SFP+&XFP Transceivers

- Fibrolan broad portfolio of optical transceivers include SFP+ and XFP series

- Optical Transceivers are Multi-Source Agreement (MSA) compliant

- These devices provide high performance Simplex and Duplex data links for bi-directional communications over MM and SM mode fibers

- These Fibrolan devices are protocol independent for the specified transmission speed and support the broadband range from FE to 10GE

- This document deals with SFP+and XFP transceivers and their usage covering, GE, 1xFC, 2xFC, 4FC,8FC, 10GE, SONET/SDH and CWDM/DWDM

- Typical Applications: Broadband Access, Business, Enterprise,Sonet/SDH, CWDM/DWDM (P2P and Ring topologies)

The radical demand for broadband access bandwidth and proliferation in applications and services, enterprise and Metro networks face a dramatic increase in data rate and traffic volume. Thus there is a growing need for optical transceivers that can support high capacity and reliable optical networks capable of handling heavy traffic for a large range of applications.
Fibrolan offers a broad range of optical transceiver modules designed to support multiple networks including XFP and SFP+ transceivers series

DS3880R1215

General description

The Fibrolan 10 Gbps XFP type Optical Transceivers (**FXFP** Series) are Multi-Source Agreement (MSA) compliant and provide high performance duplex data links for bi-directional communication over Multi-mode and Single mode fiber. The XFP has become the popular choice for the 10Gbps optical transceivers.

These Fibrolan interfaces convert a 10 GB/s serial electrical data streams into 10Gb/s optical output signal and a 10Gb/s optical input signal to 10Gb/s serial electrical data streams.

The Fibrolan XFP optical transceivers are designed for Ethernet LAN, WAN, Fiber Channel and DWDM applications.

The **XFP** optical interfaces are suitable for ease of deployment, maintenance and logistics, and do not require any settings or measurements.

The main advantages of the hot-swappable XFP optical interfaces are the density, flexibility, and cost savings. XFP modules can be easily interchanged, thus fiber optic networks can be upgraded more conveniently than with traditional modules. The fully XFP compliant form factor provides hot plug ability, easy optical port upgrades and low EMI emissions.

The XFP transceivers provide status information.

SFP+ is the next generation transceiver device designed for Fibre Channel and the Ethernet applications.

This module is similar to SFP (deployed for lower bit rates: 1Gbit/s-4Gbit/s) which is 30% smaller in size than XFP. Other advantages are low power consumption, simple optical design and low cost compared to XFP. **Single fiber** transceivers are also available.

Most of the logic has been removed from the SFP+ module which now contains only the electrical – to – optical and optical- to electrical components and functions.

Thus the reduced size and lower power consumption allow a higher port density

The main advantages of the hot-swappable SFP optical interfaces are the density, flexibility, and cost savings. **XFP and SFP+** modules can be easily interchanged, thus fiber optic networks can be upgraded more conveniently than with traditional modules. These transceivers provide status information (modules status and digital diagnostic status).

XFP Key Features

- XFP MSA Compliant
- High quality and reliable optical device and sub-assembies
- Data Rate: 9.95 ÷ 10.3 Gbps
- Data Rate: 1Gbps to 11.3/12.5Gbps
- XFI High Speed electrical interface
- 1550nm EML for up to 80km over SM fiber
- High sensitivity APD and TIA
- Duplex LC Receptacle
- XFI High Speed Electrical Interface
- Tx_Disable and Rx_LOS functions
- Digital diagnostic monitoring
- Metal enclosure for lower EMI
- 2-wire interface for management and diagnostic
- Network Extension: up to 100Km, (120Km for GBE), 80Km for DWDM
- XFP mechanical interface with color coded bail latch for easy removal
- Supported topologies: P2P, and Ring topologies with fixed and reconfigurable OADMs devices

SFP + Key Features

- **Compliant with MSA SFP+Specification SFF=8431**
- **Operating data rate up to 10.3Gbps**
- **1310nm DFB**-LD Transmitter
- 1550nm cooled **EML Transmitter**
- High sensitivity **APD Receiver**
- **Distance up to 100Km**
- digital diagnostics functions according to the -**standard SFF-8472**
- **Single 3.3V Power Supply**
- **TTL Control** Logic Interface
- **Hot-Pluggable**
- SFP **Simplex and Duplex** LC Connector Interface
- **Class 1 laser compliant to** Safety Standard IEC60825-1
- **Compliant with Digital Diagnostic** Monitor Interface SFF-8472 MSA
- **RoHS6**
  2002/95/EC 4.1&4.2
  2005/747/EC 5&7&13
- **Component Recognition**
  UL and CUL
  EN60950-1:2006
- **Electromagnetic Interference (EMI):**
  FCC Part 15 Class B
  EN55022:2006. CISPR 22B :2006
  VCCI Class B
- **Immunity**
  EN 55024:1998+A1+A2
  IEC 61000-4-3
- **Laser Eye Safety**
  CDRH compliant and Class I laser product
  FDA 21CFR 1040.10 and 1040.11
  EN (IEC) 60825-1:2007
  EN (IEC) 60825-2:2004+A1
- **Operating Case Temperature**
  0°C~+70°C
- **Operating Relative Humidity:**
  Max 95%
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General Features

- **Standard Compliance**
  Fast Ethernet (100Base-FX), Gigabit Ethernet, Fiber Channel , OC3, OC12, OC48, OC92, STM-1, STM-4, STM-16, STM-64

- **Conversion Method:**
  Universal protocol transparent device
  CWDM
  DWDM

- **F/O Ports**
  Simplex and Duplex LC connectors
  Each F/O port may be disconnected via management

- **Operating Temperature**
  0° ÷ + 70°C

- **Product Support**
  MetroStar modules:
  MCM1000X,MCM1000X-RL
  MSM2500U, MSM4000U, MSM10G-U
  MSM10G-R
  CPE Stand-alone devices:
  GSM1000x, U.CON2500 U.CON4000,
  Falcon NTUs and µFalcon series

- **Diagnostic LED**
  <u>TX-LOW LED for Port 1 and Port 2:</u>
  Off= Transmission is OK
  Lit red = Transmission signal low (does not reach the required distance)
  Blinking = Invalid Authentication: implies that is not a Fibrolan SFP used (no TX)

Applications

- 10GBASE-LR / 10GBASE-ER
- 1000 Base-LX Ethernet
- 10BASE-ZR/ZW 10G Ethernet
- 10G Fiber Channel
- 8XFC at 8.5Gbps
- 4XFC at 4.25Gbps
- 2XFC at 2.12Gbps
- 1xFC at 1.062Gbps

- CWDM applications
- DWDM applications
- Custom High speed Data Pipes
- Single Fiber working method
- SFP+Network Extension: up to 100Km
- Supported topologies:
  P2P, and Ring topologies with fixed and reconfigurable OADMs devices
- DWDM SFP+ usage:metropolitan access and core networks

Ordering Information

Part #	Model	Description
		FXFP Transceivers
3855	FXFP-85	XFP transceiver, MM, 850nm, 300m,over 50 micron fiber
3852	FXFP13-10	XFP transceiver for GA10, SM, Duplex LC, 1310nmDFB, 10km
3853	FXFP15-40	XFP transceiver, SM, Duplex LC, 1550nmEML, 40km
3854	FXFP15-80	XFP transceiver ,SM, 1550nmEML/APD, 80km
3868	FXFP-S12-10	XFP transceiver, SM, , SFS, Simplex LC, Tx:1270nm/Rx:1330nm/DFB, 10km, 9dB power budget
3869	FXFP-S13-10	XFP transceiver, SM, , SFS, Simplex LC, Tx:1330nm/Rx:1270nm/DFB, 10km, 9dB power budget
3873	FXFP-S12-20	XFP transceiver, SM, , SFS, Simplex LC, Tx:1270nm/Rx:1330nm/DFB, 20km 12dB power budget
3874	FXFP-S13-20	XFP transceiver, SM, , SFS, Simplex LC, Tx:1330nm/Rx:1270nm/DFB, 20km 12dB power budget
3886	FXFP-S12-40	XFP transceiver, SM, , SFS, Simplex LC, Tx:1270nm/Rx:1330nm/DFB, 40km, 16dB power budget
3887	FXFP-S13-40	XFP transceiver, SM, , SFS, Simplex LC, Tx:1330nm/Rx:1270nm/DFB, 40km, 16dB power budget
3875	FXFP-S12-60	XFP transceiver, SM, , SFS, Simplex LC, Tx:1270nm/Rx:1330nm/DFB, 60km, 21dB power budget
3876	FXFP-S13-60	XFP transceiver, SM, , SFS, Simplex LC, Tx:1330nm/Rx:1270nm/DFB, 60km, 21dB power budget
3856-XX	FXFP-40D-xx	DWDM (Channel =XX) XF transceiver, 40km, 14dB power budget
3857-XX	FXFP-80D-xx	DWDM (Channel =XX) XFP transceiver, 80km, 23dB power budget
3858-XX	FXFP-30C-XX	CWDM Channel=XX) XFP transceiver, EML, 30km, 14dB power budget
3867-XX	FXFP-70C-XX	CWDM (Channel=XX) XFP transceiver, EML, 70km, 23dB power budget
		SFP+ Transceivers
3880	SFPP-85	SFP+ transceiver, multi-rate, MM, Duplex LC, 850nm, 300m
3881	SFPP-13-10	SFP+ transceiver, multi-rate, SM, Duplex LC, 1310nm/DFB, 10km, 8dB power budget
3882	SFPP-15-40	SFP+ transceiver, multi-rate, SM, Duplex LC, 1550nm/EML, 40km, 16dB power budget
3883	SFPP-15-80	SFP+ transceiver, multi-rate, SM, Duplex LC, 1550nm/EML, 80km, 23dB power budget
3872	SFPP-15-100	SFP+ transceiver, multi-rate, SM, Duplex LC, 1550nm/EML 0042100km, 26dB power budget
3884	SFPP-S12-10	SFP+ transceiver, multi-rate ,SM, SFS Simplex LC, Tx:1270nm/Rx:1330nm/DFB, 10km, 9dB power budget
3885	SFPP-S13-10	SFP+ transceiver, multi-rate, SM, SFS, Simplex LC, Tx:1330nm/Rx:1270nm/DFB, 10km, 9dB power budget
3873	SFPP-S12-20	SFP+ transceiver, multi-rate, SM, , SFS, Simplex LC,Tx:1270nm/Rx:1330nm /DFB,20km, 12Db, power budget
3874	SFPP-S13-20	SFP+ transceiver, multi-rate, SM, , SFS, Simplex LC,Tx:1330nm/Rx:1270nm /DFB, 20km, 12dB power budget
3886	SFPP-S12-40	SFP+ transceiver, multi-rate, SM, , SFS, Simplex LC, Tx:1270nm/Rx:1330nm/DFB, 40km, 16dB power budget
3887	SFPP-S13-40	SFP+ transceiver, multi-rate, SM, , SFS, Simplex LC, Tx:1330nm/Rx:1270nm/DFB, 40km, 16dB power budget
3875	SFPP-S12-60	SFP+ transceiver, multi-rate, SM, SFS,, Simplex LC,Tx:1270nm/Rx:1330nm /DFB, 60km, 21dB power budget
3876	SFPP-S13-60	SFP+ transceiver, multi-rate, SM, , SFS, Simplex LC,Tx:1330nm/Rx:1270nm /DFB, 60km, 21dB power budget
3888-XX	SFPP-C8-XX	SFP+ transceiver, multi-rate, CWDM, Duplex LC, 1XX0nm (1270-1330nm)/EML, 8km, 10dB power budget
3889-XX	SFPP-C10-XX	SFP+ transceiver, multi-rate, CWDM, Duplex LC, 1XX0nm (1470-1610nm)/EML, 10km, 10dB power budget
3890-XX	SFPP-C30-XX	SFP+ transceiver, multi-rate, CWDM, Duplex LC, 1XX0nm (1470-1610nm)/EML, 30km, 14dB power budget
3891-XX	SFPP-C70-XX	SFP+ transceiver, multi-rate, CWDM, Duplex LC, 1XX0nm (1470-1610nm)/EM, 70km, 23dB power budget
3892-XX	SFPP-D-40-XX	SFP+ transceiver, multi-rate, DWDM, Duplex LC, C-band/ITU channel XX/100GHz/EML, 40km, 14dB power budget
3893-XX	SFPP-D-80-XX	SFP+ transceiver, multi-rate DWDM, Duplex LC, C-band/ITU channel XX/100GHz/EML, 80km, 23dB power budget
3894-XX	SFPP-D-100-XX	SFP+ transceiver, DWDM, Duplex LC, C-band/ITU channel XX/100GHz/EML, 25dB power budget, 100km dispersion compensated

Specifications are subject to change w/without prior notice

SFS= Single Fiber Strand

Optical Specifications

FXFP Transceivers

Model	Minimal Output Power	Maximum Output Power	Receive Sensitivity	Maximum Input Power	Wavelength nm	Distance Km
FXFP-85	-7,2 dBm	-1 dBm	11,1 dBm	1 dBm	850nm MM	60-300m
FXFP13-10	-3dBm	1 dBm	-13dBm	0.5dBm	1310DFB	5 -10
FXFP15-40	0 dBm	4 dBm	-16 dBm	0 dBm	1550EML/1550	10 -40
FXFP15-80	0 dBm	4 dBm	-23 dBm	-10 dBm	1550EML/APD/1550	35 -80
FXFP-S12/13-10	-5dBm	0dBm	-14 dBm	0.5dBm	Tx1270/1330Rx1330/1270DFB SFS	5-10
FXFP-S12/13-20	-2 dBm	3 dBm	-14 dBm	0.5dBm	Tx1270/1330Rx1330/1270DFB SFS	5-20
FXFP-S12/13-40	1 dBm	5 dBm	-15 dBm	0.5dBm	Tx1270/1330Rx1330/1270DFB SFS	10-40
FXFP-S12/13-60	1 dBm	5 dBm	-2 dBm 0	-6 dBm	Tx1270/1330Rx1330/1270DFB SFS	20-60
FXFP-40D-XX	-1 dBm	2 dBm	-15 dBm	0.5 dBm	XX= DWDM ITU GRID	10 -40
FXFP-80D-XX	0 dBm	4 dBm	-23 dBm	-7 dBm	XX= DWDM ITU GRID	35 -80
FXFP-30C-XX	-0.9 dBm	4 dBm	-15 dBm	0.5 dBm	XX =CWDM 1470-1610nmEML	10 -30
FXFP-70C-XX	0 dBm	4 dBm	-23 dBm	-9 dBm	XX=CWDM 1470-1610nm	30-70

SFP+ Transceivers

Model	Minimal Output Power	Maximum Output Power	Receive Sensitivity	Maximum Input Power	Wavelength nm	Distance Km
SFPP-85	-6 dBm	-1 dBm	-11,1 dBm	-1 dBm	850 MM	300m
SFPP-13-10	-6 dBm	0 dBm	-14,4 dBm	0.5d Bm	1310 DFBSM	5 -10
SFPP-15-40	0 dBm	4 dBm	-15.8 dBm	0 dBm	1550 EML SM	10 - 40
SFPP-15-80	0 dBm	5 dBm	-23 dBm	-8 dBm	1550 EML	3 – 80
SFPP-15-100	1.5 dBm	5 dBm	-24.5 dBm	-8 dBm	1550 EML	80-100
SFPP-S12-20	-2 dBm	3 dBm	-14 dBm	0.5 dBm	Tx1270DFB/Rx1330	5-20
SFPP-S13-20	-2 dBm	3 dBm	-14 dBm	0.5 dBm	Tx1330DFB/Rx1270	5-20
SFPP-S12-40	1 dBm	5 dBm	-15 dBm	0.5 dBm	Tx1270DFB/Rx1330 SFS	10-40
SFPP-S13-40	1 dBm	5 dBm	-15 dBm	0.5 dBm	Tx1330DFB/Rx1330 SFS	10-40
SFPP-S12-60	1 dBm	6 dBm	-20 dBm	-6 dBm	Tx1270DFB/Rx1330 SFS	20-60
SFPP-S13-60	1 dBm	6 dBm	-20 dBm	-6 dBm	Tx1330DFB/Rx1330 SFS	20-60
SFPP C-70 XX	0 dBm	4 dBm	-23 dBm	-8 dBm	CWDM: 1XX0nm(1470-`1610)	50-70
SFPP-C8-XX	-5 dBm	0 dBm	-15 dBm	0.5 dBm	1270nm to 1330nm/EML	2 -8
SFPP-C10 XX	-5 dBm	0 dBm	-15 dBm	0.5 dBm	1470nm to 1610nm/EML	2 -10
SFPP-C30-XX	-1 dBm	+4 dBm	-15 dBm	+0.5 dBm	1470nm to 1610nm/EML	10 -30
SFPP-D-40-XX	-2 dBm	+4 dBm	-16 dBm	+0.5 dBm	DWDM ITU GRID/EML	10 -40
SFPP-D-80-XX	0 dBm	+5 dBm	-23 dBm	-6 dBm	DWDM ITU GRID/EML	35 -80
SFPP-D-100-XX	0 dBm	5 dBm	-25 dBm	6 dBm	DWDM ITU GRID	80-100

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Related Product

Model	Part#	Description
GA10	3850	10 GE (LAN) NTU/extender, 2 XFP ports, 1 management slot, 19" 1RU, 1 removable AC PS, redundant PS optional
GA10-48	3851	10 GE (LAN) NTU/extender, 2 XFP ports, 1 management slot, 19" 1RU, 1 removable DC PS, ST (screw terminal) connector , redundant PS optional
MS-CH/A	2100	*MetroStar* Chassis, 3U, 16 slots, including 2 AC Power Supplies, 6*BP-01, 1*BP-02, 19" Rack-mount bracket set (*MetroStar* with DC Power Supplies is also available)
MCM1000X	2650	Flexible Gigabit Ethernet conversion module for *MetroStar* with 2 SFP modular ports, each may accept any Fibrolan copper or fiber SFP transceiver, MA management
MCM1000X-RL	2651	Any to Any link protection Gigabit Ethernet conversion module for *MetroStar* with 4 SFP modular ports, each may accept any Fibrolan copper or fiber SFP transceiver, MA
MSM2500U	2519	Universal Extender module, 100Mbps to 2.5Gbps, includes 2 SFP slots (Only Fibrolan SFP transceivers can be used)
MSM4000U	2521	Universal Extender module, 100Mbps to 4.0Gbps, includes 2 SFP slots, (Only Fibrolan SFP transceivers can be used).
MSM10G-U	2555	Multi-rate, Universal (protocol transparent) extender/transponder MetroStar module, 1Gbps to 10Gbps, 2 SFP+ slots
MSM10G-R	2556	Multi-rate, Universal (protocol transparent) extender/transponder MetroStar module, 1Gbps to 10Gbps, 4 SFP+ slots, 3R w/ protection
MSM12G-R	2557	Multi-rate, Multi-protocol extender/transponder MetroStar module, 1Gbps to 12.5Gbps, 4 SFP+ slots, 3R w/ protection
GSM1000X	3750	MA Managed Gigabit Ethernet converter/access device/extender with 2 SFP modular ports, each may accept any Fibrolan copper or fiber SFP transceiver.
U.CON2500	B266	Universal Extender , 100Mbps to 2.5Gbps, includes 2 SFP slots (Only Fibrolan SFP transceivers can be used)
U.CON40000	B315	Universal Extender , 100Mbps to 4.0Gbps, includes 2 SFP slots (Only Fibrolan SFP transceivers can be used)