DATASHEET

10G SFP+ Modules

SR SFP+

LR SFP+

ER SFP+

ZR SFP+

LR SFP+ SR SFP+ LR SFP+ ZR SFP+

The SFP+ pluggable interface is an industry standard—Multisource Agreement (MSA) for pluggable 10 Gigabit Ethernet Optics.

Features

SR SFP+

- 10GBASE-SR transceiver support with a link length up to 300 meters over 850 nm multimode fiber, LC Connector

LR SFP+

- 10GBASE-LR transceiver support with a link length up to 10 kilometers over 1310 nm single mode fiber, LC Connector

ER SFP+

- 10GBASE-ER transceiver support with a link length up to 40 kilometers over 1550 nm single mode fiber, LC Connector

ZR SFP+

- 10GBASE-ZR transceiver support with a link length up to 80 kilometers over 1550 nm single mode fiber, LC Connector

Technical Specifications

	SR SFP+	LR SFP+	ER SFP+	ZR SFP+
Fiber Type	Multimode (MMF)	Single-mode (SMF)	Single-mode (SMF)	Single-mode (SMF)
Connector Type	LC	LC	LC	LC
Launch Power min (avg)	-7.3dBm	-8.2dBm	-4.7dB	-4.7dBm
Receiver Power Range	-1 ~ -9.9dBm	0.5 ~ -14.4dBm	-1 ~ -15.8dBm	-1 ~ -15.8dBm
Optical Link Budget	*Depends on fiber type. See below.	7dB	10dB	10dB
Center Wavelength Range	840 to 860nm	1260 to 1355nm	1530 to 1565nm	1530 to 1565nm
Distance Range	2m to 300m	2m to 10km	2m~40km	2m~80km
Mean Time Between Failure (MTBF) Hours	4901960	3921568	1399188	1443343

Note: All qualified SFP+ plugables meet or exceed the IEEE 802.3ae 10 Gigabit Ethernet specification. The table above shows some SFP+ parameters that may be useful for 10 Gigabit Ethernet deployments

**62.5 µm (160/200 MHz*km) = 1.6 dB (typically 26 meters)*

*62.5 µm (200 MHz*km) = 1.6 dB) (typically 33 meters)*

*50 µm (400 MHz*km) = 1.7 dB) (typically 66 meters)*

*50 µm (500 MHz*km) = 1.8 dB (typically 82 meters)*

*50 µm (2000 MHz*km) = 2.6 dB (typically 300 meters)*

Physical Specifications

- Dimensions (HxWxD): 0.48x0.54x2.70 in 1.22x1.38x6.86 cm)
- Weight: 0.06 lb (25.1 g) unpackaged, 0.30 lb (135 g) packaged
- Shipping box dimensions (HxWxD): 2.1x6.8x7.7 in (5.4x17.2x19.6 cm)

ENVIRONMENTAL CONDITIONS OPERATIONAL

- Operating Temperature: 0° C to +40° C (32° F to 104° F)
- Operating Humidity: 10% to 93% non-condensing
- Altitude: 0 – 4000 meters (13,000 ft)
- Operational Shock: 30 m/s2 (3g), 11ms
- Operational Random Vibration: 5 – 500 Hz @ 1.5 Grms

TRANSPORTATION & STORAGE

- Temperature: -40° C to 70° C (-40° F to 158° F)
- Relative Humidity: 10% to 93%
- Shock: 180 m/s2 (18g), 6ms
- Random Vibration: 5 – 20 Hz @ 1.0 ASD w/-3dB/ oct. from 20 – 200 Hz
- Drop: 42” (105cm)

ENVIRONMENTAL STANDARDS

- EN 300 019-2-3 v2.1.2 (2003-04), Stationary Use, Class 3.1e
- EN 300 019-2-2 v2.1.2 (1999-09), Public Transportation, Class 2.3
- EN 300 019-2-1 v2.1.2 (2000-09), Storage, Class 1.2
- RoHS 6 compliant
- China RoHS compliant
- WEEE Compliant

SAFETY COMPLIANCE

North American Safety of ITE

- UL60950:2000 3rd edition of later, Recognized Component
- cUL to CSA 22.2#60950:2000 3rd Ed or later, Recognized Component

European Safety of ITE

- EN60950-1:2001+ all available countr y deviations
- 2006/95/EC Low Voltage Directive (LVD)

Laser Safety

- EN60825-1:1994, A11:1996, A2:2001
- 21 CFR Subpar t J, Class 1 Laser
- CDRH Letter of Approval

EMI/EMC COMPLIANCE

North America EMC for ITE

- FCC CFR 47 Par t 15 Class A (U.S.A.)
- ICES-003 Class A (Canada)

European EMC Standards

- EN 55022:2006, Class A
- EN 55024 A2:2003, Class A
- ETSI EN 300 386: v1.4.1 2008-04
- (EMC Telecommunications)
- 2004/108/EC EMC Directive

International EMC Certifications

- CISPR 22:2006 Ed 5.4, Class A (International Emissions)
- CISPR 24 A2:2003, Class A (International Immunity)
  - IEC/EN 61000-4-2:2001 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria B
  - IEC/EN 61000-4-3:2006 Radiated Immunity 10V/m, 30MHz to 2GHz, Criteria A
  - IEC/EN 61000-4-4:2005 Transient Burst, 1kV, Criteria A
  - IEC/EN 61000-4-5 2005, Surge, 1kV L-L, 2kV L-G, Level 4, Criteria B
  - IEC/EN 61000-4-6:2007 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A
  - IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria A

Ordering Information

PART NUMBER	NAME	DESCRIPTION
CLR-SFP-TG01	10GBASE-SR SFP+	10GBASE-SR SFP+, 850nm, LC Connector, transmission length of up to 300m on MMF
CLR-SFP-TG02	10GBASE-LR SFP+	10GBASE-LR SFP+, 1310nm, LC Connector, transmission length of up to 10km on SMF
CLR-SFP-TG03	10GBASE-ER SFP+	10GBASE-ER SFP+, 1550nm, LC Connector, transmission length of up to 40km on SMF
CLR-SFP-TG04	10GBASE-ZR SFP+	10GBASE-ZR SFP+, 1550nm, LC Connector, transmission length of up to 80km on SMF