

Alpha Bridge ASFP-1G-SX Datasheet



Features

- Data-Rate of 1.25Gbps operation
- 850nm VCSEL laser and PIN photodetector
- Compliant with SFP MSA and SFF-8472 with duplex LCreceptacle
- Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- 550m transmission with 50/125μm MMF
- 300m transmission with 62.5/125µm MMF
- 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 SFP optical transceivers are high-performance, cost-effective modules supporting data rate of 1.25Gbps and 550m transmission distance with MMF.

The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with atrans-impedance preamplifier ITIA) and 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 furtherinformation, please refer to the SFP MSA.

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.	Тур.	Max.	Units	Note
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
	_	0		70	°C	CMF
Case Operating Temprature	Тор	-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	DMI_Temp	± 3	°C	Over operating Temp
Supply Voltage Monitor Absolute Error	DMI_VCC	±0.1	V	Full operating range
RX Power Monitor Absolute Error	DMI_RX	± 3 dB	dB	1
Bias Current Monitor	DMI_Ibias	± 10%	mA	
Laser Power Monitor Absolute Error	DMI_TX	± 3 dB	dB	1

Notes:

1. 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.	Тур.	Max.	Units	Note
		Transmitte	r			
Optical Center Wavelength	λ	830	850	860	nm	
Output Optical Power	P _{TX}	-9.5		-3.5	dBm	1
Extinction Ratio	ER	9			dB	
Spectral Width (RMS)	Δλ			0.85	nm	
Optical Rise/Fall Time (20%-80%)	tr/tf			0.25	Ns	
		Receiver				
Optical Center Wavelength	λ	770		860	nm	
Receiver Overload	P _{OL}	-3			dBM	2
Receiver Sensitivity	P _{SEN}			-18	dBM	2
LOS Assert	LOSA	-35			dBM	
LOS De-assert	LOSD			-18	dBM	
LOS Hysteresis	LOSH	1		4	dB	

Note:

- 2. The optical power is launched into MMF
- 3. Measured with a PRBS2⁷-1 test pattern @1250Mbps, BER $\leq 1x10^{-12}$

Flectrical Characteristics

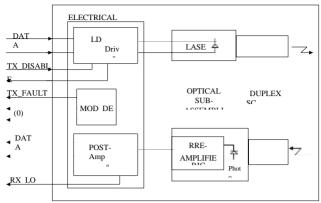
Parameter	Symbol	Min.	Тур.	Max.	Units	Note
		Transmitter				
Input Differential Impedance	ZIN	90	100	110	Ω	
Single Ended Data Input Swing	V _{IN} _pp	400		1800	mV	1
Transmit Disable Voltage	V_D	2		Vcc	V	
Transmit Enable Voltage	V _{EN}	0		0.8	V	
		Receiver				
Data Output Swing Differential	V _{OUT}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

Notes:

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



Block Diagram of Transceiver



TOP VIEW (Label side)

Pin Descriptions

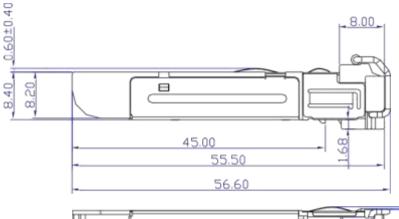
Pin	Symbol	Function/Description	Note
1	VEET	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault. Not supported	
		Transmitter Disable. Laser output disabled on high	
3	TX DISABLE	or open	2
4	MOD_DEF(2)	Module Definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module Definition 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
	1	1	l

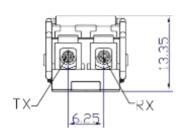
Notes:

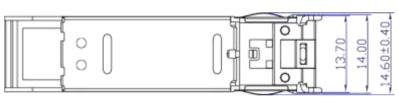
- 4. Circuit ground is isolated from chassis ground.
- 5. Disabled: TDIS>2V or open Enabled: TDIS<0.8V
- 6. Should be pulled up with 4.7k~10k ohm on the host board to a voltage between 2V and 3.6V.
- 7. LOS is open collector output.



4.







DIMENSIONS ARE IN MILLIMETERS

ALL DIMENSIONS ARE 0.2mm UNLESS OTHERWISE SPECIFIED

Ordering Information

Model Number	Part Number	Wavelength	Temperature	
ASFP-1G-SX	OP6C-MX5-85-CMF	850nm	0°C ~70 °C	
ASFP-1G-SX-I	OP6C-MX5-85-IMF	850nm	-40 °C ~85 °C	

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

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