XFPS-LR

XFP Single-Mode, Single Fiber transceiver
for 10GbE/10FC

Features

- Supports 9.95Gb/s to 10.5Gb/s data rates
- Power budget 9dB at least
- ITU-T G.694.2 Compliant
- Tx: 1270nm/Rx: 1330nm
- Tx: 1330nm/Rx: 1270nm
- Digital Diagnostic

Applications

- 10GBASE-LR 10G Ethernet at 10.3125Gbps
- 10GBASE-LW 10G Ethernet at 9.953Gbps
- 1200-SM-LL-L 10G Fiber Channel at 10.51875Gbps

Product description

The XFPS-LR is designed for Single Fiber bi-directional 10G serial optical data communications such as IEEE 802.3ae 10GBASE-BX by using 1330(1270nm) transmitter and 1270(1330) nm receiver. The transceiver consists of two sections: The transmitter section uses a multiple quantum well 1330(1270) nm DFB laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated 1270(1330) nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

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	Temp.	Distance	Interface	DDMI
XFPS-LR-2733	10.5Gbps	1270nm DFB	Standard	10km	LC	YES
XFPS-LR-3327	10.5Gbps	1330nm DFB	Standard	10km	LC	YES

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	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compatible with standards. Noise frequency range: 30 MHz to 6 GHz. 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	Compatible with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. 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*note2

Note2: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1th, 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, Item13: 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, windows, isolators, and other electronic components.

Absolute maximum ratings*

Parameter	Symbol	Min	Max	Unit
Maximum Supply Voltage	Vcc	-0.5	4.0	V
Storage Temperature	T_S	-40	85	°C
Case Operating Temperature	XFPS-LR-xxxx	0	70	°C

*Note3: Exceeding any one of these values may destroy the device permanently.

Recommend operating condition

Parameter	Symbol	Min	Typ	Max	Units
Case Operating Temperature	XFPS-LR-xx	0	-	70	°C
Power Supply Current	Icc	-	-	580	mA
Supply Voltage	Vcc	3.13	-	3.45	V

Electrical Characteristics (T_O = -10 to 85°C, V_{CC} = 3.15V to 3.45V)

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Data Rate		9.95	-	10.52	Gbps
Input differential impedance	Rin	90	100	110	Ω
Differential data input swing*Note4	Vin,pp	120	-	820	mV
Transmit Disable Voltage	V_D	2.0	-	Vcc	V
Transmit Enable Voltage	V_{EN}	GND	-	GND+ 0.8	V
Transmit Disable Assert Time		-	-	10	µs
Receiver					
Differential data output swing[4]	Vout,pp	340	650	850	mV
Data output rise time[5]	tr	-	-	38	ps
Data output fall time[5]	tf	-	-	38	ps
LOS Fault	$V_{LOS\ fault}$	2.4	-	Vcc	V
LOS Normal	$V_{LOS\ norm}$	GND	-	GND+0.5	V

Note4. Internal AC coupling.

Note5. 20 – 80 %.

Optical Characteristics

XFPS-LR-2733

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Budget		9			dB
Data Rate			9.953/10.3125		Gbps
Transmitter					
Centre Wavelength	λC	1260	1270	1280	nm
Spectral Width (-20dB)	Δλ			1	nm
Average Output Power [6]	Pout, AVG	-5		0	dBm
Extinction Ratio	ER	3.5			dB
Side Mode Suppression Ratio	SMSR	30			dB
Transmitter and Dispersion Penalty	TDP			2	dB
Average Power of OFF Transmitter				-30	dBm
Relative Intensity Noise	RIN			-128	dB/Hz

Parameter		Symbol	Min.	Typical	Max.	Unit
Input Differential Impedance		Z_{IN}	90	100	110	Ω
TX Disable	Disable		2.0		Vcc+0.3	V
	Enable		0		0.8	
TX Fault	Fault		2.0		V_{CC}+0.3	V
	Normal		0		0.8	
TX Disable Assert Time		t_off			10	µs
Receiver						
Centre Wavelength		λ_C	1320		1340	nm
Sensitivity [7]		P_{IN}			-14	dBm
Receiver Overload		P_{MAX}	0.5			dBm
Output Differential Impedance		P_{IN}	90	100	110	Ω
LOS De-Assert		LOS_D			-18	dBm
LOS Assert		LOS_A	-30			dBm
LOS	High		2.0		V_{CC}+0.3	V
	Low		0		0.8	

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Parameter	Symbol	Min.	Typical	Max.	Unit
Power Budget		9			dB
Data Rate			9.953/10.3125		Gbps
Transmitter					
Centre Wavelength	λ_C	1320	1330	1340	nm
Spectral Width (-20dB)	Δλ			1	nm
Average Output Power [6]	$P_{out, AVG}$	-5		0	dBm
Extinction Ratio	ER	3.5			dB
Side Mode Suppression Ratio	SMSR	30			dB
Transmitter and Dispersion Penalty	TDP			2	dB
Average Power of OFF Transmitter				-30	dBm
Relative Intensity Noise	RIN			-128	dB/Hz
Input Differential Impedance	Z_{IN}	90	100	110	Ω
TX Disable	Disable		2.0	Vcc+0.3	V
	Enable		0	0.8	
TX Fault	Fault		2.0	V_{CC}+0.3	V
	Normal		0	0.8	
TX Disable Assert Time	t_off			10	µs
Receiver					
Centre Wavelength	λ_C	1260		1280	nm

Parameter		Symbol	Min.	Typical	Max.	Unit
Sensitivity [7]		P_{IN}			-14	dBm
Receiver Overload		P_{MAX}	0.5			dBm
Output Differential Impedance		P_{IN}	90	100	110	Ω
LOS De-Assert		LOS_D			-18	dBm
LOS Assert		LOS_A	-30			dBm
LOS	High		2.0		V_{CC}+0.3	V
	Low		0		0.8	

*Note6. Output is coupled into a 9/125um SMF.

*Note7: Measured with a PRBS 2^{31}-1 test pattern @10.3125Gbps.