

AXFP64-80-Dxxxx

80km, DWDM XFP, Wavelength 100GHz ITU grid, Optical Transceiver

Features

- ◆ Wavelength selectable to C-band ITU-T grid wavelengths
- ◆ Suitable for use in 100GHz channel spacing DWDM systems
- ◆ XFP MSA Rev 4.5 Compliant
- ◆ Data rate from 9.95Gbps to 11.1Gbps
- ◆ No Reference Clock required
- ◆ Cooled EML and APD receiver
- ◆ Maximum link length up to 80km (1600ps/nm@G652 fiber)
- ◆ Power Dissipation 3.5W Maximum
- ◆ XFI and lineside loopback Mode Supported
- ◆ -5°C to 70°C Operating Case Temperature
- ◆ Diagnostic Performance Monitoring of module temperature,
- ◆ Supply Voltages, laser bias current, transmit optical power, and receive optical power
- ◆ RoHS6 compliant (lead free)

**Applications:**

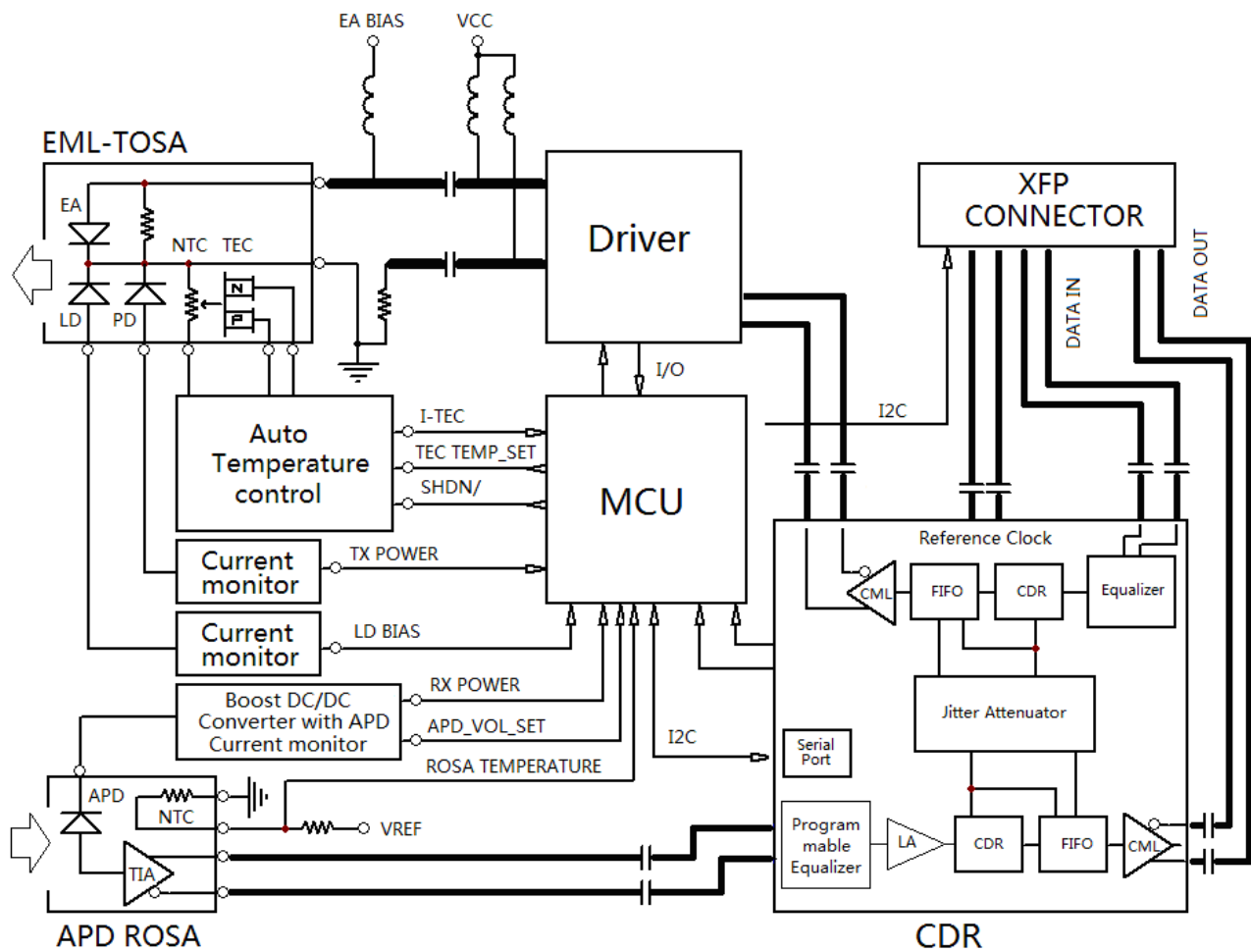
- ◆ SONET OC-192&SDH STM 64
- ◆ 10G Ethernet
- ◆ 10G Fiber Channel
- ◆ DWDM Networks

Description:

AXFP64-80-DXXXX is an 80km DWDM XFP Transceiver exhibits excellent wavelength stability, Designed for 10G DWDM SDH, 10GBASE-ZR and 10G Fiber- Channel applications..

The transceiver consists of two sections: The transmitter section incorporates a cooled EML laser. And the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. Atech XFP transceiver provides an enhanced 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.

Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TST	-40	+85	°C
Operating Case Temperature	Tc	-5	+70	°C
Supply Voltage 1	VCC3	0	+4.0	V
Supply Voltage 2	VCC5	0	+6.0	V
Supply Voltage 3	VCC1p8	0	+2	V

Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage1	Vcc3	3.13	3.3	3.47	V
Supply current1	Icc3			400	mA
Supply Voltage2	Vcc5	4.75	5.0	5.25	V
Supply current2	Icc5			350	mA
Supply Voltage3	Vcc1p8	1.71	1.8	1.89	V
Supply current3	Icc1p8			400	mA
Operating Case temperature	Tca	-5	-	70	°C
Module Power Dissipation [2]	Pm	-	1.5	3.5 [1]	W

Notes:

[1] Maximum total power value is specified across the full temperature and voltage range.

Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength-Start of Life [1]	Cs	c -25	c	c +25	pm
Center Wavelength-End of Life [1]	Ce	c -100	c	c +100	pm
Average output power	Po	0	-	+3	dBm
Optical Extinction Ratio	ER	8.2	-	-	dB
RMS spectral width (-20dB)	$\Delta\lambda_{20}$	-	-	0.3	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Average launch power of Tx OFF	Pave_off	-	-	-30	dBm
Dispersion penalty(1600ps/nm) [2]	DP			2	dB
Tx Jitter Generation(peak-to-peak)	TXJ			0.1	UI
Tx Jitter Generation(RMS)	TXJRMS			0.01	UI

Note:

1. Wavelength stability is achieved within 60 seconds (max) of power up.
2. BER=10⁻¹²; PRBS 2³¹-1 @10.3125Gbps

Transmitter Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Input differential impedance	Rim	-	100	-	Ω
Differential data Input	VtxDIFF	120	-	850	mV
Transmit Disable Voltage	VD	2.0	-	Vcc3+0.3	V
Transmit Enable Voltage	Ven	0	-	+0.8	V
Transmit Disable Assert Time	Vn	-	-	100	us

Receiver Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Input Center Wavelength	Irc	1260		1610	nm
Overload	Rovl	-7			dBm
Minimum Sensitivity	Pmin			-24	dBm
RX_LOS Assert Level	RLOSa	-34			dBm
RX_LOS Deassert Level	RLOSd			-24	dB
RX_LOS Hysteresis	RLOSh	0.5			dB
Receiver Sensitivity					
Data rate (Gb/s)	BER	Dispersion (ps/nm)	Sensitivity back-to-back at OSNR>30dB (dBm)	Power Penalty at OSNR>30dB (dB)	
9.95 ~10.3125	1e-12	-500 to 1450	-24	2	
10.7~11.1	1e-4	-500 to 1300	-27	3	
OSNR Performance					
Data rate (Gb/s)	BER	Dispersion (ps/nm)	Min OSNR Back-to-back at Power: -7 to -16dBm (dB)	Max OSNR Penalty at Power:-7 to -16dBm (dB)	
9.95 ~10.3125	1e-12	-500 to 1450	24	4	
10.7~11.1	1e-4	-500 to 1300	16	4	

Receiver Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Output differential	Rom	-	100	-	Ω

impedance					
Differential Output Swing	Vout P-P	350	-	850	mV
Rise/Fall Time [1]	Tr / Tf		-	40	ps
Loss of Signal Asserted	VOH	2	-	Vcc3+0.3	V
Loss of Signal Negated	VOL	0	-	+0.4	V

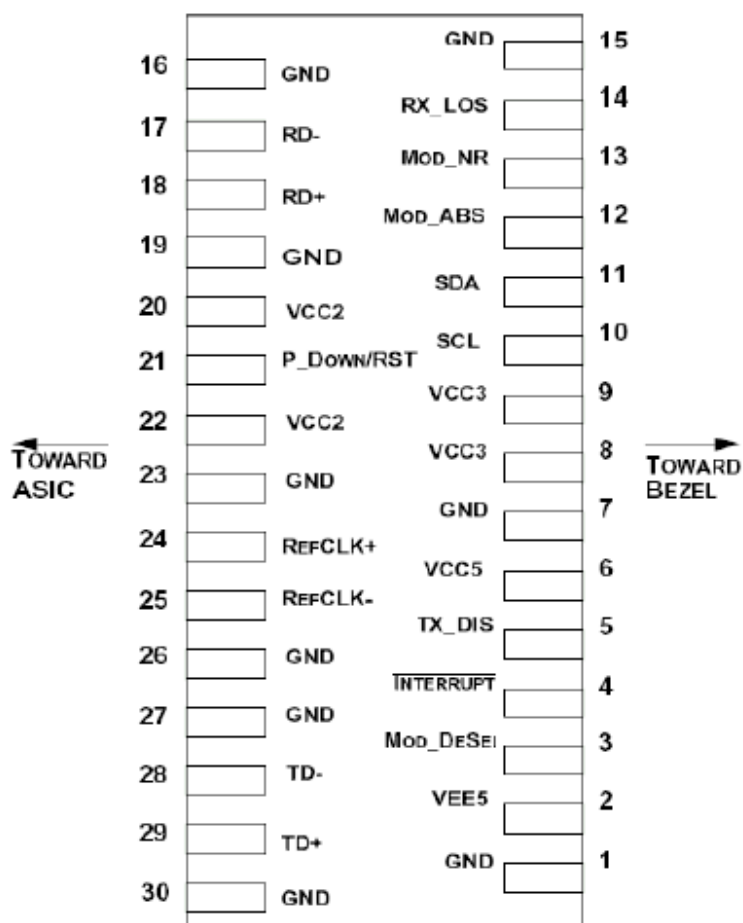
Notes:

[1] 20%~80%

Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Note
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temp
Laser power monitor absolute error	DMI_TX	-3	3	dBm	-7dBm to -26dBm range
RX power monitor absolute error	DMI_RX	-3	3	dBm	Full operating range
Supply voltage monitor absolute error	DMI_VCC	-0.08	0.08	V	
Bias current monitor	DMI_Ibias	-10%	10%	mA	

Pin-out Definition



Pin Descriptions

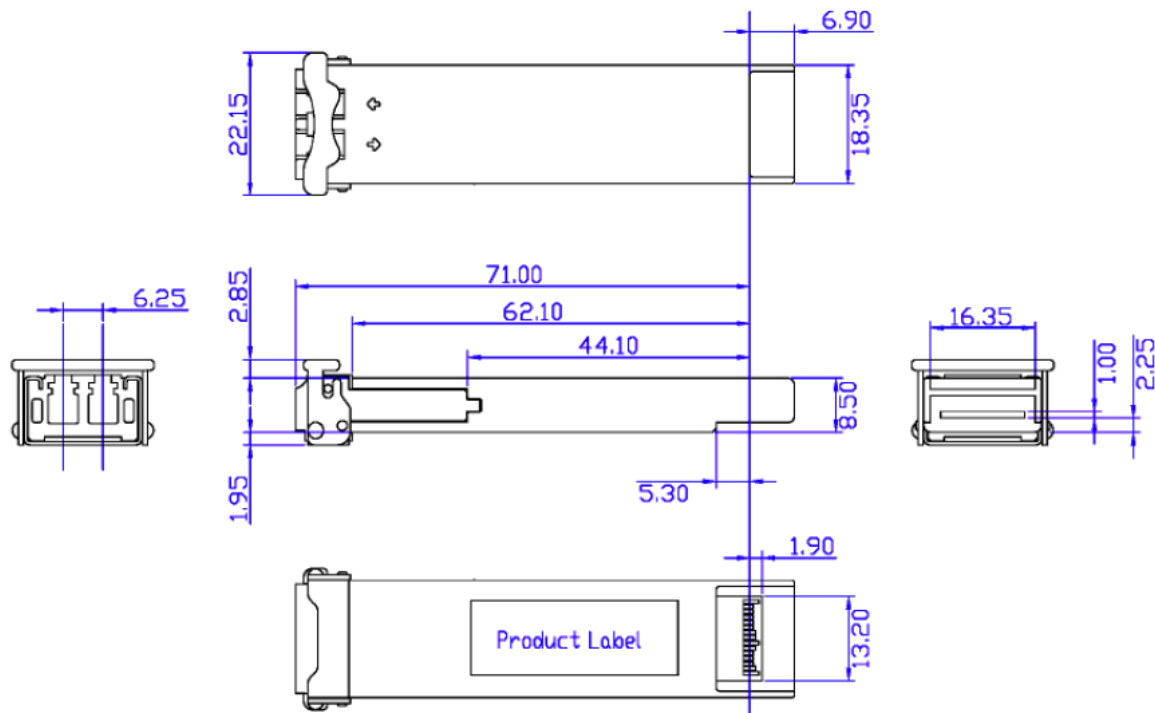
Pin	Logic	Symbol	Name/Description	Ref.
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply – Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to , respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important 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	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V PowerSupply	
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	
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	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board	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. Reference Clock input is not required.

Mechanical Specifications



Regulatory Compliance

Atech XFP transceiver is designed to be Class I Laser safety compliant and is certified per the following standards:

Feature	Agency	Standard	Certificate/Comments
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No. 50	1120288-000
Product Safety	UL	UL and CUL EN60950-2:2007	E347511
Environmental protection	SGS	RoHS Directive 2002/95/EC	GZ1001008706/CHEM
EMC	WALTEK	EN 55022:2006+A1:2007EN 55024:1998+A1+A2:2003 -	WT10093768-D-E-E

References

1. 10 Gigabit Small Form Factor Pluggable Module (XFP) Multi-Source Agreement (MSA), Rev 4.5 – August 2005. Documentation is currently available at <http://www.xfpmsa.org/>

2. IEEE802.3ae – 2002
3. ITU-T G.709 / ITU-T G.959.1 <http://www.itu.int/>
4. Telcordia GR-253-CORE

Ordering information

Par Number	Description
AXFP64-80-DxxCD	DWDM XFP, 10G, 80km, 100GHz ITU grid, -5°C ~ +70°C, DDM
xx=17~61(ITU Channel C band) =62~99, 00~16(ITU Channel L band)	

xx	Frequency (THz)	Wavelength (nm)	xx	Frequency (THz)	Wavelength (nm)
17	191.7	1563.86	40	194.0	1545.32
18	191.8	1563.05	41	194.1	1544.53
19	191.9	1562.23	42	194.2	1543.73
20	192.0	1561.42	43	194.3	1542.94
21	192.1	1560.61	44	194.4	1542.14
22	192.2	1559.79	45	194.5	1541.35
23	192.3	1558.98	46	194.6	1540.56
24	192.4	1558.17	47	194.7	1539.77
25	192.5	1557.36	48	194.8	1538.98
26	192.6	1556.55	49	194.9	1538.19
27	192.7	1555.75	50	195.0	1537.4
28	192.8	1554.94	51	195.1	1536.61
29	192.9	1554.13	52	195.2	1535.82
30	193.0	1553.33	53	195.3	1535.04
31	193.1	1552.52	54	195.4	1534.25
32	193.2	1551.72	55	195.5	1533.47
33	193.3	1550.92	56	195.6	1532.68
34	193.4	1550.12	57	195.7	1531.9
35	193.5	1549.32	58	195.8	1531.12

36	193.6	1548.51	59	195.9	1530.33
37	193.7	1547.72	60	196.0	1529.55
38	193.8	1546.92	61	196.1	1528.77
39	193.9	1546.12			

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