

NS-SFP+10G-ZR100D NEWNETS 100KM SFP+ ZR Optical Transceiver



Features

- ◆ Compliant with SFF-8431 and IEEE802.3ae
- ◆ Data rate selectable $\leq 4.25\text{Gbps}$ or 9.95Gbps to 11.3Gbps bit rates
- ◆ Cooled EML transmitter and APD receiver
- ◆ link length up to 100km
- ◆ Low Power Dissipation 1.4W Typical (Maximum:2W)
- ◆ -5°C to 70°C Operating Case Temperature
- ◆ Single 3.3V power supply
- ◆ Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- ◆ RoHS compliant and lead free

Applications

- ◆ 10G Ethernet
- ◆ 10G Fiber Channel (with/without FEC)

Description

- ◆ NEWNETS SFP+ZR Transceiver is designed for 8.5G/10G Fiber- Channel and 10GBE applications. The transceiver consists of two sections: The transmitter section incorporates a cooled EML laser. And the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. NEWNETS SFP+ZR Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------|--------|------|-----|--------------------|
| Supply Voltage | Vcc | -0.5 | 3.8 | V |
| Storage Temperature | Tst | -40 | 85 | $^{\circ}\text{C}$ |

| | | | | |
|-------------------|----|---|----|---|
| Relative Humidity | Rh | 0 | 85 | % |
|-------------------|----|---|----|---|

Operating Conditions

| Parameter | Symbol | Min | Typical | Max | Unit |
|------------------------------|--------|------|---------|------|------|
| Supply Voltage | Vcc | 3.13 | 3.3 | 3.47 | V |
| Supply current [1] | Icc | | 420 | 610 | mA |
| Operating Case temperature | Tca | -5 | - | 70 | °C |
| Module Power Dissipation [2] | Pm | - | 1.4 | 2 | W |

Notes:

[1] Supply current is shared between VCCTX and VCCR. Typical Supply current test at 25°C, Max Supply current test at 60~70°C

[2] In-rush is defined as current level above steady state current requirements

Transmitter Specifications – Optical

| Parameter | Symbol | Min | Typical | Max | Unit |
|-----------------------------------|-------------|------|---------|------|-------|
| Center Wavelength | λ_c | 1528 | | 1565 | nm |
| Optical Average Power | Po | 2 | - | +4 | dBm |
| Side Mode Suppression Ratio | SMSR | 30 | - | - | dB |
| Optical Transmit Power (disabled) | PTX_DISABLE | - | - | -30 | dBm |
| Extinction Ratio | ER | 9 | | - | dB |
| RIN ₂₁ OMA | | | | -128 | dB/Hz |
| Optical Return Loss Tolerance | | | | 21 | dB |
| Dispersion penalty(1600ps/nm) | DP | | | 2 | dB |

Transmitter Specifications – Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|------------------------------|---------|-----|---------|----------|----------|
| Data Rate | Mra | - | 10.3 | 11.3 | Gbps |
| Input differential impedance | Rim | - | 100 | - | Ω |
| Differential data Input | VtxDIFF | 120 | - | 850 | mV |
| Transmit Disable Voltage | VD | 2.0 | - | Vcc3+0.3 | V |
| Transmit Enable Voltage | Ven | 0 | - | +0.8 | V |
| Transmit Disable Assert Time | Vn | - | - | 100 | us |

Receiver Specifications – Optical

| Parameter | Symbol | Min | Typical | Max | Unit |
|----------------------------|-------------|------|---------|------|------|
| Input Operating Wavelength | λ | 1110 | - | 1650 | nm |
| Receiver sensitivity [1] | | - | - | -25 | dBm |
| Maximum Input Power | RX-overload | - | - | -8 | dBm |
| Loss of Signal Asserted | | -34 | - | - | dBm |
| LOS De-Asserted | | - | - | -25 | dBm |
| LOS Hysteresis | | 0.5 | - | - | dB |

Notes:

[1] Measured with conformance test signal for BER = 10^{-12} . PRBS31, Data Rate=10.3Gbps.

Receiver Specifications – Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|---------------------------|----------|-----|---------|-----------|------|
| Data Rate | Mra | - | 10.3 | 11.3 | Gbps |
| Differential Output Swing | Vout P-P | 350 | - | 850 | mV |
| Rise/Fall Time | Tr / Tf | 24 | - | - | ps |
| Loss of Signal –Asserted | VOH | 2 | - | Vcc3+0.3- | V |
| Loss of Signal –Negated | VOL | 0 | - | +0.4 | V |

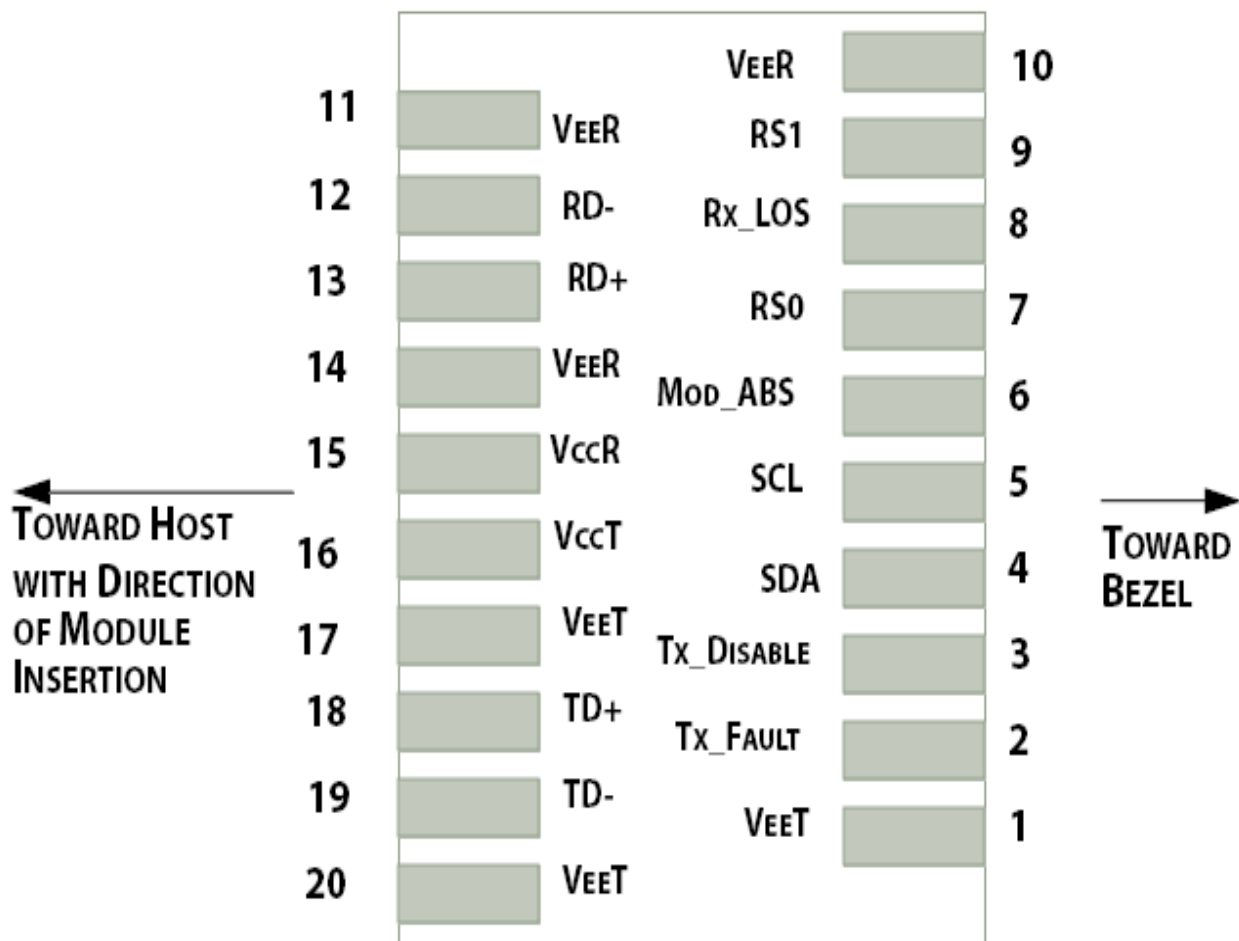


Figure1.Electrical Pin-out Details

Pin Descriptions

| Pin | Symbol | Name/Description |
|-----|--------------|---|
| 1 | VEET [1] | Transmitter Ground |
| 2 | Tx_FAULT [2] | Transmitter Fault |
| 3 | Tx_DIS [3] | Transmitter Disable. Laser output disabled on high or open |
| 4 | SDA [2] | 2-wire Serial Interface Data Line |
| 5 | SCL [2] | 2-wire Serial Interface Clock Line |
| 6 | MOD_ABS [4] | Module Absent. Grounded within the module |
| 7 | RS0 [5] | RS0 for Rate Select: Open or Low = Module supports ≤ 4.25 Gbps High = Module supports 9.95 Gb/s to 10.3125 Gb/s |
| 8 | RX_LOS [2] | Loss of Signal indication. Logic 0 indicates normal operation |
| 9 | RS1 [5] | No connection required |
| 10 | VEER [1] | Receiver Ground |
| 11 | VEER [1] | Receiver Ground |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled |
| 13 | RD+ | Receiver DATA out. AC Coupled |
| 14 | VEER [1] | Receiver Ground |
| 15 | VCCR | Receiver Power Supply |
| 16 | VCCT | Transmitter Power Supply |
| 17 | VEET [1] | Transmitter Ground |
| 18 | TD+ | Transmitter DATA in. AC Coupled |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled |
| 20 | VEET [1] | Transmitter Ground |

Notes:

[1] Module circuit ground is isolated from module chassis ground within the module.

[2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

[3]Tx_Disable is an input contact with a 4.7 k Ω to 10 k Ω pullup to VccT inside the module.

[4]Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 k Ω to 10 k Ω .Mod_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 k Ω resistors in the module.

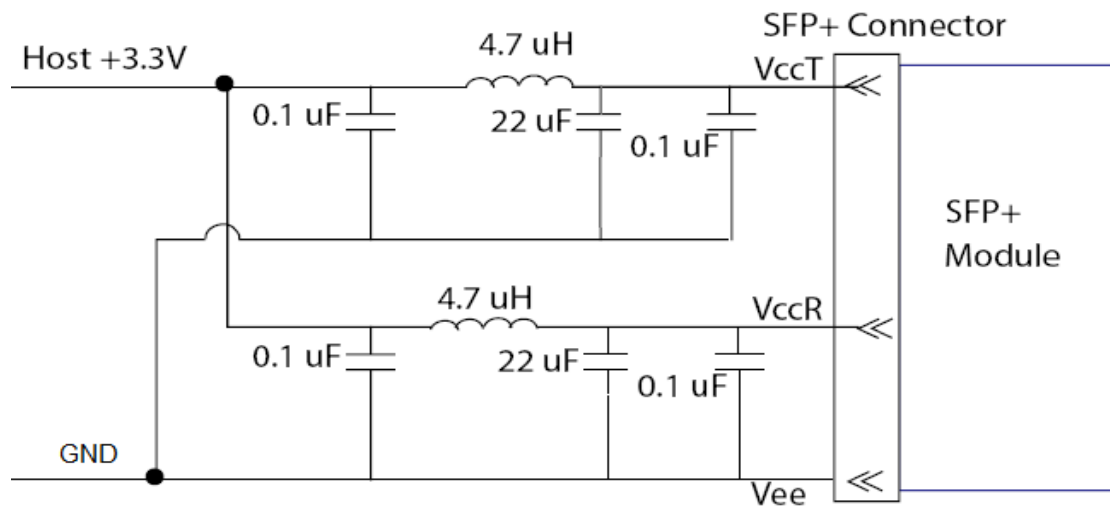


Figure2. Host Board Power Supply Filters Circuit

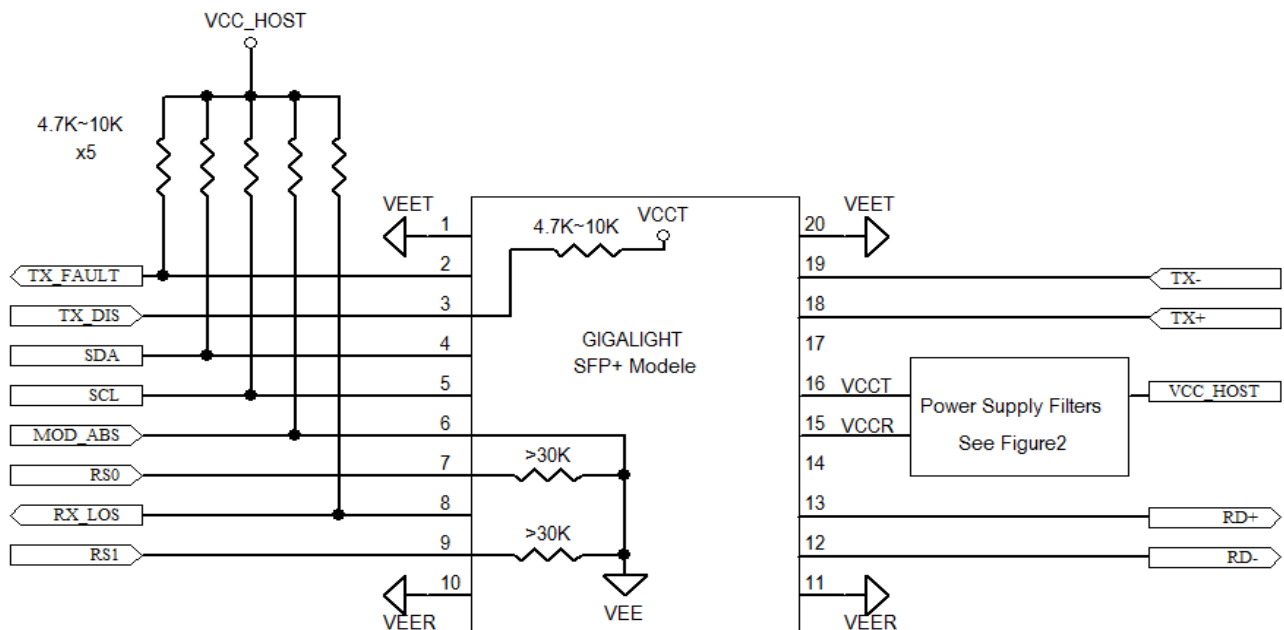


Figure3. Host-Module Interface

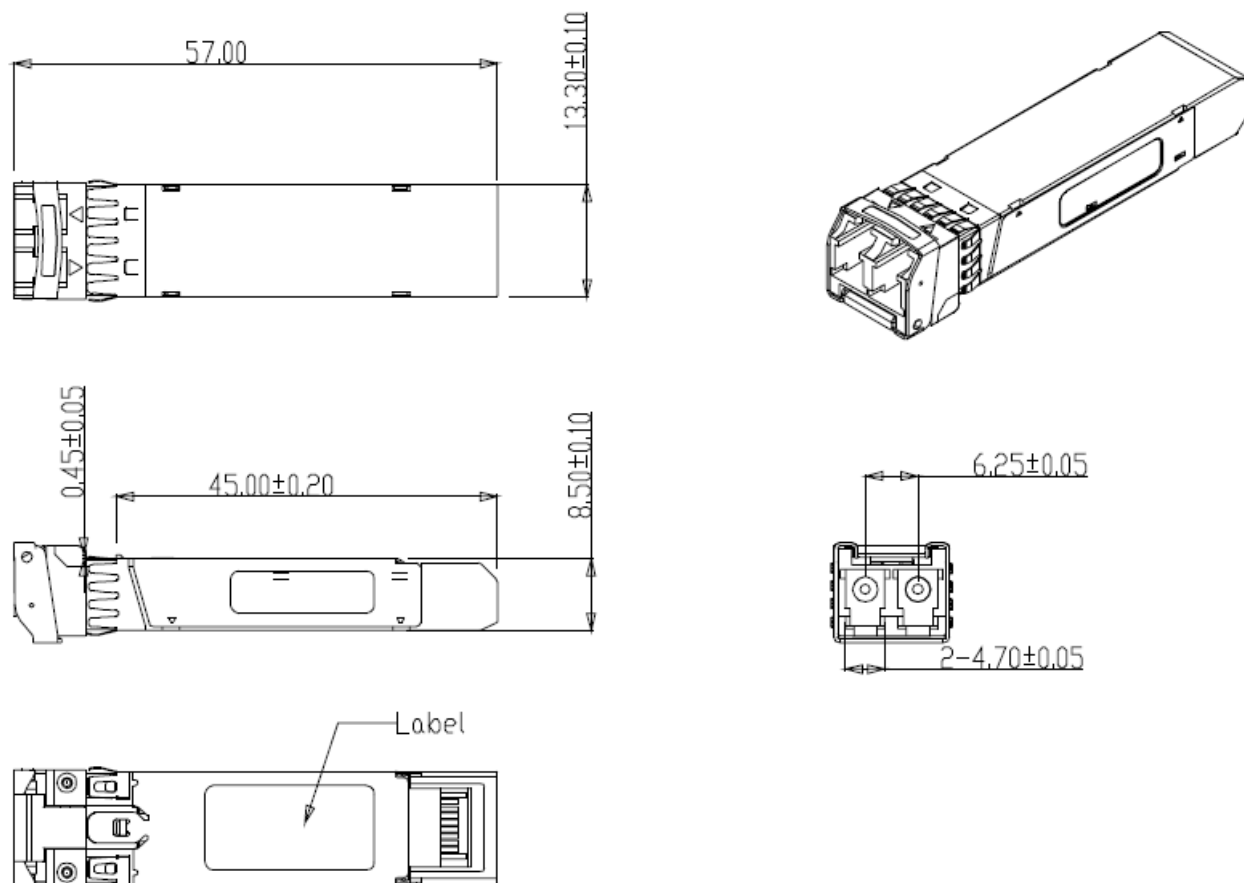


Figure4. Mechanical Specifications

Ordering information

| Part Number | Product Description |
|-------------------|---|
| NS-SFP+10G-ZR100D | 10Gbps, 1550nm SFP+ 100km, -5°C ~ +70°C |