

# EDS-728/828

▶ Award-winning Product



reddot design award  
honourable mention 2008



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



- > 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)
- > Supports MXstudio for easy, visualized industrial network management



### 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 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



#### Software Features

**Management:** IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control

**Filter:** 802.1Q VLAN, VLAN Unaware, Q-in-Q VLAN, GVRP, IGMP v1/v2, GMRP  
**Redundancy Protocols:** STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, VRRP (EDS-828 only)  
**Security:** RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (EDS-828 only)  
**Unicast Routing:** Static Routing, RIPV1/V2, OSPF (EDS-828)  
**Multicast Routing:** DVMRP, PIM-DM (EDS-828)  
**Time Management:** SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)  
**Industrial Protocols:** EtherNet/IP, Modbus/TCP  
**MIB:** MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9

### Switch Properties

**Priority Queues:** 4  
**Max. Number of 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 +30 V for state "1"  
 • -30 to +3 V for state "0"  
 • Max. input current: 8 mA

### Power Requirements

**Input Voltage:** 24 VDC, redundant dual inputs  
**Operating Voltage:** 12 to 45 VDC  
**Input Current:** 0.82 A @ 24 V  
**Overload Current Protection:** Present  
**Connection:** 2 removable 6-contact terminal blocks  
**Reverse Polarity Protection:** Present

### Physical Characteristics

**IP Rating:** IP30 protection  
**Dimensions:** 362.4 x 142.5 x 128 mm (14.27 x 5.61 x 5.04 in)  
**Weight:** 1950 g (4.30 lb)  
**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  
**EMC:** EN 55032/24

**EMI:** CISPR 32, FCC Part 15B Class A

### EMS:

IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV  
 IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m  
 IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV  
 IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV  
 IEC 61000-4-6 CS: 10 V  
 IEC 61000-4-8

**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

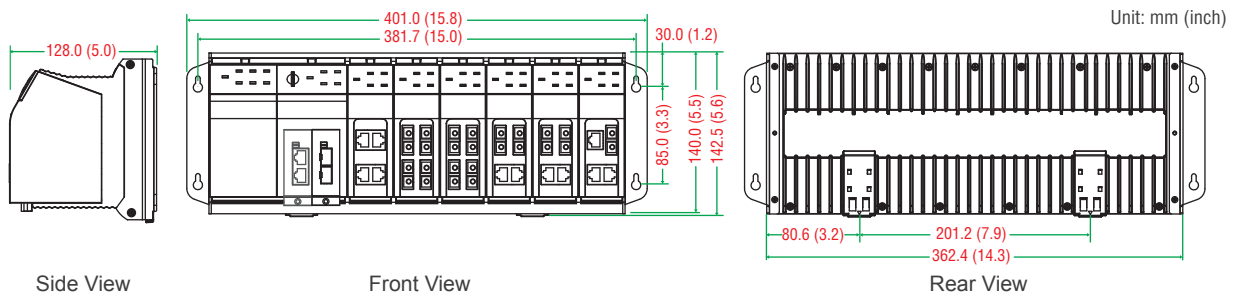
**Standard:** Telcordia (Bellcore), GB

### Warranty

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

### Dimensions



## 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

**RK-4U:** 4U-high 19-inch rack-mounting kit

**WK-32:** Wall-mounting kit for the EDS-728/828 series

### Package Checklist

- EDS-728/828 switch
- Serial Cable: CN20070
- 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 (0.33 lb)

IM-2GSFP: 148 g (0.33 lb)

**MTBF** (mean time between failures)

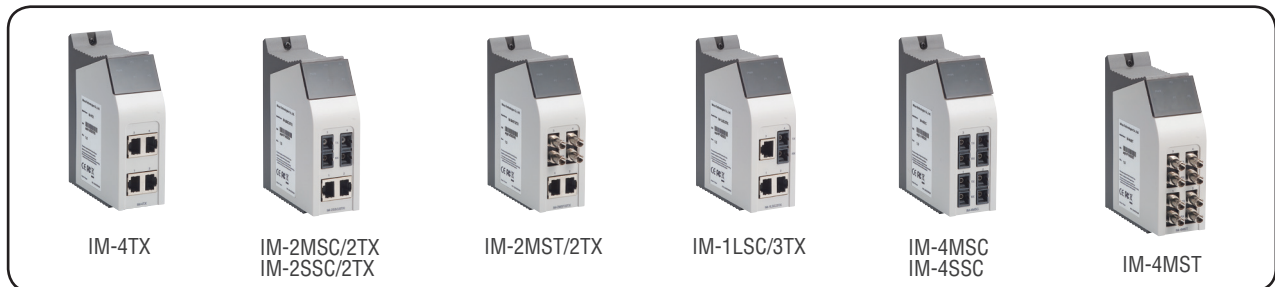
**Time:**

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

Fiber Cable Type		100BaseFX		
		Multi-Mode		Single-Mode
		OM1	50/125 $\mu$ m 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

**Note:** When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.

**Note:** Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

#### Power Requirements

**Power Consumption (@ 24 V):**

IM-4TX: 1.29 W

IM-2MSC/2TX: 2.06 W

IM-2MST/2TX: 2.06 W

IM-2SSC/2TX: 2.06 W

IM-1LSC/3TX: 2.12 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 (0.48 lb)

IM-2MSC/2TX: 245 g (0.54 lb)

IM-2MST/2TX: 250 g (0.56 lb)

IM-2SSC/2TX: 245 g (0.54 lb)

IM-1LSC/3TX: 235 g (0.52 lb)

IM-4MSC: 250 g (0.56 lb)

IM-4MST: 270 g (0.60 lb)

IM-4SSC: 270 g (0.60 lb)

## 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

**Standard:** Telcordia (Bellcore), GB

## Warranty

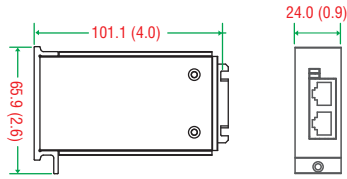
**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

Unit: mm (inch)

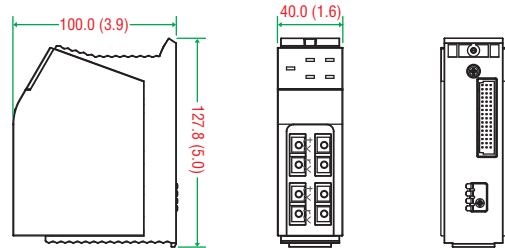
### Gigabit Ethernet Interface Modules



Side View

Front View

### Fast Ethernet Interface Modules



Side View

Front View

Rear View

## : Ordering Information

Available Models (0 to 60°C)	Port Interface						
	Gigabit Ethernet		Fast Ethernet				
	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)	100BaseFX			
				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



- > Digital Diagnostic Monitor Function
- > -40 to 85°C operating temperature range (T models)
- > 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



### : Specifications

#### Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

#### Optical Fiber

		Gigabit Ethernet SFP									
		SFP-SX		SFP-LSX		SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120
Transceiver Type		Multi-Mode		Multi-Mode		Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM2	OM2	OM1	G.652	G.652	G.652	G.652	G.652	G.652
Typical Distance		300 m	550 m	1 km	2 km	10 km	30 km	40 km	80 km	110 km	120 km
Wave-length	Typical (nm)	850		1310		1310	1310	1310	1550	1550	1550
	TX Range (nm)	830 to 860		1270 to 1355		1280 to 1355	1280 to 1355	1280 to 1340	1530 to 1570	1530 to 1570	1530 to 1570
	RX Range (nm)	770 to 860		1260 to 1610		1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1100 to 1600
Optical Power	TX Range (dBm)	-4 to -9.5		-1 to -9		-3 to -9	-3 to -8	+3 to -4	+5 to 0	+5 to 0	+3 to -2
	RX Range (dBm)	0 to -18		-1 to -19		-3 to -21	-3 to -23	-1 to -24	-1 to -24	-9 to -30	-8 to -33
	Link Budget (dB)	8.5		10		12	15	20	24	30	31
	Dispersion Penalty (dB)	4.3	3.6	5	5	1	1	1	1	1	2

Note: When connecting the SFP-LHX, ZX, EZX, or EZX-120, we recommended using an attenuator to prevent the transceiver from being damaged by excessive optical power.

		WDM Gigabit Ethernet SFP					
		SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Transceiver Type		Single-Mode		Single-Mode		Single-Mode	
Fiber Cable Type		G.652		G.652		G.652	
Typical Distance		10 km		20 km		40 km	
Wave-length	Typical (nm)	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310
	TX Range (nm)	1270 to 1355	1530 to 1570	1270 to 1355	1530 to 1570	1290 to 1330	1530 to 1570
	RX Range (nm)	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360
Optical Power	TX Range (dBm)	-3 to -9		-2 to -8		+2 to -3	
	RX Range (dBm)	-3 to -21		-2 to -23		-1 to -23	
	Link Budget (dB)	12		15		20	
	Dispersion Penalty (dB)	2		3		1	

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)

Note: When connecting the SFP-40A and 40B, we recommend using an attenuator to prevent damage caused by excessive optical power.

**Typical Distance:** To reach the typical distance of specified fiber transceiver, please refer to formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

## Power Requirements

Power Consumption: Max. 1 W

## 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: CE, FCC, TÜV (EN 60825), UL 60950-1

Marine: DNV, GL

## Warranty

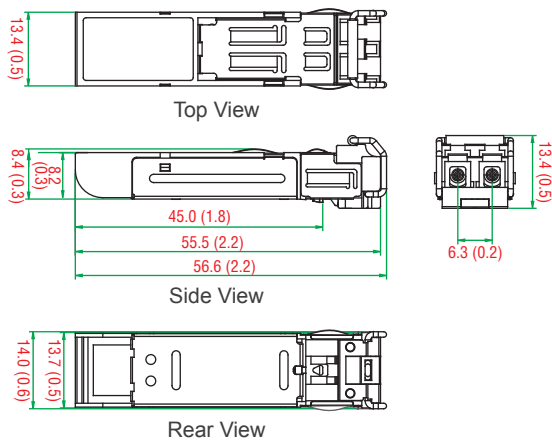
Warranty Period: 5 years

Details: See [www.moxa.com/warranty](http://www.moxa.com/warranty)

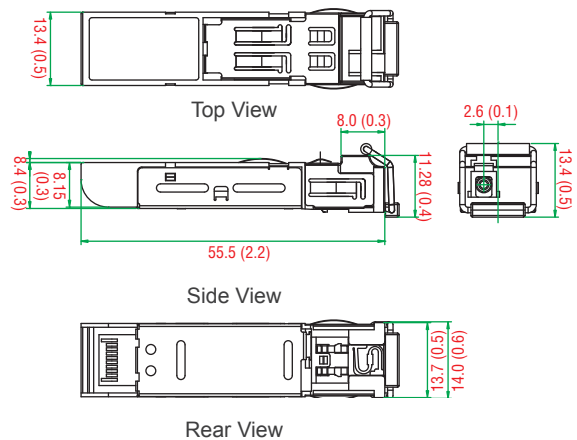
## Dimensions

Unit: mm (inch)

### SFP-1G Series



### SFP-1G Series (WDM Type)



## : Ordering Information

Gigabit Ethernet SFP Models				WDM Gigabit Ethernet SFP Models			
Standard Temperature Models (0 to 60°C)	Wide Temperature Models (-40 to 85°C)	Tranceiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Tranceiver Type	Typical Distance
SFP-1GSXLC	SFP-1GSXLC-T*	Multi-Mode	300/550 m	SFP-1G10ALC	SFP-1G10ALC-T	Single-Mode	10 km
SFP-1GLSXLC	SFP-1GLSXLC-T	Multi-Mode	1/2 km	SFP-1G10BLC	SFP-1G10BLC-T	Single-Mode	10 km
SFP-1GLXLC	SFP-1GLXLC-T	Single-Mode	10 km	SFP-1G20ALC	SFP-1G20ALC-T	Single-Mode	20 km
SFP-1GLHLC	SFP-1GLHLC-T	Single-Mode	30 km	SFP-1G20BLC	SFP-1G20BLC-T	Single-Mode	20 km
SFP-1GLHXLC	SFP-1GLHXLC-T	Single-Mode	40 km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 km
SFP-1GZXLC	SFP-1GZXLC-T	Single-Mode	80 km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 km
SFP-1GEZXLC	—	Single-Mode	110 km	—	—	—	—
SFP-1GEZXLC-120	—	Single-Mode	120 km	—	—	—	—

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

### Package Checklist

- SFP-1G module
- Warranty card