

## **SFP-10GB-BX-D-AC-OPC**

Accedian® Compatible TAA 10GBase-BX SFP+ Transceiver (SMF, 1330nmTx/1270nmRx, 10km, LC, DOM)

### **Features**

- SFF-8432 and SFF-8472 Compliance
- Simplex LC Connector
- Uncooled DFB transmitter and PIN receiver
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



### **Applications:**

- 10GBase-BX Ethernet
- 8x/10x Fibre Channel
- Access, Metro and Enterprise

### **Product Description**

This Accedian® compatible SFP+ transceiver provides 10GBase-BX throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1330nmTx/1270nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Accedian®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4.
- ESD to the LC Receptacle: compatible with IEC 61000-4-3.
- EMI/EMC: compatible with FCC Part 15 Subpart B Rules, EN55022:2010.
- Laser Eye Safety: compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1, 2.
- RoHS: compliant with EU RoHS 2.0 directive 2015/863/EU.

## Absolute Maximum Ratings

| Parameter                  | Symbol | Min. | Typ. | Max.              | Unit | Notes |
|----------------------------|--------|------|------|-------------------|------|-------|
| Maximum Supply Voltage     | Vcc    | -0.5 |      | 4.0               | V    | 1     |
| Storage Temperature        | Tstg   | -40  |      | 85                | °C   | 2     |
| Operating Case Temperature | Tc     | 0    |      | 70                | °C   | 3     |
| Data Rate                  | DR     | 9.83 |      | 11.3              | Gbps | 4     |
| Bit Error Rate             | BER    |      |      | 10 <sup>-12</sup> |      |       |
| Supply Current             | Icc    |      | 200  | 350               | mA   | 1     |

## Notes:

1. For electrical power interface.
2. Ambient temperature.
3. Case Temperature.
4. IEEE 802.3ae.

## Electrical Characteristics

| Parameter                                | Symbol            | Min. | Typ. | Max.     | Unit | Notes |
|------------------------------------------|-------------------|------|------|----------|------|-------|
| Power Supply Voltage                     | Vcc               | 3.14 | 3.3  | 3.46     | V    |       |
| Power Dissipation                        | P <sub>DISS</sub> |      | 0.65 | 1.2      | W    |       |
| Transmitter                              |                   |      |      |          |      |       |
| Input Differential Impedance             | RIN               |      | 100  |          | Ω    |       |
| Differential Data Input Swing            | VIN,pp            | 180  |      | 700      | mV   |       |
| Transmit Disable Voltage                 | VD                | 2.0  |      | Vcc      | V    |       |
| Transmit Enable Voltage                  | VEN               | Vee  |      | Vee+0.8  | V    |       |
| Receiver                                 |                   |      |      |          |      |       |
| Differential Data Output Swing           | VOUT,pp           | 300  |      | 850      | mV   |       |
| Data Output Rise Time/Fall Time (20-80%) | Tr/Tf             | 28   |      |          | ps   |       |
| LOS Assert                               | LOSA              | 2    |      | Host_Vcc | V    |       |
| LOS De-Assert                            | LOSD              | Vee  |      | Vee+0.5  | V    |       |

## Optical Characteristics

| Parameter                       | Symbol                                | Min. | Typ. | Max.  | Unit  | Notes |
|---------------------------------|---------------------------------------|------|------|-------|-------|-------|
| Transmitter                     |                                       |      |      |       |       |       |
| Output Optical Power            | Ptx                                   | -8.2 |      | 0.5   | dBm   | 1     |
| Optical Center Wavelength       | λC                                    | 1320 | 1330 | 1340  | nm    |       |
| Extinction Ratio                | ER                                    | 3.5  |      |       | dB    |       |
| Spectral Width (-20dB)          | Δλ                                    |      |      | 0.6   | nm    |       |
| Side-Mode Suppression Ratio     | SMSR                                  | 30   |      |       | dB    |       |
| Relative Intensity Noise        | RIN                                   |      |      | -128  | dB/Hz |       |
| Transmitter Dispersion Penalty  | TDP                                   |      |      | 3.2   | dB    |       |
| Launch Power of Off Transmitter | Poff                                  |      |      | -30   | dBm   | 1     |
| Transmitter Jitter              | According to IEEE 802.3ae Requirement |      |      |       |       |       |
| Receiver                        |                                       |      |      |       |       |       |
| Receiver Overload               |                                       | 0.5  |      |       | dBm   |       |
| Optical Center Wavelength       | λC                                    | 1260 | 1270 | 1280  | nm    |       |
| Receiver Sensitivity            | S                                     |      |      | -14.4 | dBm   | 2     |
| Receiver Reflectance            | TRrx                                  |      |      | -12   | dB    |       |
| LOS Assert                      | LOSA                                  | -30  |      |       | dBm   |       |
| LOS De-Assert                   | LOSD                                  |      |      | -17   | dBm   |       |
| LOS Hysteresis                  | LOSH                                  | 0.5  |      |       | dB    |       |

### Notes:

1. Average.
2. Average. Measured with worst ER: BER <  $10^{-12}$  and  $2^{31}-1$  PRBS.

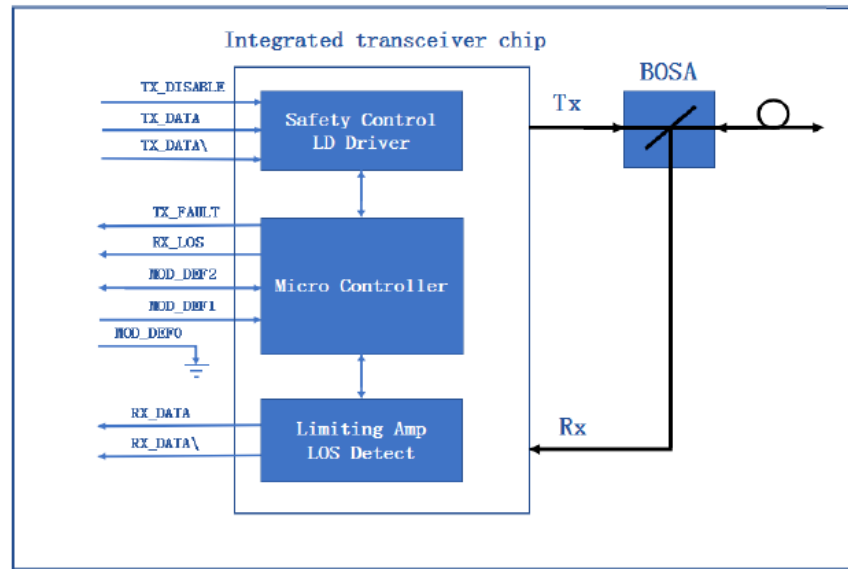
## Pin Descriptions

| Pin | Symbol     | Name/Descriptions                                                | Notes |
|-----|------------|------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground. Common with receiver ground.                 | 1     |
| 2   | Tx_Fault   | Transmitter Fault.                                               | 2     |
| 3   | Tx_Disable | Transmitter Disable. Laser output disabled on "high" or "open."  | 3     |
| 4   | SDA        | 2-Wire Serial Interface Data.                                    | 4     |
| 5   | SCL        | 2-Wire Serial Interface Clock.                                   | 4     |
| 6   | MOD_ABS    | Module Absent. Grounded within the module.                       | 4     |
| 7   | RS0        | No connection required.                                          |       |
| 8   | LOS        | Loss of Signal indication. "Logic 0" indicates normal operation. | 5     |
| 9   | RS1        | No connection required.                                          | 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:

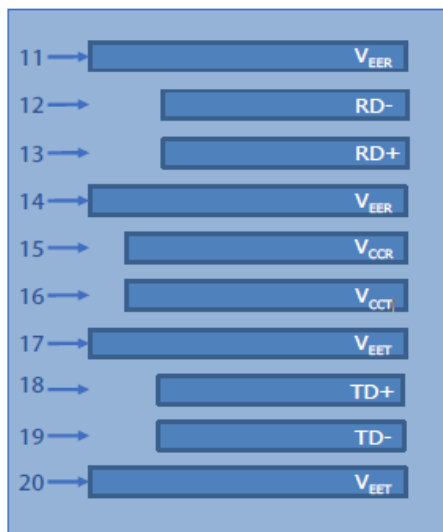
1. Circuit ground is isolated from the chassis ground.
2. Tx\_Fault is the open collector output and should be pulled up with 4.7k $\Omega$ -10k $\Omega$  on the host board to a voltage between 2V and Vcc+0.3V.
3. Disabled: TDIS>2V or open. Enabled TDIS<0.8V.
4. Should be pulled up with the 4.7k $\Omega$ -10k $\Omega$  on the host board to a voltage between 2V and Vcc+0.3V.
5. LOS is open collector output and should be pulled with 4.7k $\Omega$ -10k $\Omega$  on the host board to a voltage between 2V and Vcc+0.3V. The logic "0" indicated normal operation, and the logic "1" indicates that the receiver signal is lost.

## Transceiver Block Diagram

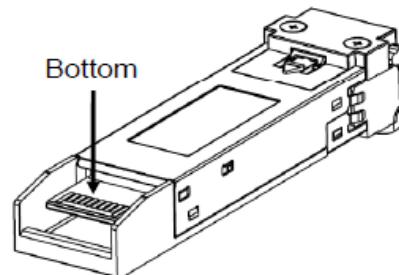
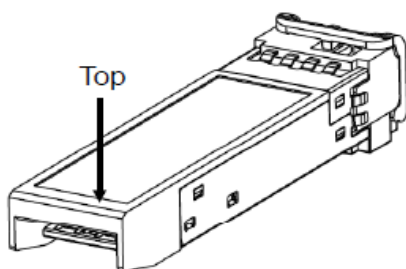
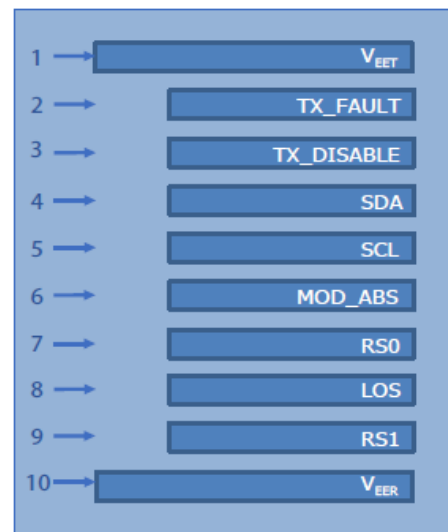


## Electical Pad Layout

Top view



Bottom view



Mechanical Specifications

