


ETU-LINK

Optical Communication System

XFP Series

XFP

EXBxxX-3LCD40

**10Gbps XFP Bi-Directional Transceiver,
40KM Reach Tx1490/Rx1550nm / Tx1550/Rx1490nm**

- Supports 9.95Gb/s to 11.3Gb/s bit rates
- 1490nm DFB laser and APD receiver
- 1550nm DFB laser and APD receiver
- Up to 40KM on 9/125μm SMF
- Hot-pluggable XFP footprint
- Duplex LC/UPC type pluggable optical interface
- Metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitoring interface
- Single +3.3V power supply
- Maximum power consumption 2.0W
- No Reference Clock required
- Case operating temperature: 0 ~ +70°C



Applications

- 10GBASE-BX 10.3125Gb/s Ethernet
- 10GBASE-BX 9.95Gb/s Ethernet
- SONET OC-192 SR-1 SDH STMI-64.1

Product Description

ETU-LINK EXBxxX-3LCD40 transceiver is designed for use in 10-Gigabit Ethernet links up to 40KM over single mode fiber. The module consists of 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.

EXBxxX-3LCD40 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, 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.

Absolute Maximum Ratings

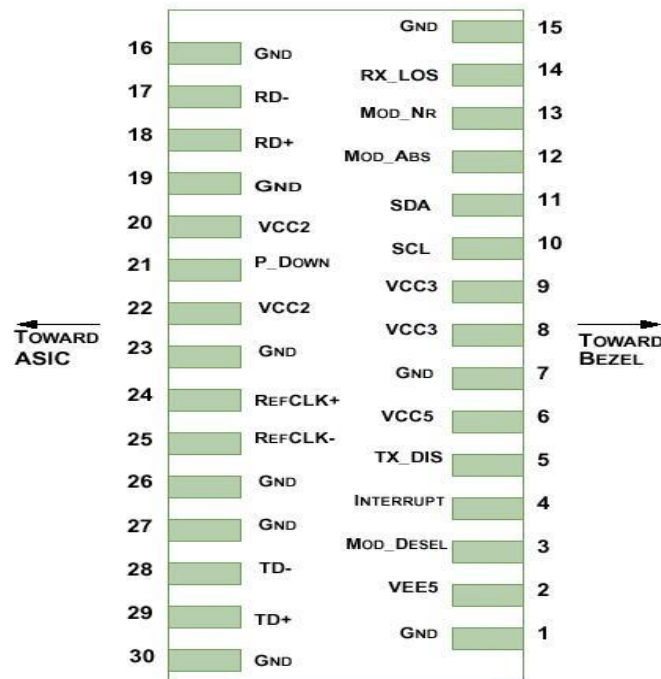
It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	T_s	-40	85	°C	
Power Supply Voltage	V_{CC}	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	5	95	%	
Damage Threshold	TH_d	0		dBm	

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	T _{OP}	See order Information			°C	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Data Rate			10.3125		Gb/s	
Control Input Voltage High		2		V _{CC}	V	
Control Input Voltage Low		0		0.8	V	
Link Distance (SMF)	D			80	km	9/125um

Pin Assignment and Pin Description



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; XGIGA'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 4.7k Ω – 10k Ω on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required by the EXBxxX-3LCD40. If present, it will be ignored.

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Power Consumption	P			3.5	W	1
Supply Current	I _{cc}			1000	mA	
Transmitter						
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						
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	T _r /T _f			40	ps	5
LOS Assert Voltage	V _{losH}	V _{cc} -1.3		V _{cc}	V	6
LOS De-assert Voltage	V _{losL}	V _{ee}		V _{ee} +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 4.7k Ω – 10k Ω 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 Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ_c	1480	1490	1500	nm	EXB45X-3LCD80
		1540	1550	1560	nm	EXB54X-3LCD80
Optical Spectral Width	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	PO	0		5	dBm	EXB45X-3LCD80
		-1		3	dBm	EXB54X-3LCD80
Optical Extinction Ratio	ER	6.0			dB	
Average Launched Power(Laser Off)	Poff			-30	dBm	
Transmitter Eye Mask	Compliant with IEEE802.3ae					
Receiver						
Center Wavelength	λ_c	1540	1550	1560	nm	EXB54X-3LCD80
		1480	1490	1500	nm	EXB45X-3LCD80
Receiver Sensitivity (Average Power)	Sen.			-24	dBm	2
Input Saturation Power (overload)	Psat	-6			dBm	
LOS Assert	LOSA	-38			dBm	
LOS De-assert	LOSD			-26	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	

Notes:

1. Average power figures are informative only, per IEEE 802.3ae.
2. Measured with Light source 1490nm and 1550nm, ER=6.0dB; BER = $<10^{-12}$ @10.3125Gbps, PRBS=2³¹-1 NRZ.

Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min.	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temp
Supply voltage monitor absolute error	DMI_VCC	-0.15	0.15	V	Full operating range
RX power monitor absolute error	DMI_RX	-3	3	dB	
Bias current monitor	DMI_bias	-10%	10%	mA	
TX power monitor absolute error	DMI_TX	-3	3	dB	

Mechanical Dimensions

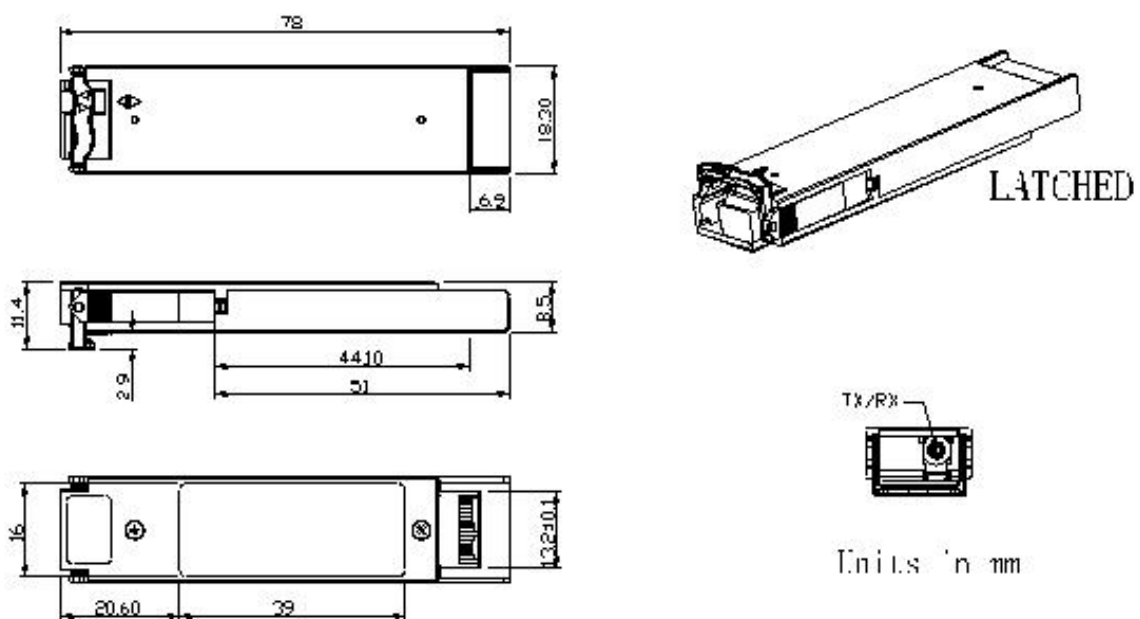


Figure2. Mechanical Outline

Product Production Process

Quality Assurance

Continuous introduction of new equipment, produced by strict standards, strict quality inspection, to guarantee the high quality standard of each product.



**Standardized
Production Line**



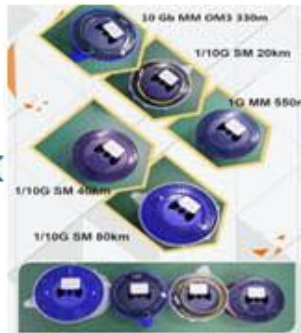
**Professional
Welding**



Assembling



Aging Testing



Distance Testing



Cleaning end face



Product Initial Test



Switch Testing



Product Final Test

Compatibility Test

In order to ensure the product compatibility, our products will be tested on the switch before shipment. Our modules can compatible with many mainstream brand switches, such as Cisco, Juniper, Extreme, Brocade, IBM, H3C, HP, Huawei, D-Link, Mikrotik, ZTE, TP-Link...

Our test equipment: VOLKTEK MEN-4110, HP 2530-8G, CRS226-24G-25+RM, Catalyst 2960G Series, Catalyst 3850 XS 10G SFP+, Catalyst 3750-E Series, HUAWEI S5700Series, H3C S3100V2 Series, Juniper-EX4200, etc.



Cisco Catalyst 3850



HUAWEI S5700



H3C S3100V2



HP J9264AR



Juniper EX 4200



Alcatel 6850E-U24X



Mikrotik CR5226-24G-25+RM



Cisco Catalyst 2960G



Volktek MEN-4110

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