

XFP-DW10Gxx-100C

10Gbps XFP DWDM Transceiver, Single Mode, 100km Reach



Product Features

- ❖ Supports 9.95Gb/s to 11.3Gb/s bit rates
- ❖ DWDM EML transmitter and APD receiver
- ❖ 100 GHz ITU channel spacing with integrated wavelength locker
- ❖ Up to 100km on 9/125 μ m SMF
- ❖ Hot-pluggable XFP footprint
- ❖ Supports Lineside and XFI loopback
- ❖ Built-in digital diagnostic functions

- ❖ Full Duplex LC connector
- ❖ RoHS compliant and lead-free
- ❖ Single +3.3V power supply
- ❖ No Reference Clock required
- ❖ Power dissipation <3.5W
- ❖ Metal enclosure, for lower EMI
- ❖ Meet ESD requirements, resist 8KV direct contact voltage
- ❖ Case operating temperature
 - Commercial: 0 ~ +70oC
 - Extended: -10 ~ +80oC
 - Industrial: -40 ~ +85oC

Applications

- ❖ 10GBASE-ZR/ZW & 10G Ethernet
- ❖ SONET OC-192 &SDH STM I-64.1
- ❖ 10G Fiber Channel

Description

Our transceiver is designed for use in 10-Gigabit Ethernet links up to 100km over single mode fiber. The module consists of DWDM EML Laser, APD and Preamplifier in a high-integrated optical sub-assembly. Digital diagnostics functions are available via a 2-wire serial interface, as specified in XFP MSA. This module is designed for single mode fiber and operates at a nominal wavelength of 100GHz ITU Grid, C Band DWDM wavelength.

The transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, and received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The XFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T _s	-40	85	V
Power Supply Voltage	V _{CC}	-0.5	3.6	°C
Relative Humidity (non-condensation)	RH	5	95	%
Damage Threshold	TH _d	0		dBm

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T _{OP}	See Ordering Information			oC	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Data Rate			10.3125		Gb/s	
Control Input Voltage High		2		V _{CC}	V	
Control Input Voltage Low		0		0.8	V	
Link Distance (SMF)	D			100	km	9/125um

Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Optical Wavelength	λ_c	$\lambda_c - 0.1$		$\lambda_c + 0.1$	nm	1
Center Wavelength Spacing			100		GHz	
Optical Spectral Width	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	Pout	+1		+5	dBm	2
Optical Extinction Ratio	ER	8.2			dB	
Transmitter and Dispersion Penalty	TDP			2	dB	
Transmitter OFF Output Power	POff			-30	dBm	
Transmitter Eye Mask		Compliant with IEEE802.3ae				
Receiver						
Center Wavelength	λ_c	1450		1620	nm	
Receiver Sensitivity (Average Power)	Sen.			-25	dBm	3
Input Saturation Power (overload)	Psat	-8			dBm	
LOS Assert	LOSA	-37			dB	
LOS De-assert	LOSD			-27	dBm	
Receiver Reflectance	Rrx			-27	dB	
LOS Hysteresis	LOSH	0.5			dBm	

Notes:

1. λ_c refer to wavelength selection, and corresponds to approximately 0.8 nm
2. Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
3. Measured with Light source 1528.77~1563.86nm, ER=8.2dB; BER = $<10^{-12}$ @10.3125Gbps, PRBS=2³¹-1 NRZ.

Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Consumption	P			3.5	W	1
Supply Current	Icc			880	mA	
Transmitter						
Single-ended Input Voltage Tolerance	Vcc	-0.3		4.0	V	
Single-ended Input Voltage Tolerance	Vin,pp	120		820	mVpp	
Differential Input Impedance	Zin	90	100	110	Ohm	2
Transmit Disable Assert Time				10	us	
Transmit Disable Voltage	Vdis	Vcc-1.3		Vcc	V	3
Transmit Enable Voltage	Ven	Vee		Vee +0.8	V	
Receiver						
Differential Output Voltage Swing	Vout,pp	650		850	mVpp	
Differential Output Impedance	Zout	90	100	110	Ohm	4
Data output rise/fall time	Tr/Tf			38	ps	5
LOS Assert Voltage	VlosH	Vcc-1.3		Vcc	V	6
LOS De-assert Voltage	VlosL	Vee		Vee +0.8	V	6
Power Supply Rejection	PSR					7

Notes:

1. Maximum total power value is specified across the full temperature and voltage range.
2. After internal AC coupling.
3. Or open circuit.
4. In to 100 ohms differential termination.
5. These are unfiltered 20-80% values
6. Loss of Signal is open collector to be pulled up with a 4.7kΩ-10kΩ resistor to 3.15-3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
7. Per Section Recommended Operating Conditions and Power Supply Requirements, Digital Diagnostic Functions and Absolute Maximum Ratings in the XFP MSA Specification1.

Pin Assignment and Pin Descriptions

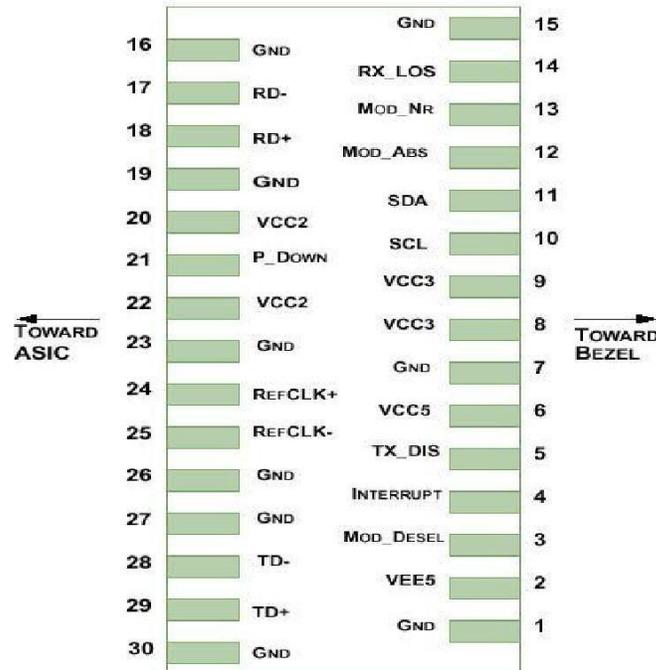


Diagram of host board connector block pin numbers and names

Pin	Symbol	Name/Description	Note
1	GND	Module Ground	1
2	VEE5	Optional -5.2 Power Supply – Not required	
3	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	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	SCL	Serial 2-wire interface clock	
11	SDA	Serial 2-wire interface data line	2
12	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module	2
13	Mod_NR	Module Not Ready; FIBER MALL's defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	2
14	RX_LOS	Receiver Loss of Signal indicator	2
15	GND	Module Ground	1
16	GND	Module Ground	1
17	RD-	Receiver inverted data output	
18	RD+	Receiver non-inverted data output	
19	GND	Module Ground	1
20	VCC2	+1.8V Power Supply – Not required	
21	P_Down/RS T	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	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	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	TD-	Transmitter inverted data input	
29	TD+	Transmitter non-inverted data input	
30	GND	Module Ground	1

Notes:

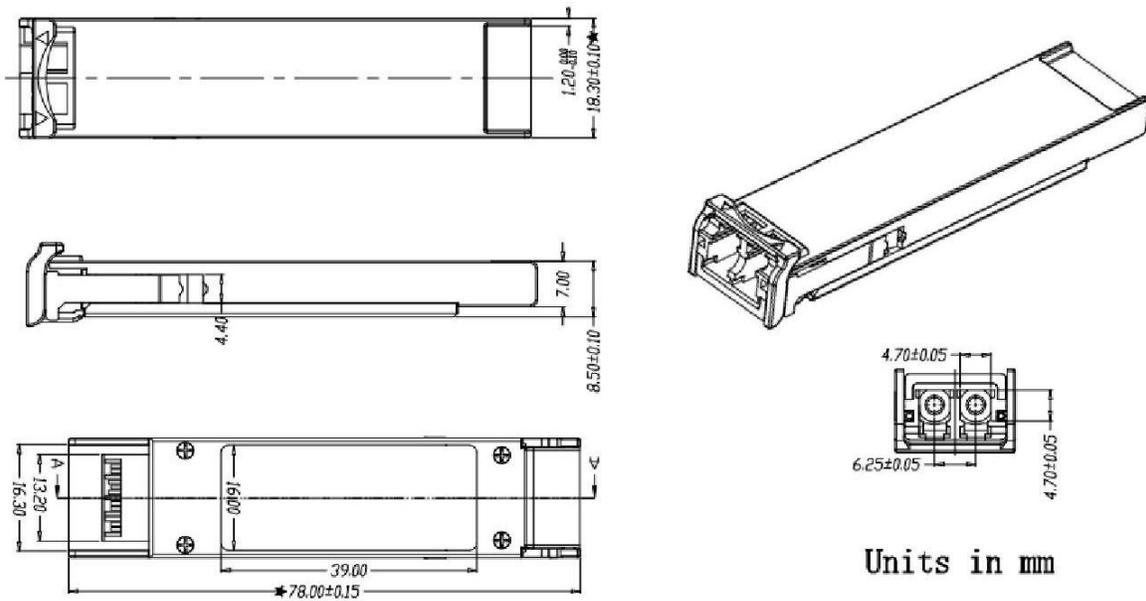
1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector, should be pulled up with 4.7kΩ-10kΩ on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required.

Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min	Max	Unit	Notes
Temperature Monitor Absolute Error	DMI_Temp	-3	3	degC	Over operating temp
Supply Voltage Monitor Absolute Error	DMI_VCC	-0.15	0.15	V	Full operating rang
RX Power Monitor Absolute Error	DMI_RX	-3	3	dB	
Bias Current Monitor	DMI_bias	-10%	10%	mA	
TX Power Monitor Absolute Error	DMI_TX	-3	3	dB	

Mechanical Specifications



Ordering Information

Part Number	Product Description
XFP-DW10Gxx-100C	10.3125Gbps, 1528.77nm-1563.86nm DWDM, LC, 100km, 0 ~ +70°C, with DDM

λC Wavelength Guide					
Channel	Frequency (THZ)	Wavelength (nm)	Channel	Frequency (THZ)	Wavelength (nm)
C17	191.7	1563.86	C40	194.0	1545.32
C18	191.8	1563.04	C41	194.1	1544.52
C19	191.9	1562.23	C42	194.2	1543.73
C20	192.0	1561.41	C43	194.3	1542.93
C21	192.1	1560.60	C44	194.4	1542.14
C22	192.2	1559.79	C45	194.5	1541.34
C23	192.3	1558.98	C46	194.6	1540.55
C24	192.4	1558.17	C47	194.7	1539.76
C25	192.5	1557.36	C48	194.8	1538.97
C26	192.6	1556.55	C49	194.9	1538.19
C27	192.7	1555.74	C50	195.0	1537.40
C28	192.8	1554.94	C51	195.1	1536.61
C29	192.9	1554.13	C52	195.2	1535.82
C30	193.0	1553.32	C53	195.3	1535.04
C31	193.1	1552.52	C54	195.4	1534.25
C32	193.2	1551.72	C55	195.5	1533.46
C33	193.3	1550.92	C56	195.6	1532.68
C34	193.4	1550.11	C57	195.7	1531.89
C35	193.5	1549.32	C58	195.8	1531.12
C36	193.6	1548.51	C59	195.9	1530.33
C37	193.7	1547.71	C60	196.0	1529.55
C38	193.8	1546.92	C61	196.1	1528.77
C39	193.9	1546.12	-	-	-