

# SO-XFP-ZR-Cxx

XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1470nm-1610nm, SM, DDM, 23dB, 70km

## OVERVIEW

The SO-XFP-ZR-Cxx series optical transceiver is designed for fiber communications application such as SONET OC-192, STM-64, 10G Ethernet (10GBASE-ZR/ZW) and 10G Fiber Channel (1200-SM-LL-L), which fully compliant with the specification of XFP MSA Rev 4.5. 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. The module is with the XFP 30-pin connector to allow hot plug capability. Only single 3.3V power supply is needed. The optical output can be disabled by LVTTTL 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 XFP MSA Rev 4.5.

## PRODUCT FEATURES

- Supports 9.95Gb/s to 11.1Gb/s Bit Rates
- Hot-Pluggable XFP Footprint
- Compliant with XFP MSA
- 8-Wavelengths CWDM EML Transmitter from 1470nm to 1610nm, with Step 20nm
- Very Low TEC Power Consumption
- 23dB Power Budget at Least
- Duplex LC connector
- Power Dissipation < 3.5W
- Case Operation Temperature Range -5°C to 70°C
- 2-Wire Interface for Integrated Digital Diagnostic Monitoring

## APPLICATIONS

- OC-192, STM-64
- 10GBASE-ZR/ZW 10G Ethernet
- 1200-SM-LL-L 10G Fibre Channel
- 10GE over G.709 at 11.09Gbps
- OC192 over FEC at 10.709Gbps

## ORDERING INFORMATION

Part Number	Description
SO-XFP-ZR-Cxx*	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1470nm-1610nm, SM, DDM, 23dB, 70km

\*xx = Refers to notation for frequency data. Please see extended order information on last page for additional information.

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## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	$V_{cc}$	-0.5	4.0	V
Storage Temperature	$T_S$	-40	85	°C
Case Operating Temperature	$T_c$	-5	70	°C
Maximum Input Power	$P_m$		-8	dBm

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ	Max.	Unit
Operating Temperature	$T_c$	-5		70	°C
Supply Voltage 1	$V_{cc3}$	3.13	3.3	3.45	V
Supply Voltage 2	$V_{cc5}$	4.75	5	5.25	V
Supply Current-Vcc3 supply	$I_{cc3}$			300	mA
Supply Current-Vcc5 supply	$I_{cc5}$			750	mA
Module Total Power	$P$			3.5	W

## ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Input Differential Impedance	$R_{in}$		100		$\Omega$	After internal AC coupling.
Differential Data Input Swing	$V_{in,pp}$	180		820	mV	
Transmit Disable Voltage	$V_{DIS}$	2.0		$V_{cc}$	V	
Transmit Enable Voltage	$V_{EN}$	GND		GND+0.8	V	
Transmit Disable Assert Time				10	us	

## ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Differential Data Output Swing	$V_{out,pp}$	340	650	850	mV	
Data Output Rise Time	$T_r$			38	ps	20 – 80 %.
Data Output Fall Time	$T_f$			38	ps	
LOS Fault	$V_{LOS\ fault}$	$V_{cc} - 0.5$		$V_{cc}$	V	20 – 80 %.
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V	HOST
Power Supply Rejection	$PSR$	Reference the Section 2.7 of the XFP MSA Rev 4.5.				

## OPTICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min.	Typ	Max.	Unit
Output Opt. Pwr: 9/125 SMF	$P_{out}$	0		4	dBm
Optical Extinction Ratio	$ER$	8.2			dB
Optical Wavelength	$\lambda$	$\lambda_c - 5.5$	$\lambda_c$	$\lambda_c + 7.5$	nm
-20dB Spectrum Width	$\Delta\lambda$			1	nm
Side Mode Suppression Ratio	$SMSR$	32			dB
Average Launch Power of OFF Transmitter	$POFF$			-30	dBm
TX Jitter	$TXj$	Per 802.3ae requirements			
Relative Intensity Noise	$RIN$			-135	dB/Hz

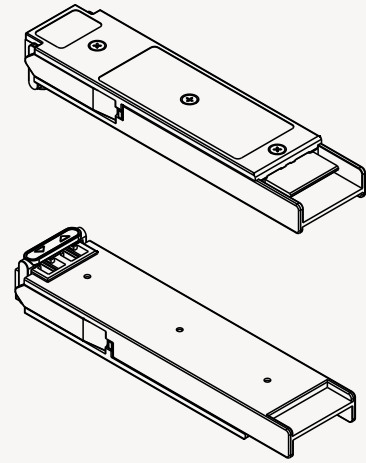
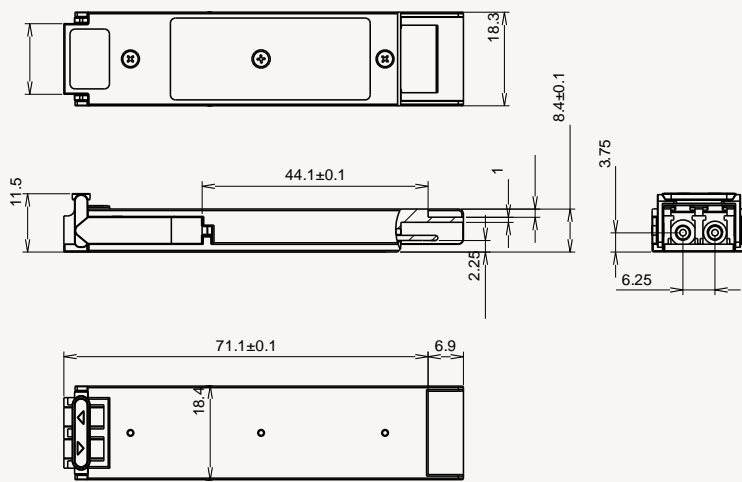
## OPTICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min.	Typ	Max.	Unit
Receiver Sensitivity @ 10.3125Gb/s	$P_{min}$			-23	dBm
Overload Power	$P_{max}$	-10			dBm
Optical Centre Wavelength	$\lambda$	1260		1620	nm
Receiver Reflectance	$R_{rf}$			-12	dB
LOS De-Assert	$LOSD$			-25	dBm
LOS Assert	$LOSA$	-37			dBm
LOS Hysteresis		1			dB

## PIN FUNCTION DEFINITIONS

PIN	Signal Name	Description	PIN	Signal Name	Description
1	$V_{EE}T$	Transmitter Ground	11	$V_{EE}R$	Receiver Ground
2	TX_Fault	Transmitter Fault Indication	12	RD-	Inv. Received Data Out
3	TX_Disable	Transmitter Disable	13	RD+	Received Data Out
4	SDA	Module Definition 2	14	$V_{EE}R$	Receiver Ground
5	SCL	Module Definition 1	15	$V_{CC}R$	Receiver Power
6	MOD_ABS	Module Definition 0	16	$V_{CC}T$	Transmitter Power
7	RS0	RX Rate Select (LVTTTL).	17	$V_{EE}T$	Transmitter Ground
8	LOS	Loss of Signal	18	TD+	Transmit Data In
9	RS1	TX Rate Select (LVTTTL).	19	TD-	Inv. Transmit Data In
10	$V_{EE}R$	Receiver Ground	20	$V_{EE}T$	Transmitter Ground

MECHANICAL SPECIFICATIONS



## EXTENDED ORDERING INFORMATION

Part Number	Description
SO-XFP-ZR-C47	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1470nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C49	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1490nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C51	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1510nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C53	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1530nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C55	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1550nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C57	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1570nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C59	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1590nm, SM, DDM, 23dB, 70km
SO-XFP-ZR-C61	XFP, 10GBase-ZR, Multirate 9.95-11.1 Gbps, CWDM 1610nm, SM, DDM, 23dB, 70km

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