EXCxxX-20D

10Gbps CWDM 20KM XFP Transceiver

PRODUCT FEATURES

- 10-Wavelengths Uncooled CWDM DFB laser,
- From 1270nm to 1330nm, with Step 20nm
- Supports 9.95Gbps to 11.3Gbps bit rates
- XFP MSA Rev 4.5 Compliant
- Maximum link length of 20KM with SMF
- No reference clock required
- +1.8V,+3.3V Supply Voltage
- Low Power Dissipation 2.5W Maximum
- XFI and line side loopback Mode Supported
- 0ºC to 70ºC Operating Case Temperature
- Diagnostic Performance Monitoring of module temperature,
- Supply Voltages, laser bias current, transmit optical power, and receive optical power
- RoHS6 compliant (lead free)

APPLICATIONS

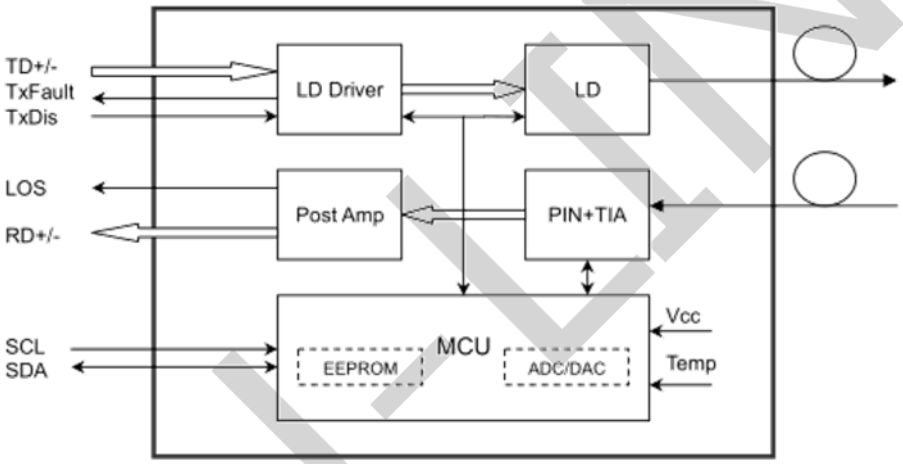
- SDH STM I-64.1 at 9.953Gbps
- 10GBASE-LR/LW 10G Ethernet
- 10G Fiber Channel

DESCRIPTIONS

ETU-Link EXCxxX-20D is compliant with the 10G Small Form-Factor Pluggable (XFP) Multi-Source Agreement (MSA), which supporting data-rate of 10.3125Gbps (10GBASE-LR) or 9.953Gbps 10GBASE-LW), and transmission distance up to 20KM on SMF.

The transceiver module comprises a transmitter with uncooled CWDM DFB laser and a receiver with a PIN photodiode. Transmitter and receiver are separate within a wide temperature range of 0℃ to +70℃ and offers optimum heat dissipation and excellent electromagnetic shielding thus enabling high port densities for 10GbE systems..

Module Block Diagram



Ordering Information

Part No.	Data Rate(optical)	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
EXCxxX-20D	10.3125Gbps	DFB	SMF	10km	LC	0~70℃	Y

Wavelength Guide Pin Descriptions

EXCxxX-20D

Wavelength	xx	Clasp Color Code	Wavelength	xx	Clasp Color Code
1270nm	27	Gray	1370nm	37	Green
1290nm	29	Gray	1390nm	39	Yellow
1310nm	31	Gray	1410nm	41	Orange

1330nm	33	Purple	1430nm	43	Red
1350nm	35	Blue	1450nm	45	Brown

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Maximum Supply Voltage	Vcc3	-0.5		4.0	V
Storage Temperature	T_S	-40		85	**℃**
Case Operating Temperature	T_{OP}	-5		75	**℃**

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Case Operating Temperature	Top	0	-	70	℃	Commercial
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Transmission Distance	TD	-	-	20	km	Over SMF

Electrical Characteristics

High-Speed Signal: Compliant to CEI-11G-SR

Low-Speed Signal: Compliant to SFF-8419

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)							
Differential Input Resistance		R_R_{din}	80	100	120	Ω	
Input Differential Voltage		R_V_{diff}	110	-	1050	mVpp	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver (Module Output)							
Differential Resistance		T_R_d	80	100	120	Ohm	
Output Differential Voltage		T_V_{diff}	360	-	770	mVpp	
Differential Termination Resistance Mismatch		T_R_{dm}	-	-	5	%	
Rx los	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Loss Signal	V_{OH}	2		VCCHOST	V	

Optical and Characteristics

(T_{OP} = 0 to 70 °C, V_{CC3} = 3.13 to 3.45 Volts)

Parameter	Symbol	Min	Typ	Max	Unit

Transmitter					
Average Optical Power	P_f	-5.0		0.5	dBm
Optical Wavelength	λ	(X-6.5)	(X+1)	(X+6.5)	nm
Sidemode Suppression ratio	SSR_{min}	30			dB
Optical Extinction Ratio	ER	3.5			dB
Transmitter and Dispersion Penalty	TDP			3.2	dB
Average Launch power of OFF transmitter	P_{OFF}			-30	dBm
Tx Jitter	Tx_j				Per 802.3ae requirements
Relative Intensity Noise	RIN			-130	dB/Hz
Receiver					
Receiver Sensitivity	R_{SENS2}			-16.5	dBm
Maximum Input Power	P_{MAX}	+0.5			dBm
Optical Center Wavelength	λ_C	1260		1600	nm
Receiver Reflectance	R_{rx}			-12	dB
LOS De-Assert	LOS_D			-18	dBm
LOS Assert	LOS_A	-32			dBm
LOS Hysteresis		0.5			dB

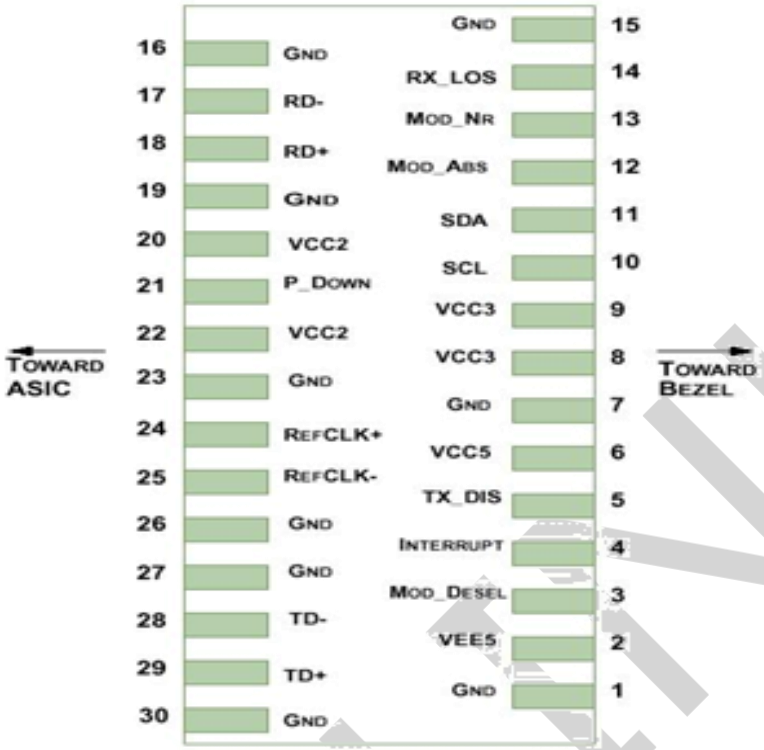
Notes:

1) Measured with worst ER; BER<10^{-12}; 2^{31} – 1 PRBS.
2) Per IEEE 802.3ae. Equivalent to –13.3dBm average power at Infinite ER.

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	±3	ºC	Internal
Voltage	3 to 3.6	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	-5 to 0.5	±3	dB	Internal
Rx Input Power	-16.5 to 0.5	±3	dB	Internal

Pin Diagram



Pin Definitions

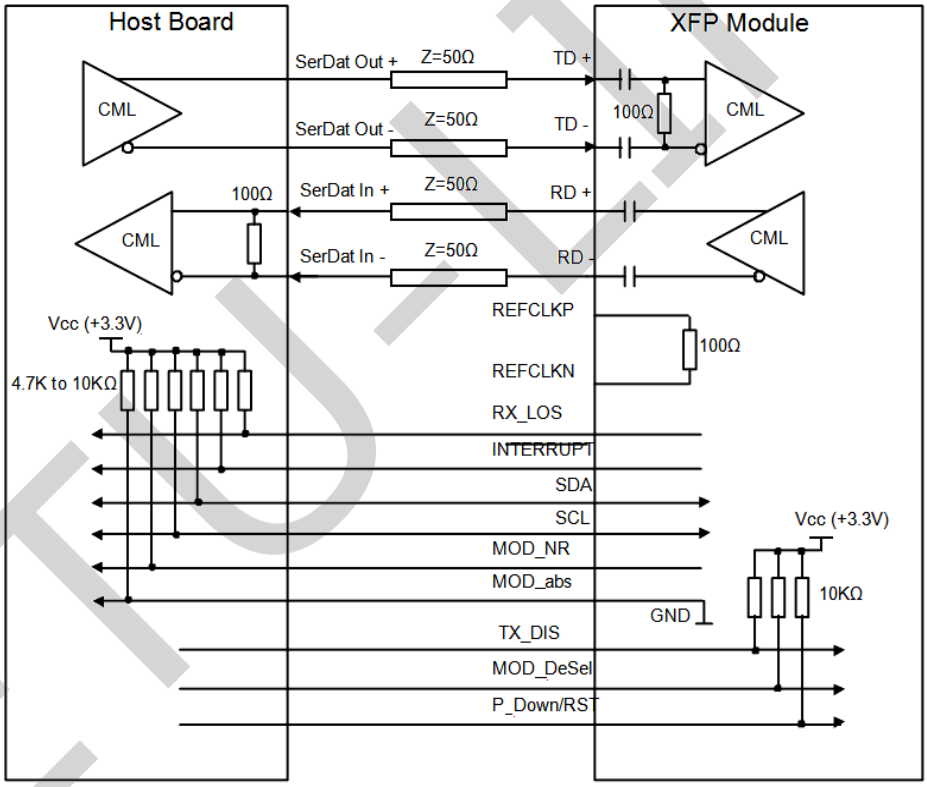
PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	4
7	RS0	Rate select0, optionally control SFP+ receiver. When high, input data rate >4.5Gb/ s; when low, input data rate <=4.5Gb/s	5
8	LOS	Receiver Loss of Signal Indication	6
9	RS1	Rate select0, optionally control SFP+ transmitter. When high, input data rate >4.5Gb/s; when low, input data rate <=4.5Gb/s	1
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data output	
13	RD+	Receiver non-inverted data output	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1

18	TD+	Transmitter inverted data output	
19	TD-	Transmitter non-inverted data output	
20	VeeT	Module transmitter ground	1

Notes:

1. Circuit ground is internally isolated from chassis ground
2. Tx FAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on Tx DIS >2.0V or open, enabled on Tx DIS <0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

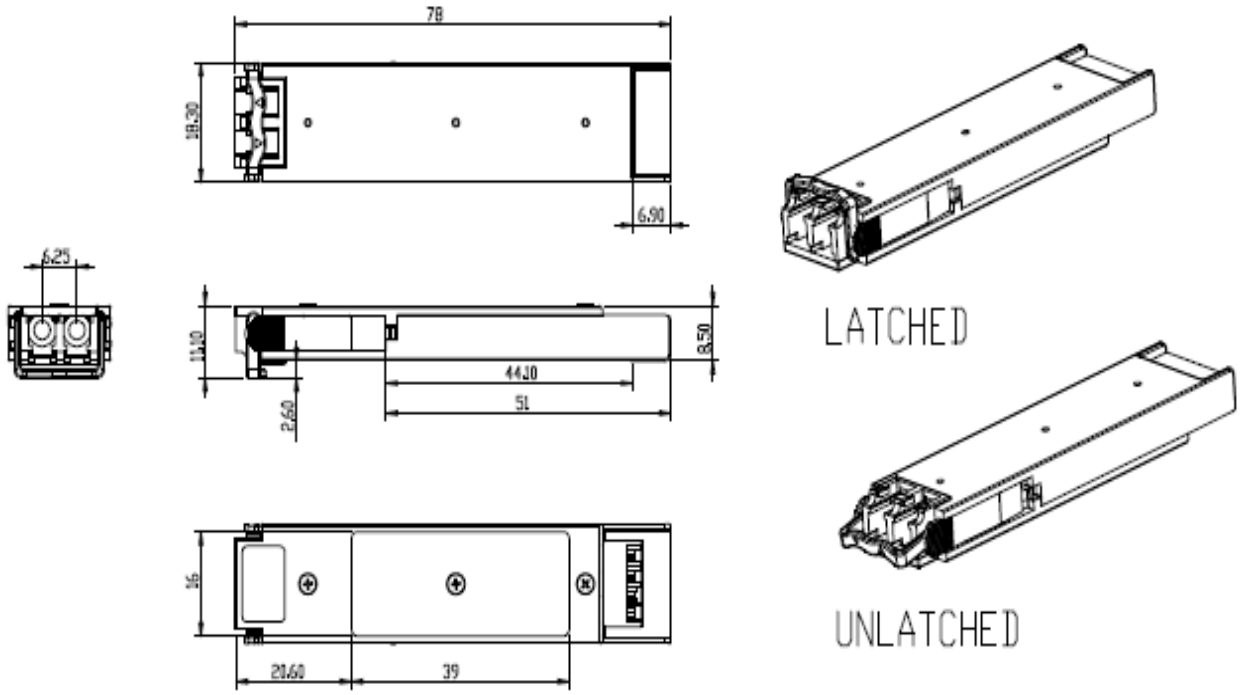
Recommended Interface Circuit



Mechanical Diagram

ETU-LINK's XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).

XFP Transceiver (dimensions are in mm)



PCB Layout and Bezel Recommendations

Revision History

Version No.	Date	Description
1.0	February 8, 2016	Preliminary datasheet
2.0	July 26, 2024	Format change

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