

XTS317-10LM

10 Gb/s, 10 km Single Mode,
Multi-Rate SFP+ Transceiver



Applications

- 6 GB/8 GB/10 GB Fibre Channel
- 6.1440 Gbps/9.8304 Gbps/10.1376 Gbps CPRI data rate
- 10GBASE-LR at 10.3125 Gbps
- 10GBASE-LW at 9.953 Gbps

Description

XenOpt SFP+ 10KM 1310 nm Transceiver is a “Limiting module”, designed for 10GBASE-LR, and 6 G/8 G/10 G Fiber Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a DFB laser, and the receiver section consisting of a PIN 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

- Up to 11.3 G bit rates
- Support CPRI line bit data rate from option 6 to option 8
- Hot-pluggable SFP+ footprint
- +3.3 V single power supply
- Electrical interface compliant to SFF-8431
- 10 km link length
- Low power dissipation (1.1 W typical)
- Duplex LC connector
- 1310 nm DFB transmitter, PIN photo-detector
- Operating case temperature: -40 to +85°C
- Built-in digital diagnostic functions
- RoHS-6 compliant (lead-free)

Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

| Parameter | Symbol | Min | Max | Unit |
|----------------------------|--------|-----|------|------|
| Power Supply Voltage | VCC | 0 | +3.6 | V |
| Storage Temperature | Tc | -40 | +85 | °C |
| Operating Case Temperature | Tc | -40 | +85 | °C |
| Relative Humidity | RH | 5 | 95 | % |

Recommended operating environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

| Parameter | Symbol | Min | Typical | Max | Unit |
|----------------------------|--------|-------|---------|-------|------|
| Power Supply Voltage | VCC | 3.135 | 3.300 | 3.465 | V |
| | ICC | | | 500 | mA |
| Operating Case Temperature | TC | -40 | | +85 | °C |
| Power Dissipation | PD | | | 1.5 | W |
| Data Rate | | | | 11 | Gbps |
| Transmission Distance | | | | 10 | KM |

Low Speed Characteristics

| Parameter | Symbol | Min | Typical | Max | Unit |
|-------------------|--------|--------------|---------|--------------|------|
| Power Consumption | | | | 1.5 | W |
| TX_Fault, RX_LOS | VOL | 0 | | 0.4 | V |
| | VOH | Host_Vcc-0.5 | | Host_Vcc+0.3 | V |
| TX_DIS | VIL | -0.3 | | +0.8 | V |
| | VIH | 2.0 | | VCCT+0.3 | V |
| RS0, RS1 | VIL | -0.3 | | +0.8 | V |
| | VIH | 2.0 | | VCCT+0.3 | V |

Optical Characteristics

| Parameter | Symbol | Min |
|---|--------|--------------|
| Operating Reach | km | 10 |
| Transmitter | | |
| Center wavelength (range) | nm | 1260 -1355 |
| Side Mode Suppression Ratio (min) | dB | 40 |
| Launched power | | |
| maximum | dBm | 0 |
| minimum | dBm | -6 (Note 1) |
| Transmitter and dispersion penalty | dB | 3.2 (Note 4) |
| Average launch power of OFF transmitter (max) | dBm | -30 |
| Extinction ratio (min) | dB | 4 |
| Optical Return Loss Tolerance (min) | dB | 12 |
| Receiver | | |
| Center wavelength (range) | nm | 1260 -1355 |
| Receive overload (max) in average power ¹ | dBm | -1 |
| Receive sensitivity (min) in average power ¹ | dBm | -17 (Note 3) |
| Receiver sensitivity (max) in OMA (footnote 2) | dBm | -15 (Note 3) |
| Receiver Reflectance (max) | dB | -12 |
| Vertical eye closure penalty (min) ³ | dB | 2.2 |
| Receiver power (damage, Max) | dBm | 0 |

Notes

1. The optical power is launched into SMF
2. Measured with a PRBS 2³¹⁻¹ test pattern@10.3125 Gbps
3. Measured with a PRBS 2³¹⁻¹ test pattern@10.3125 Gbps BER≤10⁻¹²
4. In G.652 and G.655 (NDSF)

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---------------------------------------|--------|------|---------|------|------|------------|
| Data Rate | | | 10.3125 | 11 | Gbps | |
| Power Consumption | | | | 1100 | mW | |
| Transmitter | | | | | | |
| Single Ended Output Voltage Tolerance | | -0.3 | | +4.0 | V | |
| C common mode voltage tolerance | | 15 | | | mV | |
| Tx Input Diff Voltage | VI | 400 | | 1600 | mV | |
| Tx Fault | VoL | -0.3 | | +0.4 | V | |
| Data Dependent Input Jitter | DDJ | | | 0.10 | UI | |
| Data Input Total Jitter | TJ | | | 0.28 | UI | |
| Receiver | | | | | | |
| Single Ended Output Voltage Tolerance | | -0.3 | | +4.0 | V | |
| Rx Output Diff Voltage | Vo | 300 | | 850 | mV | |
| Rx Output Rise and Fall Time | Tr/Tf | 30 | | | ps | 20% to 80% |
| Total Jitter | TJ | | | 0.70 | UI | |
| Deterministic Jitter | DJ | | | 0.42 | UI | |

Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF8472 Rev9.2 with internal calibration mode. For external calibration mode please contact our sales staff.

| 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 | |
| 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 | -40 | +90 | degC | |
| TX Output optical power | DMI_TX | -5 | 4 | dBm | |
| RX Input optical power | DMI_RX | -25 | -1 | dBm | |
| Transceiver Supply voltage | DMI_VCC | 3.0 | 3.6 | V | |
| Bias current monitor | DMI_Ibias | 0 | 40 | mA | |

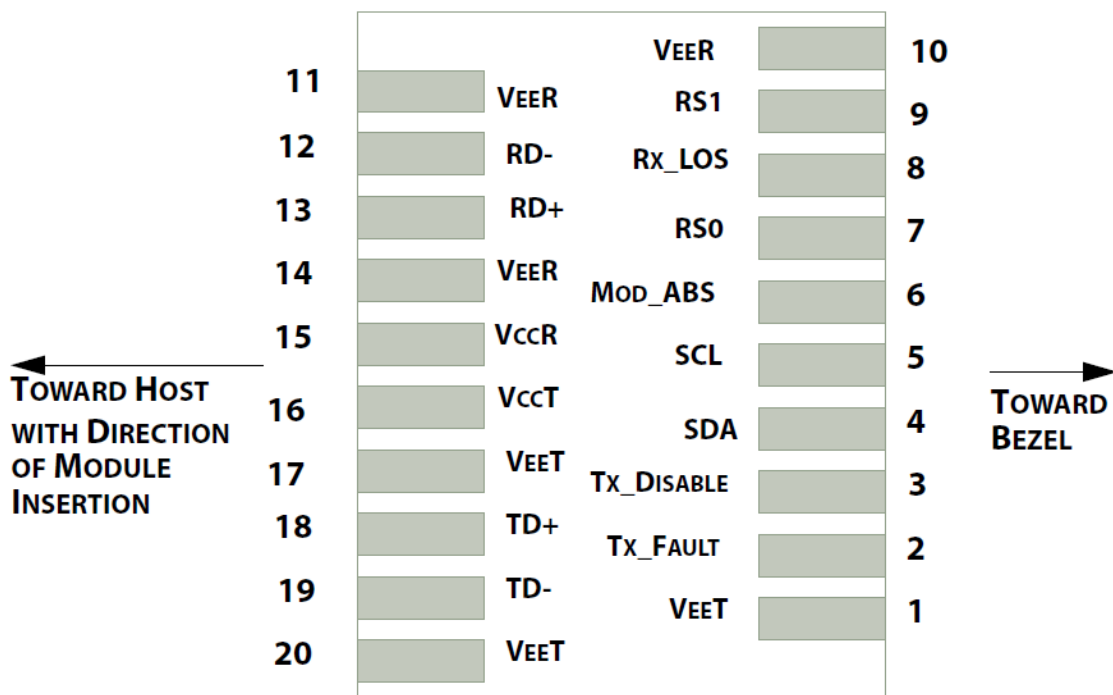


Figure 1. Host PCB SFP+ pad assignment top view

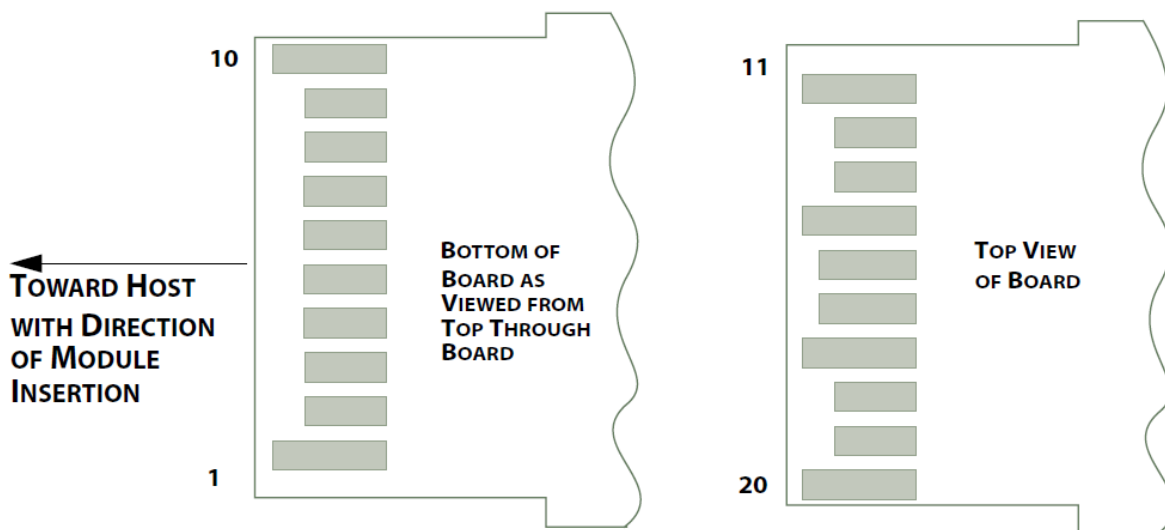


Figure 2. SFP+ module contact assignment

Pin Descriptions

| Pin | Symbol | Name/Description |
|-----|-------------|---|
| 1 | VEET[1] | Transmitter Ground |
| 2 | Tx_FAULT[2] | Transmitter Fault Indication |
| 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 |

Notes

- [1] Module circuit ground is isolated from module chassis ground within the module.
- [2] Should be pulled up with 4.7 k – 10 k ohms on host board to a voltage between 3.15 V and 3.6 V.
- [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.

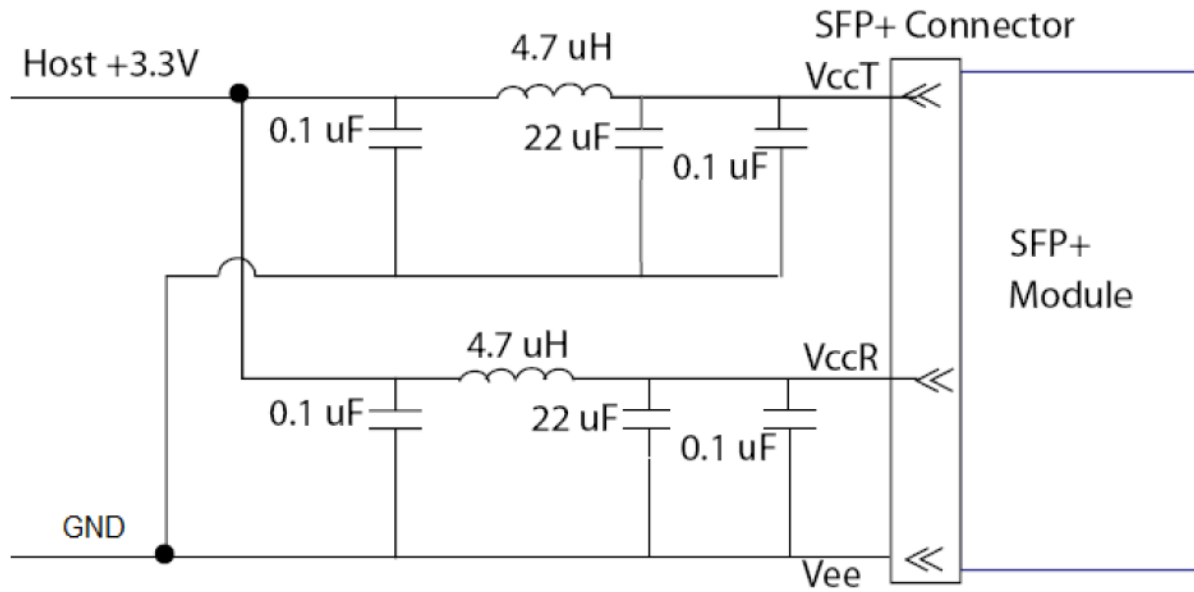


Figure 3. Host Board Power Supply Filters Circuit

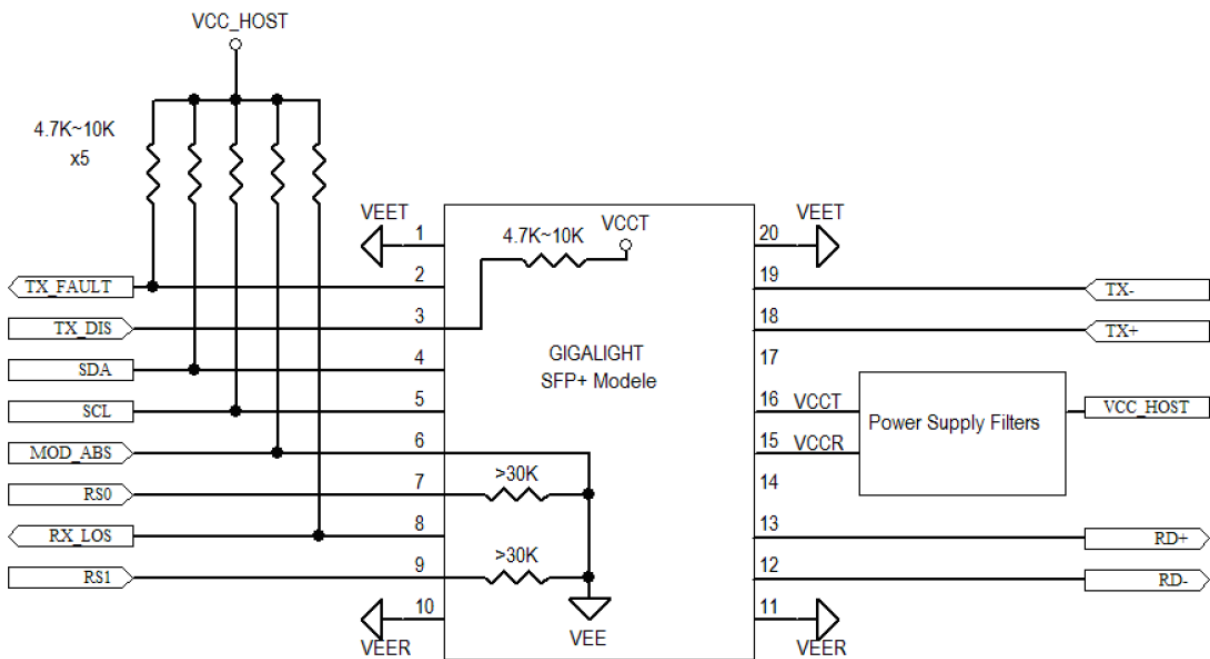


Figure 4. Host-Module Interface

Mechanical Specifications

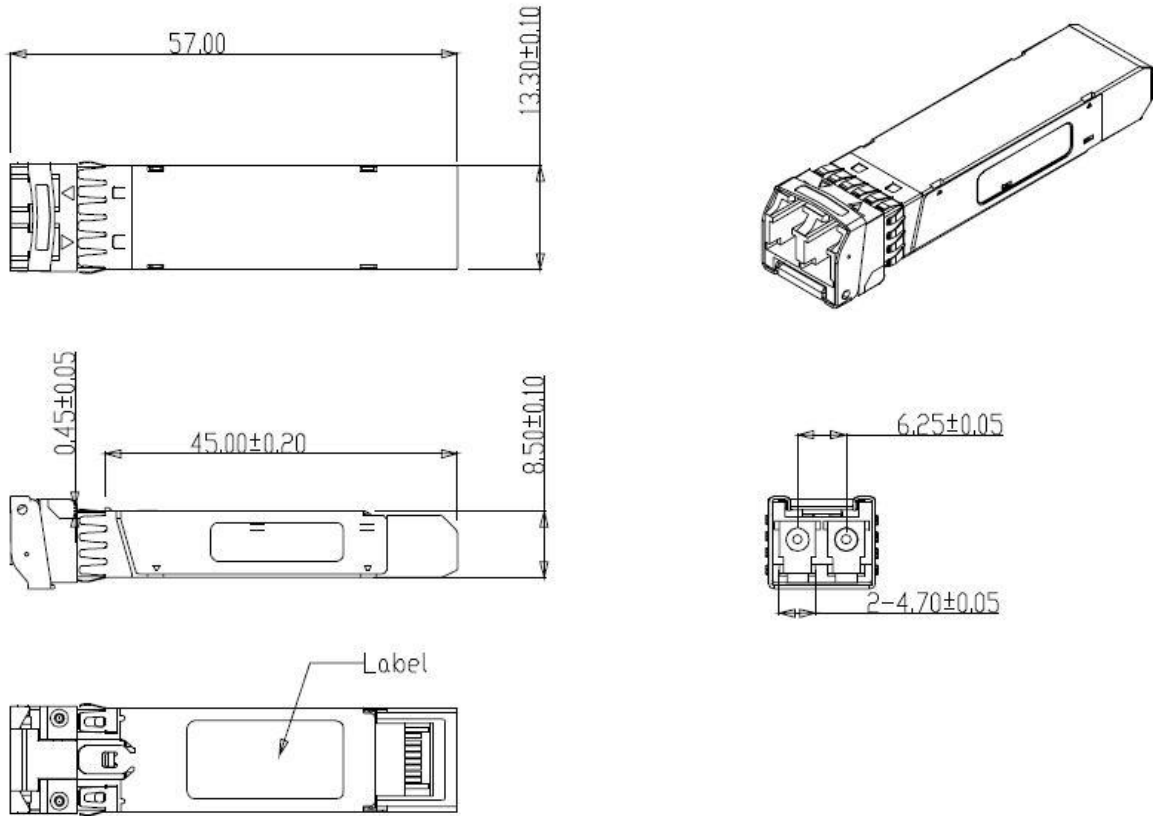


Figure 5. Mechanical Specifications

Ordering information¹

| PN | Description |
|-------------|--|
| XTS317-10LM | SFP+ 1310 nm, 10 Gbps, 10 km, -40°C ~ +85°C, LC, DDM |

Notes:

¹ Specification may change without notice. For accurate specification please contact XenOpt reseller before placing an order. The content of this document is subject to change without notice. Please specify any compatibility requirements at time of ordering. Standard MSA compatible pluggable components may not work or some function of these components may not be available in devices that require customized compatible devices. Pluggable components compatible with one type of communications equipment may not work in other type of communications equipment.

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