

**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 LC receptacle
- 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 a trans-impedance preamplifier (TIA) 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 further information, 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. | 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    | 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:**

- 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 |
|----------------------------------|-----------------|------|------|------|-------|------|
| <b>Transmitter</b>               |                 |      |      |      |       |      |
| Optical Center Wavelength        | $\lambda$       | 830  | 850  | 860  | nm    |      |
| Output Optical Power             | $P_{TX}$        | -9.5 |      | -3.5 | dBm   | 1    |
| Extinction Ratio                 | ER              | 9    |      |      | dB    |      |
| Spectral Width (RMS)             | $\Delta\lambda$ |      |      | 0.85 | nm    |      |
| Optical Rise/Fall Time (20%-80%) | tr/ta           |      |      | 0.25 | Ns    |      |
| <b>Receiver</b>                  |                 |      |      |      |       |      |
| Optical Center Wavelength        | $\lambda$       | 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:**

- The optical power is launched into MMF
- Measured with a PRBS2<sup>7</sup>-1 test pattern @1250Mbps, BER ≤ 1x10<sup>-12</sup>

## Electrical Characteristics

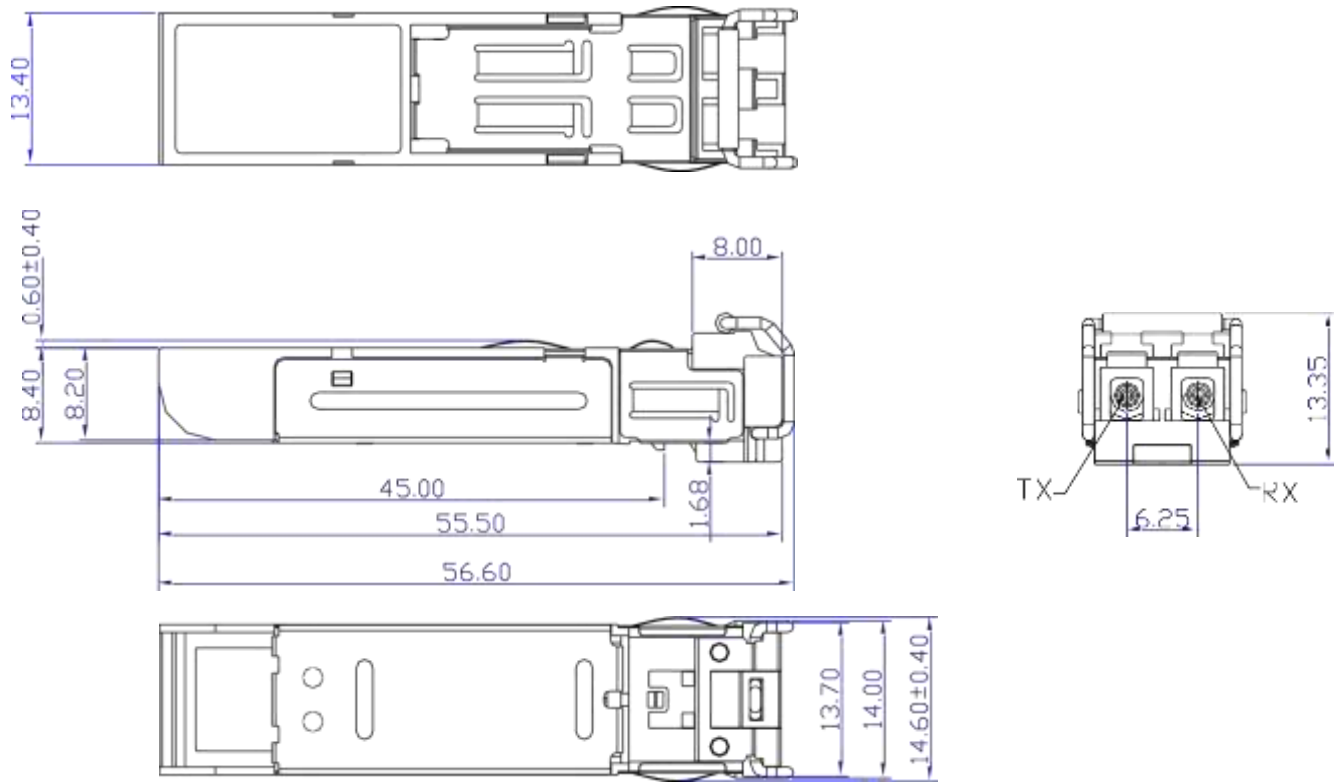
| Parameter                            | Symbol             | Min. | Typ. | Max.            | Units | Note |
|--------------------------------------|--------------------|------|------|-----------------|-------|------|
| <b>Transmitter</b>                   |                    |      |      |                 |       |      |
| Input Differential Impedance         | ZIN                | 90   | 100  | 110             | Ω     |      |
| Single Ended Data Input Swing        | V <sub>IN_PP</sub> | 400  |      | 1800            | mV    | 1    |
| Transmit Disable Voltage             | V <sub>D</sub>     | 2    |      | V <sub>CC</sub> | V     |      |
| Transmit Enable Voltage              | V <sub>EN</sub>    | 0    |      | 0.8             | V     |      |
| <b>Receiver</b>                      |                    |      |      |                 |       |      |
| Data Output Swing Differential       | V <sub>OUT</sub>   | 400  |      | 1800            | mV    | 2    |
| Data Output Rise/Fall Time (20%~80%) | tr/ta              |      |      | 300             | ps    |      |
| LOS                                  | High               | 2    |      | V <sub>CC</sub> | V     |      |
|                                      | Low                |      |      | 0.8             | V     |      |

**Notes:**

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



**Dimensions**



**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.