

SFP+ CWDM 10G 80Km ZR

SLSSC-10XX-ZR




Description

Sourcelight SFP+ZR CWDM Transceiver is a “Limiting module”, designed for 10G Ethernet, and 2G/4G/ 8G/10G Fiber- Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a cooled EML laser. And the receiver section consists of an APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. 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.

Features

- ◆ Compliant with SFF-8431,SFF-8432 and IEE802.3ae
- ◆ 10GBASE-ZR, and 2G/4G/ 8G/10G Fiber Channel applications.
- ◆ Wavelength selectable to ITU-T standards covering CWDM grid wavelengths
- ◆ Cooled EML transmitter and APD receiver
- ◆ link length up to 80km (1450ps/nm@G652 fiber)
- ◆ 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
- ◆ CWDM Networks

Ordering information

| Part Number | Product Description |
|---------------|-------------------------------------------------------|
| SLSSC-10XX-ZR | SFP+ CWDM 10Gbps, XX = 47 ~ 61, ZR 80km, -5°C ~ +70°C |

Note:

[1] XX = the wavelength support, available from 1470 (47) ~ 1610 (61) nm

Module Block Diagram

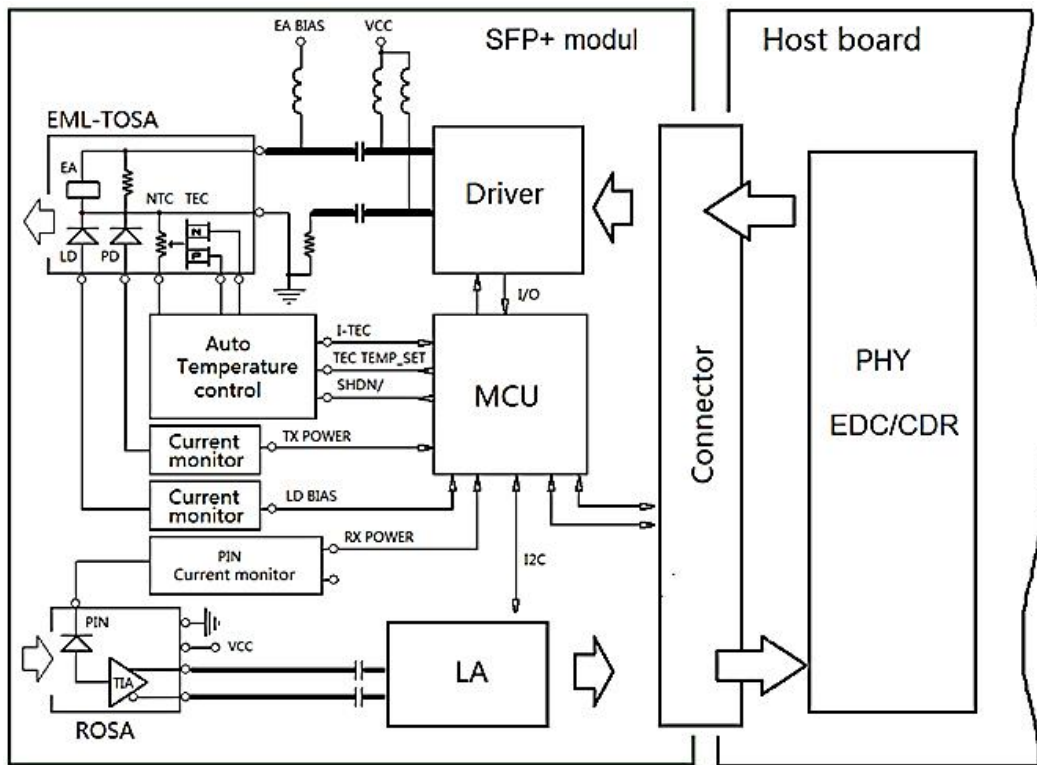


Figure1. Module Block Diagram

Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------|--------|------|-----|------|
| Supply Voltage | Vcc | -0.5 | 3.8 | V |
| Storage Temperature | Tst | -40 | 85 | °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 | Icc | - | 420 | 610 | mA |
| Operating Case temperature | Tca | -5 | - | 70 | °C |
| Module Power Dissipation | Pm | - | 1.4 | 2 | W |

Transmitter Specifications – Optical

| Parameter | Symbol | Min | Typical | Max | Unit |
|-----------------------------|----------------------|--------|-------------|--------|------|
| Center Wavelength | λ_c | 1464.5 | | 1617.5 | nm |
| Center wavelength stability | $\Delta\lambda_D$ | -6.5 | λ_c | 6.5 | nm |
| Spectral Width (-20dB) | $\Delta\lambda_{20}$ | - | - | 0.3 | nm |
| Average Optical Power [2] | Po | 0 | - | +3 | dBm |

Datasheet

| | | | | | |
|-----------------------------------|-------------|-----|---|------|-------|
| Side Mode Suppression Ratio | SMSR | 30 | - | - | dB |
| Optical Transmit Power (disabled) | PTX_DISABLE | - | - | -30 | dBm |
| Extinction Ratio | ER | 8.2 | - | - | dB |
| Dispersion penalty(1450ps/nm) [2] | DP | - | - | 2 | dB |
| Relative Intensity Noise | RIN | - | - | -128 | dB/Hz |
| Optical Return Loss Tolerance | Orl | - | - | 21 | dB |

Receiver Specifications – Optical

| Parameter | Symbol | Min | Typical | Max | Unit |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|---------|---------------------|------|
| Input Operating Wavelength | λ | 1260 | - | 1610 | nm |
| Receiver sensitivity(Average) [1] Receiver sensitivity@9.95G Receiver sensitivity@10.3125G Receiver sensitivity@11.1G | Rsen1 Rsen2 Rsen3 | - | - | -24.5 -24 -22 | dBm |
| Maximum Input Power | RX-overload | -7 | - | - | dBm |
| Path penalty at 1450ps/nm @9.95Gb/s | DP1 | - | - | 2 | dB |
| Path penalty at 1450ps/nm @10.3125Gb/s | DP2 | - | - | 3 | dB |
| Path penalty at 1300ps/nm @11.1Gb/s | DP3 | - | - | 3 | dB |
| Loss of Signal Asserted | Lsa | -34 | - | - | dBm |
| LOS De-Asserted | Lda | - | - | -24 | dBm |
| LOS Hysteresis | Lh | 0.5 | - | - | dB |

Notes:

[1] Measured with conformance test signal for BER = 10^{-12} . The stressed sensitivity values in the table are for system level BER measurements which include the effects of CDR circuits. It is recommended that at least 0.4 dB additional margin be allocated if component level measurements are made without the effects of CDR circuits.

Transmitter Specifications – Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|------------------------------|---------|-----|---------|----------|----------|
| Data Rate | Mra | - | 10.3125 | 11.1 | 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 – Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|---------------------------|----------|-----|---------|-----------|------|
| Data Rate | Mra | - | 10.3125 | 11.1 | Gbps |
| Differential Output Swing | Vout P-P | 350 | - | 850 | mV |
| Rise/Fall Time | Tr / Tf | - | - | 40- | ps |
| Loss of Signal –Asserted | VOH | 2 | - | Vcc3+0.3- | V |
| Loss of Signal –Negated | VOL | 0 | - | +0.4 | V |

Digital Diagnostic Functions

| Parameter | Symbol | Min. | Max | Unit | Notes |
|-------------------------------|-----------|-------|-------|------|-----------------------|
| Accuracy | | | | | |
| Transceiver Temperature | DMI_Temp | -3 | +3 | degC | Over operating temp |
| TX Output optical power | DMI_TX | -3 | +3 | dB | |
| RX Input optical power | DMI_RX | -3 | +3 | dB | -7dBm to -26dBm range |
| Transceiver Supply voltage | DMI_VCC | -0.08 | +0.08 | V | Full operating range |
| Bias current monitor | DMI_Ibias | -10% | 10% | mA | |
| Dynamic Range Accuracy | | | | | |
| Transceiver Temperature | DMI_Temp | -5 | 70 | degC | |
| TX Output optical power | DMI_TX | 0 | +3 | dBm | |
| RX Input optical power | DMI_RX | -26 | -7 | dBm | |
| Transceiver Supply voltage | DMI_VCC | 3.0 | 3.6 | V | |
| Bias current monitor | DMI_Ibias | 0 | 100 | mA | |

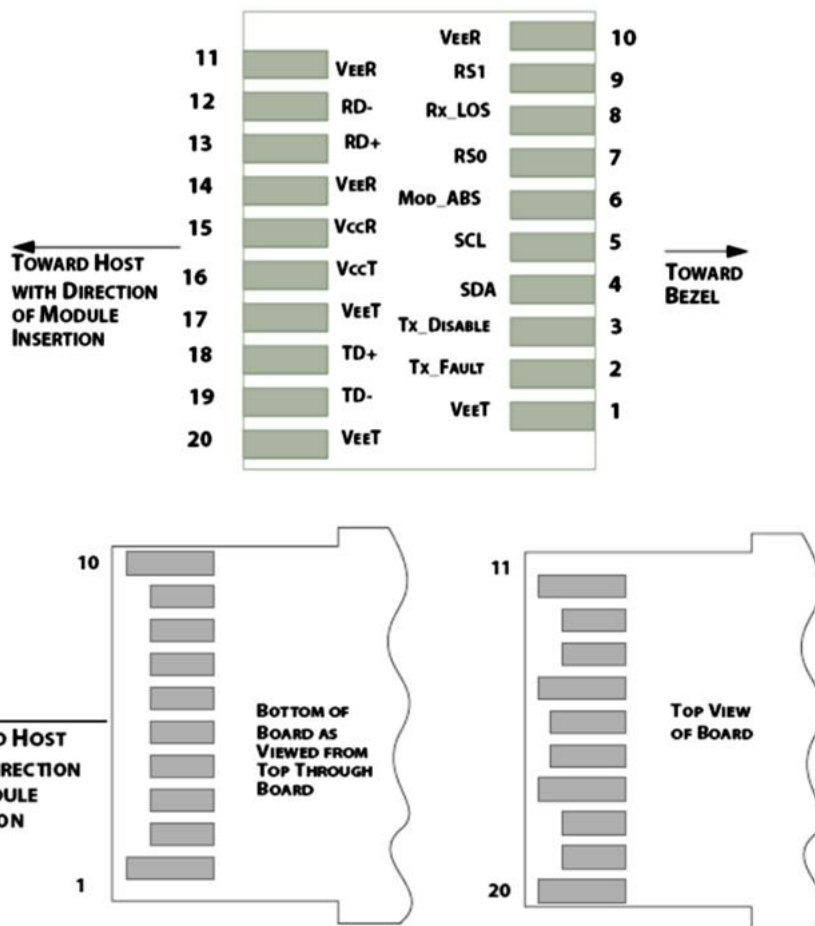


Figure2. Electrical Pin-out Details

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] | Rate Select 0 | | | | | | | | | | | | |
| 8 | RX_LOS [2] | Loss of Signal indication. Logic 0 indicates normal operation | | | | | | | | | | | | |
| 9 | RS1 [5] | Rate Select 1 | | | | | | | | | | | | |
| 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 |
| 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 kΩ to 10 kΩ 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 kΩ to 10 kΩ. 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 kΩ resistors in the module.

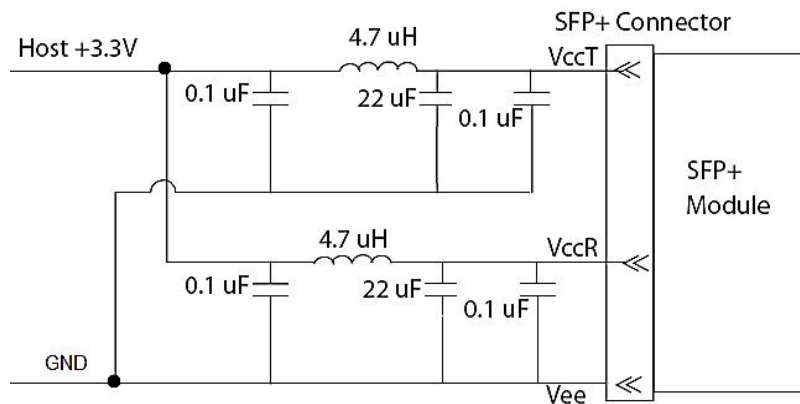


Figure3. Host Board Power Supply Filters Circuit

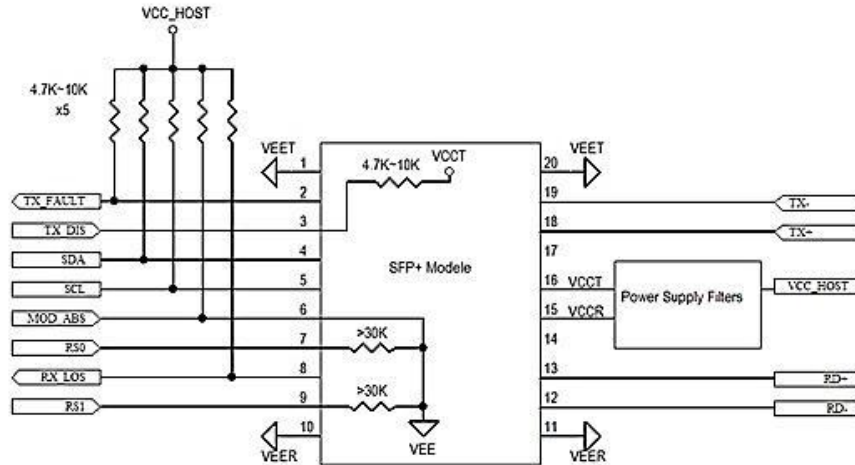


Figure4. Host-Module Interface

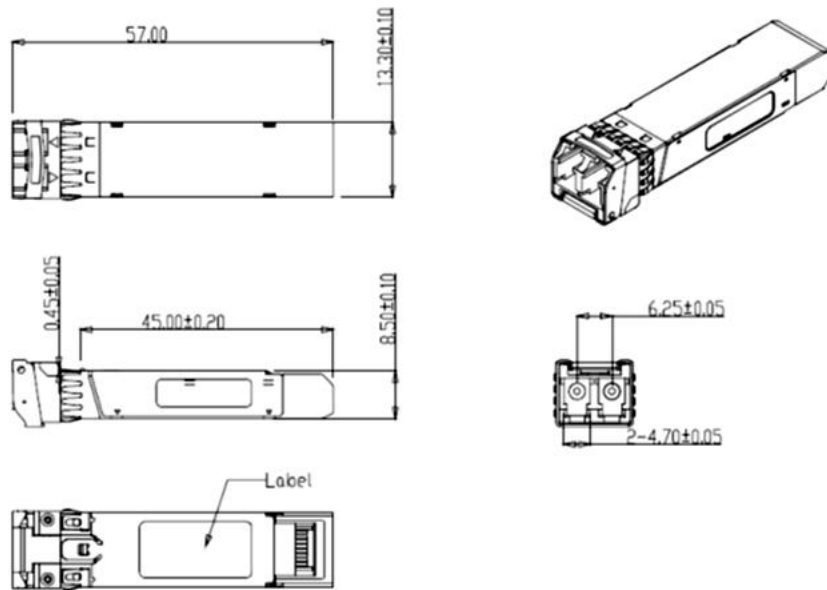


Figure5. Mechanical Specifications

References

1. "Specifications for Enhanced Small Form Factor Pluggable Module SFP+", SFF-8431, Rev 4.1, July 6, 2009.
2. "Improved Pluggable Formfactor", SFF-8432, Rev 4.2, Apr 18, 2007
3. IEEE802.3ae – 2002
4. "Diagnostic Monitoring Interface for Optical Transceivers" SFF-8472, Rev 10.3, Dec 1, 2007

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