

25G SFP28 850nm 100m DOM Transceiver

QFX-SFP-25G-SR-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 _{cc} | -0.3 | +4.0 | V |
| Storage Temperature | T _s | -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 ^{E-5} | |
| Max. Supported Link Length | L _{MAX} | | | 100 | m |

III. Recommended Operating Conditions

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

IV. Electrical Characteristics

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

Notes:

1. Differential between TD+ / TD-.

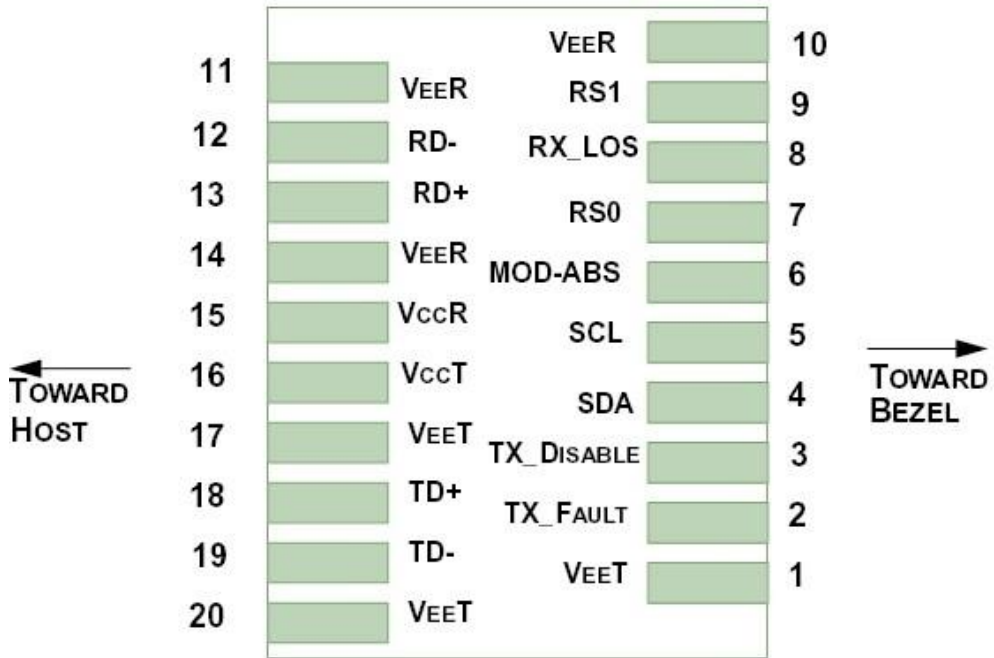
V. Optical Characteristics

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

Notes:

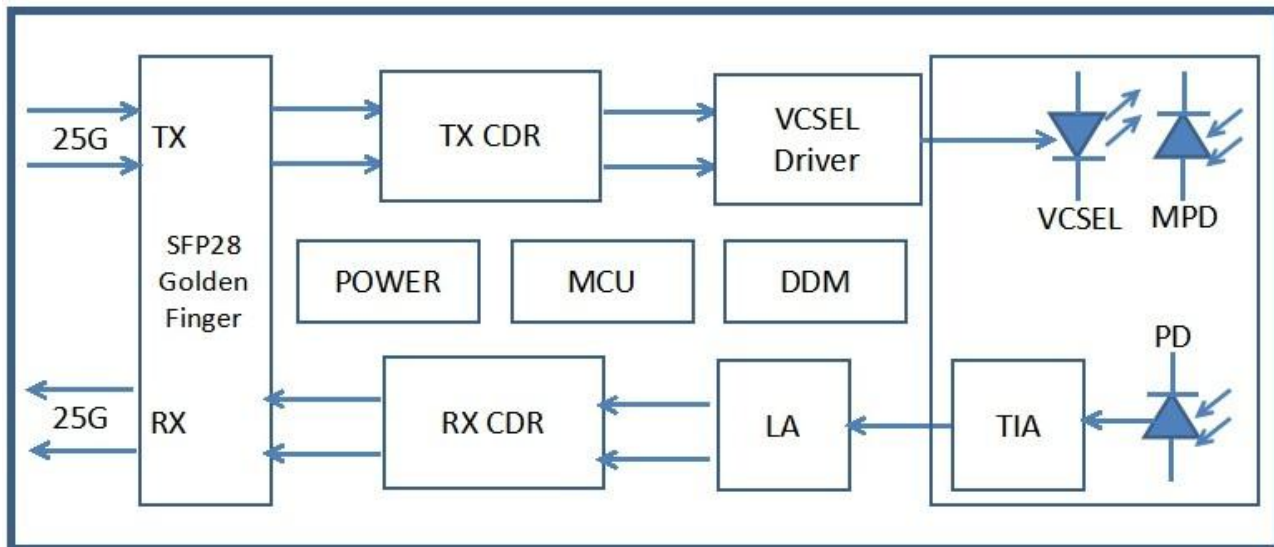
- Sensitivity for 25.78G PRBS 231-1 and BER better than or equal to $5 \cdot 10^{-5}$.
- The stressed sensitivity values in the table are for system level BER measurements which include the effects of CDR circuit.

VI. Pin Assignment



| Pin Number | Symbol | Name | Description |
|-----------------|------------|---|---|
| 1,17,20 | VeeT | Transmitter Signal Ground | These pins should be connected to signal ground on the host board. |
| 2 | TX Fault | Transmitter Fault Out (OC) | Logic "1" Output = Transmitter Fault Logic "0" Output = Normal Operation This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor. |
| 3 | TX Disable | Transmitter Disable In (LVTTTL) | Logic "1" Input (or no connection) = Laser off Logic "0" Input = Laser on This pin is internally pulled up to VccT with a 10 kΩ resistor. |
| 4 | SDA | Module Definition Identifiers | Serial ID with SFF 8472 Diagnostics Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors. |
| 5 | SCL | | |
| 6 | MOD-ABS | | |
| 7 | RS0 | Receiver Rate Select (LVTTTL) Transmitter Rate Select (LVTTTL) | NA |
| 9 | RS1 | | NA |
| 8 | LOS | Loss of Signal Out (OC) | This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor. |
| 10,11,14 | VeeR | Receiver Signal Ground | These pins should be connected to signal ground on the host board. |
| 12 | 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. |
| 13 | 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. |
| 15 | 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 |
| 16 | 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 |
| 18 | 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. |
| 19 | 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. |

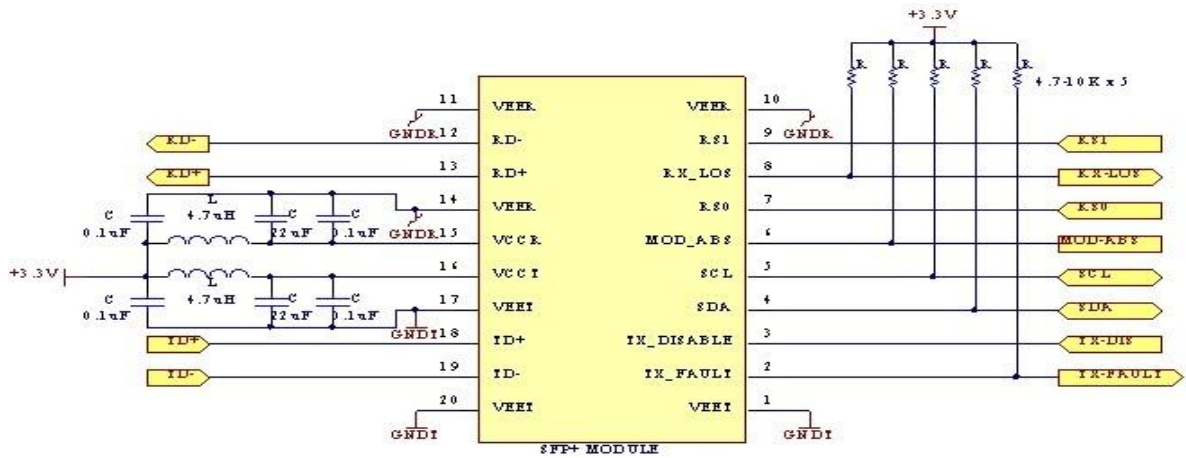
VII. Optical Module Block Diagram



VIII. Regulatory Compliance

| Feature | Test Method | Performance |
|---|---|--|
| Electrostatic Discharge (ESD) to the Electrical Pins | MIL-STD-883C Method 3015.7 | Class 1 (> 1500 Volts) |
| Electrostatic Discharge (ESD) Immunity | Variation of IEC 61000-4-2 | LV 4 (Air discharge :15KV; Contact discharge:8 KV) |
| Electromagnetic Interference (EMI) | CISPR22 ITE Class B EN55022 Class B FCC Class B | Compliant with standards |
| Immunity | IEC61000-4-3 Class 2 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

