

O2C10G-xx40DCR

10GBASE-ER X2 CWDM Transceiver, 1470nm~1610nm, 40km Reach

Features

- XAUI Electrical Interface: 4 Lanes @ 3.125Gbit/s
- 8 Channel Cooled CWDM EML 1470nm~1610nm
- Hot Z-Pluggable
- SC-Duplex Optical Receptacle
- MDIO, DOM Support
- PIN Photo-detector
- Compliant to X2 MSA
- Compliant to IEEE 802.3ae 10GBASE-ER Application
- Case operating temperature: 0 to 70 °C
- RoHS compliant



Applications

- 10 Gb/s Ethernet transmission systems

Description

Optcore's O2C10G-xx40DCR 10Gb CWDM X2 module is a hot pluggable in the Z-direction module that is usable in typical router line card applications, Storage, IP network and LAN and compliant to X2 MSA. The CWDM X2 module is a fully integrated 10.3Gbit/s optical transceiver module that consists of a 10.3Gbit/s optical transmitter and receiver, XAUI interface, Mux and Demux with clock and data recovery(CDR). This version of 10Gb CWDM X2 ER module line uses an cooled CWDM EML Laser Diode to achieve 40km over standard single mode fiber as 10GBASE-ER of the IEEE 802.3ae. This 10Gb CWDM X2 ER modules operate at nominal Coarse Wavelength Division Multiplexing (CWDM) wavelengths. There are eight center wavelengths available from 1470nm to 1610 nm, with each step being 20 nm.

Optical Characteristics Specifications

No.	Parameters	Symbol s	Min.	Typ.	Max.	Unit	Remarks
1	Optical Wavelength	λ	X-6.5	X	X+6.5	nm	1
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	-1	-	+4	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	-		-16.5	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	

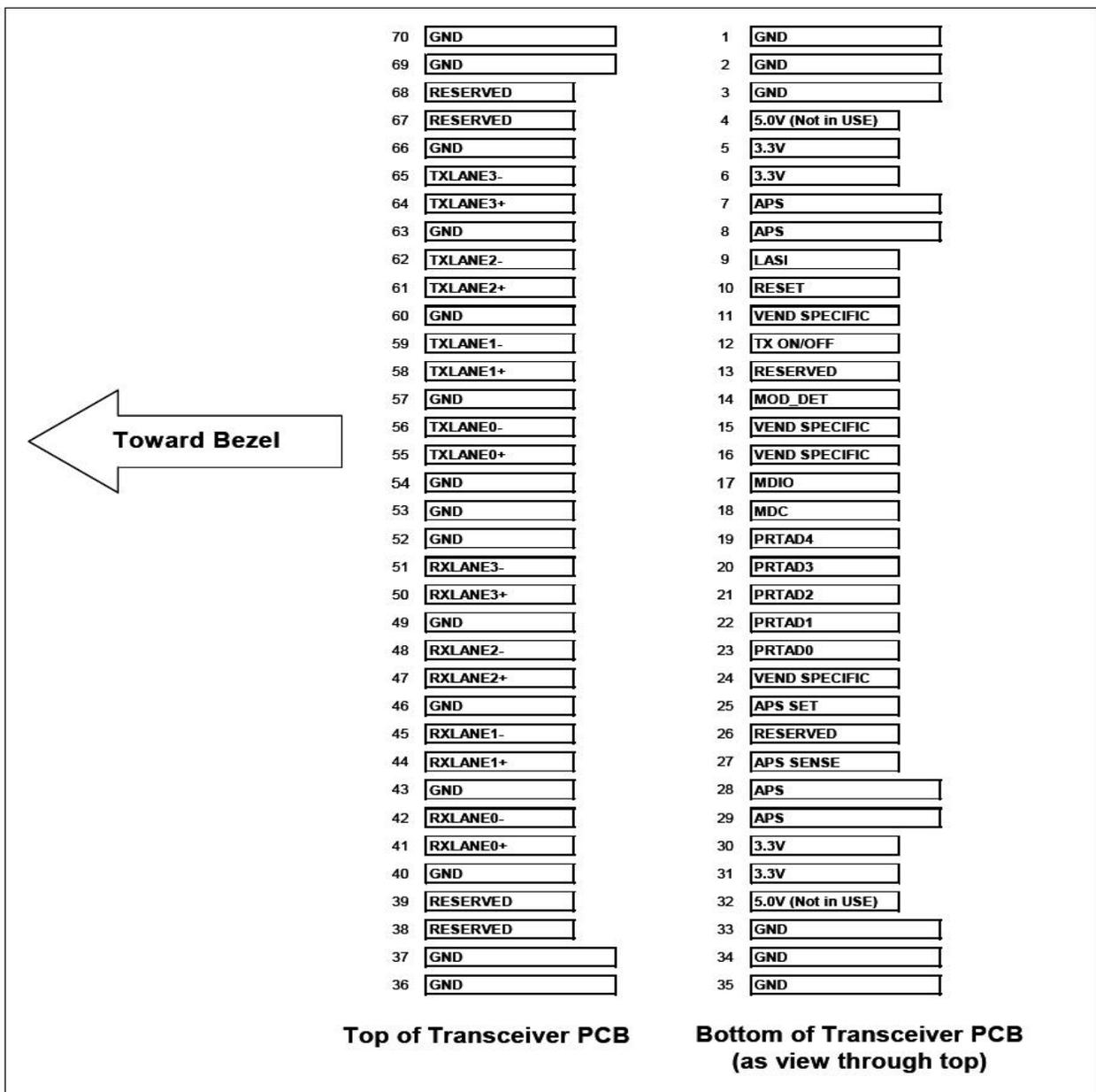
MDIO Bidirectional Interface Characteristics

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



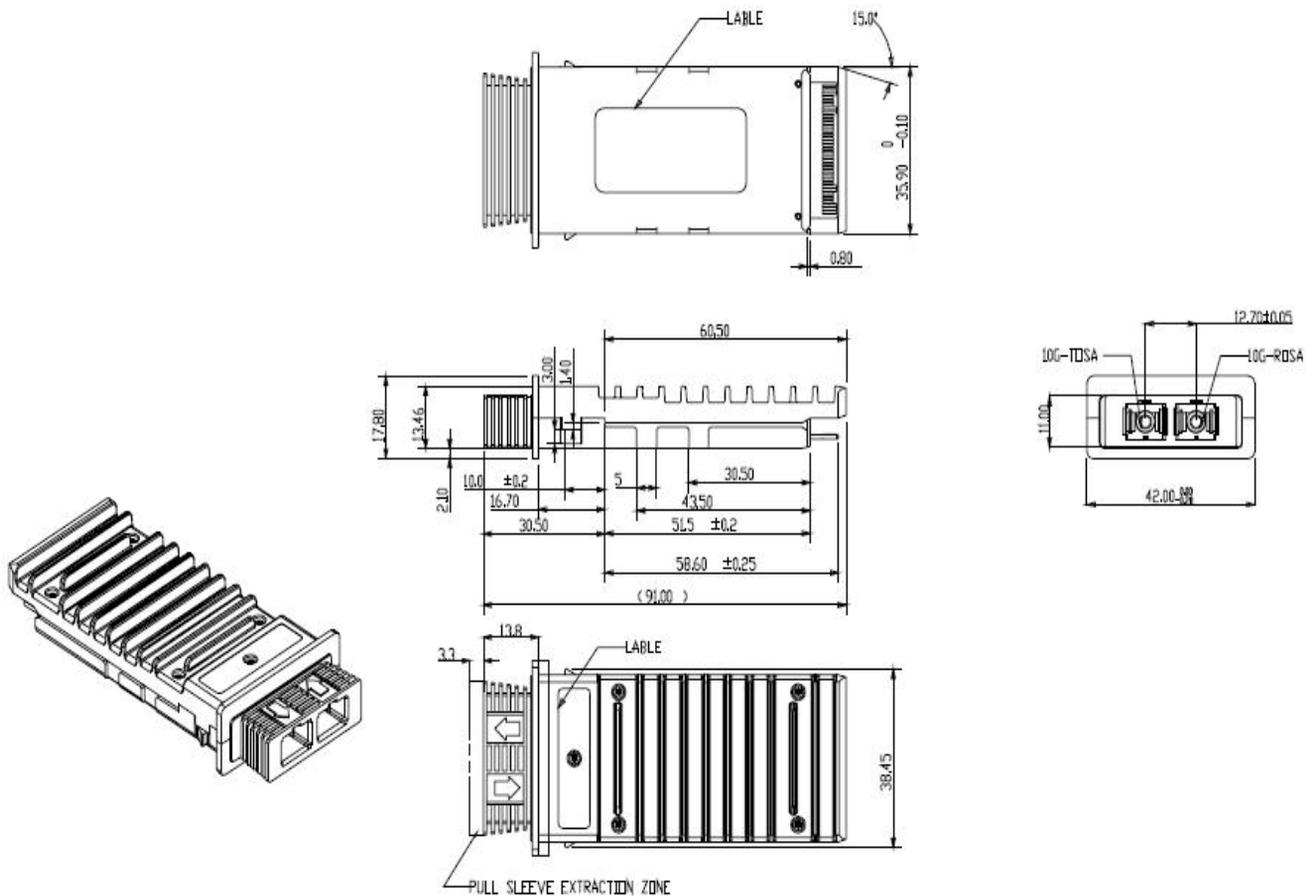
Pin Configuration

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	Description	Based on X2 to SFP+ Converter & 10G CWDM SFP+
O2C10G-4740DCR	10GBASE-ER CWDM X2 Transceiver, 1470nm, 40km	X2 Converter + OPC10G-4740DCR
O2C10G-4940DCR	10GBASE-ER CWDM X2 Transceiver, 1490nm, 40km	X2 Converter + OPC10G-4940DCR
O2C10G-5140DCR	10GBASE-ER CWDM X2 Transceiver, 1510nm, 40km	X2 Converter + OPC10G-5140DCR
O2C10G-5340DCR	10GBASE-ER CWDM X2 Transceiver, 1530nm, 40km	X2 Converter + OPC10G-5340DCR
O2C10G-5540DCR	10GBASE-ER CWDM X2 Transceiver, 1550nm, 40km	X2 Converter + OPC10G-5540DCR
O2C10G-5740DCR	10GBASE-ER CWDM X2 Transceiver, 1570nm, 40km	X2 Converter + OPC10G-5740DCR
O2C10G-5940DCR	10GBASE-ER CWDM X2 Transceiver, 1590nm, 40km	X2 Converter + OPC10G-5940DCR
O2C10G-6140DCR	10GBASE-ER CWDM X2 Transceiver, 1610nm, 40km	X2 Converter + OPC10G-6140DCR

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



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