

10G XENPAK Transceiver Module



Features

- Supports 9.95Gb/s to 10.5Gb/s bit rates
- 850nm VCSEL and Uncooled 1310nm ,1550nm DFB EA laser
- For 850nm VCSEL Laser, Maximum link length up to 300m, For1310 DFB and 1550 DFB EA Laser, The Maxim link length are 10km and 40Km respectively
- Duplex SC connector
- Power dissipation <6W(10Km),<10W(40Km)
- Built-in digital diagnostic functions
- Temperature range -5°C to 70°C

Applications

- ◆ 10GBASE-SR/LR ,10G Ethernet
- ◆ 10GBASE-ER 10G Ethernet
- ◆ 1200-SM-LL-L 10G Fibre Channel
- ◆ Router interconnect
- ◆ MAN aggregation

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage 1	Vcc1	-0.5		4.0	V	
Maximum Supply Voltage 2	Vcc2	-0.5		6.0	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TOP	-5		70	°C	

Recommend operating condition

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Operating Temperature	Top	-5		70	°C	
Supply Voltage 1	Vcc1	2.9	3.3	3.6	V	
Supply Voltage 2	Vcc2	4.5	5	5.5	V	

Electrical Characteristics (TOP = -5 to 70 °C, VCC5 = 4.75 to 5.25 Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	Vcc1	4.75		5.25	V	
	Vcc2	3.13		3.45	V	
Supply Current	Icc			500	mA	
Module total power	P (10Km)			6	W	
	P(40Km)			10		
High Speed Signals						
Differential data input swing	Vin,pp	160		2000	mV	
Differential data output swing	Vout,pp				mV	
Low Speed Signals						
VIL(MAX)		-	-	0.36	V	1.2V CMOS
VIH(MIN)		0.84	-	1.25	V	1.2V CMOS
Capacitance		-	-	320	pF	Maximum Fanout of 32. 10pF per port
Pull Up Resistance		10k		22k		

Notes:

- Both receive and transmit direction used AC coupling in the transceiver.

Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes and Conditions
Transmitter						
Transmitter Wavelength	λ (300m)	840	850	865	nm	
	λ (10Km)	1260		1355		
	λ (40Km)	1530		1565		
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter Extinction Ratio	EXR(300m)	5			dB	
	EXR(10Km)	6.5				
	EXR(40Km)	7.5				
Transmitter Optical Output Power	P _{out} (300m)	-7.3		-1.0	dBm	Average power coupled into single-mode fiber
	P _{out} (10Km)	-8.2		0.5		
	P _{out} (40Km)	-5		4.5		
Receiver						
Receiver Optical Input Wavelength	λ (300m)	835		860	nm	
	λ (10Km)	1260		1360		
	λ (40Km)	1530		1565		
Receiver Damage Threshold	P _D (300m)			-3	dBm	
	P _D (10Km)			+1		
	P _D (40Km)			+3		
Dispersion Tolerance		0		1600	ps/nm	
Optical Input Power	Pin(300m)	-9.5		-1.1	dBm	1
	Pin(10Km)	-14.0		0.5		1
	Pin(40Km)	-15.5		+4		1
Dispersion Power Penalty				3	dB	1
@ 1600 ps/nm						

1: At Bit error rate (BER) = 10e -12 with IEEE802.3 test pattern

Pin Descriptions

Pin No	Name	Dir	Function	Notes
1	GND		Electrical Ground	1
2	GND		Electrical Ground	1
3	GND		Electrical Ground	1
4	5.0V		Power	2
5	3.3V		Power	2
6	3.3V		Power	2
7	APS		Adaptive Power Supply	2
8	APS		Adaptive Power Supply	2
9	LASI		Open Drain Compatible 10K-22K pull up on host. Logic High: Normal Operation Logic Low: LASI Asserted	4
10	RESET	I	Logic High: Normal Operation, Low: Reset	4
11	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	8
12	TX ON/OFF	I	Open Drain compatible. 10-22K pull-up on transceiver Logic high = Transmitter On Logic low = Transmitter Off	4
13	RESERVED	O	Reserved	4
14	MOD DETECT	O	Pulled low inside module through 1k	
15	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	8
16	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	8
17	MDIO	I/O	Management Data IO	4
18	MDC	I	Management Data Clock	4
19	PRTAD4	I	Port Address Bit 4	4
20	PRTAD3	I	Port Address Bit 3	4
21	PRTAD2	I	Port Address Bit 20	4
22	PRTAD1	I	Port Address Bit 10	4
23	PRTAD0	I	Port Address Bit 0	4
24	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	8
25	RESERVED		Reserved	
26	RESERVED		Reserved for Avalanche Photodiode use.	8
27	APS SENSE		APS Sense Connection	

28	APS		Adaptive Power Supply	2
29	APS		Adaptive Power Supply	2
30	3.3V		Power	2
31	3.3V		Power	2
32	5.0V		Power	2
33	GND		Electrical Ground	1
34	GND		Electrical Ground	1
35	GND		Electrical Ground	1
36	GND		Electrical Ground	1
37	GND		Electrical Ground	1
38	RX CLK+	O	Reserved for WAN Phy	6
39	RX CLK-	O	Reserved for WAN Phy	6
40	GND		Electrical Ground	1
41	RX LANE0+	O	Module XAUI Output Lane 0+	7
42	RX LANE0-	O	Module XAUI Output Lane 0-	7
43	GND		Electrical Ground	1
44	RX LANE1+	O	Module XAUI Output Lane 1+	7
45	RX LANE1-	O	Module XAUI Output Lane 1-	7
46	GND		Electrical Ground	1
47	RX LANE2+	O	Module XAUI Output Lane 2+	7
48	RX LANE2-	O	Module XAUI Output Lane 2-	7
49	GND		Electrical Ground	1
50	RX LANE3+	O	Module XAUI Output Lane 3+	7
51	RX LANE3-	O	Module XAUI Output Lane 3-	7
52	GND		Electrical Ground	1
53	GND		Electrical Ground	1
54	GND		Electrical Ground	1
55	TX LANE0+	I	Module XAUI Input Lane 0+	7
56	TX LANE0-	I	Module XAUI Input Lane 0-	7
57	GND		Electrical Ground	1
58	TX LANE1+	I	Module XAUI Input Lane 1+	7
59	TX LANE1-	I	Module XAUI Input Lane 1-	7
60	GND		Electrical Ground	1
61	TX LANE2+	I	Module XAUI Input Lane 2+	7
62	TX LANE2-	I	Module XAUI Input Lane 2-	7
63	GND		Electrical Ground	1
64	TX LANE3+	I	Module XAUI Input Lane 3+	7
65	TX LANE3-	I	Module XAUI Input Lane 3-	7
66	GND		Electrical Ground	1
67	TX CLK+	I	Reserved for WAN Phy	6
68	TX CLK-	I	Reserved for WAN Phy	6

69	GND		Electrical Ground	1
70	GND		Electrical Ground	1

Notes:

- 1) Ground connections are common for TX and RX.
- 2) VCC contacts are each rated at 0.5A nominal.
- 3) Timing characteristics for further study but expected to be the same as SFP.
- 4) 1.2V CMOS compatible.
- 5) MDIO and MDC timing must comply with IEEE802.3ae, Clause 45.3
- 6) Clock Input and Output characteristics for further study.
- 7) XAUI output characteristics should comply with IEEE802.3ae Clause 47.
- 8) Transceivers will be MSA compliant when no signals are present on the vendor specific pins.
- 9) Minimum delay from TX .off. to loss of optical power 100us, TX on or off, minimum pulse width 100us

70	GND
69	GND
68	TX CLK-
67	TX CLK+
66	GND
65	TX LANE3-
64	TX LANE3+
63	GND
62	TX LANE2-
61	TX LANE2+
60	GND
59	TX LANE1-
58	TX LANE1+
57	GND
56	TX LANE0-
55	TX LANE0+
54	GND
53	GND
52	GND
51	RX LANE3-
50	RX LANE3+
49	GND
48	RX LANE2-
47	RX LANE2+
46	GND
45	RX LANE1-
44	RX LANE1+
43	GND
42	RX LANE0-
41	RX LANE0+
40	GND
39	RX CLK-
38	RX CLK+
37	GND
36	GND

Top of Transceiver PCB

1	GND
2	GND
3	GND
4	5.0V
5	3.3V
6	3.3V
7	APS
8	APS
9	LASI
10	RESET
11	VEND SPECIFIC
12	TX ON/OFF
13	RESERVED
14	MOD DETECT
15	VEND SPECIFIC
16	VEND SPECIFIC
17	MDIO
18	MDC
19	PRTAD4
20	PRTAD3
21	PRTAD2
22	PRTAD1
23	PRTAD0
24	VEND SPECIFIC
25	RESERVED
26	RESERVED
27	APS SENSE
28	APS
29	APS
30	3.3V
31	3.3V
32	5.0V
33	GND
34	GND
35	GND

Bottom of Transceiver PCB
(as viewed through top)

General Specifications

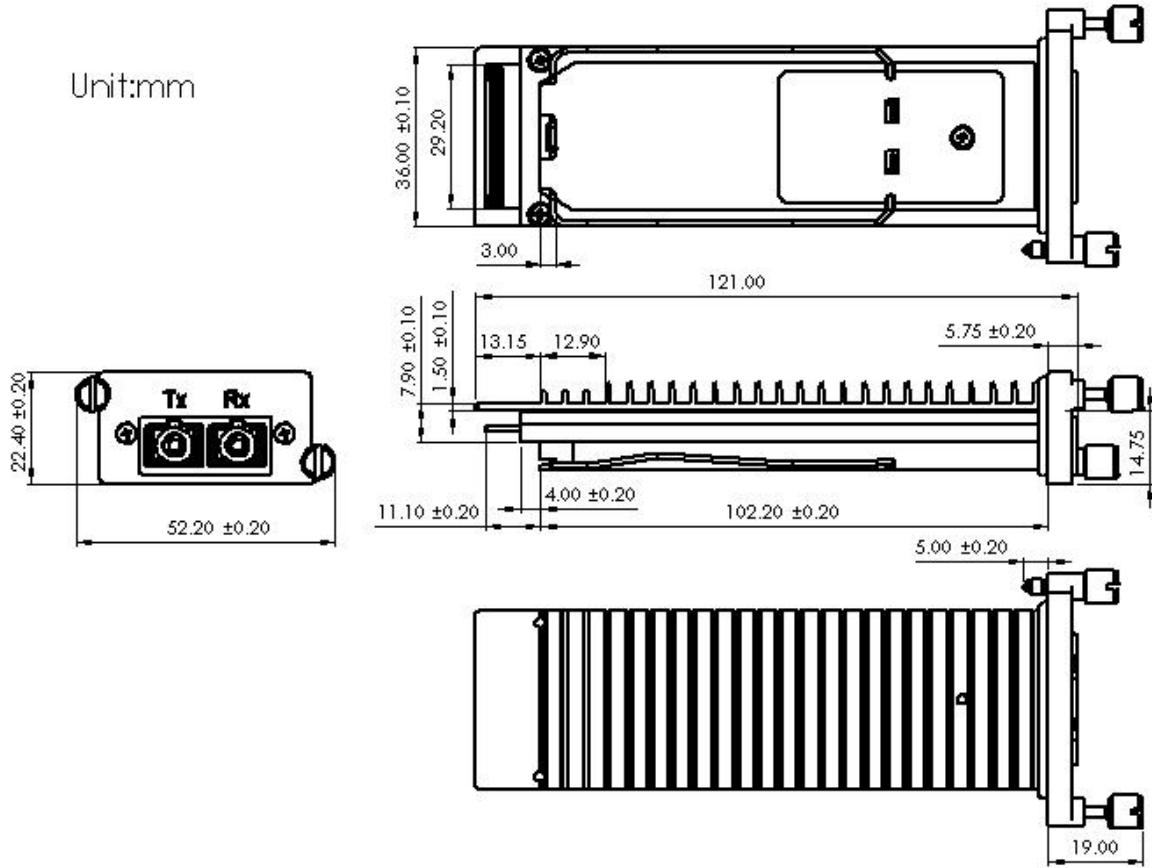
Ace Plus's XENPAK-10GB Small Form Factor 10Gb/s XENPAK transceivers are compliant with the current XENPAK Multi-Source Agreement (MSA) Specification. They comply with 10-Gigabit Ethernet 10GBASE-SR/LR/ER per IEEE 802.3ae and 10G Fibre Channel 1200-SM-LL-L. Digital diagnostics functions are available via a 2-wire serial interface, as specified in the XENPAK MSA.

Management Interface

XENPAK transceivers support the MDIO interface specified in IEEE802.3ae Clause 45. In addition to the appropriate registers to support the IEEE standard there are some registers specific to XENPAK. The Organisationally Unique Identifier method is a means not only of identifying XENPAK but also of determining the location XENPAK specific registers.

Mechanical Specifications

Ace Plus 's XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface
XENPAK-SR	10G	850 VSCSEL	MMF	<300m	SC
XENPAK-LR		1310 DFB	SMF	10Km	
XENPAK-ER		1550 DFB EA		40Km	