

# EDS-G508E/G512E/G516E Series

## 8G/12G/16G-port full Gigabit managed Ethernet switches



- > Up to 12 10/100/1000BaseT(X) ports and 4 100/1000BaseSFP ports (EDS-G516E)
- > Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > RADIUS, TACACS+, MAB Authentication, SNMPv3, IEEE 802.1x, MAC ACL, HTTPS, SSH, and MAC-address sticky to enhance network security
- > Security features based on IEC-62443
- > EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring
- > Supports MXstudio for easy, visualized industrial network management
- > V-ON™ ensures millisecond-level multicast data and video network recovery



### Introduction

The EDS-G500E series is equipped with 8/12/16 Gigabit Ethernet ports and up to 4 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speed or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of triple-play services across a network quickly. Redundant Ethernet Turbo Ring, Turbo Chain, RSTP/STP,

and MSTP increase system reliability and the availability of your network backbone. The EDS-G500E series is designed especially for communication demanding applications, such as video and process monitoring, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

### Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- 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, PROFINET, and Modbus/TCP protocols for device management and monitoring
- 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
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RADIUS, TACACS+, MAB Authentication, SNMPv3, IEEE 802.1x, MAC ACL, HTTPS, SSH, and MAC-address sticky 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
- ABC-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade.

### 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 STP
- 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

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

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

**Security:** RADIUS, TACACS+, MAB Authentication, HTTPS, SSL, SSH, Broadcast Storm Protection, Port Lock, MAC ACL, MAC Sticky, NTP Authentication, SMTP with TLS

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

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

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

#### Switch Properties

- Priority Queues:** 4
- Max. Number of VLANs:** 256
- VLAN ID Range:** VID 1 to 4094
- IGMP Groups:** 2048
- MAC Table Size:** 8 K
- Packet Buffer Size:** 4 Mbits
- Jumbo Frame Size:** 9.6 KB

**Interface**

**RJ45 Ports:** 10/100/1000BaseT(X) auto negotiation speed  
**Fiber Ports:** 100/1000BaseSFP slot  
**Console Port:** USB-serial console (Type B connector)  
**Storage Port:** USB storage (Type A connector for ABC-02-USB)  
**DIP Switches:** Turbo Ring, Master, Coupler, Reserve  
**Alarm Contact:** 1 relay output with current carrying capacity of 1 A @ 24 VDC

**Digital Inputs:** 1 input 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

**Button:** Reset button

**Power Requirements**

**Input Voltage:** 12/24/48/-48 VDC, redundant dual inputs

**Operating Voltage:** 9.6 to 60 VDC

**Input Current:**

EDS-G516E: 0.39 A @ 24 VDC

EDS-G512E: 0.34 A @ 24 VDC

EDS-G508E: 0.28 A @ 24 VDC

**Overload Current Protection:** Present

**Connection:** 2 removable 2-contact terminal blocks

**Reverse Polarity Protection:** Present

**Physical Characteristics**

**Housing:** Metal

**IP Rating:** IP30 protection

**Dimensions:** 79.2 x 135 x 137 mm (3.1 x 5.3 x 5.4 in)

**Weight:** 1440 g (3.18 lb)

**Installation:** DIN-rail mounting, wall mounting (with optional kit)

**Environmental Limits**

**Operating Temperature:**

Standard Models: -10 to 60°C (14 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

**Dimensions**

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

**Standards and Certifications**

*Note: Please check Moxa's website for the most up-to-date certification status.*

**Safety:** UL 508

**Hazardous Location:** UL/cUL Class 1 Division 2 Groups A/B/C/D,

ATEX Zone 2 Ex nA nC IIC T4 Gc

**EMC:** EN 61000-6-2/6-4

**EMI:** CISPR 22, 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: 10 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: Signal: 10 V

IEC 61000-4-8

**Electrical Substations:** IEC 61850-3, IEEE 1613

**Traffic Control:** NEMA TS2

**Rail Traffic:** EN 50121-4

**Marine:** DNV, GL, LR, ABS, NK

**Shock:** IEC 60068-2-27

**Freefall:** IEC 60068-2-32

**Vibration:** IEC 60068-2-6

**MTBF (mean time between failures)**

Time: EDS-G508E Series: 808,970 hrs

EDS-G512E-4GSFP Series: 816,823 hrs

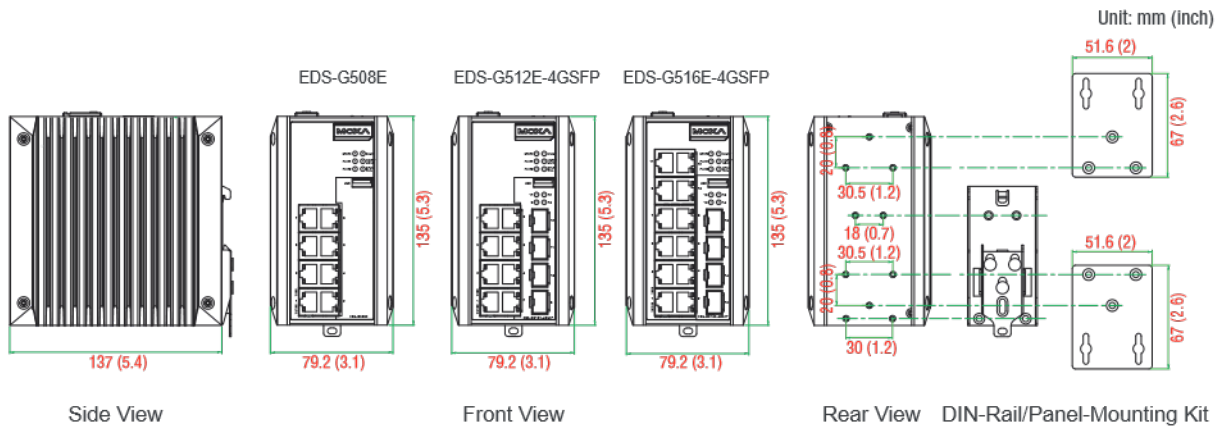
EDS-G516E-4GSFP Series: 805,491 hrs

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

**Warranty**

**Warranty Period:** 5 years

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



**Ordering Information**

| Available Models                   |                                | Gigabit Ethernet Port Interface |                  |
|------------------------------------|--------------------------------|---------------------------------|------------------|
| Standard Temperature (-10 to 60°C) | Wide Temperature (-40 to 75°C) | 10/100/1000BaseT(X)             | 100/1000BaseSFP* |
| EDS-G508E                          | EDS-G508E-T                    | 8                               | —                |
| EDS-G512E-4GSFP                    | EDS-G512E-4GSFP-T              | 8                               | 4                |
| EDS-G516E-4GSFP                    | EDS-G516E-4GSFP-T              | 12                              | 4                |

\*The EDS-G500E series supports up to 4 100/1000BaseSFP slots. See the SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for Gigabit/Fast Ethernet 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

**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-51-01:** Wall-mounting kit, 2 plates with 6 screws

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

**Package Checklist**

- EDS-G500E switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

# 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    | 2            | 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-20B          |                  |
| 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

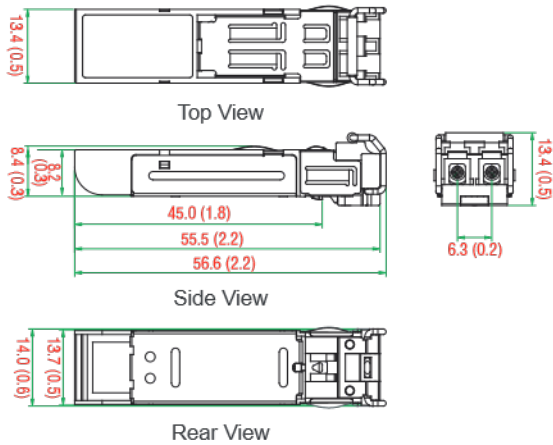
Warranty Period: 5 years

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

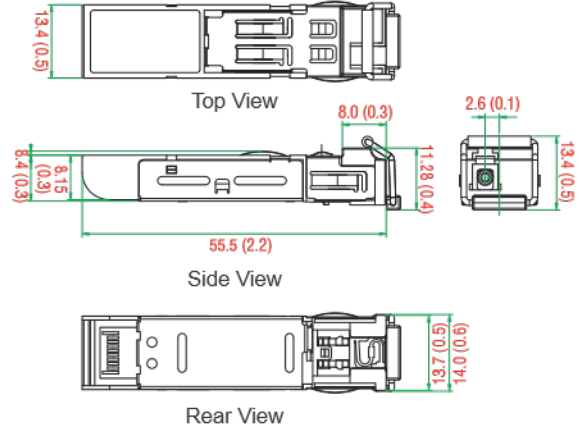
### Dimensions

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-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           | -                                | -                              | -                | -                |

#### 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

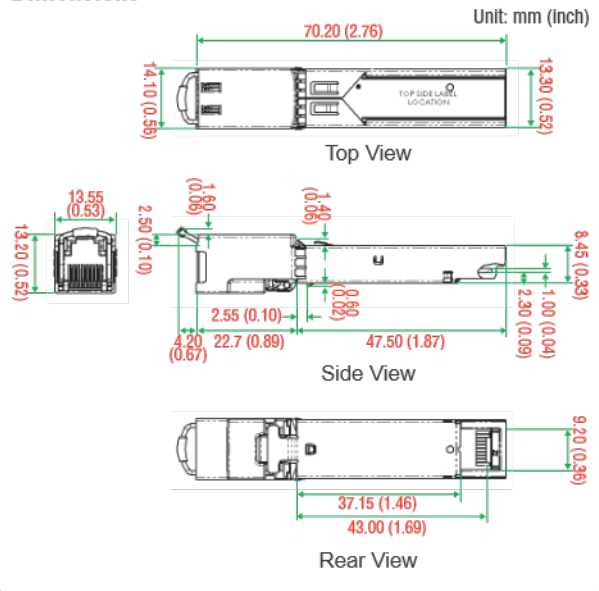
Marine: DNV, GL

#### Warranty

Warranty Period: 5 years

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

### Dimensions



### 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<br>800 MHz*km | G.652        | G.652        |
| 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

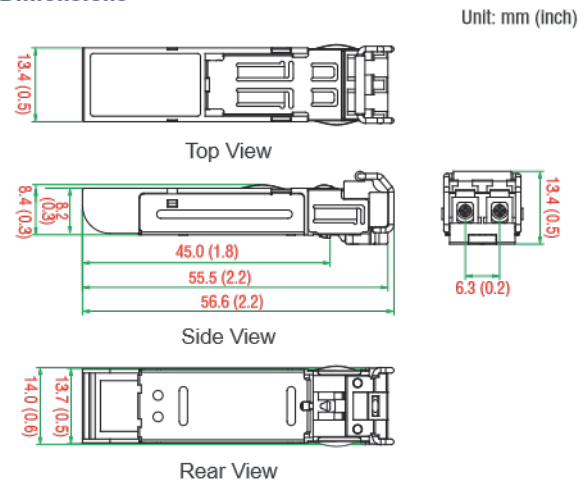
Marine: DNV, GL

#### Warranty

Warranty Period: 5 years

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

#### Dimensions



### Ordering Information

| Available Models | Port Interface                            |   |   |
|------------------|---|---|---|
|                  | 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