

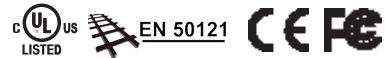
ICS-G7748/G7750/G7752

48G/48G+2 10GbE/48G+4 10GbE-port full Gigabit modular managed Ethernet switches



- > Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
- > Up to 52 optical fiber connections (SFP slots)
- > Fanless, 0 to 60°C operating temperature range
- > Modular design for maximum flexibility and hassle-free future expansion
- > Hot swap interface and power modules for continuous operation
- > 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

*Available in Q2, 2012



Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7748/G7750/G7752 series full Gigabit backbone switches' modular design makes network planning easy, and allows greater flexibility by letting you install up to 48 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports. The ICS-G7748/G7750/G7752'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

- Command line interface (CLI) for quickly configuring major managed functions*
- Supports advanced VLAN capability with Q-in-Q tagging*
- Software based IEEE 1588 PTP V2 (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 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
- 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

*Available in Q2, 2012

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

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 PTP V2*, EtherNet/IP*, Modbus/TCP, SNMP Inform, NTP Server/Client*
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

*Available in Q2, 2012

Switch Properties

Priority Queues: 8

Max. Number of Available VLANs: 256

VLAN ID Range: VID 1 to 4094

IGMP Groups and Multicast Route: 1000

MAC Table Size: 16 K

Packet Buffer Size: 12 Mbit

DRAM Size: 128 MB

Flash Size: 16 MB

Jump Frame Size: 9.6 KB

Switching Fabric Capacity:

ICS-G7748: 96 Gbps

ICS-G7750: 136 Gbps

ICS-G7752: 176 Gbps

Forwarding Rate: Max. 130.95 Mpps (packets per second)

Interface

Gigabit Ethernet: 12 slots for 4-port interface modules, 10/100/1000BaseT(X) or 100/1000BaseSFP slots

Note: See below for IM-G7000 Gigabit Ethernet module product information.

10 Gigabit Ethernet: 2 or 4 10GbE SFP+ slots (ICS-G7750 and ICS-G7752 only)

Console Port: RS-232 (RJ45 connector)

LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 1/2/3/4 for 10GbE port (ICS-G7750 and ICS-G7752 only)

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 +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)

Input Current:

ICS-G7748: Max. 1.02/0.6 A @ 110/220 VAC

ICS-G7750: Max. 1.1/0.64 A @ 110/220 VAC

ICS-G7752: Max. 1.19/0.68 A @ 110/220 VAC

Overload Current Protection: Present

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 176 x 523.8 mm (17.32 x 6.93 x 20.62 in)

Weight: 12.9 kg

Installation: 19" rack mounting

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 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 3, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11

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: 202,175 hrs

Database: Telcordia (Bellcore), GB

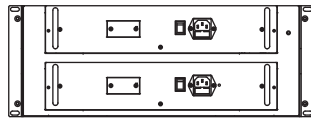
Warranty

Warranty Period: 5 years

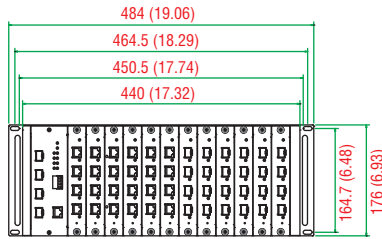
Details: See www.moxa.com/warranty

Dimensions

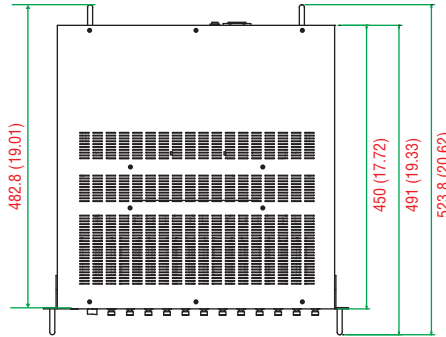
Unit: mm (inch)



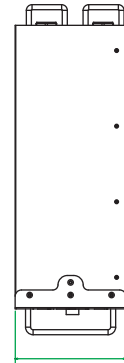
Rear View



Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

ICS-G7748/G7750/G7752
with power supply



Step 2: Select interface modules

IM-G7000
(Gigabit Ethernet)

Note: The ICS-G7748/G7750/G7752 Ethernet switch system is delivered without interface modules. See below to determine which IM-G7000 interface modules are suitable for your application.

Available Models

ICS-G7748-HV-HV: Full Gigabit modular managed Ethernet switch system with 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G ports, 0 to 60°C operating temperature

ICS-G7750-2XG-HV-HV: Full Gigabit modular managed Ethernet switch system with 2 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 2 10GbE ports, 0 to 60°C operating temperature

ICS-G7752-4XG-HV-HV: Full Gigabit modular managed Ethernet switch system with 4 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 4 10GbE ports, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 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

Power Cords: See website accessories pages for details

Package Checklist

- ICS-G7748/G7750/G7752 switch
- 12 interface cover plates
- RJ45 to DB9 console port cable
- 2 power cords (EU and US)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-G7000 Series

4G-port Gigabit Ethernet interface modules for ICS-G7700/G7800 series modular managed Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-G7000 Series



IM-G7000-4GTX



IM-G7000-4GSFP

Interface

Fiber Ports: 100/1000BaseSFP slot

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection

LED Indicators: STAT, 10/100/1000 for TP port, 100/1000 for fiber port

Hot Swap Button: Push this button prior to swapping IM-G7000 modules

Power Requirements

Power Consumption:

IM-G7000-4GTX: 4.1 W

IM-G7000-4GSFP: 3.3 W

Physical Characteristics

Housing: IP30 protection

Dimensions: 28.8 x 174.7 x 166.8 mm (1.13 x 6.88 x 6.57 in)

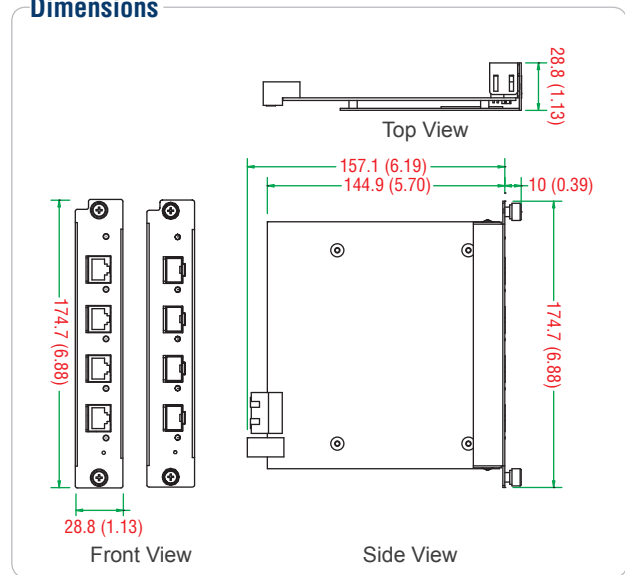
Weight: 220 g

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models

IM-G7000-4GTX: Gigabit Ethernet interface module with 4 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature

IM-G7000-4GSFP: Gigabit Ethernet interface module with 4 100/1000BaseSFP slots*, 0 to 60°C operating temperature

*See below for product information related to the SFP-1G/1FE series SFP modules.

Package Checklist

- IM-G7000 interface module
- Warranty card

PWR-G7000-AC

Plug-in power supply for ICS-G7700/G7800 series modular managed Ethernet switches



: Specifications

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)

Input Current: 2A @ 230 VAC, 4A @ 115 VAC

Input Frequency: 47 to 63 Hz

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

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

: Ordering Information

Available Models

PWR-G7000-AC: Power supply module (85 to 264 VAC) for ICS-G7000 series, 0 to 60°C operating temperature

SFP-10G Series

1-port 10 Gigabit Ethernet SFP+ modules



- > 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

10G Ethernet Port: 1
Connectors: Duplex LC Connector

Optical Fiber

	10 Gigabit Ethernet	
	SFP-SR	SFP-LR
Wavelength	850 nm	1310 nm
Max. TX	-1 dBm	0.5 dBm
Min. TX	-5 dBm	-8.2 dBm
RX Sensitivity	-10 dBm	-14.4 dBm
Link Budget	5 dB	6.2 dB
Typical Distance	33 m ^a 300 m ^b	10 km ^c
Saturation	-1 dBm	-0.5 dBm

a. 62.5/125 μm, 200 MHz*km (OM1) multi-mode fiber optic cable
 b. 50/125 μm, 2000 MHz*km (OM3) multi-mode fiber optic cable
 c. 9/125 μm single-mode fiber optic cable

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

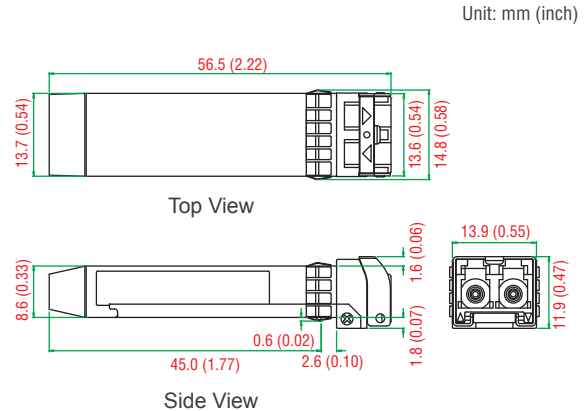
Standards and Certifications

Safety: UL 60950-1, TÜV

Warranty

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

Dimensions



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

The SFP-10G series modules can be used with the following products:

ICS-G7526/G7528, ICS-G7750/G7752, ICS-G7826/G7828, ICS-G7850/G7852

Package Checklist

- SFP-10G module
- 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



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-1GXXALC and SFP-1GXXBLC)

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 transceivers.

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

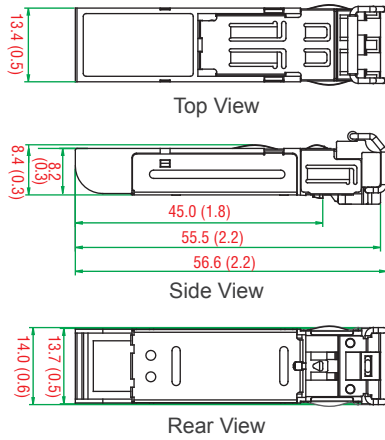
Warranty Period: 5 years

Details: See www.moxa.com/warranty

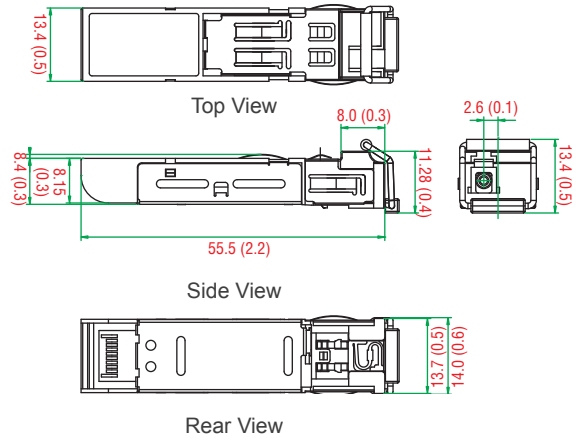
Dimensions

Unit: mm (inch)

SFP-1G Series



SFP-1G Series (WDM Type)



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	1000BaseEZ, LC Connector, 110 km	1000BaseEZ, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	-	-	-	-	-	-	-
SFP-1GLSXL	SFP-1GLSXL-T	-	1	-	-	-	-	-	-
SFP-1GLXL	SFP-1GLXL-T	-	-	1	-	-	-	-	-
SFP-1GLHL	SFP-1GLHL-T	-	-	-	1	-	-	-	-
SFP-1GLHLX	SFP-1GLHLX-T	-	-	-	-	1	-	-	-
SFP-1GZXL	SFP-1GZXL-T	-	-	-	-	-	1	-	-
SFP-1GEZXL	-	-	-	-	-	-	-	1	-
SFP-1GEZXL-120	-	-	-	-	-	-	-	-	1

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

WDM-type (BiDi) SFP Modules

Available 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-G7826/G7828 series, ICS-G7526/G7528 series, IKS-G6524/G6824 series, IKS-6726/6728 series, EDS-611/619 series, EDS-G509 series, EDS-518A series, EDS-510A series, EDS-G308 series, EDS-P510 series, EDS-G205-4PoE series, IM-G7000-4GSFP, IM-2GSFP, PM-7200-2G/4G series, PT-G7509, EDR-G903/G902 series, IMC-101G series

Package Checklist

- SFP-1G module
- Warranty card

SFP-1FE Series

1-port fast Ethernet SFP modules



- > 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-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-18 dBm	0 dBm	0 dBm
Min. TX	-8 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km ^a	40 km ^b	80 km ^b
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 μm or 62.5/125 μm, 800 MHz * km @ 1300 nm multi-mode fiber optic cable
 b. 9/125 μm single-mode fiber optic cable

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

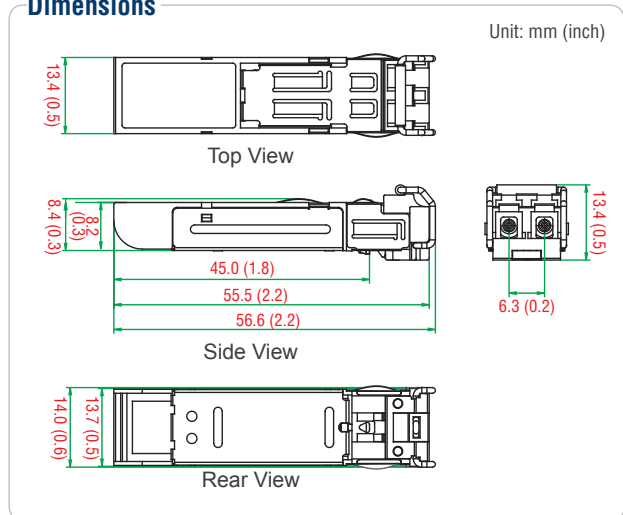
Safety: UL 60950-1, TÜV

Warranty

Warranty Period: 5 years

Details: See 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

Available Models

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

ICS-G7826/G7828 series, ICS-G7526/G7528 series, IKS-G6524/G6824 series, IKS-6726/6728 series, EDS-611/619 series, EDS-G509 series, EDS-G308-2SFP, EDS-P510 series, IM-G7000-4GSFP, PM-7200-8SFP, EDR-G903/G902 series, IM-6700-8SFP

Package Checklist

- SFP-1FE module
- Warranty card