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XFP OPTEC, 10G, SM LC, 11.4dB DFB (20km), TX1310, (Series)

Decription:

OPTEC XFP transceiver is a high performance, cost effective modulse for serial optical data communications applications specified for signal rates of 9.95 Gb/s to 11.3 Gb/s. It is fully compliant to XFP MSA Rev 4.5. The modules are designed for single mode fiber. The transmitter section incorporates uncooled directly modulated 1310 nm distributed feedback laser (DFB).

Ordering Information

Name	Rate	Temp. [°C]	Wavelength	Distance	Laser	Connector	Fibre Type	Application
XFP OPTEC, 10G, SM LC, 11,4dB DFB (20km), TX1310, DDM*	10G	0 ~ +70	1310nm	20km	DFB/PIN	LC	SMF	Eth,SDH,10GFC
XFP OPTEC, 10G, SM LC, 11,4dB DFB (20km), TX1310, DDM, IN	10G	+40~ +85	1310nm	20km	DFB/PIN	LC	SMF	Eth,SDH,10GFC

Note1: Standard version.

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

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Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Maximum Supply Voltage	Vcc3	-0.5		4.0	V
Storage Temperature	TS	-40		85	°C

Recommend operating condition

Parameter	Symbol	Min	Typ	Max	Unit
Case operating Temperature, Standard	TC	0		70	°C
Case Operating Temperature, Industrial	TC	-40		85	°C
Supply Voltage 1	Vcc3	3.13		3.45	V

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	Vcc3	3.13		3.45	V	
Supply Current - Vcc3 supply	Icc3			720		
Module total power	P			2.5	W	
Transmitter						
Input differential impedance	Rin		100		Ω	After internal AC coupling
Differential data input swing	Vin, pp	120		820	mV	
Transmit Disable Voltage	VD	2.0		Vcc	V	
Transmit Enable Voltage	Ven	GND		GND+0.8	V	
Transmit Disable Assert Time				10	us	
Receiver						
Differential data output swing	Vot, pp	340	650	850	mV	
Data output rise time	tr			38	ps	20 – 80 %
Data output fall time	tr			38	ps	
LOS Fault	VLOS fault	Vcc - 0.5		VccHOST	V	Loss Of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
LOS Normal	VLOS norm	GND		GND+0.5	V	
Power Supply Rejection	PSR	Per Section 2.7.1. in the XFP MSA Specification				

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Optical Output Power	3	-3		+1	dBm
Launch Power min (OMA)	Poma			-3.5	dBm
Optical Wave Lenght	λ	1290		1330	nm
Optical Extinction Ratio	ER	6			dB
Side Mode Supression Ratio	SSRmin			30	dB
Average Launch power of Off transmitter	POFF	-30			dBm
Tx Jitter	Txj	Compliant with each standard requirements			
Receiver					
Receiver Sensitivity @ 10.7Gb/s	RSENS			-15	dBm
Maximum Input Power	Pmax	+0,5			dBm
Optical Center Wavelenght	λC	1270		1600	nm
Receiver Reflectance	Rrx			-14	dB
LOS De-Assert	LOSD			-17	dBm
LOS Assert	LOSA	-29			dBm
LOS Hysteresis			1		dB

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Pin Descriptions

Pin	Logic	Symbol	name/Description	Ref.
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply -Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTLL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply -Not Required	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTL-I/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	LVTTL-O	Mod_NR	Module Not Ready;	2
14	LVTTL-O	Rx_LOS	Receiver Loss of Signal indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver inverted data output	
18	CML-O	RD+	Receiver non-inverted data output	
19		GND	Module Ground	1
20		VCC2	+1.8 V Power Supply -Not required	
21	LVTTL-I	P_Down/RST	Power Down; When hight, places the module in the low power stand -by mode and one the fallin edge of P_Down initiates a module reset	
			Reset; The falling edge initiates a complete reset of the module including the 2-owire serial interface, equivalent to the power cycle.	
22		VCC2	+1.8V Power Supply -Not required	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock Non-Inverted input, AC coupled ON the host board -Not Requied	3
25	PECL-I	RefCLK-	Reference Clock Inverted Input, AC coupled on the host board -Not required	3
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter inverted data Input	
29	CML-I	TD+	Transmitter non-inverted data input	
30		GND	Module Ground	1

Notes:

1. Module circuit ground is isolated from module chassis ground within the module.

2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

3. A Reference Clock input is not required.

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General Specifications						
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Bit Rate	BR	9.95		11.1	Gb/s	1
Bit Error Ratio	BER			10^{-12}		2
Max. Supported Link Length	LMAX		20		km	1

Notes:

1. SONET OC-192 LR-1, SDH STM I-64.1 ,10GBASE-LR/LW, 1200-SM-LL-L

2. Tested with a $2^{31} - 1$ PRBS

Digital Diagnostic Functions

OPTEC XFP Dual Small Form Factor 10 Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5.
As defined by the XFP MSA, OPTEC XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:
-Transceiver temperature
-Laser bias current
-Transmitted optical power
-Received optical power
-Transceiver supply voltage
It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range. The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

Recommended Host Board Power Supply Circuit:
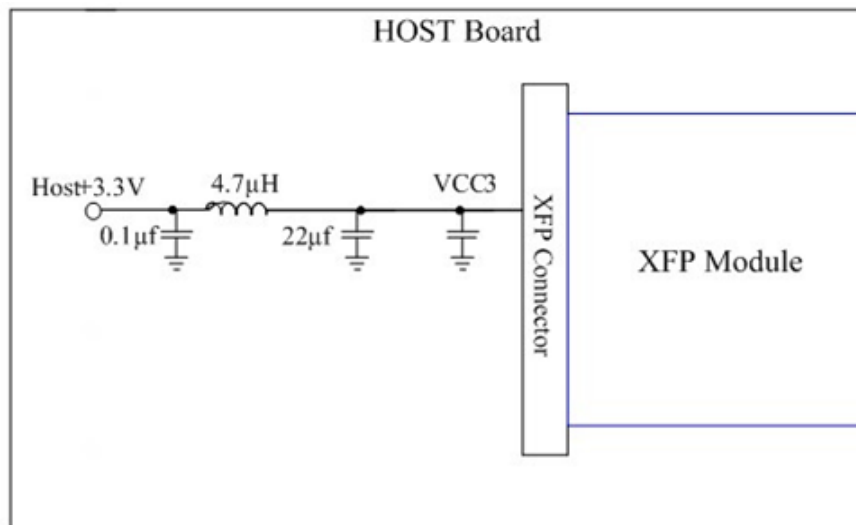
Ever since its foundation, Optec Technologies Limited has been putting a lot of effort on quality control and employee treatment to try the best to offer our clients with stable good quality products, Our fiber optic factory first gained the ISO 9001:2008. Optec Technology has passed many quality system verifications, established an internationally standardized quality assurance system and strictly implemented standardized management and control in the course of design, development, production, installation and service.

Contact OPTEC's Partner:
xbest.pl Sp. z o.o. Sp. Komandytowa
ul. Sw. Jozefa 141D, 44-200 Rybnik, Poland
tel. (+48) 32-7006900
fax. (+48) 32-7205451
email: office@xbest.pl