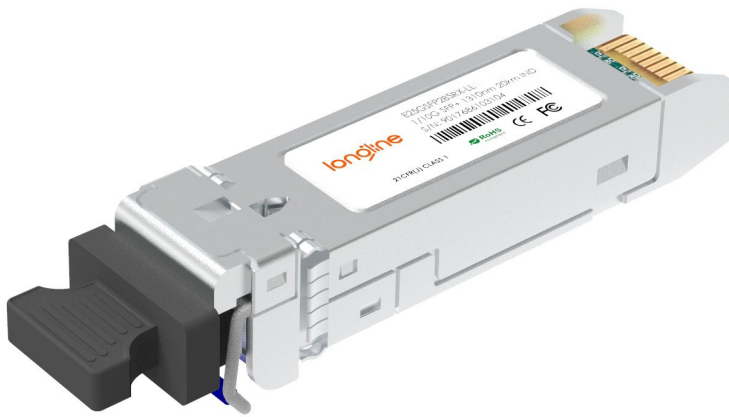


# 25G SFP28 850nm 100m DOM Transceiver

E25GSFP28SRX-LL



## Application

- 25GBASE-SR Ethernet

## Standards

- SFF-8472
- SFF-8024
- SFF-8431
- SFF-8432

## Features

- Supports 25.78Gb/s Bit Rate
- Hot-pluggable SFP+ Footprint
- 850nm VCSEL Laser and PIN Photo-detector
- Internal CDR on Transmitter and Receiver Channel
- RoHS-10 Compliant
- Link Lengths at 25.78G 100m Over OM4 MMF
- LC Duplex Connector
- Low Power Consumption < 1W
- 0°C to 70°C Operating Temperature Range
- Single +3.3V±5% Power Supply
- Programmable TX Input Equalizer
- Programmable RX Pre-emphasis
- Digital Monitoring SFF-8472 Compliant

## Description

The 25G SR short-wavelength transceiver is designed for use in 25.78Gb/s data rate over multimode fiber. The transceiver is compliant with SFF-8431, and the mechanical SFP+ plug is compatible with SFF-8432. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

## Product Specifications

### I. Absolute Maximum Ratings

| Parameter           | Symbol          | Min. | Max. | Unit |
|---------------------|-----------------|------|------|------|
| Supply Voltage      | V <sub>cc</sub> | -0.3 | +4.0 | V    |
| Storage Temperature | T <sub>s</sub>  | -40  | +85  | °C   |
| Operating Humidity  | RH              | 0    | +85  | %    |

### II. General Specifications

| Parameter                  | Symbol           | Min. | Typ.  | Max.                | Unit |
|----------------------------|------------------|------|-------|---------------------|------|
| Bit Rate                   | BR               |      | 25.78 |                     | Gbps |
| Bit Error Ratio            | BER              |      |       | 5*10 <sup>E-5</sup> |      |
| Max. Supported Link Length | L <sub>MAX</sub> |      |       | 100                 | m    |

### III. Recommended Operating Conditions

| Parameter                  | Symbol           | Min. | Typ.  | Max. | Unit |
|----------------------------|------------------|------|-------|------|------|
| Operating Temperature      | T <sub>c</sub>   | 0    |       | +70  | °C   |
| Power Supply Voltage       | V <sub>cc</sub>  | 3.14 | 3.3   | 3.46 | V    |
| Bit Rate                   | BR               |      | 25.78 |      | Gbps |
| Max. Supported Link Length | L <sub>MAX</sub> |      |       | 100  | m    |

## IV. Electrical Characteristics

| Parameter                               | Symbol      | Min.     | Typ. | Max.         | Unit     | Note |
|---|-------------|----------|------|--------------|----------|------|
| <b>Supply Voltage</b>                   | $V_{CC}$    | 3.14     | 3.3  | 3.46         | V        |      |
| <b>Supply Current</b>                   | $I_{CC}$    |          |      | 230          | mA       |      |
| <b>Transmitter</b>                      |             |          |      |              |          |      |
| <b>Input Differential Impedance</b>     | $R_{IN}$    | 80       | 100  | 120          | $\Omega$ | 1    |
| <b>Single Ended Data Input Swing</b>    | $V_{IN}$    | 90       |      | 500          | mVp-p    |      |
| <b>Transmit Disable Voltage</b>         | $V_{DIS}$   | 2        |      | $V_{CCHOST}$ | V        |      |
| <b>Transmit Enable Voltage</b>          | $V_{EN}$    | $V_{EE}$ |      | $V_{EE}+0.8$ | V        |      |
| <b>Transmit Fault Assert Voltage</b>    | $V_{FA}$    | 2        |      | $V_{CCHOST}$ | V        |      |
| <b>Transmit Fault De-Assert Voltage</b> | $V_{FDA}$   | $V_{EE}$ |      | $V_{EE}+0.8$ | V        |      |
| <b>Receiver</b>                         |             |          |      |              |          |      |
| <b>Single Ended Data Output Swing</b>   | $V_{OD}$    | 200      |      | 500          | mVp-p    |      |
| <b>LOS Fault</b>                        | $V_{LOSFT}$ | 2        |      | $V_{CCHOST}$ | V        |      |
| <b>LOS Normal</b>                       | $V_{LOSNR}$ | $V_{EE}$ |      | $V_{EE}+0.8$ | V        |      |

### Notes:

1. Differential between TD+ / TD-.

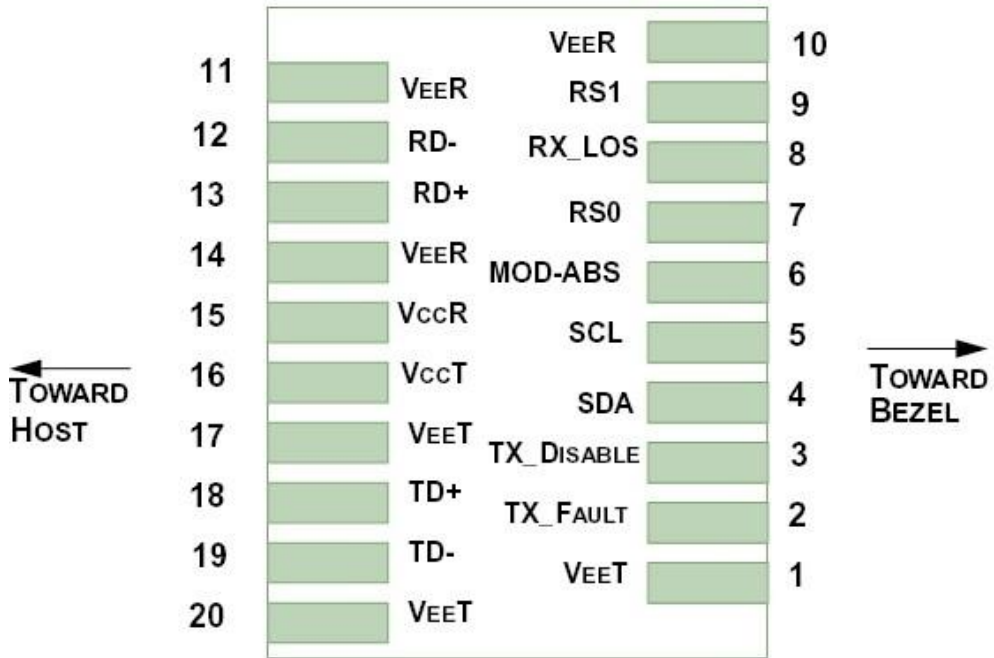
## V. Optical Characteristics

| Parameter                                      | Symbol             | Min.  | Typ. | Max. | Unit | Note |
|--|--------------------|-------|------|------|------|------|
| <b>Transmitter</b>                             |                    |       |      |      |      |      |
| <b>Nominal Wavelength</b>                      | $\lambda$          | 840   |      | 860  | nm   |      |
| <b>Spectral Width</b>                          | $\Delta\lambda$    |       |      | 0.6  | nm   |      |
| <b>Optical Modulation Amplitude</b>            | POMA               | -6.4  |      | 3    | dBm  |      |
| <b>Optical Output Power</b>                    | P <sub>av</sub>    | -8.4  |      | 2.4  | dBm  |      |
| <b>Extinction Ratio</b>                        | ER                 | 2     |      |      | dB   |      |
| <b>Transmitter and Dispersion Penalty</b>      | TDP                |       |      | 5    | dB   |      |
| <b>Average Launch Power of OFF Transmitter</b> | P <sub>OFF</sub>   |       |      | -30  | dBm  |      |
| <b>Receiver</b>                                |                    |       |      |      |      |      |
| <b>Center Wavelength</b>                       | $\lambda$          | 840   |      | 860  | nm   |      |
| <b>Average Receiver Power</b>                  | P <sub>AVG</sub>   | -10.3 |      | 2.4  | dBm  | 1    |
| <b>Stressed Receiver Sensitivity (OMA)</b>     | R <sub>SENSE</sub> |       |      | -5.2 | dBm  | 2    |
| <b>Receiver Reflectance</b>                    | R <sub>REFL</sub>  |       |      | -12  | dB   |      |
| <b>Assert LOS</b>                              | LOS <sub>A</sub>   | -30   |      |      | dBm  |      |
| <b>De-Assert LOS</b>                           | LOS <sub>D</sub>   |       |      | -13  | dBm  |      |
| <b>LOS Hysteresis</b>                          |                    | 0.5   |      |      | dB   |      |

### Notes:

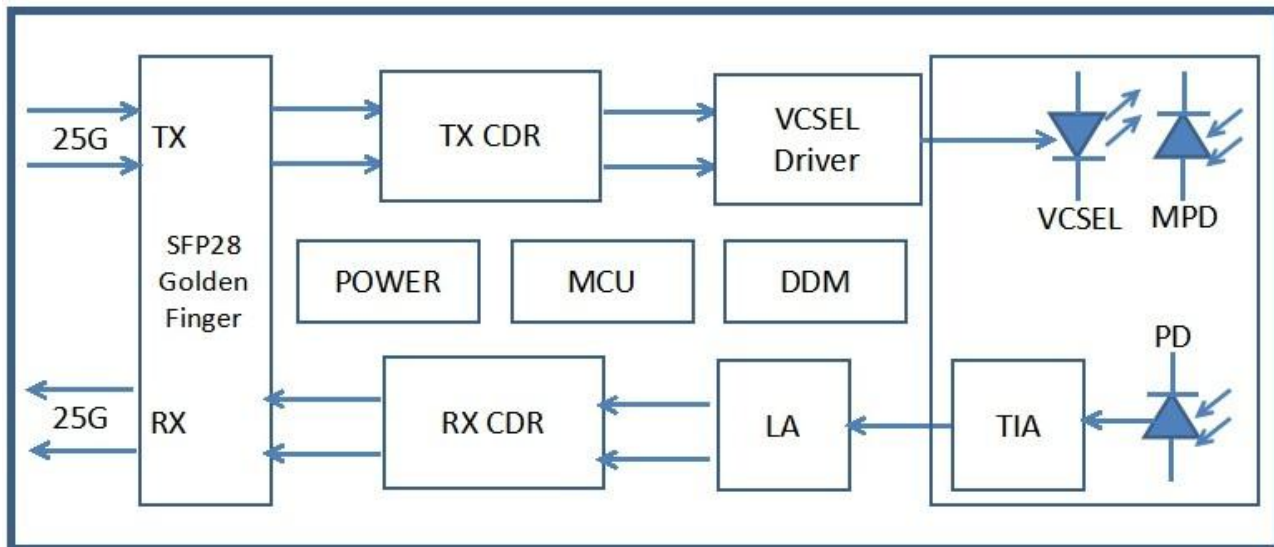
- Sensitivity for 25.78G PRBS 231-1 and BER better than or equal to  $5 \cdot 10^{-5}$ .
- The stressed sensitivity values in the table are for system level BER measurements which include the effects of CDR circuit.

## VI. Pin Assignment



| Pin Number      | Symbol     | Name  | Description   |
|-----------------|------------|---|---|
| <b>1,17,20</b>  | VeeT       | Transmitter Signal Ground   | These pins should be connected to signal ground on the host board.  |
| <b>2</b>        | TX Fault   | Transmitter Fault Out (OC)  | Logic "1" Output = Transmitter Fault<br>Logic "0" Output = Normal Operation<br>This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor. |
| <b>3</b>        | TX Disable | Transmitter Disable In (LVTTTL)                                   | Logic "1" Input (or no connection) = Laser off<br>Logic "0" Input = Laser on<br>This pin is internally pulled up to VccT with a 10 kΩ resistor.                                 |
| <b>4</b>        | SDA        | Module Definition Identifiers                                     | Serial ID with SFF 8472 Diagnostics<br>Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors.   |
| <b>5</b>        | SCL        |   |   |
| <b>6</b>        | MOD-ABS    |   |   |
| <b>7</b>        | RS0        | Receiver Rate Select (LVTTTL)<br>Transmitter Rate Select (LVTTTL) | NA  |
| <b>9</b>        | RS1        |   | NA  |
| <b>8</b>        | LOS        | Loss of Signal Out (OC)   | This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor.  |
| <b>10,11,14</b> | VeeR       | Receiver Signal Ground  | These pins should be connected to signal ground on the host board.  |
| <b>12</b>       | RD-        | Receiver Negative DATA Out (CML)                                  | Light on = Logic "0" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.  |
| <b>13</b>       | RD+        | Receiver Positive DATA Out(CML)                                   | Light on = Logic "1" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.  |
| <b>15</b>       | VccR       | Receiver Power Supply   | This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter   |
| <b>16</b>       | VccT       | Transmitter Power Supply  | This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter   |
| <b>18</b>       | TD+        | Transmitter Positive DATA In(CML)                                 | Logic "1" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.  |
| <b>19</b>       | TD-        | Transmitter Negative DATA In(CML)                                 | Logic "0" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.  |

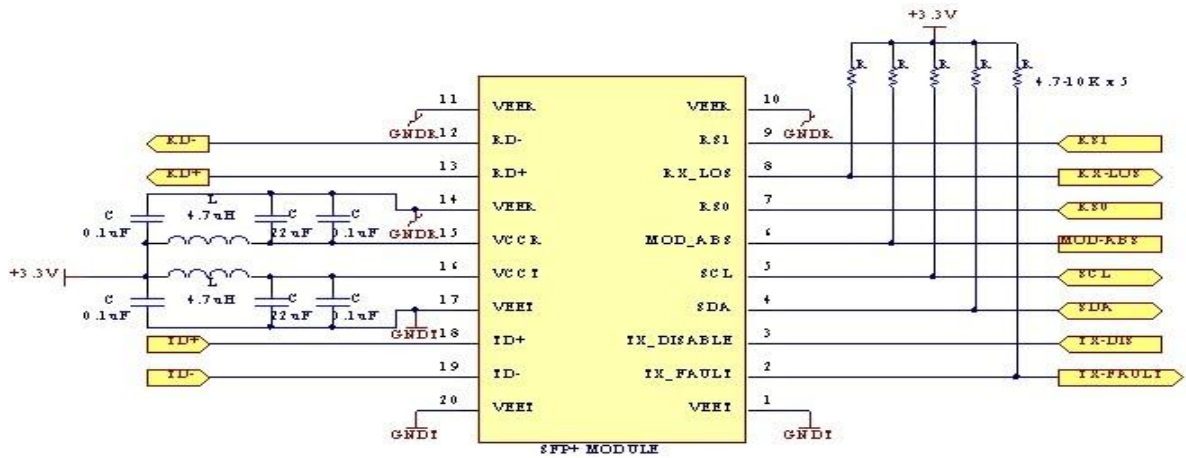
## VII. Optical Module Block Diagram



## VIII. Regulatory Compliance

| Feature   | Test Method   | Performance  |
|---|---|--|
| <b>Electrostatic Discharge (ESD) to the Electrical Pins</b> | MIL-STD-883C Method 3015.7                            | Class 1 (> 1500 Volts)   |
| <b>Electrostatic Discharge (ESD) Immunity</b>               | Variation of IEC 61000-4-2                            | LV 4 (Air discharge :15KV; Contact discharge:8 KV)   |
| <b>Electromagnetic Interference (EMI)</b>                   | CISPR22 ITE Class B<br>EN55022 Class B<br>FCC Class B | Compliant with standards   |
| <b>Immunity</b>   | IEC61000-4-3 Class 2<br>EN55024                       | Typically show no measurable effect from a 3V/m fieldswept from 80 to 1000MHz applied to the transceiver without a chassis enclosure |

### IX. Typical Application Circuit



### X. Diagram Mechanical Drawing

