

## SFP-MR25-LX/LXD-EX/EXD

SFP Single-Mode, Dual fiber transceiver  
1310nm for SDH/SONET RoHS6 compliant



### Product description

The SFP-MR25-LX-EX series single mode transceiver is small form factor pluggable module for dual fiber data communications such as Gigabit Ethernet 1000BASE-LX and Fiber Channel 1x/2x SM-LC-L FC-PI. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for single mode fiber and operates at a nominal wavelength of 1310nm.

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

The SFP-MR25-LXD-EXD series are designed to be compliant with SFF-8472 Multi-source Agreement (MSA).

### Features

- Data rate up to 2.5Gbps
- 10km with 9/125µm SMF
- 15km with 9/125µm SMF
- 40km with 9/125µm SMF
- Single 3.3V Power supply and TTL Logic Interface
- Hot-Pluggable SFP Footprint
- Duplex LC Connector Interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- Operating case temperature Standard: 0°C ~ 70°C
- Compliant with SFP MSA Specification
- Compliant with SFF-8472

### Applications

- STM16 Optical Interface
- 1GFC/2x1GFC
- Switch to Switch Interface
- 1.25Gbps 1000Base-LX Ethernet
- Other Optical Links



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	Fiber	Distance <sup>*(note2)</sup>	Interface	Temperature	DDMI
SFP-MR25-LX <sup>*(note1)</sup>	2.5Gbps	SMF	10km	LC	Standard	NO
SFP-MR25-LXD	2.5Gbps	SMF	10km	LC	Standard	YES
SFP-MR25-EX <sup>*(note1)</sup>	2.5Gbps	SMF	40km	LC	Standard	NO
SFP-MR25-EXD	2.5Gbps	SMF	40km	LC	Standard	YES

Note1: Standard version

Note2: With 9/125µm SMF, assuming worst case fiber loss of 0.35dB/km

## Regulatory compliance

Product certificate	Certificate number	Applicable standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12
		EN 60825-1:2007
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50135430 0001	EN 55022:2006
		EN 55024:1998+A1+A2
CB	JPTUV-024038-M1	IEC 60825-2
		IEC 60950-1
FCC	WTF13F0503735E	47 CFR PART 15 OCT., 2010
	WTF13F0503732E	47 CFR PART 15 OCT., 2010
FDA	1230816-000	CDRH 1040.10
ROHS	RLSZF00163462	2011/65/EU

## 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	%	

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

## Recommended operating conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating case temperature	T <sub>c</sub>	0		+70	°C
	SFP-MR25-LXD-EXD				
Power supply voltage	V <sub>cc</sub>	3.15	3.3	3.45	V
Power supply current	I <sub>cc</sub>			300	mA

Parameter		Symbol	Min.	Typical	Max.	Unit
Date rate	OC-48/STM-16			2.488		Gbps
	2×1GFC			2.125		
	GbE			1.25		
	1GFC			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 kohms @ 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 outputs*(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	
	VoL	0		0.5	V	With Serial ID

### Optical and Electrical Characteristics

(1310nm FP and PIN, 10km)

Parameter	Symbol	Min.	Typical	Max.	Unit
9µm Core Diameter SMF	L	15			km
Data Rate			2.5		Gbps
Transmitter					
Centre Wavelength	$\lambda_c$	1260	1310	1360	nm
Spectral Width (RMS)	$\Delta\lambda$			3	nm
Average Output Power*(note5)	Pout	-11.7		-3	dBm
Extinction Ratio*(note6)	ER	8.2			dB
Rise/Fall Time(20% ~ 80%)	tr/tf			260	ps
Output Optical Eye*(note6)	ITU-T G.957 Compliant*(note8)				
TX_Disable Assert Time	t_off			10	µs
Pout@TX Disable Asserted	Pout			-45	dBm

Parameter		Symbol	Min.	Typical	Max.	Unit
Receiver						
Centre Wavelength		$\lambda_c$	1260		1600	nm
Receiver sensitivity*(note7)	OC-48/STM-16	Pmin			-18	dBm
	2×1GFC				-18	
	GbE				-22	
	1GFC				-22	
Receiver Overload		Pmax	-3			dBm
Reflection					-27	dB
LOS De-Assert		LOSD			-19	dBm
LOS Assert		LOSA	-40			dBm
LOS Hysteresis*(note9)			0.5			dB

**(1310nm DFB and APD, 40km)**

Parameter		Symbol	Min.	Typical	Max.	Unit
9µm Core Diameter SMF		L	40			km
Data Rate			1		2.5	Gbps
Transmitter						
Centre Wavelength		$\lambda_C$	1260	1310	1360	nm
Spectral Width (-20dBm)		$\Delta\lambda$			1	nm
Side Mode Suppression Ratio		SMSR	30			dB
Average Output Power*(note5)		Pout	-2		+3	dBm
Extinction Ratio*(note6)		ER	8.2			dB
Rise/Fall Time(20% ~ 80%)		tr/tf			260	ps
Output Optical Eye*(note6)		ITU-T G.957 Compliant*(note8)				
TX_Disable Assert Time		t_off			10	µs
Pout@TX Disable Asserted		Pout			-45	dBm
Receiver						
Centre Wavelength		$\lambda_C$	1260		1600	nm
Receiver Sensitivity*(note7)	OC-48/STM-16	Pmin			-27	dBm
	2×1GFC				-27	
	GbE				-29	
	1GFC				-29	
Receiver Overload		Pmax	-9			dBm
Reflection					-27	dB
LOS De-Assert		LOSD			-28	dBm
LOS Assert		LOSA	-40			dBm
LOS Hysteresis*(note9)			0.5			dB

Note3: LVPECL logic, internally AC coupled and terminated to 100 differential loads.

Note4: CML logic, internally AC coupled.

Note5: Output is coupled into a 9/125µm single-mode fiber.

Note6: Filtered, measured with a PRBS  $2^{23}-1$  test pattern @2.488Gbps.

Note7: Minimum average optical power measured at BER less than  $1E-12$ , with a  $2^{23}-1$  PRBS and ER=9dB.

Note8: Eye pattern mask

Note9: LOS Hysteresis

