OSFP-800GB-2XDR4P-C

MSA and TAA 800GBase-2xDR4+ PAM4 OSFP Transceiver (SMF, 1310nm, 2km, 2xMPO, DOM, CMIS 5.0)

Features:

- • Compliant with OSFP MSA Specifications
- • Compliant with IEEE 802.3cu-2021: 8x100GBASE-FR1 Optical Interface
- • Compliant with IEEE 802.3ck-2022: 8x100GAUI-1 C2M Electrical Interface
- • Compliant with CMIS 5.0
- • 2-Wire Serial Interface with Digital Diagnostic Monitoring
- • Operating Temperature: 0 to 70 Celsius
- • Class 1 Laser
- • RoHS Compliant and Lead-Free

Applications:

- • 8x100GBase Ethernet
- • 2x400GBase Ethernet

Product Description

This MSA compliant OSFP transceiver provides 800GBase-2xDR4+ throughput up to 2km over single-mode fiber (SMF) PAM4 using a wavelength of 1310nm via a 2xMPO connector. It can operate at temperatures between 0 and 70C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products.")

Rev. 120525

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Power Supply Voltage	Vcc	-0.5		3.6	V	
Relative Humidity (Non-Condensing)	RH	5		95	%	
Data Input Voltage Differential	V_{DIP}-V_{DIN}			1	V	
Control Input Voltage	V_I	-0.3		Vcc+0.5	V	
Control Output Current	I_O	-20		20	mA	
Signaling Speed Per Lane	DRL		53.125		GBd	
Operating Distance		2		2000	m	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Instantaneous Peak Current at Hot Plug		$Icc_{\_IP}$			6600	mA	
Sustained Peak Current at Hot Plug		$Icc_{\_SP}$			5494.5	mA	
Maximum Power Dissipation		PD			16.5	W	
Maximum Power Dissipation (Low-Power Mode)		PD_{LP}			2	W	
Control Input Voltage - High		VIH	Vcc*0.7		Vcc+0.3	V	
Control Input Voltage – Low		VIL	-0.3		Vcc*0.3	V	
2-Wire Serial Interface Clock Rate					400	kHz	
Power Supply Noise (1kHz to 1MHz, Pk-Pk)					66	mVp-p	
Transmitter (TP1)							
Differential Pk-Pk Input Voltage Tolerance			750			mV	
Pk-Pk AC Common-Mode Voltage Tolerance	Low-Frequency (VCM$_{LF}$)				32	mV	
	Full-Band (VCM$_{FB}$)				80	mV	
Differential-Mode to Common-Mode Return Loss		RLCd		802.3ck 120G-2		dB	
Effective Return Loss		ERL	8.5			dB	
Differential Termination Mismatch					10	%	
Single-Ended Voltage Tolerance Range			-0.4		3.3	V	
DC Common-Mode Voltage Tolerance			-0.35		2.85	V	
Receiver (TP4)							
Pk-Pk AC Common-Mode Voltage	Low-Frequency (VCM$_{LF}$)				32	mV	
	Full-Band (VCM$_{FB}$)				80	mV	
Differential Pk-Pk Output Voltage	Short-Mode				600	mV	
	Long-Mode				845	mV	

Eye Height	EH	15			mV	
Vertical Eye Closure	VEC			12	dB	
Common-Mode to Differential-Mode Return Loss	RLDc	802.3ck 120G-1			dB	
Effective Return Loss	ERL	8.5			dB	
Differential Termination Mismatch				10	%	
Transition Time		8.5			ps	
DC Common-Mode Voltage Tolerance		-0.35		2.85	V	

Electrical Low-Speed Control and Sense Signal Specifications

Parameter	Symbol	Min.	Max.	Unit	Notes
Module Output SCL and SDA	VOL	0	0.4	V	
Module Input SCL and SDA	VIL	-0.3	Vcc*0.3	V	
	VIH	Vcc*0.7	Vcc+0.5	V	
InitMode, ResetL, and ModSelL	VIL	-0.3	0.8	V	
	VIH	2	Vcc+0.3	V	
IntL	VOL	0	0.4	V	
	VOH	Vcc-0.5	Vcc+0.3	V	

Optical Characteristics

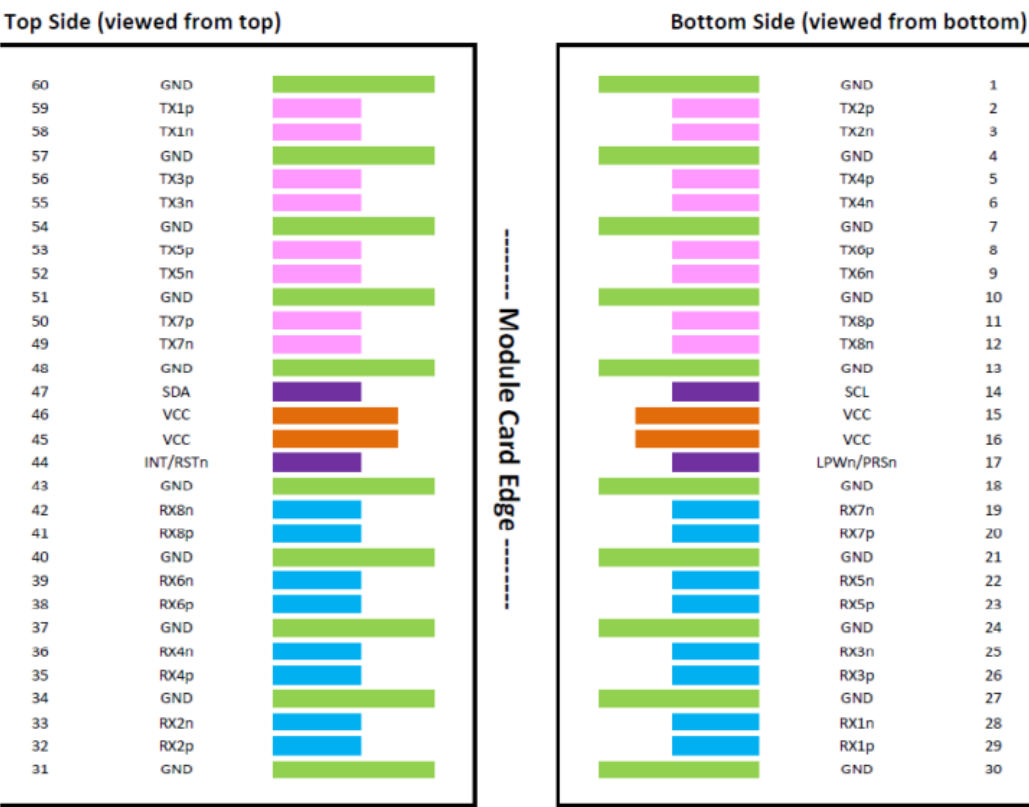| Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Wavelength		λC	1304.5	1311	1317.5	nm	
Side-Mode Suppression Ratio		SMSR	30			dB	
Average Launch Power Per Lane		AOP$_L$	-3.1		4.0	dBm	1
Outer Optical Modulation Amplitude (OMAouter) Per Lane	**TDECQ<1.4dB**	OMAouter	-0.1		4.2	dBm	
	1.4dB≤TDECQ≤3.4dB		-1.5 + TDECQ				
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane		TDECQ			3.4	dB	
Transmitter Eye Closure for PAM4 (TECQ) Per Lane		TECQ			3.4	dB	
| TDECQ - TECQ|					2.5	dB	
Over/Under-Shoot					22	%	
Transmitter Power Excursion					2	dBm	
Average Launch Power of Off Transmitter Per Lane		Toff			-15	dBm	
Extinction Ratio		ER	3.5			dB	
Transmitter Transition Time		Tr			17	ps	
RIN$_{17.1}$OMA		RIN			-136	dB/Hz	
Optical Return Loss Tolerance		ORLT			17.1	dB	
Transmitter Reflectance		TR			-26	dB	2
Receiver							
Wavelength		λC	1304.5	1311	1317.5	nm	
Damage Threshold Per Lane		AOP$_D$	5			dBm	
Average Receive Power Per Lane		AOP$_R$	-7.1		4	dBm	
Receive Power (OMAouter) Per Lane		OMA$_R$			4.2	dBm	
Receiver Reflectance		RR			-26	dB	
Receiver Sensitivity (OMAouter)	**TECQ<1.4dB**	SOMA			-4.5	dBm	3
	1.4dB≤TECQ≤3.4dB				-5.9 + TECQ		
Stressed Receiver Sensitivity (OMAouter) Per Lane		SRS			-2.5	dBm	4
Conditions of Stressed Receiver Sensitivity Test							
Stressed Eye Closure for PAM4 (SECQ) Per Lane Under Test		SECQ		3.4		dB	

Notes:
1. Average launch power, per lane (minimum), is informative and not the principal indicator of signal strength.
2. Transmitter reflectance is defined looking into the transmitter.
3. Receiver sensitivity (OMAouter) per lane (maximum) is informative and is defined for a transmitter with a value of SECQ up to 3.4dB.
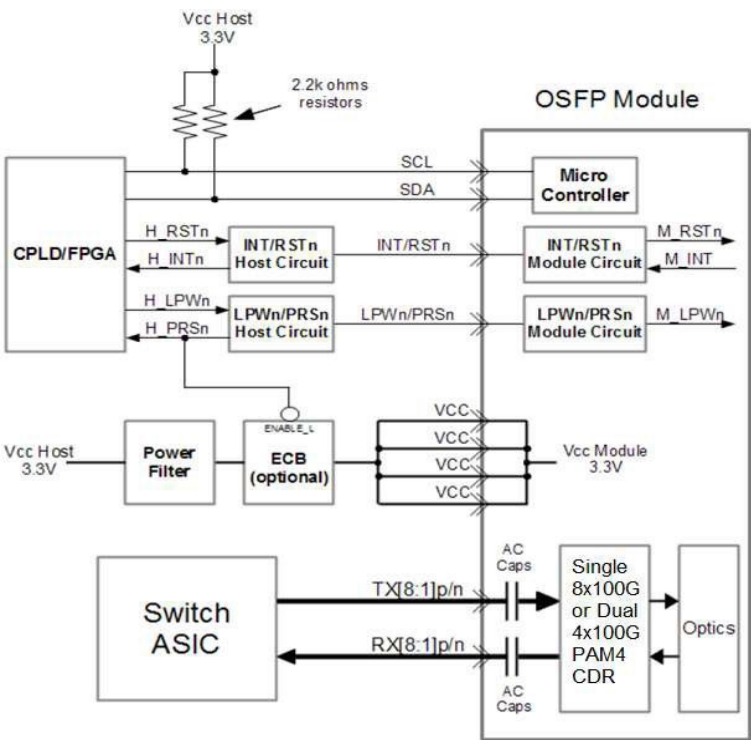4. Measured with conformance test signal at TP3 for the BER = 2.4×10^{-4}.

Pin Descriptions

Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground.	
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	
3	CML-I	Tx2-	Transmitter Inverted Data.	
4		GND	Module Ground.	
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	
6	CML-I	Tx4-	Transmitter Inverted Data.	
7		GND	Module Ground.	
8	CML-I	Tx6+	Transmitter Non-Inverted Data.	
9	CML-I	Tx6-	Transmitter Inverted Data.	
10		GND	Module Ground.	
11	CML-I	Tx8+	Transmitter Non-Inverted Data.	
12	CML-I	Tx8-	Transmitter Inverted Data.	
13		GND	Module Ground.	
14	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	
15		Vcc	+3.3V Power Supply.	
16		Vcc	+3.3V Power Supply.	
17	Multi-Level	LPWn/PRSn	Low-Power Mode/Module Present.	
18		GND	Module Ground.	
19	CML-O	Rx7-	Receiver Inverted Data.	
20	CML-O	Rx7+	Receiver Non-Inverted Data.	
21		GND	Module Ground.	
22	CML-O	Rx5-	Receiver Inverted Data.	
23	CML-O	Rx5+	Receiver Non-Inverted Data.	
24		GND	Module Ground.	
25	CML-O	Rx3-	Receiver Inverted Data.	
26	CML-O	Rx3+	Receiver Non-Inverted Data.	
27		GND	Module Ground.	
28	CML-O	Rx1-	Receiver Inverted Data.	
29	CML-O	Rx1+	Receiver Non-Inverted Data.	
30		GND	Module Ground.	
31		GND	Module Ground.	
32	CML-O	Rx2+	Receiver Non-Inverted Data.	
33	CML-O	Rx2-	Receiver Inverted Data.	
34		GND	Module Ground.	
35	CML-O	Rx4+	Receiver Non-Inverted Data.	
36	CML-O	Rx4-	Receiver Inverted Data.	

37		GND	Module Ground.	
38	CML-O	Rx6+	Receiver Non-Inverted Data.	
39	CML-O	Rx6-	Receiver Inverted Data.	
40		GND	Module Ground.	
41	CML-O	Rx8+	Receiver Non-Inverted Data.	
42	CML-O	Rx8-	Receiver Inverted Data.	
43		GND	Module Ground.	
44	Multi-Level	INT/RSTn	Module Input/Module Reset.	
45		Vcc	+3.3V Power Supply.	
46		Vcc	+3.3V Power Supply.	
47	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	
48		GND	Module Ground.	
49	CML-I	Tx7-	Transmitter Inverted Data.	
50	CML-I	Tx7+	Transmitter Non-Inverted Data.	
51		GND	Module Ground.	
52	CML-I	Tx5-	Transmitter Inverted Data.	
53	CML-I	Tx5+	Transmitter Non-Inverted Data.	
54		GND	Module Ground.	
55	CML-I	Tx3-	Transmitter Inverted Data.	
56	CML-I	Tx3+	Transmitter Non-Inverted Data.	
57		GND	Module Ground.	
58	CML-I	Tx1-	Transmitter Inverted Data.	
59	CML-I	Tx1+	Transmitter Non-Inverted Data.	
60		GND	Module Ground.	

Electrical Pad Layout

Top Side (viewed from top)

Pin	Signal
60	GND
59	TX1p
58	TX1n
57	GND
56	TX3p
55	TX3n
54	GND
53	TX5p
52	TX5n
51	GND
50	TX7p
49	TX7n
48	GND
47	SDA
46	VCC
45	VCC
44	INT/RSTn
43	GND
42	RX8n
41	RX8p
40	GND
39	RX6n
38	RX6p
37	GND
36	RX4n
35	RX4p
34	GND
33	RX2n
32	RX2p
31	GND

------- Module Card Edge -------

Bottom Side (viewed from bottom)

Signal	Pin
GND	1
TX2p	2
TX2n	3
GND	4
TX4p	5
TX4n	6
GND	7
TX6p	8
TX6n	9
GND	10
TX8p	11
TX8n	12
GND	13
SCL	14
VCC	15
VCC	16
LPWn/PRSn	17
GND	18
RX7n	19
RX7p	20
GND	21
RX5n	22
RX5p	23
GND	24
RX3n	25
RX3p	26
GND	27
RX1n	28
RX1p	29
GND	30

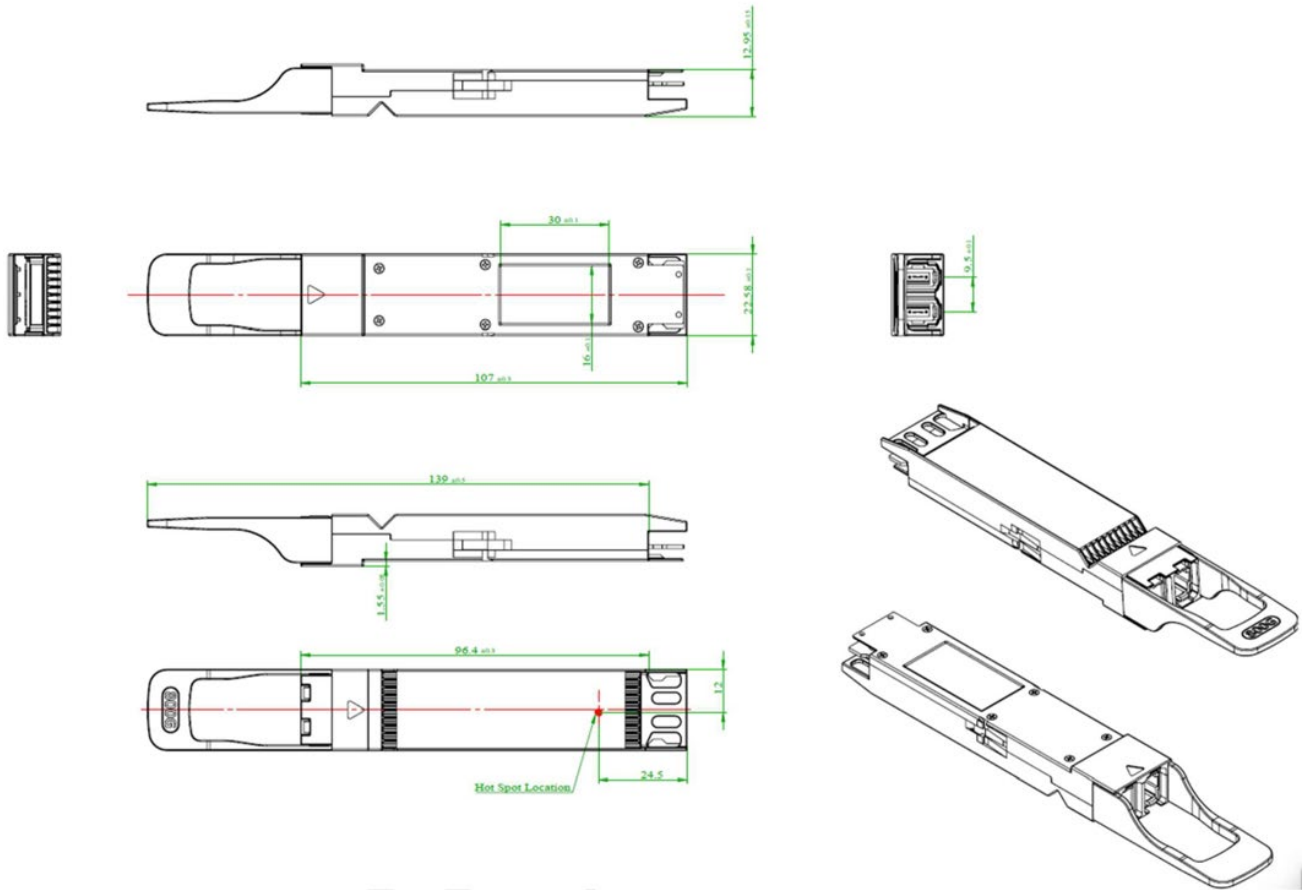## Recommended OSFP Host Board Schematic

Mechanical Specifications

About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

Contact Information
ProLabs US

Email: sales@prolabs.com
Telephone: 952-852-0252

ProLabs UK

Email: salessupport@prolabs.com
Telephone: +44 1285 719 600