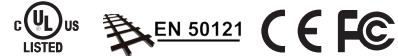


# ICS-G7526A/G7528A/G7826A/G7828A Series

**24G+2 10GbE/24G+4 10GbE-port Layer 2/Layer 3 full Gigabit managed Ethernet switches**



- > 24 Gigabit Ethernet ports plus up to 4 10G Ethernet ports
- > Up to 28 optical fiber connections (SFP slots)
- > Fanless, -10 to 60°C operating temperature range
- > Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > Isolated redundant power inputs with universal 110/220 VAC power supply range
- > Supports MXstudio for easy, visualized industrial network management
- > V-ON™ ensures millisecond-level multicast data and video network recovery



## Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7526A/G7528A/G7826A/G7828A series full Gigabit backbone switches are equipped with 24 Gigabit Ethernet ports plus up to 4 10 Gigabit Ethernet ports, and the ICS-G7826A/G7828A support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal

for large scale industrial networks. The ICS-G7526A/G7528A/G7826A/G7828A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

## Features and Benefits

- Layer 3 switching functionality to move data and information across networks (ICS-G7800A series)
- 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 EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 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
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (ICS-G7800A series)
- 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 AC power inputs

## 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 1000BaseSX/LX/LHX/ZX  
 IEEE 802.3ae for 10 Gigabit Ethernet  
 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

### Software Features

**Management:** IPv4/IPv6\*, 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

\*IPv6 only applies to ICS-G7500A series products.

**Filter:** 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMP v1/v2/v3, GMRP

**Redundancy Protocols:** STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation

**Security:** RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (ICS-G7800A series only)

**Unicast Routing:** Static Routing, RIPV1/V2, OSPF (ICS-G7800A series)

**Multicast Routing:** DVMRP, PIM-DM, PIM-SM, PIM-SSM (ICS-G7800A series)

**Time Management:** SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)

**Industrial Protocols:** EtherNet/IP, Modbus/TCP, PROFINET

**MIB:** MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9

**Routing Redundancy:** VRRP (ICS-G7800A series)

### Switch Properties

**Priority Queues:** 8

**Max. Number of VLANs:** 256

**VLAN ID Range:** VID 1 to 4094

**IGMP Groups:** 4096

**MAC Table Size:** 16 K

**Packet Buffer Size:** 12 Mbit

**DRAM Size:** 128 MB

**Flash Size:** 16 MB

**Jumbo Frame Size:** 9.6 KB

### Interface

**Gigabit Ethernet:** 10/100/1000BaseT(X) or 100/1000BaseSFP slot

**10 Gigabit Ethernet:** 10GbE SFP+ slot

**Console Port:** USB-serial console (Type B connector)

**Storage Port:** USB storage (Type A connector for ABC-02-USB)

**Alarm Contact:** 1 relay output with current carrying capacity of 2 A @ 30 VDC

**Digital Inputs:** 1 input with the same ground, but electrically isolated from the electronics.

- +13 to +30 V for state "1"
- -30 to +1 V for state "0"
- Max. input current: 8 mA

### Power Requirements

**Input Voltage:** 110 to 220 VAC

**Operating Voltage:** 85 to 264 VAC

**Input Current:**

ICS-G7526A/G7826A: Max. 0.83/0.47 A @ 110/220 VAC

ICS-G7528A/G7828A: Max. 0.99/0.65 A @ 110/220 VAC

**Overload Current Protection:** Present

**Reverse Polarity Protection:** Present

### Physical Characteristics

**IP Rating:** IP30 protection

**Dimensions:** 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)

**Weight:**

ICS-G7526A/G7826A: 5.3 kg (11.69 lb)

ICS-G7528A/G7828A: 5.5 kg (12.14 lb)

**Installation:** 19-inch rack mounting

### Environmental Limits

**Operating Temperature:** -10 to 60°C (14 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 60950-1, EN 60950-1

**EMC:** EN 55032/24

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

**EMS:**

IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV

IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m

IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV

IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV

IEC 61000-4-6 CS: Signal: 10 V

IEC 61000-4-8

**Rail Traffic:** EN 50121-4

**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:**

ICS-G7526A: 419,734 hrs

ICS-G7528A: 403,574 hrs

ICS-G7826A: 428,165 hrs

ICS-G7828A: 411,819 hrs

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

### Warranty

**Warranty Period:** 5 years

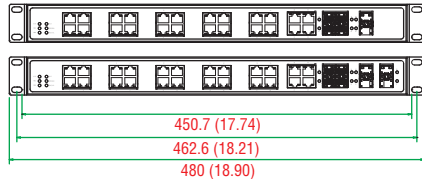
**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

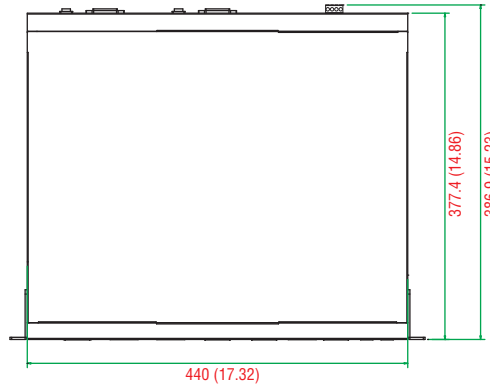
Unit: mm (inch)



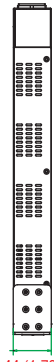
Rear View



Front View



Top View



Side View

## Ordering Information

Available Models	Port Interface				Power Supply	
	Gigabit Ethernet			10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
	10/100/1000BaseT(X)	100/1000BaseSFP*	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*			
Standard Temperature (-10 to 60°C)					HV: 85 to 264 VAC	HV: 85 to 264 VAC
<b>ICS-G7526A/G7528A Series Layer 2 Switches</b>						
ICS-G7526A-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7526A-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7526A-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7528A-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7528A-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7528A-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1
<b>ICS-G7826A/G7828A Series Layer 3 Switches</b>						
ICS-G7826A-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7826A-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7826A-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7828A-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7828A-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1

Note: The ICS-G7526A/G7528A/G7826A/G7828A series supports 10GbE SFP+ and 100/1000BaseSFP slots. See the SFP-10G, SFP-1G, SFP-1G Copper, and SFP-1FE data sheets for SFP module product information.

### 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-02-USB:** Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

**Power Cords:** See Appendix A for details

### Package Checklist

- ICS-G7526A, ICS-G7528A, ICS-G7826A, or ICS-G7828A switch
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

# SFP-10G Series

## 1-port 10 Gigabit Ethernet SFP+ modules



- > Digital Diagnostic Monitor Function
- > Compliant with IEEE 802.3ae
- > SFF-8432 SFP+ MSA compliant
- > Hot pluggable LC duplex connector
- > Class 1 Laser International Safety Standard IEC 825 compliant
- > RoHS compliant



## Specifications

### Interface

Connectors: Duplex LC Connector

10G Ethernet Ports: 1

### Optical Fiber

	10G Ethernet SFP			
	SFP-SR	SFP-LR	SFP-ER	
Transceiver Type	Multi-Mode	Single-Mode	Single-Mode	
Fiber Cable Type	OM1 OM3	G.652	G.652	
Typical Distance	33 m 300 m	10 km	40 km	
Wave-length	Typical (nm)	850	1310	1550
	TX Range (nm)	840 to 860	1260 to 1355	1530 to 1565
	RX Range (nm)	840 to 860	1260 to 1600	1260 to 1600
Optical Power	Max. Tx (dBm)	-1	+0.5	+4
	Max. Rx (dBm)	-1	+0.5	-1
	Link Budget (dB)	1.6 2.6	6.2	10.9

Note: When connecting the SFP-ER, we recommend using an attenuator to prevent damaged caused by excessive optical power.

### Power Requirements

Power Consumption: Max. 1.5 W

### Environmental Limits

Operating Temperature: 0 to 60°C (32 to 176°F)

Note: When the SFP-10GERLC is used with ICS-G7750A/G7752A/G7850A/G7852A series, operating temperature is 0 to 55°C (32 to 131°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, UL 60950-1

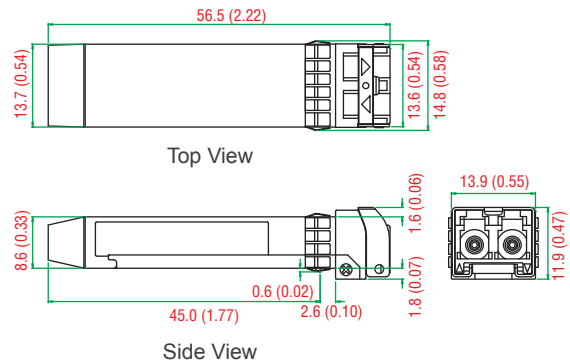
### Warranty

Warranty Period: 5 years

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

### Dimensions

Unit: mm (inch)



## Ordering Information

### Available Models

**SFP-10GSRLC:** SFP+ module with 1 10GBase-SR port for 33 m transmission, LC connector, 0 to 60°C operating temperature

**SFP-10GLRLC:** SFP+ module with 1 10GBase-LR port for 10 km transmission, LC connector, 0 to 60°C operating temperature

**SFP-10GERLC:** SFP+ module with 1 10GBase-ER port for 40 km transmission, LC connector, 0 to 60°C operating temperature

### Package Checklist

- SFP-10G module
- 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
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		1290 to 1330	
	RX Range (nm)	1480 to 1580		1260 to 1360		1480 to 1580	
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

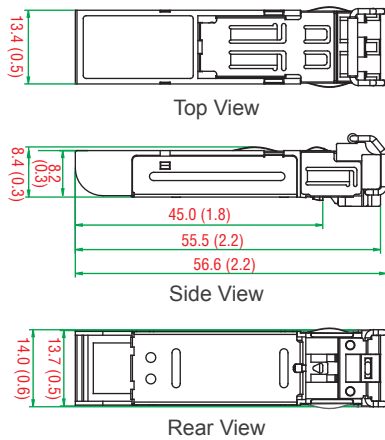
Warranty Period: 5 years

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

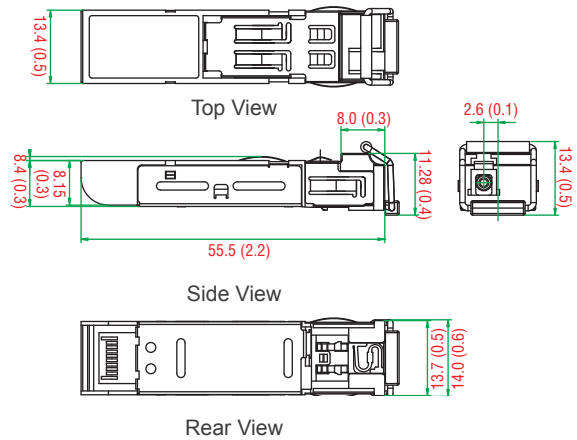
### Dimensions

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)	Transceiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Transceiver 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-1GLHXL	SFP-1GLHXL-T	Single-Mode	40 km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 km
SFP-1GZXL	SFP-1GZXL-T	Single-Mode	80 km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 km
SFP-1GEZXL	-	Single-Mode	110 km	-	-	-	-
SFP-1GEZXL-120	-	Single-Mode	120 km	-	-	-	-

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

### Package Checklist

- SFP-1G module
- Warranty card

# SFP-1G Copper Series

## 1-port Gigabit Ethernet copper SFP modules



- > Compliant with IEEE 802.3,2002
- > Fixed 1000 BASE-T speed
- > Hot pluggable RJ45 connector
- > TTL signal detection (RX los)
- > RoHS compliant and lead free



### Specifications

#### Interface

Connectors: RJ45

The port can not be used for Turbo Ring v1, Turbo Ring v2, and Turbo Chain.

Gigabit Ethernet Ports: 1

#### Power Requirements

Power Consumption: Max. 1.2 W

#### Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°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, UL 60950-1

Marine: DNV, GL

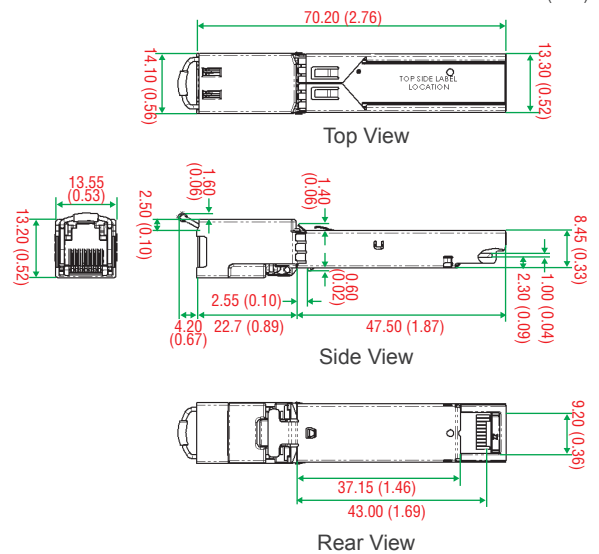
#### Warranty

Warranty Period: 5 years

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

### Dimensions

Unit: mm (inch)



### Ordering Information

#### Available Models

SFP-1GTXRJ45-T: SFP module with fixed 1000BaseT port, RJ45 connector, -40 to 75°C operating temperature

#### Package Checklist

- SFP-1G copper module
- Warranty card

# SFP-1FE Series

## 1-port Fast Ethernet SFP modules



- > Digital Diagnostic Monitor Function
- > IEEE 802.3u compliant
- > Differential PECL 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

#### Optical Fiber

	Fast Ethernet SFP			
	SFP-M		SFP-S	SFP-L
Transceiver Type	Multi-Mode		Single-Mode	
Fiber Cable Type	OM1/OM2	62.5/125, 50/125 $\mu$ m	G.652	G.652
		800 MHz* km		
Typical Distance	2 km	4 km	40 km	80 km
Wave-length	Typical (nm)	1310	1310	1550
	TX Range (nm)	1280 to 1340	1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1650	1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-8 to -18	0 to -5	0 to -5
	RX Range (dBm)	-3 to -32	-3 to -34	-3 to -34
	Link Budget (dB)	14	29	29
	Dispersion Penalty (dB)	2	3	1

Note: When connecting the SFP-S or L, we recommend using an attenuator to prevent damage caused by excessive optical power.

#### Power Requirements

Power Consumption: Max. 1 W

#### Environmental Limits

Operating Temperature: -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, UL 60950-1

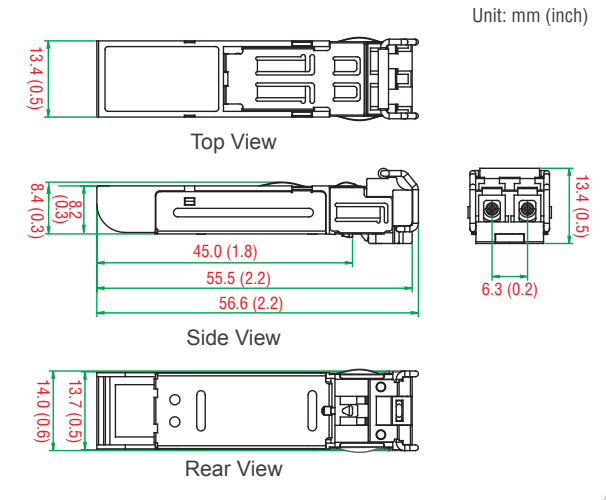
Marine: DNV, GL

#### Warranty

Warranty Period: 5 years

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

#### Dimensions



### Ordering Information

Available Models	Port Interface			
	Wide Temperature (-40 to 85°C)	100BaseFX, Multi-Mode, LC Connector, 4 km	100BaseFX, Single-Mode, LC Connector, 40 km	100BaseFX, Single-Mode, LC Connector, 80 km
SFP-1FEMLC-T		1	-	-
SFP-1FESLC-T		-	1	-
SFP-1FELLC-T		-	-	1

#### Package Checklist

- SFP-1FE module
- Warranty card