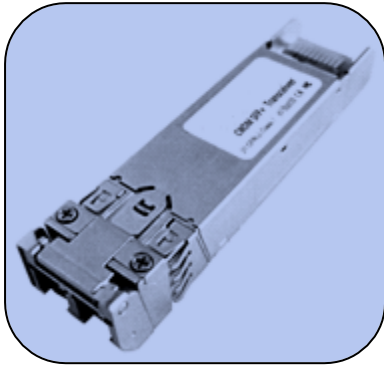




# XTCxxA-xxLY

## 10 Gbp/s 70-80km CWDM SFP+ Transceiver



**Applications**  
o 10GBASE-ZR

**Description**

XenOpt SFP+ZR CWDM Transceiver is designed for 10GBASE-ZR 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. 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.

- Product Highlights**
- Compliant with SFF-8431 and IEE802.3ae
  - Data rate selectable  $\leq 4.25\text{Gbps}$  or  $9.95\text{Gbps}$  to  $10.3\text{Gbps}$  bit rates
  - Cooled EML transmitter and APD receiver
  - Wavelength selectable to ITU-T standards covering CWDM grid wavelengths
  - $1470\text{nm}\sim 1570\text{nm}$  link length up to  $80\text{km}$  ( $1600\text{ps/nm}$ )
  - $1590\text{nm}\sim 1610\text{nm}$  link length up to  $70\text{km}$  ( $1400\text{ps/nm}$ )
  - Low Power Dissipation  $2\text{W}$  Maximum
  - $-5^{\circ}\text{C}$  to  $70^{\circ}\text{C}$  Operating Case Temperature
  - Single  $3.3\text{V}$  power supply
  - Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
  - RoHS compliant and lead free

**Absolute maximum rating**

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5	3.8	V
Storage Temperature	T <sub>st</sub>	-40	85	°C
Relative Humidity	R <sub>h</sub>	0	85	%

**Recommended Operating Environment**

Parameters	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V <sub>CC</sub>	3.13	3.3	3.47	V
Power Supply Current	I <sub>CC</sub>		420	610	mA
Operating Case temperature	T <sub>ca</sub>	-5		70	°C
Module Power Dissipation	P <sub>m</sub>	-	1.4	2	W

**Notes:**

[1] Supply current is shared between VCCTX and VCCR. X.

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

**Optical Characteristics**

Parameters	Symbol	Min.	Typical	Max.	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_c$	1464.5		1617.5	nm	
Center wavelength stability	$\Delta\lambda_D$	-6.5	$\lambda_c$	-6.5	nm	
Optical Average Power	Po	0	-	+4	dBm	
Optical OMA Power	Pom	-2.1			dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Optical Transmit Power (disabled)	PTX_DISABLE	-	-	-30	dBm	
Extinction Ratio	ER	8.2		-	dB	
RIN21OMA [1]				-128	dB/Hz	RIN measurement is made with a return loss at 21 dB.
Optical Return Loss Tolerance				21	dB	
<b>Receiver</b>						
Input Operating Wavelength	$\lambda$	1260	-	1620	nm	
Average receive power		-	-	-1.0	dBm	
Receiver sensitivity in OMA		-	-	-24	dBm	
Maximum Input Power	RX-overload	-	-	-7	dBm	
Reflectance	Rrx	-	-	-27	dB	
Loss of Signal Asserted		-25	-	-	dBm	
LOS De-Asserted		-	-	-30	dBm	
LOS Hysteresis		0.5	-	-	dB	

**Electrical Characteristics**

Parameters	Symbol	Min.	Typical	Max.	Unit	Notes
<b>Transmitter</b>						
Data Rate	Mra	-	10.3	11.3	Gbps	
Input differential impedance	Rim	-	100	-	$\Omega$	
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	

Parameters	Symbol	Min.	Typical	Max.	Unit	Notes
Transmit Disable Assert Time	Vn	-	-	100	us	
<b>Receiver</b>						
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	

**Pin Definition**

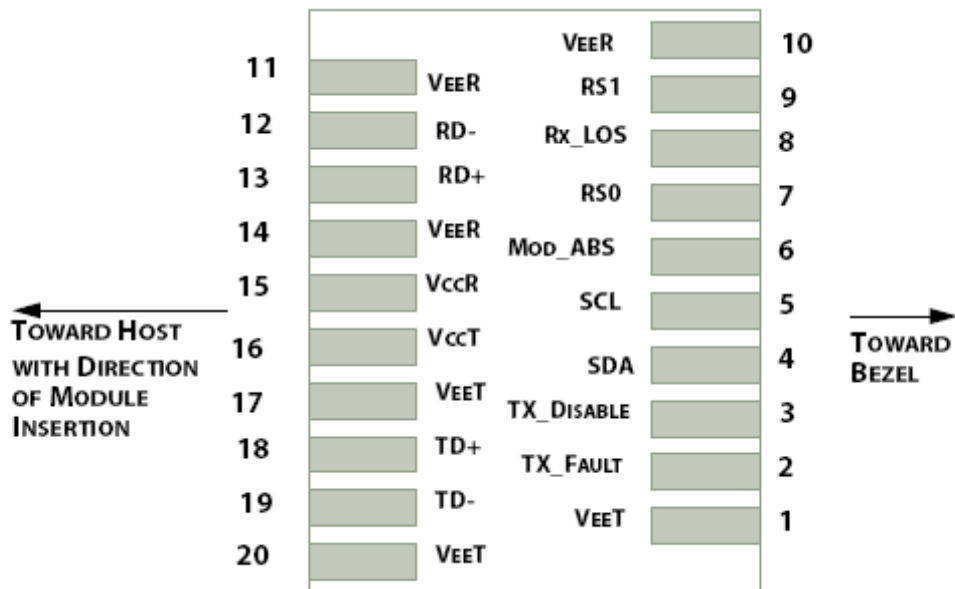


Figure 1. Electrical Pin-out Details

**PIN description**

Pin	Logic	Symbol	Name/Description	Note
1		VeeT	Module Transmitter Ground	1
2	LVTTTL-O	TX_Fault	Module Transmitter Fault	2
3	LVTTTL-I	TX_Dis	Transmitter Disable; Turns off transmitter laser output	3
4	LVTTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
5	LVTTTL-I	SCL	2-Wire Serial Interface Clock	2
6		MOD_DEF0	Module Definition, Grounded in the module	4
7	LVTTTL-I	RS0	Receiver Rate Select	5
8	LVTTTL-O	RX_LOS	Receiver Loss of Signal Indication Active LOW	2
9	LVTTTL-I	RS1	Transmitter Rate Select (not used)	5

Pin	Logic	Symbol	Name/Description	Note
10		VeeR	Module Receiver Ground	1
11		VeeR	Module Receiver Ground	1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Data Output	
14		VeeR	Module Receiver Ground	1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Receiver 3.3 V Supply	
17		VeeT	Module Transmitter Ground	1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	1

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.

Circuit Diagram

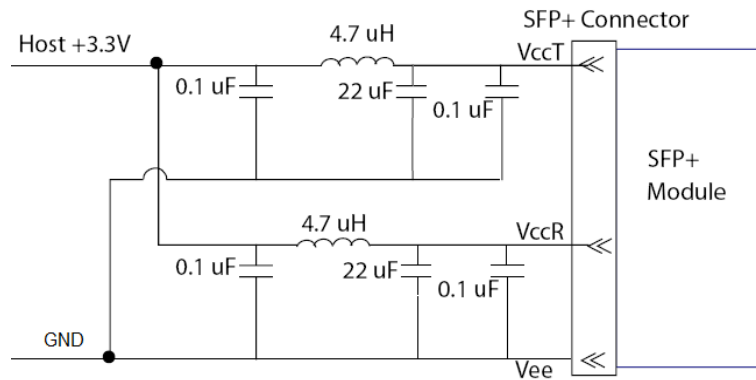


Figure 2. Host Board Power Supply Filters Circuit

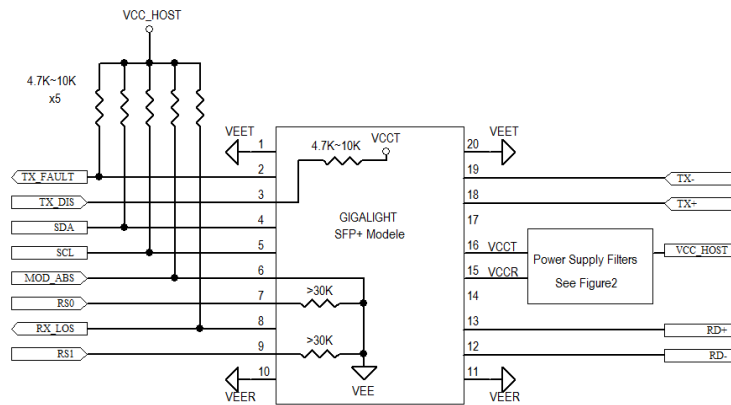


Figure 3. Host-Module Interface

### Mechanical Dimensions

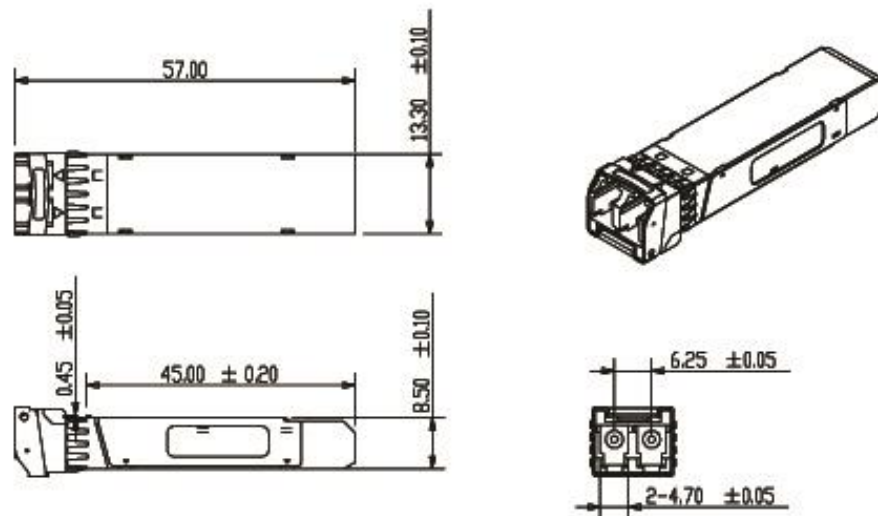


Figure 4. Mechanical Specifications

### Ordering information

Part Number	Product Description
XTC47A-80LY	10Gbps, 1470nm SFP+ZR 80km, -5°C ~ +70°C
XTC49A-80LY	10Gbps, 1490nm SFP+ZR 80km, -5°C ~ +70°C
XTC51A-80LY	10Gbps, 1510nm SFP+ZR 80km, -5°C ~ +70°C
XTC53A-80LY	10Gbps, 1530nm SFP+ZR 80km, -5°C ~ +70°C
XTC55A-80LY	10Gbps, 1550nm SFP+ZR 80km, -5°C ~ +70°C
XTC57A-80LY	10Gbps, 1570nm SFP+ZR 80km, -5°C ~ +70°C
XTC59A-70LY	10Gbps, 1590nm SFP+ZR 70km, -5°C ~ +70°C
XTC61A-70LY	10Gbps, 1610nm SFP+ZR 70km, -5°C ~ +70°C

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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