

TS-XENPAK-CWDM-80

10Gbps CWDM XENPAK Optical Transceiver, 80km Reach

Features

- XENPAK MSA Compliant
- 70-PIN connector
- SC duplex receptacle package
- Wavelength selectable to ITU-T standards covering CWDM grid wavelengths
- Cooled EA-DFB/APD-PD
- Power supply: +5.0 V, +3.3 V, APS:+1.2 V
- Power Dissipation 4W Maximum
- 0°C to 70°C Operating Case Temperature
- Digital Diagnostic Monitoring
- Management and control with MDIO 2-wire bus
- XAUI electrical interface 4 x 3.125 Gb/s Ethernet
- RoHS6 compliant and lead free



Applications

- 10 Gb/s Ethernet transmission systems

Absolute Maximum Ratings^{*Note}

Parameter	Symbol	Min	Max	Unit
Supply Voltage Range @ 3.3V	V _{CC3}	-0.5	4.0	V
Adaptable Power Supply(APS)	V _{APS}	0	2	V
Operating Relative Humidity	RH		80	%
Storage Temperature	T _s	-40	+85	°C

Note: Exceeding any one of these values may destroy the device permanently.

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T _c	0		+70	°C

Power Supply Voltage @ 3.3V	V _{CC3}	3.14	3.3	3.47	V
Adaptable Power Supply (APS)	V _{APS}	1.14	1.2	1.26	V
Power Dissipation	PD			4	W

Optical Interface

Parameter	Symbol	Min	Typical	Max	Unit
Transmitter Characteristics					
Center Wavelength	λ_c	1464.5		1617.5	nm
Center wavelength stability	$\Delta\lambda_D$	-6.5	λ_c	+6.5	nm
Optical Transmit Power	P _o	0		5	dBm
Optical Transmit Power (disabled)	P _{tx-dis}			-40	dBm
Extinction Ratio	ER	9			dB
Side Mode Suppression Ratio	SMSR	30			dB
Eye Mask	IEEE 802.3ae Compliant				
Receiver Characteristics					
Input Operating Wavelength	λ	1260		1600	nm
Received power	R _{po}	-23		-7	dBm
Maximum Input Power	RX-overload	-7			dBm
Reflectance	R _{rx}			-27	dB

XAUI I/O Characteristics ^{*Note}

Parameter	Symbol	Min	Typical	Max	Unit	Notes
XAUI Data Rate	DR		3.125		Gb/s	
XAUI Baud Rate		-100		+100	ppm	Relative Tolerance
Differential Input Voltage Swing		220		1600	mv	8B/10B Coded Input Signal
Differential Output Voltage Swing		800		1600	mVp-p	RLOAD = 100Ω ± 5%
Differential Input Impedance		80	100	120	Ω	
Total Output Jitter	TJ _{XAUI}			0.35	UI	no pre-equalization
Total Deterministic Output Jitter	DJ _{XAUI}			0.17	UI	no pre-equalization

Note: XAUI-input-Lanes and XAUI-output-Lanes are both ac-inputs.

MDIO Interface
DC Characteristics

Characteristic	Condition	Symbol	Minimum	Maximum	Unit
Input high voltage		V _H	0.84	1.5	V
Input low voltage		V _L	-0.3	0.36	V

MDIO Input current	MMD Driver in tri-state	I_{MDIO}	-10	8	pA
MDC Input current		I_{MDC}	-5	5	pA
Output low voltage	IOL= 100pA	V_{OL}	-0.3		V
	IOL= 4mA	V_{OL}		0.2	V
Output high voltage	RPULL-Up = 357Ω ±1% VPULL-Up = 1.14~1.5V	V_{OH}	1.136	1.5	V
Output low current	VI = 0.2V	I_{OL}	4		mA
MDIO Input capacitance	VI = 0~1.5V	Cin		10	pF

CWDM Wavelength (0°C ~70°C)

Band	Nomenclature	Wavelength(nm)		
		Min	Typ	Max
S-band Short Wavelength	47	1464	1470	1477.5
	49	1484	1490	1497.5
	51	1504	1510	1517.5
	53	1524	1530	1537.5
C-band Conventional	55	1544	1550	1557.5
L-band Long Wavelength	57	1564	1570	1577.5
	59	1584	1590	1597.5
	61	1604	1610	1617.5

Note: 8 Wavelengths from 1470nm to 1610nm, each step 20nm.

Pin Descriptions

Pin No.	Name	Dir	Function	Note
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 =1.2V		Adaptive Power Supply	2
8	APS =1.2V		Adaptive Power Supply	2
9	LASI		Open Drain Compatible 10K-22K pull up on host. Logic High: Normal Operation Logic Low : LASIAsserted	3
10	RESET	I	Open Drain compatible.	3

			10-22K pull-up on transceiver Logic high = Normal operation Logic low = Reset Minimum reset assert time 1 ms	
11	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	6
12	TX ON/OFF	I	Open Drain compatible. 10-22K pull-up on transceiver Logic high = Transmitter On (capable) Logic low = Transmitter Off (always)	3
13	RESERVED		Reserved	3
14	MOD DETECT	O	Pulled low inside module through 1k	
15	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	6
16	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	6
17	MDIO	I/O	Management Data IO	3,4
18	MDC	I	Management Data Clock	3,4
19	PRTAD4	I	Port Address Bit 4 (Low = 0)	3
20	PRTAD3	I	Port Address Bit 3 (Low = 0)	3
21	PRTAD2	I	Port Address Bit 2 (Low = 0)	3
22	PRTAD1	I	Port Address Bit 1 (Low = 0)	3
23	PRTAD0	I	Port Address Bit 0 (Low = 0)	3
24	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	6
25	APS SET		Feedback input for APS	
26	RESERVED		Reserved for Avalanche Photodiode use.	6
27	APS SENSE		APS Sense Connection	
28	APS =1.2V		Adaptive Power Supply	2
29	APS =1.2V		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	RESERVED		Reserved	
39	RESERVED		Reserved	
40	GND		Electrical Ground	1
41	RX LANE0+	O	Module XAUI Output Lane 0+	5
42	RX LANE0-	O	Module XAUI Output Lane 0-	5
43	GND		Electrical Ground	1
44	RX LANE1+	O	Module XAUI Output Lane 1+	5
45	RX LANE1-	O	Module XAUI Output Lane 1-	5

46	GND		Electrical Ground	1
47	RX LANE2+	O	Module XAUI Output Lane 2+	5
48	RX LANE2-	O	Module XAUI Output Lane 2-	5
49	GND		Electrical Ground	1
50	RX LANE3+	O	Module XAUI Output Lane 3+	5
51	RX LANE3-	O	Module XAUI Output Lane 3-	5
52	GND		Electrical Ground	1
53	GND		Electrical Ground	1
54	GND		Electrical Ground	1
55	TX LANE0+	I	Module XAUI Output Lane 0+	5
56	TX LANE0-	I	Module XAUI Output Lane 0-	5
57	GND		Electrical Ground	1
58	TX LANE1+	I	Module XAUI Output Lane 1+	5
59	TX LANE1-	I	Module XAUI Output Lane 1-	5
60	GND		Electrical Ground	1
61	TX LANE2+	I	Module XAUI Output Lane 2+	5
62	TX LANE2-	I	Module XAUI Output Lane 2-	5
63	GND		Electrical Ground	1
64	TX LANE3+	I	Module XAUI Output Lane 3+	5
65	TX LANE3-	I	Module XAUI Output Lane 3-	5
66	GND		Electrical Ground	1
67	RESERVED		Reserved	
68	RESERVED		Reserved	
69	GND		Electrical Ground	1
70	GND		Electrical Ground	1

Notes:

- 1) Ground connections are common for TX and RX.
- 2) All connector contacts are rated at 0.5A nominal.
- 3) 1.2V CMOS compatible.
- 4) MDIO and MDC timing must comply with IEEE802.3ae, Clause 45.3
- 5) XAUI output characteristics should comply with IEEE802.3ae Clause 47.
- 6) Transceivers will be MSA compliant when no signals are present on the vendor specific pins.

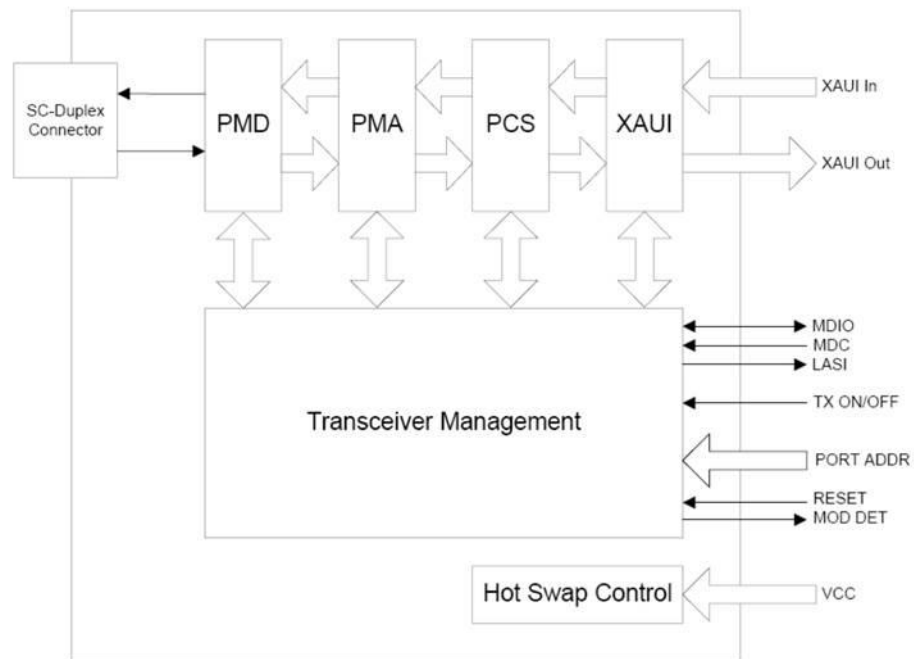


Figure1. Functional Diagram of Typical XENPAK Style Transceiver

Electrical Pad Layout

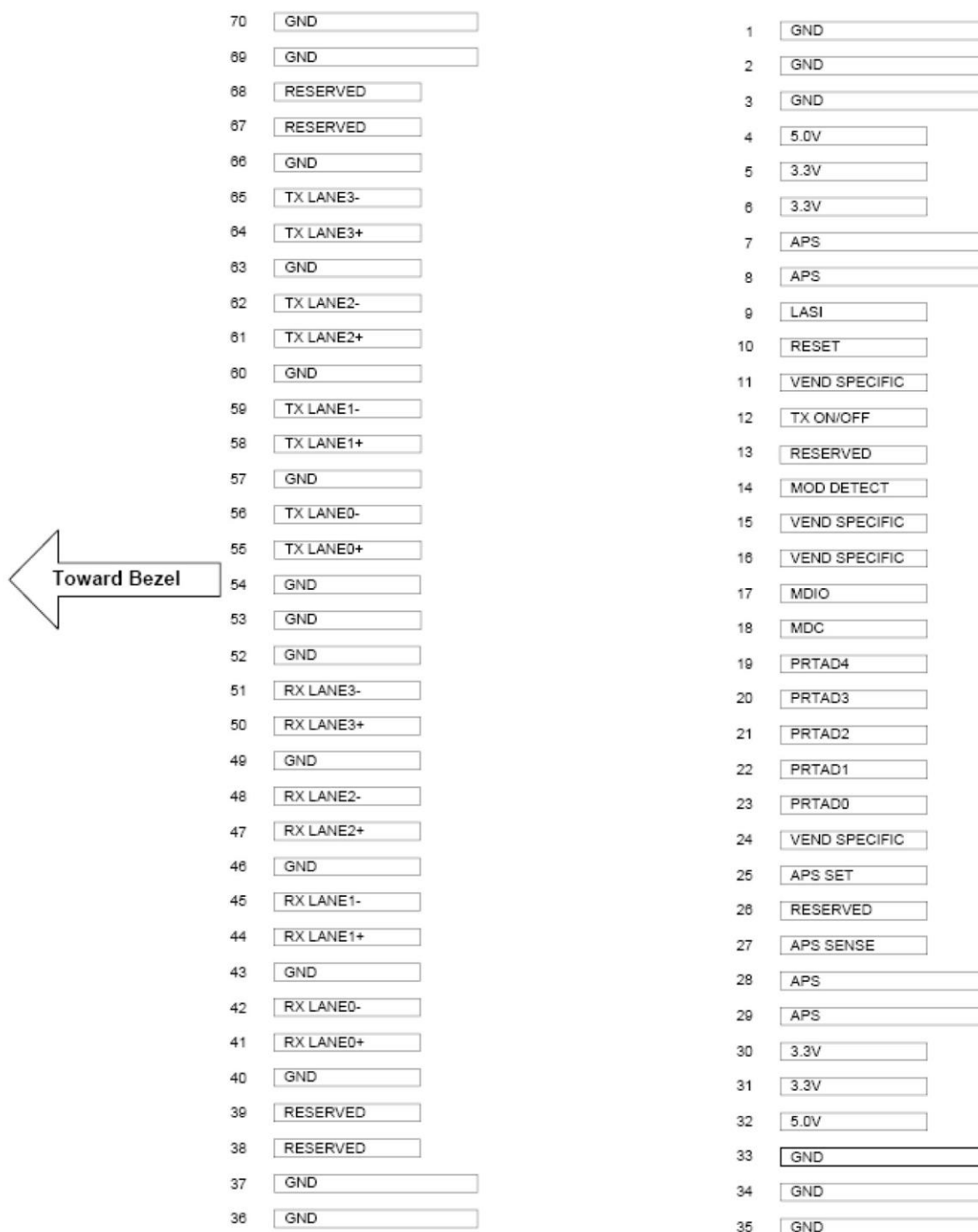


Figure2.Electrical Pin-out Details

Component Recognition	UL and CUL EN60950-1:2006	UL file E317337 TüV Certificate No. 50135086 (CB scheme)
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards ^{*note}

Note:

For update of the equipments and strict control of raw materials, TONGSION has the ability to supply the customized products since Jan 1st, 2007, which meets the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.

In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item 13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for TONGSION's transceivers, because TONGSION's transceivers use glass, which may contain Pb, for components such as lenses, isolators, and other electronic components.

Ordering information

Part Number	Product Description
TS-XENPAK-CWDM-80	1470~1610nm, 10Gbps, SC, 80km, 0°C~+70°C, With DDM

Note: xx refers to CWDM Wavelength, from 1470nm to 1610nm, xx=47, 49...and 61.

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by TONGSION before they become applicable to any particular order or contract. In accordance with the TONGSION policy of continuous improvement specifications may change without notice.

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