10Gb/s Tunable XFP Transceiver, DWDM 50GHZ, 88 Channel, 80km

P/N: AE-XFP-D80-TU

Features

- Hot pluggable XFP footprint
- Multi-Protocol, supports 9.95Gb/s to 11.3Gb/s bit rates
- Monolithically integrated full C-band tunable transmitter
- 50GHz ITU channel spacing with integrated wavelength locker
- C-band-tunable Laser and high performance APD receiver
- Maximum link length of 80km
- Full Duplex LC connector
- Supports Line-side and XFI loopback
- No Reference Clock required
- Digital diagnostic monitoring support
- Standard bail release mechanism
- Power dissipation

Applications

- DWDM 10GBASE-ZR/ZW 10Gb/s Ethernet
- DWDM 10Gb/s Fiber Channel
- DWDM SONET OC-192&SDH STM-64
- Wide, local, and storage area networks

Description

AERECH's tunable 10Gb/s XFP transceiver is a high-performance integrated fiber optic transceiver that provides a high-speed serial link at signaling rates from 9.95 Gb/s to 11.35 Gb/s. It is complied with the 10 Gigabit small formfactor pluggable (XFP) multi-source agreement-MSA Specification (INF-8077i) and Tunable XFP for ITU Frequency Grid Applications (SFF-8477). The tunable XFP module complies with the ITU-T G.698.1 standard with 50GHz channel spacing for SONET OC-192, SDH STM-64, DWDM 10GBASE-ZR Ethernet, and DWDM 10G Fiber Channel applications.

The tunable XFP transceiver integrates the receiver and transmit path on one module. On the transmit side, the 10Gbps serial data stream is recovered, retimed, and passed to a modulator driver. The modulator driver biases and modulates a C-band-tunable integrated laser Mach-Zehnder (ILMZ), enabling data transmission over single-mode fiber through an industry-standard LC connector. On the receiver side, the 10 Gbps data stream is recovered from an APD/ trans-impedance amplifier, retimed, and passed to an output driver. This tunable XFP module features a hot-pluggable XFI-compliant electrical interface.

The 10G tunable XFP transceiver provides a full C-band window covering 1528nm to 1566nmfor DWDM optical networks, which meets the need of rapid increase in the volume of communications traffic from telecom carrier and operator. The tunable DWDM XFP module can replace the fixed DWDM channel XFP transceivers that are currently used, while reduce the large stock since all wavelengths can now be covered with one transceiver module.

Wavelength Guide Pin Descriptions

Channel Number	Frequency(THZ)	Wavelength(nm)	Channel Number	Frequency(THZ)	Wavelength(nm)
1	191.75	1563.45	45	193.95	1545.72
2	191.8	1563.05	46	194	1545.32
3	191.85	1562.64	47	194.05	1544.92
4	191.9	1562.23	48	194.1	1544.53
5	191.95	1561.83	49	194.15	1544.13
6	192	1561.42	50	194.2	1543.73
7	192.05	1561.01	51	194.25	1543.33
8	192.1	1560.61	52	194.3	1542.94
9	192.15	1560.20	53	194.35	1542.54
10	192.2	1559.79	54	194.4	1542.14
11	192.25	1559.39	55	194.45	1541.75
12	192.3	1558.98	56	194.5	1541.35
13	192.35	1558.58	57	194.55	1540.95
14	192.4	1558.17	58	194.6	1540.56
15	192.45	1557.77	59	194.65	1540.16
16	192.5	1557.36	60	194.7	1539.77
17	192.55	1556.96	61	194.75	1539.37
18	192.6	1556.55	62	194.8	1538.98
19	192.65	1556.15	63	194.85	1538.58
20	192.7	1555.75	64	194.9	1538.19
21	192.75	1555.34	65	194.95	1537.79
22	192.8	1554.94	66	195	1537.40
23	192.85	1554.54	67	195.05	1537.00
24	192.9	1554.13	68	195.1	1536.61
25	192.95	1553.73	69	195.15	1536.22
26	193	1553.33	70	195.2	1535.82
27	193.05	1552.93	71	195.25	1535.43
28	193.1	1552.52	72	195.3	1535.04
29	193.15	1552.12	73	195.35	1534.64
30	193.2	1551.72	74	195.4	1534.25
31	193.25	1551.32	75	195.45	1533.86
32	193.3	1550.92	76	195.5	1533.47
33	193.35	1550.52	77	195.55	1533.07
34	193.4	1550.12	78	195.6	1532.68
35	193.45	1549.72	79	195.65	1532.29
36	193.5	1549.32	80	195.7	1531.90
37	193.55	1548.91	81	195.75	1531.51
38	193.6	1548.51	82	195.8	1531.12
39	193.65	1548.11	83	195.85	1530.72

40	193.7	1547.72	84	195.9	1530.33
41	193.75	1547.32	85	195.95	1529.94
42	193.8	1546.92	86	196	1529.55
43	193.85	1546.52	87	196.05	1529.16
44	193.9	1546.12	88	196.1	1528.77

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	T_S	-40		85	°C	
Case Operating Temperature	T_{case}	0		70	°C	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage – 1.8V supply	Vcc2	1.71		1.89	V	
Supply Voltage – 3.3V supply	Vcc3	3.13		3.47	V	
Supply Current – 1.8V supply	Icc2			180	mA	
Supply Current – 3.3V supply	Icc3			680	mA	
Module total power	P			2.5	W	1
Transmitter						
Input differential impedance	R_{in}		100		Ω	2
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	
Receiver						
Differential data output swing	Vout,pp	340	650	850	mV	3
LOS Fault	$V_{LOS\ fault}$	Vcc – 0.5		V_{CCHOST}	V	4
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V	4

Notes:

1. Maximum total power value is specified across the full temperature and voltage range.
2. After internal AC coupling.
3. Into 100 ohms differential termination.
4. 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.

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter						
Average Optical Power	Pf	-1		3	dBm	
Wavelength range		1528.38		1568.77	nm	
Optical Wavelength	λc	λc -0.05		λc +0.05	nm	
Center Wavelength Spacing			50		GHz	1
Frequency stability (BOL)		ƒc –1.5		ƒc +1.5	GHz	2
Frequency stability (EOL)		ƒc –2.5		ƒc +2.5	GHz	2
Side mode Suppression ratio	SMSR	30			dB	
Optical Extinction Ratio	ER	9			dB	
Transmitter and Dispersion Penalty	TDP			3	dB	
Average Launch power of OFF transmitter	POFF			-30	dBm	
Receiver						
Rx Sensitivity	RSENS			-24	dBm	Back to back ,3
				-21	dBm	Fiber(-300 to1450ps/nm)
Input Saturation Power (Overload)	Psat	-7			dBm	
Wavelength Range	λ_C	1260		1600	nm	
Receiver Reflectance	Rrx			-27	dB	
LOS De-Assert	LOSD			-27	dBm	
LOS Assert	LOSA	-37			dBm	
LOS Hysteresis		0.5			dB	

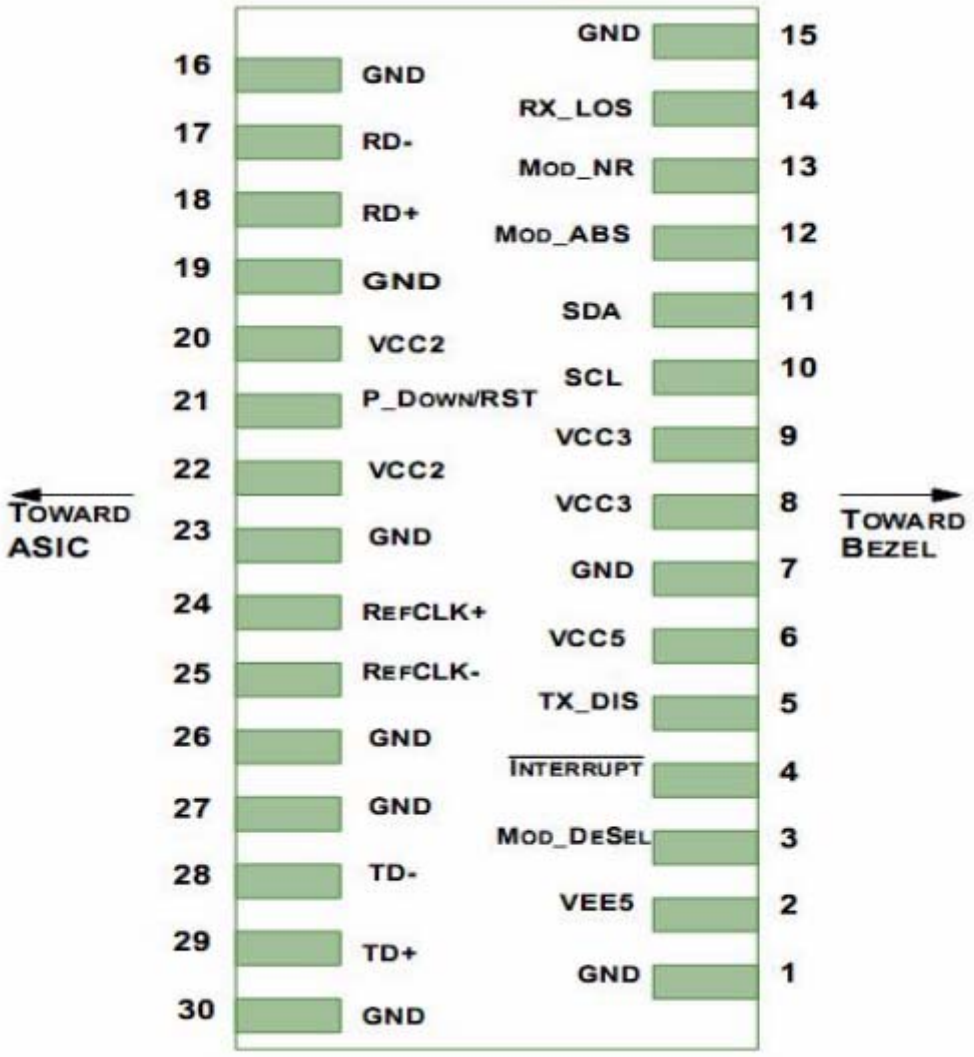
Notes:

1. Corresponds to approximately 0.4 nm.
2. ƒc refer to Page 2 the Frequency row of AE-XFP-D80-TU Wavelength Guide Table, and test condition is reflect power to transmitter lower than -27dBm.
3. Measured with worst ER; BER<10^{-12} with 10.3Gbps, 2^{31} – 1 PRBS.

Timing Parameters

Parameter	Symbol	Min	Typ	Max	Unit	Note
Time to initialize cooled module	Tstart_up			20	S	
Channel Switch time	TchannelSw			200	ms	Any channel to any

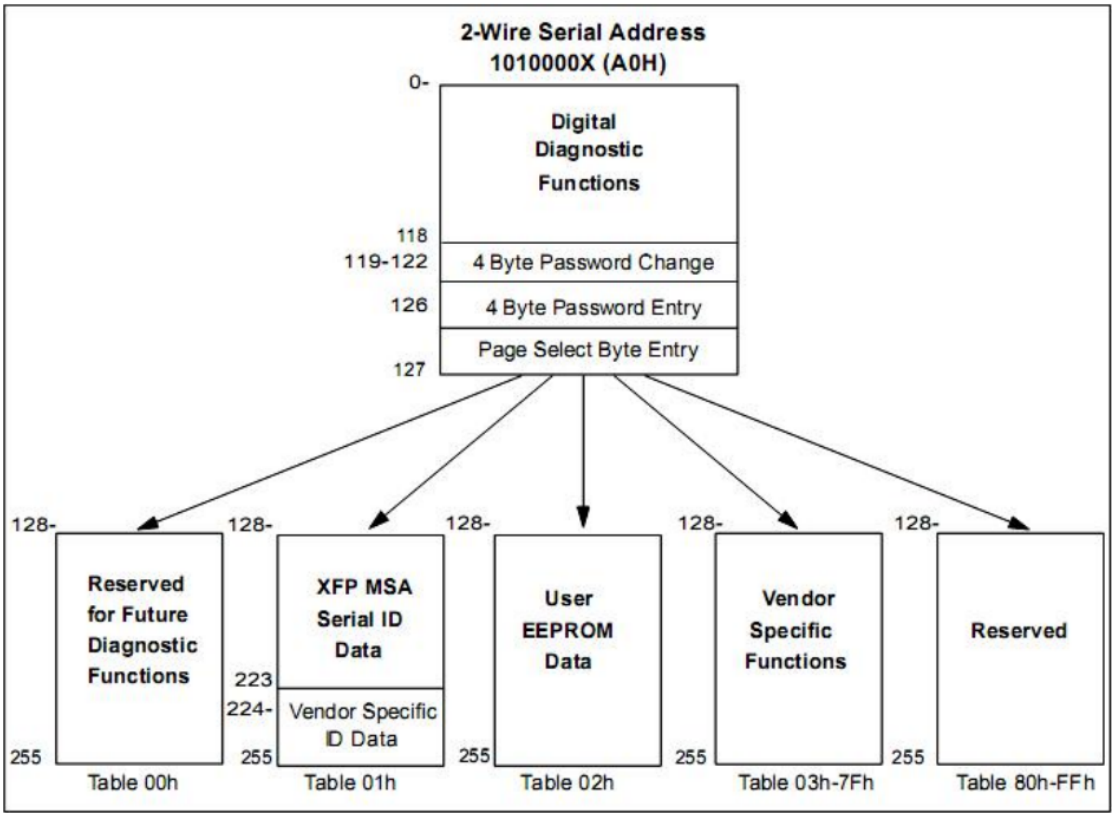
Pin Assignment



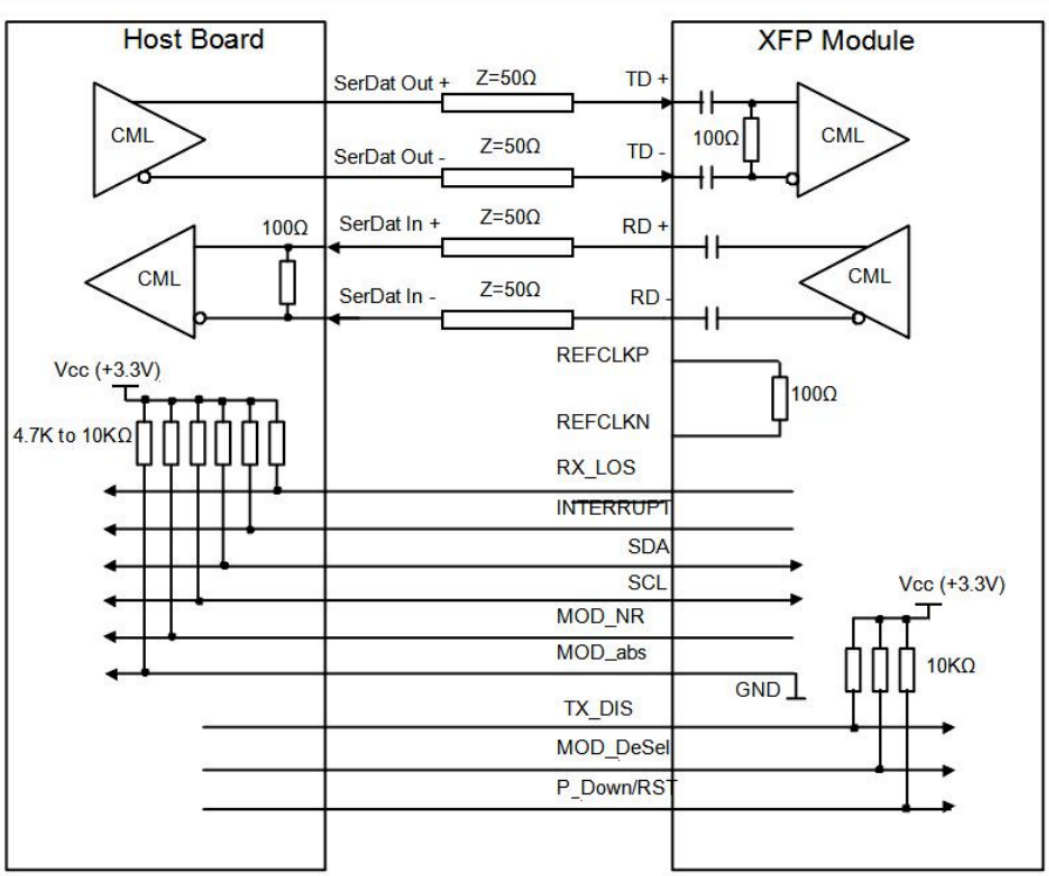
Management Interface

The 10G DWDM 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.

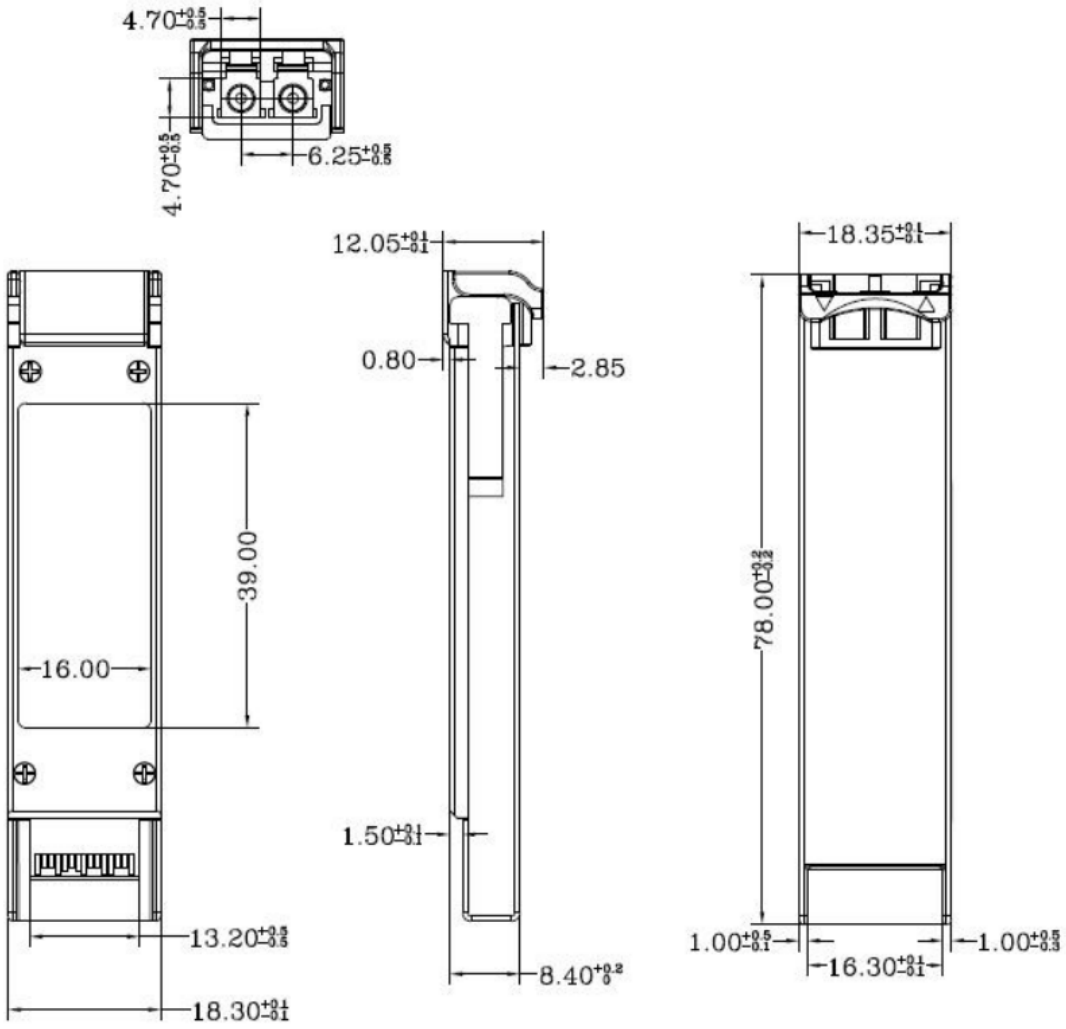
The digital diagnostic memory map specific data field defines as following.



Recommended High-speed Interface Circuit



Mechanical Specifications



Ordering information

Part Number	Descirption
AE-XFP-D80-TU	10G DWDM XFP Transceiver, SMF, DWDM 50GHZ, 88 Channel, 80km, LC, DDM, 0ºC~+70ºC