services for next-generation Cisco Catalyst 9000 Switches

Achieve infrastructure excellence faster and with less risk. Cisco Catalyst 9000 Services provide expert guidance to help you successfully deploy, manage and support the new Cisco Catalyst 9000 switching family. With unmatched networking expertise, best practices, and innovative tools, we can help you reduce overall upgrade, refresh, and migration costs as you introduce new hardware, software, and protocols into the network. Offering a comprehensive lifecycle of services - from implementation, optimization, technical, and managed services - Cisco experts help you reduce disruption and achieve operational excellence to extract maximum value from your Cisco DNA ready infrastructure.

[Learn more about Cisco Services for Enterprise Networks](#)

Software policy for Cisco Catalyst 9300 Series Switches

Software policy for network stack components

Customers with the Network Essentials Stack and Network Advantage Stack software feature sets are provided with maintenance updates and bug fixes designed to maintain compliance of the software. This includes compliance with published specifications, release notes, and industry standards as long as the original end user continues to own or use the product or up to one year from the end-of-sale date for the product, whichever occurs earlier.

Cisco embedded support for Cisco DNA term components

Cisco Embedded Support delivers the right support for Cisco software products and suites. It will keep your business applications performing as expected and protect your investment. Cisco Embedded Support for the Cisco DNA Essentials and Cisco DNA Advantage term components is included. Cisco Embedded Support provides access to TAC support, major software updates, maintenance and minor software releases, and the Cisco Embedded Support site, for increased productivity with anytime access.

Ordering information

Table 26 lists ordering information for the Cisco Catalyst 9300 Series. To place an order, visit the Cisco Ordering home page at

https://www.cisco.com/en/US/ordering/or13/or8/order_customer_help_how_to_order_listing.html.

Table 26. Ordering information

Switches	
Product number	Product description
C9300X-48HX-E	Catalyst 9300 48-port 10G/mGig with modular uplink, UPOE+, Network Essentials
C9300X-48HX-A	Catalyst 9300 48-port 10G/mGig with modular uplink, UPOE+, Network Advantage
C9300X-48TX-E	Catalyst 9300 48-port 10G/mGig with modular uplink, data only, Network Essentials
C9300X-48TX-A	Catalyst 9300 48-port 10G/mGig with modular uplink, data only, Network Advantage
C9300X-48HXR-E	Catalyst 9300 36-port 5G/mGig, 12-port 10G with modular uplink, UPOE+, Network Essentials

Switches	
C9300X-48HXN-A	Catalyst 9300 36-port 5G/mGig, 12-port 10G with modular uplink, UPOE+, Network Advantage
C9300X-24HX-E	Catalyst 9300 24-port 10G/mGig with modular uplink, UPOE+, Network Essentials
C9300X-24HX-A	Catalyst 9300 24-port 10G/mGig with modular uplink, UPOE+, Network Advantage
C9300X-12Y-E	Catalyst 9300 12-port 25G/10G/1G SFP28 with modular uplinks, Network Essentials
C9300X-12Y-A	Catalyst 9300 12-port 25G/10G/1G SFP28 with modular uplinks, Network Advantage
C9300X-24Y-E	Catalyst 9300 24-port 25G/10G/1G SFP28 with modular uplinks, Network Essentials
C9300X-24Y-A	Catalyst 9300 24-port 25G/10G/1G SFP28 with modular uplinks, Network Advantage
C9300-24T-E	Catalyst 9300 24-port 1G copper with modular uplinks, data only, Network Essentials
C9300-24T-A	Catalyst 9300 24-port 1G copper with modular uplinks, data only, Network Advantage
C9300-24P-E	Catalyst 9300 24-port 1G copper with modular uplinks, PoE+, Network Essentials
C9300-24P-A	Catalyst 9300 24-port 1G copper with modular uplinks, PoE+, Network Advantage
C9300-24U-E	Catalyst 9300 24-port 1G copper with modular uplinks, UPOE, Network Essentials
C9300-24U-A	Catalyst 9300 24-port 1G copper with modular uplinks, UPOE, Network Advantage
C9300-24UB-E	Catalyst 9300 higher scale 24-port 1G copper with modular uplinks, UPOE, Network Essentials
C9300-24UB-A	Catalyst 9300 higher scale 24-port 1G copper with modular uplinks, UPOE, Network Advantage
C9300-24U-E-UL	Catalyst 9300 24-port 1G copper with modular uplinks, UPOE, Network Advantage (Compatible with UL1069 Standard*)
C9300-24U-A-UL	Catalyst 9300 24-port 1G copper with modular uplinks, UPOE, Network Advantage (Compatible with UL1069 Standard*)
C9300-24H-E	Catalyst 9300 24-port 1G copper with modular uplinks, UPOE+, Network Essentials
C9300-24H-A	Catalyst 9300 24-port 1G copper with modular uplinks, UPOE+, Network Advantage
C9300-24UX-E	Catalyst 9300 24-port 10G/mGig with modular uplink, UPOE, Network Essentials
C9300-24UX-A	Catalyst 9300 24-port 10G/mGig with modular uplink, UPOE, Network Advantage
C9300-24UXB-E	Catalyst 9300 higher scale 24-port 10G/mGig with modular uplink, UPOE, Network Essentials
C9300-24UXB-A	Catalyst 9300 higher scale 24-port 10G/mGig with modular uplink, UPOE, Network Advantage
C9300-48T-E	Catalyst 9300 48-port 1G copper with modular uplinks, data only, Network Essentials

Switches	
C9300-48T-A	Catalyst 9300 48-port 1G copper with modular uplinks, data only, Network Advantage
C9300-48P-E	Catalyst 9300 48-port 1G copper with modular uplinks, PoE+, Network Essentials
C9300-48P-A	Catalyst 9300 48-port 1G copper with modular uplinks, PoE+, Network Advantage
C9300-48U-E	Catalyst 9300 48-port 1G copper with modular uplinks, UPOE, Network Essentials
C9300-48U-A	Catalyst 9300 48-port 1G copper with modular uplinks, UPOE, Network Advantage
C9300-48UB-E	Catalyst 9300 higher scale 48-port 1G copper with modular uplinks, UPOE, Network Essentials
C9300-48UB-A	Catalyst 9300 higher scale 48-port 1G copper with modular uplinks, UPOE, Network Advantage
C9300-48U-E-UL	Catalyst 9300 48-port 1G copper with modular uplinks, UPOE, Network Essentials (Compatible with UL1069 Standard*)
C9300-48U-A-UL	Catalyst 9300 48-port 1G copper with modular uplinks, UPOE, Network Advantage (Compatible with UL1069 Standard*)
C9300-48H-E	Catalyst 9300 48-port 1G copper with modular uplinks, UPOE+, Network Essentials
C9300-48H-A	Catalyst 9300 48-port 1G copper with modular uplinks, UPOE+, Network Advantage
C9300-48UXM-E	Catalyst 9300 48-port 2.5G (12 10G/mGig) copper with modular uplinks, UPOE, Network Essentials
C9300-48UXM-A	Catalyst 9300 48-port 2.5G (12 10G/mGig) copper with modular uplinks, UPOE, Network Advantage
C9300-48UN-E	Catalyst 9300 48-port 5G copper with modular uplinks, UPOE, Network Essentials
C9300-48UN-A	Catalyst 9300 48-port 5G copper with modular uplinks, UPOE, Network Advantage
C9300-24S-E	Catalyst 9300 24-port 1G SFP with modular uplinks, Network Essentials
C9300-24S-A	Catalyst 9300 24-port 1G SFP with modular uplinks, Network Advantage
C9300-48S-E	Catalyst 9300 48-port 1G SFP with modular uplinks, Network Essentials
C9300-48S-A	Catalyst 9300 48-port 1G SFP with modular uplinks, Network Advantage
C9300L-24T-4G-E	Catalyst 9300 24-port 1G copper, with fixed 4x1G SFP uplinks, data only Network Essentials
C9300L-24T-4G-A	Catalyst 9300 24-port 1G copper, with fixed 4x1G SFP uplinks, data only Network Advantage
C9300L-24P-4G-E	Catalyst 9300 24-port 1G copper, with fixed 4x1G SFP uplinks, PoE+ Network Essentials
C9300L-24P-4G-A	Catalyst 9300 24-port 1G copper, with fixed 4x1G SFP uplinks, PoE+ Network Advantage
C9300L-48T-4G-E	Catalyst 9300 48-port 1G copper, with fixed 4x1G SFP uplinks, data only Network Essentials

Switches	
C9300L-48T-4G-A	Catalyst 9300 48-port 1G copper, with fixed 4x1G SFP uplinks, data only Network Advantage
C9300L-48P-4G-E	Catalyst 9300 48-port 1G copper, with fixed 4x1G SFP uplinks, PoE+ Network Essentials
C9300L-48P-4G-A	Catalyst 9300 48-port 1G copper with fixed 4x1G SFP uplinks, PoE+ Network Advantage
C9300L-48PF-4G-E	Catalyst 9300 48-port 1G copper with fixed 4x1G SFP uplinks, PoE+ Network Essentials
C9300L-48PF-4G-A	Catalyst 9300 48-port 1G copper with fixed 4x1G SFP uplinks, PoE+ Network Advantage
C9300L-24T-4X-E	Catalyst 9300 24-port 1G copper with fixed 4x10G/1G SFP+ uplinks, data only Network Essentials
C9300L-24T-4X-A	Catalyst 9300 24-port 1G copper with fixed 4x10G/1G SFP+ uplinks, data only Network Advantage
C9300L-24P-4X-E	Catalyst 9300 24-port 1G copper with fixed 4x10G/1G SFP+ uplinks, PoE+ Network Essentials
C9300L-24P-4X-A	Catalyst 9300 24-port 1G copper with fixed 4x10G/1G SFP+ uplinks, PoE+ Network Advantage
C9300L-24UXG-4X-E	Catalyst 9300 24-port 8XmGig (100M/1G/2.5G/5G/10G) + 16x 10M/100M/1G copper with fixed 4x10G/1G SFP+ uplinks, UPOE, Network Essentials
C9300L-24UXG-4X-A	Catalyst 9300 24-port 8XmGig (100M/1G/2.5G/5G/10G) + 16x 10M/100M/1G copper with fixed 4x10G/1G SFP+ uplinks, UPOE, Network Advantage
C9300L-48T-4X-E	Catalyst 9300 48-port 1G copper with fixed 4x10G/1G SFP+ uplinks, data only Network Essentials
C9300L-48T-4X-A	Catalyst 9300 48-port 1G copper with fixed 4x10G/1G SFP+ uplinks, data only Network Advantage
C9300L-48P-4X-E	Catalyst 9300 48-port 1G copper with fixed 4x10G/1G SFP+ uplinks, PoE+ Network Essentials
C9300L-48P-4X-A	Catalyst 9300 48-port 1G copper with fixed 4x10G/1G SFP+ uplinks, PoE+ Network Advantage
C9300L-48PF-4X-E	Catalyst 9300 48-port 1G copper with fixed 4x10G/1G SFP+ uplinks, full PoE+ Network Essentials
C9300L-48PF-4X-A	Catalyst 9300 48-port 1G copper with fixed 4x10G/1G SFP+ uplinks, full PoE+ Network Advantage
C9300L-48UXG-4X-E	Catalyst 9300 48-port fixed uplinks UPOE, 12x mGig (100M/1G/2.5G/5G/10G) + 36x 10M/100M/1G, 4x 10G uplinks, Network Essentials
C9300L-48UXG-4X-A	Catalyst 9300 48-port 12x mGig (100M/1G/2.5G/5G/10G) + 36x 10M/100M/1G copper with fixed 4x 10G/1G SFP+ uplinks, UPOE, Network Advantage
C9300L-24UXG-2Q-E	Catalyst 9300 24-port 8x mGig (100M/1G/2.5G/5G/10G) + 16x 10M/100M/1G copper with fixed 2x 40G QSFP uplinks, UPOE, Network Essentials
C9300L-24UXG-2Q-A	Catalyst 9300 24-port 8x mGig (100M/1G/2.5G/5G/10G) + 16x 10M/100M/1G copper with

Switches	
	fixed 2x 40G QSFP uplinks, UPOE, Network Advantage
C9300L-48UXG-2Q-E	Catalyst 9300 48-port 12x mGig (100M/1G/2.5G/5G/10G) + 36x 10M/100M/1G copper with fixed 2x 40G QSFP uplinks, UPOE, Network Essentials
C9300L-48UXG-2Q-A	Catalyst 9300 48-port 12x mGig (100M/1G/2.5G/5G/10G) + 36x 10M/100M/1G copper with fixed 2x 40G QSFP uplinks, UPOE, Network Advantage
C9300LM-48UX-4Y-E	Catalyst 9300 mini 48-port UPOE, 8-port 10G Multigigabit, 40-port 1G, 4x 10G uplinks, Network Essentials
C9300LM-48UX-4Y-A	Catalyst 9300 mini 48-port UPOE, 8-port 10G Multigigabit, 40-port 1G, 4x 25G uplinks, Network Advantage
C9300LM-48U-4Y-E	Catalyst 9300 mini 48-port 1G UPOE, 4x 10G uplinks, Network Essentials
C9300LM-48U-4Y-A	Catalyst 9300 mini 48-port 1G UPOE, 4x 25G uplinks, Network Advantage
C9300LM-48T-4Y-E	Catalyst 9300 mini 48-port 1G data, 4x 10G uplinks, Network Essentials
C9300LM-48T-4Y-A	Catalyst 9300 mini 48-port 1G data, 4x 25G uplinks, Network Advantage
C9300LM-24U-4Y-E	Catalyst 9300 mini 24-port 1G UPOE, 4x 10G uplinks, Network Essentials
C9300LM-24U-4Y-A	Catalyst 9300 mini 24-port 1G UPOE, 4x 25G uplinks, Network Advantage
Network modules	
Product number	Product description
C9300X-NM-8M	Catalyst 9300X 8 x 10G/mGig Network Module
C9300X-NM-8M=	Catalyst 9300X 8 x 10G/mGig Network Module, spare
C9300X-NM-8Y	Catalyst 9300 8 x 25G/10G/1G multi-rate SFP Network Module
C9300X-NM-8Y=	Catalyst 9300 8 x 25G/10G/1G multi-rate SFP Network Module, spare
C9300X-NM-2C	Catalyst 9300 2 x 100G/40G dual rate QSFP Network Module
C9300X-NM-2C=	Catalyst 9300 2 x 100G/40G dual rate QSFP Network Module, spare
C9300X-NM-4C	Catalyst 9300 4 x 100G/40G dual rate QSFP Network Module
C9300X-NM-4C=	Catalyst 9300 4 x 100G/40G dual rate QSFP Network Module, spare
C9300-NM-4G	Catalyst 9300 4 x 1GE SFP Network Module
C9300-NM-4G=	Catalyst 9300 4 x 1GE SFP Network Module, spare
C9300-NM-8X	Catalyst 9300 8 x 10G/1G SFP+ Network Module
C9300-NM-8X=	Catalyst 9300 8 x 10G/1G SFP+ Network Module, spare
C9300-NM-2Q	Catalyst 9300 2 x 40GE QSFP Network Module

Switches	
C9300-NM-2Q=	Catalyst 9300 2 x 40GE QSFP Network Module, spare
C9300-NM-2Y	Catalyst 9300 2 x 25G/10G/1G SFP28 Network Module
C9300-NM-2Y=	Catalyst 9300 2 x 25G/10G/1G SFP28 Network Module, spare
C9300-NM-4M	Catalyst 9300 4 x 10G/mGig Network Module
C9300-NM-4M=	Catalyst 9300 4 x 10G/mGig Network Module, spare
NM-BLANK-T1=	Cisco Catalyst Type 1 Network Module Blank, spare
Storage Module	
Product number	Product description
SSD-120G	Cisco pluggable USB3.0 120G SSD storage
SSD-120G=	Cisco pluggable USB3.0 120G SSD storage, spare
SSD-240G	Cisco pluggable USB3.0 240G SSD storage
SSD-240G=	Cisco pluggable USB3.0 240G SSD storage, spare
Software licenses for C9300 SKUs	
Product number	Product description
C9300-DNA-E-24-3Y	C9300 Cisco DNA Essentials, 24-port, 3 Year Term license
C9300-DNA-E-24-5Y	C9300 Cisco DNA Essentials, 24-port, 5 Year Term license
C9300-DNA-E-24-7Y	C9300 Cisco DNA Essentials, 24-port, 7 Year Term license
C9300-DNA-A-24-3Y	C9300 Cisco DNA Advantage, 24-port, 3 Year Term license
C9300-DNA-A-24-5Y	C9300 Cisco DNA Advantage, 24-port, 5 Year Term license
C9300-DNA-A-24-7Y	C9300 Cisco DNA Advantage, 24-port, 7 Year Term license
C9300-DNA-E-48-3Y	C9300 Cisco DNA Essentials, 48-port, 3 Year Term license
C9300-DNA-E-48-5Y	C9300 Cisco DNA Essentials, 48-port, 5 Year Term license
C9300-DNA-E-48-7Y	C9300 Cisco DNA Essentials, 48-port, 7 Year Term license
C9300-DNA-A-48-3Y	C9300 Cisco DNA Advantage, 48-port, 3 Year Term license
C9300-DNA-A-48-5Y	C9300 Cisco DNA Advantage, 48-port, 5 Year Term license
C9300-DNA-A-48-7Y	C9300 Cisco DNA Advantage, 48-port, 7 Year Term license
C9300-DNA-E-24S-3Y	C9300 1G Fiber Cisco DNA Essentials, 24-port, 3 Year Term license

Switches	
C9300-DNA-E-24S-5Y	C9300 1G Fiber Cisco DNA Essentials, 24-port, 5 Year Term license
C9300-DNA-E-24S-7Y	C9300 1G Fiber Cisco DNA Essentials, 24-port, 7 Year Term license
C9300-DNA-A-24S-3Y	C9300 1G Fiber Cisco DNA Advantage, 24-port, 3 Year Term license
C9300-DNA-A-24S-5Y	C9300 1G Fiber Cisco DNA Advantage, 24-port, 5 Year Term license
C9300-DNA-A-24S-7Y	C9300 1G Fiber Cisco DNA Advantage, 24-port, 7 Year Term license
C9300-DNA-E-48S-3Y	C9300 1G Fiber Cisco DNA Essentials, 48-port, 3 Year Term license
C9300-DNA-E-48S-5Y	C9300 1G Fiber Cisco DNA Essentials, 48-port, 5 Year Term license
C9300-DNA-E-48S-7Y	C9300 Cisco DNA Essentials, 48-port, 7 Year Term license
C9300-DNA-A-48S-3Y	C9300 1G Fiber Cisco DNA Advantage, 48-port, 3 Year Term license
C9300-DNA-A-48S-5Y	C9300 1G Fiber Cisco DNA Advantage, 48-port, 5 Year Term license
C9300-DNA-A-48S-7Y	C9300 1G Fiber Cisco DNA Advantage, 48-port, 7 Year Term license
C9300-DNA-L-E-3Y	C9300 Cisco DNA Essentials license (3Y) for 12Y, 24Y SKU
C9300-DNA-L-E-5Y	C9300 Cisco DNA Essentials license (5Y) for 12Y, 24Y SKU
C9300-DNA-L-E-7Y	C9300 Cisco DNA Essentials license (7Y) for 12Y, 24Y SKU
C9300-DNA-L-A-3Y	C9300 Cisco DNA Advantage license (3Y) for 12Y, 24Y SKU
C9300-DNA-L-A-5Y	C9300 Cisco DNA Advantage license (5Y) for 12Y, 24Y SKU
C9300-DNA-L-A-7Y	C9300 Cisco DNA Advantage license (7Y) for 12Y, 24Y SKU
C9300-LIC=	Electronic Cisco DNA Upgrade License for C9300 switches. Note: when upgrading from Cisco DNA Essentials to Cisco DNA Advantage, Network Essentials is also upgraded to Network Advantage
Software licenses for C9300L SKUs	
Product number	Product number
C9300L-DNA-E-24-3Y	C9300L Cisco DNA Essentials, 24-port, 3 Year Term license
C9300L-DNA-E-24-5Y	C9300L Cisco DNA Essentials, 24-port, 5 Year Term license
C9300L-DNA-E-24-7Y	C9300L Cisco DNA Essentials, 24-port, 7 Year Term license
C9300L-DNA-A-24-3Y	C9300L Cisco DNA Advantage, 24-port, 3 Year Term license
C9300L-DNA-A-24-5Y	C9300L Cisco DNA Advantage, 24-port, 5 Year Term license
C9300L-DNA-A-24-7Y	C9300L Cisco DNA Advantage, 24-port, 7 Year Term license
C9300L-DNA-E-48-3Y	C9300L Cisco DNA Essentials, 48-port, 3 Year Term license

Switches	
C9300L-DNA-E-48-5Y	C9300L Cisco DNA Essentials, 48-port, 5 Year Term license
C9300L-DNA-E-48-7Y	C9300L Cisco DNA Essentials, 48-port, 7 Year Term license
C9300L-DNA-A-48-3Y	C9300L Cisco DNA Advantage, 48-port, 3 Year Term license
C9300L-DNA-A-48-5Y	C9300L Cisco DNA Advantage, 48-port, 5 Year Term license
C9300L-DNA-A-48-7Y	C9300L Cisco DNA Advantage, 48-port, 7 Year Term license
C9300L-LIC=	Electronic Cisco DNA Upgrade License for C9300L switches. Note: when upgrading from Cisco DNA Essentials to Cisco DNA Advantage, Network Essentials is also upgraded to Network Advantage
Power supplies	
Product number	Product description
PWR-C1-350WAC=	350WAC power supply spare
PWR-C1-715WAC=	715WAC power supply spare
PWR-C1-715WDC=	715WDC power supply spare
PWR-C1-1100WAC=	1100WAC power supply spare
PWR-C1-1900WAC=	1900WAC Power supply spare
PWR-C1-350WAC-P=	350WAC Platinum-rated power supply spare
PWR-C1-715WAC-P=	715WAC Platinum-rated power supply spare
PWR-C1-1100WAC-P=	1100WAC Platinum-rated power supply spare
PWR-C1-715WAC-UP	Upgrade to 715WAC Platinum-rated power supply
PWR-C1-1100WAC-UP	Upgrade to 1100WAC Platinum-rated power supply
PWR-C1-1900WAC-UP	Upgrade to 1900WAC Platinum-rated power supply
Cisco StackWise-480/1T and StackPower cables	
Product number	Product description
STACK-T1-50CM=	Cisco StackWise-480/1T 50cm stacking cable spare
STACK-T1-1M=	Cisco StackWise-480/1T 1m stacking cable spare
STACK-T1-3M=	Cisco StackWise-480/1T 3m stacking cable spare
CAB-SPWR-30CM=	Cisco Catalyst 3850 StackPower cable 30cm spare
CAB-SPWR-150CM=	Cisco Catalyst 3850 StackPower cable 150cm spare
Cisco StackWise-320 Accessories	

Switches	
Product number	Product description
C9300L-STACK-KIT	Stack Kit for C9300L SKUs - includes 2 Stack Adaptors and 1 Stack Cable
C9300L-STACK-KIT=	Stack Kit for C9300L SKUs - includes 2 Stack Adaptors and 1 Stack Cable, spare
STACK-T3-50CM	50CM Type 3 Stacking Cable - default with Stack Kit for C9300L SKUs
STACK-T3-50CM=	50CM Type 3 Stacking Cable, spare for C9300L SKUs
STACK-T3-1M	1M Type 3 Stacking Cable for C9300L SKUs
STACK-T3-1M=	1M Type 3 Stacking Cable, spare for C9300L SKUs
STACK-T3-3M	3M Type 3 Stacking Cable for C9300L SKUs
STACK-T3-3M=	3M Type 3 Stacking Cable, spare for C9300L SKUs
Spare power cords	
CAB-TA-NA=	AC power cord for Cisco Catalyst (North America)
CAB-TA-AP=	AC power cord for Cisco Catalyst (Australia)
CAB-TA-AR=	AC power cord for Cisco Catalyst (Argentina)
CAB-TA-SW=	AC power cord for Cisco Catalyst (Switzerland)
CAB-TA-UK=	AC power cord for Cisco Catalyst (United Kingdom)
CAB-TA-JP=	AC power cord for Cisco Catalyst (Japan)
CAB-TA-250VAC-JP=	Japan 250VAC power cord for Cisco Catalyst (Japan)
CAB-TA-EU=	AC power cord for Cisco Catalyst (Europe)
CAB-TA-IT=	AC power cord for Cisco Catalyst (Italy)
CAB-TA-IN=	AC power cord for Cisco Catalyst (India)
CAB-TA-CN=	AC power cord for Cisco Catalyst (China)
CAB-TA-DN=	AC power cord for Cisco Catalyst (Denmark)
CAB-TA-IS=	AC power cord for Cisco Catalyst (Israel)
CAB-ACBZ-12A=	AC power cord for Cisco Catalyst (Brazil), 12A/125V BR-3-20 plug up to 12A
CAB-ACBZ-10A=	AC power cord for Cisco Catalyst (Brazil), 10A/250V BR-3-10 plug up to 10A
CAB-C15-CBN	Cabinet jumper power cord, 250VAC 13A, C14-C15 connectors

Optics online reference

The Cisco Catalyst 9300 Series supports a wide range of optics. Because the list of supported optics is updated on a regular basis, consult the tables available here for the latest QSFP28, QSFP+, SFP+, and SFP compatibility information:

https://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. [Learn more.](#)

Document history

New or revised topic	Described In	Date
Added Information about 9300X, copper models	All relevant sections	February 3, 2022
Added Information about 9300X fiber models	All relevant sections	March 2, 2021
Added information about the 1G 90W UPOE+ SKUs	Across different sections	February 10, 2020
Added new SKUs for C9300L – Full PoE+ and mGig SKUs	Content added to all the tables	December 2, 2019
Updates for C9300 - large buffer/scale SKUs	All relevant sections	October 9, 2019
Adding Primary PSU upgrade option for 9300	Table 3: Power supply models	June 20, 2019
Product name change: Cisco ONE to Cisco DNA	Introduction	May 10, 2019
Wi-Fi 6 addition	Product Overview: Features	May 10, 2019
Add: Features	Product Overview: Features	May 10, 2019
Add: Modular uplink models table	Platform Details	May 10, 2019
Edit: Cisco Catalyst 9300 Series modular uplink	Platform Details	May 10, 2019
Edit: Table 1: Cisco Catalyst 9300 Series Switch configurations; uplink configuration add	Platform Details	May 10, 2019
Edit: Table 2: Name change to “Catalyst 9300...”	Platform Details	May 10, 2019
Add: Figure 3: picture for C9300L	Platform Details	May 10, 2019
Edit: Table 3: Power supply models	Platform Details	May 10, 2019

New or revised topic	Described In	Date
Add: Stacking, Table 4	Platform Details	May 10, 2019
Add: Stacking Accessories, Table 5	Platform Details	May 10, 2019
Edit: Replaced C3850 stack picture with C9300 stack picture	Platform Details	May 10, 2019
Add: Fan, Table 6	Platform Details	May 10, 2019
Edit: Table 7	Performance and Scalability	May 10, 2019
Add: Bandwidth Specifications	Performance and Scalability	May 10, 2019
Add: StackWise-320	Resiliency and High Availability	May 10, 2019
Edit: name change from Cisco One to Cisco DNA Software	Software Requirements	May 10, 2019
Edit: text edits	Licensing	May 10, 2019
Edit: Table 13	Licensing	May 10, 2019
Edit: Table 14	Specifications	May 10, 2019
Edit: Table 15	Connectors	May 10, 2019
Edit: Table 17	Power Supply Specifications	May 10, 2019
Edit: Table 21	Safety and Compliance	May 10, 2019
Edit: Table 23	Ordering Information	May 10, 2019
Added support for SD-Access Embedded Wireless	Added support for SD-Access Embedded Wireless Controller functionality.	November 13, 2018
Updated Platinum Power Supply specifications	Platinum rated power supplies available on the C9300 switches.	October 5, 2018
Updated availability of SSD card	Availability of 120G storage module for the C9300.	October 5, 2018

New or revised topic	Described In	Date
Updated Product overview	Added Catalyst 9500 high density platforms and updated associated speeds and densities, e.g. Up to 6.4-Tbps switching capacity with up to 2 Bpps of forwarding performance from “3.2 Tbps/1 Bpps” a. 32 port 100G, b. 32 port 40G, c. 48 port 25G. Added Catalyst 9500 mid density platform a. 24 port 25G, b. 16 port 1/10G. Added new optical interfaces - QSFP28, SFP28. Added new power supply options - 650W, 1600W. Added RESCONF support. Stackwise Virtual extended to all Catalyst 9500 platforms.	March 31, 2018
Updated <u>Audio Video Bridging</u>	AVB support noted for certain platforms. Corrected references to Catalyst 9000 switches, rather than Catalyst 9000 Series switches. Corrected references to Cisco IOS XE, rather than IOS-XE.	December 15, 2017

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3.5 HARD DRIVE DATA SHEET

Smart. Safe. Secure. Seagate Surveillance-Specialized Storage

SkyHawk™ leverages Seagate's extensive experience in designing drives purpose-built for surveillance applications.



Best-Fit Applications

- Network video recorders (NVR)
- Embedded surveillance DVRs (SDVR)
- Hybrid surveillance DVRs
- Surveillance DVRs



SKYHAWK

HEALTH

Key Advantages

ImagePerfect™ firmware is designed to ensure seamless video footage capture in 24x7 surveillance workloads that record video from 64 HD cameras.

SkyHawk Health Management actively helps protect your surveillance storage by focusing on prevention, intervention and recovery options.²

NVR-ready design allows drives to maintain performance in multi-bay systems, giving customers the flexibility to scale their systems when more storage is needed.

ATA streaming support enables recordings from up to 64 HD cameras for smooth, uninterrupted footage.

Up to 10TB or over 2000 hours of HD video storage support an increased number of HD cameras and allows longer data retention periods.

1M hours MTBF, 3-year limited warranty³ represents an improved total cost of ownership (TCO) with reduced maintenance costs.

Lower power consumption means a reduction in heat emissions, which improves reliability in surveillance solutions. Tarnish-resistant components help protect drive from environmental elements, increasing field reliability.

1 SkyHawk surveillance drives are designed for always-on, low transaction workloads (20% duty cycle) of 180TB/year. For higher transaction workloads, see Seagate's enterprise-class drive offerings.

2 Contact your Seagate sales representative for further information.

3 SkyHawk surveillance drives are designed to operate under ambient operating temperatures of 0°C to 60°C and normal environments. Usage of drives in higher temperatures or other extreme environmental conditions will reduce useful life.



Specifications	10TB	8TB	6TB	4TB	3TB
Standard Model Numbers	ST10000VX0004	ST8000VX0022	ST6000VX0003, ST6000VX0023	ST4000VX007	ST3000VX010
SkyHawk™ Health Management Included ¹	Yes	Yes	Yes	Yes	—
Interface	SATA 6Gb/s	SATA 6Gb/s	SATA 6Gb/s	SATA 6Gb/s	SATA 6Gb/s
Features and Performance					
Drive Bays Supported	8+	8+	8+	8+	1 to 8
Cameras Supported	Up to 64	Up to 64	Up to 64	Up to 64	Up to 64
Max. Sustained Transfer Rate OD (MB/s)	210MB/s	210MB/s	195MB/s	190MB/s	180MB/s
Cache (MB)	256	256	256	64	64
Reliability/Data Integrity					
Tarnish Resistant	Yes	Yes	Yes	Yes	No
Load/Unload Cycles	300,000	300,000	300,000	300,000	300,000
Nonrecoverable Read Errors per Bits Read, Max	1 per 10E15	1 per 10E15	1 per 10E15	1 per 10E14	1 per 10E14
Power-On Hours per Year (24x7)	8760	8760	8760	8760	8760
Workload Rate Limit (WRL) ²	180	180	180	180	180
MTBF	1,000,000hr	1,000,000hr	1,000,000hr	1,000,000hr	1,000,000hr
Warranty, Limited (years) ³	3	3	3	3	3
Power Management					
Startup Current, Typical (12V, A)	1.8	2	2	1.8	1.8
Average Operating Power (W)	6.8W	9W	9W	5.5W	5.6W
Idle Average (W)	4W	8W	7W	3W	4W
Standby Mode/Sleep Mode, Typical (W)	0.8/0.8	0.6/0.6	0.6/0.6	0.25/0.25	0.5/0.5
Voltage Tolerance (5V)	±5%	±5%	±5%	±5%	±5%
Voltage Tolerance (12V)	±10%	±10%	±10%	±10%	±10%
Environmental/Temperature					
Operating (ambient, min °C)	5	5	5	0	0
Operating (drive case, max °C) ⁴	70	70	70	70	70
Nonoperating (ambient, min °C)	-40	-40	-40	-40	-40
Physical					
Height (mm/in, max)	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in
Width (mm/in, max)	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in
Depth (mm/in, max)	146.99mm/5.787in	146.99mm/5.787in	146.99mm/5.787in	146.99mm/5.787in	146.99mm/5.787in
Weight (g/lb)	650g/1.433lb	780g/1.72lb	705g/1.55lb	635g/1.40lb	610g/1.35lb
Carton Unit Quantity	20	20	20	20	20
Cartons per Pallet/Cartons per Layer	40/8	40/8	40/8	40/8	40/8

1 10TB model available in early CY2018.

2 SkyHawk surveillance drives are designed for always-on workloads of 180TB/year. For higher transaction workloads, see Seagate's enterprise-class drive offerings.

3 Extended warranty options available. Consult your distributor for details.

4 Seagate does not recommend operating at sustained extreme temperatures. Operating at higher temperatures will reduce useful life of the products.



Specifications	2TB	1TB
Standard Model Numbers	ST2000VX008	ST1000VX005
SkyHawk™ Health Management Included ¹	—	—
Interface	SATA 6Gb/s	SATA 6Gb/s
Features and Performance		
Drive Bays Supported	1 to 8	1 to 8
Cameras Supported	Up to 64	Up to 64
Max. Sustained Transfer Rate OD (MB/s)	180MB/s	180MB/s
Cache (MB)	64	64
Reliability/Data Integrity		
Tarnish Resistant	No	No
Load/Unload Cycles	300,000	—
Nonrecoverable Read Errors per Bits Read, Max	1 per 10E14	1 per 10E14
Power-On Hours per Year (24x7)	8760	8760
Workload Rate Limit (WRL) ²	180	180
MTBF	1,000,000hr	1,000,000hr
Warranty, Limited (years) ³	3	3
Power Management		
Startup Current, Typical (12V, A)	1.8	1.8
Average Operating Power (W)	5.6W	5.6W
Idle Average (W)	4W	4W
Standby Mode/Sleep Mode, Typical (W)	0.5/0.5	0.5/0.5
Voltage Tolerance (5V)	±5%	±5%
Voltage Tolerance (12V)	±10%	±10%
Environmental/Temperature		
Operating (ambient, min °C)	0	0
Operating (drive case, max °C) ⁴	70	70
Nonoperating (ambient, min °C)	-40	-40
Physical		
Height (mm/in, max)	26.11mm/1.028in	20.20mm/0.795in
Width (mm/in, max)	101.85mm/4.01in	101.85mm/4.01in
Depth (mm/in, max)	146.99mm/5.787in	146.99mm/5.787in
Weight (g/lb)	610g/1.35lb	415g/0.915lb
Carton Unit Quantity	20	25
Cartons per Pallet/Cartons per Layer	40/8	40/8

1 10TB model available in early CY2018.

2 SkyHawk surveillance drives are designed for always-on workloads of 180TB/year. For higher transaction workloads, see Seagate's enterprise-class drive offerings.

3 Extended warranty options available. Consult your distributor for details.

4 Seagate does not recommend operating at sustained extreme temperatures. Operating at higher temperatures will reduce useful life of the products.

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Opti-Core® Fiber Optic Patch Cords and Pigtails

PANDUIT
SPECIFICATION SHEET

technical information

Fiber optic patch cords and pigtails provide interconnect and cross-connect of applications over installations in entrance facilities, telecommunications rooms, data centers and at the desk. Patch cords support network applications in main, horizontal and equipment distribution areas and are available in riser (OFNR), and low smoke zero halogen (LSZH) rated jacket materials to comply with local cabling ordinances. Pre-terminated fiber optic pigtails support fusion splice field termination applications. Fiber optic patch cords and pigtails are available in OM4, OM3, OM2, OM1, or OS1/OS2 fiber types to meet the demands of Gigabit Ethernet, 10 Gigabit Ethernet and high speed Fibre Channel.



application

Provide interconnect and cross-connect of applications in entrance facilities, telecommunications rooms, data centers, at the desk and network applications to interconnect pre-terminated cassettes in main distribution, horizontal distribution, and equipment distribution areas.

construction

Fiber count:	Simplex (1-fiber) jacketed Duplex (2-fiber) jacketed zipcord Tight buffered
Cable jacket ratings:	Riser (OFNR) Low Smoke Zero Halogen (LSZH) per: IEC 60332-1-2, IEC 60332-3-24, IEC 60754-1, IEC 60754-2, IEC 61034-2
Fiber types:	Singlemode: OS1/OS2 9/125µm Multimode: OM1 62.5/125µm OM2 50/125µm OM3 50/125µm OM4 50/125µm
Connector types end 'A':	Simplex or duplex LC, SC
Jacket color:	OS1/OS2: Yellow OM1: Orange OM2: Orange OM3: Aqua OM4: Aqua Buffered fiber (pigtail): Blue
Connector types end 'B':	Simplex or duplex LC, SC

Note: For hybrid cords, the SC connector is always on End B.

optical properties

Connector insertion loss:	0.25dB max. (Multimode - Standard IL) 0.15db max. (Multimode - Optimized IL) 0.10db max. (Multimode - Ultra IL) 0.35dB max. (LC singlemode) 1.50dB max. (SC singlemode)
Connector return loss:	20dB min. (OM1 and OM2) 26dB min. (OM3 and OM4) 55dB min. (OS1/OS2)

physical properties

Cable outside diameter (OD):	1.6mm duplex 3mm simplex 900 micron
Connector cable retention:	50N @ 0°C 19.4N @ 90°C
Connector durability:	500 cycles
Bend radius, minimum:	1.6mm: 16mm 3mm: 29mm

environmental properties

Storage and shipping temperature:	-40°C to 70°C
Operating and installation temperature:	Riser: -20°C to 70°C Plenum: 0°C to 60°C

standards

Meets or exceeds ISO/IEC 11801, TIA/EIA-568-C.3, TIA-604-3 (FOCIS-3), TIA-604-10 (FOCIS-10)	Restriction of Hazardous Substances (RoHS) Compliance:
	All patch cord components meet the requirements of Directive 2002/95/EC.

Opti-Core® Fiber Optic Patch Cords and Pigtails

part number

Example: FZ2ERLNSNSNM005 = Fiber OM4, 2-fiber, 1.6mm cable, riser rated, LC duplex to SC duplex, standard IL, 5 meters

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Example	F	Z	2	E	R	L	N	S	N	S	N	M	0	0	5

1 – Fiber Product

F = Fiber

2 – Fiber Type

6 = OM1 62.5/125µm

5 = OM2 50/125µm

X = OM3 50/125µm

Z = OM4 50/125µm

9 = OS1/OS2 9/125µm

3 – Fiber Count

1 = 1 fiber

2 = 2 fibers

4 – Cable Type

B = 900µm buffer

E = 1.6mm

3 = 3.0mm (For SC to SC cords)

5 – Jacket Type

L = LSZH (Low Smoke Zero Halogen)

N = (No Jacket) 900µm Buffered Fiber

R = OFNR (Riser)

6 – Connector Type - End A

1 = LC

3 = SC

L = LC duplex

S = SC duplex

7 – Connector Variant

N = No variant

8 – Connector Type - End B

1 = LC

3 = SC

L = LC duplex

N = None; pigtail

S = SC duplex

9 – Connector Variant

N = No variant

10 – Performance/Construction

S = Standard IL (A-B)

O = Optimized (A-B)

N = Ultra (A-B)

11 – Other

N = No variant

12 – Unit of Length

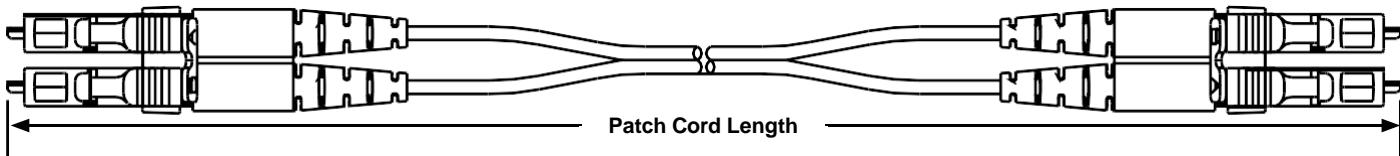
M = Meters

13, 14, 15 – Length

001-050

Note: For hybrid cords, the SC connector is always on End B.

fiber optic patch cord detail



Other options are available as follows; contact Panduit for part number:

Fiber Type: OM4+(50/125µm Signature Core™)

Cable Type: 3.0mm

Jacket Type: OFNG (General Rated)

Connector Type: ST, FC, SC/APC, E2000, MTRJ Female, FJ Jack Keyed, FJ Plug Keyed, LC Keyed, FJ Jack, FJ Plug, MTRJ Male

Performance/Construction: Optimized IL – Straight Thru (A-B), Optimized IL – Flipped (A-A), Standard IL – Flipped (A-A)

Other: Non-standard colored cable

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

PANDUIT CANADA
Markham, Ontario
cs-cdn@panduit.com
Phone: 800.777.3300

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cs-aus@panduit.com
Phone: 61.3.9794.9020

For a copy of Panduit product warranties, log on to www.panduit.com/warranty

For more information

Visit us at www.panduit.com

Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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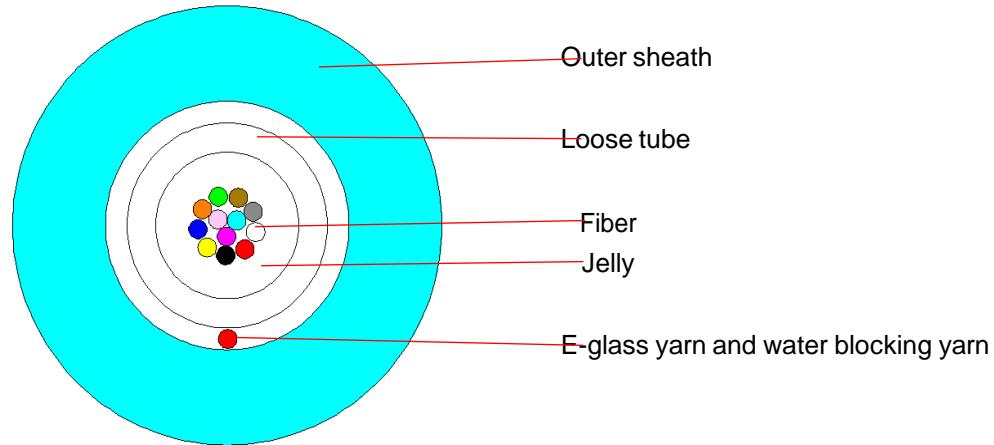
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FBSP54-WW-ENG

4/2016

Indoor Outdoor cable 6Core-12Core OM4, OD6.0

1. Cable structure:



2. Cable construction details

Number of fiber	6-12core	
Fiber type	OM4	
Strength member	Material	E-glass yarn
Loose tube	Material	PBT
	Color	Natural
	Tube filling compound	Jelly
	Thickness	$0.4\pm0.05\text{mm}$
	Diameter	$2.8\pm0.1\text{mm}$
Ripcord	Color	Red
Outer sheath	Material	LSZH
	Color	Black
	Thickness	$1.25\pm0.1\text{mm}$
	Diameter	$6.0\pm0.2\text{mm}$

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DK 7979.202

PDU metered

Estado: 22/09/2023 (Fuente: [ittal.com/es-es](https://www.ittal.com/es-es))

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



DK 7979.202 - PDU metered

Distribución de corriente para racks TI de gama alta: PDU inteligente con medición de la energía por fase, es decir, de las necesidades de potencia del rack TI completo.



Características

Referencia	DK 7979.202
Ejecución	Ejecución 19"
Descripción producto	Distribución de corriente de alta calidad con diseño compacto para racks TI para redes y servidores. Con medición de la energía en la alimentación o por fase.
Ventajas	<p>En montaje vertical puede realizarse la instalación en el espacio Zero-U en el VX IT o el rack TS IT sin herramientas</p> <p>Marcaje en color de fases y circuitos de fusibles (L1=fucsia, L2=negro, L3=blanco)</p> <p>Juego de montaje sin herramientas para VX IT</p> <p>PDU autoalimentada, no se precisa fuente de alimentación externa</p> <p>Exactitud de medición $\pm 1\%$ (kWh) según EN 62 053-21</p> <p>Reloj real integrado con batería de reserva (máx. 10 años, batería intercambiable)</p> <p>Zumbador electromagnético integrado para alertas acústicas</p> <p>Valores límite ajustables (alerta/alarma) para tensión, corriente y potencia</p> <p>Contador de horas de servicio en total y cíclicas, reajustable</p> <p>Diseño con eficiencia energética, bajo autoconsumo</p>

Características

Datos técnicos	Display/Unidad de control en cajas PDU con posibilidad de giro en 180° e intercambiable Fuente de alimentación completamente redundante integrada, alimentación desde todas las fases Fuente de alimentación PDU redundante, tolerante a fallos en todas las fases Tensión V, intensidad A, frecuencia Hz Potencia activa, trabajo activo, potencia aparente, trabajo aparente Factor de potencia (cosPhi) y ángulo de fase Medición corriente conductor neutro/Determinación de desequilibrios de carga Control de fusibles en PDU's con fusibles integrados Monitor TFT brillante de 128x128 píxeles (RGB) con retroiluminación y modo de ahorro de energía para la indicación de los datos de potencia y de la configuración básica PDU Sensores de movimiento para rotación del display y visualización correcta de la PDU en la página web Led para la indicación de la tensión
Material	Perfil de aluminio, anodizado negro Puntos de conexión: plástico
Unidad de envase	Incl. material de fijación Sin cable de conexión, debe ser proporcionado por el cliente
Opciones	Posibilidad de conectar sensores CMC III CAN-Bus para el control del entorno, máx. 16 sensores
Measurement functions, description	Medición por fase o alimentación Potente CPU (ARM Cortex A8) Entrada digital (contacto libre de potencial) Salida de alarma/salida de relé adicional (contacto conmutado)
Dimensiones	Altura: 44 mm Profundidad: 144 mm Longitud: 450 mm
Nº bases de enchufe y tipo	6 x C13
Tensión de servicio	230 V (c.a.)
Intensidad (máx.)	16 A
Potencia	3,7 kW

Características

Alimentaciones	Cantidad: 1 Fases por alimentación: 1~
Tipo de conexión (eléctrica)	IEC C20
Interfaces	Puerto USB 2.0 (USB-A) para configuración masiva, actualización de firmware y registro de datos Interfaz CAN-Bus (RJ45) para máx. 16 sensores ambientales Interfaz serie RS232 (RJ12) para unidad LTE, Scripting, CLI Uso de certificados propios/TLS 1.2 Envío correo electrónico en caso de alarma (SMTP) Administrador de usuarios incl. gestión de permisos Conexión LDAP(S)/Radius/Active Directory Conexión servidor syslog (máx. 2 servidores) Monitorización completamente redundante a través de la 2ª red Interfaz Ethernet completamente redundante 10/100/1000 Mbit/s
Directivas	Directiva EMC 2014/30/EU Directiva para baja tensión 2014/35/EG
Normas	EN 62368-1 EN 61000-3 EN 61000-4 EN 61000-6 EN 62053-21
Protocolos	Servidor web (HTTP, HTTPS, SSL) SSH, Telnet, NTP TCP/IP v4 & v6, DHCP, DNS SNMP v1, v2c & v3, Modbus/TCP, OPC-UA MIB para la integración en software DCIM de terceros FTP/SFTP (Update/Filetransfer)
Campo de temperatura de servicio	5 °C...50 °C
Humedad del aire (sin condensación)	10...95 %
Campo de temperatura de almacenaje	-20 °C...70 °C
Adecuado para	Tipo de armario: Bastidor armario VX IT: ≥ 800 mm Tipo de armario: Guías perfil de 19" VX IT: ≥ 800 mm
Unidad de embalaje	1 pza(s).
Peso/UE	2,54 kg

Características

Código arancelario 85366990

EAN 4028177947603

ETIM 7.0 EC000330

ECLASS 8.0 27142604

Aprobaciones

Certificados EAC

Explicaciones Declaración de conformidad
Declaración de conformidad UK

Gabinete SmartRack de 24U de Media Altura y Profundidad Media

NÚMERO DE MODELO: **SR24UB**



Aloja, organiza y asegura equipo de rack de profundidad estándar de 19" en micro centros de datos de borde y otras aplicaciones de TI de misión crítica.

General

SmartRack® 24U Mid-Depth Rack Enclosure Cabinet is packed with features designed to simplify rack equipment installations and rack equipment maintenance: top and bottom cable routing ports, perforated front and rear doors and solid side panels promote efficient airflow, adjustable vertical mounting rails and more. And as part of the SmartRack family, the SR24UB is compatible with an extensive range of rack-mount accessories, enabling you to customize your solution to meet any requirement. The SR24UB ships fully assembled for quick installation.

The SR24UB is compatible with all standard 19-inch rack equipment and features front and rear pairs of vertical rails with square mounting holes. The rails are adjustable in quarter-inch increments to accommodate equipment depths from three to 32.5 inches, ideal for standard server installation.

Adjustment is quick and convenient: simply unscrew the rails, slide them to the desired depth and restore the screws. The rails feature square mounting holes and are capable of supporting up to 1,000 pounds (453.6 kilograms) of equipment with included installation hardware. Each rack space within the enclosure is numbered for easy reference.

With a locking, reversible front/rear doors and locking, removable side panels, the SR24UB provides safe, secure installation for all equipment. This prevents unauthorized access to installed equipment while making it easy for authorized personnel to perform inspections, maintenance and equipment replacement. The enclosure meets all requirements toward PCI DSS compliance.

The top and bottom panels of the SR24UB are furnished with vents designed to help remove warm air from the enclosure and draw in cool air by convection. They also support installation of standard user-supplied case fans (SRFANWM). The top and bottom panels are also provided with ports for cable routing.

To simplify deployment, the SR24UB comes with an accessory caster kit consisting of four casters and all required installation hardware. With the casters installed, the SR24UB can easily be maneuvered into the desired location, and then secured in place by adjusting the unit's levelers. Note: The casters are intended for minor position adjustments within the final installation area only and are not designed for moving the enclosure over long distances.

Características

El Gabinete de 24U de Profundidad Media para Servidor Acomoda Equipo para Rack de 19"

Este gabinete SmartRack® de 24U está diseñado para salas de servidores, gabinetes de TI, micro centros de datos, aplicaciones de edge computing y otros entornos con equipos de TI esenciales instalados en rack. Fabricado de acero para servicio pesado con un durable acabado de pintura negra en polvo, el SR42UB tiene una capacidad máxima para carga estacionaria y carga en movimiento de 454 kg [1,000 lbs.].

Destacado

- Rack de 24U construido de acero con recubrimiento de pintura en polvo que resiste entornos agresivos
- Capacidad máxima: 454 kg [1000 lb] de carga estacionaria y rodante
- Las puertas y los paneles laterales se cierran con cerradura para evitar daños, manipulación indebida o robo.
- Se embarca completamente ensamblado para la instalación inmediata del equipo
- Satisface todos los requerimientos de seguridad física exigidos por el Estándar de Seguridad de Datos para la Industria de Tarjetas de Pago (PCI DSS)

El Paquete Incluye

- Rack de 24U para Servidor SR24UB
- (50) Tornillos M6
- (50) Tuercas de fijación M6
- (50) Arandelas M6
- (4) Ruedas
- (4) Niveladores
- (2) Llaves
- Manual del Propietario

Mantiene Seguro el Equipo Importante

Las puertas delantera y trasera reversibles y los paneles laterales removibles se cierran de forma segura para ayudar a evitar daños, manipulación indebida o robos. Las puertas y paneles laterales están diseñados para rápida liberación, lo que facilita el acceso al cableado y al equipo conectado con poco esfuerzo. Convenientes paneles de acceso superior e inferior permiten un fácil enrutamiento de los cables a través del gabinete. Las puertas y laterales ventilados, así como las rejillas de ventilación en la parte superior e inferior, permiten un generoso flujo de aire de adelante hacia atrás y de arriba hacia abajo para mantener su equipo fresco y funcionando al máximo.

Instalación Sencilla de Gabinete y Equipos

Este rack de servidor de 24U viene completamente ensamblado para una implementación rápida y fácil. Los rieles verticales delanteros y traseros con orificios de instalación cuadrados permiten instalar equipos de rack estándar de hasta 826 milímetros [32.5"] de profundidad. Los paneles superior e inferior permiten la instalación de ventiladores con gabinete estándar suministrados por el usuario (como SRFANWM, vendidos por separado). Cuatro ruedas de metal con accesorios de instalación le permiten maniobrar el SR24UB sobre una superficie nivelada y a través de una puerta estándar hasta su posición, donde se puede estabilizar ajustando los niveladores incluidos. **Nota:** Las ruedas están diseñadas para ajustes de posición mínimos dentro del área de instalación final y no están diseñadas para mover el gabinete a grandes distancias.

Cumple con los Estándares de la Industria de Tarjetas de Pago

El SR24UB cumple con todos los requerimientos de seguridad física exigidos por el PCI DSS [Payment Card Industry Data Security Standard]. Esto es esencial para las empresas que procesan, almacenan o transmiten información de tarjetas de crédito.

Especificaciones

GENERALIDADES	
Código UPC	037332185228
Compatibilidad del Dispositivo	Patch Panel; Network Switch; UPS; Server
Tipo de Rack	Half-Height Enclosure
FÍSICAS	
Color	Negro
Altura del Rack	24U
Profundidad de Rack	Profundidad media
Profundidad del Rack Predeterminada de Fábrica (pulgadas)	28.31
Profundidad del Rack Predeterminada de Fábrica (cm)	71.9
Profundidad del Rack Predeterminada de Fábrica (mm)	719
Profundidad Máxima del Dispositivo (cm)	82.55
Profundidad máxima del dispositivo (pulgadas)	32.5
Profundidad Máxima del Dispositivo (mm)	826

Profundidad Mínima del Dispositivo (cm)	7.62
Profundidad mínima del dispositivo (pulgadas)	3
Profundidad Mínima del Dispositivo (mm)	76
Medida del Orificio para Acceso del Cable (pulgadas)	9.812 x 2.35 (l x An)
Dimensiones de Envió (Al x An x Pr / pulgadas)	52.00 x 26.00 x 35.00
Dimensiones de Envió (Al x An x Pr / cm)	132.08 x 66.04 x 88.90
Peso de Envío (lb)	172.00
Peso de Envío (kg)	78.02
Dimensiones de la Unidad (Al x An x Pr / pulgadas)	46.060 x 24.200 x 34.060
Dimensiones de la Unidad (Al x An x Pr / cm)	115.82 x 60 x 85.09
Peso de la Unidad (lb)	123
Peso de la Unidad (kg)	55.79
Capacidad de Peso – En Movimiento (kg)	454
Capacidad de Peso – en Movimiento (lb)	1000
Capacidad de Peso - Estacionaria (kg)	454
Capacidad de Peso - Estacionaria (lb)	1000
Número de Rieles para Instalación Vertical	4

CARACTERISTICAS/ESPECIFICACIONES

Detalles de Conexión a Tierra	Marcos de puerta Delantera y Trasera
Administración del Cableado Incorporada	Sí
Ancho Extra	No
Con Bloqueo	No
Ruedas Preinstaladas	No
Outdoor Use	No

ESTÁNDARES Y COMPATIBILIDAD

Product Compliance	RoHS; EIA/ECA-310-E; UKCA
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GARANTÍA y SOPORTE

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by **EATON**

1000 Eaton Boulevard

Cleveland, OH 44122

United States

Periodo de Garantía del Producto (A
Nivel Mundial)

Garantía limitada por 5 años

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Gabinete Pequeño SmartRack 12U Bajo Perfil Profundidad de Servidor Instalación en Pared, Ventana de Acrílico Transparente, Respaldo Abisagrado

NÚMERO DE MODELO: **SRW12US33G**



El gabinete para instalación en pared asegura y organiza 12U de racks de 19" en gabinetes de cableado de redes, salones de clases y otros lugares con espacio limitado. Capacidad con profundidad adicional para alojar la mayoría de servidores de 1U, sistemas UPS, módulos de baterías e interruptores

General

El Gabinete SmartRack SRW12US33G de 12U y Profundidad de Servidor para Instalar en la Pared, es ideal para el almacenamiento de equipos para rack estándar de 19" con hasta 82.5 cm [32.5"] de profundidad, en áreas con espacio limitado, donde los equipos deben estar seguros, organizados y fuera del paso. Fabricado en acero para servicio pesado con un duradero acabado en color negro de pintura en polvo, el gabinete admite una carga máxima de 113.4 kg [250 lb].

La puerta frontal presenta una ventana de acrílico transparente resistente a impactos que le permite monitorear las lecturas del equipo sin abrir el gabinete. No solo la ventana ayuda a evitar que se manipulen indebidamente los equipos y reducen el ruido, sino que también agregan un estilo visual a la instalación de TI.

El gabinete se abre desde la pared sobre una bisagra fuerte, lo que permite un acceso fácil a los equipos y al cableado durante la instalación y mantenimiento. Para garantizar que su valioso equipo se mantenga seguro, las puertas y los paneles laterales tienen llave. Los paneles de arriba, abajo y laterales removibles tienen ventilación, lo que permite que fluya aire libremente por el rack para mantener al equipo refrigerado. Las puertas reversibles pueden abrirse hacia la izquierda o la derecha tras girar el gabinete 180° antes de instalarlo. Convenientes puertos ubicados en la parte superior e inferior permiten un fácil enrutamiento de los cables a través del gabinete.

El SRW12US33G viene completamente ensamblado y listo para instalar en la pared. Los orificios de instalación cuadrados y roscados 12-24 y los espacios de rack numerados hacen que la instalación del equipo sea sencilla. Los rieles de instalación verticales se ajustan a incrementos de 7/8" para alojar equipos de hasta 82.5 cm [32.5"], como servidores de 1U, sistemas UPS, módulos de baterías y switches.

Características

Ahorra Valioso Espacio de Trabajo Perfecto para gabinetes de cableado de redes, tiendas minoristas, salones de clases y otras áreas con espacio de piso limitado donde el equipo debe estar seguro y fuera del paso. Capacidad de profundidad extra para alojar la mayoría de los servidores, sistemas UPS, módulos de baterías y switches de 1U Capacidad de carga máxima de 113.4 kg [250 lb]

Gabinete abisagrado que ofrece acceso conveniente Se abre desde la pared sobre una bisagra fuerte,

Destacado

- Capacidad de carga máxima de 113.40 kg [250 libras].
- Se abre desde un soporte de pared sobre una bisagra para un fácil acceso
- Gabinete de acero con cerradura y ventilado en los laterales y la parte superior e inferior
- Asegura 12U de equipos de rack de 48.25 cm [19 pulgadas] en hasta 82.5 cm [32.5 pulgadas] de profundidad
- Se instala en la pared o rueda por el piso con el kit de ruedas opcional SRCASTER de Tripp Lite

El Paquete Incluye

- Gabinete SmartRack SRW12US33G de 12U para instalar en pared y profundidad extendida
- (36) Tornillos M6
- (36) Tuercas de fijación M6
- (36) Arandelas M6
- (36) Tornillos 12-24
- (2) Llaves
- Manual del Propietario

lo que permite un acceso fácil a los equipos y al cableado durante la instalación y mantenimientoHaga girar el gabinete 180° antes de instalarlo para abrir la puerta frontal reversible a la izquierda o a la derecha

Ventana Frontal de Acrílico Transparente Resistente a los ImpactosLe permite monitorear su equipo sin abrir el gabinetePreviene la manipulación indebida de los equiposReduce el ruido acústico.Brinda un atractivo visual adicional.

Mantiene Seguros los Equipos ImportantesLos paneles laterales y la puerta frontal con cerradura seguraLos paneles tienen ventilación, lo que permite que fluya aire libremente para mantener el equipo refrigerado.Los puertos con tapas removibles permiten el direccionamiento de los cables por la parte superior e inferior del gabinete

Fácil Instalación del Gabinete y el EquipoLos rieles de instalación verticales se ajustan a incrementos de 2.22 cm [7/8 de pulgada] para alojar equipos de hasta 82.55 cm [20.5 pulgadas] de profundidadSe envía totalmente ensamblado para una rápida instalaciónSe instala en la pared o rueda por el piso con el juego de ruedas SRCASTER opcional de Tripp LiteLos orificios para instalación en la pared están espaciados a 40.6 cm [16"] unos de otros para permitir la colocación en travesaños de pared estándar.Los rieles admiten la instalación con perforaciones cuadradas o roscadas 12-24Los espacios de rack están numerados para una fácil referencia

Cumple con los Estándares de la Industria de Tarjetas de Pago.Satisface todos los requerimientos de seguridad física exigidos por el PCI DSS [Payment Card Industry Data Security Standard]

Especificaciones

GENERALIDADES	
Código UPC	037332187352
Compatibilidad del Dispositivo	Patch Panel; Network Switch; UPS; Server
Tipo de Rack	Small Enclosure
FÍSICAS	
Color	Negro
Altura del Rack	12U
Profundidad de Rack	Profundidad media
Profundidad del Rack Predeterminada de Fábrica (pulgadas)	25.99
Profundidad del Rack Predeterminada de Fábrica (cm)	66.0
Profundidad del Rack Predeterminada de Fábrica (mm)	660
Profundidad Máxima del Dispositivo (cm)	82.55
Profundidad máxima del dispositivo (pulgadas)	32.5
Profundidad Máxima del Dispositivo (mm)	826
Profundidad Mínima del Dispositivo (cm)	7.62

Profundidad mínima del dispositivo (pulgadas)	3
Profundidad Mínima del Dispositivo (mm)	76
Medida del Orificio para Acceso del Cable (pulgadas)	9.812 x 2.35 (Pr x An)
Dimensiones de Envío (Al x An x Pr / pulgadas)	30.20 x 26.10 x 36.06
Dimensiones de Envío (Al x An x Pr / cm)	76.71 x 66.29 x 91.59
Peso de Envío (lb)	118.00
Peso de Envío (kg)	53.52
Dimensiones de la Unidad (Al x An x Pr / pulgadas)	25.100 x 23.600 x 33.500
Dimensiones de la Unidad (Al x An x Pr / cm)	63.5 x 60 x 85.09
Peso de la Unidad (lb)	94.5
Peso de la Unidad (kg)	42.86
Capacidad de Peso - Estacionaria (kg)	113
Capacidad de Peso - Estacionaria (lb)	250
Número de Rieles para Instalación Vertical	4
CARACTERISTICAS/ESPECIFICACIONES	
Detalles de Conexión a Tierra	Marcos de puerta Delantera y Trasera
Administración del Cableado Incorporada	No
Ancho Extra	No
Ruedas Preinstaladas	No
ESTÁNDARES Y COMPATIBILIDAD	
Product Compliance	RoHS; EIA/ECA-310-E; UKCA
GARANTÍA y SOPORTE	
Periodo de Garantía del Producto (A Nivel Mundial)	Garantía limitada por 5 años

TRIPP-LITE

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1000 Eaton Boulevard

Cleveland, OH 44122

United States

TRIPP-LITE

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► Network/server rack VX IT with vented doors, with 482.6 mm (19") mounting angles, standard – VX **5311.116**

Date : Nov 12, 2020

ENCLOSURES

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Network/server rack VX IT with vented doors, with 482.6 mm (19") mounting angles, standard – VX 5311.116

created: 12.11.2020 on www.ittal.com/com-en



Product description

Material:	Sheet steel Aluminium
Surface finish:	Enclosure frame: Dipcoat-primed Interior installation: Spray-finished Rear door and roof: Dipcoat-primed, powder-coated Front door: Aluminium, anodised/spray-finished
Colour:	Enclosure frame, rear door and roof: RAL 7035 Front door: Vertical sections, silver coloured and horizontal sections, RAL 9005 Interior installation, vent grille at the front: RAL 9005 Handle and hinges: RAL 9005
Supply includes:	VX enclosure frame with doors and roof plate Aluminium/sheet steel door at the front, vented (vented surface area approx. 85% perforated), 180° hinges Sheet steel rear door, vented (vented surface area approx. 85% perforated) Lock front and rear: Comfort handle for profile half-cylinders and security lock 3524 E Spacers, height 50 mm, to raise the cover plate above the fan cut-out in the roof plate, for passive cooling (supplied loose) 12 x 482.6 mm (19") fastener, 1 U, conductive (supplied loose) 25 multi-tooth screws, conductive (supplied loose) IPPC pallet Sheet steel rear door, vented, vertically divided, 180° hinges Roof plate, multi-piece, with side cable entry in the depth, double-sided, prepared for fan mounting plate
Note:	Depending on how and where it is sited, the door opening angle may vary for selected applications
Basic material:	Sheet steel

Product features

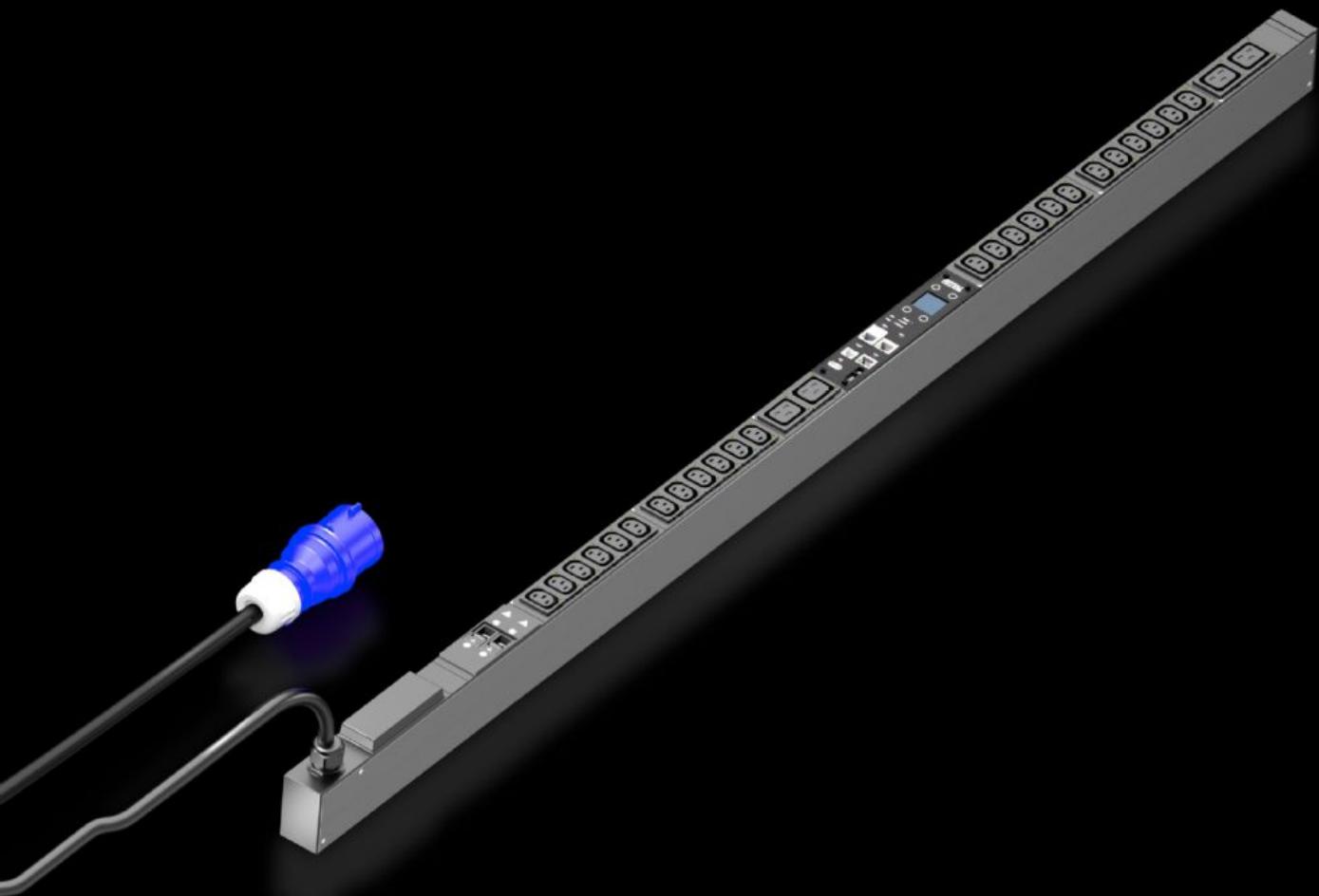
Dimensions:	Width: 800 mm Height: 2000 mm Depth: 1200 mm
Installation height for components:	42 U
Distance between levels as delivered:	720 mm
482.6 mm (19") version:	front and rear
482.6 mm (19") attachment:	screw-fastened onto depth stays, top and bottom, and to the support rail on the frame structure
Free mounting space to the 482.6 mm (19") level, front/rear:	150 mm / 330 mm
Load capacity:	15000 N Static (max.) per enclosure to UL 2416: 12000 N
Packs of:	1 pc(s).
Weight/pack:	101 kg
EAN:	4028177945210
Customs tariff number:	94032080
ETIM 7.0:	EC011217
ETIM 6.0:	EC002499
eCl@ss 8.0/8.1:	27180207
eCl@ss 6.0/6.1:	27180207
Product description:	VX IT, 19" mounting angles, standard, front and rear, vented, WHD: 800 x 2000 x 1200 mm, 42 U

Approvals

Approvals:	UL + C-UL
Declarations:	Declaration of conformity

Rittal – The System.

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DK 7979.216

PDU metered

Estado: 21/09/2023 (Fuente: [ittal.com/es-es](https://www.ittal.com/es-es))



DK 7979.216 - PDU metered

Distribución de corriente para racks TI de gama alta: PDU inteligente con medición de la energía por fase, es decir, de las necesidades de potencia del rack TI completo.



Características

Referencia	DK 7979.216
Descripción producto	Distribución de corriente de alta calidad con diseño compacto para racks TI para redes y servidores. Con medición de la energía en la alimentación o por fase.
Ventajas	<p>En montaje vertical puede realizarse la instalación en el espacio Zero-U en el VX IT o el rack TS IT sin herramientas</p> <p>Marcaje en color de fases y circuitos de fusibles (L1=fucsia, L2=negro, L3=blanco)</p> <p>Juego de montaje sin herramientas para VX IT</p> <p>PDU autoalimentada, no se precisa fuente de alimentación externa</p> <p>Exactitud de medición $\pm 1\%$ (kWh) según EN 62 053-21</p> <p>Reloj real integrado con batería de reserva (máx. 10 años, batería intercambiable)</p> <p>Zumbador electromagnético integrado para alertas acústicas</p> <p>Valores límite ajustables (alerta/alarma) para tensión, corriente y potencia</p> <p>Contador de horas de servicio en total y cíclicas, reajustable</p> <p>Diseño con eficiencia energética, bajo autoconsumo</p>

Características

Datos técnicos	Display/Unidad de control en cajas PDU con posibilidad de giro en 180° e intercambiable Disyuntor magnetotérmico compacto (16 A - tipo Carling) Fuente de alimentación completamente redundante integrada, alimentación desde todas las fases Fuente de alimentación PDU redundante, tolerante a fallos en todas las fases Tensión V, intensidad A, frecuencia Hz Potencia activa, trabajo activo, potencia aparente, trabajo aparente Factor de potencia ($\cos\Phi$) y ángulo de fase Medición corriente conductor neutro/Determinación de desequilibrios de carga Control de fusibles en PDU's con fusibles integrados Monitor TFT brillante de 128x128 píxeles (RGB) con retroiluminación y modo de ahorro de energía para la indicación de los datos de potencia y de la configuración básica PDU Sensores de movimiento para rotación del display y visualización correcta de la PDU en la página web Led para la indicación de la tensión
Material	Perfil de aluminio, anodizado negro Puntos de conexión: plástico
Unidad de envase	Incl. material de fijación
Opciones	Protección contra sobretensión tipo 3 con descargadores intercambiables durante el funcionamiento, con control de estado, integrable en armario PDU Medición de la corriente diferencial (tipo B) por alimentación/fase/fusible Control de la protección contra sobretensión disponible opcionalmente Posibilidad de conectar sensores CMC III CAN-Bus para el control del entorno, máx. 8 sensores Otros colores de armario disponibles
Measurement functions, description	Medición por fase o alimentación Potente CPU (ARM Cortex A8) Entrada digital (contacto libre de potencial) Salida de alarma/salida de relé adicional (contacto comutado)
Dimensiones	Anchura: 44 mm Profundidad: 70 mm Longitud: 1.495 mm

Características

Nº bases de enchufe y tipo	24 x C13 / 4 x C19
Tensión de servicio	230 V (c.a.)
Intensidad (máx.)	32 A
Potencia	7,4 kW
Alimentaciones	Cantidad: 1 Fases por alimentación: 1~
Long. cable de conexión	3 m
Tipo de conexión (eléctrica)	CEE
Interfaces	Puerto USB 2.0 (USB-A) para configuración masiva, actualización de firmware y registro de datos Interfaz CAN-Bus (RJ45) para máx. 8 sensores ambientales Interfaz serie RS232 (RJ12) para unidad LTE, Scripting, CLI Uso de certificados propios/TLS 1.2 Envío correo electrónico en caso de alarma (SMTP) Administrador de usuarios incl. gestión de permisos Conexión LDAP(S)/Radius/Active Directory Conexión servidor syslog (máx. 2 servidores) Monitorización completamente redundante a través de la 2ª red Interfaz Ethernet completamente redundante 10/100/1000 Mbit/s
Number RJ45 ports for sensor units max	2
Directivas	Directiva EMC 2014/30/EU Directiva para baja tensión 2014/35/EG
Normas	EN 62368-1 EN 61000-3 EN 61000-4 EN 61000-6 EN 62053-21
Protocolos	Servidor web (HTTP, HTTPS, SSL) SSH, Telnet, NTP TCP/IP v4 & v6, DHCP, DNS SNMP v1, v2c & v3, Modbus/TCP, OPC-UA MIB para la integración en software DCIM de terceros FTP/SFTP (Update/Filetransfer)
Campo de temperatura de servicio	5 °C...50 °C

Características

Humedad del aire (sin condensación)	10...95 %
Campo de temperatura de almacenaje	-20 °C...70 °C
Adecuado para	Tipo de armario: Bastidor armario VX IT: \geq 1.800 mm Tipo de armario: Guías perfil de 19" VX IT: \geq 1.800 mm
Unidad de embalaje	1 pza(s).
Peso/UE	5,46 kg
Código arancelario	85366990
EAN	4028177947696
ETIM 7.0	EC000330
ECLASS 8.0	27142604

Aprobaciones

Certificados	EAC
Explicaciones	Declaración de conformidad Declaración de conformidad UK