

**Alpha Bridge
ASFP-1G-LX
Datasheet**

Features

- Data-Rate of 1.25Gbps operation
- 1310nm FP laser and PIN photodetector
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- Compliant with SONET OC-24-LR-1
- Single +3.3V power supply
- RoHS Compliant
- Operating case temperature: Class C : 0°C ~70°C
- Class I : -40°C ~85°C

Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface.
- Switched backplane applications.
- Router/Server Interface
- Other optical transmission systems

Description

The Small Form Factor Pluggable (SFP) transceivers are compatible with the SFP Multi-Source Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE Std 802.3 and 1x Fiber Channel as defined in FC-PI-4 Rev.8.00.

Digital diagnostics functions are available via the 2-wire serial bus specified in the SFP MSA. The optical transceiver is RoHS compliant as described in Application Note AN-2038^{4,5}.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max.	Units	Note
Storage Temperature	Ts	-40	85	°C	
Supply Voltage	Vcc	-0.5	4.5	V	
Operating Relative Humidity		5	Vcc	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Power Supply Voltage	Vcc	3.13	3.3	3.47	v	
Case Operating Temperature	Top	0		70	°C	CMF
		-40		85	°C	IMF
Power Supply Current	Icc			300	mA	
Data Rate			1.25		Gbps	

Digital Diagnostic Functions

Parameter	Symbol	Accuracy	Unit	Notes
Temperature Monitor Absolute Error	<i>DMI_Temp</i>	± 3	°C	Over operating Temp
Supply Voltage Monitor Absolute Error	<i>DMI_VCC</i>	±0.1	V	Full operating range
RX Power Monitor Absolute Error	<i>DMI_RX</i>	± 3 dB	dB	1
Bias Current Monitor	<i>DMI_Ibias</i>	± 10%	mA	
Laser Power Monitor Absolute Error	<i>DMI_TX</i>	± 3 dB	dB	1

Notes:

- Due to the measurement accuracy of different single mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Transmitter						
Optical Center Wavelength	λ	1260	1310	1360	nm	
Output Optical Power	P_{TX}	-9		-3	dBm	1
Extinction Ratio	<i>ER</i>	9			dB	
Spectral Width (RMS)	$\Delta\lambda$			4	nm	
Optical Rise/Fall Time (20%-80%)	<i>tr/tf</i>			0.26	Ns	
Receiver						
Optical Center Wavelength	λ	1260		1560	nm	
Receiver Overload	P_{OL}	-3			dBm	2
Receiver Sensitivity	P_{SEN}			-23	dBm	2
LOS Assert	<i>LOSA</i>	-35			dBm	
LOS De-assert	<i>LOSD</i>			-24	dBm	
LOS Hysteresis	<i>LOSH</i>	1		4	dB	

Note:

- The optical power is launched into MMF
- Measured with a PRBS2⁷-1 test pattern @1250Mbps, BER ≤ 1x10⁻¹²

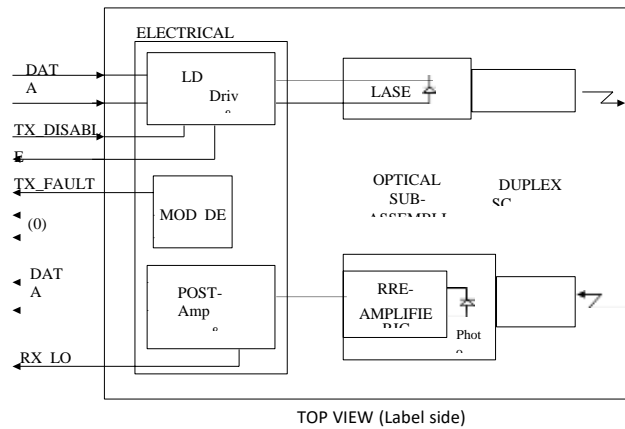
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Transmitter						
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
Single Ended Data Input Swing	V_{IN_PP}	400		1800	mV	1
Transmit Disable Voltage	V_D	2.0		Vcc	V	
Transmit Enable Voltage	V_{EN}	0		0.8	V	
Receiver						
Data Output Swing Differential	V_{OUT}	400		1800	mV	2
Data Output Rise/Fall Time (20%~80%)	<i>tr/tf</i>			300	ps	
LOS	<i>High</i>	2.0		Vcc	V	
	<i>Low</i>			0.8	V	

Notes:

- PECL input, internally AC-coupled and terminated.
- Internally AC-coupled.

Block Diagram of Transceiver



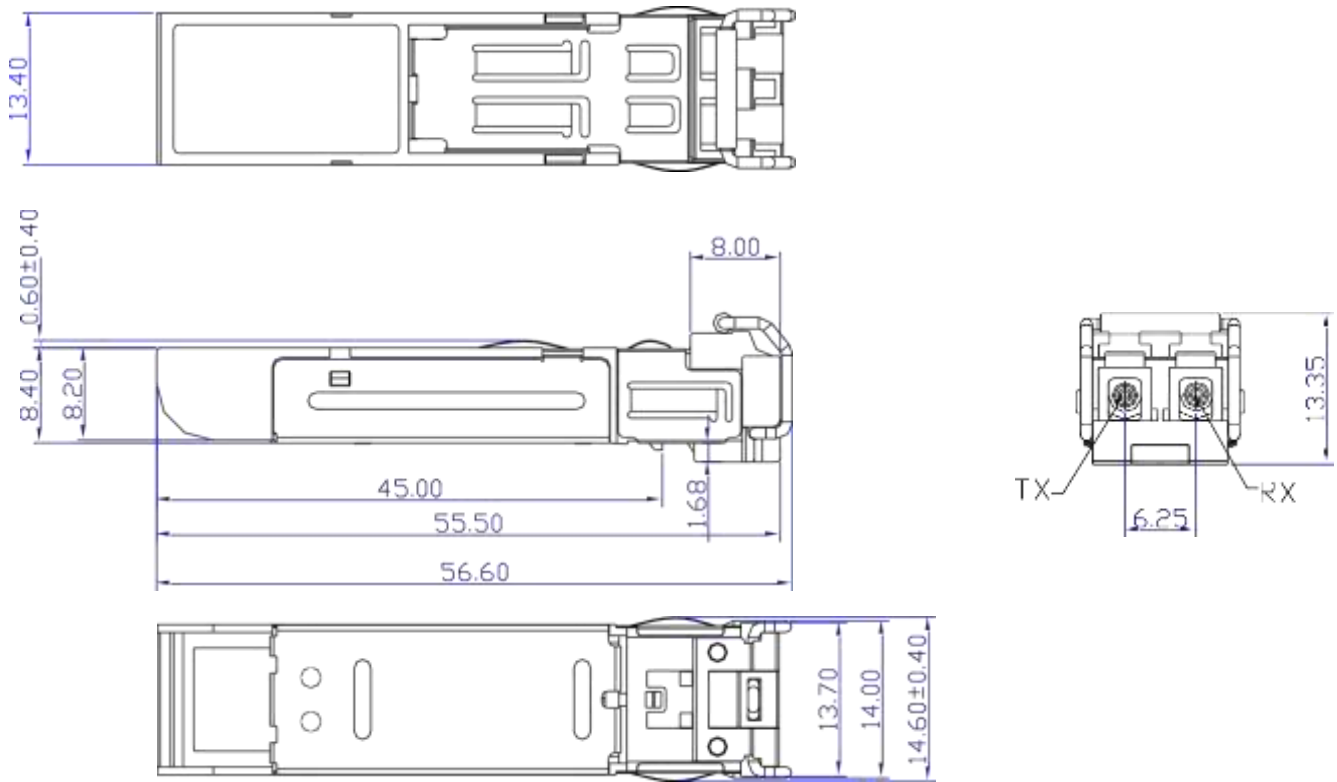
Pin Descriptions

Pin	Symbol	Function/Description	Note
1	VEET	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault. Not supported	
		Transmitter Disable. Laser output disabled on high	
3	TX DISABLE	or open	2
4	MOD_DEF(2)	Module Definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module Definition 1. Clock line for serial ID	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	3
7	Rate Select	No connection required	
		Loss of Signal indication. Logic 0 indicates normal	
8	LOS	operation	4
9	VEER	Receiver ground (common with transmitter ground)	1
10	VEER	Receiver ground (common with transmitter ground)	1
11	VEER	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	VEER	Receiver ground (common with transmitter ground)	1
15	VCCR	Receiver power supply	
16	VCCT	Transmitter power supply	
17	VEET	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	VEET	Transmitter ground (common with receiver ground)	1

Notes:

- Circuit ground is isolated from chassis ground.
- Disabled: TDIS>2V or open Enabled: TDIS<0.8V
- Should be pulled up with 4.7k~10k ohm on the host board to a voltage between 2V and 3.6V.
- LOS is open collector output.

Dimensions



DIMENSIONS ARE IN MILLIMETERS
ALL DIMENSIONS ARE 0.2mm UNLESS OTHERWISE SPECIFIED
 +

Ordering Information

Model Number	Part Number	Wavelength	Temperature
ASFP-1G-LX	OP6C-S10-13-CMF	1310nm	0°C ~70 °C
ASFP-1G-LX-I	OP6C-S10-13-IMF	1310nm	-40 °C ~85 °C

Note: All information contained in this document is subject to change without notice.