

XEN-10GBASE-LR-C

MSA and TAA 10GBase-LR XENPAK Transceiver (SMF, 1310nm, 10km, SC, DOM)

Features:

- INF-8474 Compliance
- Duplex SC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



Applications:

- 10GBase-LR Ethernet
- 8x/10x Fibre Channel
- Access, Datacenter and Enterprise
- Mobile Fronthaul CPRI/OBSAI

Product Description

This MSA compliant XENPAK transceiver provides 10GBase-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an SC connector. It can operate at temperatures between 0 and 70C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products.")



Absolute Maximum Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Ambient Temperature Range		Tstg	-40		+85	°C	
Powered Case Temperature Range					+70	°C	
Supply Voltage APS		Vaps			1.5	V	
Supply Voltage Range @ 3.3V		Vcc3	-0.5		4.0	V	
Operating Case Temperature		Tc			+70	°C	
Power Supply Voltage	Vcc3		3.13	3.3	3.47	V	
	Vaps		1.152	1.2	1.248		
Power Dissipation		PD		3.5	4	W	
Operating Range	Single-Mode Fiber	Lop	2		10,000	m	
Data Rate	10GBASE-LR Module	DR		10.3125		Gbps	

Electrical DC Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
1.2V CMOS (1.8V CMOS Compatible) I/O DC Characteristics (PRTAD;LASI;RESET;TX_ONOFF)							
Output High Voltage		VOH	1			V	1
Output Low Voltage		VOL			0.15	V	
Input High Voltage		VIH	0.84		1.5	V	
Input Low Voltage		VIL			0.36	V	
Input Pull-Down Current		IPD	20		120	uA	
XAUI I/O DC Characteristics (TXLANE[0..3]; RXLANE[0..3])							
Differential Input Amplitude (Pk-Pk)			220		1600	mV	4
Differential Output Amplitude (Pk-Pk)			800		1600		4
MDIO I/O DC Characteristics (MDIO; MDC)							
Output Low Voltage		VOL	-0.3		0.2	V	
Output Low Current		IOL			20	mA	
Input High Voltage		VIH	0.84		1.5	V	
Input Low Voltage		VIL	-0.3		0.36	V	

Notes:

1. For 1.8V CMOS, VOH=1.65V (minimum), VOL=0.15V (maximum), VIH=1.17V (minimum), and VIL = 0.63V (maximum).
2. Rpull-up=10kΩ to 1.86V.
3. VIN=1.8V.
4. AC coupled.

Electrical AC Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
XAUI Input AC Characteristics (TXLANE[0..3])						
XAUI Baud Rate	DRin		3.125		Gbps	
Differential Input Impedance	ZIN	80	100	120	Ω	
XAUI Output AC Characteristics (RXLANE[0..3])						
XAUI Baud Rate	DRout		3.125		Gbps	
XAUI Eye Mask (Far-End)	According to IEEE 802.3ae					3
Output Differential Impedance	ZO	80	100	120	Ω	
Total Jitter	TJXAUI			0.35	UI	4
Deterministic Jitter	DJXAUI			0.37	UI	4
Power-On Reset AC Characteristics						
Power-On Reset AC Characteristics	According to XENPAK MSA Issue 3.0, 2002-9-18					
MDIO I/O AC Characteristics (MDIO; MDC)						
MDIO Data Hold Time	tHOLD	10			ns	
MDIO Data Set-Up Time	tSU	10			ns	
Delay from MDC Rising Edge to MDIO Data Change	tDELAY			300	ns	2
MDC Clock Rate	fMAX			2.5	MHz	1

Notes:

1. 100MHz to 2.5GHz.
2. At crossing point.
3. Per IEEE Std 802.3ae.
4. At near-end, no pre-equalization, 1UI = 320ps.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Average Launch Power	Pavg	−8.2		−0.5	dBm	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Center Wavelength Range	λ	1260	1310	1355	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	4.0	6		dB	
RIN _{12OMA}	RIN			−128	dB/Hz	
Eye Mask Definition	According to IEEE 802.3ae					1
Optical Return Loss Tolerance	ORLT			12	dB	
Average Launch Power of Off Transmitter	Poff			−30	dBm	
Receiver						
Stressed Receiver Sensitivity in OMA	Psen			−10.3	dBm	2
Receiver Sensitivity in OMA	Psen			−12.6	dBm	2
Power Overload	Po	0.5			dBm	
Signal Detect Assert Level	PSD			−13	dBm	
Signal Detect Hysteresis	PSD	1			dB	
Center Wavelength Range	λ	1260		1355	nm	

Notes:

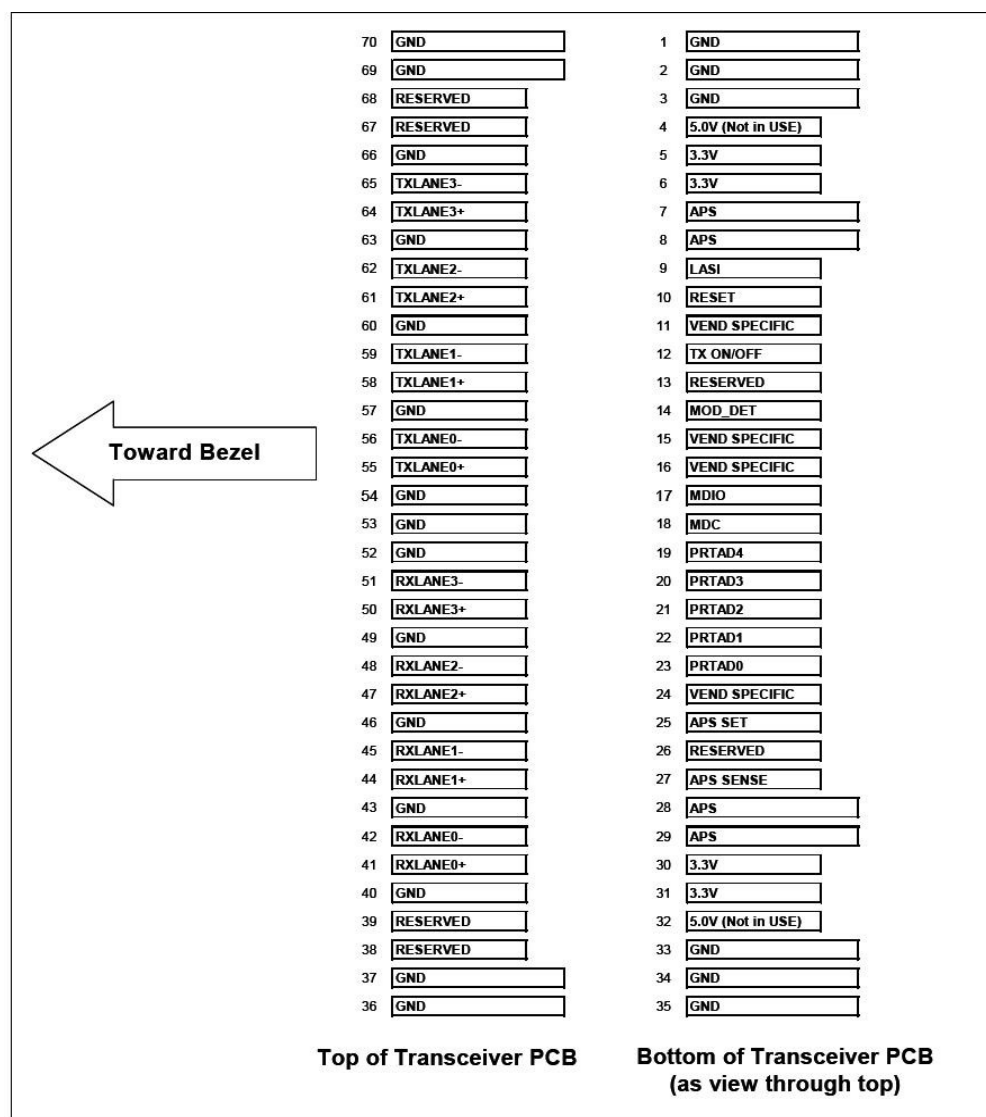
1. Conforms to IEEE triple trade-off between center wavelength, RMS spectral width, and minimum OMA.
2. Receiver sensitivity, which is defined for an ideal input signal, is informative only.

Pin Descriptions

Item #	Signal Name	Level	I/O	Pin	Name/Description
1	GND			1, 2, 3, 33, 34, 35, 36, 37, 40, 43, 46, 49, 52, 53, 54, 57, 60, 63, 66, 69, 70	Ground connection for signal ground on the module.
2	APS	+1.2V		7, 8, 28, 29	Input from Adaptive Power Supply.
3	APS SENSE	+1.2V		27	APS Sense Output. Connected to the APS sense output. Connected to the APS input from APS.
4	APS SET			25	Feedback Input from APS. Connected to the GND through a 1.18kΩ resistor inside the transponder.
5	3.3V	+3.3 V DC		5, 6, 30, 31	DC Power Input,+5.0V DC, Nominal.
6	Reserved			25	Reserved for APD.
7	Reserved			13	Reserved.
8	MDIO	Open Drain	I/O	17	Management Data I/O. Requires external 10-22kΩ pull-up to the APS on the host.
9	MDC	1.2V CMOS	I	18	Management Data Clock Input.
10	PRTAD4	1.2V CMOS	I	19	Port Address Input Bit 4.
11	PRTAD3	1.2V CMOS	I	20	Port Address Input Bit 3.
12	PRTAD2	1.2V CMOS	I	21	Port Address Input Bit 2.
13	PRTAD1	1.2V CMOS	I	22	Port Address Input Bit 1.
14	PRTAD0	1.2V CMOS	I	23	Port Address Input Bit 0.
15	LASI	Open Drain	O	9	Link Alarm Status Interrupt Output. Open drain compatible output with 10 - 20kΩ pull-up on the host. Logic high = normal operation. Logic low = status flag triggered.
16	RESET	Open Drain	I	10	Reset Input. Open drain compatible input with 22kΩ pull-up to APS internal to the transponder. Logic high = normal operation. Logic low = reset.
17	Vendor-Specific			11, 15, 16, 24	Vendor-Specific Pins. Leave unconnected when not used.
18	TX ON/OFF	Open Drain	I	12	TX ON/OFF Input. Open drain compatible input with 22kΩ pull-up to APS internal to the transponder. Logic high = transmitter on. Logic low = transmitter off.
19	MOD DETECT		O	14	Pulled low inside the transponder through a 1kΩ resistor to the ground.
20	Reserved		I	67, 68, 38, 39	Reserved for future use.
21	TX LANE 3– TX LANE 3+		I	65 64	Module XAUI Input Lane 3– Module XAUI Input Lane 3+
22	TX LANE 2– TX LANE 2+		I	62 61	Module XAUI Input Lane 2– Module XAUI Input Lane 2+
23	TX LANE 1– TX LANE 1+		I	59 58	Module XAUI Input Lane 1– Module XAUI Input Lane 1+

24	TX LANE 0– TX LANE 0+		I	56 55	Module XAUI Input Lane 0– Module XAUI Input Lane 0+
25	RX LANE 0+ RX LANE 0–		O	41 42	Module XAUI Output Lane 0+ Module XAUI Output Lane 0–
26	RX LANE 1+ RX LANE 1–		O	44 45	Module XAUI Output Lane 1+ Module XAUI Output Lane 1–
27	RX LANE 2+ RX LANE 2–		O	47 48	Module XAUI Output Lane 2+ Module XAUI Output Lane 2–
28	RX LANE 3+ RX LANE 3–		O	50 51	Module XAUI Output Lane 3+ Module XAUI Output Lane 3–

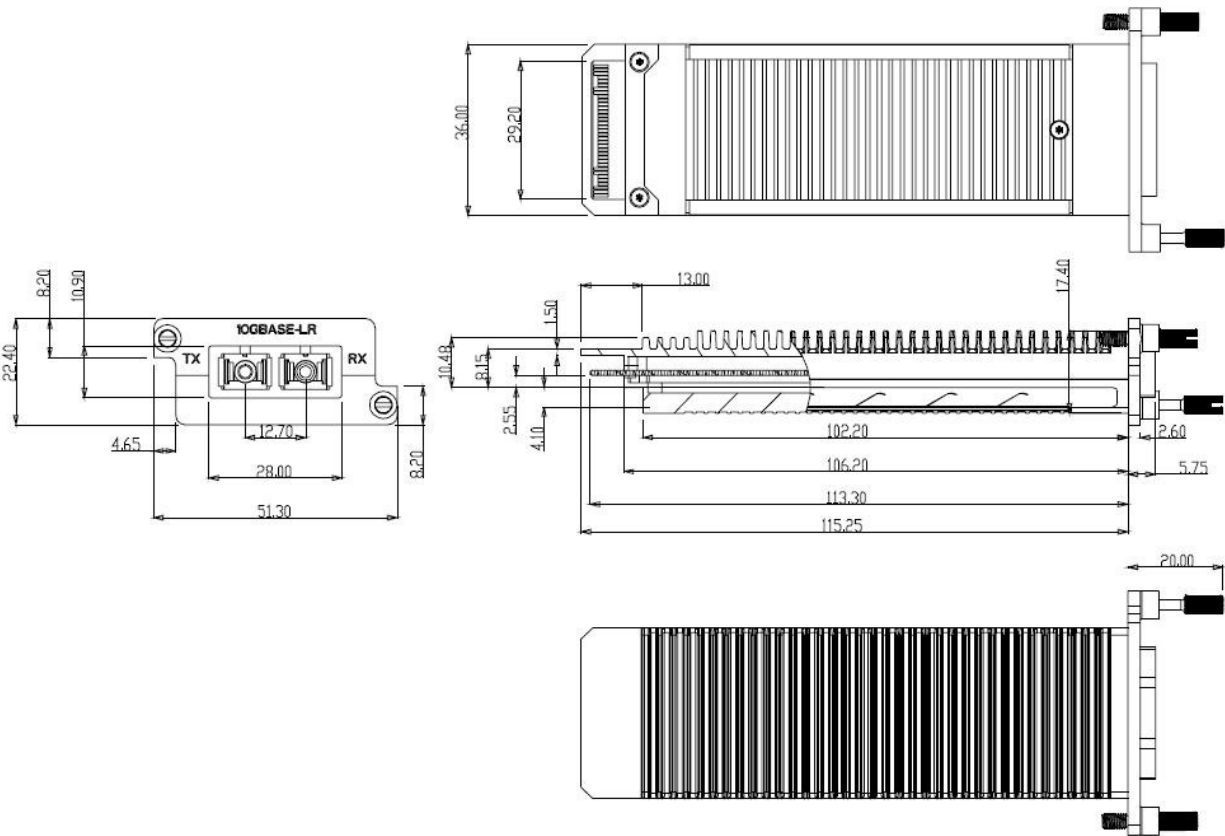
Electrical Pad Layout



Host PCB Xenpak Pin-Out

1	 GND	GND 	70
2	 GND	GND 	69
3	 GND	RESERVED 	68
4	 5.0V (Not in USE)	RESERVED 	67
5	 3.3V	GND 	66
6	 3.3V	TXLANE3- 	65
7	 APS	TXLANE3+ 	64
8	 APS	GND 	63
9	 LASI	TXLANE2- 	62
10	 RESET	TXLANE2+ 	61
11	 VEND SPECIFIC	GND 	60
12	 TX ON/OFF	TXLANE1- 	59
13	 RESERVED	TXLANE1+ 	58
14	 MOD_DET	GND 	57
15	 VEND SPECIFIC	TXLANE0- 	56
16	 VEND SPECIFIC	TXLANE0+ 	55
17	 MDIO	GND 	54
18	 MDC	GND 	53
19	 PRTAD4	GND 	52
20	 PRTAD3	RXLANE3- 	51
21	 PRTAD2	RXLANE3+ 	50
22	 PRTAD1	GND 	49
23	 PRTAD0	RXLANE2- 	48
24	 VEND SPECIFIC	RXLANE2+ 	47
25	 APS SET	GND 	46
26	 RESERVED	RXLANE1- 	45
27	 APS SENSE	RXLANE1+ 	44
28	 APS	GND 	43
29	 APS	RXLANE0- 	42
30	 3.3V	RXLANE0+ 	41
31	 3.3V	GND 	40
32	 5.0V (Not in USE)	RESERVED 	39
33	 GND	RESERVED 	38
34	 GND	GND 	37
35	 GND	GND 	36

Mechanical Specifications



About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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