XFP-10GE-LR-A
10Gbps XFP Transceiver

Features

- Supports 9.95Gb/s to 11.1Gb/s bit rates
- Hot-pluggable XFP footprint
- Maximum link length of 10km
- Uncooled 1310nm EML/DFB laser
- Duplex LC connector
- Power dissipation <2.5W
- Built-in digital diagnostic functions
- Temperature range -5°C to 70°C

Applications

SONET OC-192 SR-1 SDH STM I-64.1 at 9.953Gbps

10GBASE-LR/LW 10G Ethernet

1200-SM-LL-L 10G Fiber Channel

10GE over G.709 at 11.09Gbps

OC192 over FEC at 10.709Gbp

Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>500 V)
Electromagnetic Interference (EMI)	FCC Part 15 Class B	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product. Compatible with TμV standards
Component Recognition	UL and CUL	UL file E317337
Green Products	RoHS	RoHS6

Absolute Maximum Ratings

Parameter	Symbol		Min.	Max.	Unit
Maximum Supply Voltage 1	VCC3		-0.5	4.0	V
Maximum Supply Voltage 2	VCC5		-0.5	6.0	V
Storage Temperature	Ts		-40	85	°C
Case Operating Temperature	Top		-5	70	°C

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Temperature	Top	-5		70	°C
Supply Voltage 1	VCC3	3.13		3.45	V
Supply Voltage 2	VCC5	4.75		5.25	V

Electrical Characteristics

(TOP = -5 to 70°C, VCC5 = 4.75 to 5.25 Volts)

Parameter		Symbol	Min	Typ	Max	Unit	Note
Main Supply Voltage		Vcc5	4.75		5.25	V	
Supply Voltage S#2		Vcc3	3.13		3.45	V	
Supply Current	Vcc5	Icc5			250	mA	
Supply Current	Vcc3	Icc3			500	mA	
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		Vcc	V	
Transmit Enable Voltage		VEN	GND		GND+0.8	V	
Transmit Disable Assert Time					10	us	
Receiver							
Differential data output swing		Vout,pp	340	650	850	mV	
Data output rise time		tr			38	ps	2
Data output fall time		tf			38	ps	2
LOS Fault		VLOS fault	Vcc–0.5		VccHOST	V	3

LOS Normal	VLOS norm	GND		GND+0.5	V	
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.

Optical Characteristics

(TOP = -5 to 70°C, VCC5 = 4.75 to 5.25 Volts)

Parameter	Symbol	Min.	Typ.	Max	Unit	Ref.
Transmitter						
Optical output Power	P	-6		0	dBm	
Optical Wavelength	λ	1290	1310	1330	nm	
Optical Extinction Ratio	ER	6			dB	
Sidemode Suppression ratio	SSRmin			30	dB	
Average Launch power of OFF transmitter	POFF	-30			dBm	
Tx Jitter	Txj	Compliant with each standard requirements				
Receiver						
Receiver Sensitivity (OMA) @ 10.7Gb/s	RSENS			-14.5	dBm	
Maximum Input Power	PMAX	+0.5			dBm	
Optical Center Wavelength	λC	1270		1600	nm	
Receiver Reflectance	Rrx			-14	dB	
LOS De-Assert	LOSD			-18	dBm	
LOS Assert	LOSA	-32			dBm	
LOS Hysteresis		1			dB	

General Specifications

Parameter	Symbol	Min	Typ	Max	Units
Bit Rate	BR	9.95		11.1	Gb/s
Bit Error Ratio	BER			10-12	
Max. Supported Link Length	LMAX		10		km
MTBF	HRS		715,000		hrs

Digital Diagnostic Functions

XFP-10GE-LR-A 10Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5.
As defined by the XFP MSA, 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

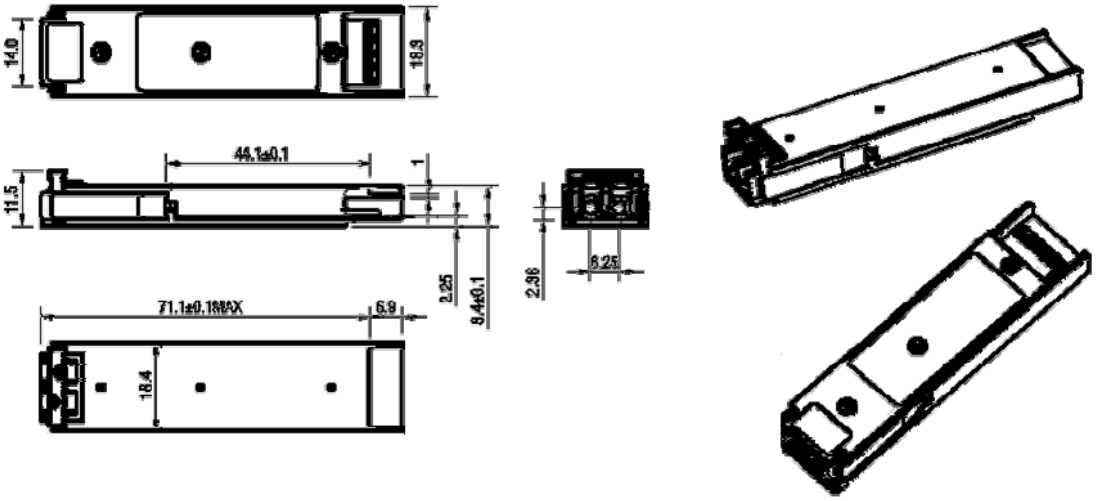
• Received optical power

• 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 is 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.

Mechanical Specifications

Approved Optics XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



Contact Information

Approved Optics is a leading supplier of Network Transceivers and Connectivity products to Channel Partners, Resellers, and OEMs. With more than 9 years of direct industry experience, our products are resident in the most demanding and mission critical functional networks Worldwide. We serve as a Master Distributor to the largest CM's in the world and deploy the most rigorous testing and firmware management programs to bring the highest level of functional product to the market at a cost that makes sense.

Corporate Offices:
Approved Optics
Tel: 800.590.9535
Web: http://www.ApprovedOptics.com