DW-D10010-03XDC2
Networks100GBASE-SR10 CFP2 Optical Transceiver Module

Features

♦ Compliant to CFP2 Hardware Specification Version 1.0

♦ Compliant to CFP2 MSA Management Interface Specification Version 2.2

♦ Compliant to the IEEE 802.3ba(100GBASE-SR10)

♦ Transmission data rate up to 11.18 Gbit/s per channel

♦ Up to 300m on OM3 and 400m on OM4 MMF

♦ Power class 1 (<7W max)

♦ OTU4 compatible

♦ 10 channels 850nm VCSEL array transmitter

♦ 10 channels PIN photo detector array receiver

♦ MDIO digital diagnostic interface and control capabilities.

♦ TX input and RX output CDR retiming

♦ Hot pluggable electrical interface

♦ Single 3.3V power supply

♦ RoHS 6 compliant(lead free)

♦ Utilizes a standard 24/20 lane optical fiber with MPO connector

♦ Operating case temperature:

      Standard : 0 to +70°C

      Industrial : -40 to +85°C
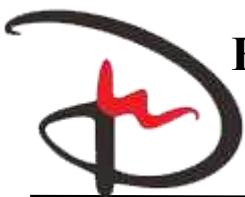
Applications

♦ 100GBE interconnects

♦ High-speed core router connections& Datacom/Telecom switch

♦ Data aggregation and backplane applications

♦ Proprietary protocol and density application

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Description

DONGWE CFP2 optical transceiver module are a high performance, low power consumption, short reachinterconnect solution supporting 100G Ethernet and Telecom. It is compliant with the CFP2 MSA and IEEE P802.3ba 100GBASE-SR10.   NetworksCFP2 SR10 modules offer 10 transmit and 10 receive asynchronous channels operating at up to 11.18Gbps per channel.

As shown in Figure 1, the transmitter side of the module consists of an array of VCSELs (Vertical Cavity Surface Emitting Lasers) and associated circuitry, which converts 10 parallel electrical data inputs to 10 parallel optical data output signals and also converts 10 parallel optical signals into 10 parallel electrical signals through an array of PIN photodiodes and associated circuitry.
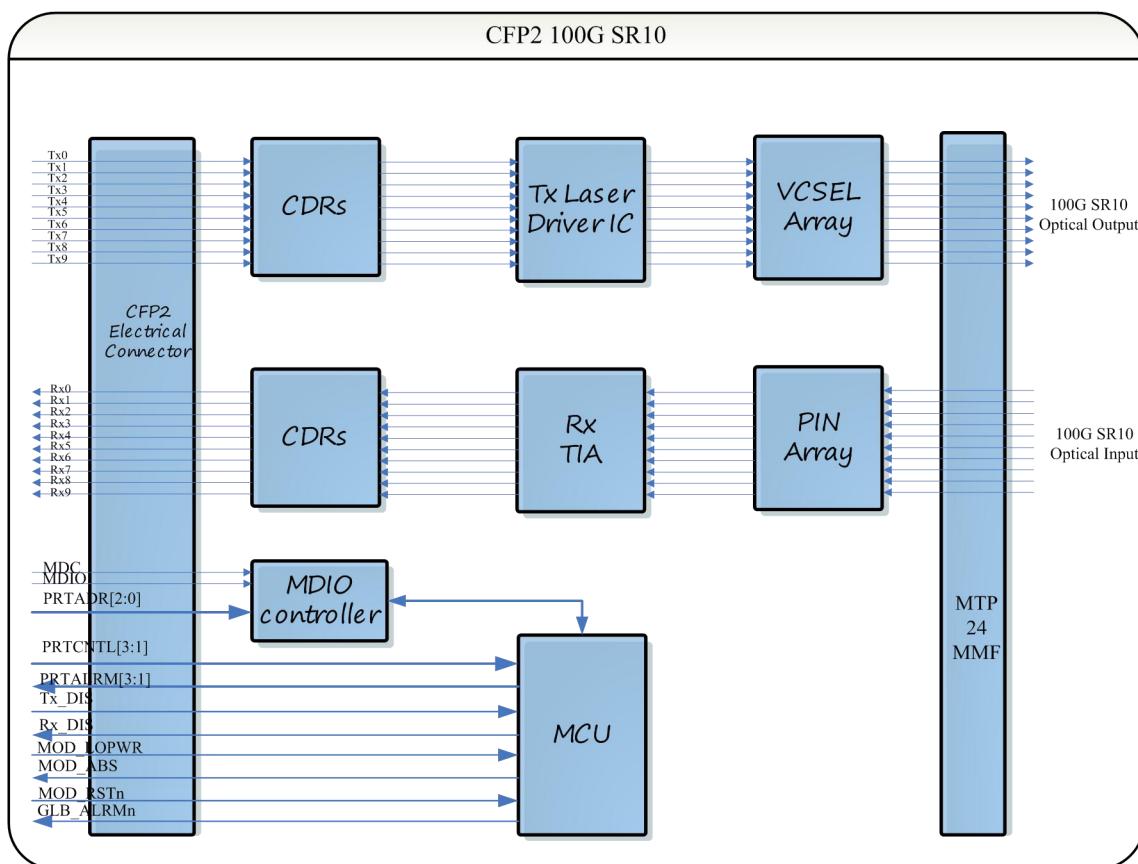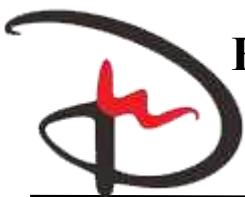

Figure1.Module Block Diagram

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Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	3.6	V
Input Voltage	Vin	-0.3	Vcc+0.3	V
Storage Temperature	Tst	-40	85	ºC
Humidity(non-condensing)	Rh	5	85	%

*Exceeding any one of these values may destroy the device immediately

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.13	3.3	3.47	V
Operating Case temperature	Tca	0		70	ºC
Data Rate Per Lane	fd	-	10.3125	11.18	Gbps
Power Dissipation	Pm			7	W
Low Power Mode Dissipation	Plow			2	W
Aggregate Bit Rate	BRaggr		103.125	111.8	Gbps

Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Differential input impedance	Zin	90	100	110	ohm	
Differential Output impedance	Zout	90	100	110	ohm	
Differential input voltage amplitude	ΔVin	120		820	mVp-p	
Differential output voltage amplitude	ΔVout	300		820	mVp-p	
Input Logic Level High	VIH	2.0		VCC+0.3	V	3.3V LVCOMS
		0.84		1.2	V	1.2V LVCOMS
Input Logic Level Low	VIL	-0.3		0.8	V	3.3V LVCOMS
		-0.3		0.36	V	1.2V LVCOMS
Output Logic Level High	VOH	VCC-0.2		VCC	V	3.3V LVCOMS
		1.0		1.5	V	1.2V LVCOMS
Output Logic Level Low	VOL	0		0.2	V	3.3V LVCOMS
		-0.3		0.2	V	1.2V LVCOMS
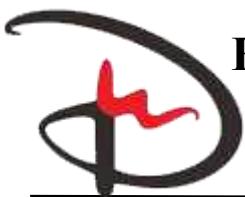
Note：
1. Differential input voltage amplitude is measured between TxnP and TxnN.
2. Differential output voltage amplitude is measured between RxnP and RxnN.

Optical Characteristics
Transmitter Optical Specifications (T = 25°C, VCC =3.3V +/- 5%)

Parameter	Symbol	Min	Typical	Max	Unit
Average Optical Power(per channel)	Pout	-7.6	-1	+2.4	dBm
Average Optical Power(per channel) - Disabled	Poff			-30	dBm
Optical Return Loss Tolerance				12	dB
Extinction Ratio	ER	3			dB
Center Wavelength	λc	840	850	860	nm
RMS Spectral Width	λ		0.5	0.65	nm
Transmit OMA,per Lane	TX_OMA/lane	-5.6		3	dBm
Difference in launch power between any two lanes(OMA)				4	dB
Transmitter and dispersion penalty,each lane	TDP/lane			3.5	dB
Transmitter eye mask	Compliant to IEEE802.3ba eye mask specification				

Note：

1. Average optical power is measured at the output of the modules optical interface.

Receiver Optical Specifications (T = 25°C, VCC =3.3V +/- 5%)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power Sensitivity(per channel)	Pin min	-	-12	-9.9	dBm
Optical Power Saturation(per channel)	Pin max	+1	-	-	dBm
Stressed Receiver Sensitivity	P_S	-	-	-5.4	dBm
Center Wavelength	λc	840	850	860	nm
RMS Spectral Width	λ		0.5	0.65	nm
Optical Return Loss	RI	12			dB
Damage Threshold		3.4			dBm
Optical modulation amplitude,each lane				3	dBm

Note：

1. Optical power sensitivity is measured with BER@10^{-12} at 10.3125Gbps per channel.
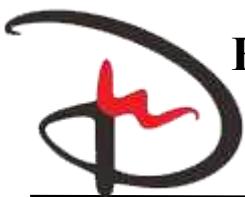
Pin Descriptions
Part A:Bottom Row Pin Function Definition

Pin	Symbol	Type	I/O	Description
1	GND			
2	TX9n	CML	I	Transmit data input
3	TX9p	CML	I	Transmit data input
4	GND			
5	TX8n	CML	I	Transmit data input
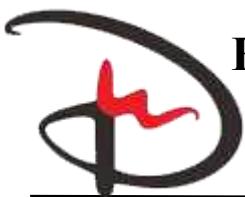
6	TX8p	CML	I	Transmit data input
7	GND			3.3V Module Supply Voltage Return Ground, can be separate or tied together with Signal Ground
8	3.3V_GND			
9	3.3V			
10	3.3V			
11	3.3V			
12	3.3V			
13	3.3V_GND			
14	3.3V_GND			
15	VND_IO_A		I/O	Module vendor I/O A.
16	VND_IO_B		I/O	Module vendor I/O B.
17	PRG_CNTL1	LVCMOS w/PU	I	Programmable Control 1 set via MDIO, MSA default: TRXIC_RSTn – TX & RX IC reset. "0" = reset, "1" or NC = enabled or not used
18	PRG_CNTL2	LVCMOS w/PU	I	Programmable Control 2 set via MDIO, MSA default: Hardware Interlock LSB, "00" ≤3W, "01" ≤6W, "10" ≤9W, "11" or NC ≤12W= not used
19	PRG_CNTL3	LVCMOS w/PU	I	Programmable Control 3 set via MDIO, MSA default: Hardware Interlock MSB, "00" ≤3W, "01" ≤6W, "10" ≤9W, "11" or NC ≤12W= not used
20	PRG_ALRM1	LVCMOS	O	Programmable Alarm 1 set via MDIO, MSA default:HIPWR_ON, "1" = Module high power up completed, "0" = Module not high powered up
21	PRG_ALRM2	LVCMOS	O	Programmable Alarm 2 set via MDIO,MSA default: MOD_READY,"1" = ready, "0" = not ready
22	PRG_ALRM3	LVCMOS	O	Programmable Alarm 3 set via MDIO, MSA default: MOD_FAULT, module fault detected, "1" = fault, "0" = no fault
23	GND	GND		
24	TX_DIS	LVCMOS w/PU	I	Transmitter Disable for all channels, "1" or NC = transmitter disabled, "0" = transmitter enabled
25	RX_LOS	LVCMOS	O	Receiver loss of optical signal on any channel, "1" = loss of signal, "0" = normal condition
26	MOD_LOPWR	LVCMOS w/PU	I	Module low power mode. "1" or NC = module in low power (safe) mode, "0" = power-on enabled
27	MOD_ABS	GND	O	Module Absent. "1" or NC = Module absent, "0" = module present. Pull-up resistor on Host
28	MOD_RSTn	LVCMOS w/PD	I	Module Reset. "0" = reset the module, "1" or NC = module enabled, Pull Down resistor in module
29	GLB_ALRMn	LVCMOS	O	Global Alarm. "0" = alarm condition in any MDIO alarm register, "1" = no alarm .Pull-up resistor on Host
30	GND			
31	MDC	1.2V CMOS	I	Management data clock (electrical specs as per IEEE std802.3-2012)
32	MDIO	1.2V CMOS	I/O	Management Data I/O bi-directional data (electrical specs as IEEE std802.3-2012)
33	PRTADR0	1.2V CMOS	I	MDIO port address bit 0
34	PRTADR1	1.2V CMOS	I	MDIO port address bit 1
35	PRTADR2	1.2V CMOS	I	MDIO port address bit 2
36	VND_IO_C		I/O	Module vendor I/O C.
37	VND_IO_D		I/O	Module vendor I/O D.
38	VND_IO_E		I/O	Module vendor I/O E.
39	3.3V_GND			

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40	3.3V_GND			
41	3.3V			3.3V Module power Supply
42	3.3V			
43	3.3V			
44	3.3V			
45	3.3V_GND			
46	GND			
47	RX9n	CML	O	Received data output
48	RX9p	CML	O	Received data output
49	GND			
50	RX8n	CML	O	Received data output
51	RX8p	CML	O	Received data output
52	GND			
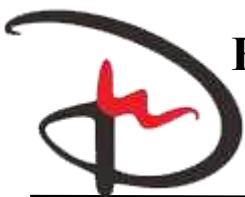
Part B:Top Row Pin Function Definition

Pin	Symbol		Pin	Symbol
104	GND		78	REFCLKp
103	TX7n		77	GND
102	TX7p		76	RX7n
101	GND		75	RX7p
100	TX6n		74	GND
99	TX6p		73	RX6n
98	GND		72	RX6p
97	TX5n		71	GND
96	TX5p		70	RX5n
95	GND		69	RX5p
94	TX4n		68	GND
93	TX4p		67	RX4n
92	GND		66	RX4p
91	TX3n		65	GND
90	TX3p		64	RX3n
89	GND		63	RX3p
88	TX2n		62	GND
87	TX2p		61	RX2n
86	GND		60	RX2p
85	TX1n		59	GND
84	TX1p		58	RX1n
83	GND		57	RX1p

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| 82	TX0n		56	GND
81	TX0p		55	RX0n
80	GND		54	RX0p
79	REFCLKn		53	GND
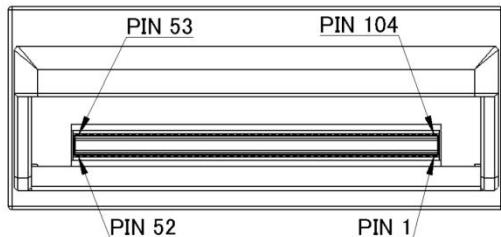
Figure2. Pad Layout of the CFP2 module

CFP2 Optical Interface lanes and Assignment

Figure 3 shows the orientation of the multimode fiber facets of the optical connector.
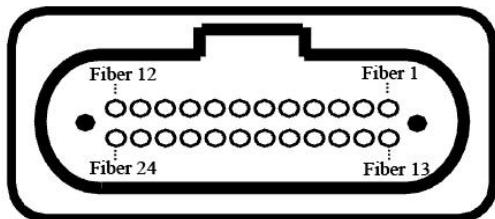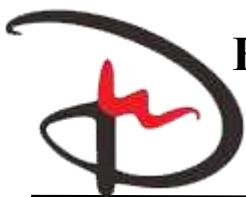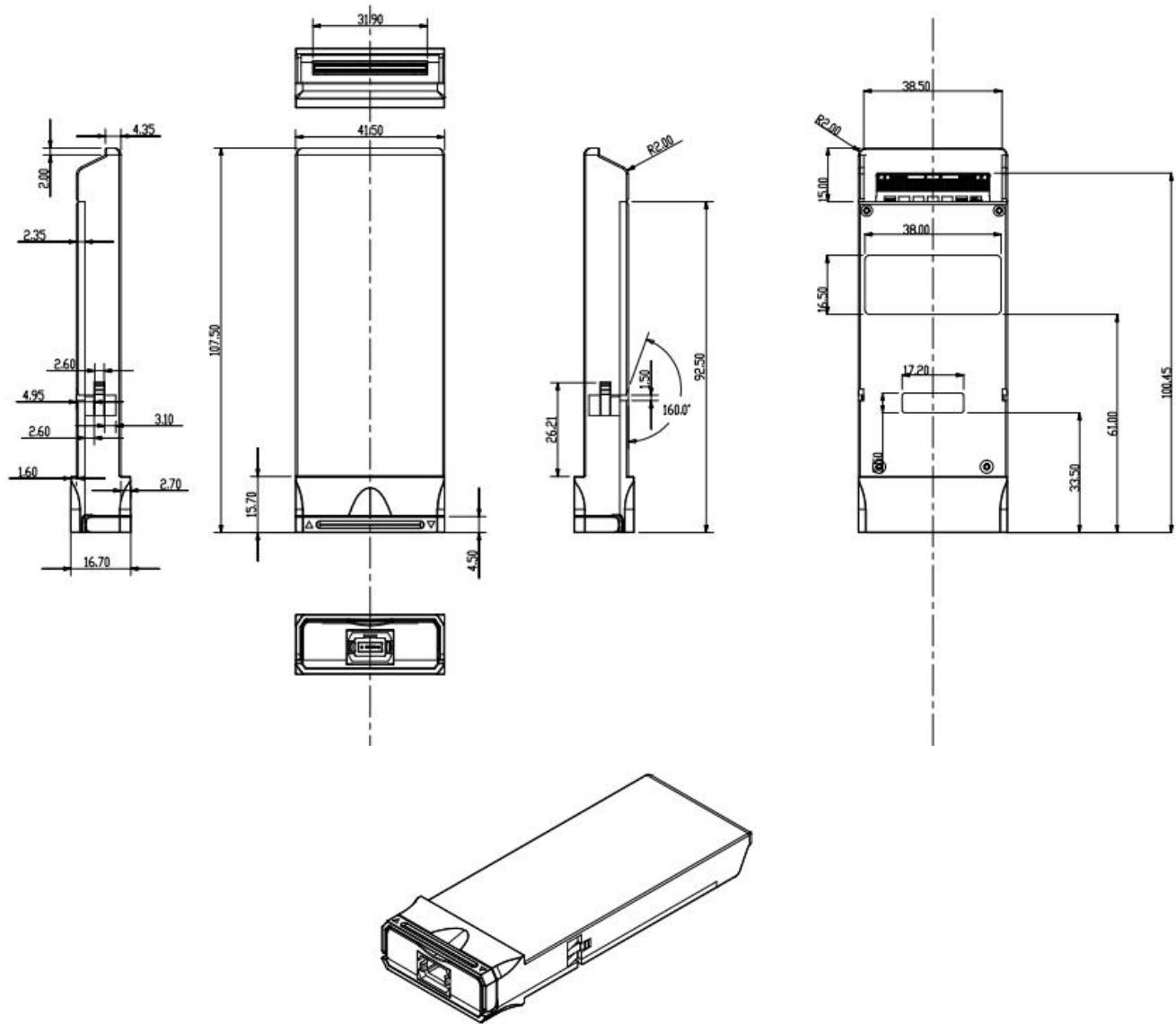

Figure3. Outside view of the CFP2 module MPO receptacle
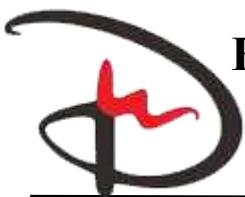
Lane Assignment

Fiber	Symbol	Corresponding Electrical pins	Fiber	Symbol	Corresponding Electrical pins
1	Unused		13	Unused	
2	RX0	54，55	14	TX0	81，82
3	RX1	57，58	15	TX1	84，85
4	RX2	60，61	16	TX2	87，88
5	RX3	63，64	17	TX3	90，91
6	RX4	66，67	18	TX4	93，94
7	RX5	69，70	19	TX5	96，97
8	RX6	72，73	20	TX6	99，100
9	RX7	75，76	21	TX7	102，103
10	RX8	50，51	22	TX8	5，6
11	RX9	47，48	23	TX9	2，3
12	Unused		24	Unused	

Mechanical Dimensions

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Regulatory Compliance

DONGWE's transceiver is designed to be Class I Laser safety compliant and is certified per the following standards:

Feature	Agency	Standard
Laser Safety	FDA	CDRH 21 CFR 1040 annd Laser Notice No. 50
Product Safety	UL	UL and CUL EN60950-2:2007
Environmental protection	SGS	RoHS Directive 2002/95/EC
EMC	WALTEK	EN 55022:2006+A1:2007 EN 55024:1998+A1+A2:2003

Ordering information

Part Number	Product Description
DW-D10010-03CDC2	CFP2,100GBASE-SR10, 300m on OM3 MMFand400m on OM4 MMF,0 to +70°C
DW-D10010-03IDC2	CFP2,100GBASE-SR10, 300m on OM3 MMFand400m on OM4 MMF,-40 to +85°C

Important Notice

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

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