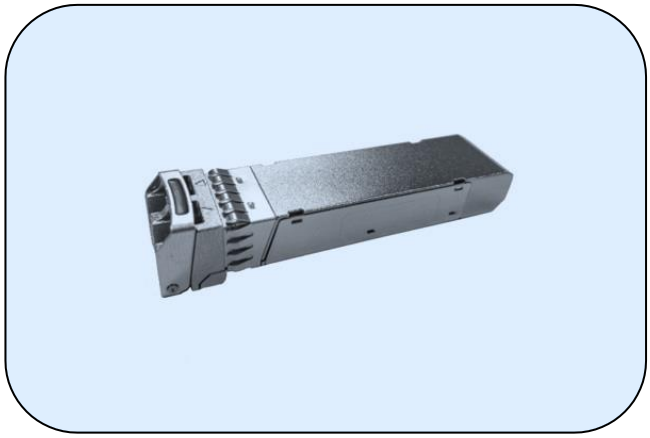
XTS317-10LM

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



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)

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.

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	℃
Operating Case Temperature	Tc	-40	+85	℃
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	℃
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 2^{31-1} test pattern@10.3125 Gbps
3. Measured with a PRBS 2^{31-1} 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 stuff.

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	

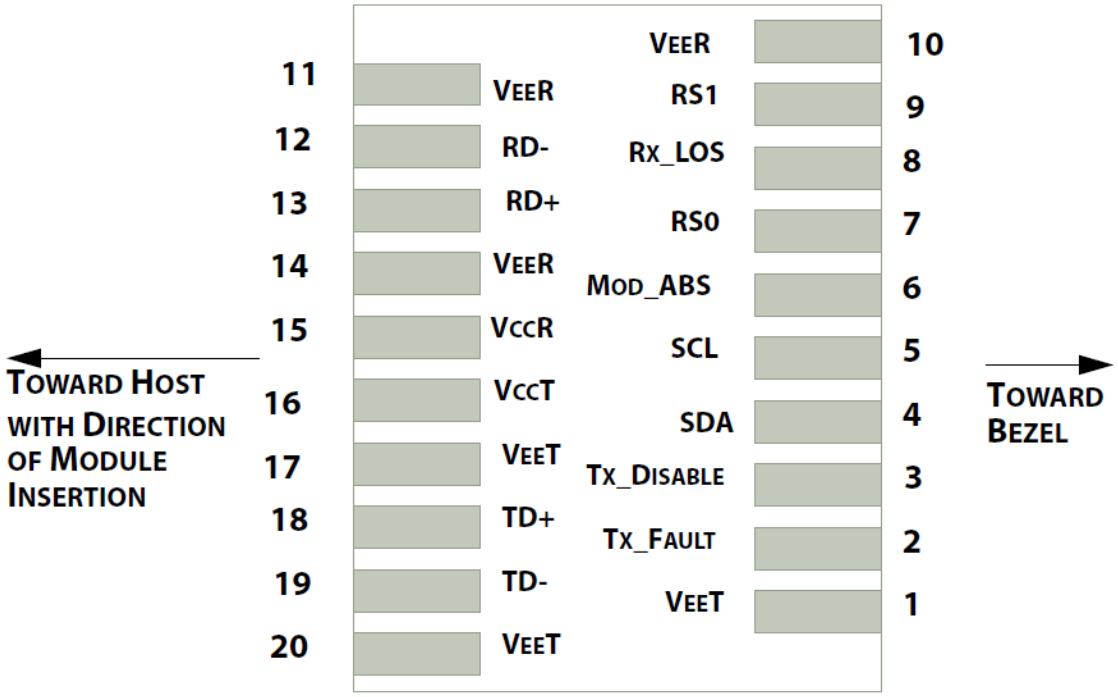


Figure 1. Host PCB SFP+ pad assignment top view

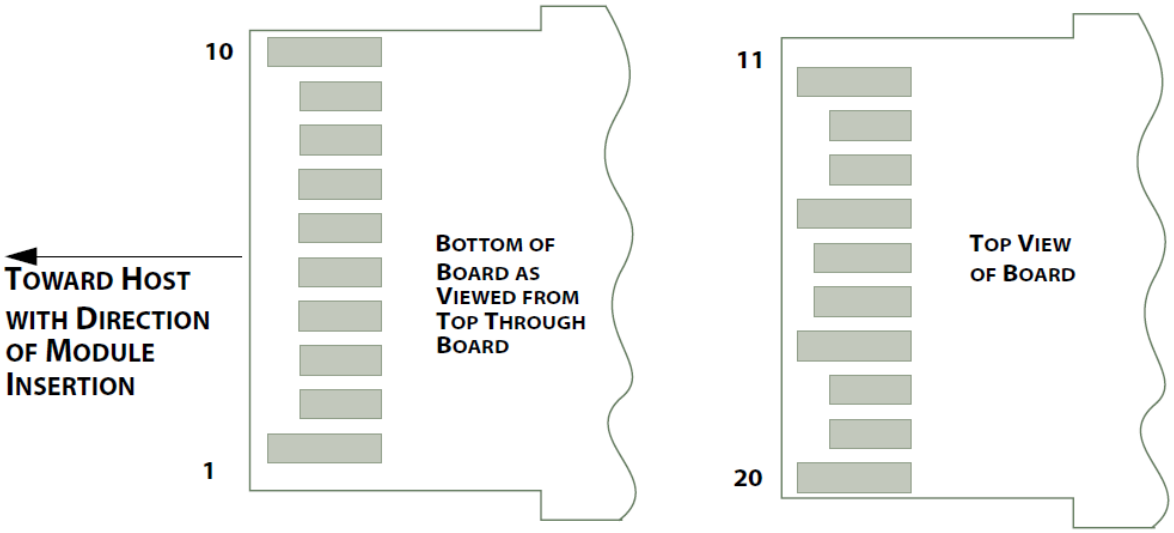


Figure 2. SFP+ module contact assignment

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.

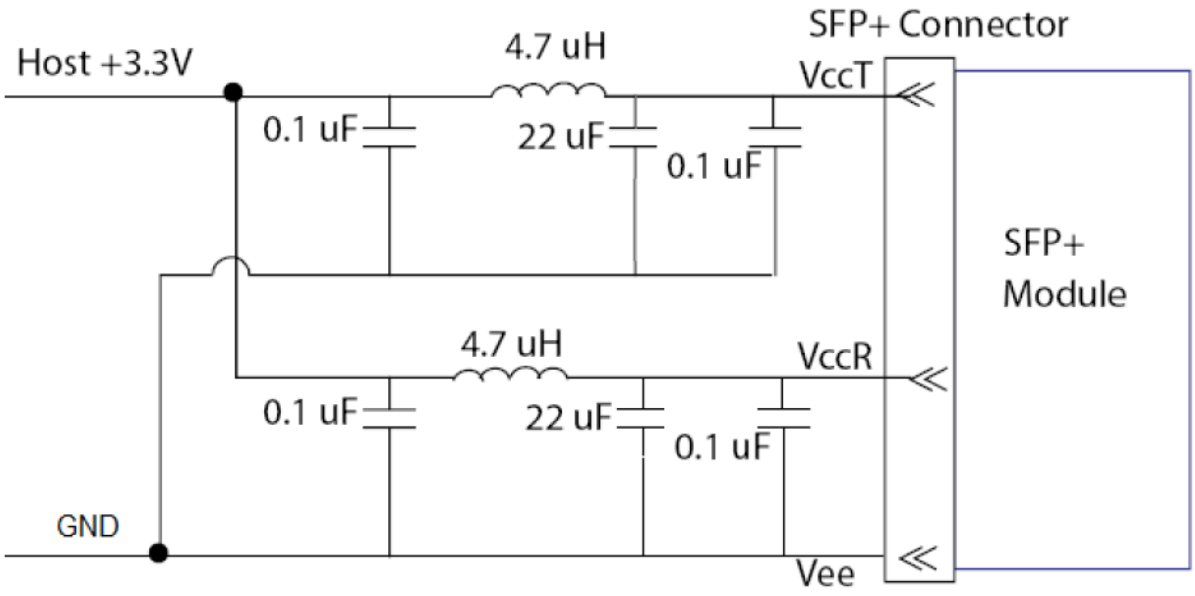


Figure 3. Host Board Power Supply Filters Circuit

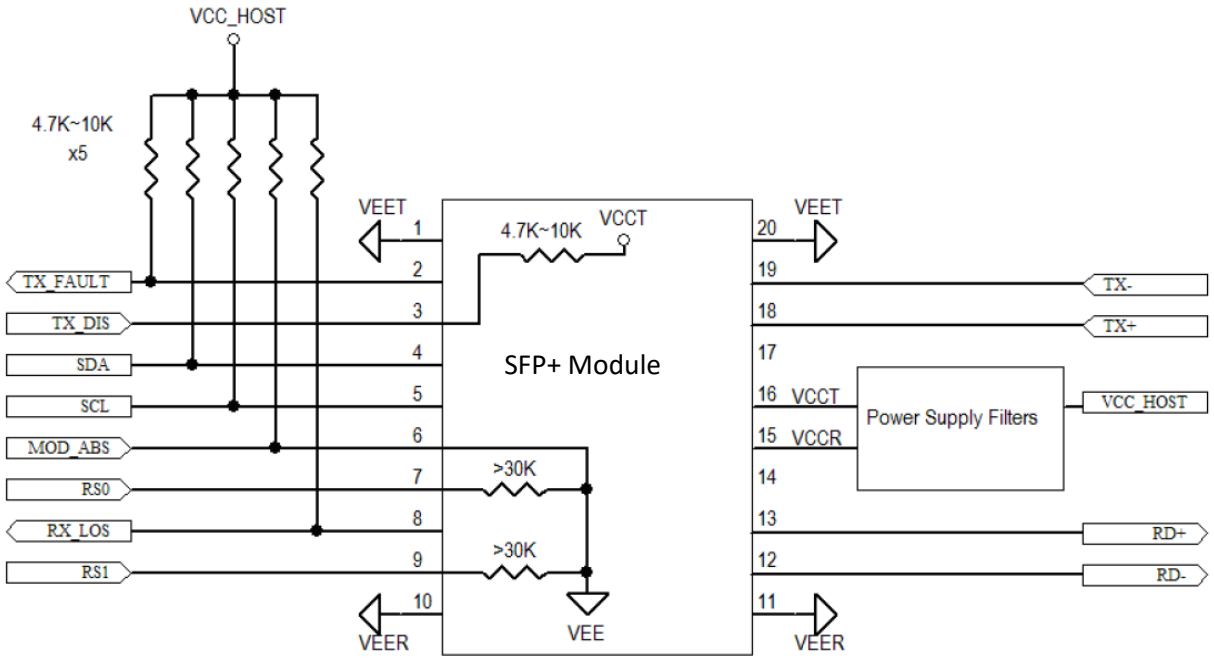


Figure 4. Host-Module Interface

Mechanical Specifications

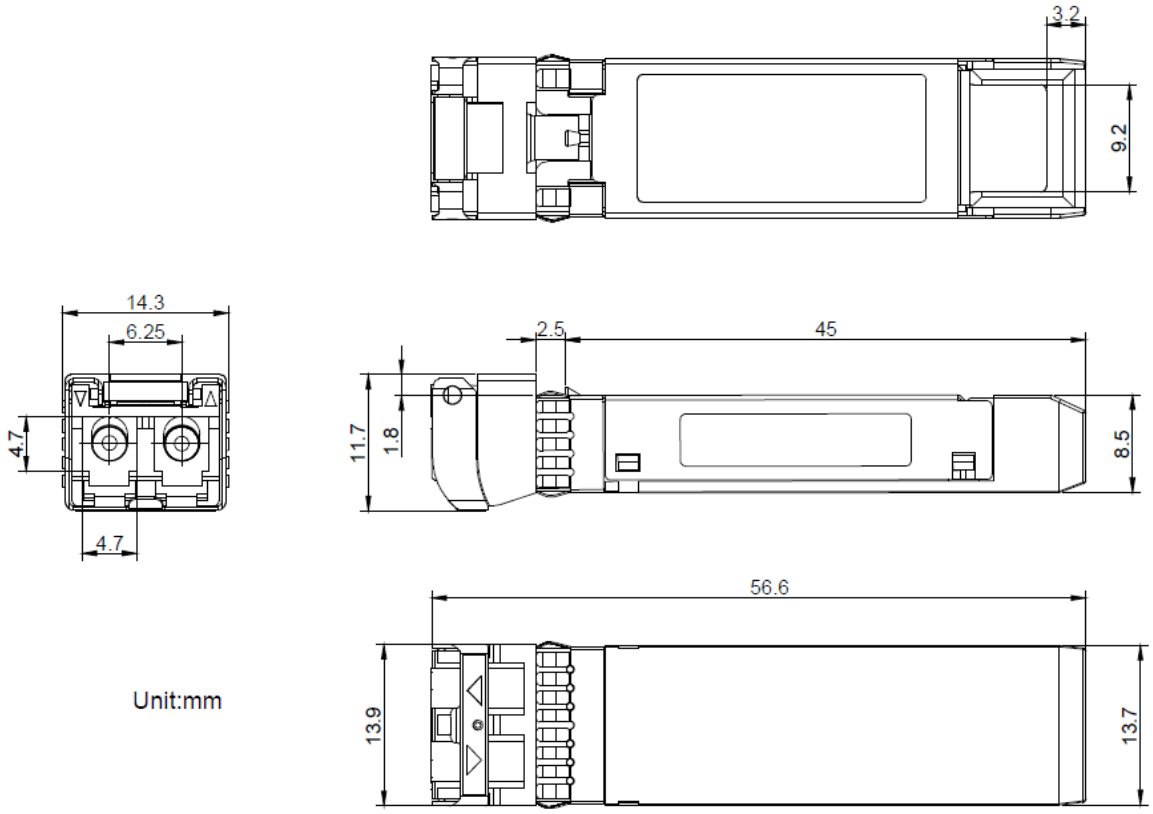


Figure 5. Mechanical Specifications

Ordering information[1]

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

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.

Important Notice

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