

## SFP-SX



SFP Multi-Mode 850nm 1xFC /GBE  
Transceiver Dual Fiber



### Product Description

The SFP-SX multi-mode transceiver is a small form factor pluggable module for bi-directional serial optical data communications such as Gigabit Ethernet 1000BASE-SX and Fiber Channel FC-PH-2 for 100-M5-SN-1 and 100-M6-SN-1. With its 20-pin connector it allows hot plug capability. This module is designed for multi-mode fiber and operates at a nominal wavelength of 850nm.

The transmitter section uses a Vertical Cavity Surface Emitted Laser (VCSEL) which is a Class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated GaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

### Features

- Data Rate up to 1.25Gbps
- 850nm VCSEL Laser Transmitter
- 550m with 50/125µm MMF
- 300m on 62.5/125µm MMF
- Compliant with SFP MSA Specification

### Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch Interface
- Other Optical Links

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*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	Fiber	Distance	Interface	Temperature	DDMI
SFP-SX	1.25Gbps	MMF	550m	LC	Standard	NO

## 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	Compliant with Standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compliant with Standards Noise frequency range: 30MHz to 6GHz. 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	Compliant with standards. 1KHz sine-wave, 80% AM, from 80MHz to 1GHz. 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 <sup>*note1</sup>

Note 1: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1st, 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, isolators, and other components.

## Absolute Maximum Ratings\*

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T <sub>s</sub>	-40	+85	°C
Supply Voltage	V <sub>CC</sub>	-0.5	3.6	V
Operating Relative Humidity		-	95	%

\*Note 2: Exceeding any one of these values may destroy the device immediately.

## Recommended Operating Conditions

Parameter		Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature		$T_c$	0		+70	°C
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
	FC			1.063		

## Performance Specifications - Electrical

Parameter		Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter							
LVPECL Inputs(Differential)		$V_{in}$	500		2000	mVpp	AC coupled inputs*note3
Input Impedance (Differential)		$Z_{in}$	85	100	115	ohm	$R_{in} > 100 \text{ kohm @ DC}$
TX Disable	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 output*note3
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 ( 2:0 )		VoH	2.5			V	With Serial ID
		VoL	0		0.5	V	

## Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
50µm Core Diameter MMF	L		550		m
Data Rate			1.063/1.25		Gbps
Transmitter					
Center Wavelength	$\lambda_c$	830	850	860	nm
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm
Average Output Power*note4	Pout	-9.5		-3	dBm
Extinction Ratio*note5	ER	9			dB
Rise/Fall Time(20%~80%)	tr/tf			260	ps
Total Jitter*(note5)	TJ			0.43	UI
Output Optical Eye*note5	IEEE802.3z and ANSI Fiber Channel Compliant*note7				
TX Disable Assert Time	t_off			10	us
Receiver					
Center Wavelength	$\lambda_c$	760		860	nm
Receiver Sensitivity*note6	Pmin			-17	dBm
Receiver Overload	Pmax	-3			dBm
Return Loss		12			dB
LOS De-Assert	LOSD			-18	dBm
LOS Assert	LOSA	-35			dBm
LOS Hysteresis*note8		1			dB

Note3: LVPECL logic, internally AC coupled.

Note4: Output is coupled into a 62.5/125 mm multi-mode fiber.

Note5: Filtered, measured with a PRBS 27-1 test pattern @1.25Gbps.

Note6: Minimum average optical power measured at BER less than 1E-12, with a 27-1 PRBS and ER=9 dB.

Note7: Eye Pattern Mask.

Note8: LOS Hysteresis