Product Specification

10.3125Gb/s ZR XFP 1550nm 80km
Optical Transceiver

P/N: 10G-XFP-ZR

Features

- Hot Pluggable XFP form factor
- Operating data rate 10.3125Gbps
- Single +3.3V power supply
- Duplex LC-UPC connector
- Max power dissipation <3.5W
- Maximum link length of 80km
- 1550nm DFB laser transmitter
- PIN receivers
- Built-in digital diagnostic function
- Commercial temperature range 0°C to 70°C

Compliance

- Compliant with XFP MSA INF-8077i
- RoHS

Applications

- 10GBASE-SR/SW Ethernet
- 1200-Mx-SN-I 10G Fibre Channel
- SONET OC-192/SDH STM-64
- Other devices with XFP Ports

Description

The 10G-XFP-ZR XFP Optical Transceiver is a high-performance, ultra-long-reach solution designed for 10Gb/s SONET/SDH and Ethernet applications. Featuring a cooled 1550nm EML transmitter and a high-sensitivity APD receiver, this transceiver delivers reliable transmission distances of up to 80 kilometers over single-mode fiber (SMF). Ideal for carrier-grade networks, long-haul network interconnects, and data center backbones spanning vast geographical areas, it ensures robust connectivity for mission-critical environments demanding low latency and high signal integrity.

Compliant with the XFP Multi-Source Agreement (MSA) specifications, this module supports both SONET/SDH OC-192/STM-64 and 10GBASE-ZR Ethernet standards. Its advanced EML laser technology optimizes power efficiency and minimizes dispersion, while the PIN receiver enhances sensitivity for error-free performance over extended distances. The transceiver's design adheres to stringent industry protocols, ensuring seamless interoperability with XFP-compatible switches, routers, and transport equipment.

The 10G-XFP-ZR combines carrier-class reliability with plug-and-play simplicity, making it a cost-effective choice for scaling high-speed networks across metropolitan and regional boundaries. Its compact XFP form factor enables high-density deployments in space-constrained chassis, while the industrial-grade components ensure stable operation in demanding environments. Tailored for telecom operators and large enterprises, this transceiver bridges the gap between performance and scalability, offering a future-proof solution for 10G ultra-long-haul optical connectivity.

Product performance Specifications

1、Basic Product Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Storage Temperature	T_S	-40	-	+85	°C
Supply Voltage	V_{CC}	-0.5	-	4.0	V
Relative Humidity	RH	5	-	85	%
Operating Case Temperature	T_C	0	-	70	°C
Power Supply Voltage	V_{CC}	3.13	3.3	3.45	V
Power Supply Current	I_{CC}			800	mA
Module total power	PD	-	-	3.5	W
Data Rate	DR	-	10.3125	-	Gbps
Transmission Distance	-		-	80	km

2、Product Optical and Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Transmitter						
Single-ended Input Voltage Tolerance	V_{CC}	-0.3		4.0	V	
Differential Input Voltage Swing	$V_{IN,PP}$	120		820	mVpp	
Differential Input Impedance	Z_{IN}	90	100	110	Ohm	
Transmit Disable Assert Time				10	μs	
Transmit Disable Voltage	V_{DIS}	V_{CC}-1.3		V_{CC}	V	
Transmit Enable Voltage	V_{EN}	V_{EE}		V_{EE}+0.8	V	
Center Wavelength	λ_C	1530	1550	1570	nm	1
Optical Spectral Width	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	P_{AVG}	0		5	dBm	
Optical Extinction Ratio	ER	8.2			dB	
Transmitter and Dispersion Penalty	TDP			3.0	dB	
Average Launch Power of OFF Transmitter	P_{OFF}			-30	dBm	
Transmitter Eye Mask	Compliant with IEEE802.3ae					
Receiver						
Differential Output Voltage Swing	$V_{OUT,PP}$	340	650	850	mVpp	
Differential Output Impedance	Z_{OUT}	90	100	110	Ohm	
Data Output Rise/Fall Time	Tr/Tf			38	ps	
LOS Assert Voltage	$V_{LOS}H$	V_{CC}-0.5		V_{CC}	V	
LOS De-assert Voltage	$V_{LOS}L$	V_{EE}		V_{EE}+0.5	V	
Power Supply Rejection	PSR	See Note 2 below				2
Center Wavelength	λ_C	1270		1610	nm	
Receiver Sensitivity	Sen			-24	dBm	3
Input Saturation Power	Psat	-8			dBm	
LOS Assert	LOS_A	-37			dBm	

LOS De-assert	LOS_D			-27	dBm	
LOS Hysteresis	LOS_H	0.5			dB	

Note1: Average power figures are informative only, per IEEE 802.3ae.

Note2: Per section 2.7.1 in the XFP MSA specification 1.

Note3: Measured with Light Source 1550nm, ER=8.2dB; BER=<10^{-12}@10.3125Gbps, PRBS=2^{31}-1 NRZ.

Recommended Host Board Power Supply Circuit

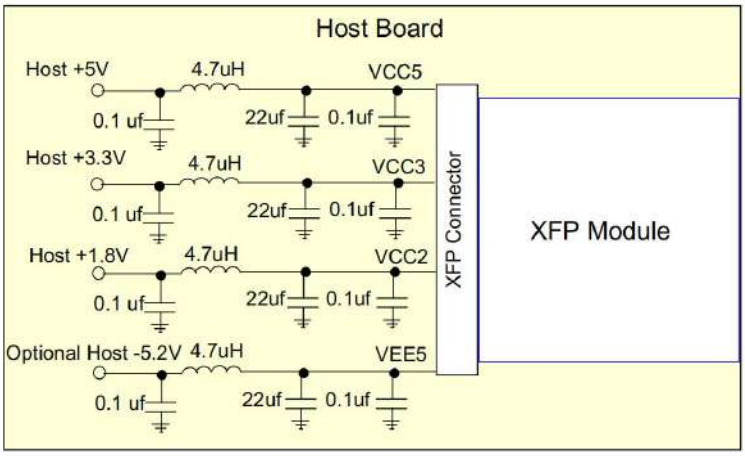


Figure 1: Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

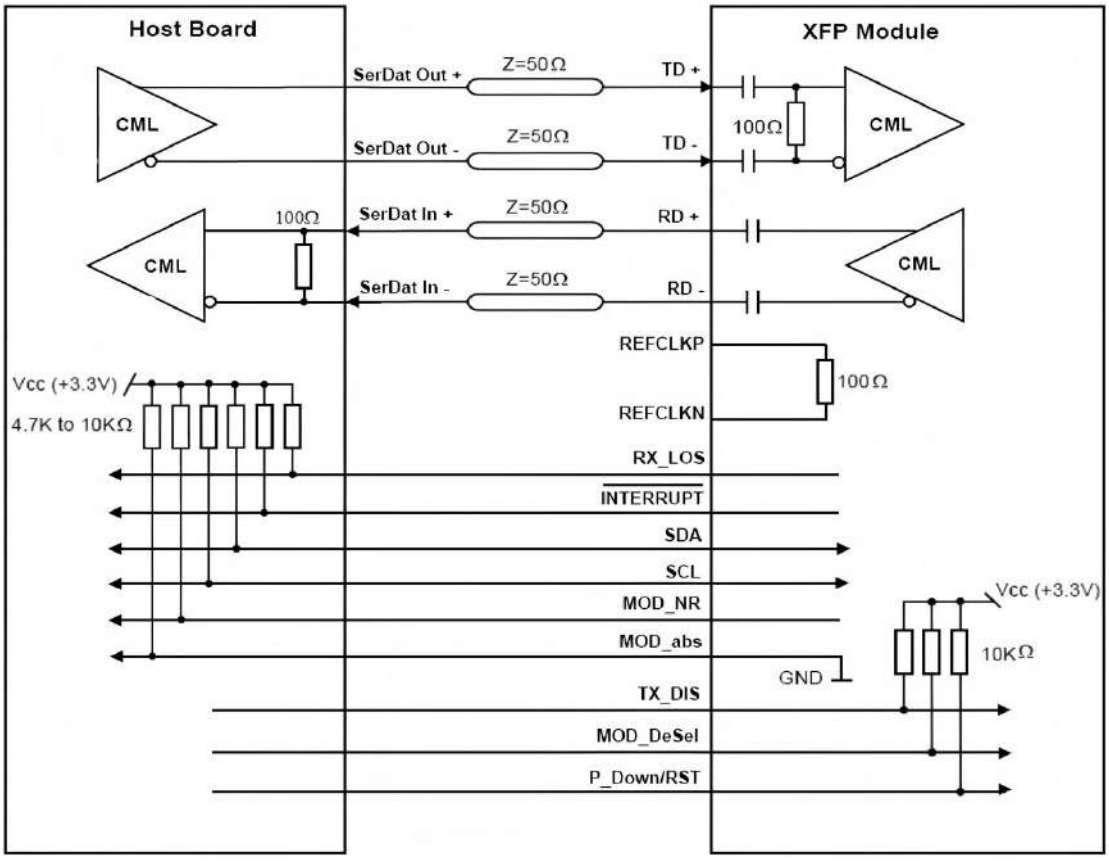


Figure2: Recommended Interface Circuit

Pin-out Definition

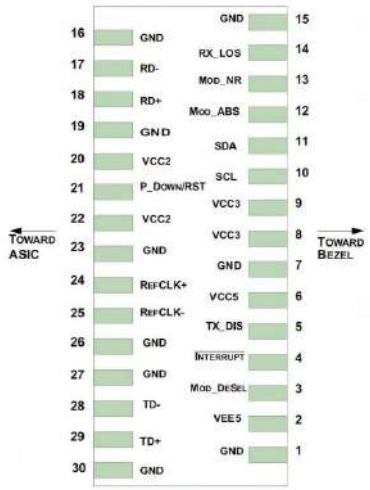


Figure3: Pin view

Pin Function Definitions

Pin	Logic	Symbol	Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply	
3	LVTTL-I	Mod_DeSel	Module De-select; When held low allows module to respond to 2-wire serial interface	
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; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
12	LVTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	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	3
21	LVTTL-I	P_Down/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. 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	3
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock Non-Inverted Input, AC coupled on the host board	
25	PECL-I	RefCLK-	Reference Clock Inverted Input, AC coupled on the host board	
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

Note1: Module ground pins Gnd are isolated from the module case and chassis ground within the module.

Note2: Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

Note3: The 1.8 V power supply can be optionally programmed to voltages lower than 1.8 V in modules supporting the variable power supply.

Monitoring Specification

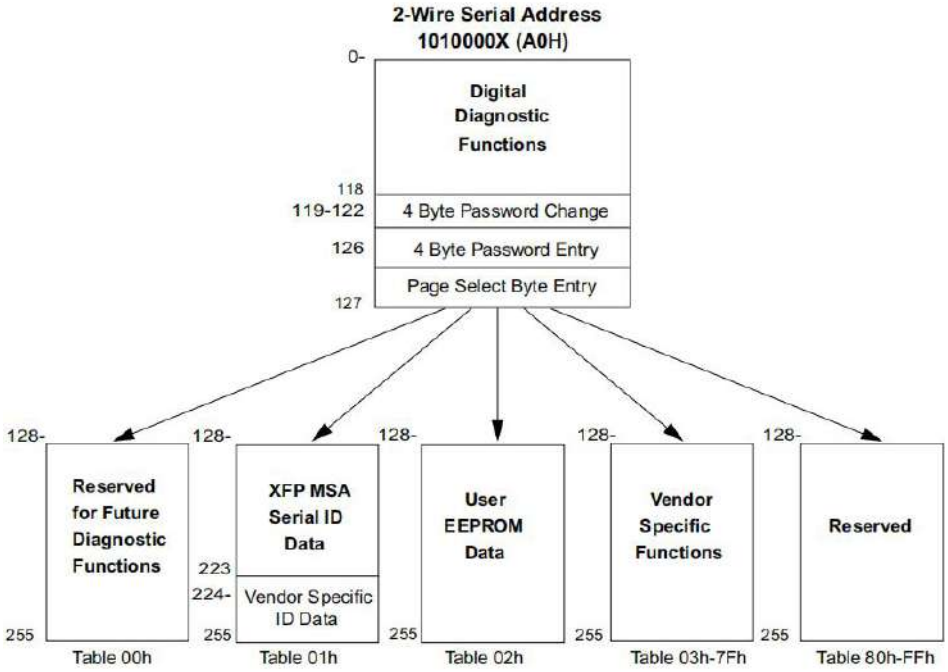
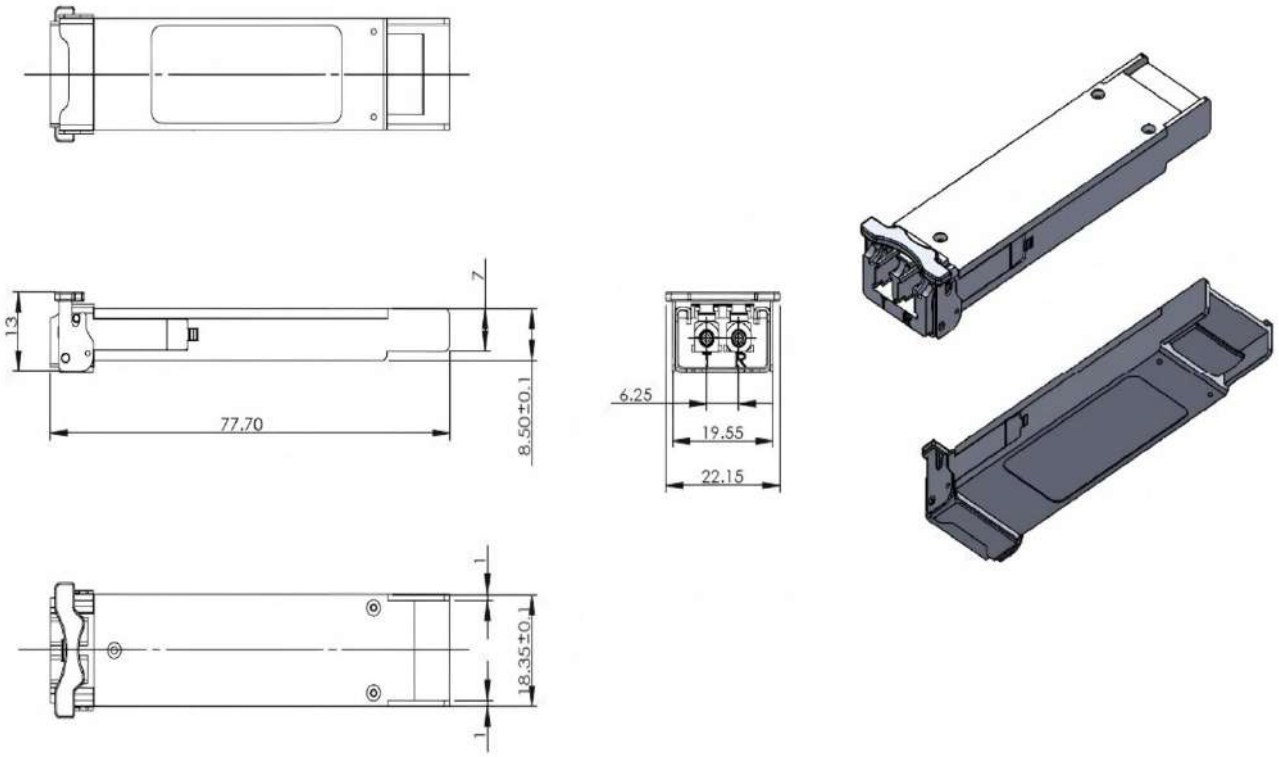


Figure4: Memory map

Memory map Table

A0h	Bytes	Description
0	1	Identifier
1	1	Signal Conditioner Control
2-57	56	Threshold Values used for Alarm and Warning Flags
58-59	2	Optional VPS Control Registers
60-69	10	Reserved
70-71	2	BER Reporting
72-75	4	Wavelength Control Registers
76-79	4	FEC control Registers
80-95	16	Flags and Interrupt Control
96-109	14	A/D readout
110-111	2	General Control/Status bits
112-117	6	Reserved
118	1	Serial Interface Read/Write Error Checking
119-122	4	Password Change Entry Area (Optional)
123-126	4	Password Entry Area (optional)
127	1	Page Select Byte

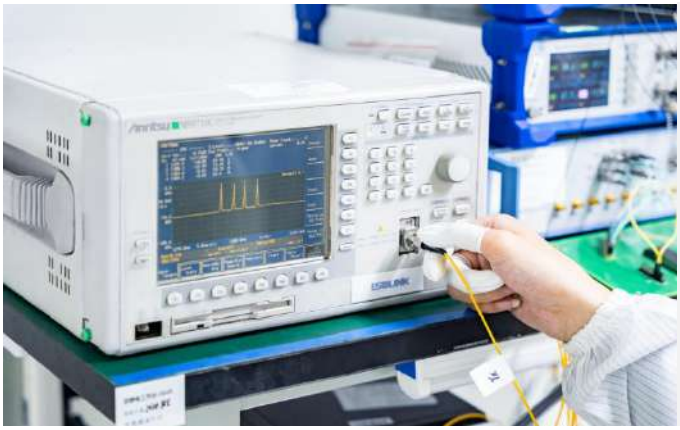
Mechanical Dimension



Test Center

1、Performance Testing

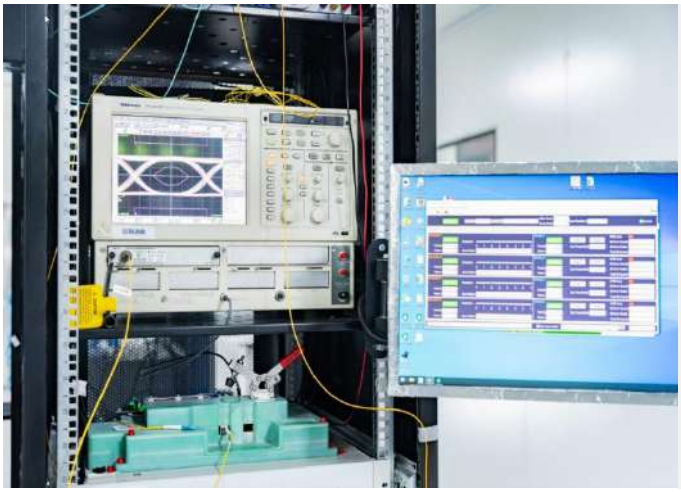
Every fiber optic transceiver is thoroughly tested by the LSOLINK Assurance Program, which is equipped with the world's most advanced analytical equipment to ensure that our transceivers meet the industry's international public protocol standards while still functioning flawlessly in your facility.



Optical Spectrum Inspection

Using the industry's leading optical spectrum analyser to check in real time that the parameters of the optical transceiver's laser comply with industry standards.

- **Peak:** Peak wavelength and peak level
- **2nd Peak:** Side-mode wavelength and level
- **Mean WI:** Center wavelength
- **Total Power:** Total power of spectrum
- **SMSR:** Side-Mode Suppression Ratio



Optical Signal Quality Inspection

Using highly efficient sampling oscilloscopes and BERT testers, equipped with an automated test platform to accurately test the signal quality of the transceiver, test records are kept for up to 5 years to ensure the traceability of each transceiver.

- **Eye Mask Margin(NRZ)**
- **TDECQ(PAM4):**transmitter dispersion eye closure
- **OMA:** Optical modulation amplitude
- **BER:** Bit error rate
- **ER:** Extinction Ratio

Flow Pressure Test

Using multi-protocol network traffic analyser with various brands of switches to test the transceiver's ability to transmit at full speed.

- **Bandwidth:** Actual transceiver bandwidth on the port
- **Packet Loss**
- **Packet Errors:**CRC Errors/PCS Errors/Symbol Errors
- **LinkDown Counts**
- **latency**

Aboveis part of our test bed network equipment. For more information, Please click download for optical transceiver performance test report.

2、Quality Control

We adopt advanced quality management solutions. Each transceiver is self-inspected, including:20x microscope inspection, 200x microscope inspection, and QC process inspection.

visual inspection

Microscopic inspection: 20X

Microscopic inspection: 200X

Reliability Verification

Optical endface inspection

OQC Inspection

Order Information

Part Number	Description
10G-XFP-SR	10GBASE-SR XFP 850nm 300m DOM LC MMF Transceiver Module
10G-XFP-LR	10GBASE-LR XFP 1310nm 10km DOM LC SMF Transceiver Module
10G-XFP-ER	10GBASE-ER XFP 1550nm 40km DOM LC SMF Transceiver Module
10G-XFP-ZR	10GBASE-ZR XFP 1550nm 80km DOM LC SMF Transceiver Module

Further Information

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Disclaimer

1. We are committed to continuous product improvement and feature upgrades, and the contents con t ained in this manual are subject to change without notice.

2. Nothing herein should be construed as constituting an additional warranty.

3. LSOLINK assumes no responsibility for the use or reliability of equipment or software not provided by LSOLINK.