

# PRODUCT SPECIFICATION

<b>Part No.:</b>	<b>AC-XFBL-23G10-20/AC-XFBL-32G10-20</b>	
<b>Description:</b>	10G XFP Transceiver, BIDI TX1270nm/RX1330nm 20km 10G XFP Transceiver, BIDI TX1330nm/RX1270nm 20km	
<b>Release Date</b>	<b>Rev.</b>	<b>Revision Change Description</b>
<b>2016/07/16</b>	<b>A0</b>	New Release
<b>2020/12/28</b>	<b>A1</b>	Template Update

## Features

- ✧ Up to 9.95 Gbps to 10.5Gbps
- ✧ Supports 9.95Gbps to 11.3Gbps bit rates
- ✧ Hot-pluggable XFP footprint
- ✧ XFI Loopback Mode
- ✧ 1270nm DFB laser and PIN receiver for AC-XFBL-23G10-20
- ✧ 1330nm DFB laser and PIN receiver for AC-XFBL-32G10-20
- ✧ Up to 20km for SMF transmission
- ✧ Compliant with SFP+ MSA and SFF-8472 with single LC receptacle
- ✧ Compatible with RoHS
- ✧ Single +3.3V power supply
- ✧ Power dissipation<2.0W
- ✧ 2-wire interface with integrated Digital Diagnostic monitoring
- ✧ EEPROM with Serial ID Functionality
- ✧ Operating case temperature:
- ✧ Standard: 0 to +70°C
- ✧ Industrial: -40 to +85°C

## Application

- ✧ 10GBASE-BX 10.3125Gb/s Ethernet
- ✧ 10GBASE-BX 9.953Gb/s Ethernet
- ✧ SONET OC-192 SR-1 SDH STM I-64.1

## Standard

- ✧ Compliant with SFF-8472
- ✧ Compliant with XFP MSA

## Specification:

### Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	0	4	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	95	%
Signal Input Voltage		Vcc-0.3	Vcc+0.3	V

### Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	0		+70	°C
	Industrial	-40		+85	°C
Power Supply Voltage	Vcc	3.135	3.30	3.465	V
Power Supply Current	Icc			600	mA
Data Rate			10.3	11.3	Gbps
Fiber Length 9/125μm core SMF		-	20	-	km

### Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Transmitter</b>						
Centre Wavelength	$\lambda_c$	1260	1270	1280	nm	AC-XFBL-23G10-20
		1320	1330	1340	nm	AC-XFBL-32G10-20
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio	SMSR	30	-		dB	
Average Output Power	P <sub>out</sub>	-5		0	dBm	1
Extinction Ratio	ER	3.5			dB	
Data Input Swing Differential	V <sub>IN</sub>	120		820	mV	2
Input Differential Impedance	Z <sub>IN</sub>	85	100	115	Ω	
TX Disable	Disable	2.4		Vcc	V	
	Enable	-0.3		0.8	V	
TX Fault	Fault	2.0		Vcc+0.3	V	
	Normal	-0.3		0.8	V	
<b>Receiver</b>						

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Centre Wavelength	$\lambda_c$	1320	1330	1340	nm	AC-XFBL-23G10-20
		1260	1270	1280	nm	AC-XFBL-32G10-20
Receiver Sensitivity				-15	dBm	3
Receiver Overload		0.5			dBm	3
LOS De-Assert	LOS <sub>D</sub>			-17	dBm	
LOS Assert	LOS <sub>A</sub>	-32			dBm	
LOS Hysteresis		0.5		4	dB	
Data Output Rise/Fall time	tr/tf		20		ps	
LOS Output Voltage-High	VLOSH	2		V <sub>cc</sub>	V	
LOS Output Voltage-Low	VLOSL	-0.3		0.4	V	
Receiver LOS Pull up Resistor	RLOS	4.7		10	KOhm	

**Notes:**

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS<sup>231</sup>-1 test pattern @10312Mbps, BER  $\leq 1 \times 10^{-12}$ .

### Digital Diagnostic Memory Map

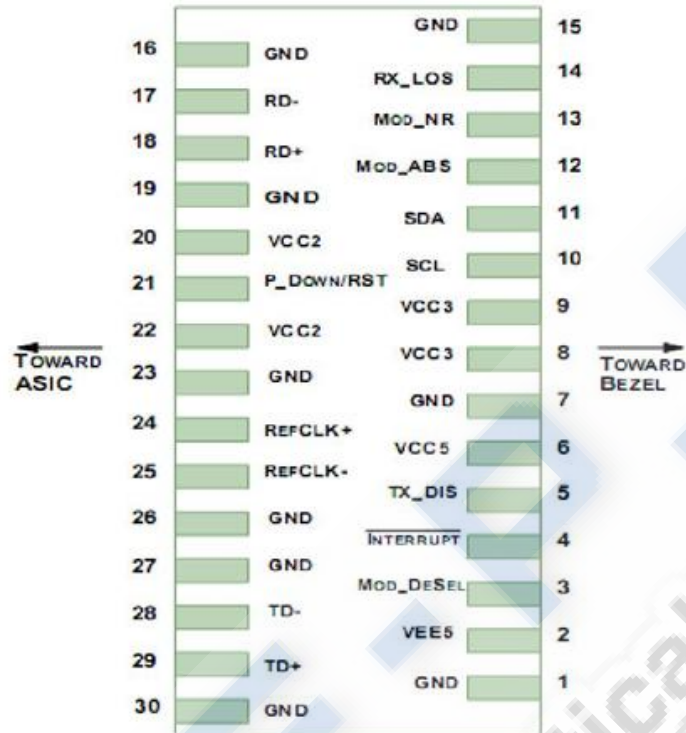
AC-XFBL-23/32G10-20 As defined by the XFP MSA, XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- 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 (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.

## Pin Descriptions



## Pin Assignment

Pin	Signal Name	Description	Plug Seq.	Notes
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	LVTTTL-I	
4	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	LVTTTL-O	2
5	TX_DIS	Transmitter Disable; Transmitter laser source turned off	LVTTTL-I	
6	VCC5	+5 Power Supply		
7	GND	Module Ground		1
8	VCC3	+3.3V Power Supply		
9	VCC3	+3.3V Power Supply		
10	SCL	Serial 2-wire interface clock	LVTTTL-I	2
11	SDA	Serial 2-wire interface data line	LVTTTL-I/O	2
12	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	LVTTTL-I	2

13	Mod_NR	Module Not Ready; XGIGA defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	LVTTTL-I	2
14	RX_LOS	Receiver Loss of Signal indicator	LVTTTL-I	2
15	GND	Module Ground		1
16	GND	Module Ground		1
17	RD-	Receiver inverted data output	CML-O	
18	RD+	Receiver non-inverted data output	CML-O	
19	GND	Module Ground		1
20	VCC2	+1.8V Power Supply – Not required		
21	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	LVTTTL-I	
22	VCC2	including the 2-wire serial interface, equivalent to a power cycle. +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	PECL-I	3
25	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	PECL-I	3
26	GND	Module Ground		1
27	GND	Module Ground		1
28	TD-	Transmitter inverted data input	CML-I	
29	TD+	Transmitter non-inverted data input	CML-I	
30	GND	Module Ground		1

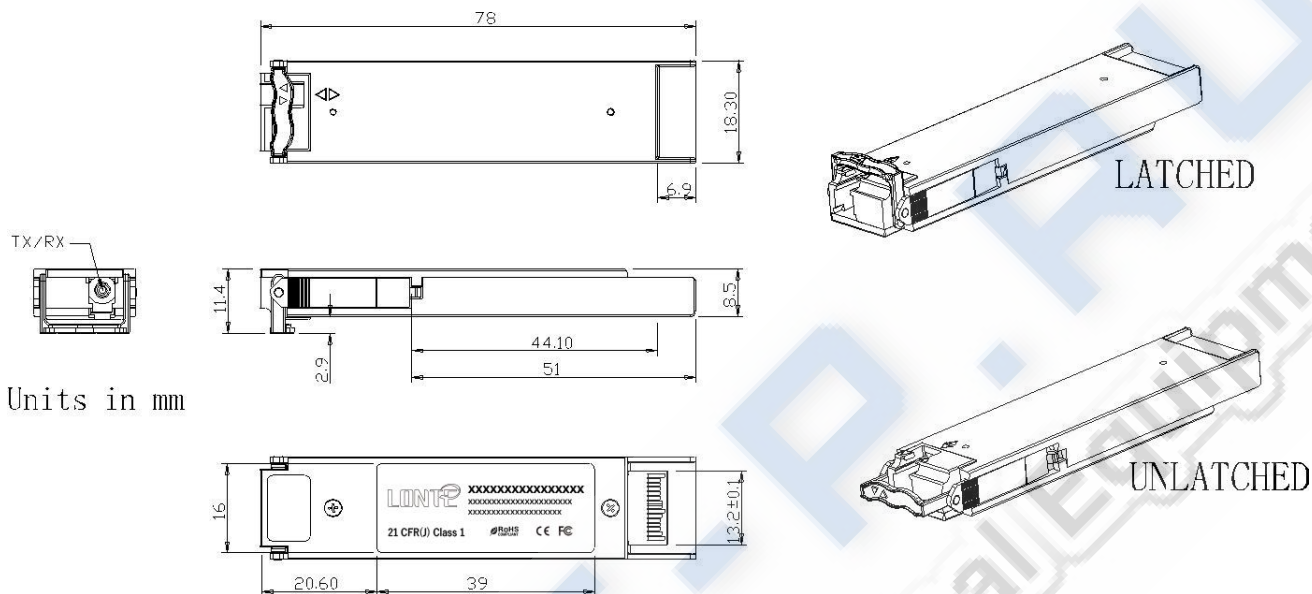
**Notes:**

Plug Seq.: Pin engagement sequence during hot plugging.

- 1) Module circuit ground is isolated from module chassis ground within the module.
- 2) Open collector; should be pulled up with 4.7k – 10kohms on host board to a voltage between 3.15V and 3.6V.
- 3) A Reference Clock input is not required by the AC-XFBL-23/32G10-20. If present, it will be ignored.

## Package Outline

Dimensions are in millimeters. All dimensions are  $\pm 0.2\text{mm}$  unless otherwise specified. (Unit: mm)



## Regulatory Compliance

Feature	Test	Method
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000V for other pins.)
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1	Comply with standard
Immunity	IEC61000-4-3	Comply with standard
Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2	Compatible with Class I laser Product

### Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX (nm)	Sen (dBm)	Temp (°C)	Rea ch (km)	DDM
AC-XFBL-23G10-20	XFP	10.3125	1270	-5~0	1330	<-15	0~70	20	Y
AC-XFBL-32G10-20	XFP	10.3125	1330	-5~0	1270	<-15	0~70	20	Y
AC-XFBL-23G10-20F	XFP	10.3125	1270	-5~0	1330	<-15	-40~85	20	Y
AC-XFBL-32G10-20F	XFP	10.3125	1330	-5~0	1270	<-15	-40~85	20	Y

S-F-P  
Network Optical Equipment

