Preliminary Datasheet

ORHS224-1600GB-2XDR4-AO

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

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

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.

AddOn's transceivers are RoHS compliant and lead-free

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:

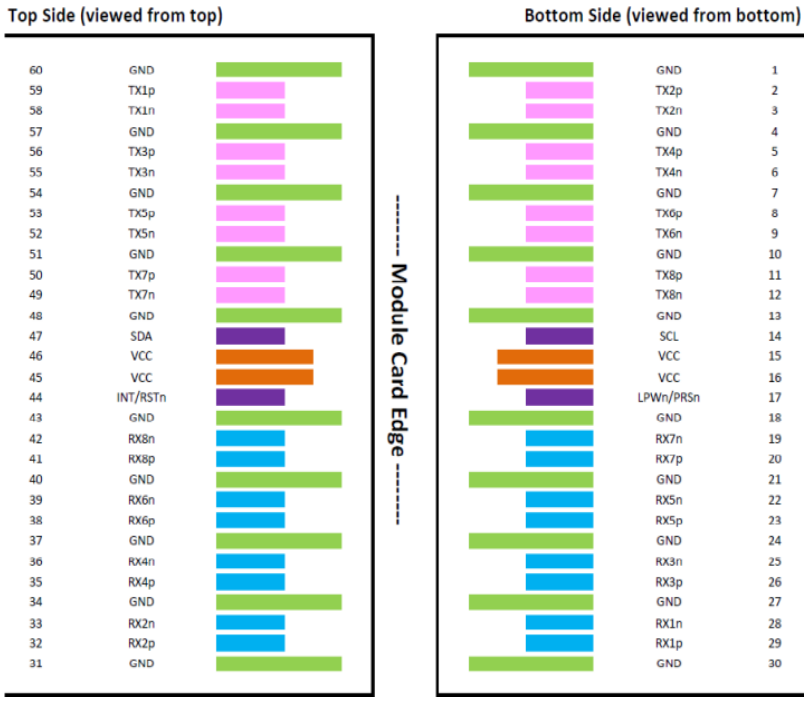
1. Average launch power per lane (minimum) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Transmitter reflectance is defined looking into the transmitter.
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

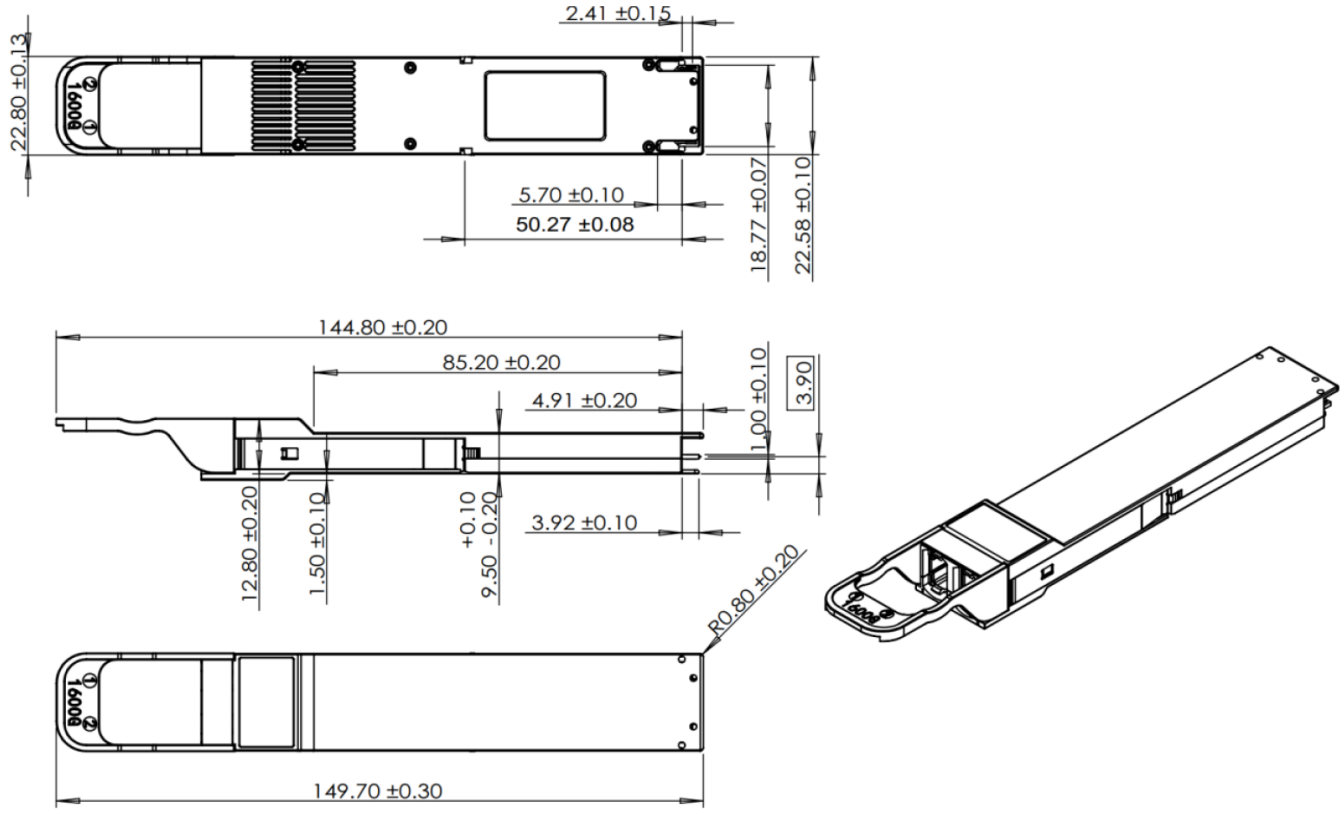
Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground.	
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	
3	CML-I	Tx2-	Transmitter Inverted Data.	
4		GND	Module Ground.	
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	
6	CML-I	Tx4-	Transmitter Inverted Data.	
7		GND	Module Ground.	
8	CML-I	Tx6+	Transmitter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

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is in engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.

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