



XFD59040100D000

MSA 10GBase-DWDM XFP Transceiver 100GHz (SMF, 1534.25nm, 40km, LC, DOM)

Product Description

This MSA Compliant XFP transceiver provides 10GBase-DWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1534.25nm via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- INF-8077i Compliance
- Temperature-stabilized EML transmitter and PIN receiver
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 10x Gigabit Ethernet over DWDM
- Access, Metro and Enterprise
- 8x/10x Fibre Channel

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Wavelength Guide (100GHz ITU-T Channel)

Channel #	Frequency (THz)	Center Wavelength (nm)
17	191.7	1563.86
18	191.8	1563.05
19	191.9	1562.23
20	192.0	1561.42
21	192.1	1560.61
22	192.2	1559.79
23	192.3	1558.98
24	192.4	1558.17
25	192.5	1557.36
26	192.6	1556.55
27	192.7	1555.75
28	192.8	1554.94
29	192.9	1554.13
30	193.0	1553.33
31	193.1	1552.52
32	193.2	1551.72
33	193.3	1550.92
34	193.4	1550.12
35	193.5	1549.32
36	193.6	1548.51
37	193.7	1547.72
38	193.8	1546.92
39	193.9	1546.12
40	194.0	1545.32
41	194.1	1544.53
42	194.2	1543.73
43	194.3	1542.94
44	194.4	1542.14

45	194.5	1541.35
46	194.6	1540.56
47	194.7	1539.77
48	194.8	1538.98
49	194.9	1538.19
50	195.0	1537.40
51	195.1	1536.61
52	195.2	1535.82
53	195.3	1535.04
54	195.4	1534.25
55	195.5	1533.47
56	195.6	1532.68
57	195.7	1531.90
58	195.8	1531.12
59	195.9	1530.33
60	196.0	1529.55
61	196.1	1528.77

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	Vcc3	-0.5	4.0	V
	Vcc5	-0.5	6.0	V
Storage Temperature	TS	-40	85	°C
Operating Case Temperature	TO	0	70	°C
Relative Humidity	RH	5	95	%
Data Rate		9.95	11.3	Gb/s

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc3	3.135	3.3	3.465	V	
	Vcc5	4.75	5.00	5.25	V	
Power Supply Current	Icc3			750	mA	
	Icc5			500		
Power Dissipation	Pd			3500	mW	
Transmitter						
Differential data input swing	Vin,pp	120		1000	mVp-p	
Input differential impedance	Zin		100		Ω	
TX_Disable, P_Down/RST	VIH	2.0		Vcc3+0.3	V	
	VIL	-0.3		0.8	V	
Transmit Disable Assert Time				10	us	
Receiver						
Differential data output swing	Vout, pp	340		850	mVp-p	1
Output differential impedance	Zo		100		Ω	
Data Output Rise Time, Fall Time	tr, tf	24			ps	2
Rx_LOS, Mod-NR, Interrupt	VOH	VccHost-0.5		VccHost+0.3	V	3
	VOL	0		0.4	V	3

Notes:

1. Internally AC coupled, but requires an external 100 Ω differential termination.
2. 20-80%.
3. Loss of Signal is an open collector output. Should be pulled up with a 4.7k Ω -10k Ω resistor on the host board.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Launch Average Optical Power	Po	-1		+4	dBm	1
Center Wavelength Range	λ_c	1528.77		1563.86	nm	
Center Wavelength Spacing			100		GHz	
Center Wavelength Tolerance	$\Delta\lambda_c$	-100		100	pm	
Extinction Ratio	ER	9			dB	2
Spectral Width (-20dB)	$\Delta\lambda$			0.3	nm	
Side Mode Suppression Ratio	SMSR	30			dB	

Average Optical Power (Laser Off)	Poff			-30	dBm	1
Eye Diagram	ITU-T G.691 SDH STM-64 L-64.2 compatible					2
Receiver						
Center Wavelength	λc	1528		1565	nm	
Receiver Sensitivity @ 9.953Gb/s	S			-24.0	dBm	3
Receiver Sensitivity @ 11.1 Gb/s	S			-15	dBm	4
Receiver overload (Pavg)	POL	-1			dBm	3
Path Penalty @1600ps @9.953Gb/s	PP1			2	dB	3
Path Penalty @1600ps @11.1 Gb/s	PP2			3	dB	4
Optical Return Loss	ORL	27			dB	
LOS De-Assert	LOSD			-27	dBm	
LOS Assert	LOSA	-38			dBm	
LOS Hysteresis		0.5			dB	

Notes:

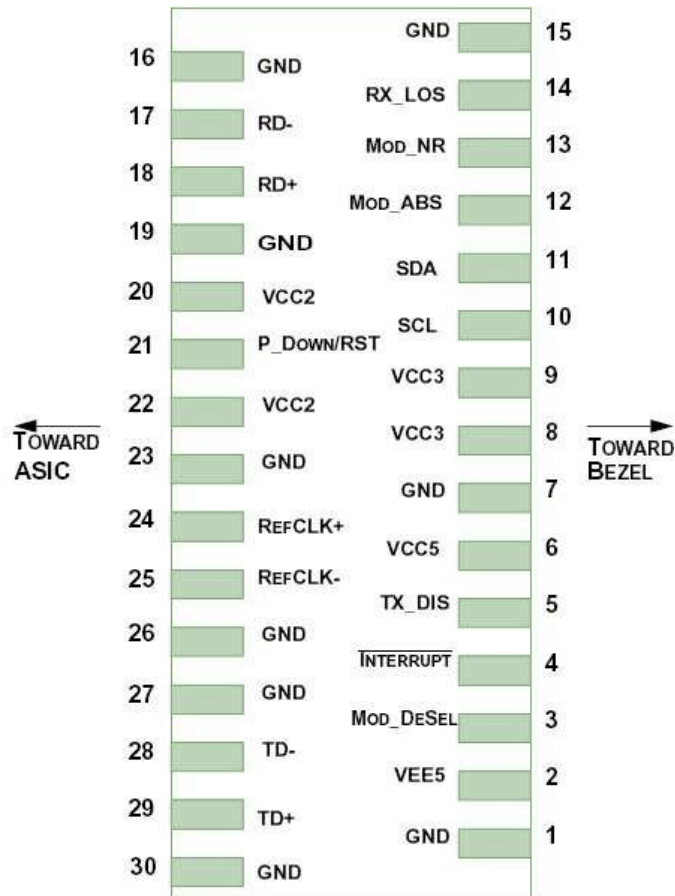
1. Measured with worst ER; 1550nm; PRBS 2³¹-1 test pattern @ 9.953 Gb/s, BER<10⁻¹².
2. Measured with worst ER; 1550nm; PRBS 2³¹-1 test pattern @ 11.1 Gb/s, BER<10⁻¹².

Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Module Ground	1
2		Vee5	Optional -5.2v Power Supply (not required)	
3	LVTTL-I	MOD_DESEL	Module De-select; When Held low allows the module to respond to 2-wire serial interface.	
4	LVTTL-O	INTERRUPT	Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface.	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I/O	SCL	2-Wire Serial Interface Clock.	2
11	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line.	2
12	LVTTL-O	MOD_Abs	Indicates Module is not present. Grounded in the Module.	2
13	LVTTL-O	MOD_NR	Module Not Ready; Indicating Module Operational Fault.	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output.	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply (Not required).	
21	LVTTL-I	P_DOWN/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply (Not required)	
23		GND	Module Ground	1
24	PECL-I	REFCLK+	Reference Clock Non-Inverted Input, AC coupled on the host board- not required.	3
25		REFCLK-	Reference Clock Inverted Input, AC coupled on the host board-Not Required	3
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input.	
29	CML-I	TD+	Transmitter Non-Inverted Data Input.	
30		GND	Module Ground	1

Notes:

1. Module ground pins GND are isolated from the module case.
2. Shall be pulled up with 4.7KΩ to 10KΩ to a voltage between 3.15V and 3.45V on the host board.
3. Reference Clock is not required. If present, it will be ignored.

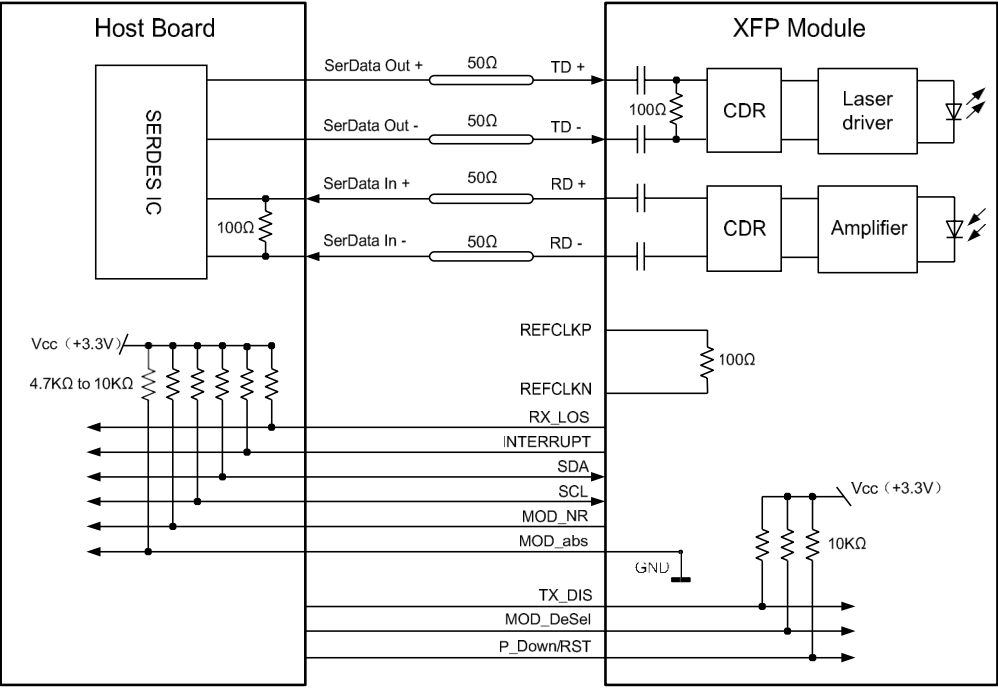


Pin-out of connector Block on Host board

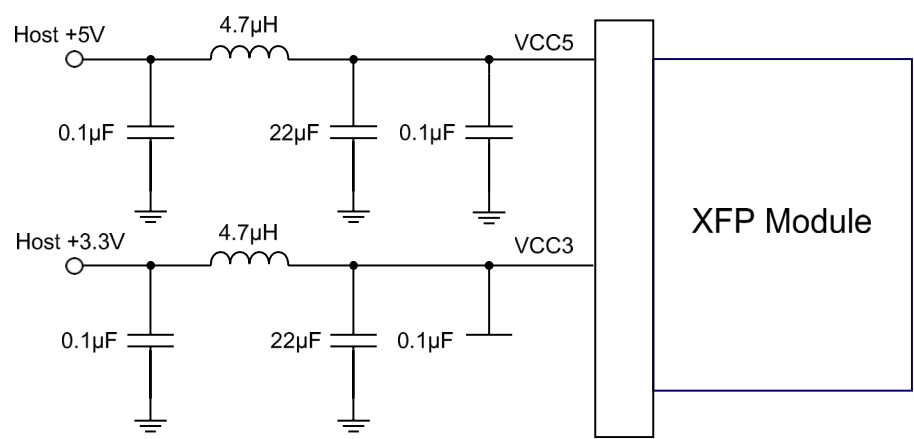
OSNR Characteristics

Bit Rate (Gbps)	Dispersion (ps/nm)	OSNR (dB)	Receiver Sensitivity (dBm)	BER
9.95/10.3	0	>30	-24 ~-7	10E-12
		>25	-18 ~-7	
	1200	>30	-23 ~-7	
		>27	-18 ~-7	
	1600	>30	-22 ~-7	
		>28	-18 ~-7	
10.7/11.1 with FEC	0	>30	-26 ~-7	10E-4
		>16	-18 ~-7	
	1200	>30	-25 ~-7	
		>18	-18 ~-7	
	1600	>30	-22 ~-7	
		>20	-18 ~-7	

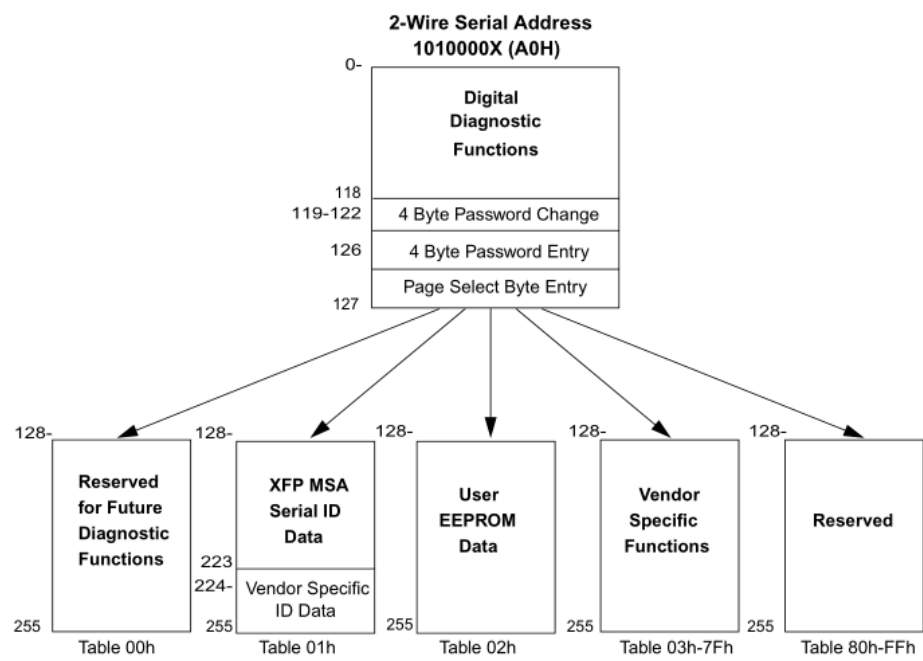
Recommended Application Interface Block Diagram



Recommended Host Board Power Supply Filter Network

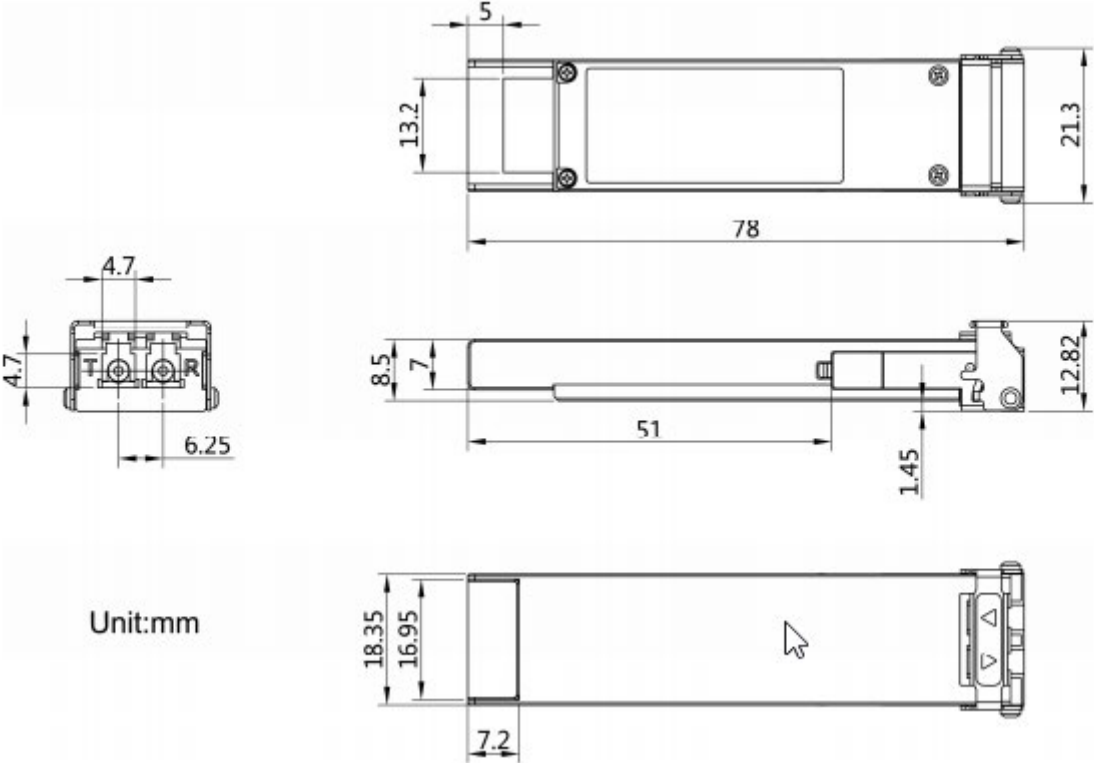


Management Interface



Mechanical Specifications

Small Form Factor Pluggable (XFP) transceivers are compatible with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

