

SFPS-MX Series

SFP Multi-Mode, Single Fiber transceiver



Product description

The SFPS-MX series is high performance multi-rate module for Gigabit Ethernet fiber communications by using 1310nm/1550nm transmitter and 1550nm/1310nm receiver. It is with the SFP 20-pin connector to allow hot plug capability.

The transmitter section uses a multiple quantum well A type/ B type laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated B type/ A type detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

The SFPS-MX series are designed to be compliant with SFF-8472 SFP Multi-source Agreement (MSA).

Features

- Data Rate up to 1.25Gbps
- A type: 1310nm FP Tx/1550nmRx
- B type: 1550nm FP Tx/1310nmRx
- 550m with 50/125µm MMF
- Single 3.3V power supply and TTL logic interface
- Hot-Pluggable SFP Footprint
- Simplex LC connector interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- MSA Compliant
- Compliant with SFF-8472

Applications

- Gigabit Ethernet switches and routers
- Fiber Channel switch infrastructure



All product specifications are subject to change without notice to improve reliability, function or design or otherwise.

Opticonnect SYSTEMS B.V., an Optical Networking vendor with its headquarters in the Netherlands, provides Optical Transport solutions and Optical Transceivers at the best price performance ratio possible. Our goal is to simplify the planning, deployment and maintenance of

complex Optical Networks. This is achieved by our user friendly planning apps and information, sophisticated products and transparent support. Relying on our superior product quality, all items are supplied with life time warranty.

Ordering information

Part no.	Data rate	Wavelength	Interface	Temp.	DDMI
SFPS-MX-3155D	1.25Gbps	1310nm	LC	Standard	YES
SFPS-MX-5531D	1.25Gbps	1550nm	LC	Standard	YES
SFPS-MX-3155DI	1.25Gbps	1310nm	LC	Industrial	YES
SFPS-MX-5531DI	1.25Gbps	1550nm	LC	Industrial	YES

Note1: Standard version

Regulatory compliance

Feature	Standard	Performance
Electrostatic discharge (ESD) to the electrical pins	MIL-STD-883G Method 3015.7	Class 1C (>1000 V)
Electrostatic discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compatible with standards.
Electromagnetic interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compatible with standards. Noise frequency range: 30 MHz to 6 GHz. Good system EMI design practice required to achieve Class B margins. System margins are dependent on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compatible with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. No effect on transmitter/receiver performance is detectable between these limits.
Laser eye safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1:2007 EN (IEC) 60825-2:2004+A1	CDRH compliant and Class I laser product. TüV Certificate No. 50135086
Component recognition	UL and CUL EN60950-1:2006	UL file E317337 TüV Certificate No. 50135086 (CB scheme)
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards* ^{note2}

Note2: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1th, 2007, which meet the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.

In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for Opticonnect's transceivers, because Opticonnect's transceivers use glass, which may contain Pb, for components such as lenses, windows, isolators, and other electronic components.

Absolute maximum ratings

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	T_s	-40	+85	°C
Supply voltage	V_{CC}	-0.5	3.6	V
Operating relative humidity		-	95	%

*Exceeding any one of these values may destroy the device immediately.

Recommended operating conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	
Operating case temperature	T_c	SFPS-MX-xxxxD	0		+70	°C
		SFPS-MX-xxxxDI	-40		+85	
Power supply voltage	V_{CC}	3.15	3.3	3.45	V	
Power supply current	I_{CC}			300	mA	
Data rate	GbE		1.25		Gbps	
	1GFC		1.063		Gbps	

Performance specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
LVPECL Inputs (differential)	V_{in}	400		2000	mVpp	AC coupled inputs ^{*(note5)}
Input impedance (differential)	Z_{in}	85	100	115	ohms	$R_{in} > 100$ kohms @ DC
Tx_Dis	Disable	2		V_{CC}	V	
	Enable	0		0.8		
Tx_FAULT	Fault	2		$V_{CC}+0.3$	V	
	Normal	0		0.5		
Receiver						
LVPECL Outputs (differential)	V_{out}	370		2000	mVpp	AC coupled outputs ^{*(note5)}
Output impedance (differential)	Z_{out}	85	100	115	ohms	
Rx_LOS	LOS	2		$V_{CC}+0.3$	V	
	Normal	0		0.8	V	
MOD_DEF (0:2)	VoH	2.5			V	With serial ID
	VoL	0		0.5	V	

Optical and electrical characteristics (SFPS-MX-3155, 1310nm FP and PIN, 550m)

Parameter	Symbol	Min.	Typical	Max.	Unit
50µm Core diameter MMF	L		0.55		km
Data rate			1.063/1.25		Gbps
Transmitter					
Centre wavelength	λ_c	1260	1310	1360	nm
Spectral width (RMS)	$\Delta\lambda$			4	nm
Average output power*(note3)	Pout	-9.5		-3	dBm
Extinction ratio*(note4)	ER	6			dB
Rise/Fall time(20%~80%)	t_r / t_f			0.26	ns
Total jitter	TJ			56.5	ps
Output optical eye*(note4)	Compatible with IEEE 802.3ah-2004*(note7)				
TX_Disable assert time	t_{off}			10	µs
Pout@TX Disable asserted	Pout			-45	dBm
Receiver					
Centre wavelength	λ	1500	1550	1580	nm
Receiver sensitivity*(note6)	GbE	Pmin		-21	dBm
	1GFC			-22	dBm
Receiver overload	Pmax	-3			dBm
LOS De-Assert	LOSD			-23	dBm
LOS assert	LOSA	-45			dBm
LOS hysteresis*(note8)		0.5			dB

(SFPS-MX-5531, 1550nm FP and PIN, 550m)

Parameter	Symbol	Min.	Typical	Max.	Unit
50µm Core diameter MMF	L		0.55		km
Data rate			1.25		Gbps
Transmitter					
Centre wavelength	λ_c	1500	1550	1580	nm
Spectral width (RMS)	$\Delta\lambda$			4	nm
Average output power*(note3)	Pout	-9.5		-3	dBm
Extinction ratio*(note4)	ER	6			dB
Rise/Fall time(20%~80%)	t_r / t_f			0.26	ns
Total jitter	TJ			56.5	ps
Output optical eye*(note4)	Compatible with IEEE 802.3ah-2004*(note7)				
TX_Disable assert time	t_{off}			10	µs
Pout@TX disable asserted	Pout			-45	dBm

Parameter	Symbol	Min.	Typical	Max.	Unit
Receiver					
Centre wavelength	λ	1260	1310	1360	nm
Receiver sensitivity*(note6)	GbE	Pmin		-21	dBm
	1GFC			-22	dBm
Receiver overload	Pmax	-3			dBm
LOS De-Assert	LOSD			-23	dBm
LOS Assert	LOSA	-45			dBm
LOS Hysteresis*(note8)		0.5			dB

Note3: Output is coupled into a 50/125 μ m Multi-mode fiber.

Note4: Filtered, measured with a PRBS 2⁷-1 test pattern @1.25Gbps

Note5: LVPECL logic, internally AC coupled.

Note6: Measured at all data rates specified in Data Rate table with ER=9 dB, 2⁷-1 PRBS data pattern, BER <1E-12.

Note7: Eye pattern mask

Note8: LOS Hysteresis

