

DATASHEET

DESCRIPTION:

PeakOptical®'s PXFP-0D71SF-XX Small Form Factor 10Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification. The high performance Temperature-stabilized DWDM-rated EML transmitter high sensitivity PIN receiver provide superior performance for SONET/SDH and Ethernet applications up to 80km optical links.

FEATURES:

- Support multi protocol from 9.95Gb/s to 11.1Gb/s
- Hot pluggable 30 pin connector
- Compliant with XFP MSA
- Transmission distance of 40km over single mode fiber
- Temperature-stabilized DWDM-rated EML transmitter and APD Receiver
- Duplex LC connector
- 100GHz ITU Grid, C Band
- 2-wire interface for management and diagnostic monitor
- XFI electrical interface with AC coupling
- Temperature range -5°C to 70°C
- Power dissipation: <3.5W
- RoHS Compliant Part

APPLICATIONS:

- DWDM Networks
- SONET OC-192 IR-2/SDH STM S-64.2b
- 10GBASE-ZR/ZW
- 80KM 10G Fiber Channel

SPECIFICATIONS:

Electrical Characteristics: (Condition: $T_a=T_{OP}$)

Parameter	Symbol	Min	Typ	Max	Unit	Note	
Supply Voltage	V_{CC5}	4.75		5.25	V		
	V_{EE5}	3.13		3.45	V		
	V_{CC3}	-5.46		-4.94	V		
Supply Current – V_{CC5} supply	I_{CC5}			500	mA		
Supply Current – V_{EE5} supply	I_{EE5}			50	mA		
Supply Current – V_{CC3} supply	I_{CC3}			750	mA		
Module total power	P			3.5	W		
Transmitter							
Input differential impedance	R_{in}		100		Ω	1	
Differential data input swing	$V_{in,pp}$	120		820	mV		
Transmit Disable Voltage	VD	2.0		V_{CC}	V		
Transmit Enable Voltage	VEN	GND		GND+ 0.8	V		
Transmit Disable Assert Time	T_{off}			10	us		
Tx Enable Assert Time	T_{on}			2	ms		
Receiver							
Differential data output swing	$V_{out,pp}$	500	650	800	mV		
Data output rise time	t_r			45	ps	2	
Data output fall time	t_f			45	ps	2	
LOS Fault	VLOS fault	$V_{CC} - 0.5$		V_{CCHOST}	V	3	
LOS Normal	VLOS norm	GND		GND+0.5	V	3	
Power Supply Rejection	PSR	See Note 4 below					4

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: (Condition: $T_a=T_{op}$)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.	
Transmitter							
Operating Data Rate	B	9.95		11.1	Gb/s		
Optical Modulation Amplitude (OMA)	POMA	0		+4	dBm	1	
Center Wavelength Spacing	•		100		GHz	2	
Center Wavelength (BOL)	•	-0.1	•	+0.1	nm	3	
Center Wavelength (EOL)	•	-0.025	•	+0.025		3	
Optical Extinction Ratio	ER	9			dB	1	
Sidemode Suppression ratio	SSRmin	30			dB		
Dispersion penalty at 1600ps/nm) @9.953Gb/s				2	dB	1	
Dispersion penalty at 1600ps/nm) @10.709Gb/s				2.5	dB	2	
Rise/Fall Time (20%~80%)	Tr/Tf			50	ps		
Tx Jitter	Txj	Compliant with each standard requirements					1
Optical Eye Mask 1		GR-253-CORE/ITU-T G.691					1
Optical Eye Mask 2		IEEE802.3ae					2
Receiver							
Operating Data Rate	B	9.95		11.1	Gb/s		
Receiver Sensitivity @9.953Gb/s	R _{MIN 1}			-23	dBm	1	
Receiver Sensitivity @ @11.1Gb/s	R _{MIN 2}			-24	dBm	2	
Stressed Sensitivity in OMA				-11.3	dBm	2	
Maximum Input Power	P _{MAX}	-7			dBm	2	
Optical Center Wavelength	λ_C	1260		1600	nm		
Receiver Reflectance	R _{rx}			-27	dB		
LOS De-Assert	LOSD			-26	dBm		
LOS Assert	LOSA	-37			dBm		
LOS Hysteresis	-	0.5	2	4	dB		

Notes:

1. Measured at 9.95328Gb/s,Framed PRBS2³¹-1,NRZ.
2. Measured at 10.3125Gb/s,Non-framed PRBS2³¹-1,NRZ.
3. • =Specified ITU Grid Wavelength.

Absolute Maximum Ratings:

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T _{ST}	-40	+85	°C
Operating Temperature	T _{IP}	-5	+70	°C
Supply Voltage 1	V _{CC3}	-0.5	+4.0	V
Supply Voltage 2	V _{CC5}	-0.5	+6.0	V
Supply Voltage 3	V _{EE5}	0.5	-6.0	V

Recommend Operation Environment:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage 1	V _{CC3}	+3.1	3.3	+3.5	V
Supply Voltage 2	V _{CC5}	+4.75	5.0	+5.25	V
Supply Voltage 3	V _{EE5}	-5.46	-5.2	-4.94	V
Operating Temperature	T _{OP}	-5	-	+70	°C

Pin Assignment:

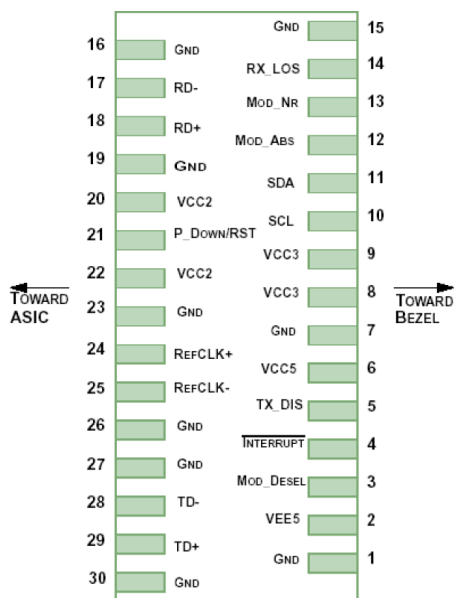


Diagram of Host Board Connector Block Pin Numbers and Name

Pin Description:

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	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply	
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 – 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	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	PECL-I	RefCLK-	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

Note:

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. A Reference Clock input is not required.

Digital Diagnostic Functions:

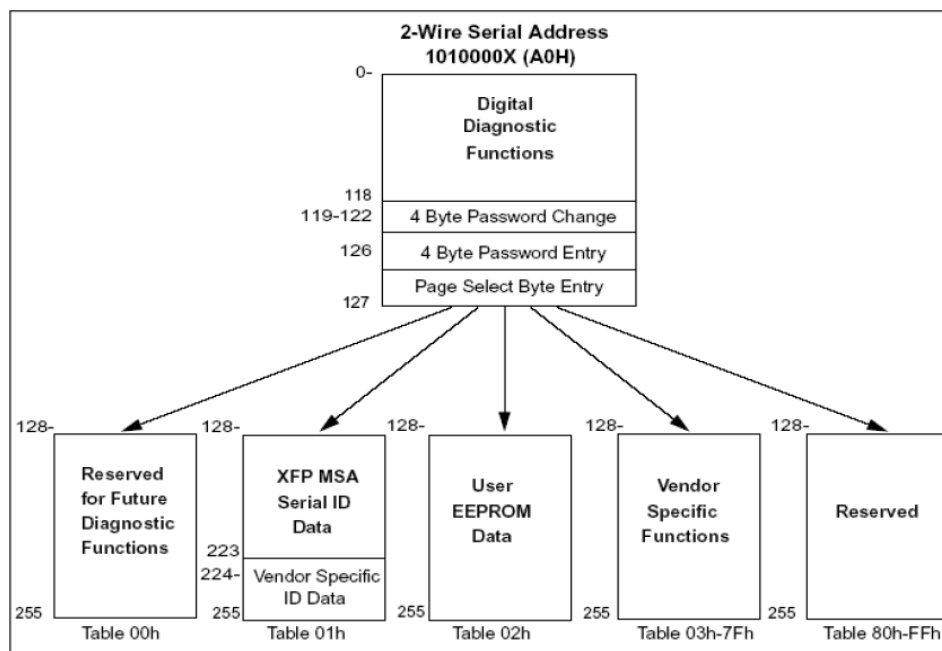
As defined by the XFP MSA 1, PeakOptical®'s XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- ✓ Transceiver temperature
- ✓ Laser bias current
- ✓ Transmitted optical power
- ✓ Received optical power
- ✓ Transceiver supply voltage

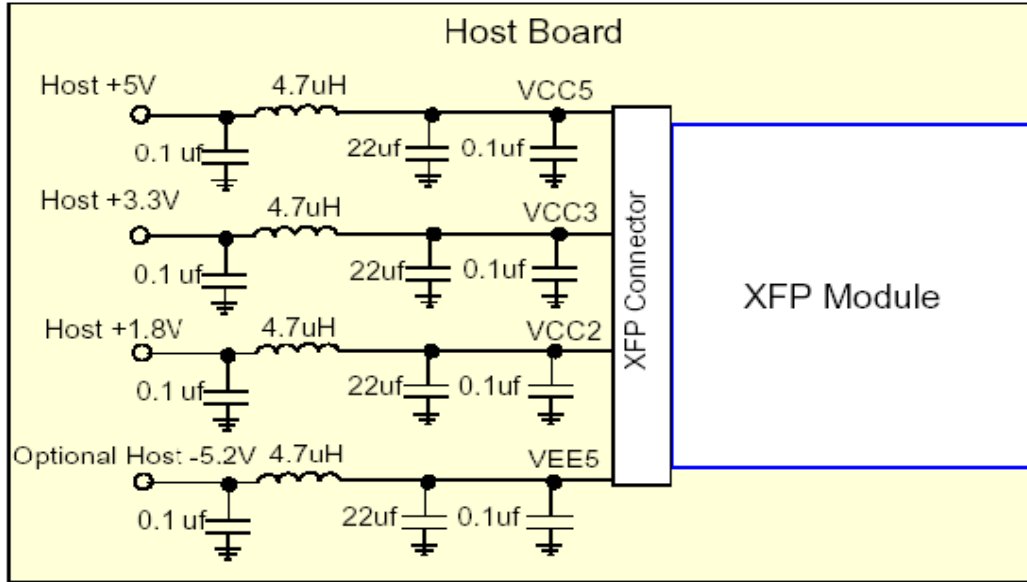
It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) 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.

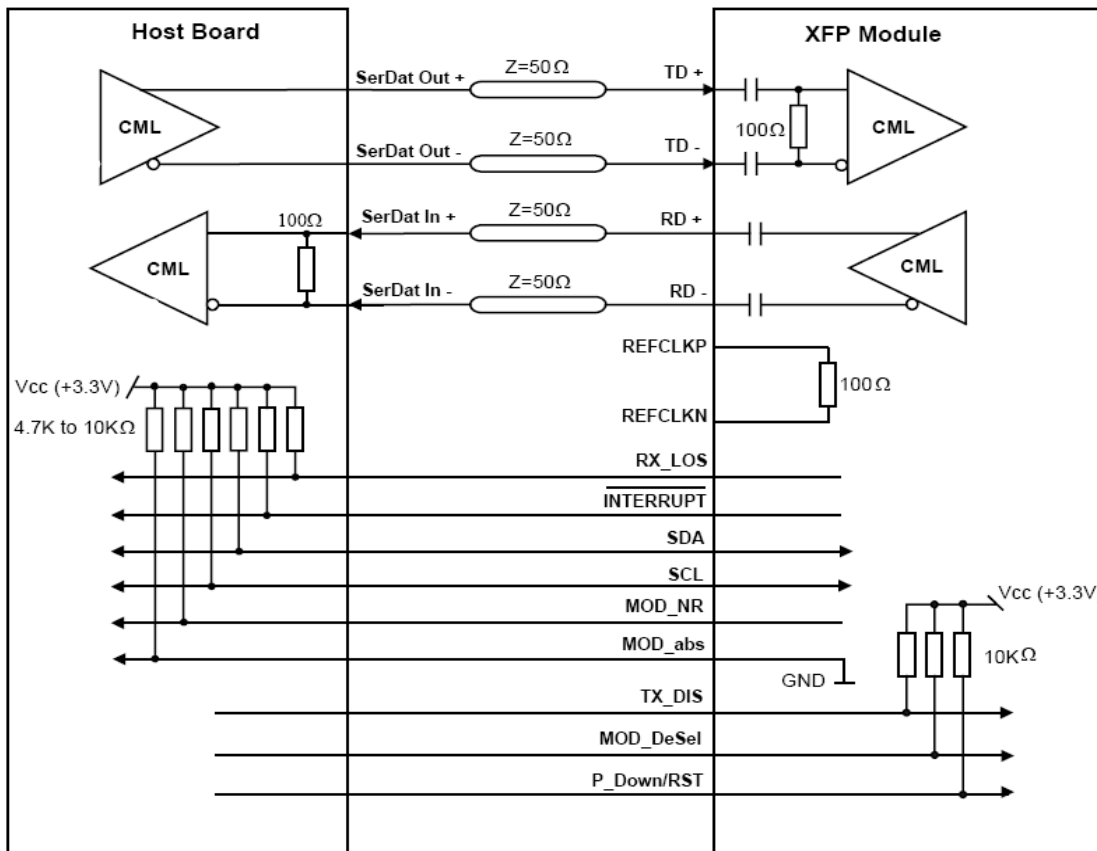
For more detailed information including memory map definitions, please see the XFP MSA Specification.



Recommended Circuit:



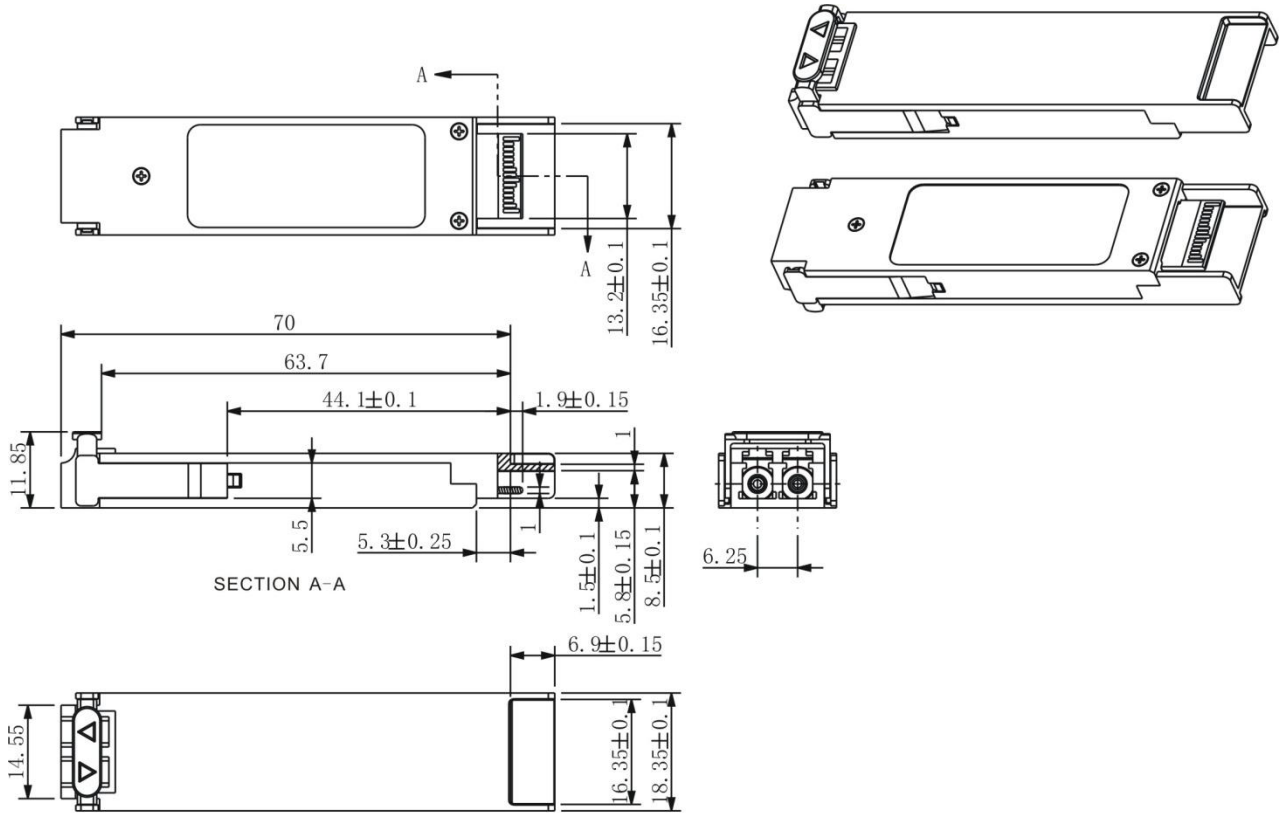
Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit

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Mechanical Dimensions:



XFP Transceiver, LC Receptacle
 All dimensions are in mm.

Order Information:

PXFP-0D71SF-XX

XX: 100GHZ ITU Grid Wavelength

Part No.	Central Wavelength(nm)	Frequency (THZ)
PXFP-0D71SF-61	1528.77	196.1
PXFP-0D71SF-60	1529.55	196
PXFP-0D71SF-59	1530.33	195.9
PXFP-0D71SF-58	1531.12	195.8
PXFP-0D71SF-57	1532.68	195.7
PXFP-0D71SF-56	1533.47	195.6
PXFP-0D71SF-55	1534.25	195.5
PXFP-0D71SF-54	1535.04	195.4
PXFP-0D71SF-53	1535.82	195.3
PXFP-0D71SF-52	1536.61	195.2
PXFP-0D71SF-51	1537.4	195.1
PXFP-0D71SF-50	1538.19	195
PXFP-0D71SF-49	1538.98	194.9
PXFP-0D71SF-48	1539.77	194.8
PXFP-0D71SF-47	1540.56	194.7
PXFP-0D71SF-46	1541.35	194.6
PXFP-0D71SF-45	1542.14	194.5
PXFP-0D71SF-44	1542.94	194.4
PXFP-0D71SF-43	1543.73	194.3
PXFP-0D71SF-42	1544.53	194.2
PXFP-0D71SF-41	1545.32	194.1
PXFP-0D71SF-40	1546.12	194
PXFP-0D71SF-39	1546.92	193.9
PXFP-0D71SF-38	1547.72	193.8
PXFP-0D71SF-37	1547.72	193.7
PXFP-0D71SF-36	1548.51	193.6
PXFP-0D71SF-35	1549.32	193.5
PXFP-0D71SF-34	1550.12	193.4
PXFP-0D71SF-33	1550.92	193.3
PXFP-0D71SF-32	1551.72	193.2
PXFP-0D71SF-31	1552.52	193.1
PXFP-0D71SF-30	1553.33	193
PXFP-0D71SF-29	1554.13	192.9
PXFP-0D71SF-28	1554.94	192.8

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10Gb DWDM XFP Transceiver
Hot Pluggable, Duplex LC,
APD Receiver, EML, SM, 80km
PXFP-0D71SF-XX

PXFP-0D71SF-27	1555.75	192.7
PXFP-0D71SF-26	1556.55	192.6
PXFP-0D71SF-25	1557.36	192.5
PXFP-0D71SF-24	1558.17	192.4
PXFP-0D71SF-23	1558.98	192.3
PXFP-0D71SF-22	1559.79	192.2
PXFP-0D71SF-21	1560.61	192.1
PXFP-0D71SF-20	1561.42	192
PXFP-0D71SF-19	1562.23	191.9
PXFP-0D71SF-18	1563.05	191.8
PXFP-0D71SF-17	1563.86	191.7

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