

EX55X-100D (I)

10Gbps 1550nm 100KM XFP Optical Transceiver

PRODUCT FEATURES

- Supports 9.95Gb/s to 11.3Gb/s bit rates
- 1550nm EML transmitter and APD receiver
- Up to 100km on 9/125μm SMF
- Hot-pluggable XFP footprint
- Duplex LC/UPC type pluggable optical interface
- RoHS-10 compliant and lead-free
- Support Digital Diagnostic Monitoring interface
- Single +3.3V power supply
- No Reference Clock required
- Case operating temperature

Commercial: 0 ~ +70℃

Extended: -10 ~ +80℃

Industrial: -40 ~ +85℃

APPLICATIONS

- 10GBASE-ZR/ZW & 10G Ethernet
- 10G Fiber Channel
- Other Optical Links

DESCRIPTIONS

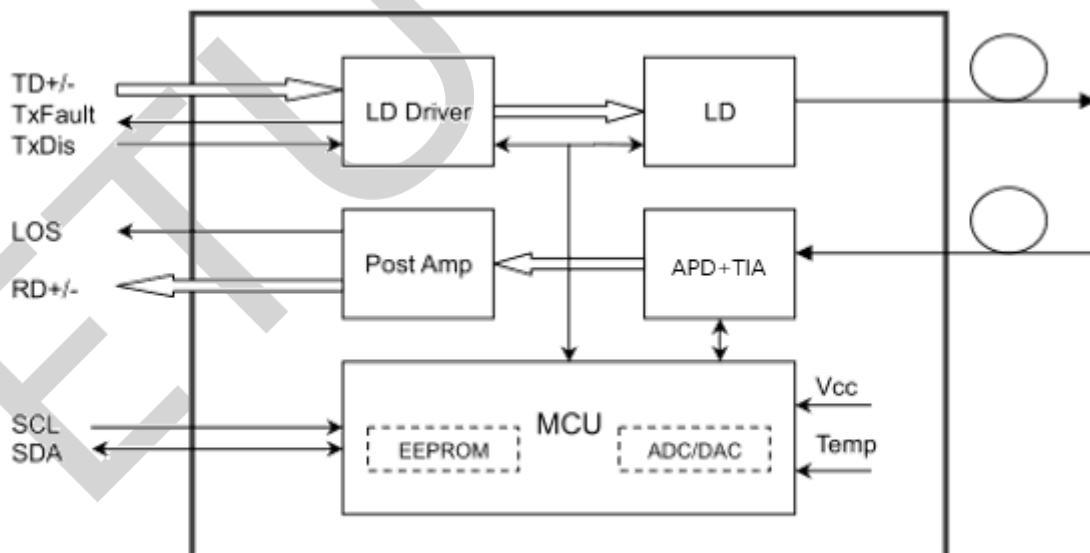
XFP transceiver is designed for use in 10-Gigabit Ethernet links up to 100km over single mode fiber. The module consists of 1550 EML Laser, APD and Preamplifier in a high-integrated optical sub-assembly. Digital diagnostics functions are available via a 2-wire serial interface, as specified in XFP MSA.

Transceivers provide a unique enhanced digital diagnostic 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. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The XFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module

Module Block Diagram



Ordering Information

Part No.	Data Rate(optical)	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI	Latch Color
EX55X-100D	10.3125Gbps	EML	SMF	100km	LC	0~70℃	Y	White
EX55X-100DE	10.3125Gbps	EML	SMF	100km	LC	-10~80℃	Y	White
EX55X-100DI	10.3125Gbps	EML	SMF	100km	LC	-40~85℃	Y	White

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TS	-40		85	℃	
Maximum Supply Voltage 1	VCC3	-0.5		4.0	V	
Maximum Supply Voltage 2	VCC5	-0.5		6.0	V	
Relative Humidity (non-condensation)	RH	5		95	%	
Damage Threshold	THd	0			dBm	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Case Operating Temperature	Top	0	-	70	℃	Commercial
		-40		85		Industrial
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V	
Transmission Distance	TD	-	-	100	km	Over SMF

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Consumption	P			2.5	W	1
Supply Current	I _{CC}			750	mA	
Transmitter (Module Input)						
Single-ended Input Voltage Tolerance	V _{CC}	-0.3		4.0	V	
Differential Input Voltage Swing	V _{in,pp}	120		820	mV _{pp}	
Differential Input Impedance	Z _{in}	85	100	115	Ohm	2
Transmit Disable Assert Time				10	us	
Transmit Disable Voltage	V _{dis}	V _{CC} -1.3		V _{CC}	V	3
Transmit Enable Voltage	V _{en}	V _{EE}		V _{EE} +0.8	V	
Receiver (Module Output)						
Differential Output Voltage Swing	V _{out,pp}	300	650	850	mV _{pp}	
Differential Output Impedance	Z _{out}	80	100	120	Ohm	4
Data output rise/fall time	Tr/Tf			40	ps	5

LOS Assert Voltage	VlosH	Vcc-1.3		Vcc	V	6
LOS De-assert Voltage	VlosL	Vee		Vee +0.8	V	6
Power Supply Rejection	PSR					7

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) In to 100 ohms differential termination.
- 5) These are unfiltered 20-80% values
- 6) Loss of Signal is open collector to be pulled up with a 4.7kΩ-10kΩ resistor to 3.15-3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
- 7) Per Section 2.7.1. in the XFP MSA Specification1.

Optical and Characteristics

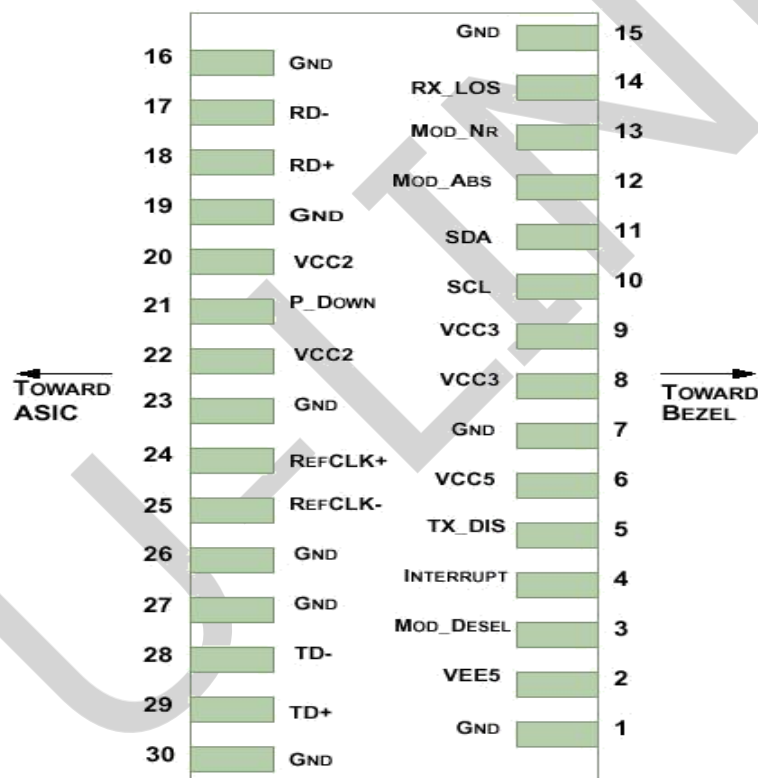
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Optical Power	Pf	1		5	dBm	
Optical Wavelength	λ	1530	1550	1570	nm	
Sidemode Suppression ratio	SMSRmin	30			dB	
Optical Extinction Ratio	ER	8.2			dB	
Tx Jitter Generation(peak-to-peak)	Txj1			0.1	UI	
Tx Jitter Generation(RMS)	Txj2			0.01	UI	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Average Launch power of OFF transmitter	POFF			-30	dBm	
Relative Intensity Noise	RIN			-130	dB/Hz	
Receiver						
Receiver Sensitivity	RSNS			-25	dBm	1
Input Saturation Power (Overload)	Psat	-6			dBm	
Wavelength Range	λ_c	1270		1610	nm	
Receiver Reflectance	Rrx			-27	dB	
LOS De-Assert	LOSD			-28	dBm	
LOS Assert	LOSA	-34			dBm	
LOS Hysteresis		0.5			dB	

Notes: Measured with worst ER; BER<10⁻¹² @ 10.3Gbps, 2³¹ – 1 PRBS.

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	±3	°C	Internal
Voltage	0 to Vcc	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	1 to 5	±3	dB	Internal
Rx Input Power	-24 to -6	±3	dB	Internal

Pin Diagram



Pin Definitions

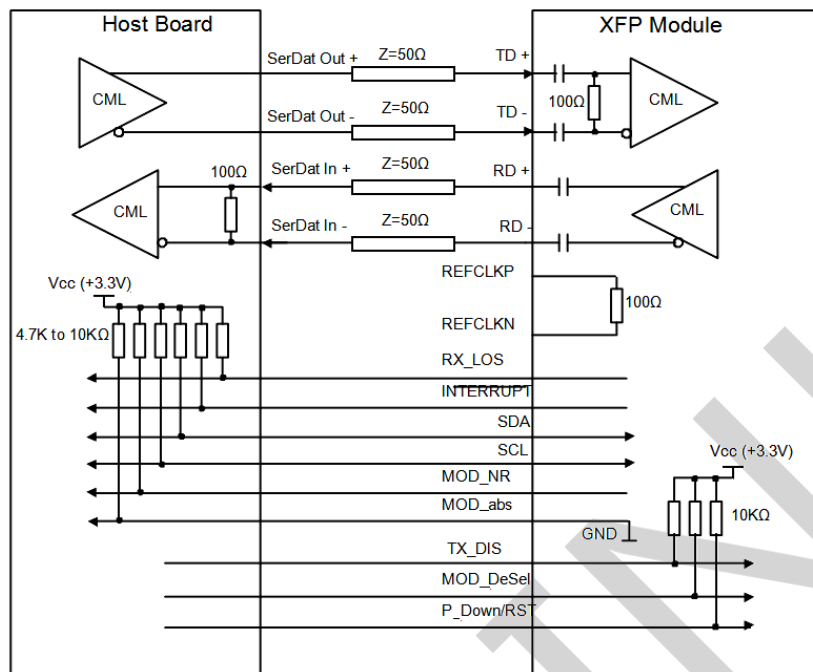
Pin	Symbol	Name/Description	Notes
1	GND	Module Ground	1
2	VEE5	Optional -5.2 Power Supply – Not required	
3	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6	VCC5	+5 Power Supply – Not required	
7	GND	Module Ground	1

8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	Serial 2-wire interface clock	
11	SDA	Serial 2-wire interface data line	2
12	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	Mod_NR	Module Not Ready; Walsun's defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	2
14	RX_LOS	Receiver Loss of Signal indicator	2
15	GND	Module Ground	1
16	GND	Module Ground	1
17	RD-	Receiver inverted data output	
18	RD+	Receiver non-inverted data output	
19	GND	Module Ground	1
20	VCC2	+1.8V Power Supply – Not required	
21	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	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	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	TD-	Transmitter inverted data input	
29	TD+	Transmitter non-inverted data input	
30	GND	Module Ground	1

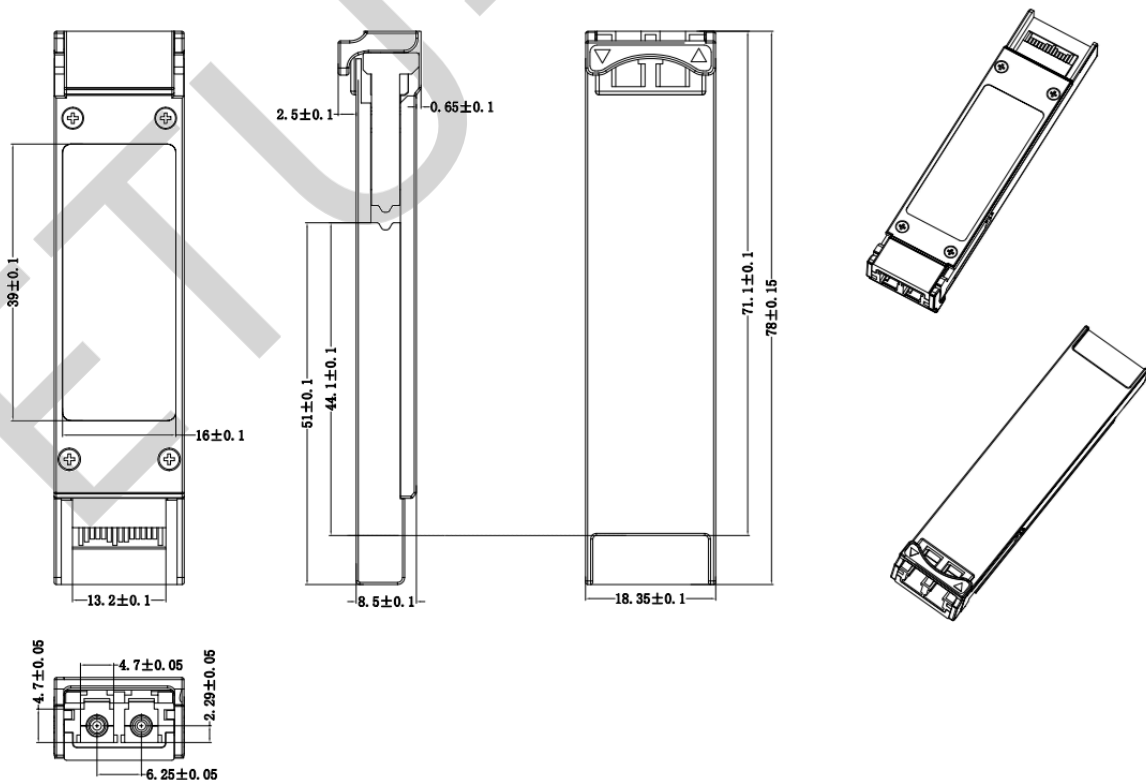
Notes:

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7kΩ-10kΩ on host board to a voltage between 15V and 3.6V.
3. A Reference Clock input is not required by the If present, it will be ignored.

Recommended Interface Circuit



Mechanical Diagram



Revision History

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

Company: ETU-Link Technology Co., LTD

Production base: Right side of 3rd floor, No. 102 building, Longguan expressway, Dalang street,
Longhua District, Shenzhen city, Guangdong Province, China 518109

R&D base: Floor 4, Building 4, Nanshan Yungu Phase LI, Taoyuan Community, Xili Street, Nanshan District,
Shenzhen

Tel: +86-755 2328 4603

Addresses and phone number also have been listed at www.etulinktechnology.com.

Please e-mail us at sales@etulinktechnology.com or call us for assistance.