

SFPD-ZX Series

SFP Single-Mode, Dual Fiber transceiver for DWDM applications



Product description

The SFPD-ZX-xx series single mode transceiver is small form factor pluggable module for duplex optical data communications. This module is designed for single mode fiber and operates at a nominal DWDM wavelength from 1528.77nm to 1565.50nm as specified by the ITU-T. It is designed to deploy in the DWDM networking equipment in metropolitan access and core networks.

It is with the SFP 20-pin connector to allow hot plug capability. The transmitter section uses a DWDM multiple quantum well DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825.

The SFPD-ZX series are designed to be compliant with SFF-8472 Multi-Source Agreement (MSA).

Features

- Data Rate up to 1.25. Gbps
- 100GHz DWDM ITU grid C-band
- Budget up to 37dB
- Hot pluggable
- Duplex LC Connector
- MSA compliant
- Digital diagnostics

Applications

- DWDM networks
- Fast ethernet, Gigabit ethernet
- Fiber channel



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	Laser	Budget	Interface	Temperature
SFPD-ZX-xx ^(note1)	1.25Gbps	DWDM DFB	24dB	LC	Standard
SFPD-EZX-xx ^(note1)	1.25Gbps	DWDM DFB	32dB	LC	Standard
SFPD-XZX-xx ^(note1)	1.25Gbps	DWDM DFB	37dB	LC	Standard

Note1: xx refers to DWDM Wavelength range as ITU-T specified

XX- Channel refers to the following table:

Channel (XX)	Part NO.	Frequency (THz)	Center wavelength (nm)
15	SFPD-xx-*15	191.5	1565.50
16	SFPD-xx-*16	191.6	1564.68
17	SFPD-xx-*17	191.7	1563.86
18	SFPD-xx-*18	191.8	1563.05
19	SFPD-xx-*19	191.9	1562.23
20	SFPD-xx-*20	192.0	1561.42
21	SFPD-xx-*21	192.1	1560.61
22	SFPD-xx-*22	192.2	1559.79
23	SFPD-xx-*23	192.3	1558.98
24	SFPD-xx-*24	192.4	1558.17
25	SFPD-xx-*25	192.5	1557.36
26	SFPD-xx-*26	192.6	1556.55
27	SFPD-xx-*27	192.7	1555.75
28	SFPD-xx-*28	192.8	1554.94
29	SFPD-xx-*29	192.9	1554.13
30	SFPD-xx-*30	193.0	1553.33
31	SFPD-xx-*31	193.1	1552.52
32	SFPD-xx-*32	193.2	1551.72
33	SFPD-xx-*33	193.3	1550.92
34	SFPD-xx-*34	193.4	1550.12
35	SFPD-xx-*35	193.5	1549.32
36	SFPD-xx-*36	193.6	1548.51
37	SFPD-xx-*37	193.7	1547.72
38	SFPD-xx-*38	193.8	1546.92
39	SFPD-xx-*39	193.9	1546.12
40	SFPD-xx-*40	194.0	1545.32
41	SFPD-xx-*41	194.1	1544.53
42	SFPD-xx-*42	194.2	1543.73
43	SFPD-xx-*43	194.3	1542.94

Channel (XX)	Part NO.	Frequency (THz)	Center wavelength (nm)
44	SFPD-xx-*44	194.4	1542.14
45	SFPD-xx-*45	194.5	1541.35
46	SFPD-xx-*46	194.6	1540.56
47	SFPD-xx-*47	194.7	1539.77
48	SFPD-xx-*48	194.8	1538.98
49	SFPD-xx-*49	194.9	1538.19
50	SFPD-xx-*50	195.0	1537.40
51	SFPD-xx-*51	195.1	1536.61
52	SFPD-xx-*52	195.2	1535.82
53	SFPD-xx-*53	195.3	1535.04
54	SFPD-xx-*54	195.4	1534.25
55	SFPD-xx-*55	195.5	1533.47
56	SFPD-xx-*56	195.6	1532.68
57	SFPD-xx-*57	195.7	1531.90
58	SFPD-xx-*58	195.8	1531.12
59	SFPD-xx-*59	195.9	1530.33
60	SFPD-xx-*60	196.0	1529.55
61	SFPD-xx-*61	196.1	1528.77

*xx refers to the type: ZX, EZX or XZX.

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_s	-40	+85	°C
Supply voltage	V_{CC}	-0.5	3.6	V
Operating relative humidity		-	95	%

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

Recommended operating conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating case temperature	T_x SFPD-ZX-xx, SFPD-EZX-xx and SFPD-XZX-xx	0	-	+70	°C
Power supply voltage	V_{CC}	3.15	3.3	3.45	V
Power supply current	I_{CC}	-	-	450	mA
Date rate				1.25G	bps

Performance specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
LVPECL Inputs(Differential)	V_{in}	400		2000	mVpp	AC coupled inputs*(note4)
Input impedance (Differential)	Z_{in}	85	100	115	ohm	$R_{in} > 100 \text{ kohm @ DC}$
TX_Dis	Disable	2		V_{CC}	V	
	Enable	0		0.8		
TX_FAULT	Fault	2		V_{CC}	V	
	Normal	0		0.8		
Receiver						
LVPECL outputs (Differential)	V_{out}	370		2000	mVpp	AC coupled outputs*(note4)
Output impedance (Differential)	Z_{out}	85	100	115	ohm	
RX_LOS	LOS	2		V_{CC}	V	
	Normal	0		0.8	V	
MOD_DEF (0:2)	VoH	2.5			V	
	VoL	0		0.8	V	

Performance specifications – Optical
SFPD-ZX-xx (DWDM DFB and PIN/TIA, 24dB Power Budget at Least)

Parameter	Symbol	Min.	Typical	Max.	Unit
Data rate			1.25G		bps
Transmitter					
Center wavelength	λ	1528		1566	nm
Spectral width (-20dB)	$\Delta\lambda$			0.3	nm
Side Mode Suppression Ratio	SMSR	30			dB
Channel spacing	Δf		100		GHz
Deviation from central Frequency@EOL		-12		12	GHz
Average output power*(note5)	Pout	0		5	dBm
Average launch power (Tx: OFF)	Poff			-45	dBm
Extinction ratio*(note6)	ER	8.2			dB
Rise/Fall time(20%~80%)	tr/tf			260	ps
Output optical eye*(note6)	Compatible with IEEE 802.3*(note8)				
TX_Disable assert time	t_off			10	μ s
Pout@TX disable asserted	Pout			-45	dBm
Optical Signal Noise Ratio @ 0.1nm	OSNR		40		dB
Relative intensity noise	RIN			-135	dB/Hz
Dispersion Tolerance	DT		1760		ps/nm
Receiver					
Center wavelength	λ	1528		1566	nm
Receiver sensitivity*(note7)	Pmin			-24	dBm
Receiver overload	Pmax	-3			dBm
LOS De-Assert	LOSD			-25	dBm
LOS assert	LOSA	-42			dBm
LOS hysteresis*(note9)		0.5			dB

SFPD-EZX-xx (DWDM DFB and APD/TIA, 32dB Power Budget at Least)

Parameter	Symbol	Min.	Typical	Max.	Unit
Data rate			1.25G		bps
Transmitter					
Center wavelength	λ	1528		1566	nm
Spectral width (-20dB)	$\Delta\lambda$			0.3	nm
Side mode suppression ratio	SMSR	30			dB
Channel spacing	Δf		100		GHz
Deviation from central Frequency@EOL		-12		12	GHz

Parameter	Symbol	Min.	Typical	Max.	Unit
Average output power ^{*(note5)}	P _{out}	0		5	dBm
Average launch power (Tx: OFF)	P _{off}			-45	dBm
Extinction ratio ^{*(note6)}	ER	8.2			dB
Rise/Fall time(20%~80%)	tr/tf			260	ps
Output optical eye ^{*(note6)}	Compatible with IEEE 802.3 ^{*(note8)}				
TX_Disable assert time	t _{off}			10	μs
P _{out} @TX Disable asserted	P _{out}			-45	dBm
Optical Signal Noise Ratio @ 0.1nm	OSNR		40		dB
Relative intensity noise	RIN			-135	dB/Hz
Dispersion Tolerance	DT		2400		ps/nm
Receiver					
Center wavelength	λ	1528		1566	nm
Receiver sensitivity ^{*(note7)}	P _{min}			-32	dBm
Receiver overload	P _{max}	-10			dBm
LOS De-Assert	LOSD			-33	dBm
LOS assert	LOSA	-45			dBm
LOS hysteresis ^{*(note9)}		0.5			dB

SFPD-XZX-xx (DWDM DFB and APD/TIA, 37dB Power Budget at Least)

Parameter	Symbol	Min.	Typical	Max.	Unit
Data rate			1.25G		bps
Transmitter					
Center wavelength	λ	1528		1566	nm
Spectral width (-20dB)	Δλ			0.3	nm
Side Mode Suppression Ratio	SMSR	30			dB
Channel spacing	Δf		100		GHz
Deviation from central Frequency@EOL		-12		12	GHz
Average output power ^{*(note5)}	P _{out}	2		5	dBm
Average launch power (Tx: OFF)	P _{off}			-45	dBm
Extinction ratio ^{*(note6)}	ER	8.2			dB
Rise/Fall time(20%~80%)	tr/tf			260	ps
Output optical eye ^{*(note6)}	Compatible with IEEE 802.3 ^{*(note8)}				
TX_Disable assert time	t _{off}			10	μs
P _{out} @TX Disable asserted	P _{out}			-45	dBm
Optical Signal Noise Ratio @ 0.1nm	OSNR		40		dB
Relative intensity noise	RIN			-135	dB/Hz
Dispersion Tolerance	DT		2800		ps/nm

Parameter	Symbol	Min.	Typical	Max.	Unit
Receiver					
Center wavelength	λ	1528		1566	nm
Receiver sensitivity ^{*(note7)}	Pmin			-35	dBm
Receiver overload	Pmax	-10			dBm
LOS De-Assert	LOSD			-36	dBm
LOS assert	LOSA	-45			dBm
LOS hysteresis ^{*(note9)}		0.5			dB

Note3: Output is coupled into a 9/125 μ m single-mode fiber.

Note4: Filtered, measured with a PRBS 2⁷-1 test pattern @1.25Gbps

Note5: LVPECL logic, internally AC coupled.

Note6: Minimum average optical power measured at BER less than 1E-12, with a 2⁷-1 PRBS and ER=9dB.

Note7: Measured with a PRBS 2⁷-1 test pattern @1.25Gbps, BER $\leq 1 \times 10^{-12}$.

Note8: Eye pattern mask

Note9: LOS hysteresis

