

SO-XFP-ER-Cxx

XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1470nm-1610nm, SM, DDM, 14dB, 40km

OVERVIEW

The SO-XFP-ER-Cxx series optical transceiver is designed for fiber communications application such as 10G Ethernet (10GBASE-ER/EW) 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. A guaranteed optical link budget of 14dB is offered. 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
- 14dB power budget, minimum
- 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

- SONET / SDH
- 10GBASE-ER/EW 10G Ethernet
- 1200-SM-LL-L 10G Fiber Channel
- 10GE over G.709 at 11.09Gbps
- OC192 over FEC at 10.709Gbps

ORDERING INFORMATION

Part number	Description
SO-XFP-ER-Cxx*	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1470nm-1610nm, SM, DDM, 14dB, 40km

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

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

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		Ω	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 %.
				HOST		
LOS normal	$V_{LOS\ norm}$	GND		GND+0.5	V	
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
Optical modulation amplitude	P_{OMA}	-1		+4.4	dBm
Output Opt. Pwr: 9/125 SMF	P_{out}	-0.9		+4.0	dBm
Optical extinction ratio	ER	8.2			dB

Subject to change without notice.

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Optical wavelength	λ	$\lambda_c - 5.5$	λ_c	$\lambda_c + 7.5$	nm
-20dB spectrum width	$\Delta\lambda$			1	nm
Side mode suppression ratio	<i>SMSR</i>	30			dB
Path penalty	<i>Pp</i>			2.5	dB
Average launch power of OFF transmitter	<i>POFF</i>			-30	dBm
TX jitter	<i>TXj</i>	Per 802.3ae requirements			
Relative intensity noise	<i>RIN</i>			-128	dB/Hz

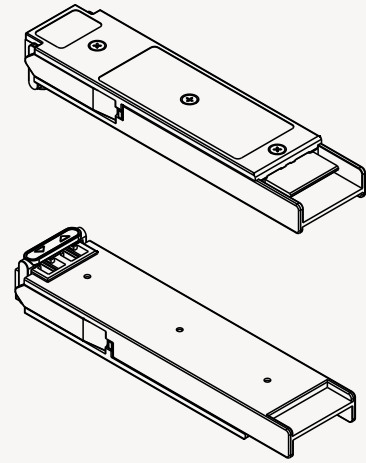
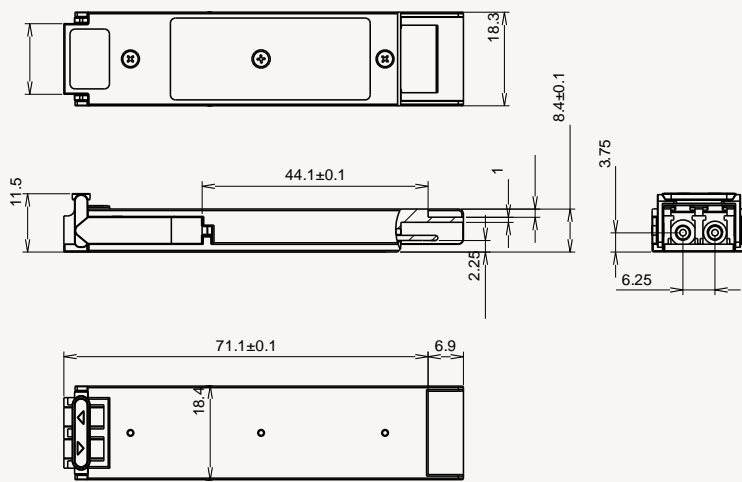
OPTICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min.	Typ	Max	Unit
Receiver sensitivity @ 10.3125Gb/s	<i>Pmin</i>			-15	dBm
Maximum input power	<i>Pmax</i>	0.5			dBm
Optical centre wavelength	λ	1260		1620	nm
Receiver reflectance	<i>Rrf</i>			-12	dB
LOS de-assert	<i>LOSD</i>			-17	dBm
LOS assert	<i>LOSA</i>	-29			dBm
LOS hysteresis		1			dB

PIN FUNCTION DEFINITIONS

PIN	Signal name	Description	PIN	Signal name	Description
1	<i>V_{EE}T</i>	Transmitter ground	11	<i>V_{EE}R</i>	Receiver ground
2	<i>TX_Fault</i>	Transmitter fault indication	12	<i>RD-</i>	Inv. received data out
3	<i>TX_Disable</i>	Transmitter disable	13	<i>RD+</i>	Received data out
4	<i>SDA</i>	Module definition 2	14	<i>V_{EE}R</i>	Receiver ground
5	<i>SCL</i>	Module definition 1	15	<i>V_{CC}R</i>	Receiver power
6	<i>MOD_ABS</i>	Module definition 0	16	<i>V_{CC}T</i>	Transmitter power
7	<i>RS0</i>	RX rate select (LVTTTL).	17	<i>V_{EE}T</i>	Transmitter ground
8	<i>LOS</i>	Loss of signal	18	<i>TD+</i>	Transmit data in
9	<i>RS1</i>	TX rate select (LVTTTL).	19	<i>TD-</i>	Inv. transmit data in
10	<i>V_{EE}R</i>	Receiver ground	20	<i>V_{EE}T</i>	Transmitter ground

MECHANICAL SPECIFICATIONS



EXTENDED ORDERING INFORMATION

Part Number	Description
SO-XFP-ER-C47	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1470nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C49	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1490nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C51	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1510nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C53	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1530nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C55	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1550nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C57	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1570nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C59	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1590nm, SM, DDM, 14dB, 40km
SO-XFP-ER-C61	XFP, 10GBase-ER, Multirate 9.95-11.1 Gbps, CWDM 1610nm, SM, DDM, 14dB, 40km

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