PRODUCT SPECIFICATION

FLXF-1596-80D

10Gb/s 80km XFP Transceiver
Hot Pluggable, Duplex LC, 1550nm, EML&APD, Single mode

■ Features:

★ Support multi protocol from 9.95Gb/s to11.3Gb/s
★ Hot pluggable 30 pin connector
★ Compliant with XFP MSA
★ Transmission distance of 80km over single mode fiber
★ Cooled EML laser transmitter
★ APD Receiver
★ Duplex LC connector
★ 2-wire interface for management and diagnostic monitor
★ XFI electrical interface with AC coupling
★ Power supply voltages : +3.3V, +5V
★ Temperature range 0°C to 70°C
★ Power dissipation: <3.5W
★ RoHS Compliant Part

■ Applications:

★ 10GBASE-ER/EW Ethernet
★ SONET OC-192/ SDH STM-64 ITU-T G.959.1 P1L1-2D2
★ 80km 10G FC
★ Other Optical Link

■ Description:

Flowlink FLXF-1596-80D8 Small Form Factor 10Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification. The high performance cooled EML transmitter and high sensitivity APD receiver provide superior performance for SONET/SDH and Ethernet applications up to 80km optical links

■ Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	TST	-40		+85	℃
Case Operating Temperature	TIP	0		+70	℃
Supply Voltage 1	VCC3	-0.5		+4.0	V
Supply Voltage 2	VCC5	-0.5		+6.0	V

■ Electrical Characteristics (T_{OP} = Tc)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage 1	Vcc5	4.75		5.25	V	
Supply Voltage 2	Vcc3	3.13		3.45	V	
Supply Current – Vcc5 supply	Icc5			250	mA	
Supply Current – Vcc3 supply	Icc3			500	mA	
Module total power	P			3.5	W	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,pp	150		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	T_off			100	ms	
Tx Enable Assert Time	T_on			100	ms	
Receiver						
Differential data output swing	Vout,pp	300	500	850	mV	
Data output rise time	tr			35	ps	2
Data output fall time	tf			35	ps	2
LOS Fault	$V_{LOS\ fault}$	Vcc – 0.5		Vcc_{HOST}	V	3
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V	3
Power Supply Rejection	PSR	See Note 4 below				4

Note:

1. After internal AC coupling.
2. 2. 20 – 80 %
3. 3.Loss of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
4. 4. Per Section 2.7.1. in the XFP MSA Specification.

■ Optical Parameters(T_{OP} = Tc)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ_c	1530	1550	1570	nm	
Spectral Width(-20dB)	σ			1	nm	
Side mode Suppression ratio	SMSR	30			dB	
Optical Output Power	P_{out}	-1		5	dBm	1
Optical Rise/Fall Time	t_r / t_f			35	ps	2
Extinction Ratio	ER	8.2			dB	
Eye Mask for Optical Output	Compliant with IEEE802.3ae					
Receiver Section:						
Optical Input Wavelength		1530		1570	nm	
Receiver Overload	P_{ol}	-7			dBm	4
RX Sensitivity	Sen			-21	dBm	4
RX_LOS Assert	LOS_A	-34			dBm	
RX_LOS Deassert	LOS_D			-22	dBm	
RX_LOS Hysteresis	LOS_H	0.5		5	dB	
General Specifications						
Data Rate	BR	9.95	10.3125	11.3	Gb/s	
Bit Error Rate	BER			10^{-12}		
Total System Budget	LB	20			dB	

Note

1. The optical power is launched into SMF.
2. 20-80%.
3. Jitter measurements taken using Agilent OMNIBERT 718 in accordance with GR-253.
4. Measured with PRBS 2^{31-1}at 10^{-12}BER

■ Pin Assignment

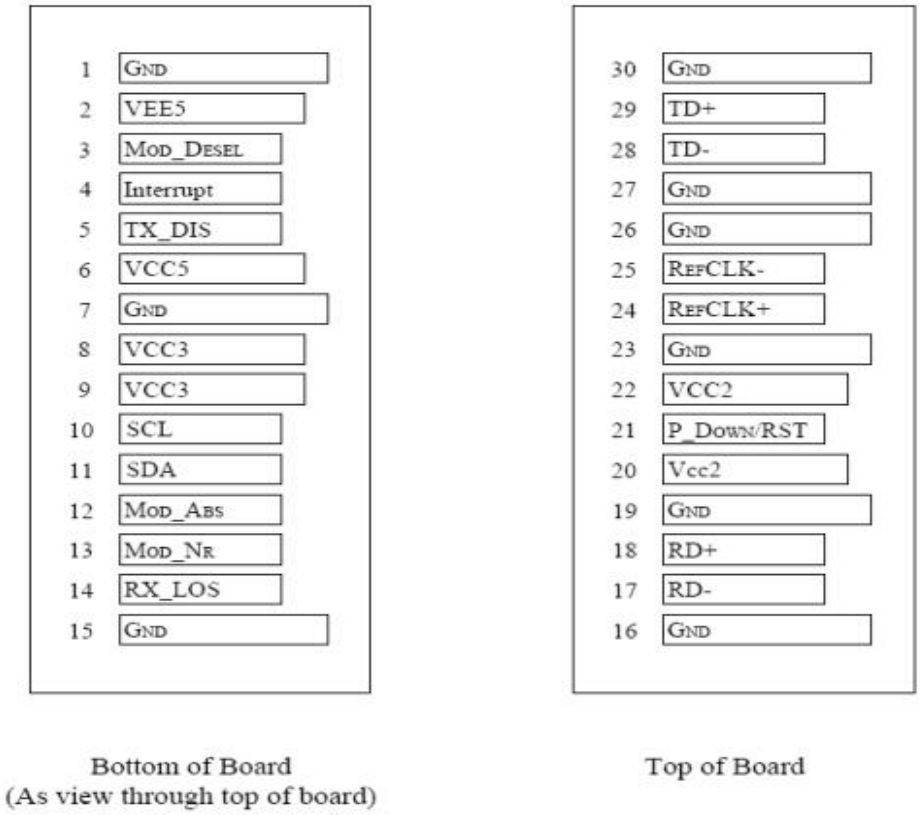


Diagram of Host Board Connector Block Pin Numbers and Names

■ Pin Function Definitions

Pin No	Name	Function Plug Seq	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	
7	GND	Module Ground	**1**
8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	Serial 2-wire interface clock	**2**
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;	**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. CML-O	
18	RD+	Receiver Non-Inverted Data Output. CML-O	
19	GND	Module Ground	**1**
20	VCC2	+1.8V Power Supply (Not required).	**3**
21	P_DOWN/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. LVTTL-I Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle. LVTTL-I	
22	VCC2	+1.8V Power Supply (Not required)	
23	GND	Module Ground	**1**
24	REFCLK+	Reference Clock (Not required)	**3**
25	REFCLK-	Reference Clock (Not required)	**3**
26	GND	Module Ground	**1**
27	GND	Module Ground	**1**
28	TD-	Transmitter Inverted Data Input. CML-I	
29	TD+	Transmitter Non-Inverted Data Input. CML-I	
30	GND	Module Ground	**1**

Notes:

1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Open collector, Should be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.6V on the host board.
3. The pins are open within module.

■ XFP Module EEPROM Information and Management

The Glight's XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

★ Transceiver temperature

★ Laser bias current

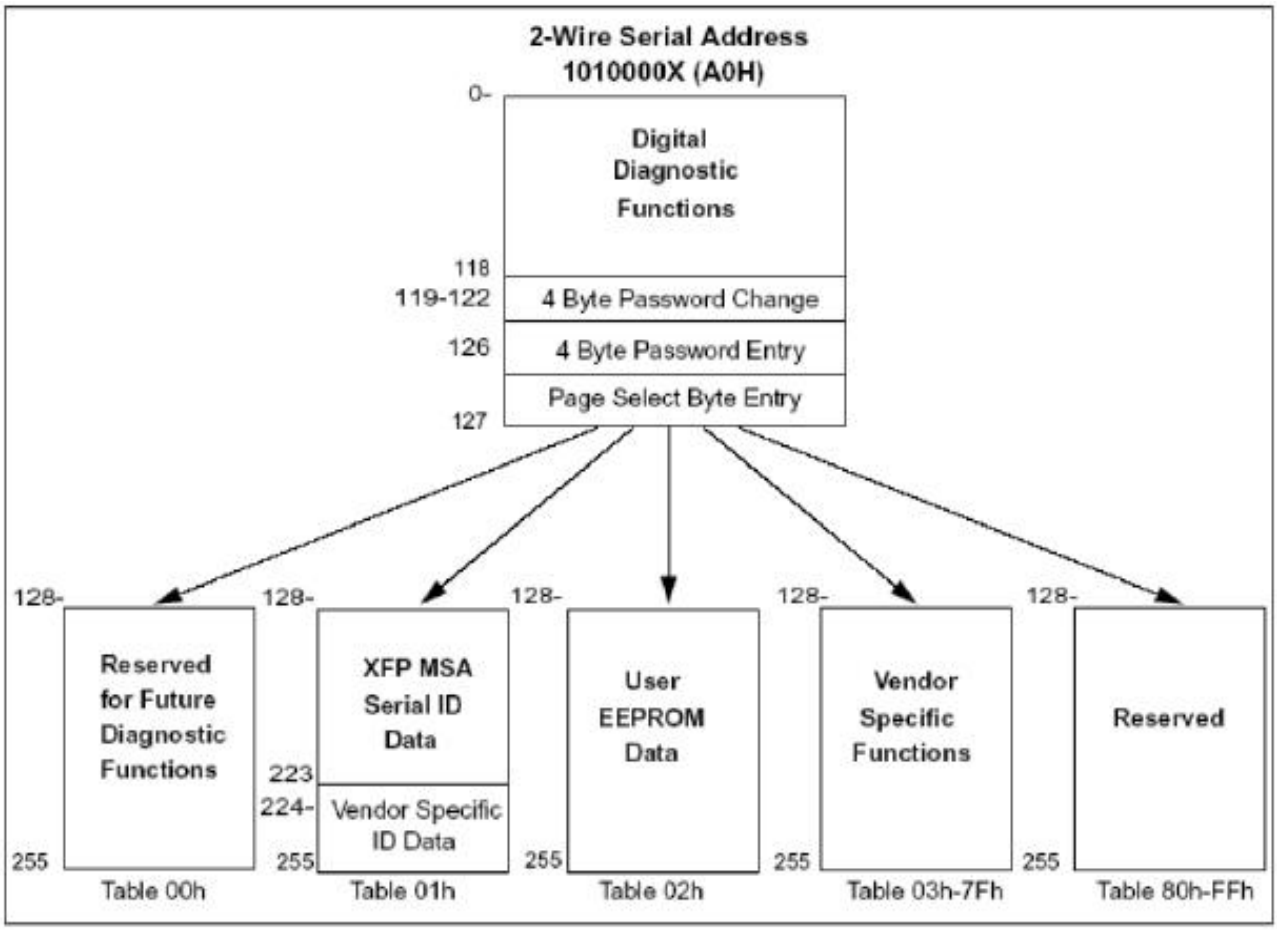
★ Transmitted optical power

★ Received optical power

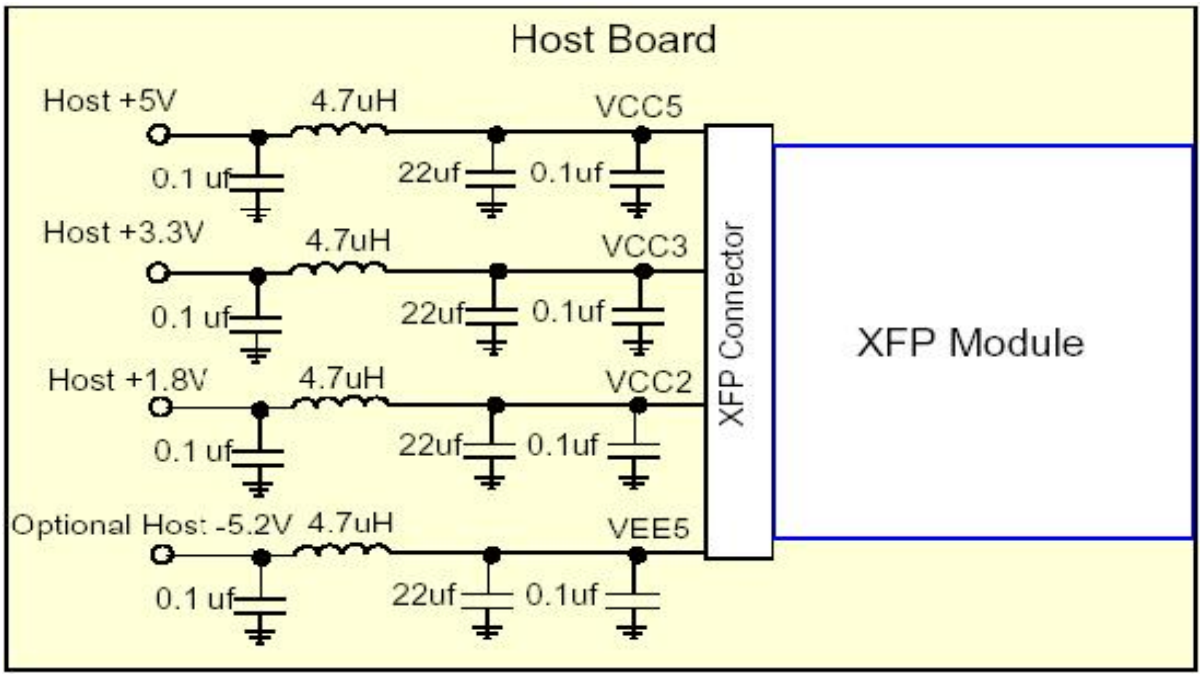
★ Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

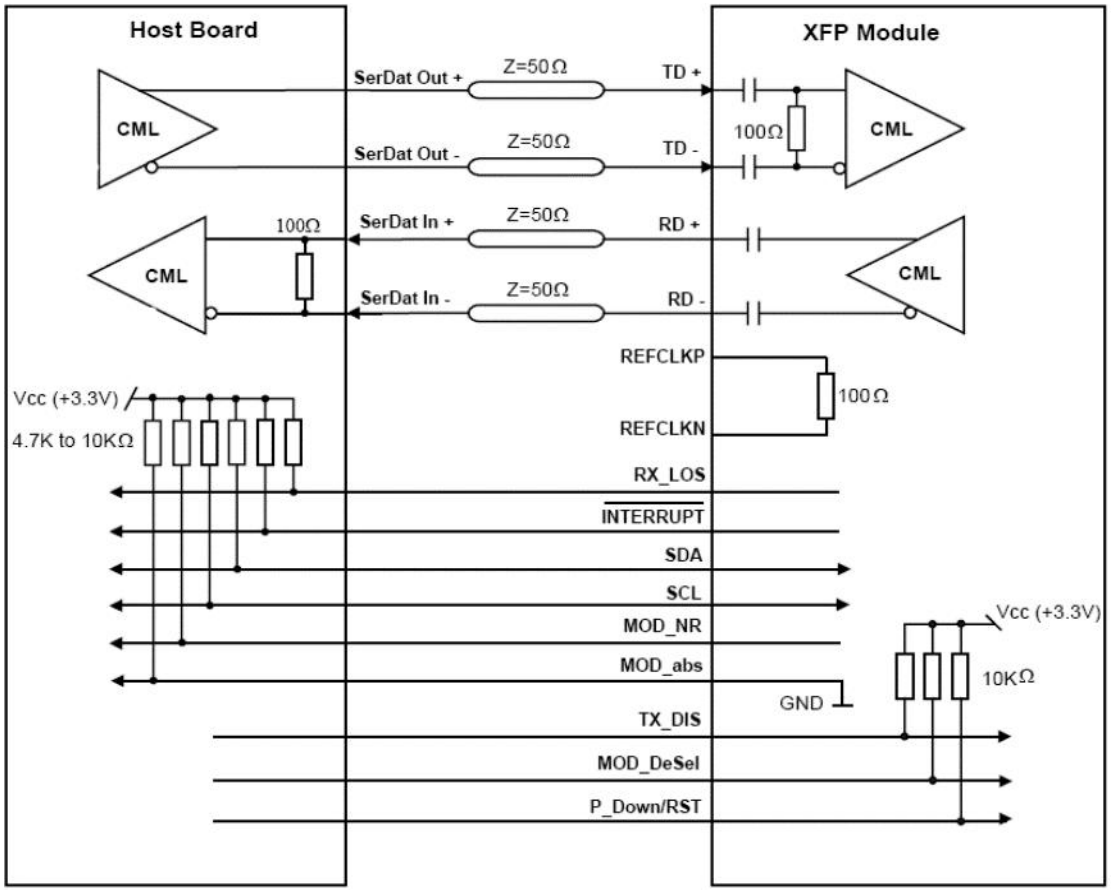
Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)



Recommended Circuit

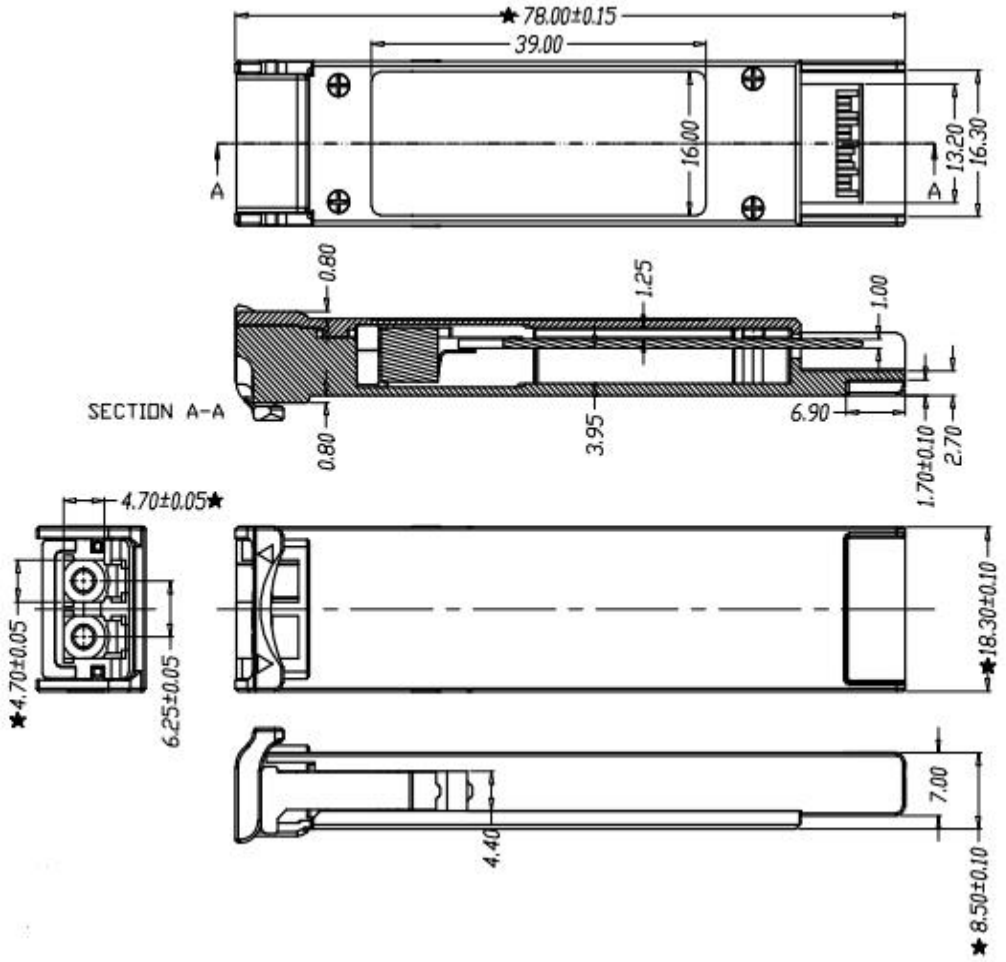


Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit

■ Mechanical Dimensions



Flowlink Technology Co., Ltd.
No:201, Building 7, Lian Jian Industrial Park, Hua Rong Road, Da Lang Street, Long Hua District, Shenzhen.