

LP-OSFPSR02D LC duplex 10GBASE-SR MM Multimode OM3/4 Fiber SFP+ 850nm MSA Transceiver up to 300m

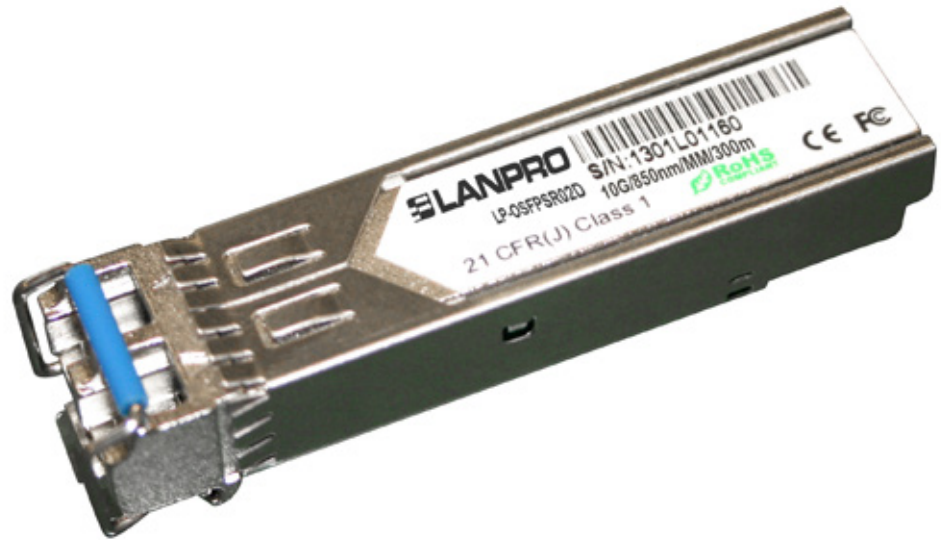
LPOSFPSR02D_SS_ENB01W

Features

- Optical interface compliant to IEEE 802.3ae 10GBASE-SR.
- Electrical interface compliant to SFF-8431.
- Hot Pluggable.
- 850nm VCSEL transmitter, PIN photo-detector.
- Maximum link length of 300m on 2000MHz/km MMF.
- Operating case temperature: 0 to 70°C.
- Low power consumption.
- All-metal housing for superior EMI performance.
- Advanced firmware allows customer system encryption information to be stored in transceiver.
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth.

Applications

- 10GBASE-SR at 10.3125Gbps.
- 10GBASE-SW at 9.953Gbps.
- Other optical links.



**LP-OSFPSR02D
LC duplex 10GBASE-SR MM Multimode
OM3/4 Fiber SFP+ 850nm
MSA Transceiver up to 300m**

This 850 nm VCSEL 10Gigabit SFP+ transceiver is designed to transmit and receive optical data over 50/125 μm or 62.5/125 μm multimode optical fiber (Table 1).

Fiber type	Minimum modal bandwidth @850nm (MHz*km)	Operating range (meters)
62.5 μm MMF	160	2 to 26
	200	2 to 33
50 μm MMF	400	2 to 66
	500	2 to 82
	2000	2 to 300

Table 1: SFP+ SR Operating Range for each Optical Fiber type

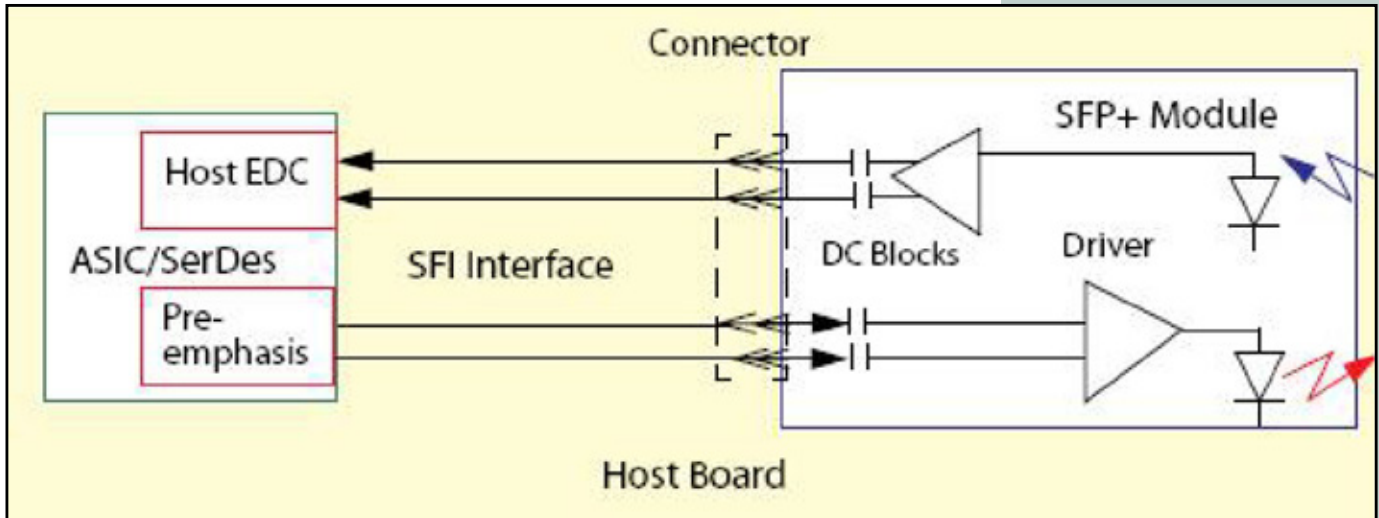


Figure 1: Interface to Host

A Pin definition

The SFP+ modules are hot-pluggable. Hot pluggable refers to plugging in or unplugging a module while the host board is powered. The SFP+ host connector is a 0.8 mm pitch 20 position right angle improved connector specified by SFF-8083, or stacked connector with equivalent with equivalent electrical performance. Host PCB contact assignment is shown in Figure 2 and contact definitions are given in Table 2. SFP+ module contacts mates with the host in the order of ground, power, followed by signal as illustrated by Figure 3 and the contact sequence order listed in Table 2.

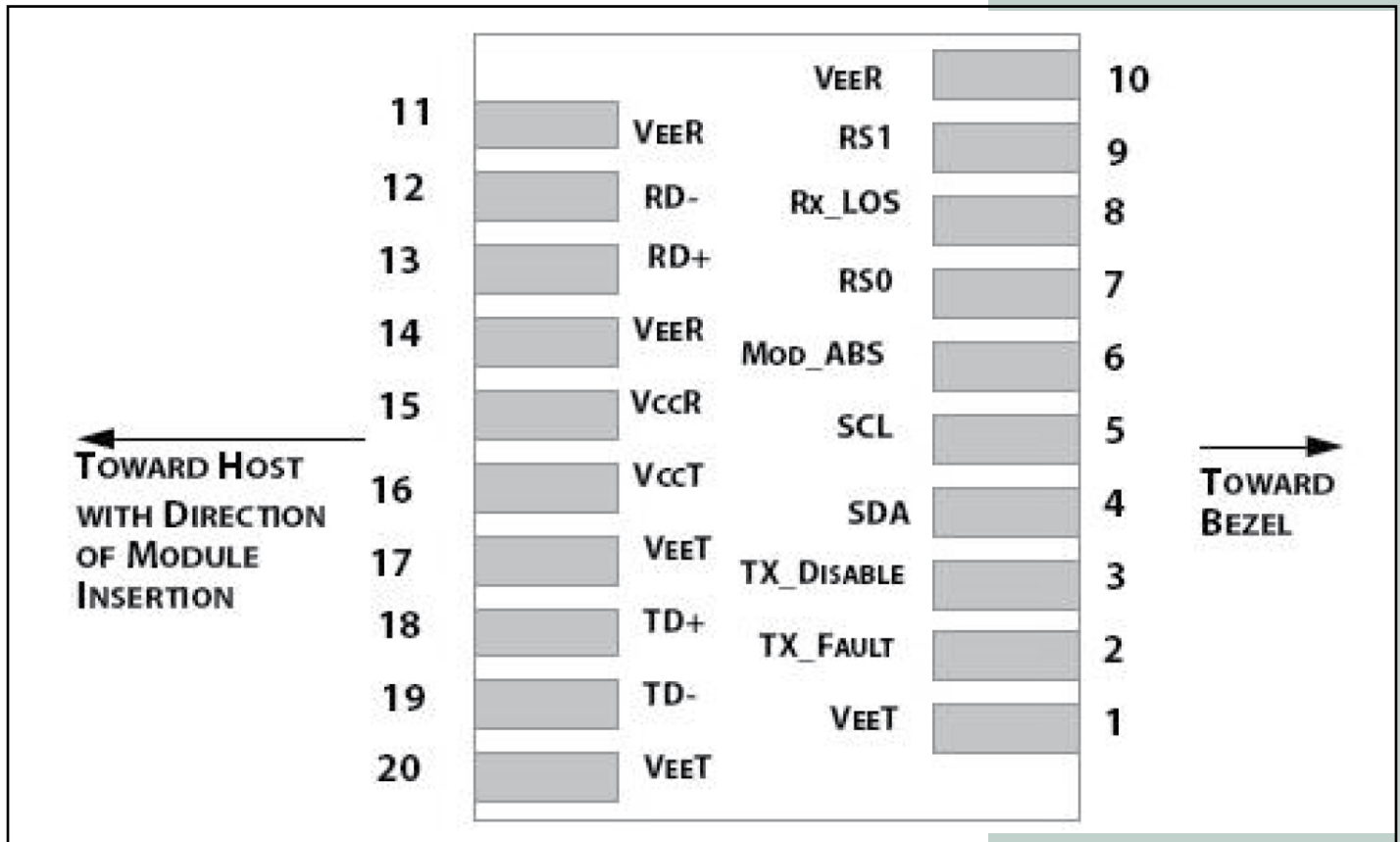


Figure 2: Interface to Host PCB

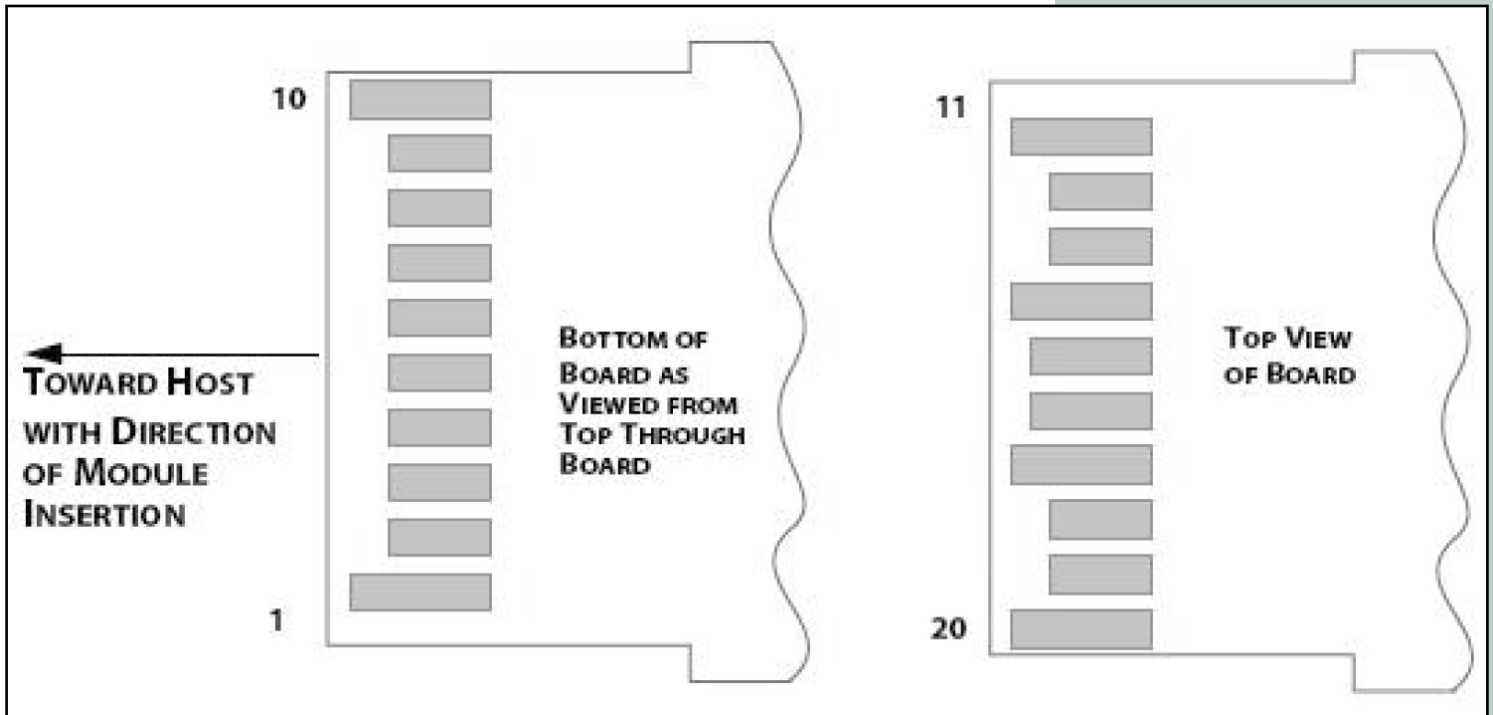


Figure 3: Module contact Assignment

Contacts	Logic	Symbol	Power Sequence Order	Name/ Description
1		Veet	1st	Module Transmitter ground
2	LVTTTL-O	TX_Fault	3rd	Module Transmitter fault
3	LVTTTL-I	TX_Disable	3rd	Transmitter disable; turns off transmitter laser output
4	LVTTTL-I/O	SDA	3rd	2-Wire serial interface data line (same as MOD-DEF2 in the INF-8074i)
5	LVTTTL-I/O	SCL	3rd	2-Wire serial interface data line (same as MOD-DEF1 in the INF-8074i)
6		Mod_ABS	3rd	Module absent, connected to Veet or VeeR in the module
7	LVTTTL-I	RS0	3rd	Rate select, 0 optionally controls SFP+ module receiver. When high input signaling rate > 4.25 GBd and when low input signaling rate ≤ 4.25 GBd
8	LVTTTL-O	Rx_LOS	3rd	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as signal detect)
9	LVTTTL-I	RS1	3rd	Rate Select 1, optionally controls SPFF+ transmitter. When high input signaling rate
10		VeeR	1st	Module Receiver Ground
11		VeeR	1st	Module Receiver Ground

Contacts	Logic	Symbol	Power Sequence Order	Name/ Description
12	CML-O	RD-	3rd	Receiver inverted data output
13	CML-O	RD+	3rd	Receiver non-inverted data output
14		VeeR	1st	Module receiver ground
15		VccR	2nd	Module Receiver 3.3 V Supply
16		VccT	2nd	Module transmitter 3.3 V Supply
17		VeeT	1st	Module transmitter ground
18	CML-I	TD+	3rd	Transmitter Non-inverted data input
19	CML-I	TD-	3rd	Transmitter inverted data input
20		VeeT	1st	Module transmitter ground

Figure 3: Module contact Assignment

B Absolute maximum rating

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	0	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Operating Case Temperature	Tc	0	+70	°C
Relative Humidity	RH	5	95	%
RX Input Average Power	Pmax	-	0	dBm

Table 3: Absolute Maximum rating

C Recommended operating environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameter	Symbol	Min.	Typical	Max	Unit
Power Supply Voltage	VCC	3.135	3.3	3.465	V
Operating Case Temperature	TC	0	25	70	°C

Table 4: Recommended Operating Environment

D Optical characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ_t	840	850	860	nm	
RMS spectral width	P_m	-	-	Note 1	nm	
Average Optical Power	P_{avg}	-6.5	-	-1	dBm	2
Extinction Ratio	ER	3.5	-	-	dB	3
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	
Relative Intensity Noise	R_{in}	-	-	-128	dB/Hz	12dB reflection
Optical Return Loss Tolerance		-	-	12	dB	
Receiver						
Center Wavelength	λ_r	840	850	860	nm	
Receiver Sensitivity	P_{sens}	-	-	-11.1	nm	4
Stressed Sensitivity in OMA		-	-	-7.5	dBm	4
Los function	Los	-30	-	-12	dB	
Overload	P_{in}	-	-	-1.0	dB	4
Receiver Reflectance		-	-	-12	dB/Hz	

Table 5: Optical Characteristics

Note 1.

- Trade-offs are available between spectral width, center wavelength and minimum OMA, as shown in table 6.
- The optical power is launched into MMF
- Measured with a PRBS 231-1 test pattern @10.3125Gbps
- Measured with a PRBS 231-1 test pattern @10.3125Gbps, BER \leq 10⁻¹².

Center Wavelength (nm)	RMS Spectral width (nm)								
	Hasta 0.05	0.05 a 0.1	0.1 a 0.15	0.15 a 0.2	0.2 a 0.25	0.25 a 0.3	0.3 a 0.35	0.35 a 0.4	0.4 a 0.45
840 a 842	-4.2	-4.2	-4.1	-4.1	-3.9	-3.8	-3.5	-3.2	-2.8
842 a 844	-4.2	-4.2	-4.2	-4.1	-3.9	-3.8	-3.6	-3.3	-2.9
844 a 846	-4.2	-4.2	-4.2	-4.1	-4.0	-3.8	-3.6	-3.3	-2.9
846 a 848	-4.3	-4.2	-4.2	-4.1	-4.0	-3.8	-3.6	-3.3	-2.9
848 a 850	-4.3	-4.2	-4.2	-4.1	-4.0	-3.8	-3.6	-3.3	-3.0
850 a 852	-4.3	-4.2	-4.2	-4.1	-4.0	-3.8	-3.6	-3.4	-3.0
852 a 854	-4.3	-4.2	-4.2	-4.1	-4.0	-3.9	-3.7	-3.4	-3.1
854 a 856	-4.3	-4.3	-4.2	-4.1	-4.0	-3.9	-3.7	-3.4	-3.1
856 a 858	-4.3	-4.3	-4.2	-4.1	-4.0	-3.9	-3.7	-3.5	-3.1
858 a 860	-4.3	-4.3	-4.2	-4.2	-4.1	-3.9	-3.7	-3.5	-3.2

Table 6: Minimum 10GBASE-SR OMA as a function of wavelength and spectral width

E Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF8472 Rev9.2 with internal calibration mode. For external calibration mode please contact our sales staff.

Parameter	Symbol	Min.	Max	Unit	Notes
Temperature monitors absolute error	DMI_Temp	-3	+3	degC	Over operating temp
Laser power monitor absolute error	DMI_TX	-3	+3	dB	
RX power monitor absolute error	DMI_RX	-3	+3	dB	-3dBm to -12dBm range
Supply voltage monitor absolute error	DMI_VCC	-0.08	+0.08	V	Full operating range
Bias current monitor	DMI_Ibias	-0.08	10%	mA	

F Electrical characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Data Rate		-	10.3125	-	Gbps	
Power Consumption		-	600	800	mW	
Transmisor						
Single Ended Output Voltage Tolerance		-0.3	-	4.0	V	
C common mode voltage tolerance		15	-	-	mV	
Tx Input Diff Voltage	VI	180		1200	mV	
Tx Fault	VoL	-0.3		0.4	V	A 0.7mA
Data Dependent Input Jitter	DDJ			0.10	UI	
Data Input Total Jitter	TJ			0.28	UI	
Receptor						
Single Ended Output Voltage Tolerance		-0.3	-	4.0	V	
Rx Output Diff Voltage	Vo	300		850	mV	
Rx Output Rise and Fall Time	Tr/Tf	30			ps	20% a 80%
Total Jitter	TJ			0.70	UI	
Deterministic Jitter	DJ			0.42	UI	

Table 7: Electrical Characteristics

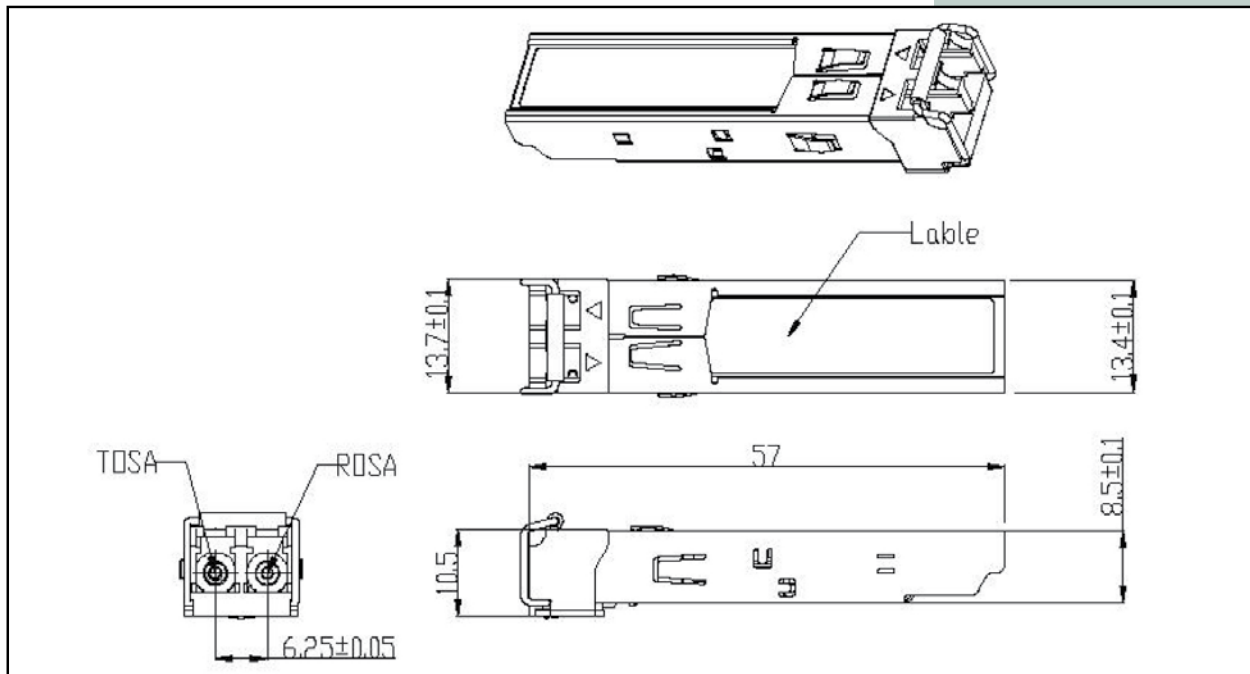


Figure 4: Key mechanical Dimensions

ESD

This transceiver is specified as ESD threshold 2kV for all electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

LASER SAFTY

This is a Class 1 Laser Product according to IEC 60825-1:1993: +A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (July 26, 2001)

G How to order

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