# E-SFP28-BD-LR-27

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

## 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

## 1. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Supply Voltage | Vcc | 0 | 3.6 | V |
| Storage Temperature | Ts | -40 | +85 | °C |
| Operating Humidity | - | 0 | 85 | % |

## 2. 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 |

## 3. Optical and Electrical Characteristics

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Transmitter | | | | | | |
| Centre Wavelength | λc | 1265 | 1271 | 1277 | nm | |
| Spectral Width (-20dB) | Δλ | | | 1 | nm | |
| Side-Mode Suppression | SMSR | 30 | - | | dB | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ratio | | | | | | |
| Average Output Power | Pout | -5.0 | | +2.0 | 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 | 1325 | 1331 | 1337 | nm | |
| Receiver Sensitivity | | | | -9 | 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.
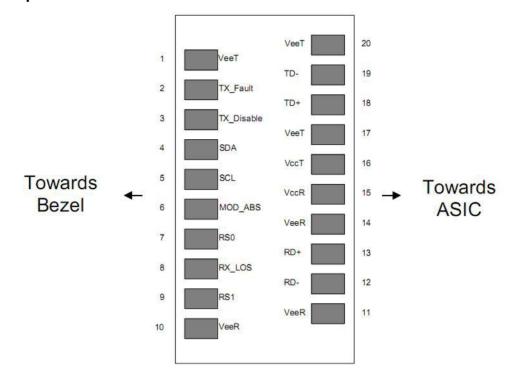
2.PECL input, internally AC-coupled and terminated.

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

4.Internally AC-coupled.

## 4. 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 |

## 5. 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.*