

SO-XFP-LRM

XFP, 10GBase-LRM, 1310nm, MM, DDM, 3.4dB, 300m

OVERVIEW

The SO-XFP-LRM series single mode transceiver is small form factor pluggable module for serial optical data communications such as IEEE 802.3ae 10GBASE-LR/LW. This module is designed for single mode fiber and operates at a nominal wavelength of 1310 nm. The transmitter section uses a 1310nm multiple quantum well DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

PRODUCT FEATURES

- Operating data rate up to 11.1Gbps
- 1310nm FP transmitter
- Distance up to 220m with MMF
- Single 3.3V power supply and TTL logic interface
- Duplex LC connector interface
- Hot-Pluggable
- Power dissipation < 1.0W
- Operating case temperature
Standard: 0C~+70C
- Compliant with MSA SFP+ specification SFF-8431
- Compliant with IEEE 802.3aq 10GBASE-LRM

APPLICATIONS

- 10GBASE-LRM
- Other optical links

ORDERING INFORMATION

Part Number	Description
SO-XFP-LRM	XFP, 10GBase-LRM, 1310nm, MM, DDM, 3.4dB, 300m

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T_s	-40	+85	°C
Supply Voltage	V_{cc}	-0.5	3.6	V
Input Voltage	V_{in}	-0.5	V_{cc}	V
Output Current	I_o	-	50	mA

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit	
Operating Case Temperature	T_c	EOLP-1396-10	-5		+70	°C
		EOLP-1396-10-I	-20		+85	
Power Supply Voltage	V_{cc}	3.15	3.3	3.45	V	
Power Supply Current	I_{cc}			300	mA	
Surge Current	I_{Surge}			+30	mA	
Baud Rate		0.6		11.1	Gbps	

PERFORMANCE SPECIFICATIONS - ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Inputs(Differential)	V_{IN}	150		1200	mVpp	AC coupled inputs
Input AC Common Mode Voltage		0		25	mV	RMS
Input Impedance (Differential)	Z_{IN}	85	100	115	ohm	$R_{in} > 100$ kohms @ DC
Differential Input S-paramete	S_{DD11}	-	-	-10	dB	
Differential to Common Mode Conversion	$SCD11$	-	-	-10	dB	
Tx_DISABLE Input Voltage – High		2		3.45	V	
Tx_DISABLE Input Voltage – Low		0		0.8	V	
Tx_FAULT Output Voltage – High		2		$V_{cc}+0.3$	V	$I_o = 400\mu A$; Host V_{cc}
Tx_FAULT Output Voltage – Low		0		0.5	V	$I_o = -4.0mA$

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Outputs (Differential)	V_{out}	350		700	mVpp	AC coupled outputs
Output AC Common Mode Voltage		0		15	mV	RMS
Output Impedance (Differential)	Z_{out}	90	100	110	ohm	
Differential Output S-parameter	$SD22$	-	-	-10	dB	
Rx_LOS Output Voltage – High		2		$V_{cc}+0.3$	V	$I_o = 400\mu A$; Host V_{cc}
Rx_LOS Output Voltage – Low		0		0.8	V	$I_o = -4.0mA$
MOD_DEF (0:2)	V_{oH}	2.5			V	With Serial ID
	V_{oL}	0		0.5	V	

Subject to change without notice.

For more information, visit smaroptics.com.

PERFORMANCE SPECIFICATIONS – OPTICAL

Parameter	Symbol	Min	Typ	Max	Unit
9µm Core Diameter SMF			10		Km
Data Rate		0.6		11.1	Gbps

PERFORMANCE SPECIFICATIONS – OPTICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	1270	1310	1355	nm
Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Average Output Power	P_{out}	-8.2		+0.5	dBm
Extinction Ratio	ER	3.5			dB
Average Power of OFF Transmitter	P_{off}			-30	dBm
Side Mode Suppression Ratio	$SMSR$	30			dB
Transmitter Dispersion Penalty	TDP			3.2	dB
Input Differential Impedance	Z_{IN}	90	100	110	Ω
TX Disable Assert Time	t_{off}	-	-	10	us
TX_DISABLE Negate Time	t_{on}	-	-	1	ms
TX_BISABLE time to start reset	t_{reset}	10	-	-	Us
Time to initialize, include reset of TX_FAULT	t_{init}	-	-	300	ms
TX_FAULT from fault to assertion	t_{fault}	-	-	100	us
Total Jitter	TJ	-	-	0.28	UI(p-p)
Data Dependant Jitter	DDJ	-	-	0.1	UI(p-p)
Uncorrelated Jitter	UJ	-	-	0.023	RMS

PERFORMANCE SPECIFICATIONS – OPTICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ	1260		1565	nm
Sensitivity	P_{min}			-14.4	dBm
Receiver Overload	P_{max}	0.5			dBm
Optical Return Loss	ORL			-12	dB
LOS De-Assert	$LOSD$			-16	dBm
LOS Assert	$LOSA$	-28			dBm
LOS	High	2.0		VCC+0.3	V
	Low	0		0.8	

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 (LVTTL).	17	V _{EE} T	Transmitter Ground
8	LOS	Loss of Signal	18	TD+	Transmit Data In
9	RS1	TX Rate Select (LVTTL).	19	TD-	Inv. Transmit Data In
10	V _{EE} R	Receiver Ground	20	V _{EE} T	Transmitter Ground

MECHANICAL SPECIFICATIONS

