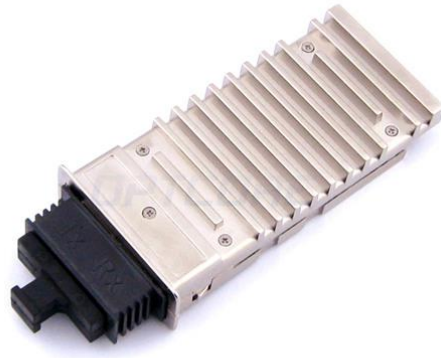
O2D10G-xx80DCR

10GBASE-ZR X2 DWDM Transceiver, 1470nm~1610nm, 80km Reach

Features



- XAUI Electrical Interface: 4 Lanes @ 3.125Gbit/s
- X2 MSA Compliant
- 70-PIN connector
- SC duplex receptacle package
- Wavelength selectable to C-band ITU-T grid wavelengths
- Cooled EA-DFB/APD-PD
- Power Dissipation 4W Maximum
- 0ºC to 70ºC Operating Case Temperature
- Digital Diagnostic Monitoring
- Management and control with MDIO 2-wire bus
- XAUI electrical interface 4 x 3.125 Gb/s Ethernet
- ≤80km ZR 10GBE
- RoHS6 compliant and lead free

Applications

- 10 Gb/s Ethernet transmission systems

Description

The DWDM X2 transceiver module provides 10-Gigabit connectivity up to 80km on single mode fiber (SMF) for data center, enterprise wiring closet and service provider transport applications. The DWDM X2 transceiver module consists of a 10.3Gbit/s optical transmitter and receiver, XAUI interface, Mux and Demux with clock and data recovery(CDR). This DWDM X2 module operates at nominal DWDM wavelengths. There are 45 center wavelengths available from 1528.77nm to 1563.86nm. The 10GBASE-ZR DWDM X2 transceiver module is a Class 1 laser product complies with FDA/CDRH and IEC-60825 standards.

Optical Characteristics Specifications

No.	Parameters	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Optical Wavelength	λ	λ-0.05	ITU-T grid Wavelengths	Λ+0.05	nm	
2	Signaling speed		-	10.3125	-	Gbit/s	
3	Signaling speed variation from nominal		-100	-	+100	ppm	
4	Optical modulation amplitude	OMA	-2.1	-	-	dBm	
5	Optical Output Power	Pf	0	-	5	dBm	Average
6	Side Mode Suppression Ratio	Sr	30	-	-	dB	Average
7	Extinction Ratio	Er	8.2	-	-	dB	
8	Off Transmit Power	Poff	-	-	-30	dBm	Average
9	Tx Jitter Generation(peak-to-peak)	Txj1	-	-	0.3	UI	
10	Tx Jitter Generation(RMS)	Txj2	-	-	0.1	UI	

11	Receiver Sensitivity	Rsense	-		-24.0	dBm	
12	Receiver Overload	Rro	+0.5	-	-	dBm	Average
13	Receiver Return Loss	RL	12	-	-	dB	Average

Notes: 1."λ" is:1470,1490,1510,1530,1550,1570,1590,1610.

Electrical Performance

Power Supply Characteristics

No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Supply Voltage	VCC1	3.135	3.300	3.465	V	
2	Supply Voltage	VCC2	1.152	1.200	1.248	V	
3	Supply Current	ICC1	-	-	1.2	A	+3.3 V
4	Supply Current	ICC2	-	-	1.7	A	APS
5	Power Consumption	PDS	-	-	4.0	W	
6	Power supply stabilization time	TDF	-	-	500	ms	Figure 7
7	Initialization Time	TINIT	-	-	5	s	Figure 7
8	RESET Assert Time	TRESET	1	-	-	ms	Figure 9
9	Hold Time after rising edge of RESET	THOLD	500	-	-	ms	Figure 9

XAUI Driver Characteristics

No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Baud Rate		-	3.125	-	Gbit/s	
2	Baud Rate Tolerance		-100	-	+100	ppm	
3	Differential Amplitude		800	-	1600	mVPP	AC, near-end value

1.2V CMOS Interface Characteristics

No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Input High Voltage	VIH	0.84	-	1.5	V	
2	Input Low Voltage	VIL	-0.3	-	0.36	V	
3	Input Pull-down Current	IIn	20	40	120	μA	Vih=1.2V
4	Output High Voltage	VOH	1.0	-	-	V	Pull-up=10k ohm to 1.2V
5	Output Low Voltage	VOL	-	-	0.2	V	
6	Pull up Resistance	RLASI	10	-	22	k ohm	
7	Capacitance	CLASI	-	-	10	pF	
8	Load Capacitance	CLoad	-	-	320	pF	

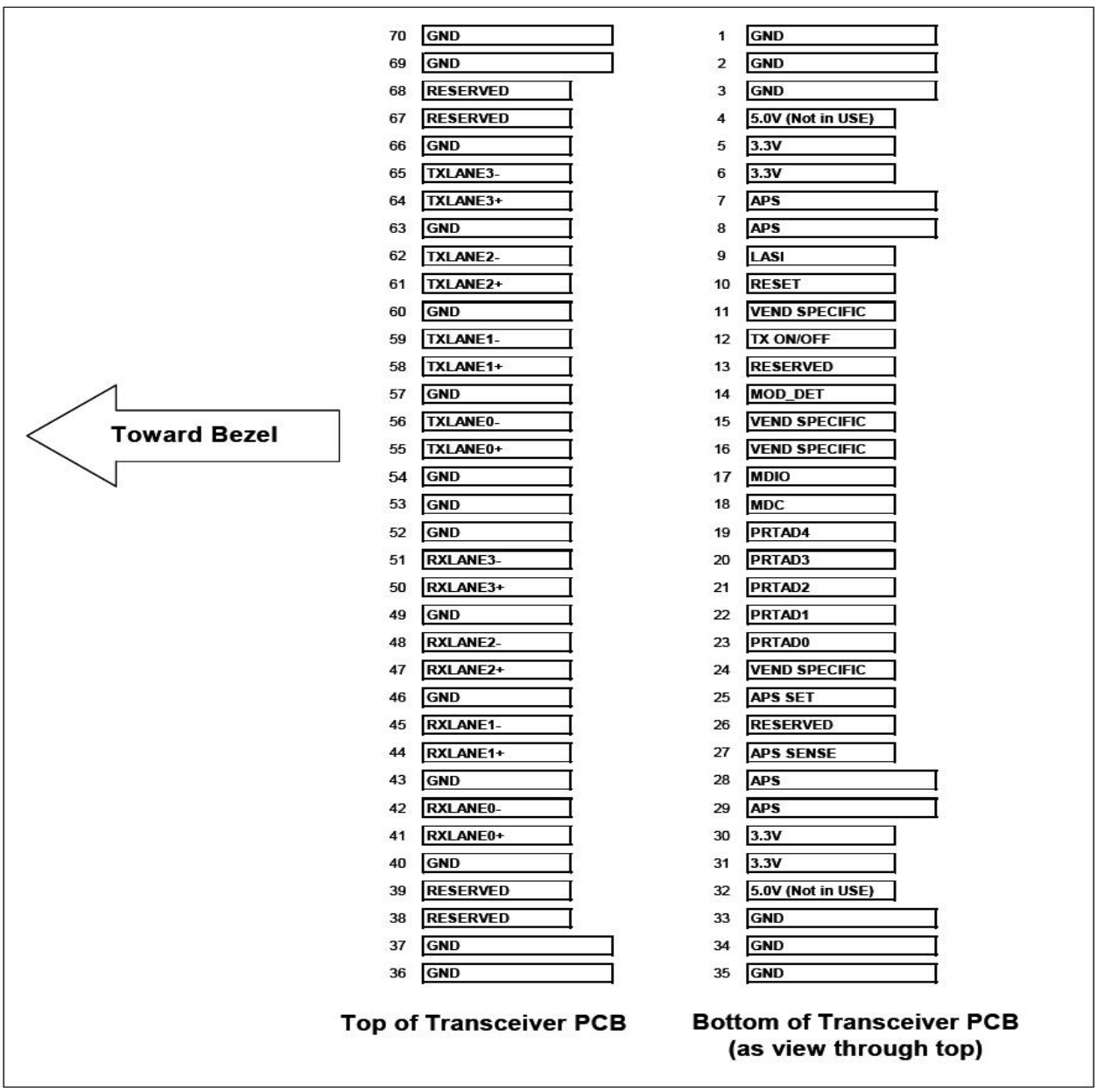
MDIO Bidirectional Interface Characteristics

No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Input High Voltage	VIHM	0.84	-	1.5	V	
2	Input Low Voltage	VILM	-0.3	-	0.36	V	

3	Output High Voltage	VOHM	1.0	-	1.5	V	
4	Output Low Voltage	VOLM	-0.3	-	0.2	V	
5	Pull up Resistance	RMDIO	200	-		Ohm	
6	MDC min high/low time	THM,TLM	160	-	-	ns	
7	MDC Frequency	1/TCK	TBD	-	2.5	MHz	
8	Setup time	TDIS	10	-	-	ns	
9	Hold time	TDIH	10	-	-	ns	
10	MDIO output delay after rising edge of MDC	TPD	0	-	300	ns	
12	Input Capacitance	Ci	-	-	10	pF	
13	Bus Loading	CL	-	-	470	pF	

Note: The maximum value of RMDIO depends on bus loading(CL),input capacitance(Ci),and MDC frequency.

Electrical Pad Layout



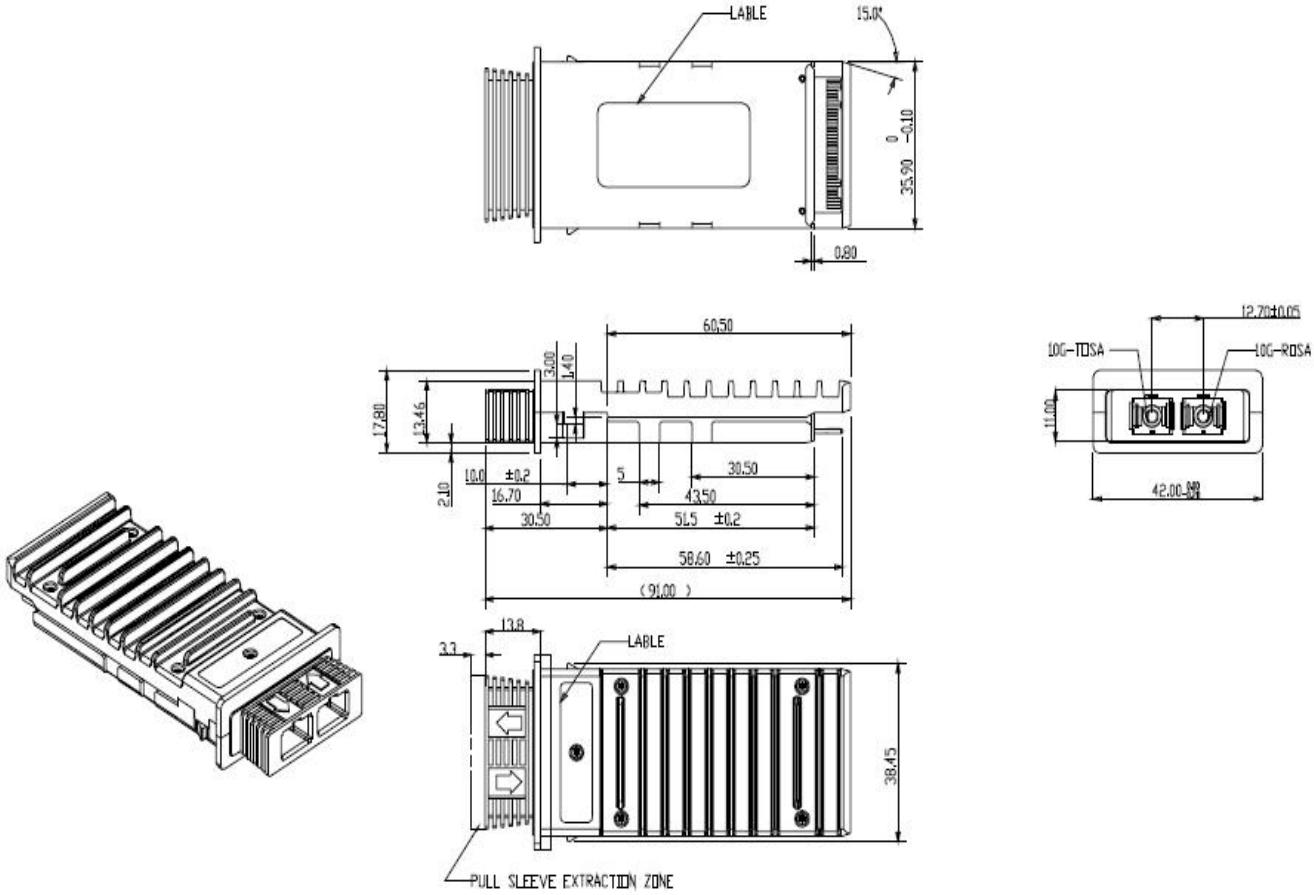
Pin Configuration

Pin #	Symbol	I/O	Logic	Description
1	GND	I	Supply	Electrical ground
2	GND	I	Supply	Electrical ground
3	GND	I	Supply	Electrical ground
4	RESERVED	-	-	Reserved
5	3.3 V	I	Supply	Power
6	3.3 V	I	Supply	Power
7	APS	I	Supply	Adaptive Power Supply
8	APS	I	Supply	Adaptive Power Supply
9	LASI	O	Open Drain	Link Alarm Status Interrupt. 10-22k ohm pull up on host.
10	RESET	I	1.2V CMOS	TX OFF when MDIO RESET
11	VEND SPECIFIC	-	-	Vendor Specific Pin. Leave unconnected.
12	TX ON/OFF	I	1.2V CMOS	Transmitter ON/OFF
13	RESERVED	-	-	Reserved
14	MOD DETECT	O	-	Pulled low inside module through 1k ohm.
15	VEND SPECIFIC	-	-	Vendor Specific Pin. Leave unconnected.
16	VEND SPECIFIC	-	-	Vendor Specific Pin. Leave unconnected.
17	MDIO	I/O	Open Drain	Management Data IO
18	MDC	I	1.2V CMOS	Management Data Clock
19	PRTAD4	I	1.2V CMOS	Port Address bit 4 (Low=0)
20	PRTAD3	I	1.2V CMOS	Port Address bit 3 (Low=0)
21	PRTAD2	I	1.2V CMOS	Port Address bit 2 (Low=0)
22	PRTAD1	I	1.2V CMOS	Port Address bit 1 (Low=0)
23	PRTAD0	I	1.2V CMOS	Port Address bit 0 (Low=0)
24	VEND SPECIFIC	-	-	Vendor Specific Pin. Leave unconnected.
25	APS SET	O	-	Feedback output for APS
26	RESERVED	-	-	Reserved for Avalanche Photodiode use.
27	APS SENSE	O	Analog	APS Sense Connection
28	APS	I	Supply	Adaptive Power Supply
29	APS	I	Supply	Adaptive Power Supply
30	3.3 V	I	Supply	Power
31	3.3 V	I	Supply	Power
32	RESERVED	-	-	Reserved
33	GND	I	Supply	Electrical Ground
34	GND	I	Supply	Electrical Ground
35	GND	I	Supply	Electrical Ground
36	GND	I	Supply	Electrical Ground
37	GND	I	Supply	Electrical Ground
38	RESERVED	-	-	Reserved

39	RESERVED	-	-	Reserved
40	GND	I	Supply	Electrical Ground
41	RX LANE 0+	O	AC	Module XAUI Output Lane 0+
42	RX LANE 0-	O	AC	Module XAUI Output Lane 0-
43	GND	I	Supply	Electrical Ground
44	RX LANE 1+	O	AC	Module XAUI Output Lane 1+
45	RX LANE 1-	O	AC	Module XAUI Output Lane 1-
46	GND	I	Supply	Electrical Ground
47	RX LANE 2+	O	AC	Module XAUI Output Lane 2+
48	RX LANE 2-	O	AC	Module XAUI Output Lane 2-
49	GND	I	Supply	Electrical Ground
50	RX LANE 3+	O	AC	Module XAUI Output Lane 3+
51	RX LANE 3-	O	AC	Module XAUI Output Lane 3-
52	GND	I	Supply	Electrical Ground
53	GND	I	Supply	Electrical Ground
54	GND	I	Supply	Electrical Ground
55	TX LANE 0+	I	AC	Module XAUI Input Lane 0+
56	TX LANE 0-	I	AC	Module XAUI Input Lane 0-
57	GND	I	Supply	Electrical Ground
58	TX LANE 1+	I	AC	Module XAUI Input Lane 1+
59	TX LANE 1-	I	AC	Module XAUI Input Lane 1-
60	GND	I	Supply	Electrical Ground
61	TX LANE 2+	I	AC	Module XAUI Input Lane 2+
62	TX LANE 2-	I	AC	Module XAUI Input Lane 2-
63	GND	I	Supply	Electrical Ground
64	TX LANE 3+	I	AC	Module XAUI Input Lane 3+
65	TX LANE 3-	I	AC	Module XAUI Input Lane 3-
66	GND	I	Supply	Electrical Ground
67	RESERVED	-	-	Reserved
68	RESERVED	-	-	Reserved
69	GND	I	Supply	Electrical Ground
70	GND	I	Supply	Electrical Ground

Note: Case is connected to electrical ground in the module.

Package Dimensions



Ordering information

Model	Based on *X2 to SFP+ Converter & 10G DWDM SFP+*	ITU Channel	Frequency (THz)	Center Wavelength(nm)
O2D10G-1780DCR	= X2 Converter + OPD10G-1780DCR	17	191.7	1563.86
O2D10G-1880DCR	= X2 Converter + OPD10G-1880DCR	18	191.8	1563.05
O2D10G-1980DCR	= X2 Converter + OPD10G-1980DCR	19	191.9	1562.23
O2D10G-2080DCR	= X2 Converter + OPD10G-2080DCR	20	192.0	1561.42
O2D10G-2180DCR	= X2 Converter + OPD10G-2180DCR	21	192.1	1560.61
O2D10G-2280DCR	= X2 Converter + OPD10G-2280DCR	22	192.2	1559.79
O2D10G-2380DCR	= X2 Converter + OPD10G-2380DCR	23	192.3	1558.98
O2D10G-2480DCR	= X2 Converter + OPD10G-2480DCR	24	192.4	1558.17
O2D10G-2580DCR	= X2 Converter + OPD10G-2580DCR	25	192.5	1557.36
O2D10G-2680DCR	= X2 Converter + OPD10G-2680DCR	26	192.6	1556.55
O2D10G-2780DCR	= X2 Converter + OPD10G-2780DCR	27	192.7	1555.75
O2D10G-2880DCR	= X2 Converter + OPD10G-2880DCR	28	192.8	1554.94
O2D10G-2980DCR	= X2 Converter + OPD10G-2980DCR	29	192.9	1554.13
O2D10G-3080DCR	= X2 Converter + OPD10G-3080DCR	30	193.0	1553.33
O2D10G-3180DCR	= X2 Converter + OPD10G-3180DCR	31	193.1	1552.52
O2D10G-3280DCR	= X2 Converter + OPD10G-3280DCR	32	193.2	1551.72

O2D10G-3380DCR	= X2 Converter + OPD10G-3380DCR	33	193.3	1550.92
O2D10G-3480DCR	= X2 Converter + OPD10G-3480DCR	34	193.4	1550.12
O2D10G-3580DCR	= X2 Converter + OPD10G-3580DCR	35	193.5	1549.32
O2D10G-3680DCR	= X2 Converter + OPD10G-3680DCR	36	193.6	1548.51
O2D10G-3780DCR	= X2 Converter + OPD10G-3780DCR	37	193.7	1547.72
O2D10G-3880DCR	= X2 Converter + OPD10G-3880DCR	38	193.8	1546.92
O2D10G-3980DCR	= X2 Converter + OPD10G-3980DCR	39	193.9	1546.12
O2D10G-4080DCR	= X2 Converter + OPD10G-4080DCR	40	194.0	1545.32
O2D10G-4180DCR	= X2 Converter + OPD10G-4180DCR	41	194.1	1544.53
O2D10G-4280DCR	= X2 Converter + OPD10G-4280DCR	42	194.2	1543.73
O2D10G-4380DCR	= X2 Converter + OPD10G-4380DCR	43	194.3	1542.94
O2D10G-4480DCR	= X2 Converter + OPD10G-4480DCR	44	194.4	1542.14
O2D10G-4580DCR	= X2 Converter + OPD10G-4580DCR	45	194.5	1541.35
O2D10G-4680DCR	= X2 Converter + OPD10G-4680DCR	46	194.6	1540.56
O2D10G-4780DCR	= X2 Converter + OPD10G-4780DCR	47	194.7	1539.77
O2D10G-4880DCR	= X2 Converter + OPD10G-4880DCR	48	194.8	1538.98
O2D10G-4980DCR	= X2 Converter + OPD10G-4980DCR	49	194.9	1538.19
O2D10G-5080DCR	= X2 Converter + OPD10G-5080DCR	50	195.0	1537.40
O2D10G-5180DCR	= X2 Converter + OPD10G-5180DCR	51	195.1	1536.61
O2D10G-5280DCR	= X2 Converter + OPD10G-5280DCR	52	195.2	1535.82
O2D10G-5380DCR	= X2 Converter + OPD10G-5380DCR	53	195.3	1535.04
O2D10G-5480DCR	= X2 Converter + OPD10G-5480DCR	54	195.4	1534.25
O2D10G-5580DCR	= X2 Converter + OPD10G-5580DCR	55	195.5	1533.47
O2D10G-5680DCR	= X2 Converter + OPD10G-5680DCR	56	195.6	1532.68
O2D10G-5780DCR	= X2 Converter + OPD10G-5780DCR	57	195.7	1531.90
O2D10G-5880DCR	= X2 Converter + OPD10G-5880DCR	58	195.8	1531.12
O2D10G-5980DCR	= X2 Converter + OPD10G-5980DCR	59	195.9	1530.33
O2D10G-6080DCR	= X2 Converter + OPD10G-6080DCR	60	196.0	1529.55
O2D10G-6180DCR	= X2 Converter + OPD10G-6180DCR	61	196.1	1528.77

Warnings

Process plug

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles.It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

Handling Precautions

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

For more product information, visit us on the web at www.optcore.net