



RoHS Compliant 100Gb/s CFP2 SR10 850nm 100m Optical Transceiver

OP-MCF2B85M1MD-0.1



Shenzhen Optostar Optoelectronics Co., Ltd
2013. 2 (Version 2)

Product Features

- Supports 103.1Gb/s to 112Gb/s bit rates
- MPO 24 receptacle optical interface
- CPPI electrical interface
- Uncooled 10x10Gb/s 850nm transmitter
- 10 parallel electrical serial interface
- Applicable for 100m with OM3 MMF and 150m with OM4 MMF
- Low power consumption <4W
- Digital Diagnostic Monitor Interface
- MDIO Communication Interface
- Compliant with 100GBASE-SR10
- Operating case temperature: Commercial: 0 to 70 °C

Applications

- 100GBASE-SR10 Ethernet
- 10x11.2Gb/s Multimode OTN
- 10x 10GE-SR Lite Ethernet

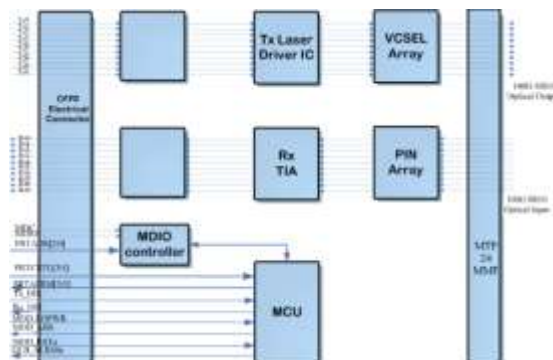
Standards

- Compliant with IEEE 802.3ba
- Compliant with CFP2 MSA hardware specifications
- Compliant with CFP2 MSA management specifications

Functional Description

OPTOSTAR' OP-MCF2B85M1MD-0.1, the 100GE SR10 CFP2 (ALT1) transceiver modules are designed for use in 100 Gigabit Ethernet links and 10x11.2G OTN client interfaces over multimode fiber. They are compliant with the CFP2 MSA and with IEEE 802.3ba 100GBASE-SR10. Digital diagnostics functions are available via the MDIO interface.

Functional Diagram





Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature	Ts	-40	85	°C	
Relative Humidity	RH	0	85	%	
Receiver Damage Threshold	PRdmg	5			Per Lane

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the transceiver.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	DR		103	112	Gb/s	
Supply Voltage	Vcc	3.14		3.47	V	
Operating Case Temp.	Tc	0		70	°C	

Electrical Characteristics (TOP = 0 to 70°C, VCC = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter (per Lane)						
Data Rate Per Lane	DRPL		10.3125	11.1810	Gb/s	1
Input voltage tolerance	VIN	-0.3		4	V	
Differential data input swing	VIN,PP	120		1200	mVpp	2
Differential input threshold	VIN,TH		50		mV	
J2 Jitter Tolerance	JT2	0.17			UI	
J9 Jitter Tolerance	JT9	0.29			UI	
Receiver (per Lane)						
Output voltage	VOUT	-0.3		4.0	V	
Differential data output swing	VOUT,PP	300		800	mVpp	3
output voltage (RMS)	PSEN2			7.5	mV	
Termination mismatch at 1 MHz	PPx			5	%	
Output rise time and fall time	Tr, Tf		28		Ps	4
J2 Jitter output	JOT2			0.42	UI	
J9 Jitter output	JOT9			0.65	UI	
Power Supply Ripple Tolerance	PRS	Per CFP MSA			mVpp	

Notes:

1. +/- 100ppm at 10.3125 Gb/s and +/-20ppm at 11.1810 Gb/s.
2. After internal AC coupling. Self-biasing 100Ω differential input.
3. AC coupled with 100Ω differential output impedance. Limiting output.
4. 20%~80%

Optical Characteristics (TOP = 0 to 70 ° C, VCC = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter (per Lane)						
Data Rate Per Lane	DRPL		10.3125	11.1810	Gb/s	1
Center wavelength	λ	840	850	860	nm	
RMS Spectral Width	Δλ			0.65	nm	



Average Power per Lane	P_{AVEp}	-8		1	dBm	
Transmit OMA per Lane	P_{OMA}	-6		3.0	dBm	2
Average launch Power of OFF	D_P			-30	dB	
Peak Power per Lane	P_P			4.0	dBm	
TDP per Lane	TDP			4	dBm	
Extinction Ratio	ER	3.0			dB	
Return Loss Tolerance				12	dB	
Relative Intensity Noise	RIN			-128	dB/Hz	3
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		0.23, 0.34, 0.43, 0.27, 0.35, 0.4				
Receiver (per Lane)						
Center wavelength	λ	840	850	860	nm	
Receiver Sensitivity per Lane	P_{SEN1}			-9.9	dBm	4
Receiver Sensitivity (OMA) per Lane	P_{SEN2}			-5.4	dBm	
Peak Power, per lane	P_{Px}			4	dBm	
Overload,perlane	P_{AVE}	1			dBm	
Receiver Reflectance	R_{rx}			-12	dB	
Dispersion penalty , per lane	TDP			1.9	dB	
Stressed eye J2 jitter, per Lane	J_{E2P}		0.35		UI	
Stressed eye J9 jitter, per Lane	J_{E9P}		0.47		UI	
Jitter tolerance [OMA], per lane	JTP		-5.4		dBm	
LOS De-Assert	P_a	-11			dBm	
LOS Assert	P_d			-25	dBm	
LOS Hysteresis	P_d-P_a	0.5			dB	

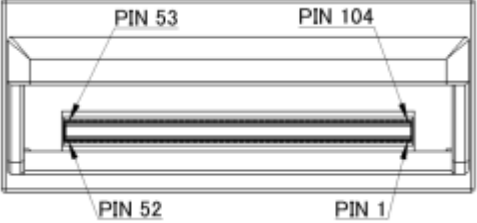
Notes:

1. Transmitter consists of 10 lasers operating at a maximum rate of 11.1810 Gb/s each.
2. Even if TDP is <0.9dB, the OMA min must exceed this value.
3. RIN is scaled by $10 \cdot \log(10/4)$ to maintain SNR outside of transmitter.
4. Measured using DUT Tx and DUT Rx; no golden transmitters shall be used.

Pin Description

The CFP2 connector has 104 pins which are arranged in Top and Bottom rows. The pin map is shown in Picture and Table below.

	CFP2		CFP2	
	Bottom ALT1		Top ALT1	
1	GND	104	GND	
2	TX9n	103	TX7n	
3	TX9p	102	TX7p	
4	GND	101	GND	
5	TX8n	100	TX6n	
6	TX8p	99	TX6p	
7	GND	98	GND	
8	3.3V_GND	97	TX5n	
9	3.3V	96	TX5p	
10	3.3V	95	GND	
11	3.3V	94	TX4n	
12	3.3V	93	TX4p	
13	3.3V_GND	92	GND	
14	3.3V_GND	91	TX3n	
15	VDD_IO_A	90	TX3p	
16	VDD_IO_B	89	GND	
17	FXG_CTL1	88	TX2n	
18	FXG_CTL2	87	TX2p	
19	FXG_CTL3	86	GND	
20	FXG_AIRN1	85	TX1n	
21	FXG_AIRN2	84	TX1p	
22	FXG_AIRN3	83	GND	
23	GND	82	TX0n	
24	TX_DIS	81	TX0p	
25	TX_IOS	80	GND	
26	MOD_IOPWR	79	(RXPCLKn)	
27	MOD_ANS	78	(RXPCLKp)	
28	MOD_RSTn	77	GND	
29	TX_AIRNn	76	TX7n	
30	GND	75	TX7p	
31	ADC	74	GND	
32	MDIO	73	TX6n	
33	PHYAD0	72	TX6p	
34	PHYADR1	71	GND	
35	PHYADR2	70	TX5n	
36	VDD_IO_C	69	TX5p	
37	VDD_IO_D	68	GND	
38	VDD_IO_E	67	TX4n	
39	3.3V_GND	66	TX4p	
40	3.3V_GND	65	GND	
41	3.3V	64	TX3n	
42	3.3V	63	TX3p	
43	3.3V	62	GND	
44	3.3V	61	TX2n	
45	3.3V_GND	60	TX2p	
46	GND	59	GND	
47	TX9n	58	TX1n	
48	TX9p	57	TX1p	
49	GND	56	GND	
50	TX8n	55	TX0n	
51	TX8p	54	TX0p	
52	GND	53	GND	

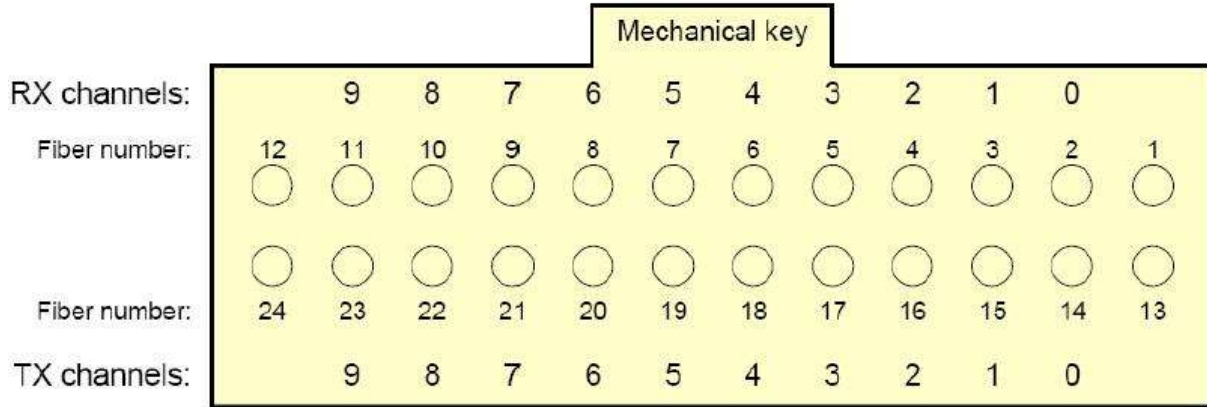


PIN#	Description	PIN#	Description
1	GND	104	GND
2	TX9n	103	TX7n
3	TX9p	102	TX7p
4	GND	101	GND



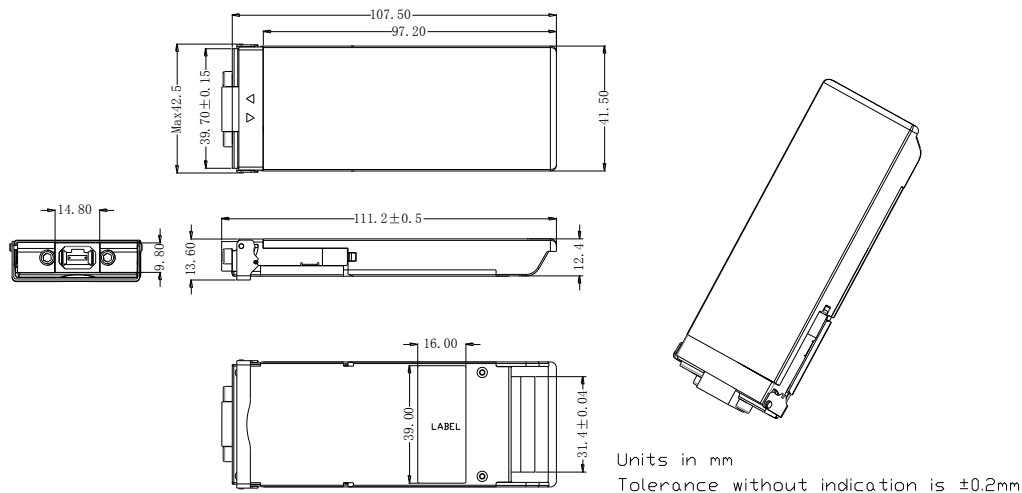
5	TX8n	100	TX6n
6	TX8p	99	TX6p
7	3.3V_GND	98	GND
8	3.3V_GND	97	TX5n
9	3.3V	96	TX5p
10	3.3V	95	GND
11	3.3V	94	TX4n
12	3.3V	93	TX4p
13	3.3V_GND	92	GND
14	3.3V_GND	91	TX3n
15	VND_IO_A	90	TX3p
16	VND_IO_B	89	GND
17	PRG_CNTL1	88	TX2n
18	PRG_CNTL2	87	TX2p
19	PRG_CNTL3	86	GND
20	PRG_ALARM1	85	TX1n
21	PRG_ALARM2	84	TX1p
22	PRG_ALARM3	83	GND
23	GND	82	TX0n
24	TX_DIS	81	TX0p
25	RX_LOS	80	GND
26	MOD_LOPWR	79	(REFCLKn)
27	MOD_ABS	78	(REFCLKp)
28	MOD_RSTn	77	GND
29	GLB_ALARMn	76	RX7n
30	GND	75	RX7p
31	MDC	74	GND
32	MDIO	73	RX6n
33	PRTADR0	72	RX6p
34	PRTADR1	71	GND
35	PRTADR2	70	RX5n
36	VND_IO_C	69	RX5p
37	VND_IO_D	68	GND
38	VND_IO_E	67	RX4n
39	3.3V_GND	66	RX4p
40	3.3V_GND	65	GND
41	3.3V	64	RX3n
42	3.3V	63	RX3p
43	3.3V	62	GND
44	3.3V	61	RX2n
45	3.3V_GND	60	RX2p
46	3.3V_GND	59	GND
47	RX9n	58	RX1n
48	RX9p	57	RX1p
49	GND	56	GND
50	RX8n	55	RX0n
51	RX8p	54	RX0p
52	GND	53	GND

Optical lane assignment (front view of MPO receptacle)



Fiber number	Channel	Electrical pin	Fiber	Channel	Electrical pin
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	51,50	22	TX8	6,5
11	RX9	48,47	23	TX9	3,2
12	Unused		24	Unused	

Package Dimensions





Ordering Information

Part Number	Description
OP-MCF2B85M1MD-0.1	CFP2 100G SR10 850nm100m 0~70°C

Important Notice

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