

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

Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- 1310nm FP laser and PIN photodetector for 20km transmission
- +3.3 single power supply
- Compliant with SFP MSA AND SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring
- Internal Calibration or External Calibration
- Compatible with RoHS
- Operating case temperature:
 - Standard: 0°C ~70°C
 - Industrial: -40°C ~85°C

Applications

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

Description

The SFP transceivers are high-performance, cost-effective modules supporting dual data rate of 1.25Gbps/1.0625Gbps and 20km transmission distance with SMF.

The transceiver consists of three sections: an FP laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA), and an MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with the SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Storage Temperature	T _s	-40		85	°C	
Supply Voltage	VCC	-0.5		4.5	V	
Operating Humidity	-	5		85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temperature -Standard	T _c	0		70	°C
Case Operating Temperature - Industrial	T _c	-40		85	°C
Data Rate - Gigabit Ethernet			1.25		Gbps
Date Rate - Fiber Channel			1.063		
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V
Power Supply Current	I _{cc}			300	mA

Digital Diagnostic Functions

Parameter/Range	Symbol	Accuracy	Unit	Notes
Temperature /0 to 70	DMI_Temp	± 3 °C	°C	
Temperature /-40 to 85	DMI_Temp	± 3 °C	°C	
Voltage/3.0 to 3.6	DMI_VCC	±3 %	V	
TX Power / -9 to -3	DMI_TX	± 3 dB	dBm	
RX power/-23 to 0	DMI_RX	± 3 dB	dBm	
Bias Current/ 0 to 100	DMI_Ibias	± 10%	mA	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Transmitter						
Center Wavelength	λ_C	1260	1310	1360	nm	
Spectral Width (RMS)	σ			4	nm	
Average Output Power	P_{out}	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	
Optical Rise/Fall Time (20%~80%)	tr/tf			0.26	ns	
Receiver						
Center Wavelength	λ_C	1260		1580	nm	
Receive Overload		-3			dBm	2
Receiver Sensitivity				-23	dBm	2
LOS Assert	$LOSA$	-35			dBm	
LOS De-assert	$LOSD$			-24	dBm	
LOS Hysteresis	$LOSH$	1		4	dB	

NOTES:

1. The optical power is launched into SMF
2. Measured with a PRBS 27-1 test pattern @1250Mbps, BER $\leq 1 \times 10^{-12}$.

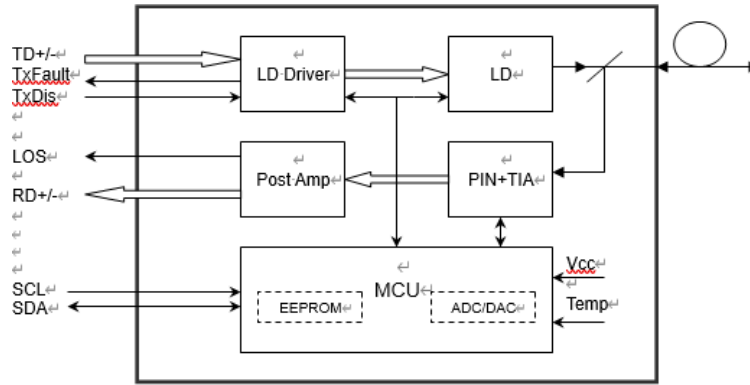
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Transmitter						
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
Data Input Swing Differential	V_{IN}	400		1800	mV	1
Disable	VD	2		V _{CC}	V	
Transmit Disable						
Enable	VEN	0		0.8	V	
Fault		2		V _{CC}	V	
Transmit Fault						
Normal		0		0.8	V	
Receiver						
Data Output Swing Differential	V_{out}	400		1800	mV	1
LOS	High	2		V _{CC}	V	
	Low	0		0.8	V	

Notes:

1. Internally AC-coupled.

Block Diagram of Transceiver



Pin Descriptions

Pin	Symbol	Function/Description	Note
1	VEET	Transmitter Ground	
2	TX FAULT	Transmitter Fault Indication	1
3	TX DISABLE	Transmitter Disable	2
4	MOD_DEF(2)	SDA Serial Data Signal	3
5	MOD_DEF(1)	SCL Serial Clock Signal	3
6	MOD_DEF(0)	TTL Low	3
7	Rate Select	Not Connected	
8	LOS	Loss of Signal	4
9	VEER	Receiver ground	
10	VEER	Receiver ground	
11	VEER	Receiver ground	
12	RD-	Inv. Received Data Out	5
13	RD+	Received Data Out	5
14	VEER	Receiver ground	
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground	
18	TD+	Transmit Data In	6
19	TD-	Inv. Transmit Data In	6
20	VEET	Transmitter Ground	

Notes:

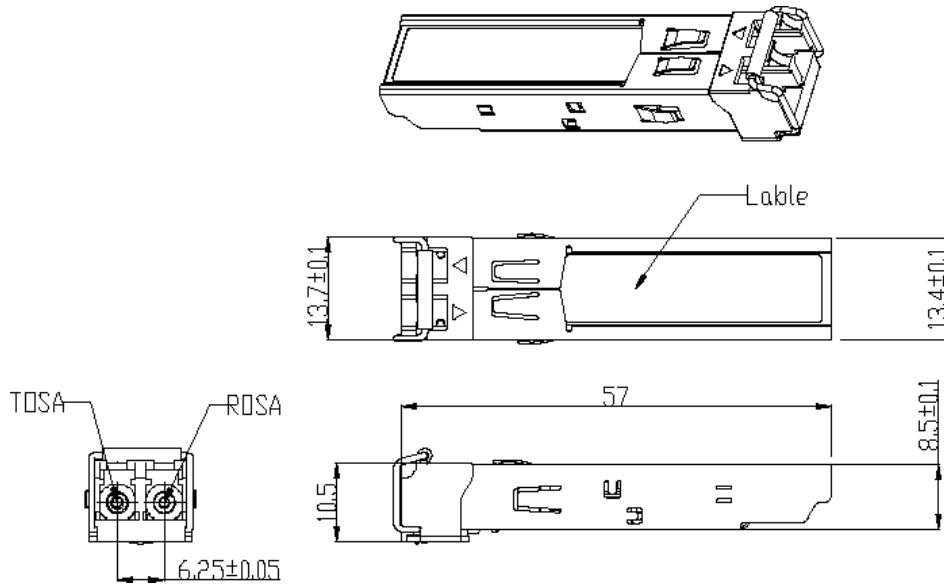
Plug Seq.: Pin engagement sequence during hot plugging.

- TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- TX Disable is an input that is used to shut down the transmitter's optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
 Low (0 to 0.8V): Transmitter on
 (>0.8V, < 2.0V): Undefined
 High (2. DisabledOpen): Transmitter Disabled
- Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
 Mod-Def 0 is grounded by the module to indicate that the module is present
 Mod-Def 1 is the clock line of the wire serial interface for serial ID
 Mod-Def 2 is the data line of two wire serial interfaces for serial ID
- LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and

Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.

- RD-/+ : These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- TD-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Dimensions



Ordering Information

Model Number	Part Number	Wavelength	Temperature
ASFP-1G-eLX	OP6C-S20-13- CMF	1310nm	0°C ~70 °C
ASFP-1G-eLX-I	OP6C-S20-13- IMF	1310nm	-40°C ~85°C

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