

# PT-7528 系列

## IEC 61850-3 28 埠 Layer2 網管型機架式乙太網路交換器



### 特色與優點

- 符合 IEC 61850-3、IEEE 1613 ( 變電站 )
- 內建 MMS Server，採用 IEC 61850-90-4 交換器資料模型，適用於 Power SCADA
- Noise Guard™ 纜線速率零封包遺失技術
- 支援 Turbo Ring 和 Turbo Chain ( 對於 250 台交換器斷線復連時間小於 20 毫秒 )<sup>1</sup>、RSTP/STP 和 MSTP 網路備援
- 隔離式備援電源輸入，具有通用 24 VDC、48 VDC 或 110/220 VDC/VAC 電源供應範圍
- -40°C 至 85°C 操作溫度範圍

### 認證



### 簡介

PT-7528 系列專為變電站自動化應用所設計，可在極為嚴峻的環境下運作。PT-7528 系列支援 Moxa 雜訊防護技術，符合 IEC 61850-3 規範，其 EMC 耐受能力超過 IEEE 1613 Class2，在以線速傳輸時確保零封包損耗。PT-7528 系列還具備關鍵封包優先順序 ( GOOSE 和 SMV )、內建 MMS Server，以及專為變電站自動化設計的設定精靈。

PT-7528 系列採用 Gigabit 乙太網路、備援環網，以及 110/220 VDC/VAC 隔離式備援電源供應器，進一步提升通訊的可靠性，並節省線材/佈線成本。提供多種 PT-7528 機型，可支援多種連接埠設定，最多可提供 28 個銅線或 24 個光纖連接埠，以及最多 4 個 Gigabit 連接埠。這些功能結合在一起，可提供更大彈性，因此 PT-7528 系列適合多種工業應用。

### 附加特色與優點

- 以 IEC 61850-90-4 標準為基礎的交換器資料建模
- Fiber Check™ 對 MST/MSC/SSC/SFP 光纖連接埠提供狀態監視及診斷功能
- VLAN Unaware：支援由特定 IED 接收的優先順序標記訊框
- 支援 EtherNet/IP 和 Modbus TCP 工業級乙太網路通訊協定
- 可透過網頁瀏覽器、Telnet / 序列主控台、CLI、Windows 工具程式，以及 ABC-02 自動備份設定程式進行設定
- 支援 Turbo Ring 和 Turbo Chain ( 對於 250 台交換器斷線復連時間小於 20 毫秒 )<sup>1</sup>、RSTP/STP 和 MSTP 網路備援
- DHCP Option 82 以不同原則指派 IP 位址
- IGMP snooping 和 GMRP，用於篩選來自工業級乙太網路協定的廣播封包
- IEEE 802.3ad、LACP 提供最佳化頻寬使用率
- 頻寬管理可預防不穩定的網路狀態出現
- 多埠監控可用於線上除錯
- 發生狀況時可透過電子郵件或是繼電器輸出自動發出告警
- RMON 提供主動且有效率的網路監控
- 自動恢復連線設備的 IP 位址
- 線路切換快速恢復
- Noise Guard™ 為關鍵應用提供高階的 EMC 耐受能力，超過 IEEE 1613 class2

### 網路安全功能

- 具有多層安全性的使用者密碼可防止未經授權的設定
- 採用 SSH/HTTPS 進行密碼和資料加密
- 透過 802.1X 連接埠型網路存取控制來鎖定交換器連接埠，只有授權的用戶端才能存取連接埠
- RADIUS/TACACS+ 允許您從中控位置管理密碼
- 802.1Q VLAN 可讓您以邏輯方式分割在所選交換器連接埠之間傳輸的流量
- 安全交換器連接埠，僅讓特定裝置及 / 或 MAC 位址存取連接埠
- 停用一或多個連接埠以封鎖網路流量
- SNMPv3 提供加密驗證及存取安全性

1. Gigabit 乙太網路斷線復連時間小於 50 毫秒

## 規格

### Ethernet Interface

10/100BaseT(X) Ports (RJ45 connector)	PT-7528-4TX Series: 4 PT-7528-8TX Series: 8 PT-7528-12TX Series: 12 PT-7528-16TX Series: 16 PT-7528-24TX Series: 24																																																											
100/1000BaseSFP Ports	PT-7528-4GSFP Models: 4																																																											
100BaseFX Ports (multi-mode SC connector)	PT-7528-8MSC Series: 8 PT-7528-12MSC Series: 12 PT-7528-16MSC Series: 16 PT-7528-20MSC Series: 20																																																											
100BaseFX Ports (multi-mode ST connector)	PT-7528-8MST Series: 8 PT-7528-12MST Series: 12 PT-7528-16MST Series: 16 PT-7528-20MST Series: 20																																																											
100BaseFX Ports (single-mode SC connector)	PT-7528-8SSC Series: 8																																																											
Optical Fiber	<table border="1"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="4">100BaseFX</th> </tr> <tr> <th colspan="2">Multi-Mode</th> <th colspan="2">Single-Mode</th> </tr> <tr> <th rowspan="2">Fiber Cable Type</th> <th rowspan="2">O M1</th> <th>50/125 μm</th> <th colspan="2" rowspan="2">G.652</th> </tr> <tr> <th>800 MHz x km</th> </tr> </thead> <tbody> <tr> <td colspan="2">Typical Distance</td> <td>4 km</td> <td>5 km</td> <td>40 km</td> <td>80 km</td> </tr> <tr> <td rowspan="3">Wavelength</td> <td>Typical (nm)</td> <td colspan="2">1300</td> <td>1310</td> <td>1550</td> </tr> <tr> <td>TX Range (nm)</td> <td colspan="2">1260 to 1360</td> <td>1280 to 1340</td> <td>1530 to 1570</td> </tr> <tr> <td>RX Range (nm)</td> <td colspan="2">1100 to 1600</td> <td>1100 to 1600</td> <td>1100 to 1600</td> </tr> <tr> <td rowspan="4">Optical Power</td> <td>TX Range (dBm)</td> <td colspan="2">-14 to -20*</td> <td>0 to -5</td> <td>0 to -5</td> </tr> <tr> <td>RX Range (dBm)</td> <td colspan="2">-3 to -32</td> <td>-3 to -34</td> <td>-3 to -34</td> </tr> <tr> <td>Link Budget (dB)</td> <td colspan="2">12</td> <td>29</td> <td>29</td> </tr> <tr> <td>Dispersion Penalty (dB)</td> <td colspan="2">3</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>*This range only applies to the PT-7528 multi-mode SC and ST fiber modules.</p> <p>Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.</p> <p>Note: Compute the “typical distance” of a specific fiber transceiver as follows: Link budget (dB) &gt; dispersion penalty (dB) + total link loss (dB).</p>			100BaseFX				Multi-Mode		Single-Mode		Fiber Cable Type	O M1	50/125 μm	G.652		800 MHz x km	Typical Distance		4 km	5 km	40 km	80 km	Wavelength	Typical (nm)	1300		1310	1550	TX Range (nm)	1260 to 1360		1280 to 1340	1530 to 1570	RX Range (nm)	1100 to 1600		1100 to 1600	1100 to 1600	Optical Power	TX Range (dBm)	-14 to -20*		0 to -5	0 to -5	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34	Link Budget (dB)	12		29	29	Dispersion Penalty (dB)	3		1	1
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Compatible Modules	PT-7528-24TX Series: Slot 1: PM-7500-2GTXSP, PM-7500-4GTXSFP, PM-7500-2MSC/4MSC, PM-7500-2MST/4MST, PM-7500-2SSC/4SSC
Standards	IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1s for Multiple Spanning Tree Protocol IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.1X for authentication IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3ad for Port Trunk with LACP IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control IEEE 802.3z for 1000BaseSX/LX/LHX/ZX

### Ethernet Software Features

Filter	802.1Q GMRP GVRP IGMP v1/v2c Port-based VLAN VLAN unaware
Industrial Protocols	EtherNet/IP Modbus TCP
Management	Back Pressure Flow Control BOOTP DHCP Option 66/67/82 DHCP Server/Client Flow control HTTP IPv4/IPv6 LLDP Port Mirror RARP RMON SMTP SNMP Inform SNMPv1/v2c/v3 Syslog Telnet TFTP Fiber check
MIB	Bridge MIB Ethernet-like MIB MIB-II P-BRIDGE MIB Q-BRIDGE MIB RMON MIB Groups 1, 2, 3, 9 RSTP MIB
Power Substation	IEC 61850 QoS MMS Configuration Wizard
Redundancy Protocols	Link Aggregation MSTP RSTP STP Turbo Chain Turbo Ring v1/v2

Security	Broadcast storm protection HTTPS/SSL TACACS+ Port Lock RADIUS Rate Limit SSH
Time Management	NTP Server/Client SNTP

### Switch Properties

IGMP Groups	256
Jumbo Frame Size	9.6 KB
Max. No. of VLANs	256
VLAN ID Range	VID 1 to 4094
Priority Queues	4
Switching Capacity	12.8 Gbps
Forwarding Capacity	12.8 Gbps

### USB Interface

Storage Port	USB Type A
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### Serial Interface

Console Port	USB-serial console (Type B connector)
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### Input/Output Interface

Alarm Contact Channels	Resistive load: 3 A @ 30 VDC, 240 VAC
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### Power Parameters

Connection	10-pin terminal block
Input Voltage	PT-7528-HV-HV/WV-WV/WV-HV Series: Redundant power modules PT-7528-WV Series: 24/48 VDC (18 to 72 VDC) PT-7528-HV Series: 110/220 VAC/VDC (85 to 264 VAC, 88 to 300 VDC)
Input Current	For models with fewer than 8 fiber ports: PT-7528-WV Series: 0.741 A @ 24 VDC, 0.364 A @ 48 VDC PT-7528-HV Series: 0.147/0.077 A @ 110/220 VDC, 0.283/0.190 A @ 110/220 VAC  For models with 8 or more fiber ports: PT-7528-WV Series: 1.428 A @ 24 VDC, 0.735 A @ 48 VDC PT-7528-HV Series: 0.586/0.382 A @ 110/220 VAC, 0.313/0.167 A @ 110/220 VDC
Overload Current Protection	Supported
Reverse Polarity Protection	Supported

### Physical Characteristics

Housing	Aluminum
IP Rating	IP40
Dimensions (without ears)	440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight	4900 g (10.89 lb)
Installation	19-inch rack mounting

## Environmental Limits

Operating Temperature	-40 to 85°C (-40 to 185°F) Note: Cold start requires minimum of 100 VAC @ -40°C
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

## Standards and Certifications

EMI	EN 55032 Class A CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-11
Safety	UL 508
Power Substation	IEC 61850-3 IEEE 1613 Class 2 Note: Models with MCS and SSC fiber ports are compliant with IEEE 1613 Class 1
Railway	EN 50121-4
Traffic Control	NEMA TS2

## MTBF

Time	771,320 hrs
Standards	Telcordia SR332

## Warranty

Warranty Period	5 years
Details	See <a href="http://www.moxa.com/tw/warranty">www.moxa.com/tw/warranty</a>

## Package Contents

Device	1 x PT-7528 Series switch
Cable	1 x USB type A male to USB type B male
Installation Kit	4 x cap, plastic, for RJ45 port 4 x cap, plastic, for SFP slot 2 x rack-mounting ear
Documentation	1 x document and software CD 1 x quick installation guide 1 x product certificates of quality inspection, Simplified Chinese 1 x product notice, Simplified Chinese 1 x warranty card
Note	SFP modules and/or modules from the PM-7500 Module Series need to be purchased separately for use with this product.

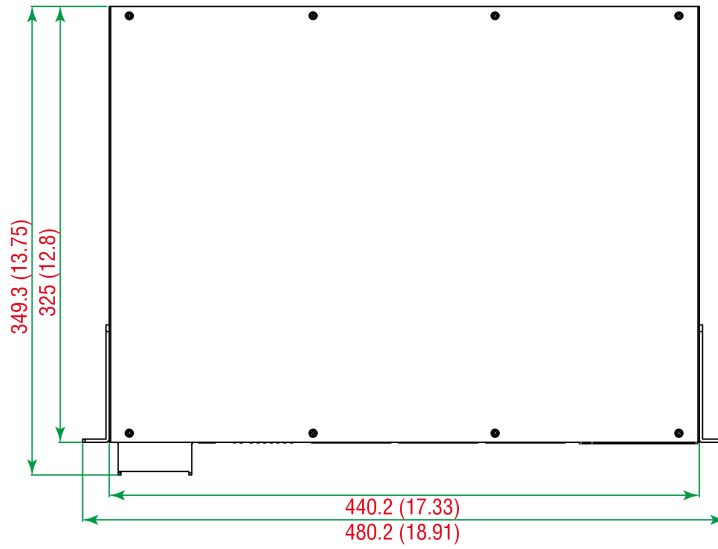
# 尺寸

單位：公釐 (英吋)

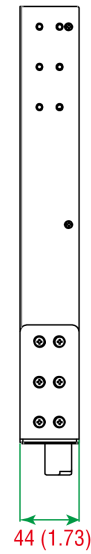
Rear View



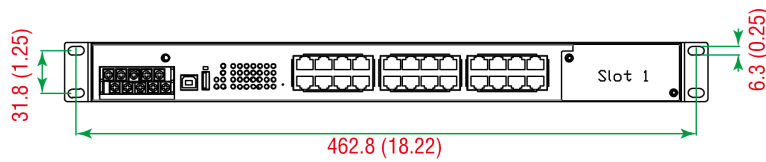
Top View



Side View



Front View



## 訂購資訊

Model Name	1000Base SFP Slots	10/100BaseT(X)	100BaseFX	Input Voltage 1	Input Voltage 2	Redundant Power Module	Operating Temp.
PT-7528-24TX-WV-HV	-	24	-	24/48 VDC	110/220 VDC/ VAC	✓	-45 to 85°C
PT-7528-24TX-WV	-	24	-	24/48 VDC	-	-	-45 to 85°C
PT-7528-24TX-HV	-	24	-	110/220 VDC/ VAC	-	-	-45 to 85°C
PT-7528-24TX-WV-WV	-	24	-	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-24TX-HV-HV	-	24	-	110/220 VDC/ VAC	110/220 VDC/ VAC	✓	-45 to 85°C
PT-7528-8MSC-16TX-4GSFP-WV	4	16	8 x multi-mode, SC connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-8MSC-16TX-4GSFP-WV-WV	4	16	8 x multi-mode, SC connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-8MSC-16TX-4GSFP-HV	4	16	8 x multi-mode, SC connector	110/220 VDC/ VAC	-	-	-45 to 85°C
PT-7528-8MSC-16TX-4GSFP-HV-HV	4	16	8 x multi-mode, SC connector	110/220 VDC/ VAC	110/220 VDC/ VAC	✓	-45 to 85°C
PT-7528-12MSC-12TX-4GSFP-WV	4	12	12 x multi-mode, SC connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-12MSC-12TX-4GSFP-WV-WV	4	12	12 x multi-mode, SC connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C

Model Name	1000Base SFP Slots	10/100BaseT(X)	100BaseFX	Input Voltage 1	Input Voltage 2	Redundant Power Module	Operating Temp.
PT-7528-12MSC-12TX-4GSFP-HV	4	12	12 x multi-mode, SC connector	110/220 VDC/VAC	-	-	-45 to 85°C
PT-7528-12MSC-12TX-4GSFP-HV-HV	4	12	12 x multi-mode, SC connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-16MSC-8TX-4GSFP-WV	4	8	16 x multi-mode, SC connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-16MSC-8TX-4GSFP-WV-WV	4	8	16 x multi-mode, SC connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-16MSC-8TX-4GSFP-HV	4	8	16 x multi-mode, SC connector	110/220 VDC/VAC	-	-	-45 to 85°C
PT-7528-16MSC-8TX-4GSFP-HV-HV	4	8	16 x multi-mode, SC connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-20MSC-4TX-4GSFP-WV	4	4	20 x multi-mode, SC connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-20MSC-4TX-4GSFP-WV-WV	4	4	20 x multi-mode, SC connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-20MSC-4TX-4GSFP-HV	4	4	20 x multi-mode, SC connector	110/220 VDC/VAC	-	-	-45 to 85°C
PT-7528-20MSC-4TX-4GSFP-HV-HV	4	4	20 x multi-mode, SC connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-8SSC-16TX-4GSFP-WV-WV	4	16	8 x single-mode, SC connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-8SSC-16TX-4GSFP-HV-HV	4	16	8 x single-mode, SC connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-8MST-16TX-4GSFP-WV	4	16	8 x multi-mode, ST connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-8MST-16TX-4GSFP-WV-WV	4	16	8 x multi-mode, ST connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-8MST-16TX-4GSFP-HV	4	16	8 x multi-mode, ST connector	110/220 VDC/VAC	-	-	-45 to 85°C
PT-7528-8MST-16TX-4GSFP-HV-HV	4	16	8 x multi-mode, ST connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-12MST-12TX-4GSFP-WV	4	12	12 x multi-mode, ST connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-12MST-12TX-4GSFP-WV-WV	4	12	12 x multi-mode, ST connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-12MST-12TX-4GSFP-HV	4	12	12 x multi-mode, ST connector	110/220 VDC/VAC	-	-	-45 to 85°C
PT-7528-12MST-12TX-4GSFP-HV-HV	4	12	12 x multi-mode, ST connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-16MST-8TX-4GSFP-WV	4	8	16 x multi-mode, ST connector	24/48 VDC	-	-	-45 to 85°C
PT-7528-16MST-8TX-4GSFP-WV-WV	4	8	16 x multi-mode, ST connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-16MST-8TX-4GSFP-HV	4	8	16 x multi-mode, ST connector	110/220 VDC/VAC	-	-	-45 to 85°C
PT-7528-16MST-8TX-4GSFP-HV-HV	4	8	16 x multi-mode, ST connector	110/220 VDC/VAC	110/220 VDC/VAC	✓	-45 to 85°C
PT-7528-20MST-4TX-4GSFP-WV	4	4	20 x multi-mode, ST connector	24/48 VDC	-	-	-45 to 85°C

Model Name	1000Base SFP Slots	10/100BaseT(X)	100BaseFX	Input Voltage 1	Input Voltage 2	Redundant Power Module	Operating Temp.
PT-7528-20MST-4TX-4GSFP-WV-WV	4	4	20 x multi-mode, ST connector	24/48 VDC	24/48 VDC	✓	-45 to 85°C
PT-7528-20MST-4TX-4GSFP-HV	4	4	20 x multi-mode, ST connector	110/220 VDC/ VAC	-	-	-45 to 85°C
PT-7528-20MST-4TX-4GSFP-HV-HV	4	4	20 x multi-mode, ST connector	110/220 VDC/ VAC	110/220 VDC/ VAC	✓	-45 to 85°C

## 配件 (選購)

### PM-7500 Module Series

PM-7500-2GTXSFP	Gigabit Ethernet module with 2 100/1000BaseSFP slots or 2 100/1000BaseT(X) ports, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-2MSC	Fast Ethernet module with 2 100BaseFX multi-mode ports with SC connectors, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-2MST	Fast Ethernet module with 2 100BaseFX multi-mode ports with ST connectors, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-2SSC	Fast Ethernet module with 2 100BaseFX single-mode ports with SC connectors, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-4GTXSFP	Gigabit Ethernet module with 4 100/1000BaseSFP slots or 4 100/1000BaseT(X) ports, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-4MSC	Fast Ethernet module with 4 100BaseFX multi-mode ports with SC connectors, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-4MST	Fast Ethernet module with 4 100BaseFX multi-mode ports with ST connectors, compliant with IEC 61850-3, -40 to 85°C operating temperature
PM-7500-4SSC	Fast Ethernet module with 4 100BaseFX single-mode ports with SC connectors, compliant with IEC 61850-3, -40 to 85°C operating temperature

### Storage Kits

ABC-02-USB-T	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature
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### SFP Modules

SFP-1G10ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G10ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G10BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G10BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G20ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G20ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G20BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G20BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G40ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G40ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature



SFP-1G40BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G40BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1GEZXLC	SFP module with 1 1000BaseEZXC port with LC connector for 110 km transmission, 0 to 60°C operating temperature
SFP-1GEZXLC-120	SFP module with 1 1000BaseEZXC port with LC connector for 120 km transmission, 0 to 60°C operating temperature
SFP-1GLHLC	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature
SFP-1GLHLC-T	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature
SFP-1GLHXLC	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature
SFP-1GLHXLC-T	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GLSXLC	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature
SFP-1GLXLC	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature
SFP-1GLXLC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature
SFP-1GSXLC	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, 0 to 60°C operating temperature
SFP-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature
SFP-1GZXLC	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature
SFP-1GZXLC-T	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1GTXRJ45-T	SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature
SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode, LC connector for 2/4 km transmission, -40 to 85°C operating temperature
SFP-1FESLC-T	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature

## Software

MXview-50	MXview license for 50 nodes
MXview-100	MXview license for 100 nodes
MXview-250	MXview license for 250 nodes
MXview-500	MXview license for 500 nodes
MXview-1000	MXview license for 1000 nodes
MXview-2000	MXview license for 2000 nodes
MXview Upgrade-50	MXview license expansion for 50 nodes

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