10G CWDM XFP 1570-1610nm 10km Optical Transceiver GXC-xx192-01C

Features

- Uncooled CWDM DFB laser from1570nm to 1610nm, with Step 20nm
- Supports 9.95Gbps to 11.3Gbps bit rates
- XFP MSA Rev 4.5 Compliant
- Maximum link length of 10km with SMF
- No reference clock required
- +1.8V,+3.3V Supply Voltage
- Low Power Dissipation 2.5W Maximum
- XFI and lineside loopback Mode Supported
- 0ºC to 70ºC Operating Case Temperature
- Diagnostic Performance Monitoring of module temperature,
  Supply Voltages, laser bias current, transmit optical power, and receive optical power
- RoHS6 compliant (lead free)

Applications

- 10G Ethernet
- 10G Fibre Channel
- SONET OC-192 / SDH STM-64
- OTN OTU2e

Description

Gigalight GXC-xx192-01C is compliant with the 10G Small Form-Factor Pluggable (XFP) Multi-Source Agreement (MSA), supporting data-rate of 10.3125Gbps(10GBASE-LR) or 9.953Gbps 10GBASE-LW), and transmission distance up to 10km on SMF. The transceiver module comprises a transmitter with uncooled CWDM DFB laser and a receiver with a PIN photodiode. Transmitter and receiver are separate within a wide temperature range of 0℃ to +70℃ and offers optimum heat dissipation and excellent electromagnetic shielding thus enabling high port densities for 10 GbE systems.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage 1	Vcc3.3	-0.5	4.0	V
Supply Voltage 2	Vcc1.8	-0.5	2	V
Storage Temperature	Tst	-40	85	ºC
Case Operating Temperature	Top	0	70	ºC
Operating Relative Humidity	RH		85	%

Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage 1	Vcc3	3.13	3.3	3.47	V
Supply current 1	Icc3	-	-	400	mA
Supply Voltage 2	Vcc2	1.71	1.8	1.89	V
Supply current 2	Icc2	-	-	400	mA
Operating Case temperature	Tca	-5	-	70	ºC
Module Power Dissipation	Pm	-	-	2.5	W

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Optical output Power	Po	-3		+3	dBm	
Optical Wavelength	λ		1570 1550 1590 1610		nm	
Optical Extinction Ratio	ER	3.5			dB	1
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch power of OFF transmitter	POFF	-30			dBm	
Tx Jitter	Tx_j		Compliant with each standard requirements			
Receiver						
Average receive power	Rip	-14.4			dBm	2
Receiver Sensitivity in OMA	RSENS1			-12.6	dBm	2
Stressed Receiver Sensitivity (OMA) @ 10.5Gb/s	RSENS2			-10.3	dBm	
Maximum Input Power	PMAX	+0.5			dBm	
Optical Center Wavelength	λC	1260		1600	nm	
LOS De-Assert	LOS_D			-15	dBm	

LOS Assert	LOS_A	-28			dBm	
LOS Hysteresis		0.5			dB	

Notes:
1. PRBS 2^{31}-1 test pattern @10.3125Gbps.
2. PRBS 2^{31}-1 test pattern @10.3125Gbps, BER≤10^{-12}.

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Operating Case Temperature Range	*Tc*	0		+70	℃	
Power Supply Voltage @ 3.3V	Vcc3	3.13	3.3	3.47	V	
Module total power	P			2.5	W	
Transmitter						
Input differential impedance	Rin		100		Ω	1
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	Vout,pp	500		850	mV	
Data output rise time	t_r			58	ps	2
Data output fall time	t_f			58	ps	2
LOS Fault	$V_{LOS\ fault}$	Vcc - 0.5		Vcc_{HOST}	V	3
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V	3
Power Supply Rejection	PSR	See Note 4 below				4

Notes:
1. After internal AC coupling.
2. 20 – 80 %
3. 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.
4. Per Section 2.7.1. in the XFP MSA Specification.

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	LVTTL-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	+1.8V Power Supply	
21	LVTTL-I	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset	
			Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – **Not required**	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 3.15Vand 3.6V.
3. Reference Clock input is not required.

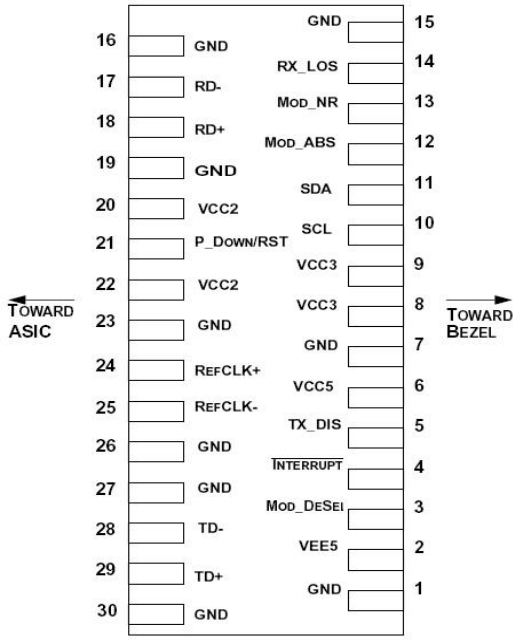

Figure2. Electrical Pin-out Details

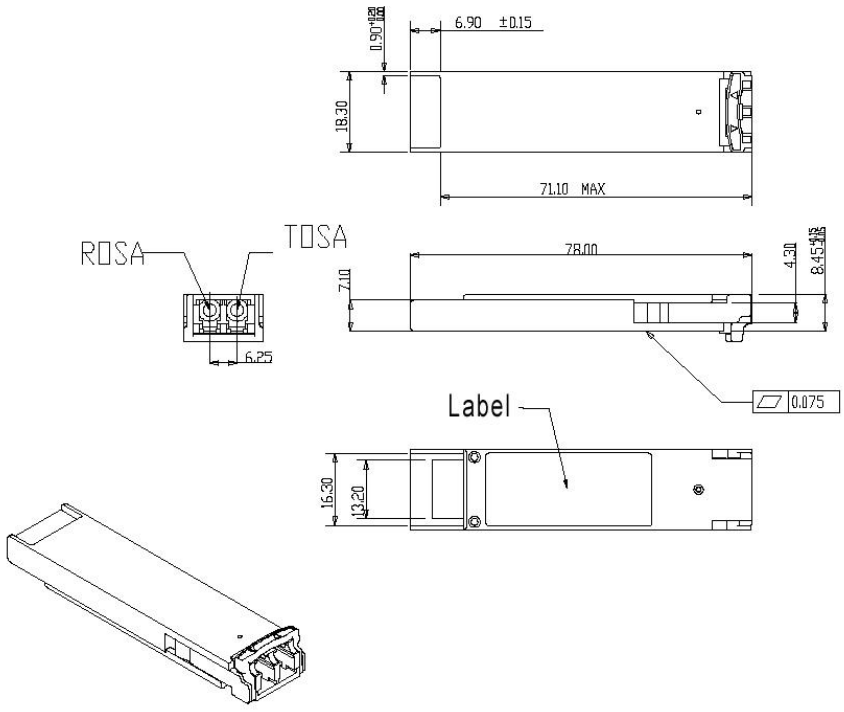

Figure3. Mechanical Specifications

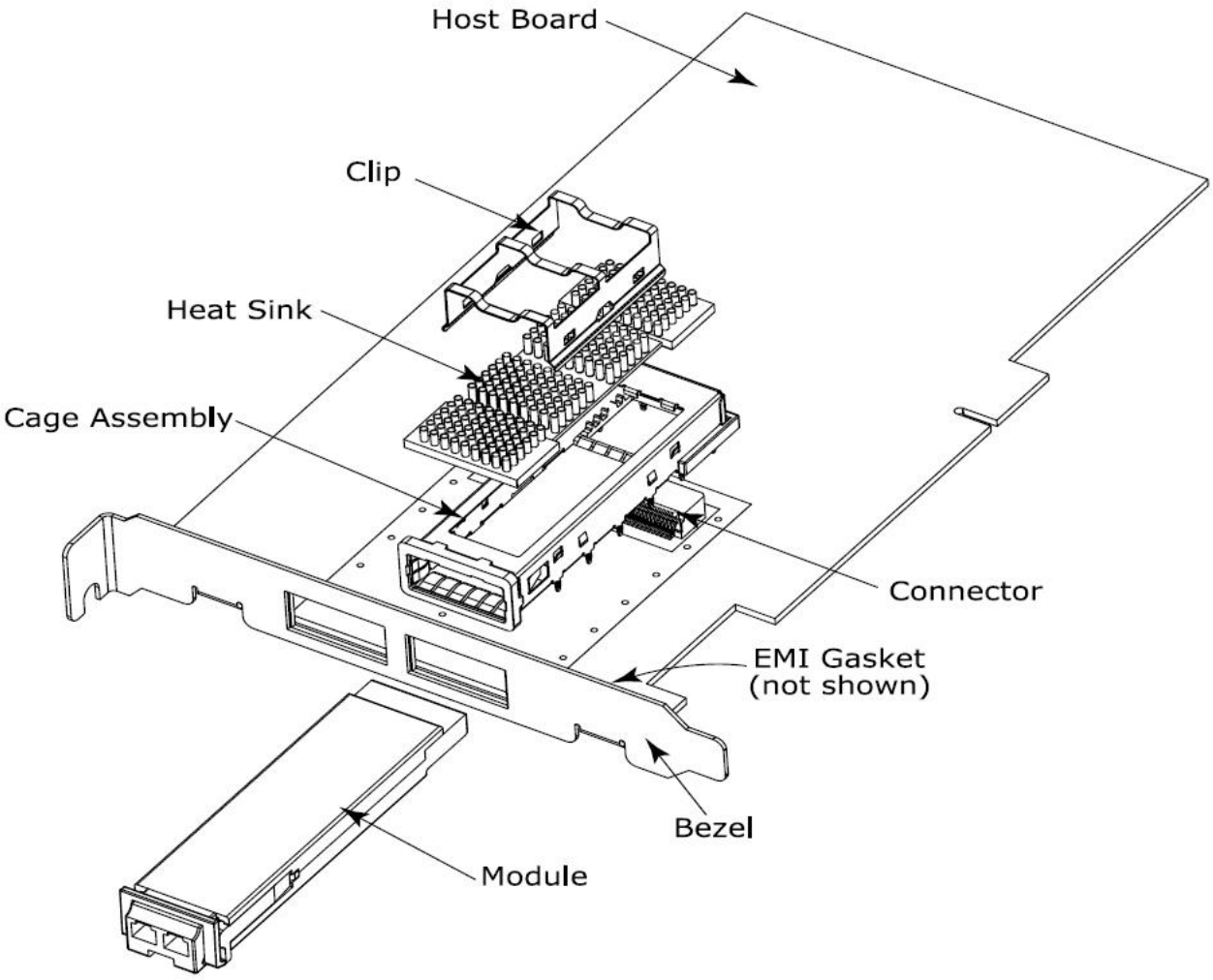

Figure4. XFP Mechanical Components

The mechanical components defined:

1. The module, clip and connector dimensions are constant for all applications. While the bezel, cage assembly, EMI gasket and heat sink can be designed and/or adjusted for the individual application.
2. The relatively small form factor of the XFP module combined with an adaptable heatsink option allows host system design optimization of module location, heatsink shape/dimension/fins design, and airflow control. The module can be inserted and removed from the cage with the heat sink and clip attached.

Regulatory Compliance

GIGALIGHT XFP transceiver is designed to be Class I Laser safety compliant and is certified per the following standards:

Feature	Agency	Standard	Certificate / Comments
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No. 50	1120288-000
Product Safety	UL	UL and CUL EN60950-2:2007	E347511

Environmental protection	SGS	RoHS Directive 2002/95/EC	GZ1001008706/CHEM
EMC	WALTEK	EN 55022:2006+A1:2007 EN 55024:1998+A1+A2:2003 -	WT10093768-D-E-E

Ordering information

Part Number	Product Description
GXC-xx192-01C	CWDM XFP, 11.3Gb/s, 1570-1610nm with 20nm Spacing, 10km, SMF, Duplex LC xx=57, 59, 61

References

1. 10 Gigabit Small Form Factor Pluggable Module (XFP) Multi-Source Agreement (MSA), Rev 4.5 – August 2005.
2. IEEE802.3ae – 2002
3. ITU-T G.709 / ITU-T G.959.1
4. Telcordia GR-253-CORE

Important Notice

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E-mail: sales@gigalight.com
Web : http://www.gigalight.com/