XFP-ATLP-XXXX-60 10 Gb/s BIDI XFP 60 km Transceiver

- **Hot-pluggable XFP footprint**
- **Supports 9.95 Gb/s to 11.3 Gb/s bit rates**
- **XFI Loopback Mode**
- **1270 nm DFB laser and APD receiver for XFP-AT-LP-2733-60D**
- **1330 nm DFB laser and APD receiver for XFP-AT-LP-3327-60D**
- **RoHS-6 compliant (lead-free)**
- **Power dissipation < 2W**
- **Case operating temperature:0 ~ 70°C**
- **Up to 60km transmission on SMF**
- **2-wire interface with integrated Digital Diagnostics monitoring**
- **EEPROM with Serial ID functionality**
- **Compliant with XFP MSA with LC connector**

XFP-ATLP-XXXX-60 is a hot pluggable 3.3V small form-factor transceiver module. It is designed expressly for high-speed communications applications that require rates up to 11.3 Gb/s, and is compliant with XFP MSA. The module data link can handle distances up to 60 km with a 9/125 µm single-mode fiber.

As defined by the XFP MSA, ASCENT XFP transceivers provide digital diagnostics 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 alarms and warning flags which can be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operational 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.
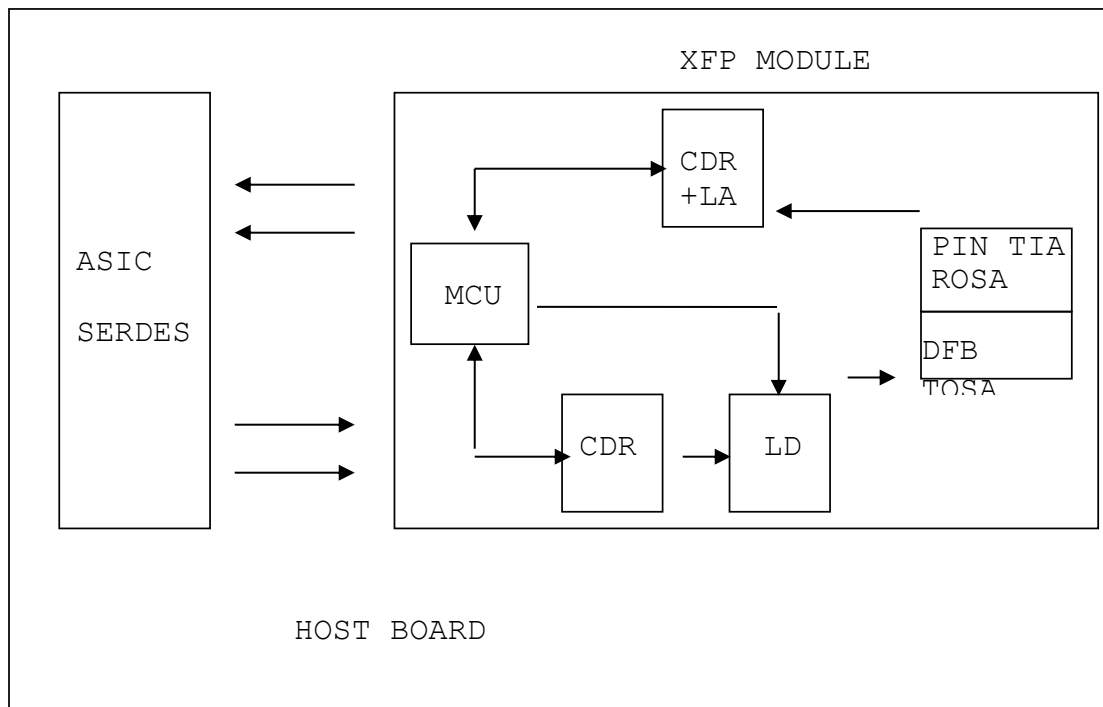
Key Features

- Applicable for 10GBASE-BX 10.3125 Gb/s and 9.953 Gb/s Ethernet networks
- SONET OC-192 &SDH STM I-64.1

Outline Dimensions

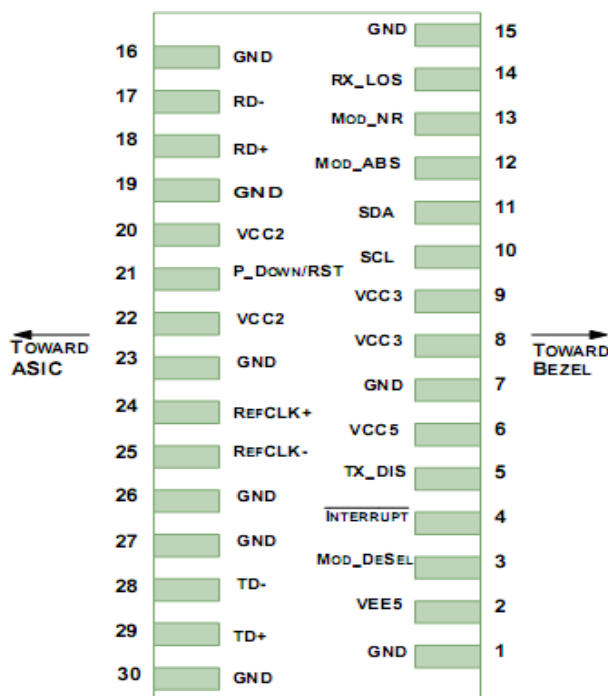Units in mm
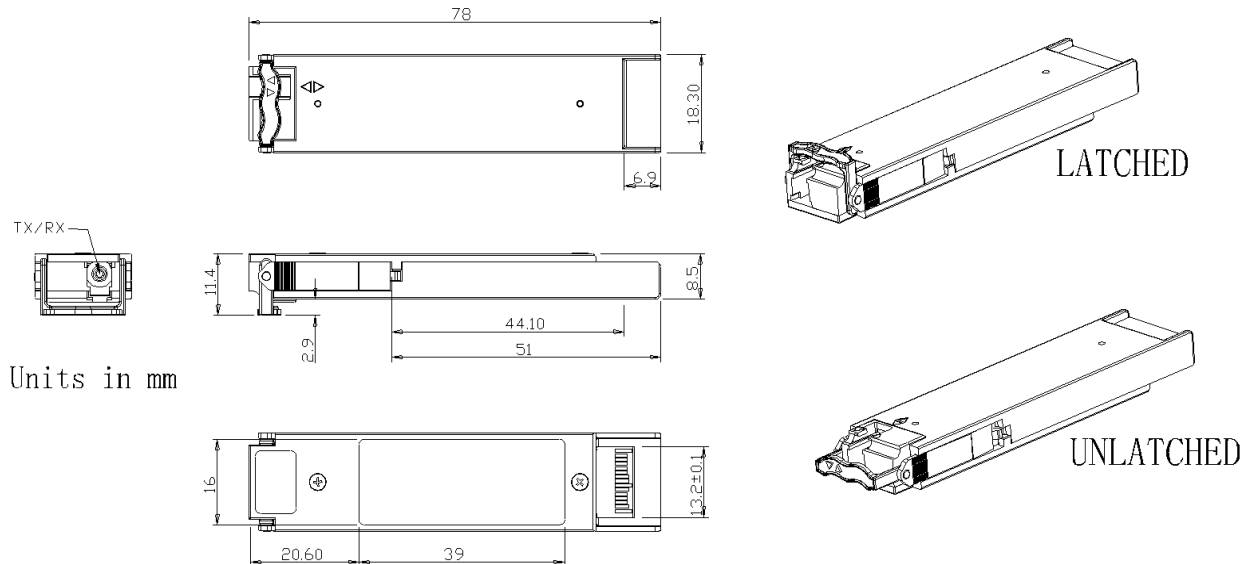
Recommended Block Circuit

Pin Assignment

Diagram of Host Board Connector Block Pin Numbers and Name

Pin	Logic	Symbol	Name/Description	Note
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	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; XGIGA defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	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

Notes:

1. Module circuit ground is isolated from module chassis ground within the module.

2. Open collector; should be pulled up with 4.7k ~ 10 kΩ on host board to a voltage between 3.15V and 3.6V.

3. A Reference Clock input is not required by XFP-ATLP-XXXX-60. If present, it will be ignored.

Specifications

Parameter	Symbol	Value	Notes
Absolute Maximum Ratings			
Storage Temperature	Ts	-40 ~ 85°C	
Relative Humidity	RH	5 ~ 95%	
Power Supply Voltage	VCC	-0.3 ~ 4V	
Signal Input Voltage		Vcc – 0.3 ~ Vcc + 0.3	
Recommended Operating Conditions			
Case Operating Temperature	Tcase	0 ~ 70°C	Without air flow
Power Supply Voltage	VCC	3.14 ~ 3.47V, 3.3V typical	
Power Supply Current	ICC	600 mA maximum	
Data Rate	BR	9.95 ~ 11.3 Gbps, 10.3125 Gbps typical	
Transmission Distance	TD	2 ~ 60 km	
Coupled Fiber		Single-mode fiber	
Optical Characteristics			
Transmitter			
Average Launched Power	PO	0 ~ 5 dBm	
Average Launched Power(Laser Off)	Poff	-45 dBm maximum	Note (1)
Center Wavelength Range	λC	1260 ~ 1280 nm, 1270 nm typical	XFP-AT-LP-2733-60D
		1320 ~ 1340 nm, 1330 nm typical	XFP-AT-LP-3327-60D
Side Mode Suppression Ratio	SMSR	30 dB minimum	
Spectrum Bandwidth (-20 dB)	σ	1 nm maximum	
Extinction Ratio	ER	3.5 dB minimum	Note (2)
Output Eye Mask		Compliant with IEEE 802.3ae requirements	Note (2)
Receiver			
Input Optical Wavelength	λIN	1320 ~ 1340 nm, 1330 nm typical	XFP-AT-LP-2733-60D
		1260 ~ 1280 nm, 1270 nm typical	XFP-AT-LP-3327-60D
Receiver Sensitivity	Psen	-20 dBm maximum	Note (3)
Input Saturation Power (Overload)	PSAT	-6 dBm minimum	Note (3)
LOS -Assert Power	PA	-38 dBm minimum	
LOS -Deassert Power	PD	-21 dBm maximum	
LOS -Hysteresis	PHys	0.5 ~ 4 dB	
Electrical Interface Characteristics			
Total power supply current	Icc	600 mA maximum	
Transmitter			
Differential Data Input Voltage	VDT	120 ~ 820 mVp-p	
Differential line input Impedance	RIN	85 ~ 115 Ω, 100 Ω typical	
Transmitter Fault Output-High	VFaultH	2.4V ~ Vcc	
Transmitter Fault Output-Low	VFaultL	-0.3 ~ +0.8V	
Transmitter Disable Voltage- High	VDisH	2V ~ Vcc + 0.3	
Transmitter Disable Voltage- low	VDisL	-0.3 ~ +0.8V	
Receiver			
Differential Data Output Voltage	VDR	300 ~ 850 mVp-p	
Differential line Output Impedance	ROUT	80 ~ 120 Ω, 100 Ω typical	
Receiver LOS Pull up Resistor	RLOS	4.7 ~ 10 kΩ	
Data Output Rise/Fall time	tr/tf	20 ps maximum	
LOS Output Voltage-High	VLOSH	2V ~ Vcc	
LOS Output Voltage-Low	VLOSL	-0.3 ~ +0.4V	

Notes:

1. The optical power is launched into SMF

2. Measured with RPBS 2^31-1 test pattern @10.3125Gbs

3. Measured with RPBS 2^31-1 test pattern @10.3125Gbs BER=<10^-12

Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge（ESD）	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards

Ordering Information

Product Part Number	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance (km)	Temperature Range (T$_{case}$) (°C)	
XFP-AT-LP-2733-60D	10.3125	Single-mode fiber	1270/1330	60	-5 ~ 70	commercial
XFP-AT-LP-3327-60D	10.3125	Single-mode fiber	1330/1270	60	-5 ~ 70	commercial

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