

OSFP224-1600GB-2XFR4-SKY

MSA 1.6T 2xFR4 PAM4 OSFP224-IHS Transceiver (SMF, 1310nm, 2km, 2xLC, DOM, CMIS 5.3)

Product Description

This MSA compliant OSFP224-IHS transceiver provides 1600GBase-2xFR4 throughput up to 2km over single-mode fiber (SMF) PAM4 using a wavelength of 1310nm via a 2xLC 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. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- OSFP MSA Compliant
- Duplex LC Optical Receptacle Connector
- Hot-Pluggable
- CMIS 5.3
- Up to 2km Transmission on Single-Mode Fiber
- Single 3.3V Power Supply
- Power Consumption: 28W Maximum
- Operating Temperature: 0 to 70 Celsius
- RoHS compliant and Lead-Free

Applications:

- 16x100GBase Ethernet
- 2x800GBase Ethernet
- InfiniBand

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0	25	70	°C	
Relative Humidity – Storage (Non-Condensing)	RHstg	0		95	%	2
Relative Humidity – Operating (Non-Condensing)	RHc	0		85	%	2
Supply Voltage	Vcc	-0.5		3.6	V	

Notes:

1. Exceeding the “Absolute Maximum Ratings” may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous “Absolute Maximum Ratings,” a condition which may cause irreversible damage to the device.
2. Non-Condensing.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Consumption	PC		25	28	W	
Transmitter						
Tx_Data Differential Input Voltage	VIN			880	mV	
Tx_Data Differential Input Impedance	ZIN		93		Ω	
Signaling Rate Per Lane	S		106.25		GBaud	1
Receiver						
Rx_Data Differential Output Voltage	VOOUT			800	mV	
Rx_Data Differential Output Impedance	ZOUT		93		Ω	2
Signaling Rate Per Lane	S		106.25		GBaud	1

Notes:

1. ±8%
2. Range: ±50ppm.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Rate Per Lane		113.4375 ± 50ppm			GBd	
Laser Type		DFB+SiPho PIC				
Lane Wavelength	λ	1264.5	1271	1277.5	nm	
		1284.5	1291	1297.5	nm	
		1304.5	1311	1317.5	nm	
		1324.5	1331	1337.5	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power Per Lane	P _{out}	-2.2		4.9	dBm	
Outer Optical Modulation Amplitude	OMA _{outer}	-0.8		4.8	dBm	1
		-1+TDECQ		4.8	dBm	2
Transmitter and Dispersion Penalty Eye Closure for PAM4	TDECQ			3.4	dB	3
Optical Output with Tx Off Per Lane	P _{off}			-16	dBm	
Extinction Ratio	ER	3.5			dB	3
Transmitter Reflectance	RFL			-26	dB	
Receiver						
Signaling Rate Per Lane	S _r	113.4375 ± 50ppm			GBd	
Lane Wavelength	λ	1264.5	1271	1277.5	nm	
		1284.5	1291	1297.5	nm	
		1304.5	1311	1317.5	nm	
		1324.5	1331	1337.5	nm	
Receiver Sensitivity (OMA _{outer}) Per Lane	SEN	-3.7		4.8	dBm	4, 6
		-4.6+TECQ		4.8	dBm	5, 6
Average Receiver Power Per Lane	P _{IN}	-6.2		4.9	dBm	6
Damage Threshold Per Lane		5.9			dBm	
Receiver Reflectance	RFL			-26	dB	

Notes:

1. For TDECQ<0.9dB
2. For 0.9dB≤TDECQ≤3.4dB.
3. Test with SSPRQ pattern, the reference equalizer is 15-tap FFE.
4. For TECQ<0.9dB
5. For 0.9dB≤TECQ≤3.4dB.
6. PAM4 Signaling rate per lane 113.4375GBaud, PRBS 2³¹-1.

Pin Descriptions

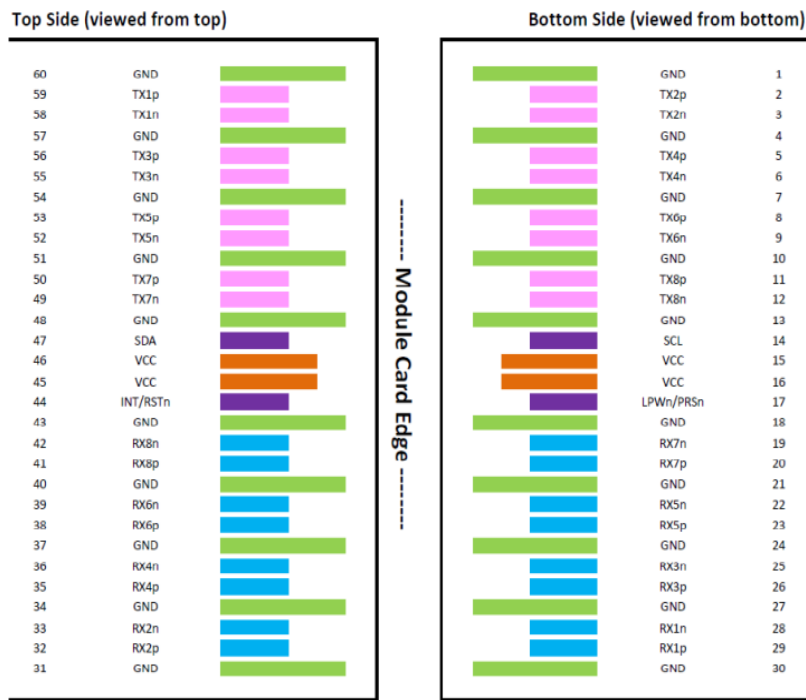
Pin	Logic	Symbol	Name/Description	Direction	Plug Sequence	Notes
1		GND	Module Ground.		1	
2	CML-I	Tx2+	CH2 Transmitter Data Non-Inverted.	Input from Host	3	
3	CML-I	Tx2-	CH2 Transmitter Data Inverted.	Input from Host	3	
4		GND	Module Ground.		1	
5	CML-I	Tx4+	CH4 Transmitter Data Non-Inverted.	Input from Host	3	
6	CML-I	Tx4-	CH4 Transmitter Data Inverted.	Input from Host	3	
7		GND	Module Ground.		1	
8	CML-I	Tx6+	CH6 Transmitter Data Non-Inverted.	Input from Host	3	
9	CML-I	Tx6-	CH6 Transmitter Data Inverted.	Input from Host	3	
10		GND	Module Ground.		1	
11	CML-I	Tx8+	CH8 Transmitter Data Non-Inverted.	Input from Host	3	
12	CML-I	Tx8-	CH8 Transmitter Data Inverted.	Input from Host	3	
13		GND	Module Ground.		1	
14	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock.	Bi-Directional	3	1
15		Vcc	+3.3V Power Supply.	Power from Host	2	
16		Vcc	+3.3V Power Supply.	Power from Host	2	
17	Multi-Level	LPWn/PRSn	Low-Power Mode/Module Present.	Bi-Directional	3	2
18		GND	Module Ground.		1	
19	CML-O	Rx7-	CH7 Receiver Data Inverted.	Output to Host	3	
20	CML-O	Rx7+	CH7 Receiver Data Non-Inverted.	Output to Host	3	
21		GND	Module Ground.		1	
22	CML-O	Rx5-	CH5 Receiver Data Inverted.	Output to Host	3	
23	CML-O	Rx5+	CH5 Receiver Data Non-Inverted.	Output to Host	3	
24		GND	Module Ground.		1	
25	CML-O	Rx3-	CH3 Receiver Data Inverted.	Output to Host	3	
26	CML-O	Rx3+	CH3 Receiver Data Non-Inverted.	Output to Host	3	
27		GND	Module Ground.		1	
28	CML-O	Rx1-	CH1 Receiver Data Inverted.	Output to Host	3	
29	CML-O	Rx1+	CH1 Receiver Data Non-Inverted.	Output to Host	3	
30		GND	Module Ground.		1	
31		GND	Module Ground.		1	
32	CML-O	Rx2+	CH2 Receiver Data Non-Inverted.	Output to Host	3	
33	CML-O	Rx2-	CH2 Receiver Data Inverted.	Output to Host	3	
34		GND	Module Ground.		1	
35	CML-O	Rx4+	CH4 Receiver Data Non-Inverted.	Output to Host	3	
36	CML-O	Rx4-	CH4 Receiver Data Inverted.	Output to Host	3	

37		GND	Module Ground.		1	
38	CML-O	Rx6+	CH6 Receiver Data Non-Inverted.	Output to Host	3	
39	CML-O	Rx6-	CH6 Receiver Data Inverted.	Output to Host	3	
40		GND	Module Ground.		1	
41	CML-O	Rx8+	CH8 Receiver Data Non-Inverted.	Output to Host	3	
42	CML-O	Rx8-	CH8 Receiver Data Inverted.	Output to Host	3	
43		GND	Module Ground.		1	
44	Multi-Level	INT/RSTn	Module Interrupt/Module Reset.	Bi-Directional	3	3
45		Vcc	+3.3V Power Supply.	Power from Host	2	
46		Vcc	+3.3V Power Supply.	Power from Host	2	
47	LVCMS-I/O	SDA	2-Wire Serial Interface Data.	Bi-Directional	3	4
48		GND	Module Ground.		1	
49	CML-I	Tx7-	CH7 Transmitter Data Inverted.	Input from Host	3	
50	CML-I	Tx7+	CH7 Transmitter Data Non-Inverted.	Input from Host	3	
51		GND	Module Ground.		1	
52	CML-I	Tx5-	CH5 Transmitter Data Inverted.	Input from Host	3	
53	CML-I	Tx5+	CH5 Transmitter Data Non-Inverted.	Input from Host	3	
54		GND	Module Ground.		1	
55	CML-I	Tx3-	CH3 Transmitter Data Inverted.	Input from Host	3	
56	CML-I	Tx3+	CH3 Transmitter Data Non-Inverted.	Input from Host	3	
57		GND	Module Ground.		1	
58	CML-I	Tx1-	CH1 Transmitter Data Inverted.	Input from Host	3	
59	CML-I	Tx1+	CH1 Transmitter Data Non-Inverted.	Input from Host	3	
60		GND	Module Ground.		1	

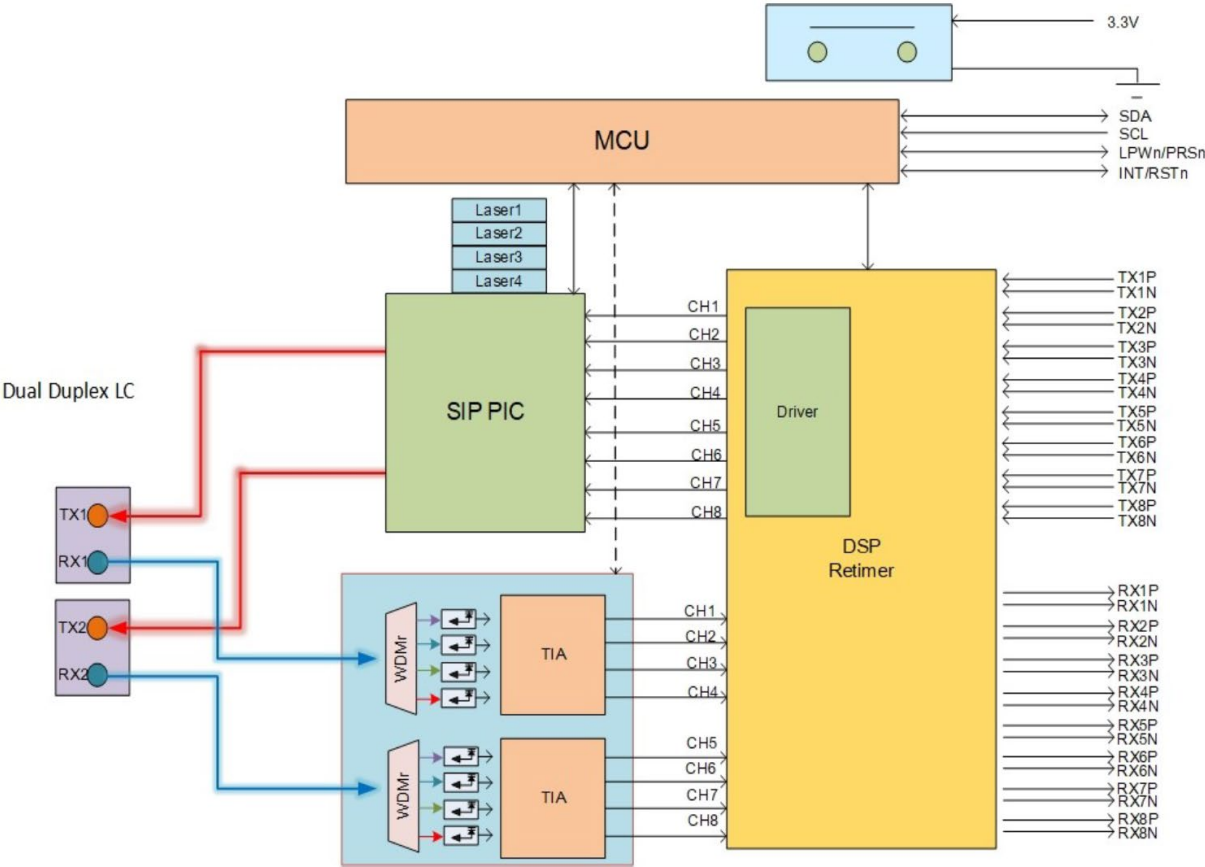
Notes:

1. Open-drain with pull-up resistor on host.
2. LPWn/PRSn is a dual function signal that allows the host to signal Low-Power Mode and for the module to indicate that the module is present.
3. INT/RSTn is a dual function signal that allows the module to raise an interrupt to the host and also allows the host to reset the module.

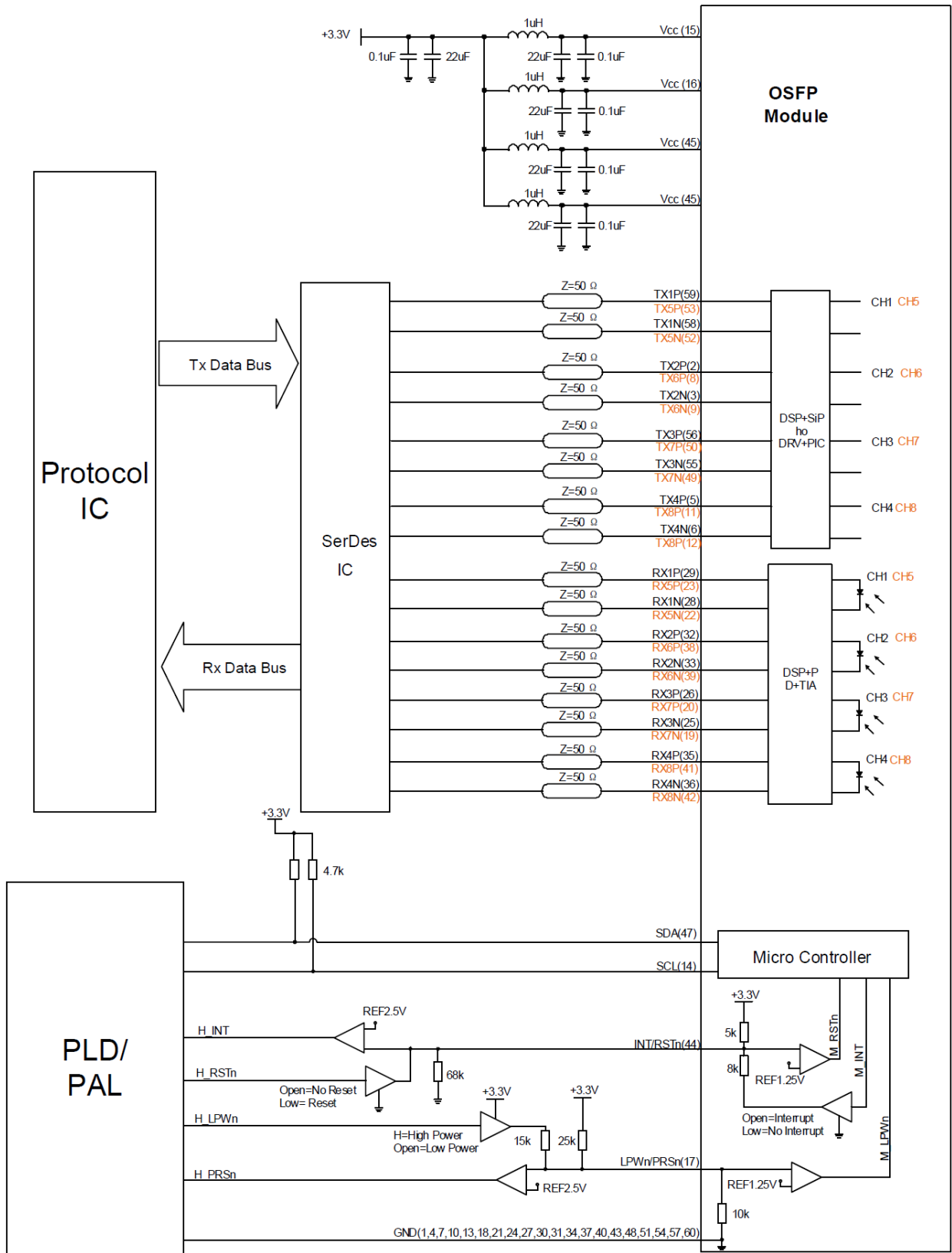
Electrical Pad Layout



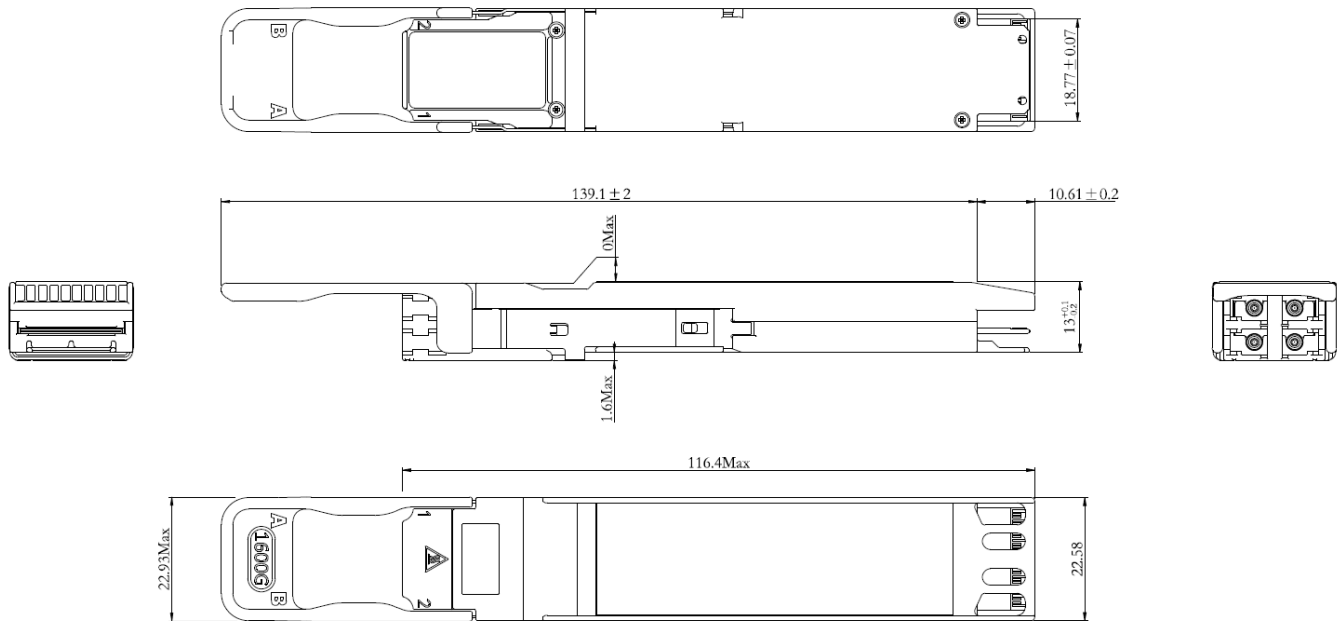
Block Diagram



Host Board



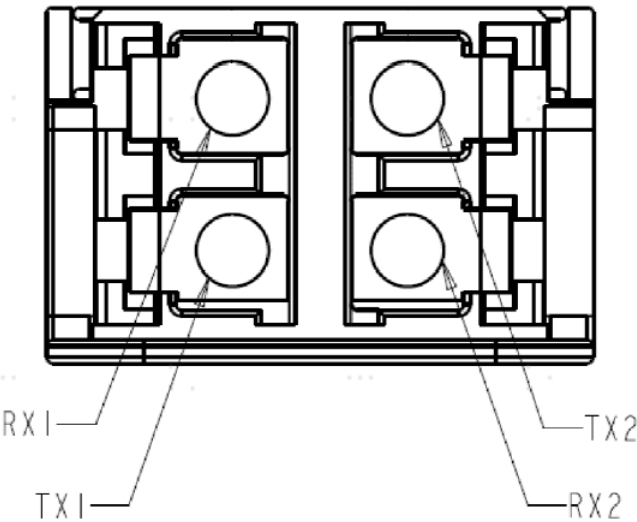
Mechanical Specification



Notes:

- 1. Tolerance: $\pm 0.1\text{mm}$.
- 2. Others according with OSFP MSA.
- 3. Optical port according with Fiber Connector Specifications.

Optical Lane Assignment



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

