10G XFP ZR 1550nm 80km Industrial Optical Transceiver
GX-55192-ZRT

Features

- XFP MSA Rev 4.5 compliant
- Data rates from 9.95Gbps to 11.3Gbps
- No reference clock required
- Cooled 1550nm EML transmitter and APD receiver
- Reach up to 80km over SMF
- Single +3.3V Supply Voltage
- Low power dissipation < 2.5W
- Operating case temperature range -40°C to +85°C
- RoHS compliant (lead free)

Applications

- SONET OC-192 & SDH STM-64
- 10GBASE-ZR/ZW
- 10G Fibre Channel
- OTN OTU2e

Description

The Gigalight 10G XFP ZR 1550nm 80km industrial optical transceiver features excellent wavelength stability and is designed for 10G SDH/SONET, 10GBASE-ZR Etherent, OTN OTU2e and 10G Fibre Channel applications. The transceiver consists of two sections: the transmitter section incorporates a cooled EML laser; the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. The Gigalight XFP transceiver provides an enhanced monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

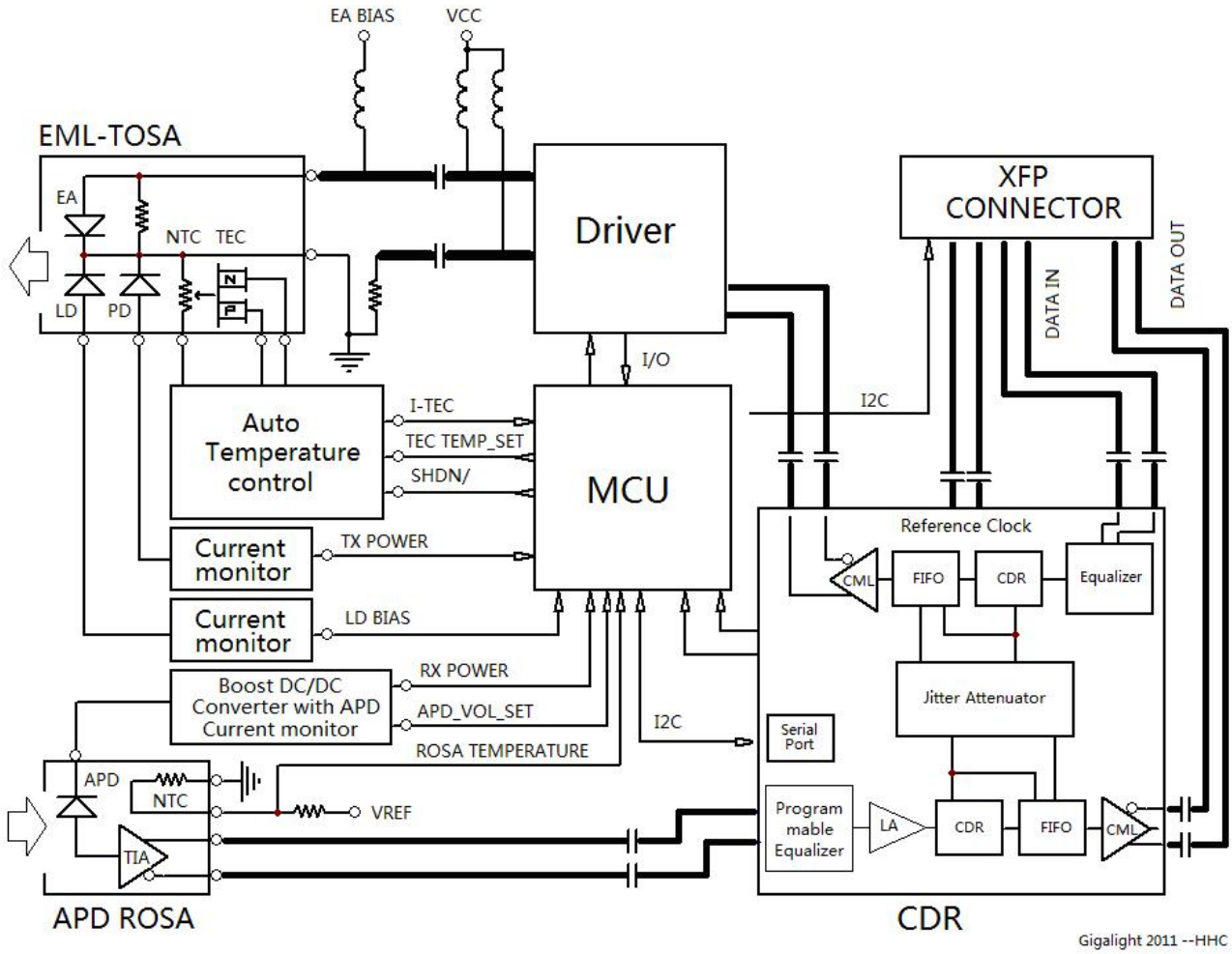

Figure 1. Module Block Diagram

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc3	-0.5	4.0	V
Storage Temperature	Tst	-40	85	°C
Case Operating	Top	-40	85	°C

Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc3	3.13	3.3	3.47	V
Supply current	Icc3	-	500	720	mA
Operating Case	Tca	-40	-	85	°C
Module Power Dissipation	Pm	-	1.8	2.5	W

Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength [1]	c		1550		nm [1]
Optical Transmit Power	Po	0	-	+4	dBm
Optical Transmit Power	PTX_DIS		-	-30	dBm
Extinction Ratio	ER	9	-	-	dB
Jitter Generation(P-P)	JG P-P	-	-	0.1	UI
Jitter Generation(RMS)	JG RMS	-	-	0.01	UI
Spectral Width (-20dB)	Δλ20	-	-	0.3	nm
Side Mode Suppression	SMSR	30	-	-	dB
Relative Intensity Noise	RIN	-	-	-130	dB/Hz
Eye Mask	Compliant with ITU-T G.691 STM-64 eye mask				

Note:

1. Wavelength stability is achieved within 60 seconds (max) after power up.

Transmitter Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Input differential impedance	Rim	-	100	-	Ω
Differential data Input	VtxDIFF	120	-	850	mV
Transmit Disable Voltage	VD	2.0	-	Vcc3+0.3	V
Transmit Enable Voltage	Ven	0	-	+0.8	V
Transmit Disable Assert	Vn	-	-	10	us

Receiver Specifications – Optical

Parameter	Bit Rate	BER	Symbol	Min	Typical	Max	dBm
Sensitivity（0KM）	9.95-10.7	$<10^{-12}$	Rsen		-	-26	dBm
	11.1	$<10^{-12}$	Rsen			-25	dBm
		$<10^{-4}$	Rsen			-28	dBm
	11.3	$<10^{-4}$	Rsen			-28	dBm
Sensitivity（80KM）	9.95-10.7	$<10^{-12}$	Rsen			-23	dBm
	11.1	$<10^{-12}$	Rsen			-22	dBm
Maximum Input			RX-overload	-7	-	-	dBm
Input			λ	1260	-	1600	nm
Reflectance			Rrx	-	-	-27	dBm
Loss of Signal			LOS_A	-37	-	-30	dBm
LOS			LOS_D	-	-	-28	dBm
LOS Hysteresis			LOS_H	0.5	-	-	dB

Notes:
1. Measured with ER=9 dB; PRBS $2^{31}-1$.
2. For 10GEthernet application, -24dBm is equivalent to an OMA of -22.09dBm for an ER = 9 dB.

Receiver Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Output differential	Rom	-	100	--	Ω
Differential Output Swing	Vout P-P	350	-	850	mV
Rise/Fall Time[1]	Tr / Tf	24	-	40	ps
Loss of Signal –Asserted	VOH	2	-	Vcc3+0.3-	V
Loss of Signal –Negated	VOL	GND	-	GND+0.5	V

Note:
1. 20%-80%;

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, open collector	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	3
6		VCC5	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, open collector	2
11	LVTTL- I/O	SDA	Serial 2-wire interface data line, open collector	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	
13	LVTTL-O	Mod_NR	Module Not Ready; open collector	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator; open collector	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	Not required	
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	Not required	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board, Not required	4
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board, Not required	4
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. Laser output disabled on TX_DIS >2.0V or open, enabled on TDIS <0.8V.
4. Reference Clock input is not required.

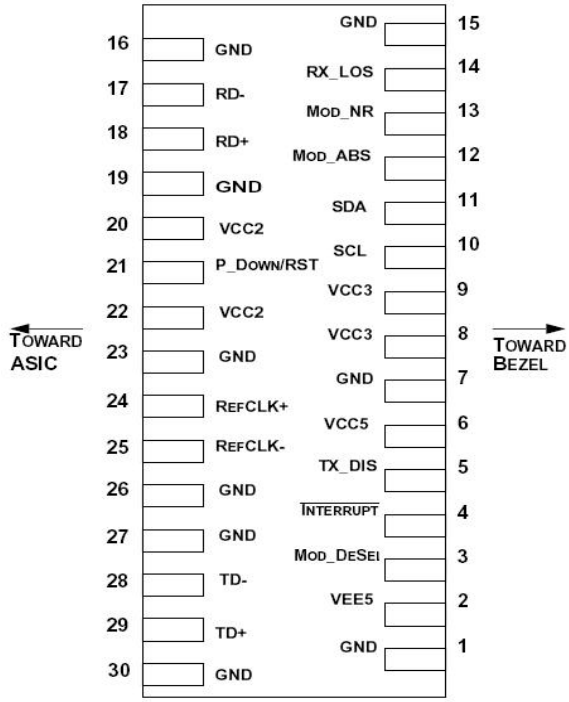

Figure 2. Electrical Pin-out Details

Mechanical Dimensions

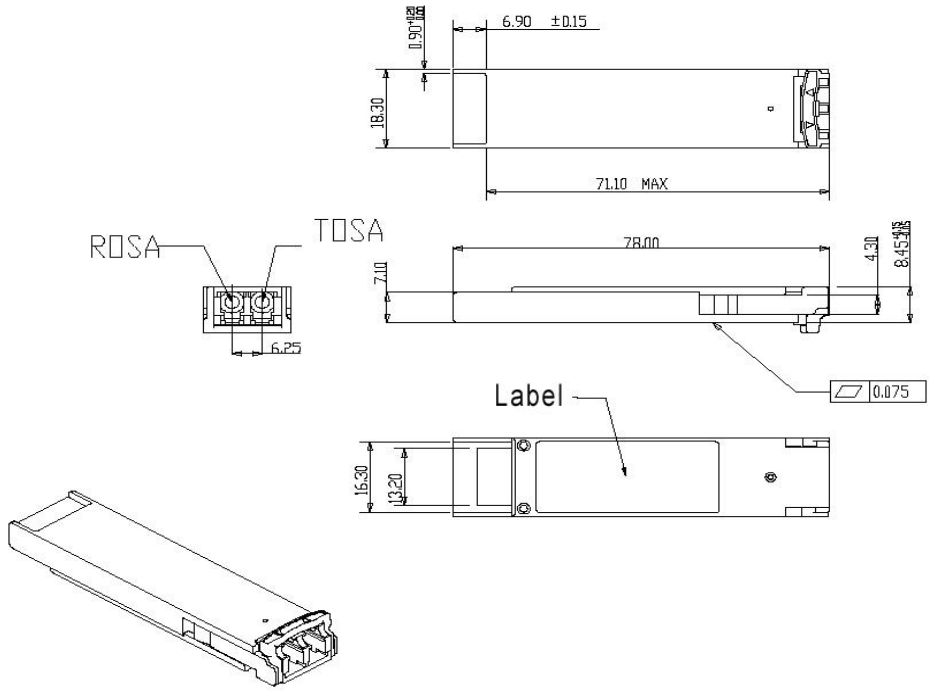

Figure 3. Mechanical Specifications

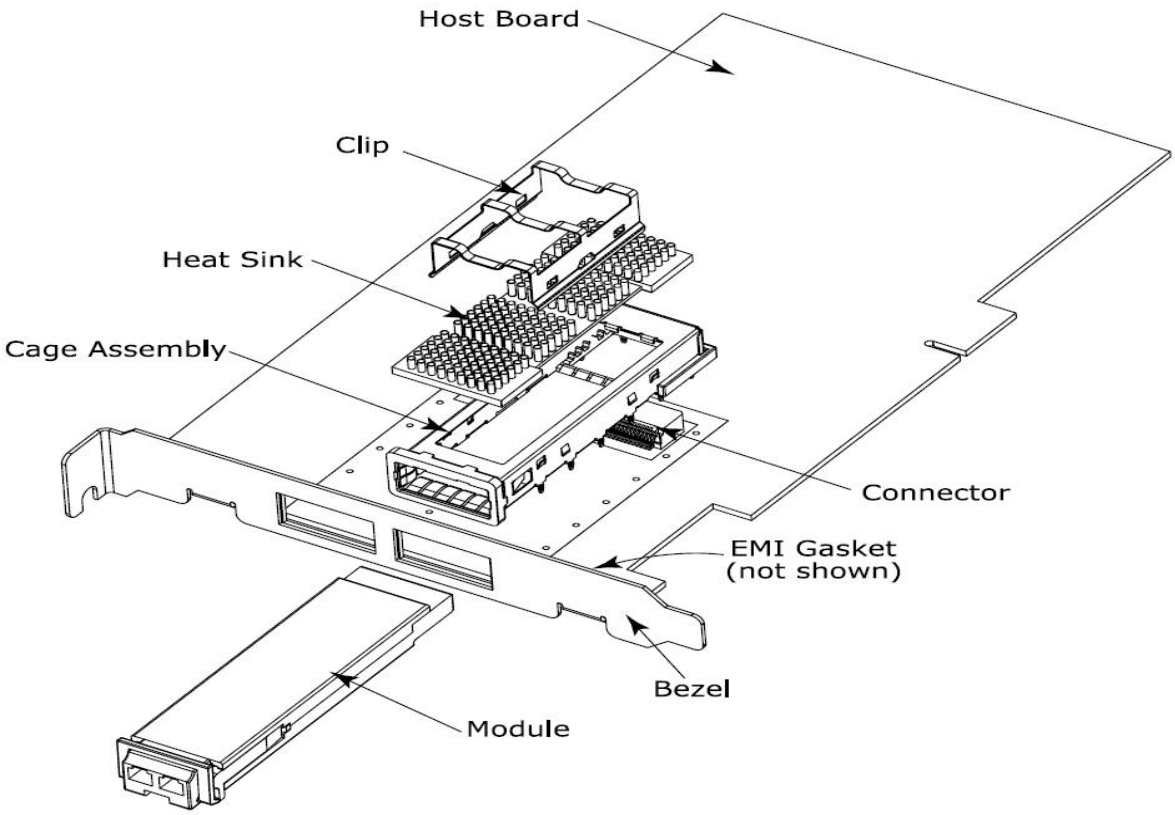

Figure 4. XFP Mechanical Components

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	Standard
Laser Safety	IEC 60825-1:2014(Third Edition)
Environmental protection	2011/65/EU
CE EMC	EN55032：2015 EN55035：2017 EN61000-3-2:2014 EN61000-3-3:2013
FCC	FCC Part 15, Subpart B; ANSI C63.4-2014

References

1. 10 Gigabit Small Form Factor Pluggable Module (XFP) Multi-Source Agreement (MSA), Rev 4.5 – August 2005. Documentation is currently available at*http://www.xfpmsa.org/*
2. IEEE802.3ae – 2002
3. ITU-T G.709 / ITU-T G.959.1 *http://www.itu.int/*
4. Telcordia GR-253-CORE

⚠CAUTION:

Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Ordering information

Part Number	Product Description
GX-55192-ZRT	10G XFP ZR 1550nm 80km Industrial Optical Transceiver

Important Notice

Performance figures,data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Gigalight before they become applicable to any particular order or contract. In accordance with the Gigalight policy of continuous improvement specifications may change without notice.

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Revision History

Revision	Date	Description
V0	May-21-2019	Advance Release.