

## EXCxxX-80D

### 10Gbps CWDM 1470~1610nm 80KM XFP Transceiver

#### PRODUCT FEATURES

- Wavelength selectable to ITU-T standards covering CWDM grid wavelengths
- XFP MSA Rev 4.5 Compliant
- Data rate from 9.95Gbps to 11.3Gbps
- No Reference Clock required
- Cooled EML and APD receiver
- link length up to 80KM
- Low Power Dissipation 3.5W Maximum
- XFI and line side loopback Mode Supported
- 0°C to 70°C 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

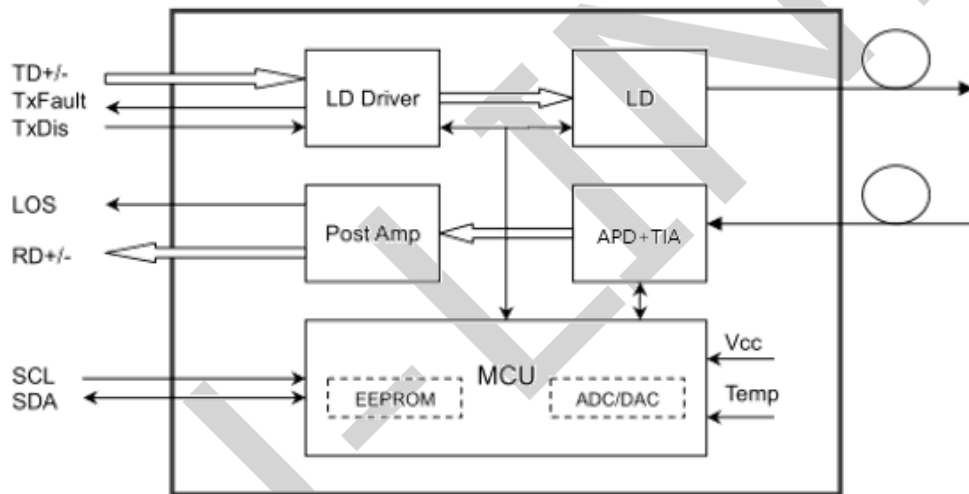
- SONET OC-192& SDH STM 64
- CWDM 80km 10G Ethernet
- CWDM 80km 10G Fiber Channel
- CWDM Networks
- CWDM 80km 10G Ethernet with FEC

## DESCRIPTIONS

ETU-Link EXCxxX-80D Transceiver exhibits excellent wavelength stability, supporting operation at 100GHz channel, cost effective module. It is designed for 10G CWDM SDH, 10GBASE-ZR/ZW and 10G Fiber-Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a cooled EML laser. And the receiver section consists of an APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. ETU-Link CWDM XFP transceiver provides an enhanced monitoring interface, 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.

## Module Block Diagram



## Ordering Information

Part No.	Data Rate(optical)	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
EXCxxX-80D	10.3125Gbps	EML	SMF	80km	LC	0~70°C	Y

## Wavelength Guide Pin Descriptions

EXCxxX-80D

Wavelength	xx	Clasp Color Code	Wavelength	xx	Clasp Color Code
1470nm	47	Gray	1550nm	55	Yellow
1490nm	49	Purple	1570nm	57	Orange
1510nm	51	Blue	1590nm	59	Red

1530nm	53	Green	1610nm	61	Brown
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## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	$T_{stg}$	-40		+85	°C	
Relative Humidity - Storage	$R_{HS}$	5		95	%	
Relative Humidity - Operating	$R_{HO}$	5		85	%	
DC Supply Voltage	$V_{CC}$	0		3.6	V	

## Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Case Operating Temperature	$T_{op}$	0	-	70	°C	Commercial
Power Supply Voltage	$V_{CC}$	3.13	3.3	3.47	V	
Transmission Distance	TD	-	-	80	km	Over SMF

## Electrical Characteristics

( $T_{OP} = -5$  to  $75$  °C,  $V_{CC3} = 3.13$  to  $3.45$  Volts)

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{CC3}$	3.13		3.45	V
Supply Current	$I_{CC3}$			600	mA
Module total power	P			2.0	W
<b>Transmitter</b>					
Input differential impedance	$R_{in}$		100		$\Omega$
Differential data input swing	$V_{in,pp}$	120		820	mV
Transmit Disable Voltage	$V_D$	2.0		$V_{CC}$	V
Transmit Enable Voltage	$V_{EN}$	GND		GND+ 0.8	V
Transmit Disable Assert Time				10	us
<b>Receiver</b>					
Differential data output swing	$V_{out,pp}$	340	650	850	mV
Data output rise time	$t_r$			38	ps
Data output fall time	$t_f$			38	ps
LOS Fault	$V_{LOS\ fault}$	$V_{CC} - 0.5$		$V_{CC\_HOST}$	V
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	
Power Supply Rejection		PSR			See Note 7 below

### Notes:

- 1) Maximum total power value is specified across the full temperature and voltage range.
- 2) After internal AC coupling.
- 3) Or open circuit.
- 4) Into 100 ohms differential termination.

- 5) 20 – 80 %
- 6) Loss of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic indicates normal operation; logic 1 indicates no signal detected.
- 7) Per Section 2.7.1. in the XFP MSA Specification<sup>1</sup>.

## Optical and Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
<b>Transmitter</b>					
Average Optical Power	$P_f$	0		5.0	dBm
Optical Wavelength	$\lambda$	(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
<b>Receiver</b>					
Receiver Sensitivity	$R_{SENS1}$			-24.4	dBm
Maximum Input Power	$P_{MAX}$	-6			dBm
Optical Center Wavelength	$\lambda_C$	1260		1610	nm
Receiver Reflectance	$R_{rx}$			-27	dB
LOS De-Assert	$LOS_D$			-27	dBm
LOS Assert	$LOS_A$	-32			dBm
LOS Hysteresis		0.5			dB

### Notes:

- 1) Wavelength stability is achieved within 60 seconds (max) of power up.
- 2) BER=10<sup>-12</sup>; PRBS 2<sup>31</sup>-1@10.3125Gbps

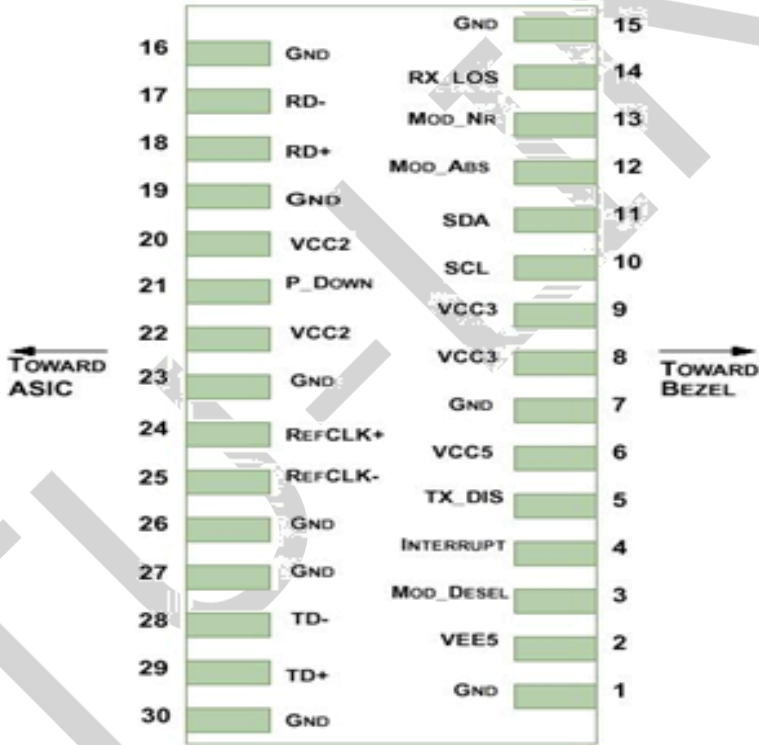
## Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	±3	°C	Internal
Voltage	3 to 3.6	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	0 to 5	±3	dB	Internal
Rx Input Power	-24 to -6	±3	dB	Internal

### Communication Interface Timing Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
TX_Disable Assert Time	t_off			100	us	
TX_Disable Negate Time	t_on			2	ms	
Time to Initialize Include Reset of TX_FAULT	t_int			300	ms	
TX_FAULT from Fault to Assertion	t_fault			100	us	
TX_Disable Time to Start Reset	t_reset	10			us	
Receiver Loss of Signal Assert Time	T <sub>A,RX_LOS</sub>			100	us	
Receiver Loss of Signal Deassert Time	T <sub>d,RX_LOS</sub>			100	us	
Rate-Select Chage Time	t_ratesel			10	us	

### Pin Diagram



### Pin Definitions

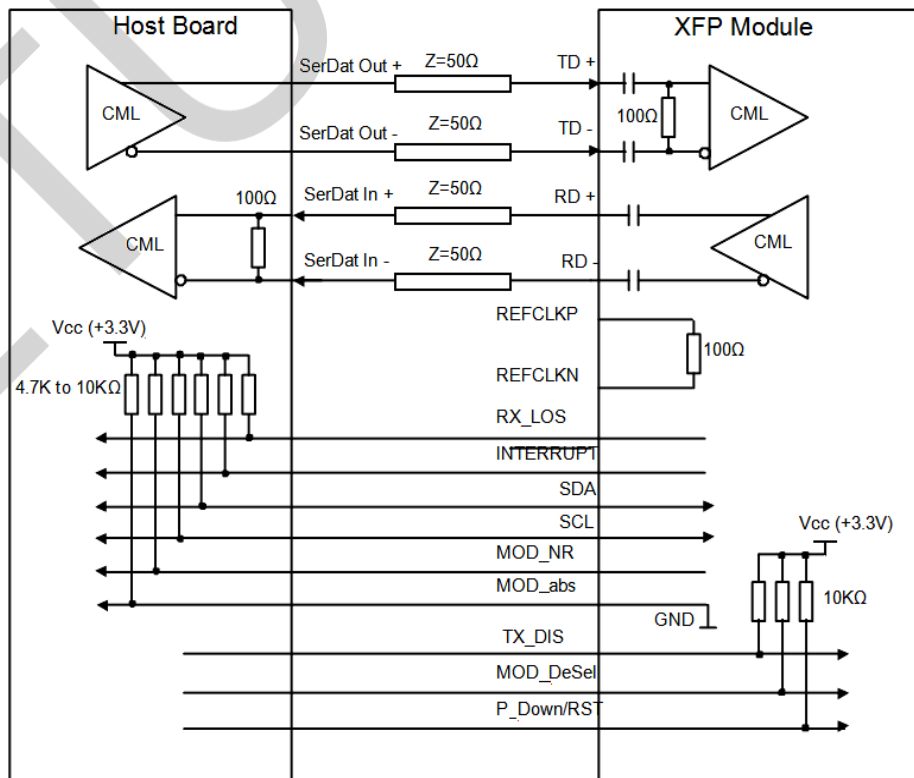
PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD-ABS	Module Absent, 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.

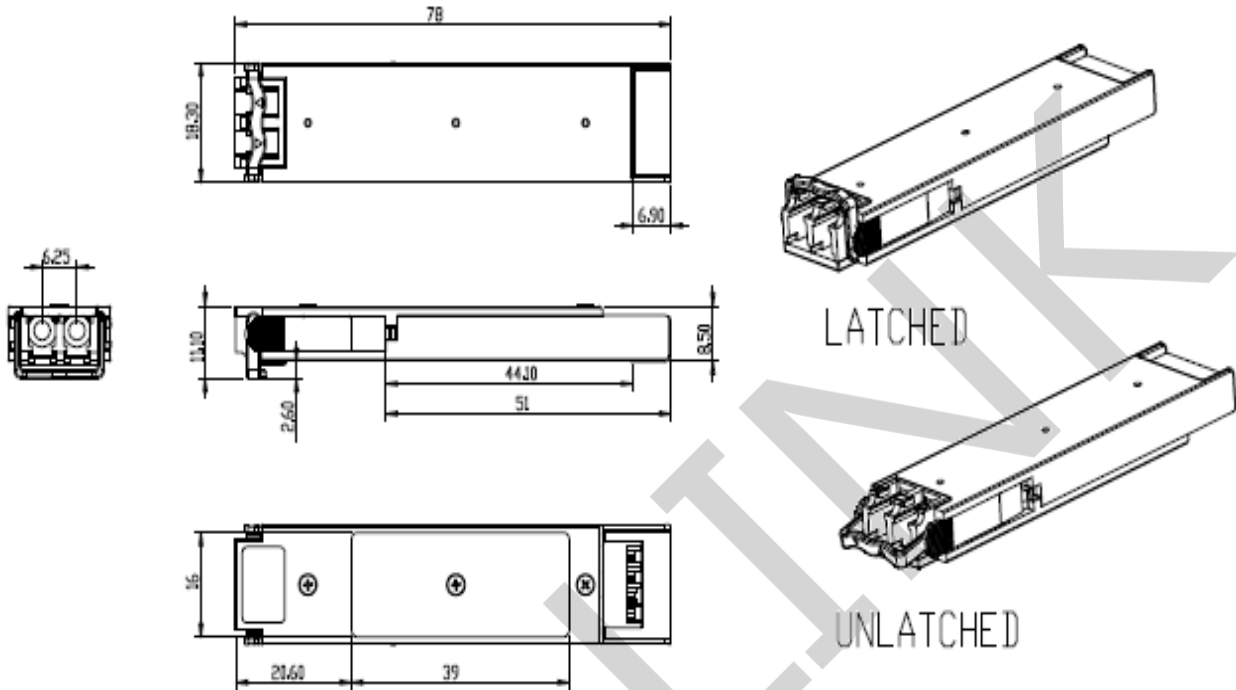
Recommended Interface Circuit



## 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)**



## Revision History

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

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