T-10G-X2-SM-40KM

10Gbps X2 Single Mode Transceiver 40km

Features

X2 MSA Compliant
70-PIN Connector
SC duplex receptacle package
Cooled EA-DFB/PIN-PD
Power Supply: +5.0V,+3.3V, APS:+1.2V
Power Dissipation 4W Maximum
0℃ to 70℃ Operating Case Temperature
Digital Diagnostic Monitoring
Management and control with MDIO 2 wire bus
XAUI electrical interface 4X3.125Gb/s Ethernet
≤40km ER (Extended Range) 10GBE
RoHS compliant

Applications

10Gb/s Ethernet transmission systems
10Gb/s Ethernet Switched and Routers
10GE Core-routers and Storage

Ordering Information

Part No.	Data Rate	Fiber	Distance	Interface	Temperature	DDMI
T-10G-X2-SM-40 KM	9.95~10.3Gbps	SMF	1550nm 40KM	SC	Standard	YES

Regulatory Compliance

Feature	Agency	Standard	Certificate / Comments
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No.50	1120292-000
Product Safety	UL	UL and CUL EN60950-2:2007	WT10093766-D-E-E
Environmental Protection	SGS	RoHS Directive 2002/95/EC	GZ1001008918/CHEM
EMC	WALTEK	EN55022:2006+A1:20077 EN55024:1998+A1+A2:2003	WT10093759-D-E-E

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage +5V	Vcc5		6.0	V
Supply Voltage _3.3V	Vcc3		4	V
Supply Voltage APS	Vaps		2	V
Storage Temperature	Tst	-20	85	°C
Optical Input Received Power	PIN		-1	dBm

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	Tca	0		70	°C
Supply Voltage +5V	Vcc5	4.75	5	5.25	V
Supply Current +5V	Icc5			500	mA
Supply Voltage +3.3V	Vcc3	3.14	3.3	3.47	V
Supply Current +3.3V	Icc3			1000	mA
Supply Voltage APS	Vaps	1.14	1.2	1.26	V
Supply Current APS	Iaps			1100	mA
Module Power Dissipation	Pm			4	W

Transmitter Specifications-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
Center Wavelength	λ_c	1530		1565	nm
Optical Transmit Power	Po	-1		2	dBm
Optical Transmit Power(disable)	Ptx-dis			-40	dBm
Extinction Ratio	ER	9			dB
Side Mode Suppression Ratio	SMSR	30			dB
Eye Mask	IEEE 802.3ae Compliant				

Receiver Specifications-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
Input Operating Wavelength	λ_c	1260		1600	nm
Average Receive Power	Pavg	-15.8		-1.0	dBm
Receiver Sensitivity in 10.3Gbps(OMA)	Rsen1			-14.1	nm
Stressed Receiver Sensitivity in 10.3Gbps(OMA)	Rsen2			-11.3	dBm
Reflectance	Rrx			-26	dB
LOS Asserted	Lsa	-28			dBm
LOS De-Asserted	Lda			-19	dBm
LOS Hysteresis	Lh	0.5			dB

Transmitter Specification-Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit
Data Rate(TXLINE0-3)	TX-xaui		3125		Mbps
Differential Impendance	Zo	80	100	120	Ω
Differential Input Amplitude	Vin P-P	160		2000	mVpp
Input Rise/Fall	TR /TF	60		130	ps
Differential Impendence of Zin	Zin		100		ohm

Receiver Specification-Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit
Data Rate(TXLINE0-3)	RX-xaui		3125		Mbps
Supply Voltage	VccRX	3.13	3.3	3.47	V
Differential Output Amplitude	Vout P-P	800		1600	mV
Rise / Fall Time	Tr / Tf	50		90	ps
Differential Impendence of Zout	Zout		100		ohm

Signal Specification-Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit
1.2V CMOS					
Input High Voltage	VIL(MAX)			0.36	V
Input Low Voltage	VIH(MIN)	0.84		1.25	V
Capacitance				320	pF
Pull Up Resistance	Rpull	10k		22k	ohm
MDIO I/O					
Output Low Voltage	VOL	-0.3		0.2	V
Output Low Current	IOL			4	mA
Input High Voltage	VIH	0.84		1.5	V
Input Low Voltage	VIL	-0.3		0.36	V
Pull-up Supply Voltage	VPULL	1.14	1.2	1.26	
Input Capacitance	CIN			10	Pf
Load Capacitance	CLOD			470	Pf
External Pull-up Resistance	EPULL	200			Ohm

Pin Definition

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=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: LASI Asserted	4
10	RESET	I	Open Drain compatible. 10-22K pull-up on transceiver Logic high = Normal operation Logic low = Reset Minimum reset assert time 1 ms	4
11	VEND SPECIFIC		Vendor Specific Pin.	8
			Leave unconnected when not in use.	
12	TX ON/OFF	I	Open Drain compatible. 10-22K pull-up on transceiver Logic high = Transmitter On (capable) Logic low = Transmitter Off (always)	4
13	RESERVED		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	4.5
18	MDC	I	Management Data Clock	4.5
19	PRTAD4	I	Port Address Bit 4 (Low = 0)	4
20	PRTAD3	I	Port Address Bit 3 (Low = 0)	4
21	PRTAD2	I	Port Address Bit 2 (Low = 0)	4
22	PRTAD1	I	Port Address Bit 1 (Low = 0)	4
23	PRTAD0	I	Port Address Bit 0 (Low = 0)	4
24	VEND SPECIFIC		Vendor Specific Pin. Leave unconnected when not in use.	8
25	APS SET		Feedback input for APS	
26	RESERVED		Reserved for Avalanche Photodiode use.	8
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+	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 LANE 0+	I	Module XAUI Input Lane 0+	7
56	TX LANE 0-	I	Module XAUI Input Lane 0-	7
57	GND		Electrical Ground	1
58	TX LANE 1+	I	Module XAUI Input Lane 1+	7
59	TX LANE 1-	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	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.

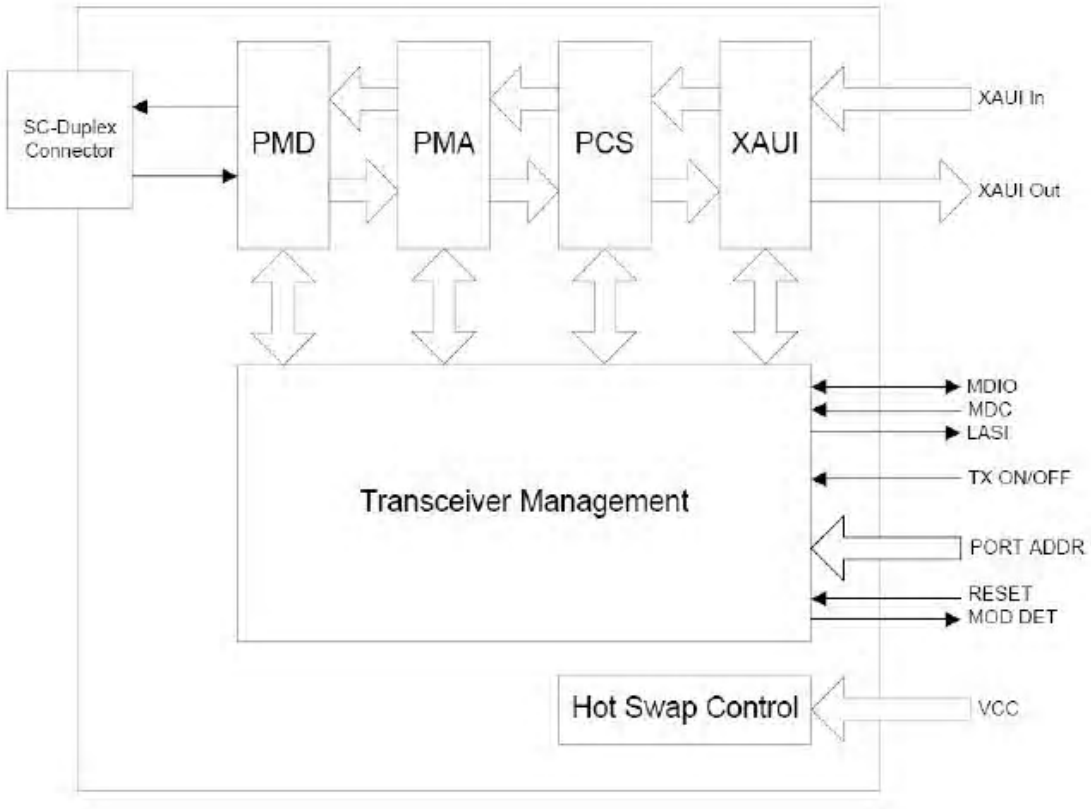
4) 1.2V CMOS compatible.

5) MDIO and MDC timing must comply with IEEE802.3ae, Clause 45.3

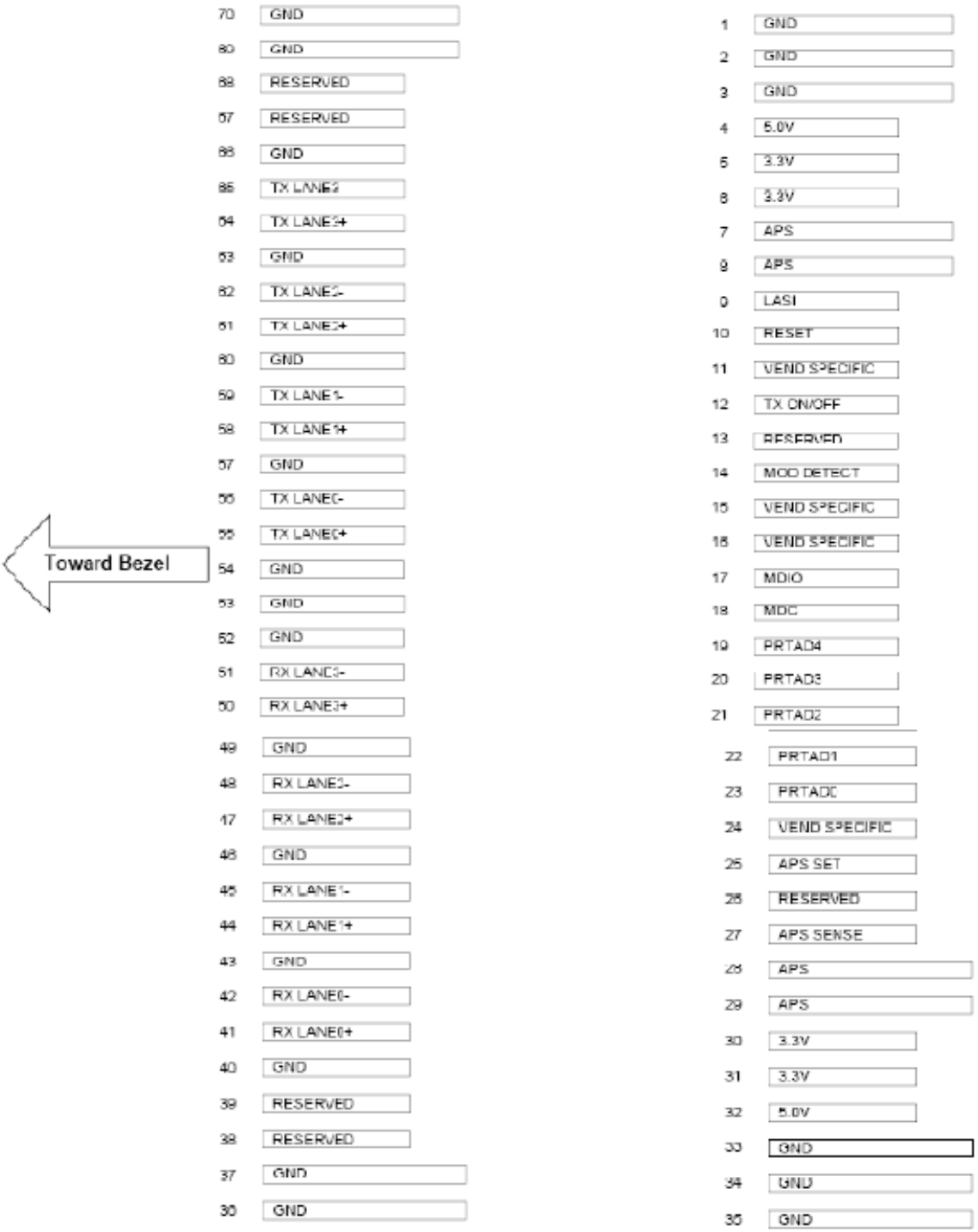
7) XAUI output characteristics should comply with IEEE802.3ae Clause 47.

8) Transceivers will be MSA compliant when no signals are present on the vendor specific pins.

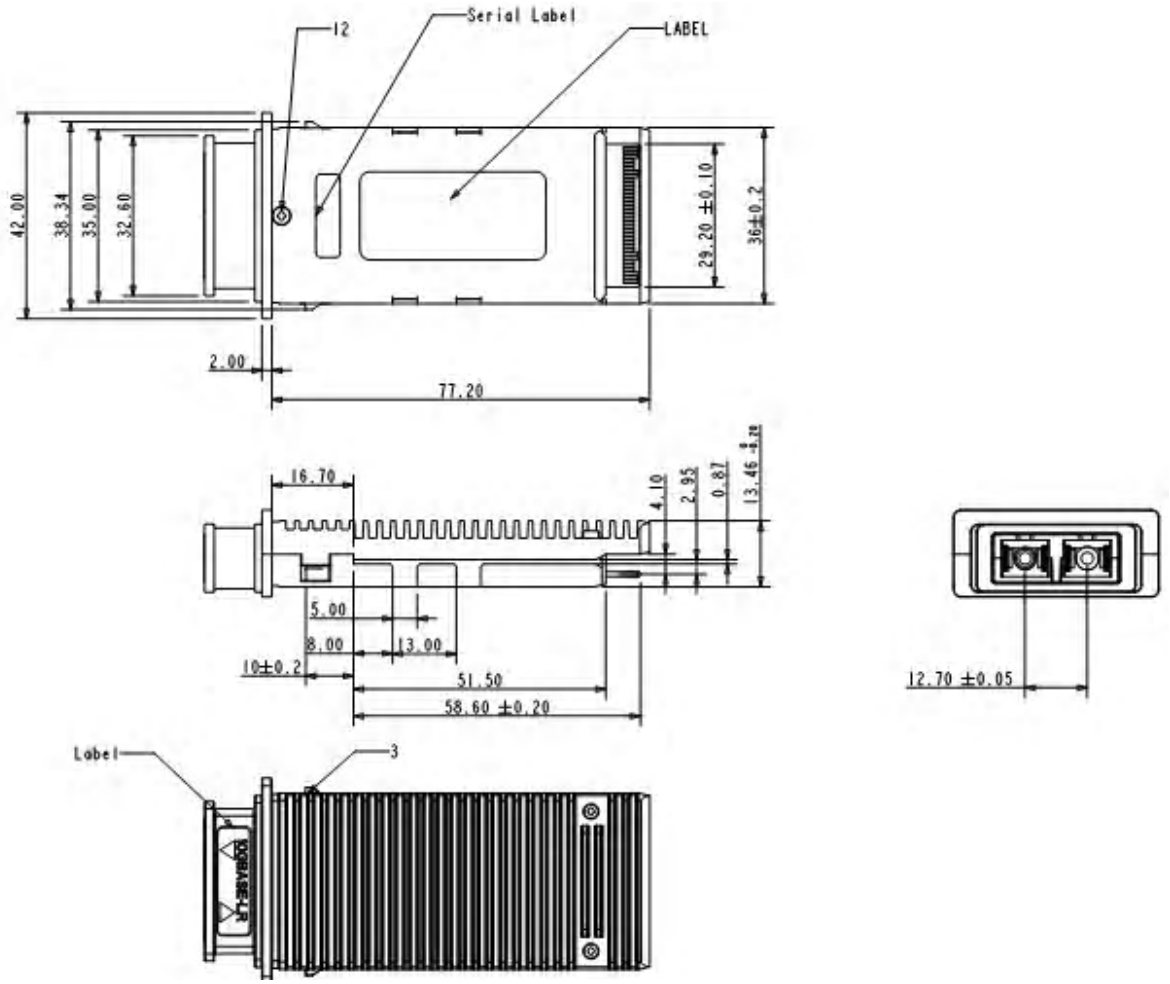
Functional Diagram of Typical X2 Style Transceiver



Electrical Pin-out Details



Mechanical Specification



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