

## **10GBASE-BX BIDI XFP 1270nm-TX/1330nm-RX 10km Transceiver**

**P/N: AE-XFP-BX10-U**

### **Features**

- Supports 9.95Gb/s to 11.1Gb/s bit rates
- Hot-pluggable XFP footprint
- Maximum link length of 10km with SMF
- 1270nm DFB laser Transmitter and 1330nm PIN Receiver
- XFP MSA package with simplex LC connector
- No reference clock required
- Loop Back Support.
- +3.3V, +1.8V power supply
- Power dissipation <2W
- Compatible with RoHS
- Built-in digital diagnostic functions
- Temperature range 0°C to 70°C

### **Applications**

- 10GBASE-BX 10G Ethernet

## I. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Ref.
Storage Ambient Temperature Range		-40	+85	°C	
Powered case Temperature Range		0	+70	°C	
Operating Relative Humidity	RH		85	%	
Supply Voltage Range @3.3V	Vcc3	0	3.6	V	
Supply Voltage Range @ 1.8V		0	1.98	V	

Any stress beyond the maximum ratings can result in permanent damage. The device specifications are guaranteed only under the recommended operating conditions.

## II. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note	
Operating Case Temperature Range	$T_c$	0		+70	°C		
Power Supply Voltage @ 3.3V	Vcc3	3.13	3.3	3.47	V		
Power Supply Voltage @ 1.8V		1.62	1.8	1.98			
Module total power	P			2	W		
Transmitter							
Input differential impedance	Rin		100		Ω	1	
Differential data input swing	V <sub>in,pp</sub>	120		820	mV		
Transmit Disable Voltage	VD	2.0		VCC	V		
Transmit Enable Voltage	VEN	0		0.8	V		
Transmit Disable Assert Time				10	us		
Receiver							
Differential data output swing	V <sub>out,pp</sub>	340		850	mV		
Data output rise time	t <sub>r</sub>			38	ps	2	
Data output fall time	t <sub>f</sub>			38	ps	2	
LOS Fault	V <sub>LOS fault</sub>	V <sub>cc</sub> – 0.5		V <sub>CCHOST</sub>	V	3	
LOS Normal	V <sub>LOS norm</sub>	GND		GND+0.5	V	3	
Power Supply Rejection	PSR	See Note 3 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.

## III. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Optical output Power	P	-5		0	dBm	
Optical Wavelength	λ	1260	1270	1280	nm	
Side Mode Suppression Ratio	SMSR	30			dB	

Optical Extinction Ratio	ER	3.5			dB	1
Average Launch power of OFF transmitter	POFF	-30			dBm	
Tx Jitter	T <sub>xj</sub>	Compliant with each standard requirements				
Receiver						
Receiver Sensitivity	RSENS			-14	dBm	2
Receiver Sensitivity in OMA	RSENS			-12.5	dBm	2
Maximum Input Power	PMAX	+0.5			dBm	
Optical Center Wavelength	λ <sub>C</sub>	1320		1340	nm	
LOS De-Assert	LOS <sub>D</sub>			-16	dBm	
LOS Assert	LOS <sub>A</sub>	-28			dBm	
LOS Hysteresis		1		5	dB	

Notes:

1, PRBS 231-1 test pattern @10.3125Gbps.

2, PRBS 231-1 test pattern @10.3125Gbps, BER≤10<sup>-12</sup>.

#### IV. Pin Descriptions

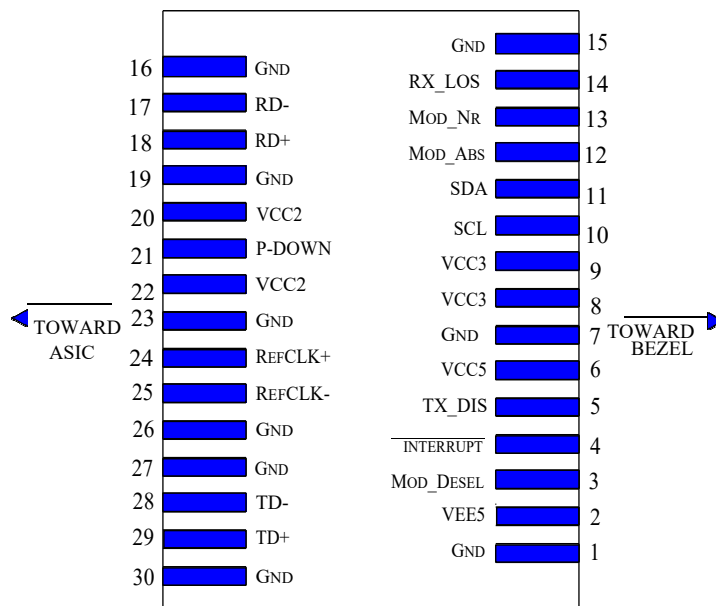
Pin	Logic	Symbol	Name/Description	Ref
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply – Not required	
3	LVTTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTTL-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	LVTTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTTL-I/O	SDA	Serial 2-wire interface data line	2
12	LVTTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	LVTTTL-O	Mod_NR	Module Not Ready;	2
14	LVTTTL-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	
21	LVTTTL-I	P_Down/RS	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	
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

Notes:

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.

### V. Host board Connector Pinout



### VI. General Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Bit Rate	BR	9.95		11.1	Gb/s	1
Bit Error Ratio	BER			10 <sup>-12</sup>		2
Max. Supported Link Length	L <sub>MAX</sub>		10		km	1

Notes:

1. SONET OC-192 SR-1, SDH STM -64,10GBASE-LR/LW, 1200-SM-LL-L
2. Tested with a 231 – 1 PRBS

## VII. Ordering information

Part Number	Product Description
AE-XFP-BX10-U	BIDI XFP, 10Gbps, 1270nm, SMF, 10KM, DDM, LC connector, 0°C ~ +70°C
AE-XFP-BX10-D	BIDI XFP, 10Gbps, 1330nm, SMF, 10KM, DDM, LC connector, 0°C ~ +70°C