# 25GBASE-BX BIDI SFP28 1270nm-TX/1330nm-RX 10km Transceiver

# P/N: AE-SFP28-BX10-U

## Features

- Supports up to 25.78Gbps bit rates
- Hot-pluggable SFP+ footprint
- 1270nm DFB laser and PIN photodiode, Up to 10km for SMF transmission
- Compliant with SFP+ MSA and SFF-8472 with simplex LC receptacle
- Compatible with RoHS
- Single +3.3V power supply
- Real Time Digital Diagnostic Monitoring
- Operating case temperature: Standard: 0 to +70°C Industrial: -40 to +85°C

## Applications

- 25GBASE-LR

## I. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Supply Voltage | Vcc | -0.5 | 4.5 | V |
| Storage Temperature | Ts | -40 | +85 | °C |
| Operating Humidity | - | 5 | 85 | % |

## II. Recommended Operating Conditions

| Parameter | Symbol | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Operating Case Temperature | Tc | 0 | | +70 | °C |
| Power Supply Voltage | Vcc | 3.135 | 3.30 | 3.465 | V |
| Power Supply Current | Icc | | | 300 | mA |
| Data Rate | | | 25.78 | | Gbps |

## III. Optical and Electrical Characteristics

| Parameter | | Symbol | Min | Typical | Max | Unit | Notes |
|---|---|---|---|---|---|---|---|
| Transmitter | | | | | | | |
| Centre Wavelength | | λc | 1260 | 1270 | 1280 | nm | |
| Spectral Width (-20dB) | | Δλ | | | 1 | nm | |
| Side-Mode Suppression Ratio | | SMSR | 30 | - | | dB | |
| Average Output Power | | Pout | -2 | | 4 | dBm | 1 |
| Extinction Ratio | | ER | 3.5 | | | dB | |
| Data Input Swing Differential | | VIN | 180 | | 850 | mV | 2 |
| Input Differential Impedance | | ZIN | 90 | 100 | 110 | Ω | |
| TX Disable | Disable | | 2.0 | | Vcc | V | |
| | Enable | | 0 | | 0.8 | V | |
| TX Fault | Fault | | 2.0 | | Vcc | V | |
| | Normal | | 0 | | 0.8 | V | |
| Receiver | | | | | | | |
| Centre Wavelength | | λc | 1320 | 1330 | 1340 | nm | |
| Receiver Sensitivity | | | | | -13 | dBm | 3 |
| Receiver Overload | | | | | 2 | dBm | 3 |
| LOS De-Assert | | LOSD | | | -16 | dBm | |
| LOS Assert | | LOSA | -30 | | | dBm | |
| LOS Hysteresis | | | 0.5 | | | dB | |
| Data Output Swing Differential | | Vout | 300 | | 900 | mV | 4 |
| LOS | | High | 2.0 | | Vcc | V | |
| | | Low | | | 0.8 | V | |

*1. The optical power is launched into SMF.*

*2. PECL input, internally AC-coupled and terminated.*

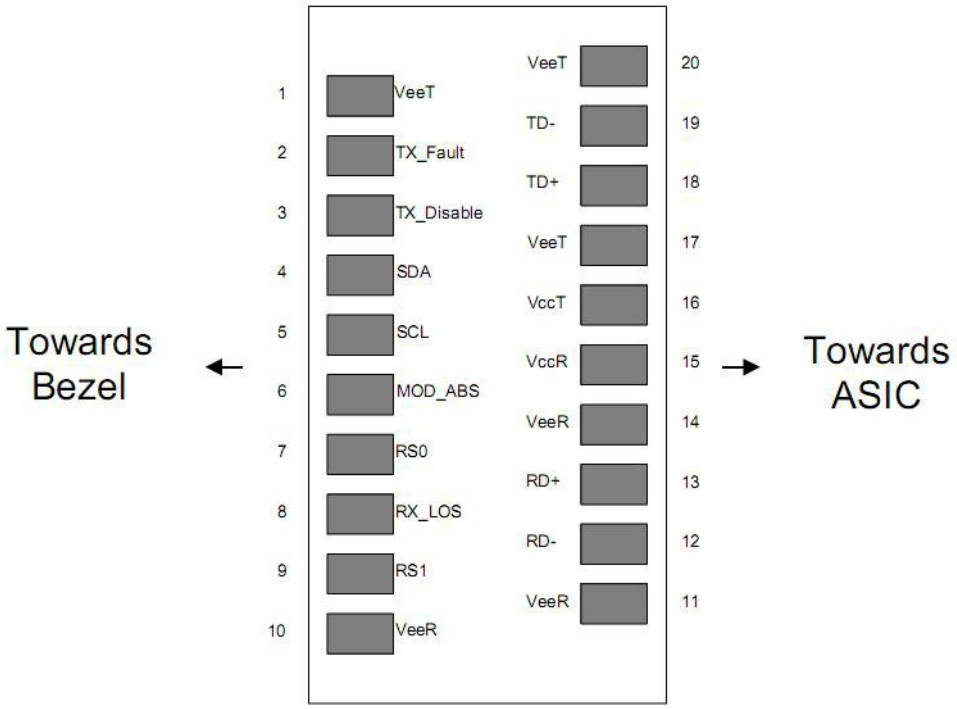
*3. Measured with a PRBS 231-1 test pattern @25.78Gps, BER ≤5×10-5.*

*4. Internally AC-coupled.*

## IV. Timing and Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Tx Disable Negate Time | t_on | | | 2 | ms |
| Tx Disable Assert Time | t_off | | | 100 | μs |
| Time To Initialize, including Reset of Tx Fault | t_init | | | 300 | ms |
| Tx Fault Assert Time | t_fault | | | 100 | μs |
| Tx Disable To Reset | t_reset | 10 | | | μs |
| LOS Assert Time | t_loss_on | | | 100 | μs |
| LOS De-assert Time | t_loss_off | | | 100 | μs |
| Serial ID Clock Rate | f_serial_clock | | 100 | 400 | KHz |
| MOD_DEF (0:2)-High | $V_H$ | 2 | | Vcc | V |
| MOD_DEF (0:2)-Low | $V_L$ | | | 0.8 | V |

## V. Pin Descriptions




| Pin | Signal Name | Description | Plug Seq. | Notes |
|---|---|---|---|---|
| 1 | VEET | Transmitter Ground | 1 | |
| 2 | TX FAULT | Transmitter Fault Indication | 3 | Note 1 |
| 3 | TX DISABLE | Transmitter Disable | 3 | Note 2 |
| 4 | SDA | SDA Serial Data Signal | 3 | |
| 5 | SCL | SCL Serial Clock Signal | 3 | |
| 6 | MOD_ABS | Module Absent. Grounded within the module | 3 | |
| 7 | RS0 | Not Connected | 3 | |

| | | | | |
|---|---|---|---|---|
| 8 | LOS | Loss of Signal | 3 | Note 3 |
| 9 | RS1 | Not Connected | 3 | |
| 10 | VEER | Receiver ground | 1 | |
| 11 | VEER | Receiver ground | 1 | |
| 12 | RD- | Inv. Received Data Out | 3 | Note 4 |
| 13 | RD+ | Received Data Out | 3 | Note 4 |
| 14 | VEER | Receiver ground | 1 | |
| 15 | VCCR | Receiver Power Supply | 2 | |
| 16 | VCCT | Transmitter Power Supply | 2 | |
| 17 | VEET | Transmitter Ground | 1 | |
| 18 | TD+ | Transmit Data In | 3 | Note 5 |
| 19 | TD- | Inv. Transmit Data In | 3 | Note 5 |
| 20 | VEET | Transmitter Ground | 1 | |

***Notes:***

*Plug Seq.: Pin engagement sequence during hot plugging.*

*1. 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.*

*2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.*

*3. LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.*

*4. 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.*

*5. TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.*

## VI. Ordering Information

| Part Number | Product Description |
|---|---|
| AE-SFP28-BX10-U | 1270nm-TX/1330nm-RX, 25Gbps, LC, 10km, 0°C~+70°C, with DDM |
| AE-SFP28-BX10-UI | 1270nm-TX/1330nm-RX, 25Gbps, LC, 10km, -40°C~+85°C, with DDM |