XVExx3-50LY

100 GHz DWDM 3 Gbps Medium Power SM Video Digital Diagnostic Transceiver

Applications

- SMPTE 297-2006 Compliant Electrical-to-Optical Interfaces
- High-density Video Routers

Laser Safety

This single mode transmitter is a Class 1 laser product. It complies with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

Features

- SMPTE 297-2006 Compatible
- Hot Pluggable SFP Footprint LC Optical Transceiver
- Small Form-Factor Pluggable (SFP) MSA compatible
- Speed from 50 Mbps to 3 Gbps
- Distance up to 50 km for 3G-SDI
- Support Video Pathological Patterns for SD-SDI, HD-SDI and 3G-SDI
- SFF-8472 Digital Diagnostic Function
- Temperature-stabilized DWDM DML Transmitter
- 100 GHz ITU Grid, C Band
- 20 dB Power Budget at Least
- Single +3.3 V Power Supply
- RoHS 6/6 Compliant
- 0°C to 70°C Operation
- Class 1 Laser International Safety Standard IEC-60825 Compliant

Description:

The XVExx3-50LY is a single mode transceiver module designed to transmit/receive optical serial digital signals as defined in SMPTE 297-2006. It supports from 50 Mbps to 3 Gbps and is specifically designed for transmitted the SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M SDI pathological patterns. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I^2C. This module is designed for single mode fiber and operates at a nominal wavelength of 100 GHz ITU Grid, C Band DWDM wavelength. A guaranteed minimum optical link budget of 20 dB is offered. The transmitter can transmit signal from 50 Mbps to 3 Gbps with up to 50 km of single-mode fiber. A maximum distance of 50 km is achievable with 3Gbps pathological signals.

Absolute Maximum Ratings

Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Operating Case Temperature	Topr	0	70	°C	
Power Supply Voltage	Vcc	0	4	V	
ESD Tolerance on all pins			1	KV	HBM
Relative Humidity	RH	5	95	% RH	Non-condensing

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units/Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Operating Case Temperature	Topr	0		70	°C
Data Rate		50		3000	Mb/s
Power Supply Current	$I_{CC\ (TX+RX)}$			430	mA

Transmitter Specifications (0°C < Tc < 70°C, 3.13 V < Vcc < 3.47 V)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Average Launch Power	$P_{o, AVG}$	0	---	4	dBm	1
Center Wavelength Spacing			100		GHz	2
Transmitter Center Wavelength - over life time	λc	X-100	X	X+100	pm	3
Output Spectrum Width	Δλ	---		1	nm	-20 dB width
Extinction Ratio	ER	5	7.5		dB	
Relative Intensity Noise	RIN			-120	dB/Hz	
Optical Rise Time/Fall Time	tr/tf			135	ps	4, SMPTE 424M
				270	ps	4, SMPTE 292M
				800	ps	4, SMPTE 344M
				1.5	ns	4, SMPTE 259M
Electrical						
Differential Input Voltage	V_{IH} - V_{IL}	200		800	mVp-p	AC coupled input
Disable Input Voltage - Low	$V_{TDIS,L}$	0		0.8	V	TX Output Enabled
Disable Input Voltage - High	$V_{TDIS,H}$	2.0		Vcc+0.3	V	TX Ouput Disabled
SCL, SDA	V_{OH}	2.5		Vcc+0.3	V	
	V_{OL}	0		0.5	V	

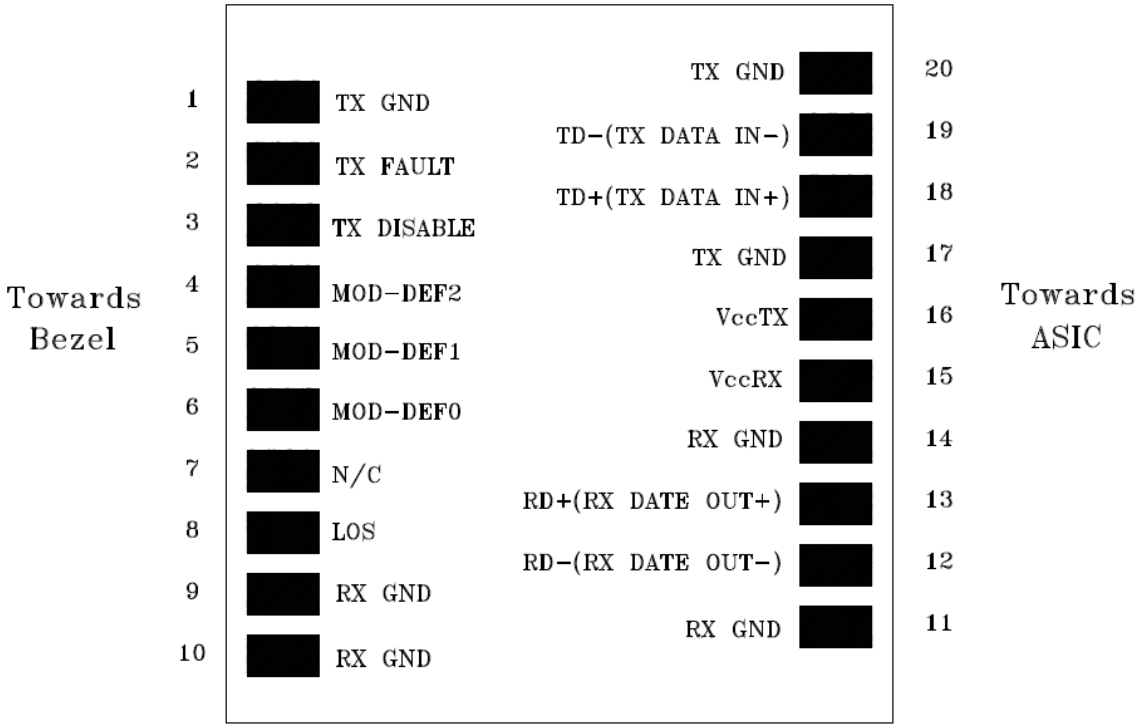
Notes
1. Output power is power coupled into a 9/125 µm single mode fiber.
2. Corresponds to approximately 0.8 nm.
3. X = specified ITU Grid wavelength
4. 20 % to 80 %, unfiltered.

Receiver Specifications (0°C < Tc < 70°C, 3.13 V < Vcc < 3.47 V)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Wavelength of Operation		1260	---	1620	nm	
Sensitivity for SMPTE 424M 2.97 Gb/s	Sen	0	---	-18	dBm	Pathological
		0		-20	dBm	PRBS 2^{23}-1, BER=1E-12
Sensitivity for SMPTE 292M 1.485 Gb/s	Sen	0	---	-20	dBm	Pathological
		0		-21	dBm	PRBS 2^{23}-1, BER=1E-12
Signal Detect -- Asserted	Pa	---	---	-20	dBm	Transition: low to high
Signal Detect -- Deasserted	Pd	-29	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1		6	dB	
Optical Return Loss			-27		dB	
Electrical						
CML Output (Differential)		550	660	850	mVp-p	AC coupled output
Optical Rise Time / Fall Time	tr/tf			135	ps	5, SMPTE 424M
				270	ps	5, SMPTE 292M
				800	ps	5, SMPTE 344M
				1.5	ns	5, SMPTE 259M
Output LOS Voltage -- Low	V_{OL}	0		0.5	V	IOL=-1.6 mA, 1 TTL unit load
Output LOS Voltage -- High	V_{OH}	2.5		Vcc+0.3	V	IOH=40 µA, 1 TTL unit load
SCL, SDA	V_{OH}	2.5		Vcc+0.3	V	
	V_{OL}	0		0.5	V	

5. 20% to 80%, unfiltered.

Connection Diagram



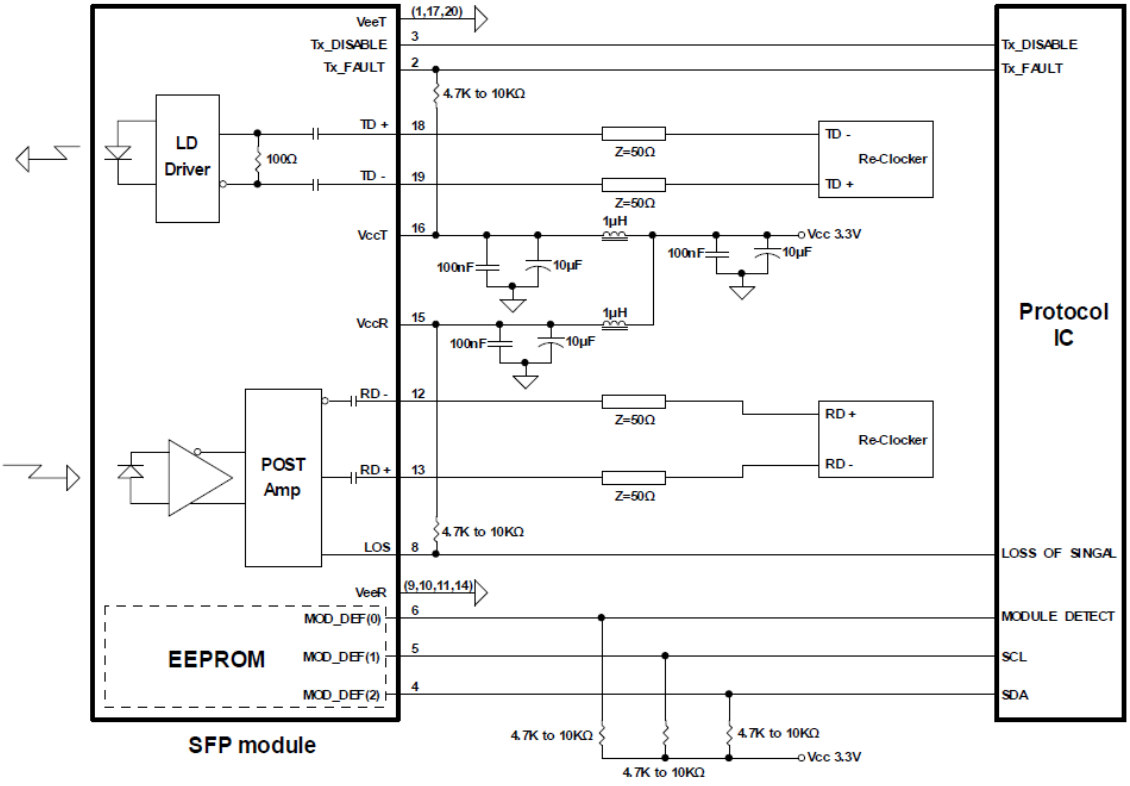
PIN	Signal Name	Description	PIN	Signal Name	Description
1	TX GND	Transmitter Ground	11	RX GND	Receiver Ground
2	TX Fault	Transmitter Fault Indication	12	RX DATA OUT-	Inverse Receiver Data Out
3	TX Disable	Transmitter Disable (Module disables on high or open)	13	RX DATA OUT+	Receiver Data Out
4	MOD-DFE2	Modulation Definition 2 - Two wires serial ID Interface	14	RX GND	Receiver Ground
5	MOD-DEF1	Modulation Definition 1 - Two wires serial ID Interface	15	Vcc RX	Receiver Power - 3.3V±5%
6	MOD-DEF0	Modulation Definition 0 - Ground in Module	16	Vcc TX	Transmitter Power - 3.3V±5%
7	N/C	Not Connected	17	TX GND	Transmitter Ground
8	LOS	Loss of Signal	18	TX DATA IN+	Transmitter Data In
9	RX GND	Receiver Ground	19	TX DATA IN-	Inverse Transmitter Data In
10	RX GND	Receiver Ground	20	TX GND	Transmitter Ground

Module Definition

Module Definition	MOD-DEF2 PIN 4	MOD-DEF1 PIN 5	MOD-DEF0 PIN 6	Interpretation by Host
4		SCL	SDA	Serial module definition protocol

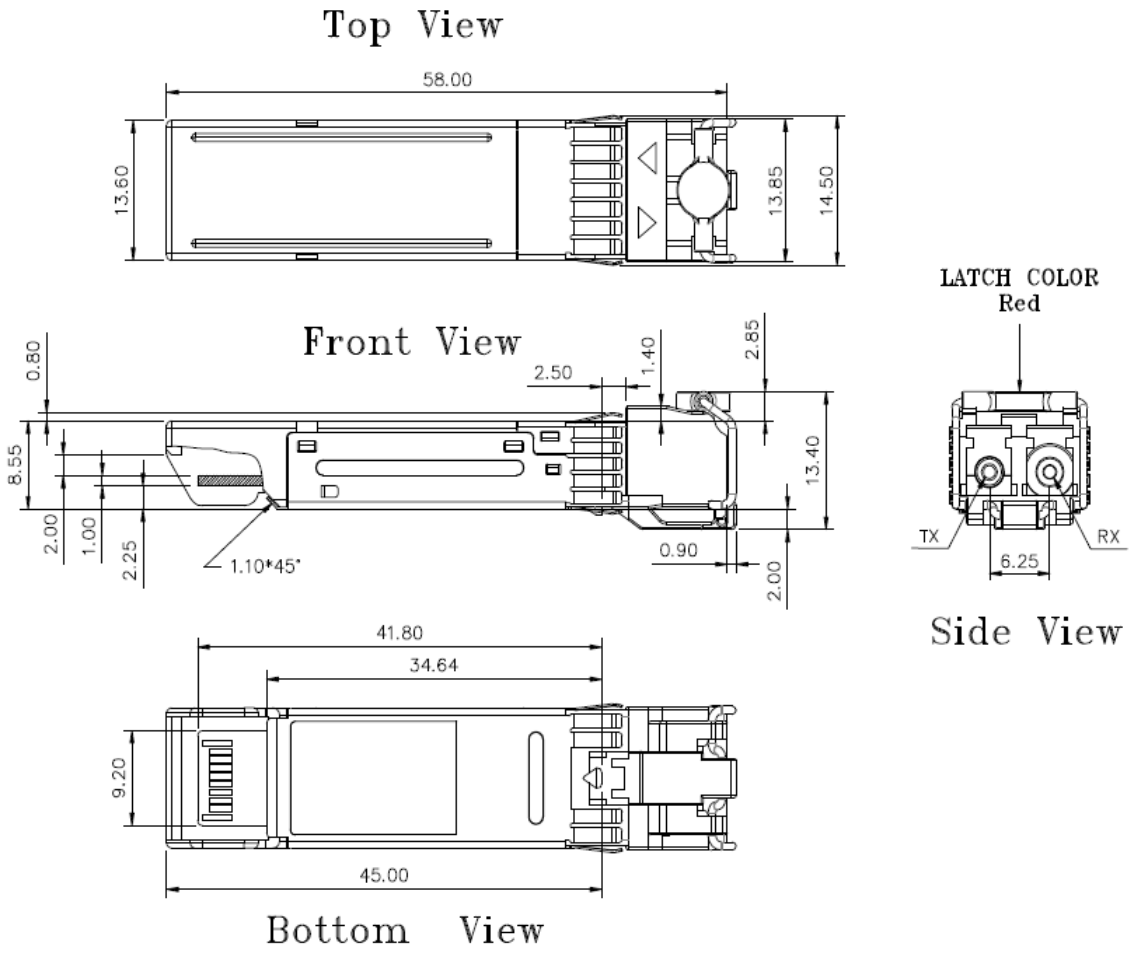
Note
Module Definition 4 specifies a serial definition protocol. For this definition, upon power up, MOD-DEF(1:2) appear as no connector (NC) and MOD-DEF(0) is TTL LOW. When the host system detects this condition, it activates the serial protocol. The protocol uses the 2-wire serial CMOS E^2PROM protocol of the ATMEL AT24C01A/02/04 family of components.

Recommended Circuit Schematic



Package Diagram

Units in mm



Note: Specifications subject to change without notice.

Ordering information[1]

PN	Description
XVExx3-50LY	Video DWDM SFP Transceiver, xx=20~60 (ITU Channel C-band), 3 Gbps, 50 km Reach, LC, 0°C ~ +70°C, Digital Diagnostic Monitoring

Notes:

[1] For accurate order specification please contact Xenopt reseller before placing an order. The content of this document is subject to change without notice. Xenopt does not guarantee errorless or outdated information. 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.

To find out more, please contact: