EDS-728/828

24+4G-port Layer 2/Layer 3 Gigabit modular managed Ethernet switches

▶ *Award-winning Product*

Good Design
reddot design award honourable mention 2008
iF product design award 2006

> 4 Gigabit plus 24 Fast Ethernet ports for copper and fiber
> Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
> TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
> Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
> Layer 3 routing interconnects multiple LAN segments (EDS-828)

Turbo Ring
Turbo Chain

Industrial IT enabled
c UL us LISTED
DNV
G L
Lloyd's Register LIFE MATTERS
ABS APPROVED PRODUCT
ClassNK APPROVED
CE FC

: Introduction

The EDS-728/828 modular Gigabit Ethernet switch features a versatile modular design that allows different combinations of fiber and copper modules, creating a wide array of connection options ideal for any automation network. The modular design lets you install up to 4 Gigabit ports and 24 Fast Ethernet ports. The EDS-728/828 is specially designed for redundant Gigabit network backbones and uses a modular configuration to provide a high degree of flexibility for network expansion. Top network performance, security, and reliability is assured through the EDS-728/828's advanced management and

security features. The EDS-728/828 also features industrial-grade construction, a console port for automatic configuration backup, and an angled LED troubleshooting panel that can be conveniently viewed from both horizontal and vertical orientations. In addition to Layer 2 features, the EDS-828 is a high-performance Layer 3 Ethernet switch designed for network routing. The improved hardware technology built into the EDS-828 replaces the software logic used by traditional routers, offering better performance, and making the switch ideal for large-scale local area networks.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (EDS-828)
- Command Line Interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning

- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- Access Control Lists (ACL) increase the flexibility and security of network management (EDS-828)
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

: Specifications

Technology
Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Layer 2/Layer 3 Modular Managed Ethernet Switch System, EDS-72810G/82810G

Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, LLDP, IEEE 1588 PTPv2, EtherNet/IP, Modbus/TCP, SNMP Inform, NTP Server/Client

MOXA®

Layer 3 Switching: Static routing, RIP V1/V2, OSPF, DVMRP, PIM-DM (EDS-828)
Layer 3 Switching Redundancy: VRRP (EDS-828)
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties
Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 32 MB

Interface
Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, T.RING
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA
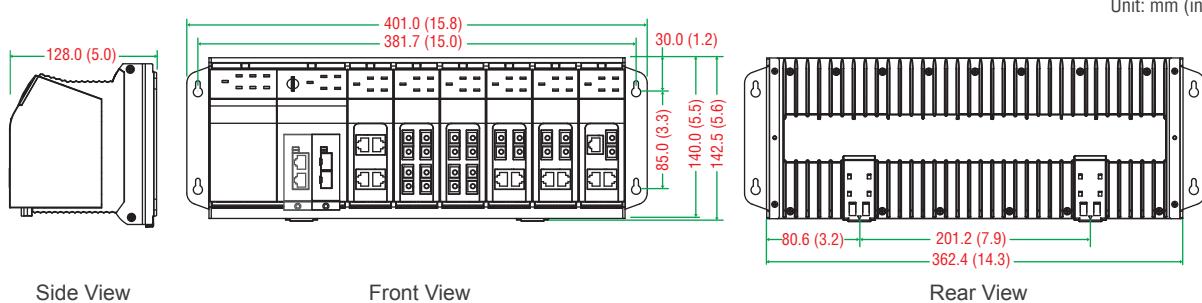
Power Requirements
Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current: 0.96 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics
Housing: IP30 protection
Dimensions: 362.4 x 142.5 x 128 mm (14.27 x 5.61 x 5.04 in)
Weight: 1950 g
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits
Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-12
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

## MTBF (mean time between failures)
Time: 191,203 hrs
Database: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

128.0 (5.0) · 401.0 (15.8) · 381.7 (15.0) · 30.0 (1.2) · 85.0 (3.3) · 140.0 (5.5) · 142.5 (5.6) · 80.6 (3.2) · 201.2 (7.9) · 362.4 (14.3)

Side View — Front View — Rear View

: Ordering Information

Step 1: Select Ethernet switch system

EDS-72810G/82810G

Step 2: Select interface modules

IM series
(Gigabit or Fast Ethernet)

Note: The EDS-72810G/82810G switch system is delivered without interface modules. See the IM series and SFP-1G datasheets for Gigabit and Fast Ethernet interface module product information.

Available Models
EDS-72810G/82810G: Layer 2/Layer 3 modular managed Ethernet switch system with 6 slots for 4-port Fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-32: Wall mounting kit for the EDS-728/828 series
RK-4U: 4U-high 19" rack mounting kit

Package Checklist
• EDS-728/828 switch
• RJ45 to DB9 console port cable
• Documentation and software CD
• Hardware installation guide (printed)
• Warranty card

IM Series

2-port Gigabit Ethernet and 4-port Fast Ethernet interface modules for EDS-728/828 series Ethernet switches

: Specifications

Gigabit Ethernet Interface Modules, IM-2G Series

| IM-2GTX | IM-2GSFP |

Interface
Fiber Ports: 1000BaseSFP slot
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed and auto MDI/MDI-X connection
LED Indicators: Port status
Note: See the SFP-1G datasheet for Gigabit Ethernet SFP module product information.

Power Requirements
Power Consumption (@ 24 V):
IM-2GTX: 2.96 W
IM-2GSFP: 3.04 W

Physical Characteristics
Dimensions: 24 x 65.9 x 101.1 mm (0.94 x 2.59 x 3.98 in)
Weight:
IM-2GTX: 150 g
IM-2GSFP: 148 g
Time:
IM-2GTX: 417,521 hrs
IM-2GSFP: 424,955 hrs
Database: Telcordia (Bellcore), GB
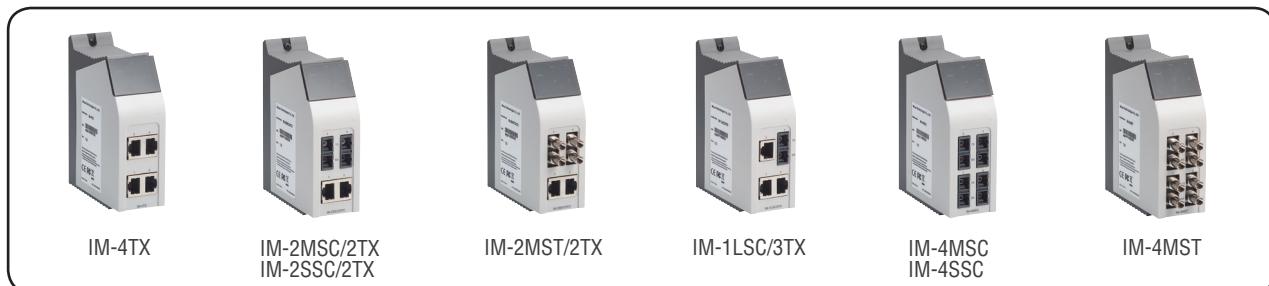
Fast Ethernet Interface Modules, IM Series

| IM-4TX | IM-2MSC/2TX IM-2SSC/2TX | IM-2MST/2TX | IM-1LSC/3TX | IM-4MSC IM-4SSC | IM-4MST |

Interface
Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR, P1, P2, P3, P4 port status

Optical Fiber

	100BaseFX	
	Multi Mode	Single Mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements
Power Consumption (@ 24 V):
IM-4TX: 1.52 W
IM-2MSC/2TX: 2.43 W
IM-2MST/2TX: 2.43 W
IM-2SSC/2TX: 2.43 W
IM-1LSC/3TX: 2.5 W
IM-4MSC: 6.6 W
IM-4MST: 6.6 W
IM-4SSC: 6.6 W

Physical Characteristics
Housing: IP30 protection
Dimensions: 40 x 127.8 x 100 mm (1.57 x 5.03 x 3.94 in)
Weight:
IM-4TX: 215 g
IM-2MSC/2TX: 245 g
IM-2MST/2TX: 250 g
IM-2SSC/2TX: 245 g
IM-1LSC/3TX: 235 g
IM-4MSC: 250 g
IM-4MST: 270 g
IM-4SSC: 270 g
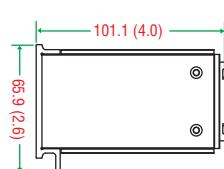
MTBF (mean time between failures)

Time:
IM-4TX: 4,403,579 hrs
IM-2MSC/2TX, IM-2MST/2TX, IM-2SSC/2TX: 1,011,453 hrs
IM-1LSC/3TX: 3,924,924 hrs
IM-4MSC, IM-4MST, IM-4SSC: 696,138 hrs
**Database:** Telcordia (Bellcore), GB
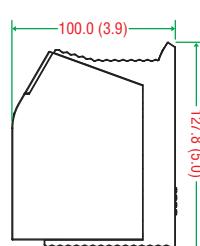
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

Gigabit Ethernet Interface Modules

101.1 (4.0)   24.0 (0.9)

65.9 (2.6)
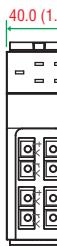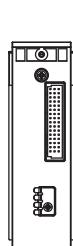
Side View   Front View

Fast Ethernet Interface Modules

100.0 (3.9)   40.0 (1.6)

127.8 (5.0)

Side View   Front View   Rear View

: Ordering Information

Available Models (0 to 60°C)	Port Interface						
	Gigabit Ethernet		Fast Ethernet				
			10/100BaseT(X)	100BaseFX			
	10/100/1000BaseT(X)	1000BaseSFP*		Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
IM-2G Series							
IM-2GTX	2	–	–	–	–	–	–
IM-2GSFP	–	2	–	–	–	–	–
IM Series							
IM-4TX	–	–	4	–	–	–	–
IM-4MSC	–	–	–	4	–	–	–
IM-4MST	–	–	–	–	4	–	–
IM-2MSC/2TX	–	–	2	2	–	–	–
IM-2MST/2TX	–	–	2	–	2	–	–
IM-4SSC	–	–	–	–	–	4	–
IM-2SSC/2TX	–	–	2	–	–	2	–
IM-1LSC/3TX	–	–	3	–	–	–	1

*See the SFP-1G datasheet for Gigabit Ethernet SFP module product information.

Package Checklist

- IM series interface modules
- Warranty card

SFP-1G Series

1-port Gigabit Ethernet SFP modules

> IEEE 802.3z compliant
> Differential LVPECL inputs and outputs
> TTL signal detect indicator
> Hot pluggable LC duplex connector
> Class 1 laser product, complies with EN 60825-1

EN : 60825   c ℛ𝖀 US

⦂ Specifications

Interface
Ethernet Ports: 1
Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)
Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)
Note: When connecting long distance SFP (SFP-ZX, EZX or EZX-120), please ensure at least 5 dB attenuation between both ends. Without attenuation, excessive optical power may damage the transeivers.

Optical Fiber

	Gigabit Ethernet													
	SFP-SX	SFP-LSX	SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	1550 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	-2 dBm	1 dBm	5 dBm	5 dBm	3 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-8 dBm	-4 dBm	0 dBm	0 dBm	-2 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-30 dBm	-33 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	24 dB	30 dB	31 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m[a]	2 km[b]	10 km[c]	30 km[c]	40 km[c]	80 km[c]	110 km[c]	120 km[c]	10 km[c]		20 km[c]		40 km[c]	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-8 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 µm, 400 MHz-km or 62.5/125 µm, 500 MHz-km @ 850 nm multi-mode fiber optic cable
b. 62.5/125 µm, 750 MHz-km @ 1310 nm multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Note: The actual communication distance depends on many factors, including connector loss, cable deployment, and the age of the cabling system. We recommend doing a link budget analysis and reserving a 3 dB margin for such factors.

Environmental Limits
Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
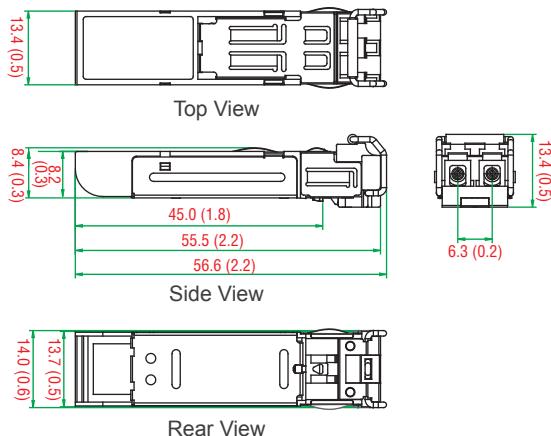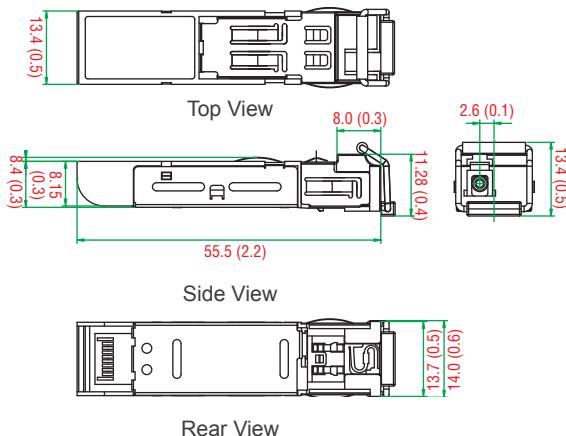
### Standards and Certifications
Safety: UL 60950-1, TÜV

Warranty
**Warranty Period:** 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

SFP-1G Series

Top View

Side View

Rear View

SFP-1G Series (WDM Type)

Top View

Side View

Rear View

: Ordering Information

SFP Modules

Available Models		Port Interface							
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLH, LC Connector, 30 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZX, LC Connector, 110 km	1000BaseEZX, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	–	–	–	–	–	–	–
SFP-1GLSXLC	SFP-1GLSXLC-T	–	1	–	–	–	–	–	–
SFP-1GLXLC	SFP-1GLXLC-T	–	–	1	–	–	–	–	–
SFP-1GLHLC	SFP-1GLHLC-T	–	–	–	1	–	–	–	–
SFP-1GLHXLC	SFP-1GLHXLC-T	–	–	–	–	1	–	–	–
SFP-1GZXLC	SFP-1GZXLC-T	–	–	–	–	–	1	–	–
SFP-1GEZXLC	–	–	–	–	–	–	–	1	–
SFP-1GEZXLC-120	–	–	–	–	–	–	–	–	1

*SFP-1GSXLC-T: -20 to 75˚C operating temperature

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1	–	–	–	–	–
SFP-1G10BLC	SFP-1G10BLC-T	–	1	–	–	–	–
SFP-1G20ALC	SFP-1G20ALC-T	–	–	1	–	–	–
SFP-1G20BLC	SFP-1G20BLC-T	–	–	–	1	–	–
SFP-1G40ALC	SFP-1G40ALC-T	–	–	–	–	1	–
SFP-1G40BLC	SFP-1G40BLC-T	–	–	–	–	–	1

Available Models

The SFP-1G series modules can be used with the following products:

ICS-G7850A/G7852A series, ICS-G7850/G7852 series, ICS-G7750A/G7752A series, ICS-G7750/G7752 series, IM-G7000A-4GSFP, IM-G7000-4GSFP, ICS-G7826A/G7828A series, ICS-G7826/G7828 series, ICS-G7526A/G7528A series, ICS-G7526/G7528 series, IKS-G6524A/G6824A series, IKS-G6524/G6824 series, IKS-6726A/6728A series, IKS-6726/6728 series, IM-2GSFP, EDS-611/619 series, EDS-G516E series, EDS-G512E series, EDS-G509 series, EDS-518A series, EDS-510A series, EDS-510E series, EDS-G308 series, EDS-210A series, IKS-6728A-8PoE series, IKS-6728-8PoE series, EDS-P510A-8PoE series, EDS-P510 series, EDS-G205A-4PoE series, PM-7200-2G/4G series, PT-G7509 series, IMC-101G series, EDR-G903/G902 series, EDR-810 series

Package Checklist

- SFP-1G module
- Warranty card