10Gbps CWDM XFP Transceiver Module, SMF, 80km

P/N: AE-XFP-C80-XX

Features

- Supports 9.95 to 11.3Gb/s bit rates
- Duplex LC connector
- Hot-pluggable XFP footprint
- Cooled 1470nm~1610nm EML transmitter, APD photo-detector
- Applicable for 80km SMF connection
- Low power consumption, <3.5W
- Digital Diagnostic Monitor Interface
- XFP MSA Rev 4.5 Compliant
- Operating Case Temperature: Standard 0~70ºC, Industrial -40~85ºC

Applications

- CWDM 10G SONET/SDH
- CWDM, IEEE 10GBASE-ZR based Ethernet
- ITU G.709 / OTN FEC applications
- 10G Fibre Channel
- Other optical link

Description

AERECH's AE-XFP-C80-XX is a high performance and cost effective 10Gb/s CWDM (Coarse Wavelength-Division-Multiplexing) XFP ZR optical transceiver module, which provides extended high capacity, high bandwidth communication solutions for multiplexed optical networks. This CWDM XFP transceiver module is designed for 10G CWDM SDH, 10GBASE-ZR/ZW and 10G Fiber Channel applications, and supports links up to 80km over single-mode fiber. It features a highly performance CWDM EML transmitter and APD diode into a duplex LC optical connector. There are 8 center wavelengths available from 1470nm to 1610nm with each step 20nm. The CWDM XFP transceiver module is comply with XFP MSA specifications, 10 Gigabit Ethernet specifications (10GBASE-ZR/ZW per IEEE 802.3ae and 10G Fibre Channel. It's suitable for use with 10G Ethernet switches, routers, network interface cards (NICs), fiber media converters and storage networking equipment in CWDM networks usage. Additionally, the CWDM XFP module has been integrated with a digital diagnostic monitoring interface (DDMI), which providing real-time monitoring of the transceiver temperature, laser bias current, optical power, received optical power and transceiver supply voltage. There are two versions of the series 10G XFP CWDM 80km transceiver for different applications. The Standard grade(0~70ºC) is for commonly commercial application and the Industrial grade (-40~85ºC) is made with robust and reliable components to meet the needs of Industrial Ethernet application under harsh environmental conditions. The CWDM XFP 80km transceiver need use with CWDM Multiplexer/Demultiplexer (CWDM Mux/Demux) that is separately sold by Aerech.

Functional Diagram
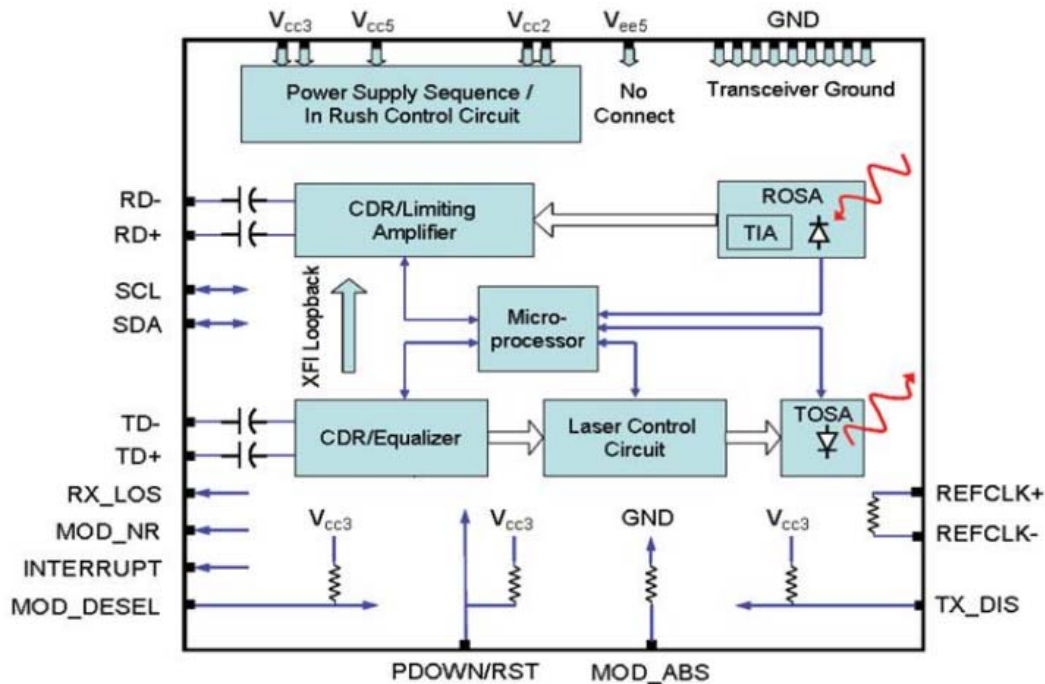
Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Any stress beyond the maximum ratings can result in permanent damage. The device specifications are guaranteed only under the recommended operating conditions.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Supply Current	Icc			750	mA	
Case Operating Temperature	Tc	0		70	°C	Standard
		-40		85	°C	Industrial
Data Rate	DR	9.95	10.3125	11.3	Gbps	
Maximum supported distance	L_{max}			80	km	

Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λ	λ-7.5nm	λ	λ+7.5nm	nm	
Ave. output power (Enabled)	P_{AVE}	0		4.0	dBm	1
Side-Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	9.0			dB	
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			45	ps	
Dispersion penalty	TDP			3	dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Output Optical Eye	Compliant with IEEE 802.3ae					
Receiver						
Operating Wavelength	λ	1260		1610	nm	
Receiver Sensitivity	P_{SEN}			-24.0	dBm	2
Overload	P_{AVE}	-7.0			dBm	
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-26.0	dBm	
LOS Hysteresis	Pd-Pa	0.5			dB	

Notes:

1. Average power figures are informative only, per IEEE 802.3ae.

2. Measured with worst ER=8.2@10.3125G; BER<10^{-12}; $2^{31} - 1$ PRBS.

Pin Descriptions

Pin	Logic	Symbol	Name/Description	Ref
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 – **Not required**	
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;	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	LVTTL-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. Open collector, should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

3. A Reference Clock input is not required.

Pin Definitions
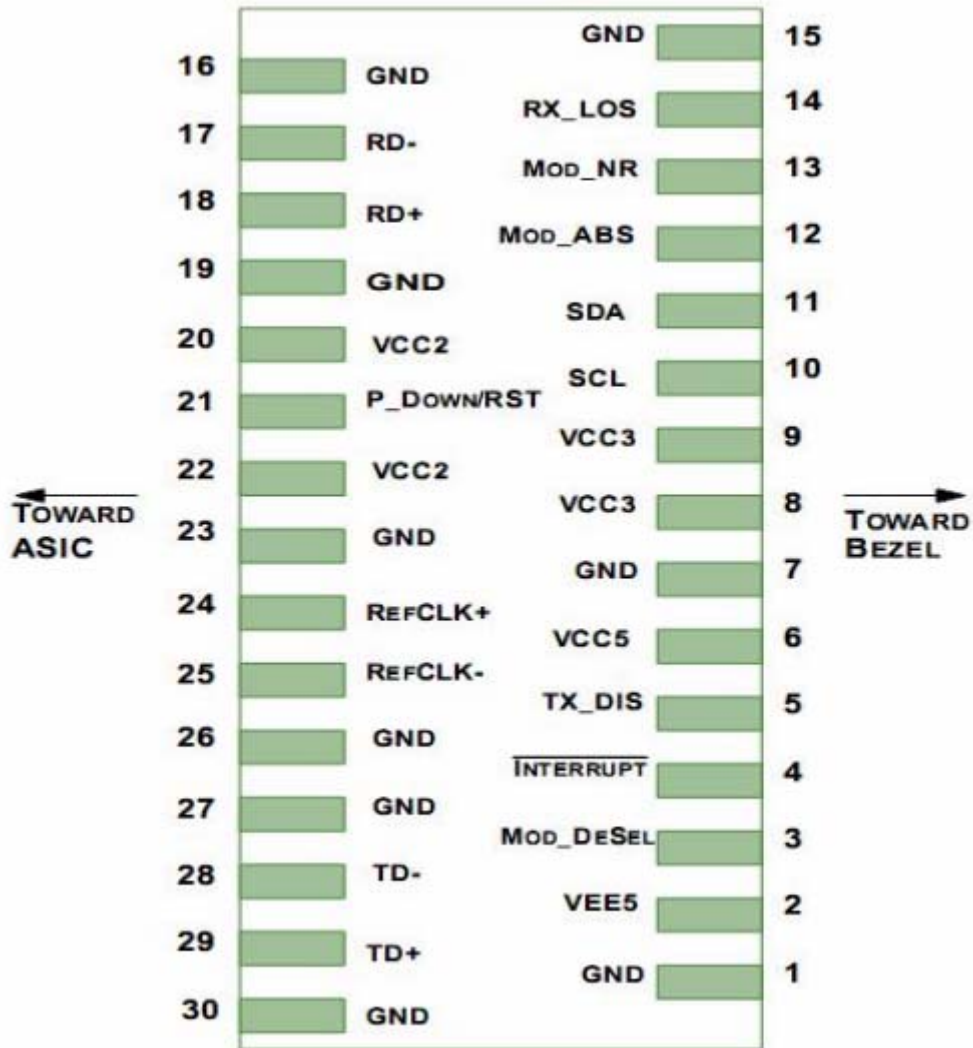
Management Interface

The 10G CWDM XFP transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA). The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented.
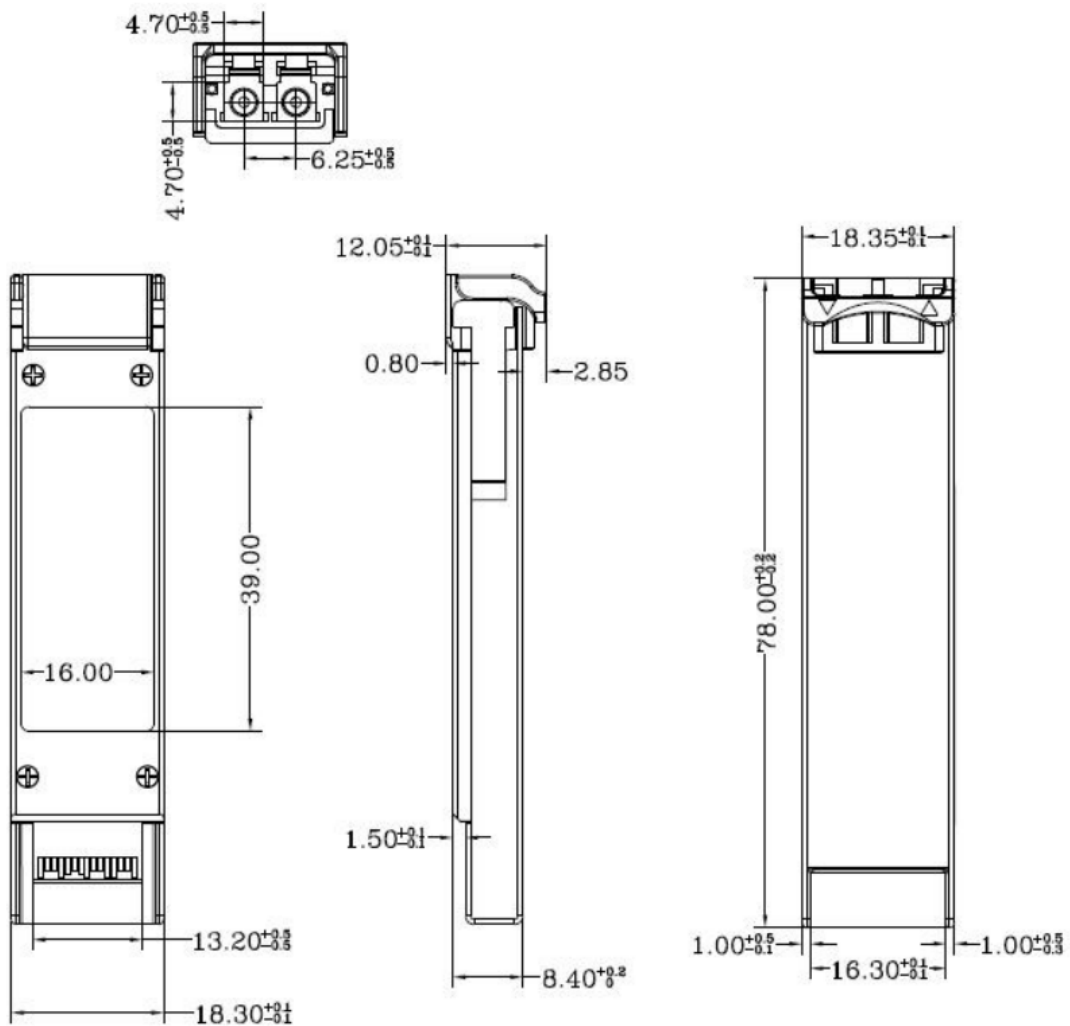
The digital diagnostic memory map specific data field defines as following.
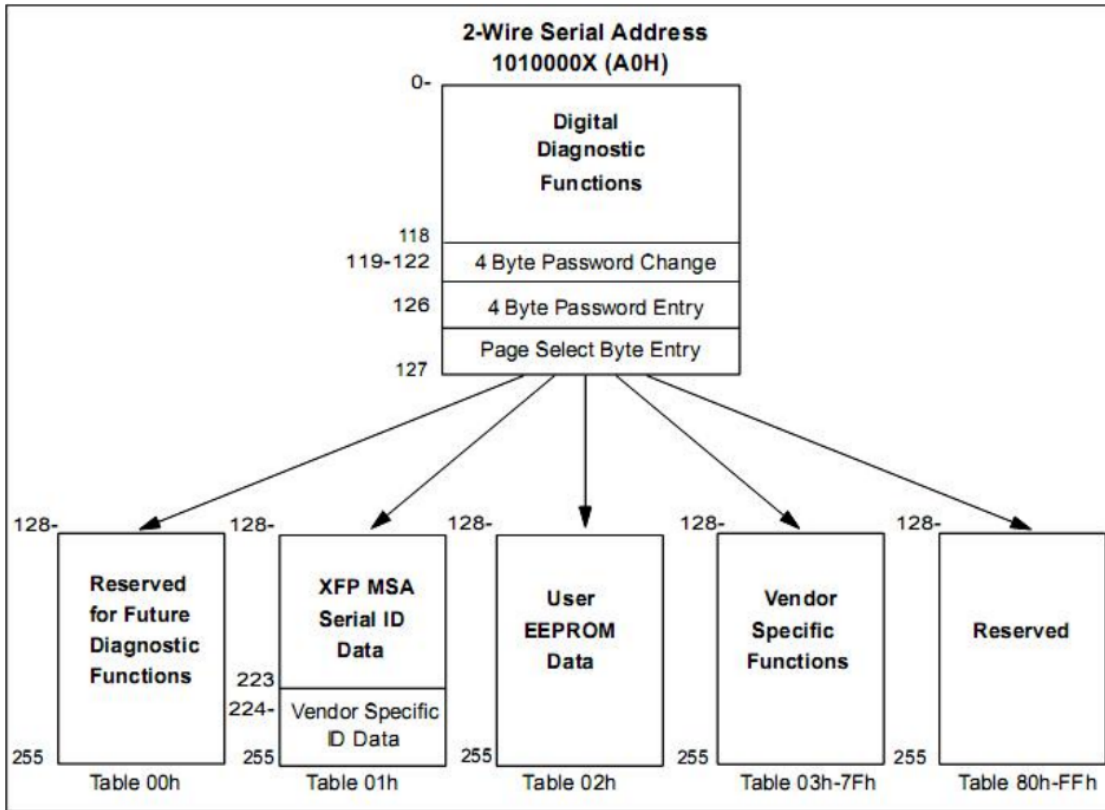
Recommended High-speed Interface Circuit
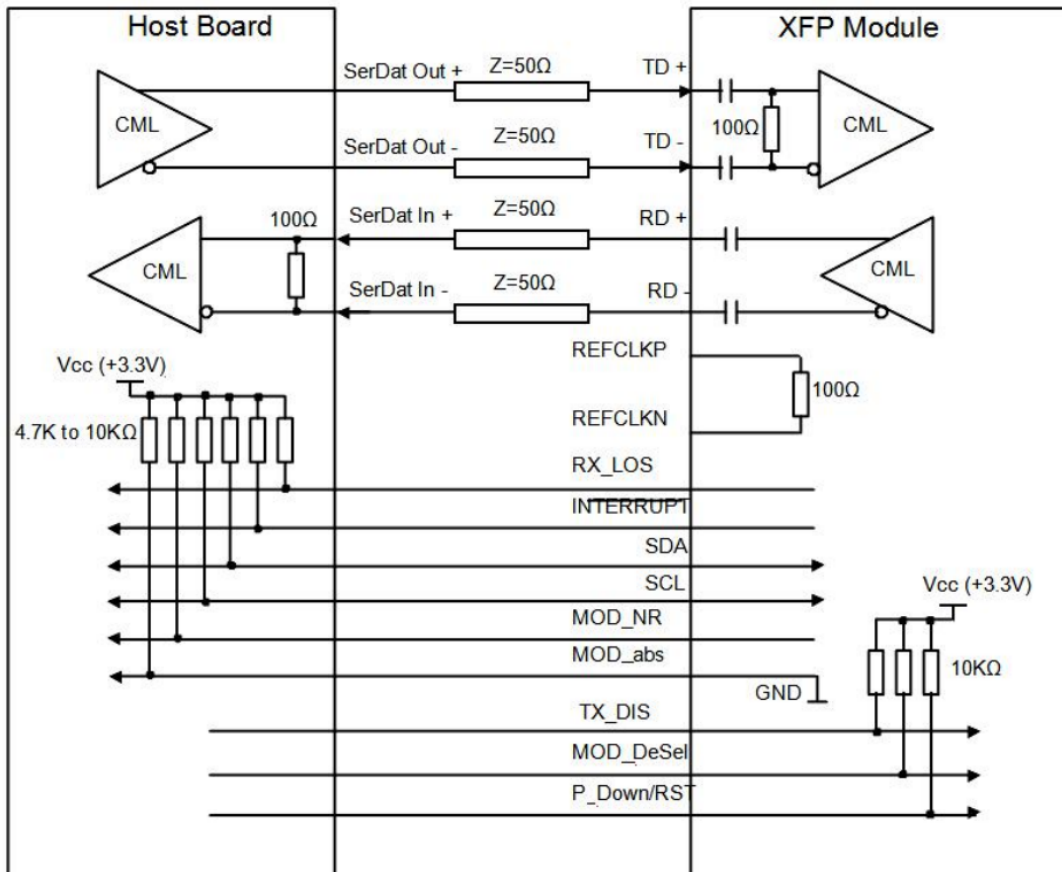
Mechanical Specifications

Ordering information

Part Number	Description
AE-XFP-C80-XX	10G CWDM XFP Transceiver, SMF, 1470-1610nm, 80km, LC, DDM, 0ºC~+70ºC