

SO-XFP-SR

XFP, 10GBase-SR, 10.3125 Gbps, 850nm, MM, DDM, 3.8dB, 300m@OM3

OVERVIEW

The SO-XFP-SR series multi-mode transceiver is XFP module for duplex optical data communications such as 10GBASE-SR and 10GBASE-SW. Digital diagnostic functions are available via an I2C. This module is designed for multi-mode fiber and operates at a nominal wavelength of 850 nm. The transmitter section uses a Vertical Cavity Surface Emitted Laser (VCSEL) and is a Class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated GaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

PRODUCT FEATURES

- Operating data rate up to 10.3Gbps
- 850nm VCSEL transmitter
- Distance up to 300m @50 / 125 um MMF
- Single 3.3V power supply and TTL logic interface
- Duplex LC connector interface, Hot-Pluggable
- Compliant with MSA XFP specification SFF-8472
- Compliant with IEEE 802.3ae 10GBASE-SR/SW
- Power dissipation < 1.0W
- Dispersion tolerance up to 40 ps/nm over G.652
- Operating case temperature

Standard: 0°C to +70°C

Extended: -10°C to +85°C

APPLICATIONS

- 10GBASE-SW at 9.953Gbps
- 10GBASE-SR at 10.3125Gbps

ORDERING INFORMATION

Part Number	Description
SO-XFP-SR	XFP, 10GBase-SR, 10.3125 Gbps, 850nm, MM, DDM, 3.8dB, 300m@OM3
SO-XFP-SR-I	XFP, 10GBase-SR, 10.3125 Gbps, 850nm, MM, DDM, 3.8dB, 300m@OM3, extend. Temp.

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	SO-XFP-SR	0	70	°C
		SO-XFP-SR-I	-10	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	10GEBASE-SR		10.31		Gbps
	10GEBASE-SW		9.95		

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Inputs(Differential)	V_{IN}	150		1200	mVpp	AC coupled inputs
Input Impedance (Differential)	C_{IN}	85	100	115	ohms	$R_{in} > 100 \text{ kohms @ DC}$
Tx_DISABLE Input Voltage – High		2		$V_{cc}+0.3$	V	
Tx_DISABLE Input Voltage – Low		0		0.8	V	
Tx_FAULT Output Voltage – High		2		$V_{cc}+0.3$	V	$I_o = 400\mu\text{A}; \text{Host } V_{cc}$
Tx_FAULT Output Voltage – Low		0		0.8	V	$I_o = -4.0\text{Ma}$

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Outputs (Differential)	V_{out}	350		700	mVpp	AC coupled inputs
Output Impedance (Differential)	C_{out}	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		$V_{cc}+0.3$	V	$I_o = 400\mu\text{A}; \text{Host } V_{cc}$
Rx_LOS Output Voltage – Low		0		0.8	V	$I_o = -4.0\text{Ma}$
MOD_DEF (2:0)	VoH	2.5			V	With Serial ID
	VoL	0		0.5	V	

OPTICAL AND ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
50 / 125 um MMF			300		m
Data Rate			10.3125		Gbps

OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	840	850	860	nm
Spectral Width (RMS)	$\Delta\lambda$			0.45	nm
Average Output Power	P_{out}	-6		-1	dBm
Extinction Ratio	Er	3.0	5.0		dB
Output Optical Eye		IEEE 802.3-2005 Compliant			
Transmitter Dispersion Penalty	TDP			3.9	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

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	840	850	860	nm
Receiver Sensitivity	P_{min}			-11.1	dBm
Output Differential Impedance	R_{IN}	90	100	110	Ω
Receiver Overload2	P_{max}	-1			dBm
Optical Return Loss	ORL			-12	dB
LOS De-Assert	$LOSD$			-12.5	dBm
LOS Assert	$LOSA$	25			dBm
LOS Hysteresis		0.5			dB
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 Signal Ground	11	V _{EE} R	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	12	RD-	Inverse Receiver Data Out
3	TX_Disable	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	13	RD+	Receiver Data Out
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	V _{EE} R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V _{CC} R	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V _{CC} T	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	17	V _{EE} T	Transmitter Signal Ground
8	RX_LOS	Loss of Signal Out (OC).	18	TD+	Transmitter Data In*
9	RS1	TX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	V _{EE} R	Receiver Signal Ground	20	V _{EE} T	Transmitter Signal Ground

MECHANICAL DRAWING

