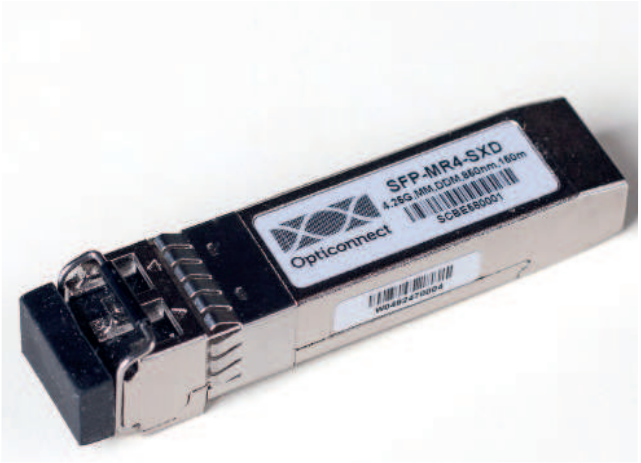
SFP-MR4-SXD

SFP Multi-Mode, Dual Fiber Transceiver
for 4X/2X/1X Fiber Channel



Features

- Up to 4.25 Data Rate
- 40km with 9/125 µm SMF
- 80km with 9/125 µm SMF
- Digital Diagnostics

Applications

- Fiber Channel Links
- Gigabit Ethernet Links
- Fast Ethernet Links
- Other Optical Links

Product Description

The SFP-MR4-SXD series multi-mode transceiver is small form factor pluggable module for duplex optical data communications such as 4X/2X/1X Fiber Channel and Gigabit Ethernet 1000BASE-SX. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for multi-mode fiber and operates at a nominal wavelength of 850 nm.
The transmitter section uses a Vertical Cavity Surface Emitted Laser (VCSEL) and 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.
The SFP-MR4-SXD series are designed to be compliant with SFF-8472 Multi-source Agreement (MSA).

For more information please contact:

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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*(note1)	Interface	Temperature	DDMI
SFP-MR4-SXD	4.25Gbps	MMF	150m	LC	Standard	YES

Note1: 150m with 50/125 μm MMF

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*note2

Note 2: 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, Item 13: 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	Ts	-40	+85	°C
Supply Voltage	Vcc	-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_A	SFP-MR4-SXD	0		+70	°C
Power Supply Voltage		Vcc		3.15	3.3	3.45	V
Power Supply Current		Icc				300	mA
Date Rate	4xFC				4.25		Gbps
	OC-48				2.5		
	2xFC				2.125		
	GBE				1.25		
	FC				1.063		

Performance Specifications - Electrical

Parameter		Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter							
CML Inputs(Differential)		Vin	400		1600	mVpp	AC coupled inputs*(note3)
Input Impedance (Differential)		Zin	85	100	115	ohm	Rin > 100 kohm @ DC
TX_Dis	Disable		2		Vcc+0.3	V	
	Enable		0		0.8		
TX_FAULT	Fault		2		Vcc+0.3	V	
	Normal		0		0.8		
Receiver							
CML Outputs (Differential)		Vout	400	800	1200	mVpp	AC coupled output*(note4)
Output Impedance (Differential)		Zout	85	100	115	ohm	
RX_LOS	LOS		2		Vcc+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

Parameter		Symbol	Min.	Typical	Max.	Unit
50µm Core Diameter MMF	4xFC	L		150		m
	2xFC			300		
	GBE/FC			500		
62.5µm Core Diameter MMF	4xFC	L		70		m
	2xFC			150		
	GBE/FC			300		
Data Rate	4xFC			4.25		Gbps
	2xFC			2.125		
	GBE			1.25		
	FC			1.063		
Transmitter						
Center Wavelength		λ_C	830	850	860	nm
Spectral Width (RMS)		Δλ			0.85	nm
Average Output Power*(note5)		Pout	-9		0	dBm
Extinction Ratio@4.25Gb/s		ER	5			dB

Rise/Fall Time(20%～80%)		tr/tf			90	ps
Output Optical Eye*(note6)		Complies with ANSI FC-PI specification*(note8)				
TX_Disable Assert Time		t_off			10	us
Receiver						
Center Wavelength		λ_C	760		860	nm
Receiver Sensitivity*(note7)	4xFC	Pmin			-15	dBm
	2xFC				-18	
	GBE/FC				-20	
Receiver Overload		Pmax	-3			dBm
Return Loss			12		dB	
LOS De-Assert		LOSD			-16	dBm
LOS Assert		LOSA	-30			dBm
LOS Hysteresis*(note9)			1			dB

Note3: Internally AC coupled, and terminated to 100Ω differential load.
Note4: AC-coupled CML logic family
Note5: Output power is power coupled into a 62.5/125 μm multi-mode fiber.
Note6: Filtered, measured with a PRBS 27-1 test pattern @4.25Gbps
Note7: Minimum average optical power at BER less than 1E-12, with a 27-1 NRZ PRBS and ER=9 dB.
Note8: Eye Pattern Mask
Note9: LOS Hysteresis