10G CWDM XFP 1350-1450nm 40km Optical Transceiver GXC-xx192-04C

Features

- Uncooled CWDM DFB laser and a receiver with a APD photodiode
- XFP MSA Rev 4.5 Compliant
- Data rate from 9.95Gbps to 11.3Gbps
- link length up to 40km on SMF G652D
- Low Power Dissipation 2.5W Maximum
- XFI and lineside loopback Mode Supported
- -5ºC 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-xx192-04C is compliant with the 10G Small Form-Factor Pluggable (XFP) Multi-Source Agreement (MSA), supporting data-rate of 10.3125Gbps(10GBASE-ER) or 9.953Gbps 10GBASE-EW), and transmission distance up to 40km on SMF G652D. The transceiver module comprises a transmitter with uncooled CWDM DFB laser and a receiver with a APD photodiode. Transmitter and receiver are separate within a wide temperature range of -5℃ to +70℃ and offers optimum heat dissipation and excellent electromagnetic shielding thus enabling high port densities for 10 GbE systems.

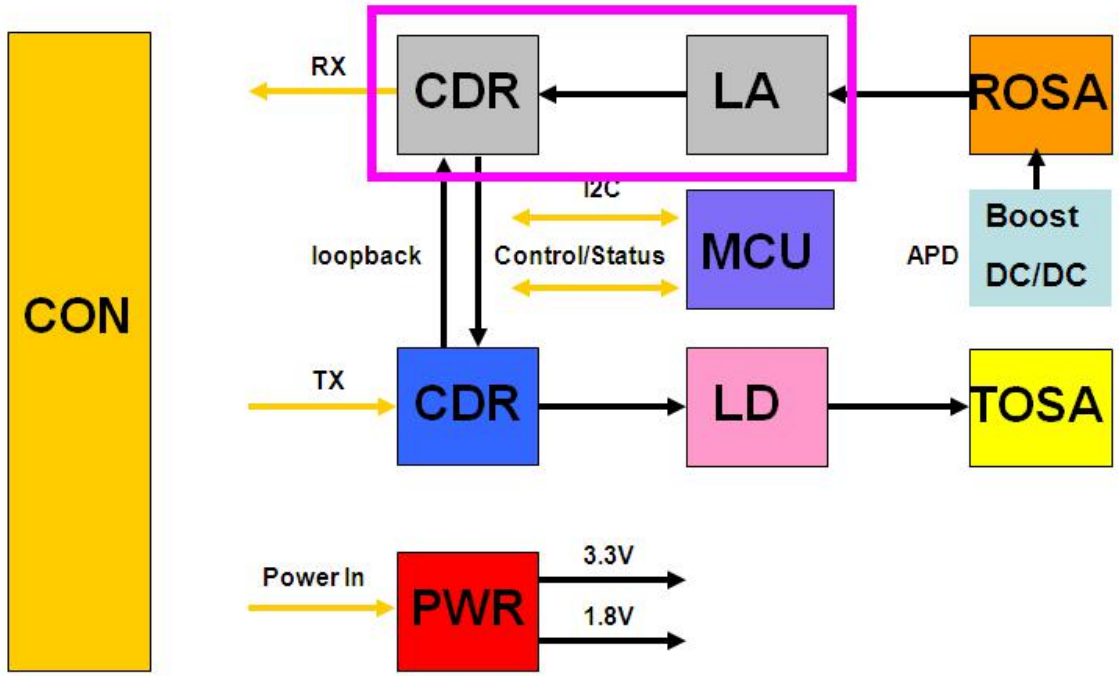

Figure1. Module Block Diagram

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Maximum Supply Voltage Vcc	Vcc	-0.5	4	V
Storage Temperature	Tst	-40	85	ºC
Case Operating Temperature	Top	-5	70	ºC
Relative Humidity	RH	0	85	%

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Optical output Power	Po	-3		+3	dBm	
Center Wavelength	λ		λ_c		nm	3
Center wavelength stability	$\Delta\lambda_D$	−6.5	λ_c	6.5	nm	
Optical Extinction Ratio	ER	3			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						

Receiver sensitivity (max) in OMA	Rsen			-18	dBm	2
Overload (Average Power)	Pavg			-1	dBm	
Optical Center Wavelength	λC	1260		1600	nm	
LOS De-Assert	LOS_D			-22	dBm	
LOS Assert	LOS_A	-35			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}.
3. ITU-T G.694.2 CWDM wavelength from 1470nm to 1610nm, each step 20nm.
All specifications are based on G.652.D transmission fiber

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply current	Icc	-	-	550	mA	
Module total power	P			2	W	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,pp	200		1800	mV	
Transmit Disable Voltage	VD	Vcc-0.8		Vcc	V	
Transmit Enable Voltage	Ven	GND		GND+0.8	V	
Transmit Disable Assert Time				10	us	
Receiver						
Differential data output swing	Vout,pp	300		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 - 0.8		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.

Digital Diagnostic Functions

Parameter	Symbol	Min.	Max	Unit	Notes
Accuracy					
Transceiver Temperature	DMI_Temp	-5	+5	degC	1
TX Output optical power	DMI_TX	-2	+2	dB	
RX Input optical power	DMI_RX	-2	+2	dB	-6dBm to -20dBm range
Transceiver Supply voltage	DMI_VCC	-3%	+3%	V	Full operating range
Bias current monitor	DMI_Ibias	-10%	10%	mA	2
Dynamic Range Accuracy					
Transceiver Temperature	DMI_Temp	-5	70	degC	
TX Output optical power	DMI_TX	-1	+2	dBm	
RX Input optical power	DMI_RX	-18	0	dBm	
Transceiver Supply voltage	DMI_VCC	3.0	3.6	V	
Bias current monitor	DMI_Ibias	0	100	mA	

Notes:
1. Internally measured
2. Accuracy of measured Tx bias current is 10% of the actual bias current from the laser driver to the laser.

Pin Descriptions

Pin	Logic	Symbol	Name/Description	Ref.
1		GND	Module Ground	1
2		VEE5	Optional –5.2 Power Supply	4
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	4
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	4
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	4
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board	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.
4.Not required

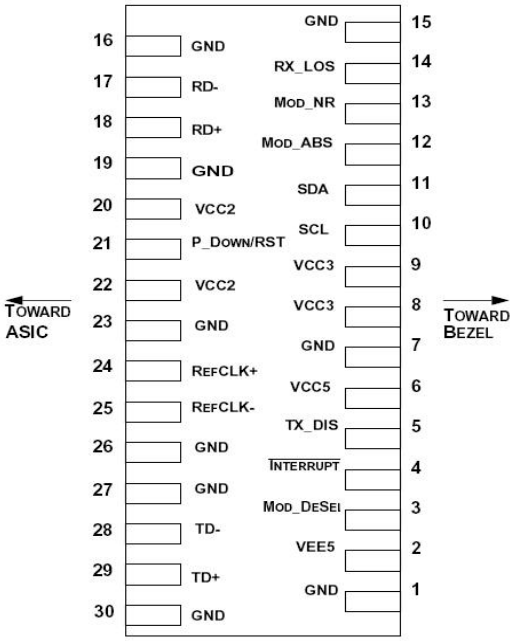

Figure2. Electrical Pin-out Details

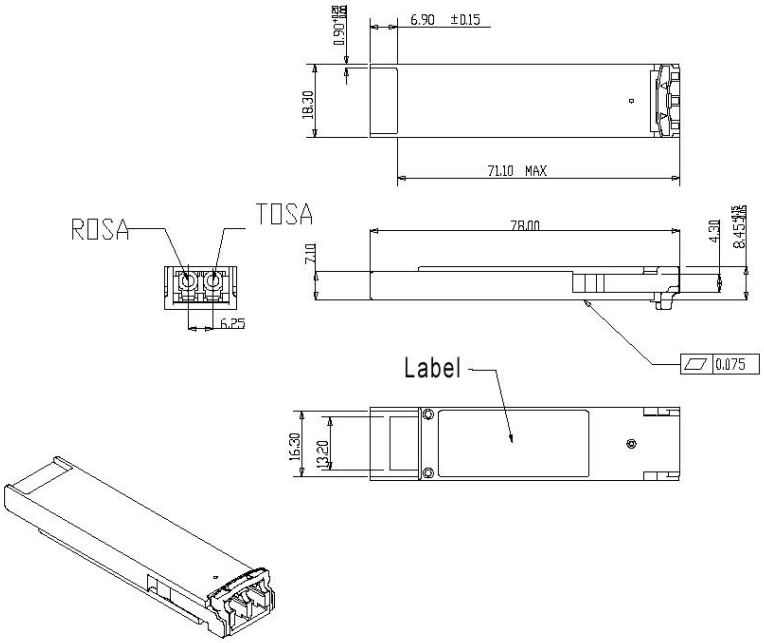

Figure3. Mechanical Specifications

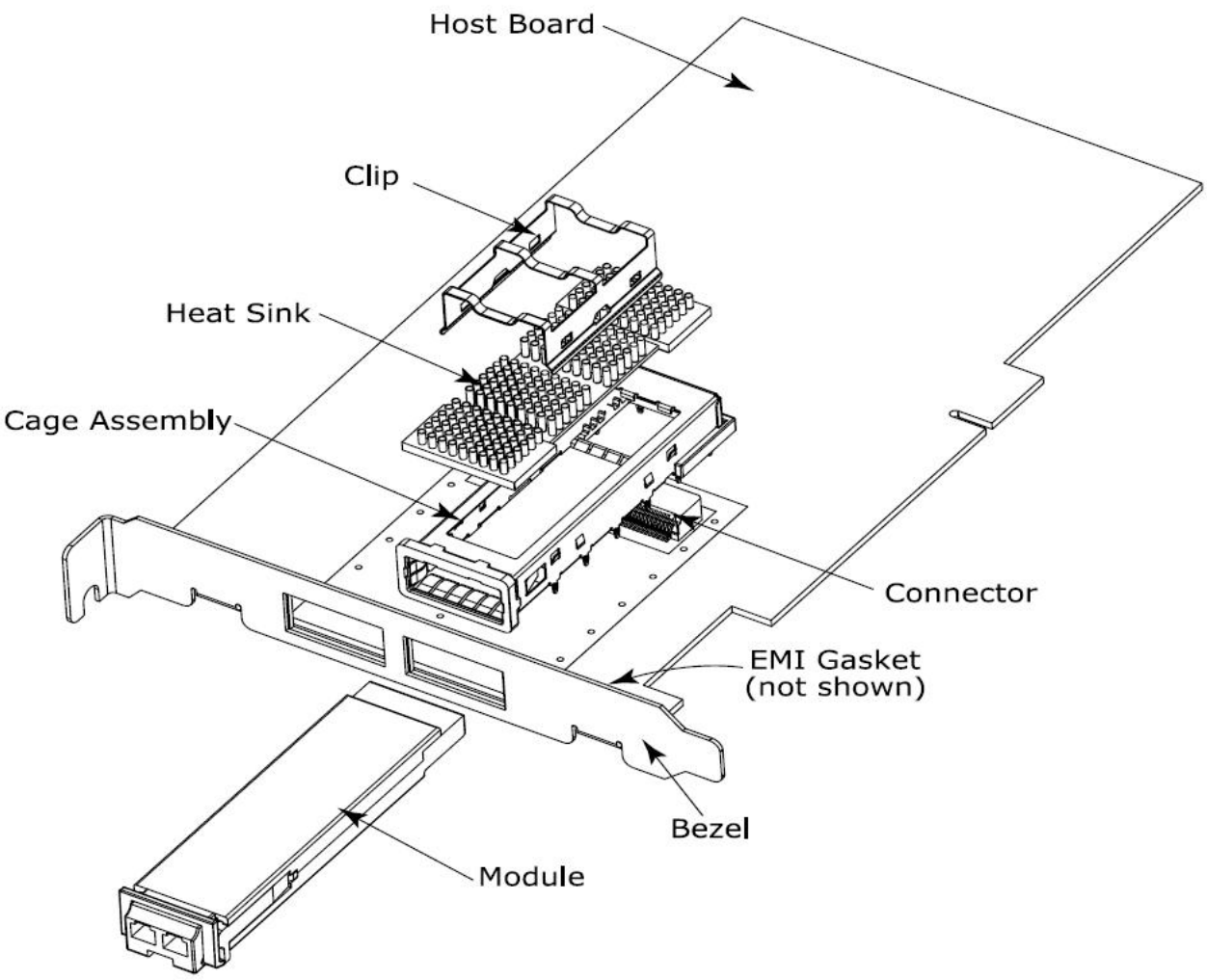

Figure4. XFP Mechanical Components

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-xx192-04C	CWDM XFP, 11.3Gb/s, 1350-1450nm with 20nm Spacing, 40km, SMF, Duplex LC xx=35, 37, 39, 41, 43, 45

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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