FiberStore

Datasheet

10Gbps 100GHz DWDM XFP Single-mode 40km Optical Transceiver
DXFP-10GXX-40-xx

Features

- Supports 9.95Gb/s to 11.1Gb/s data rates
- 14dBPower budget
- Temperature-Stabilized DWDM Rated EML Transmitter
- 100GHz ITU Grid, C Band
- Duplex LC Connector
- Built-in Digital Diagnostic Functions
- Support Line Side Loopback
- Support XFI Loopback
- Auxiliary 1 Monitoring Laser Temperature
- Auxiliary 2 Monitoring 5V Supply
- Operating Case temperature range:
  Standard: 0~+70℃

Applications

- 10GBASE-ER/EW Ethernet
- 1200-SM-LL-L 10G Fiber Channel
- SONET OC-192 IR-2
- SDH STM S-64.2b
- SONET OC-192 IR-3
- SDH STM S-64.3b
- ITU-T G.709

Description

FiberStore DXFP-10GXX-40-xx Small Form Factor 10Gb/s (XFP) transceivers comply with the current XFP Multi-Source Agreement (MSA) Specification1. This module is designed for single mode fiber and operates at a nominal DWDM wavelength from 1528nm to 1563nm as specified by the ITU-T. It is designed to deploy in the DWDM networking equipment in metropolitan access and core networks.

They exceed the requirements for DWDM 10Gb/s SONET/SDH interfaces per ITU-T G.698.1 S-D100S1-2D, and support DWDM 10-Gigabit Ethernet, 10-Gigabit Fiber Channel, and 10-Gigabit Ethernet. Digital diagnostics functions are available via a 2-wire serial interface, as specified in the XFP MSA.

Specifications

Table 1- Absolute Maximum Ratings

Parameter	Symbol	Min	Typical	Max	Unit
Maximum Supply Voltage 1	Vcc3	-0.5		4.0	V
Maximum Supply Voltage 2	Vcc5	-0.3		6.0	V
Storage Temperature	TS	-40		85	°C

Table 2-Recommend Operating Condition

Parameter	Symbol	Min	Typical	Max	Unit
Case Operating Temperature	TC,	0	-	70	°C
	TC,	-20	-	85	°C
Supply Voltage 1	Vcc3	3.13	3.3	3.45	V
Supply Voltage 2	Vcc5	4.75	5	5.25	v

Table 3-Electrical Characteristics

Parameter	Symbol	Min	Typ.	Typ. Max	Unit	Note
Main Supply Voltage	Vcc5	4.75		5.25	V	
Supply Voltage #2	Vcc3	3.13		3.45	V	
Supply Current – Vcc5 supply	Icc5			500	mA	
Supply Current – Vcc3 supply	Icc3			750	mA	
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	µs	
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 Normal	GND		GND+0.5	V	3
Power Supply Noise Rejection	PSNR	Compliant to Section 2.7.1 of XFP MSA				

Notes:

1. 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.

Table 4- Optical Characteristics

Please note that the transmitter becomes operational within 60 seconds of power-up. This is due to the time required for the EML to reach its optimum operating temperature.

Parameter	Symbol	Min	Typ.	Max	Unit
Transmitter					
Output Opt. Pwr: 9/125 SMF	Pout	-1		4	dBm
Center Wavelength Spacing			100		GHz
			0.8		nm
Optical Wavelength-EOL	λc	X-100	X	X+100	pm
Transmitter Center Wavelength –BOL	λc	X-40	X	X+40	pm
Optical Extinction Ratio	ER	8.2			dB
Transmitter and Dispersion Penalty	TDP			2	dB
Side Mode Suppression Ratio	SMSR	30			dB
TX Jitter Generation (peak-to-peak)	TXj			0.1	UI
TX Jitter Generation (RMS)	TXjRMS			0.01	UI
Receiver					
Receiver Sensitivity @ 10.7Gb/s	Pmin			-15	dBm
Maximum Input Power	Pmax	0.5			dBm
Optical Center Wavelength	λc	1270		1600	nm
Path Penalty				2	dB
Receiver Reflectance	Rrx			-27	dB
LOS De-Assert	LOSD			-17	dBm
LOS Assert	LOSA	-29			dBm
LOS Hysteresis		1			dB

Table 5-XX- Channel refers to the following table:

Channel(XX) *note 1	Part No.	Frequency (THz)	Center Wavelength (nm)
17*	DXFP-10G17-40-xx	191.7	1563.86
18*	DXFP-10G18-40-xx	191.8	1563.05
19*	DXFP-10G19-40-xx	191.9	1562.23
20*	DXFP-10G20-40-xx	192.0	1561.42
21	DXFP-10G21-40-xx	192.1	1560.61
22	DXFP-10G22-40-xx	192.2	1559.79
23	DXFP-10G23-40-xx	192.3	1558.98
24	DXFP-10G24-40-xx	192.4	1558.17
25	DXFP-10G25-40-xx	192.5	1557.36
26	DXFP-10G26-40-xx	192.6	1556.55

27	DXFP-10G27-40-xx	192.7	1555.75
28	DXFP-10G28-40-xx	192.8	1554.94
29	DXFP-10G29-40-xx	192.9	1554.13
30	DXFP-10G30-40-xx	193.0	1553.33
31	DXFP-10G31-40-xx	193.1	1552.52
32	DXFP-10G32-40-xx	193.2	1551.72
33	DXFP-10G33-40-xx	193.3	1550.92
34	DXFP-10G34-40-xx	193.4	1550.12
35	DXFP-10G35-40-xx	193.5	1549.32
36	DXFP-10G36-40-xx	193.6	1548.51
37	DXFP-10G37-40-xx	193.7	1547.72
38	DXFP-10G38-40-xx	193.8	1546.92
39	DXFP-10G39-40-xx	193.9	1546.12
40	DXFP-10G40-40-xx	194.0	1545.32
41	DXFP-10G41-40-xx	194.1	1544.53
42	DXFP-10G42-40-xx	194.2	1543.73
43	DXFP-10G43-40-xx	194.3	1542.94
44	DXFP-10G44-40-xx	194.4	1542.14
45	DXFP-10G45-40-xx	194.5	1541.35
46	DXFP-10G46-40-xx	194.6	1540.56
47	DXFP-10G47-40-xx	194.7	1539.77
48	DXFP-10G48-40-xx	194.8	1538.98
49	DXFP-10G49-40-xx	194.9	1538.19
50	DXFP-10G50-40-xx	195.0	1537.40
51	DXFP-10G51-40-xx	195.1	1536.61
52	DXFP-10G52-40-xx	195.2	1535.82
53	DXFP-10G53-40-xx	195.3	1535.04
54	DXFP-10G54-40-xx	195.4	1534.25
55	DXFP-10G55-40-xx	195.5	1533.47
56	DXFP-10G56-40-xx	195.6	1532.68
57	DXFP-10G57-40-xx	195.7	1531.90
58	DXFP-10G58-40-xx	195.8	1531.12
59	DXFP-10G59-40-xx	195.9	1530.33
60*	DXFP-10G60-40-xx	196.0	1529.55
61*	DXFP-10G61-40-xx	196.1	1528.77

*Note2: This channel is supported with limited availability; please contact Fiberstore for further details.

Table 6-Regulatory Compliance

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12
		EN 60825-1:2007
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50135430 0001	EN 55022:2006
		EN 55024:1998+A1+A2
CB	JPTUV-024038-M1	IEC 60825-2
		IEC 60950-1
FCC	WTF13F0503735E	47 CFR PART 15 OCT., 2010
	WTF13F0503732E	47 CFR PART 15 OCT., 2010
FDA	1230816-000	CDRH 1040.10
ROHS	RLSZF00163462	2011/65/EU

Table7– Pin Descriptions

Pin	Logic	Symbol	Name/Description	Notes
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; 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	LVTTLI/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 – 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	+1.8V Power Supply – Not required	
23		GND	Module Ground	1
24	PECL-I	Ref CLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	PECL-I	Ref CLK	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 connect should be pulled up with 4.7k – 10k ohm on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required.

Host board Connector Pinout

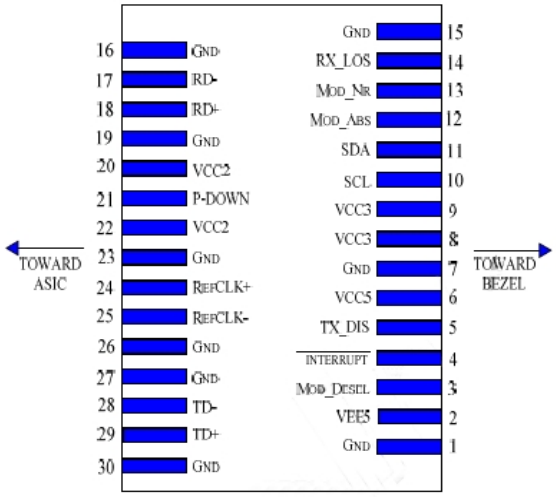


Diagram of Host Board Connector Block Pin Numbers and Name

Digital Diagnostic Functions

Fiberstore's DXFP-ER--40km Small Form Factor 10Gbps (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5.

As defined by the XFP MSA,Fiberstore XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

A.Transceiver temperature

B. Laser bias current

C. Transmitted optical power

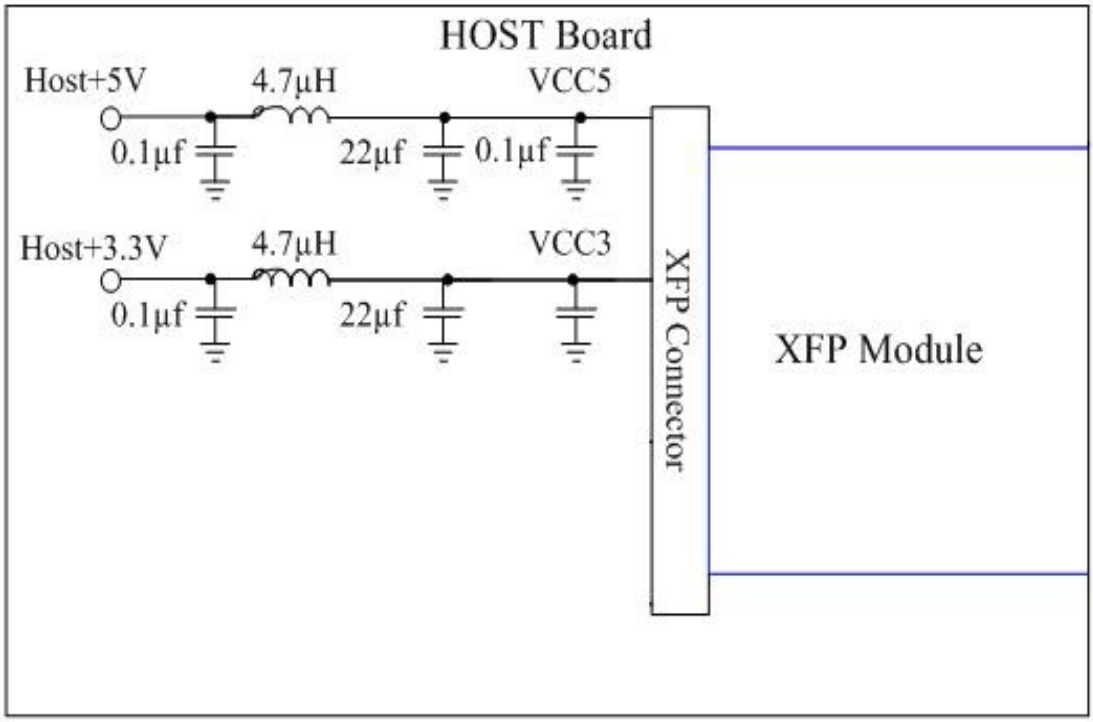
D. Received optical power

E. Transceiver supply voltage

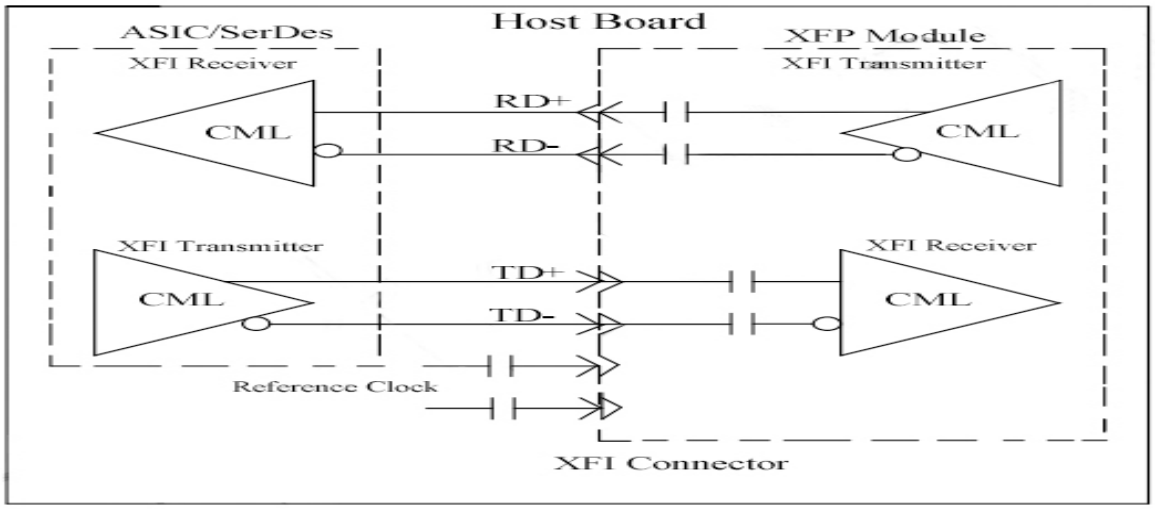
It also provide s a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

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 are 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.

Recommended Host Board Power Supply Circuit

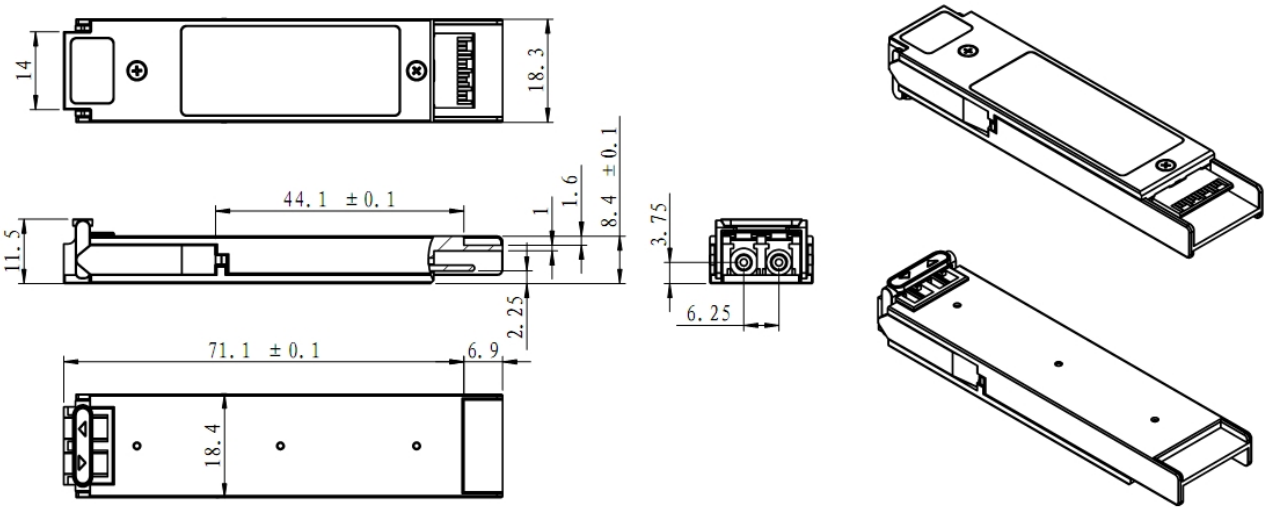


Recommended High-speed Interface Circuit



Mechanical Specifications

Fiberstore's XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



Ordering Information

Part No.	Data Rate (Gbps)	Frequency (GHz)	ITU Channel/ Wavelength (nm)	Connector Type	Transmission Distance (km)	Operating case temperature (° C)	Digital Diagnostics
DXFP-10GXX-40-xx	10	100GHz	CH17~CH61 (1563.86~1528.77)	LC	40	0 to +70	Yes

Notes:

XX means DWDM ITU Channel (CH17= channel 17, CH61 = channel 61, etc.)

xx means compatible brand. (For example: CO= Cisco, JU=Juniper, FD=Foundry, EX=Extreme, NE=Netgear,etc.)

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