

## XFPD-ZR



XFP Single-Mode Dual Fiber DWDM Transceiver for 10GbE/10GFC/SDH/SONET



### Features

- 100GHz ITU Grid, C Band
- 10 Gbit/s Data Rate
- 23dB Power Budget
- Built-in Digital Diagnostics

### Applications

- Ethernet 10GBASE-ZR/ZW
- Fiber Channel 10G 1200-SM-LL-L 10G
- SONET OC-192 IR-2
- SDH STM S-64.2b
- SONET OC-192 IR-3
- SDH STM S-64.3b
- ITU-T G.709

### Product Description

The XFPD-ZR (10GbE Gigabit Small Form Factor Pluggable) is a hot - swappable, protocol independent optical DWDM transceiver, operating at the ITU Grid 100Ghz wavelengths, for 10 Gigabit per second SONET/SDH, Fibre Channel, gigabit Ethernet, 10 gigabit Ethernet and other applications. It includes digital diagnostics similar to SFF-8472 but more extensive, that provide a robust management tool. The XFI electrical interface specification is a portion of the XFP Multi Source Agreement specification. OC-192 / STM-64 is a network line with transmission speeds of up to 9953.28 Mbit/s (payload: 9621.504 Mbit/s; overhead: 331.776 Mbit/s).

### 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	Laser	Fiber Type	Power Budget	Optical Interface
XFPD-ZR-xx*	10G	EML EA	SMF	23dB	LC

Note1: xx refers to the DWDM Wavelength List

## DWDM Wavelength List:

Channel	Part NO.	Frequency (THz)	Center Wavelength (nm)
17	XFPD-ZR-17	191.7	1563.86
18	XFPD-ZR-18	191.8	1563.05
19	XFPD-ZR-19	191.9	1562.23
20	XFPD-ZR-20	192.0	1561.42
21	XFPD-ZR-21	192.1	1560.61
22	XFPD-ZR-22	192.2	1559.79
23	XFPD-ZR-23	192.3	1558.98
24	XFPD-ZR-24	192.4	1558.17
25	XFPD-ZR-25	192.5	1557.36
26	XFPD-ZR-26	192.6	1556.55
27	XFPD-ZR-27	192.7	1555.75
28	XFPD-ZR-28	192.8	1554.94
29	XFPD-ZR-29	192.9	1554.13
30	XFPD-ZR-30	193.0	1553.33
31	XFPD-ZR-31	193.1	1552.52
32	XFPD-ZR-32	193.2	1551.72
33	XFPD-ZR-33	193.3	1550.92
34	XFPD-ZR-34	193.4	1550.12
35	XFPD-ZR-35	193.5	1549.32
36	XFPD-ZR-36	193.6	1548.51
37	XFPD-ZR-37	193.7	1547.72
38	XFPD-ZR-38	193.8	1546.92
39	XFPD-ZR-39	193.9	1546.12
40	XFPD-ZR-40	194.0	1545.32
41	XFPD-ZR-41	194.1	1544.53
42	XFPD-ZR-42	194.2	1543.73
43	XFPD-ZR-43	194.3	1542.94
44	XFPD-ZR-44	194.4	1542.14
45	XFPD-ZR-45	194.5	1541.35
46	XFPD-ZR-46	194.6	1540.56
47	XFPD-ZR-47	194.7	1539.77
48	XFPD-ZR-48	194.8	1538.98
49	XFPD-ZR-49	194.9	1538.19
50	XFPD-ZR-50	195.0	1537.40
51	XFPD-ZR-51	195.1	1536.61
52	XFPD-ZR-52	195.2	1535.82
53	XFPD-ZR-53	195.3	1535.04
54	XFPD-ZR-54	195.4	1534.25
55	XFPD-ZR-55	195.5	1533.47
56	XFPD-ZR-56	195.6	1532.68
57	XFPD-ZR-57	195.7	1531.90
58	XFPD-ZR-58	195.8	1531.12
59	XFPD-ZR-59	195.9	1530.33
60	XFPD-ZR-60	196.0	1529.55
61	XFPD-ZR-61	196.1	1528.77

Note 2: Contact Opticonnect for the wavelength availability.

## Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000V)
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>*note3</sup>

Note 3: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1, 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, windows, isolators, and other electronic components.

## Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Maximum Supply Voltage 1	Vcc3	-0.5		4.0	V
Maximum Supply Voltage 2	Vcc5	-0.5		6.0	V
Storage Temperature	T <sub>s</sub>	-40		85	°C
Case Operating Temperature	T <sub>OP</sub>	-5		70	°C
Maximum Input Power	Pm			-8	dBm

## Recommend operating condition

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	Top	-5		70	°C
Supply Voltage 1	Vcc3	3.13	3.3	3.45	V
Supply Voltage 2	Vcc5	4.75	5	5.25	V

## Electrical Characteristics - (TOP = -5 to 70 °C, VCC5 = 4.75 to 5.25 Volts)

Parameter	Symbol	Min	Typ	Max	Unit
Main Supply Voltage	Vcc5	4.75		5.25	V
Supply Voltage #2	Vcc3	3.13		3.45	V
Supply Current – Vcc5 supply	Icc5			350	mA
Supply Current – Vcc3 supply	Icc3			520	mA
Module Total Power	P			3.5	W
<b>Transmitter</b>					
Input Differential Impedance	Rin		100		Ω
Differential Data Input Swing <sup>4</sup>	Vin, pp	120		820	mV
Transmit Disable Voltage	VD	2.0		Vcc	V
Transmit Enable Voltage	VEN	GND		GND+ 0.8	V
Transmit Disable Assert Time				10	us
<b>Receiver</b>					
Differential Data Output Swing <sup>4</sup>	Vout, pp	340	650	850	mV
Rise Time (20~80%)	tr			38	ps
Fall Time (20~80%)	tf			39	ps
LOS Fault <sup>5</sup>	VLOS fault	Vcc – 0.5		VccHOST	V
LOS Normal <sup>5</sup>	VLOS norm	GND		GND+0.5	V

Note 4: After internal AC coupling.

Note 5: Loss of signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

## Optical Characteristics - (TOP = -5 to 70 °C, VCC5 = 4.75 to 5.25 Volts)

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Output Opt. Pwr: 9/125 SMF	Pout	-1		+4	dBm
Frequency Range	-	191.7		196.1	THz
Center Wavelength Spacing	$\lambda_c$		100		GHz
Center Frequency Spacing	fc		0.8		nm
Transmitter Center Wavelength End Of Life	$\lambda$	X-100	X	X+100	pm
Transmitter Center Wavelength Beginning Of Life	$\lambda$	X-25	X	X+25	pm
Optical Extinction Ratio	ER	8.2			dB
Transmitter and Dispersion Penalty	TDP			2	dB
Average Launch Power of OFF transmitter	POFF			-30	dBm
TX Jitter Generation (Peak-to-Peak)	Txj			0.1	UI
TX Jitter Generation (RMS)	TxjRMS			0.01	UI
Receiver					
Optical Center Wavelength	$\lambda_c$	1520		1600	nm
Receive Sensitivity @ 10.7Gbps	Pin			-24	dBm
Receive Overload @ 10.7Gbps	Pin	-10			dBm
Receiver Reflectance	Rrx			-27	dB
Path Penalty				2	dB
LOS De-Assert	LOSD			-30	dBm
LOS Assert	LOSA	-37			dBm
LOS Hysteresis		0.5			dB