SPPC-ZR

SFP+ Single-Mode Dual Fiber CWDM Transceiver
for 10GbE

Features

- 10 Gbit/s Bit Rate
- 8-Wavelengths CWDM
- 1470nm to 1610nm
- 20nm spacing
- 23dB Power Budget

Applications

- 10GBASE-ZR/ZW
- 10GBASE-ZR at10.31Gbps
- 10GBASE-ZW at 9.95Gbps

Product Description

The SPPC-ZR-XX series optical transceiver is designed for fiber communications application such as 10G Ethernet (10GBASE-ZR/ZW), which fully compliant with the specification of SFP+ MSA SFF-8431.

This module is designed for single mode fiber and operates at a nominal wavelength of CWDM wavelength. There are eight center wavelengths available from 1470nm to 1610nm, with each step 20nm. A guaranteed optical link budget of 23 dB is offered.

The module is with the SFP+ connector to allow hot plug capability. Only single 3.3V power supply is needed. The optical output can be disabled by LVTTL logic high-level input of TX_DIS. Loss of signal (RX_LOS) output is provided to indicate the loss of an input optical signal of receiver.

This module provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification.

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	Power Budget	Interface
SPPC-ZR-xx*note1	10G	CWDM EML	SMF	23dB	LC

Note1: xx refers to CWDM Wavelength range 1470nm to 1610nm, X=47~61, denotes 1470~1610nm.

CWDM* Wavelength (0C~70C)

Band	Nomenclature	Wavelength(nm)		
		Min.	Typ.	Max.
S-band Short Wave-length	47	1464	1470	1477.5
	49	1484	1490	1497.5
	51	1504	1510	1517.5
	53	1524	1530	1537.5
C-band Conventional	55	1544	1550	1557.5
L-band Long Wavelength	57	1564	1570	1577.5
	59	1584	1590	1597.5
	61	1604	1610	1617.5

Note 2: CWDM*: 8 Wavelengths from 1470nm to 1610nm, each step 20nm.

Regulatory Compliance

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

Note 3:: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1st, 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, Item 13: 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, isolators, and other components.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typical	Max	Unit
Maximum Supply Voltage 1	Vcc	-0.5		4.0	V
Storage Temperature	TS	-40		85	°C
Case Operating Temperature	TOP	-5		70	°C

Recommend Operating Condition

Parameter	Symbol	Min	Typical	Max	Units
Case Operating Temperature	T_{OP}	-5		70	°C
Supply Voltage	Vcc	3.13	3.3	3.45	V
Supply Current	Icc			435	mA
Data Rate		9.95		10.3125	Gbps

Electrical Characteristics (T_{OP} = -5 to 70℃, V_{CC} = 3.15 to 3.45V)

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
CML Inputs(Differential)	Vin	180		1000	mVpp	1
Input Impedance (Differential)	Zin	85	100	115	ohm	
TX_DISABLE Input Voltage - High		2		Vcc+0.3	V	
TX_DISABLE Input Voltage - Low		0		0.8	V	
TX_FAULT Output Voltage - High		2		Vcc+0.3	V	
TX_FAULT Output Voltage - Low		0		0.8	V	
Receiver						
CML Outputs (Differential)	Vout	350		700	mVpp	1
Output Impedance (Differential)	Zout	85	100	115	ohm	
RX_LOS Output Voltage - High		2		Vcc+0.3	V	
RX_LOS Output Voltage - Low		0		0.8	V	
MOD_DEF (0:2)	VoH	2.5			V	2
	VoL	0		0.5	V	

Note 1: After internal AC coupling.
Note 2: Reference the SFF-8472 MSA.

Optical Characteristics (T_{OP} = -5 to 70℃, V_{CC} = 3.15 to 3.45V)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Transmitter						
Output Opt. Pwr: 9/125 SMF	Pout	0		+4	dBm	1
Optical Extinction Ratio	ER	3.5			dB	
Optical Wavelength	λ	λc–6	λc	λc+7.5	nm	2
-20dB Spectrum Width	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power of OFF Transmitter	POFF			-30	dBm	
Transmitter Dispersion Penalty	TDP			3.5	dB	
TX Jitter	TXj	Per 802.3ae requirements				
Relative Intensity Noise	RIN			-128	dB/Hz	
Receiver						
Receiver Sensitivity @ 10.3125Gb/s	Pmin			-23	dBm	3
Input Overload	Pmax	-6			dBm	
Optical Center Wavelength	λ	1260		1620	nm	
Receiver Reflectance	Rrf			-12	dB	
LOS De-Assert	LOSD			-24	dBm	
LOS Assert	LOSA	-37			dBm	
LOS Hysteresis		1			dB	

Note 1: Output power is coupled into a 9/125μm SMF.
Note 2: ITU-T G.694.2 CWDM wavelength from 1470nm to 1610nm, each step 20nm.
Note 3: Average received power; BER less than 1E-12 and PRBS 2^{31}-1 test pattern.