

EXDxxX-40D

10Gbps DWDM 40KM XFP Transceiver

PRODUCT FEATURES

- Wavelength selectable to C-band ITU-T grid wavelengths
- Suitable for use in 100GHz channel spacing DWDM systems
- XFP MSA Rev 4.5 Compliant
- Data rate from 9.95Gbps to 11.3Gbps
- No Reference Clock required
- Cooled EML and PIN receiver
- link length up to 40km
- Low Power Dissipation 3.5W Maximum
- XFI and lineside 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

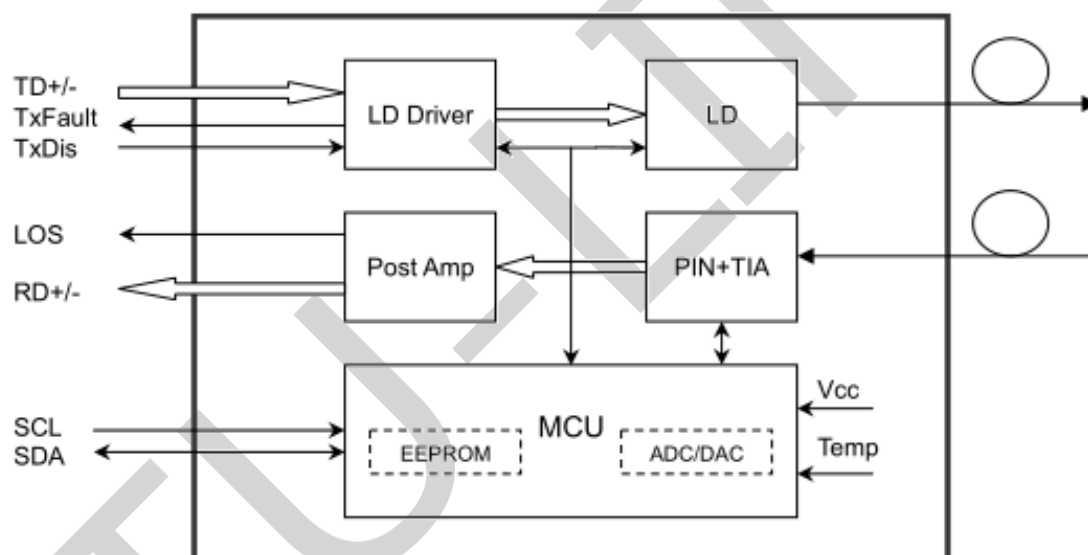
- SONET OC-192 & SDH STM 64
- 10GBASE ER/EW
- 40km 10G Fiber Channel
- DWDM Networks

DESCRIPTIONS

ETU-Link EXDxxX-40D Transceiver exhibits excellent wavelength stability, supporting operation at 100 GHz channel, cost effective module. It is designed for 10G DWDM SDH, 10GBASE-ER/EW 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 a PIN photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. ETU-Link DWDM 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, and 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
EXDxxX-40D	10.3125Gbps	EML	SMF	40km	LC	0~70°C	Y

Wavelength Guide Pin Descriptions

EXDxxX-40D

Channel	Wavelength (nm)	Frequency (THZ)	Channel	Wavelength (nm)	Frequency (THZ)
C17	1563.86	191.70	C39	1546.12	193.90
C18	1563.05	191.80	C40	1545.32	194.00
C19	1562.23	191.90	C41	1544.53	194.10

C20	1561.42	192.00	C42	1543.73	194.20
C21	1560.61	192.10	C43	1542.94	194.30
C22	1559.79	192.20	C44	1542.14	194.40
C23	1558.98	192.30	C45	1541.35	194.50
C24	1558.17	192.40	C46	1540.56	194.60
C25	1557.36	192.50	C47	1539.77	194.70
C26	1556.55	192.60	C48	1538.98	194.80
C27	1555.75	192.70	C49	1538.19	194.90
C28	1554.94	192.80	C50	1537.40	195.00
C29	1554.13	192.90	C51	1536.61	195.10
C30	1553.33	193.00	C52	1535.82	195.20
C31	1552.52	193.10	C53	1535.04	195.30
C32	1551.72	193.20	C54	1534.25	195.40
C33	1550.92	193.30	C55	1533.47	195.50
C34	1550.12	193.40	C56	1532.68	195.60
C35	1549.32	193.50	C57	1531.90	195.70
C36	1548.51	193.60	C58	1531.12	195.80
C37	1547.72	193.70	C59	1530.33	195.90
C38	1546.92	193.80	C60	1529.55	196.00
Non-ITU	Peak wavelength between 1528.77nm-1563.86		C61	1528.77	196.10

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Maximum Supply Voltage 1	Vcc3	-0.5		4.0	V	
Maximum Supply Voltage 2	Vcc5	-0.5		6.0	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	Tcase	0		70	°C	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Notes
Case Operating Temperature		0	25	70	°C	Temperature Range = C
DC Supply Voltage	Vcc	3.13	-	3.47	V	

Transmission Distance	TD	-	-	40	km	Over SMF
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Electrical Characteristics

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

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	Vcc3	3.13		3.45	V
Supply Current	Icc3			600	mA
Module total power	P			2.0	W
Transmitter					
Input differential impedance	R_{in}		100		Ω
Differential data input swing	Vin,pp	120		820	mV
Transmit Disable Voltage	V_D	2.0		Vcc	V
Transmit Enable Voltage	V_{EN}	GND		GND+ 0.8	V
Transmit Disable Assert Time				10	us
Receiver					
Differential data output swing	Vout,pp	340	650	850	mV
Data output rise time	t_r			38	ps
Data output fall time	t_f			38	ps
LOS Fault	$V_{LOS\ fault}$	Vcc – 0.5		Vcc _{HOST}	V
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V
Power Supply Rejection	PSR				See Note 7 below

Notes:

- Maximum total power value is specified across the full temperature and voltage range.
- After internal AC coupling.
- Or open circuit.
- Into 100 ohms differential termination.
- 20 – 80 %
- 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.
- Per Section 2.7.1. in the XFP MSA Specification¹.

Optical and Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Average Output Power	POUT	-1		4	dBm	1
Average Output Power(Laser Off)	POFF			-30	dBm	
Wavelength	λ	$\lambda-0.1$		$\lambda+0.1$	nm	
Center Wavelength Spacing			100		GHz	4
Spectrum Bandwidth @ -20dB	$\Delta\lambda$			1	nm	
Side mode suppression ratio(SMSR)	SMSR	30			dB	

Extinction ratio	ER	8.2			dB	
RIN ₂₀ OMA	RIN			-128	dB/Hz	2
Optical return loss tolerance	ORLT	20			dB	
Receiver						
Wavelength	λ	1270		1610	nm	
Received Sensitivity	P _{IN}			-16	dBm	3
Optical Power Overload	P _{IN} (SAT)	0			dBm	
Rx_LOS of Signal Assert	P _A	-30			dBm	
Rx_LOS of Signal De-assert	P _D			-17	dBm	
Rx_LOS of Signal Hysteresis	PHy	0.5			dB	
Optical Return Loss Tolerance	ORLT	20			dB	

Notes:

1. Output is coupled into a 9/125um SMF.
2. 12dB reflection.
3. Measured with worst ER, BER less than 1E-12 and PRBS 2³¹-1 at 10.3125Gbps.
4. Corresponds to approximately 0.8 nm.

Digital Diagnostics

The following characteristics are defined over recommended operating condition

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	3 to 3.6	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	-1 to 4	±3	dB	Internal
Rx Input Power	-16 to 0	±3	dB	Internal

Pin Diagram

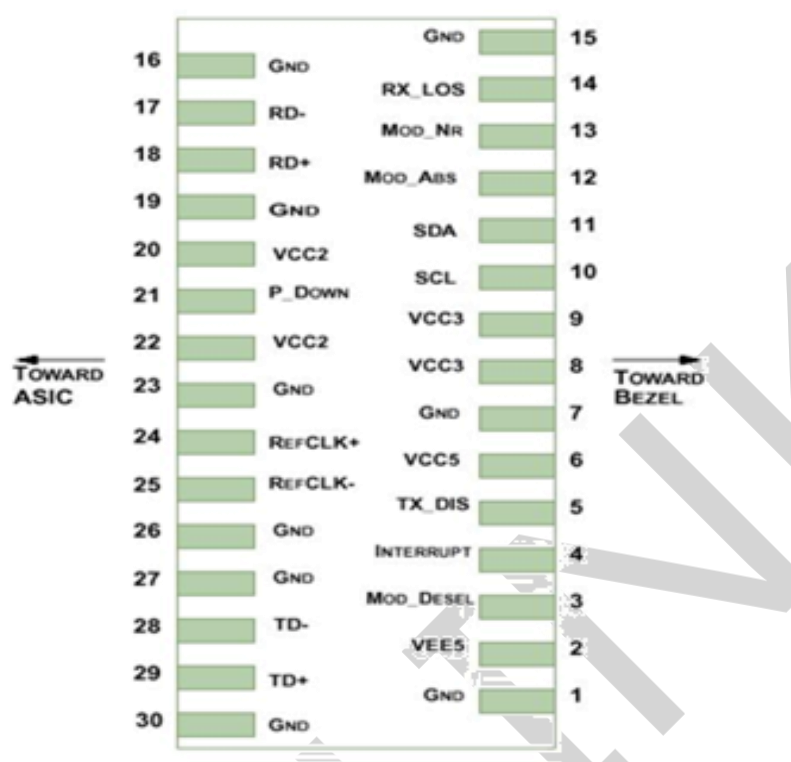


Diagram of Host Board Connector Block Pin Numbers and Name

Pin Definitions

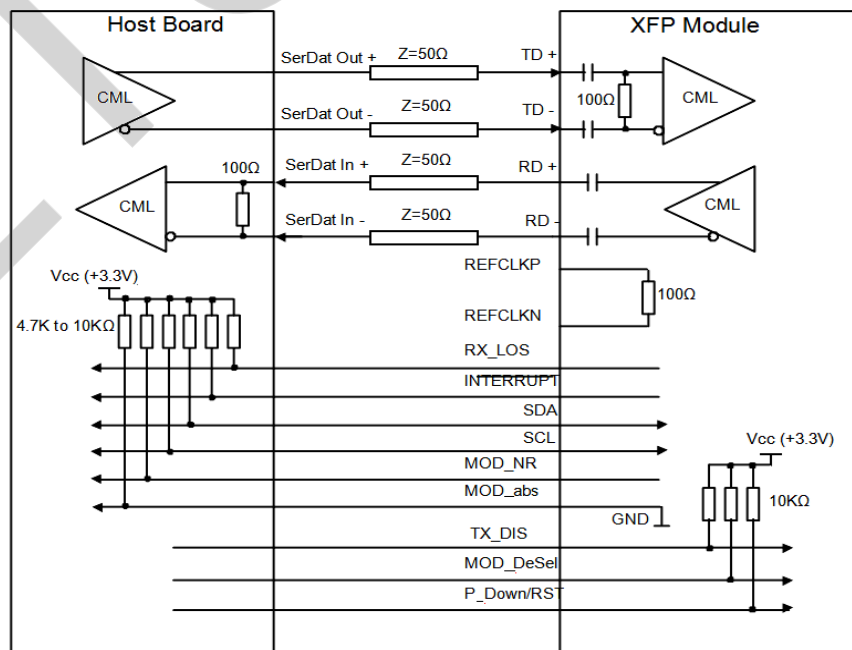
Pin	Logic	Symbol	Name/Description	NOTE
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply – Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTL/I/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	LVTTL-O	Mod_NR	Module Not Ready; ETU-LINK defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator	2

15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver inverted data output	
18	CML-O	RD+	Receiver non-inverted data output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply – Not required	
21	LVTTTL-I	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset	
			Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply – Not required	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	3
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter inverted data input	
29	CML-I	TD+	Transmitter non-inverted data input	
30		GND	Module Ground	1

Notes:

- 1) Module circuit ground is isolated from module chassis ground within the module.
 - 2) 2 Open collector; should be pulled up with 4.7k – 10kohms on host board to a voltage between 3.15V and 3.6V.
- A Reference Clock input is not required by the XFP 40KM tunable. If present, it will be ignored.

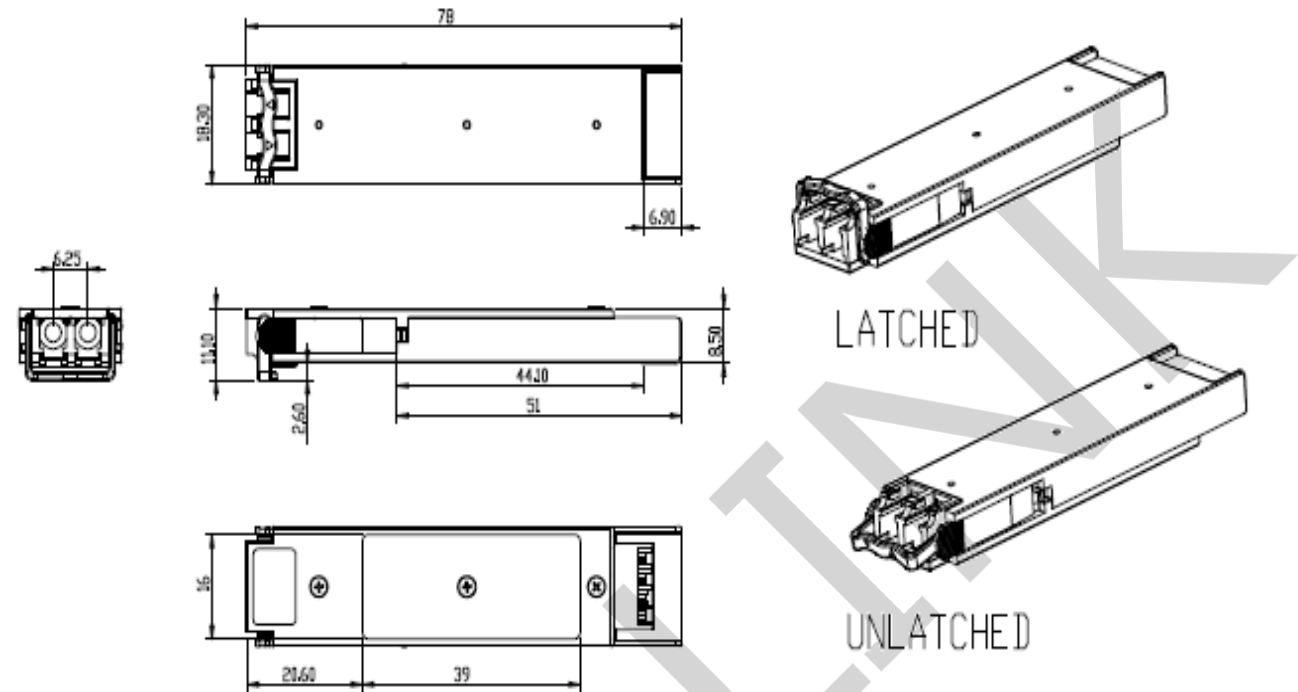
Recommended Interface Circuit



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	Aug 8, 2017	Preliminary datasheet
2.0	July 26, 2024	Format change

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