Preliminary Datasheet

ORHS224-1600GB-2XDR4-SKY

MSA 1.6T 2xDR4 PAM4 OSFP224-RHS Transceiver (SMF, 1310nm, 500m, 2xMPO, DOM, CMIS 5.0)

Product Description

This MSA compliant OSFP224-RHS transceiver provides 1600GBase-2xDR4 throughput up to 500m 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. 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
- 8x212.5Gbps PAM4 Optical and Electrical Interfaces
- Compliant with IEEE802.3dj and CEI-224G
- 8 Duplex Channels Transmitters and Receivers
- Up to 500m Transmission on Single-Mode Fiber with FEC
- 2xMPO-12 APC Connector
- 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	℃	
Operating Case Temperature	Tc	0		70	℃	
Relative Humidity	RH	5		85	%	
Supply Voltage	Vcc	-0.5		3.6	V	
Damage Threshold Per Lane		5			dBm	
Link Distance with G.652	D	2		500	m	
Modulation Format			PAM4			

High Speed Electrical Characteristics

Parameter		Symbol/ Test Point	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Power Consumption		PC			28	W	
Input							
Signaling Rate Per Lane (PAM4 Encoded)		TP1		106.25 ± 50ppm		GBd	
Differential Pk-Pk Input Voltage Tolerance		TP1a	750			mV	
AC Common-Mode RMS Voltage Tolerance		TP1a	25			mV	
Differential Termination Mismatch					10	%	
Single-Ended Voltage Tolerance Range		TP1a	-0.4		3.3	V	
DC Common-Mode Voltage Tolerance		TP1	0.35		2.85	V	
Output							
Signaling Rate Per Lane (PAM4 Encoded)		TP4		106.25 ± 50ppm		GBd	
AC Common-Mode Output Voltage (RMS)		TP4			25	mV	
Differential Pk-Pk Output Voltage	**Short Mode**	TP4			600	mV	
	Long Mode	TP4			845	mV	
Eye Height		TP4	15			mV	
DC Common-Mode Voltage Tolerance			-0.35		2.85	V	
Differential Termination Mismatch					10	%	
Transition Time (Minimum, 20-80%)			8.5			ps	

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Signaling Rate Per Lane			106.25 ± 50ppm			GBd	
Wavelength		λC	1304.5	1310	1317.5	nm	
Average Launch Power Per Lane		AOP_L	-2.8		4	dBm	1
Outer Optical Modulation Amplitude (OMAouter) Per Lane	**(TECQ, TDECQ) < 0.9dB**	OMAouter	-0.3		4.2	dBm	
	0.9< Max.(TECQ, TDECQ) < 3.4dB		-1.2 + Max. (TECQ, TDECQ)				
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane					3.4	dB	
Maximum TECQ					3.4	dB	
|TDECQ - TECQ| Maximum					2.5	dB	
Side-Mode Suppression Ratio		SMSR	30			dB	
Over/Under-Shoot					22	%	
Extinction Ratio		ER	3.5			dB	
Transmitter Transition Time		Tr			8	ps	
Average Launch Power of Off Transmitter Per Lane		Poff			-15	dBm	
$RIN_{21.4}OMA$		RIN			-139	dB/Hz	
Optical Return Loss Tolerance		ORLT			21.4	dB	
Transmitter Reflectance					-26		2
Receiver							
Signaling Rate Per Lane			106.25 ± 50ppm			GBd	
Wavelength		λC	1304.5	1310	1317.5	nm	
Damage Threshold Per Lane		AOP_D	5			dBm	3
Average Receive Power Per Lane		AOP_R	-5.8		4	dBm	4
Receive Power (OMAouter) Per Lane		R_{OMA}			4.2	dBm	
Receiver Reflectance		RR			-26	dB	
Receiver Sensitivity (OMAouter) Per Lane	**TECQ < 0.9dB**	SEN	3.4			dBm	
	0.9dB < TECQ <= SECQ		-4.3+TECQ				
LOS Assert		LOSA	-26			dBm	
LOS De-Assert		LOSD			-8	dBm	
LOS Hysteresis		LOSH	0.5			dB	
Stressed Receiver Sensitivity (OMAouter) Per Lane		SRS			-0.9	dBm	5
Conditions of Stressed Receiver Sensitivity Test							
Stressed Eye Closure for PAM4 (SECQ) Per Lane Under Test		SECQ		3.4		dB	6
OMAouter of Each Aggressor Lane				2.9		dB	6

Notes:

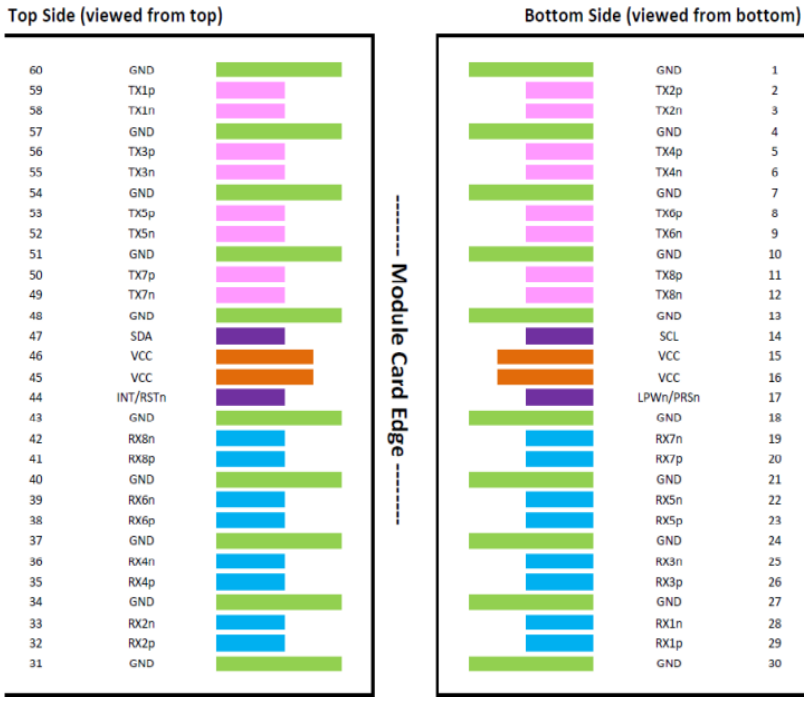
1. Average launch power per lane (minimum) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Transmitter reflectance is defined looking into the transmitter.
3. The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level. The receiver does not have to operate correctly at this input power.
4. Average receive power per lane (minimum) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
5. Measured with conformance test signal at TP3 (see 180.7) for the BER specified in 180.1.1.
6. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Pin Descriptions

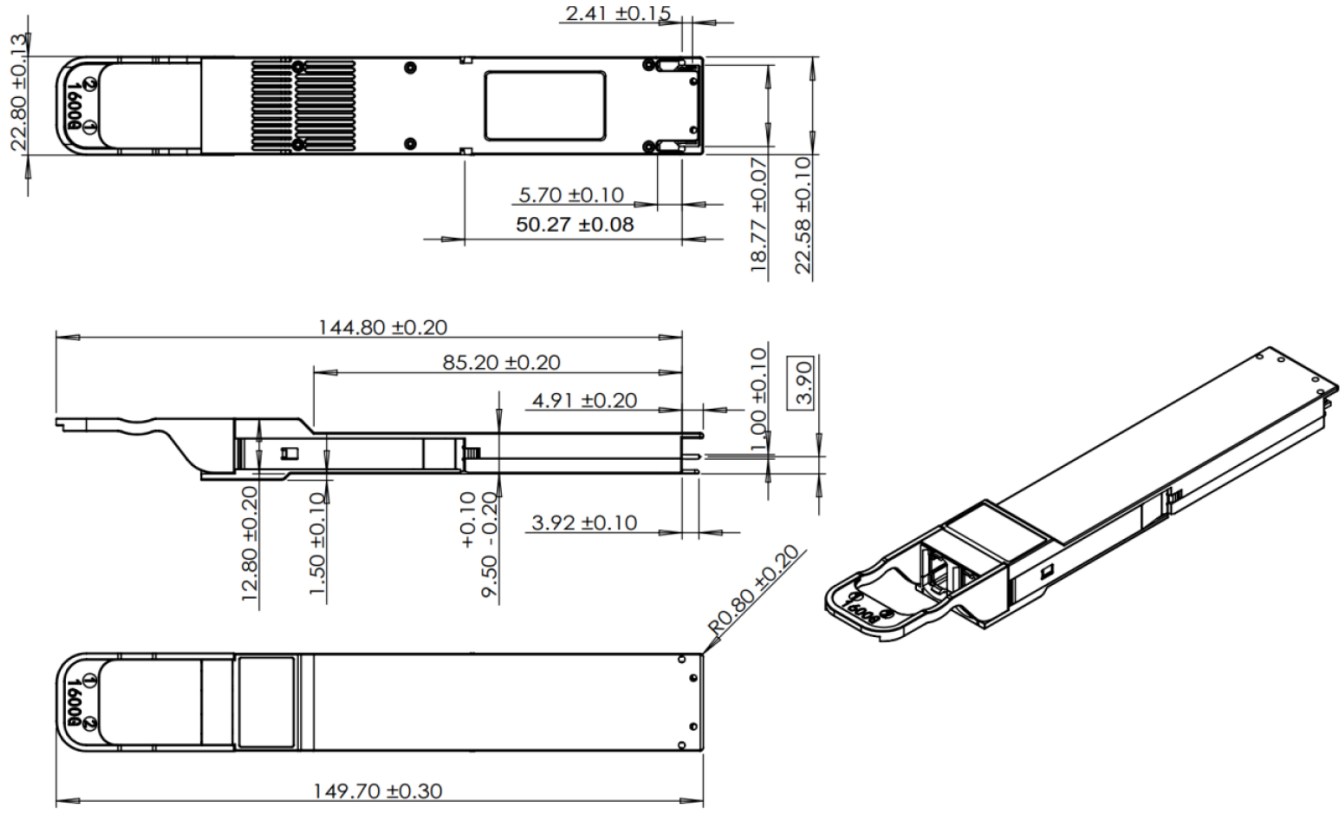
Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground.	
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	
3	CML-I	Tx2-	Transmitter Inverted Data.	
4		GND	Module Ground.	
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	
6	CML-I	Tx4-	Transmitter Inverted Data.	
7		GND	Module Ground.	
8	CML-I	Tx6+	Transmitter 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



Mechanical Specification



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.