10GBASE-ZR+ XFP 1550nm 100km Transceiver

P/N: AE-XFP-ZR100

Features

- XFP MSA Rev 4.5 Compliant
- Data rate from 9.95Gbps to 11.3Gbps
- Cooled EML with isolator
- APD receiver
- link length up to 100km (with amplifier)
- Low Power Dissipation 3.5W Maximum
- XFI and lineside loopback Mode Supported
- -5ºC to 70ºC Operating Case Temperature
- Diagnostic Performance Monitoring of module temperature, Supply Voltages, laser bias current,
- transmit optical power, and receive optical power
- RoHS compliant (lead free)

Applications

- SONET OC-192&SDH STM 64
- Ethernet (10GBASE and 10GBASE with FEC)
- Fiber Channel (10G and 10G with FEC)

I. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage 1	Vcc3	-0.5	4.0	V
Supply Voltage 2	Vcc5	-0.5	6.0	V
Supply Voltage 3	Vcc2	-0.5	2	V
Storage Temperature	Tst	-40	85	ºC
Case Operating Temperature	Top	-5	70	ºC

II. Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage 1	Vcc3	3.13	3.3	3.47	V
Supply current 1	Icc3	-	-	800	mA
Supply Voltage 2	Vcc5	4.75	5	5.25	V
Supply current 2	Icc5	-	-	500	mA
Supply Voltage 3	Vcc2	1.71	1.8	1.89	V
Supply current 3	Icc2	-	-	750	mA
Operating Case temperature	Tca	-5	-	70	ºC
Module Power Dissipation	Pm	-	-	3.5	W

III. Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate Multirate	Mra	9.95	-	11.3	Gbps
Center Wavelength	□ c	1530	-	1565	pm
Optical Transmit Power	Po	0	-	+5	dBm
Optical Transmit Power (disabled)	PTX_DIS	-	-	-30	dBm
Extinction Ratio	ER	9	-	-	dB
Jitter Generation(P-P)	JG P-P	-	-	0.1	UI
Jitter Generation(RMS)	JG RMS	-	-	0.01	UI
Spectral Width (-20dB)	Δλ20	-		0.3	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Dispersion penalty(2400ps/nm) [1]	DP1	-	-	2	dB
Dispersion penalty(2400ps/nm) [2]	DP2			4	dB
Relative Intensity Noise	RIN	-	-	-130	dB/Hz
Eye Mask	Compliant with ITU-T G.691 STM-64 eye mask				

Note:
BER=10^-12; PRBS 2^31-1@9.95Gbps
BER=10^-12; PRBS 2^31-1@11.3Gbps

IV. 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	-	-	10	us

V. Receiver Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate Multirate	Mra	9.95	-	11.3	Gbps
Receiver Sensitivity 9.95Gb/s [1]	Rsens9	-	-	-26	dBm
Receiver Sensitivity 11.3Gb/s [1]	Rsens11	-	-	-24	dBm
Maximum Input Power	RX-overload	-7	-	-	dBm
Input Operating Wavelength	λ	1528	-	1565	nm
Reflectance	Rrx	-	-	-27	dB
Loss of Signal Asserted	LOS_A	-37	-	-	dBm
LOS De-Asserted	LOS_D	-	-	-27	dBm
LOS Hysteresis	LOS_H	0.5	-	-	dB

Note:
1. BER=10^-12; PRBS 2^31-1;

VI. Receiver Specifications – Electrical

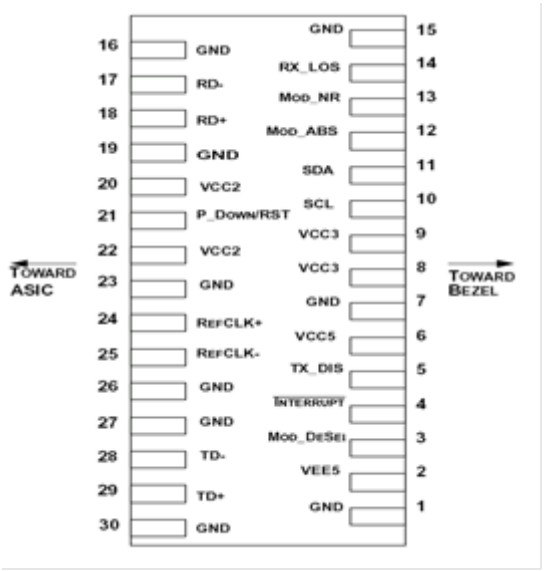
Parameter	Symbol	Min	Typical	Max	Unit
Output differential impedance	Rom	-	100	--	Ω
Differential Output Swing	Vout P-P	350	-	850	mV
Rise/Fall Time [1]	Tr / Tf	24	-	-	ps
Loss of Signal –Asserted	VOH	2	-	Vcc3+0.3-	V
Loss of Signal –Negated	VOL	GND	-	GND+0.5	V

Note:
1. 20%-80%;

VII. Reference Clock

Parameter	Symbol	Min	Typical	Max	Unit
Clock Differential Input Impedance	CI	80	100	120	Ω
Differential Input Clock Amplitude (p-p)	DCA	640-	-	1600	mV
Reference Clock Duty Cycle	RCY	40	-	60	%
Reference Clock Rise/Fall Time [1]	Tr/Tf	200	-	1250	ps
Reference Clock Frequency	*fu*	-	Baud/64	-	MHz

VIII. 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 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	
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 3.15Vand3.6V.

3. Reference Clock input is required.

IX. Ordering information

Part Number	Product Description
AE-XFP-ZR100	XFP, 10Gbps, 1550nm, SMF, 100KM, DDM, LC connector, -5℃ ~ +70℃