Product Specification

OSFP 800G SR8 RHS Transceiver

OSFP-2280050MS895AD-ARH

FEATURES

- ✓ Compliant with OSFP MSA Hardware
- ✓ CMIS 5.0 compliance
- ✓ 800G SR8 multi-mode transceiver
- ✓ 53.125GBd PAM4 *8 channel 800GAUI-8 C2M Electrical interface
- ✓ 53.125GBd PAM4 *8 channel 800G-SR8 Optical interface
- ✓ 8 channels 850nm VCSEL array
- ✓ 8 channels PIN photo detector array
- ✓ Up to 50m reach on OM4/OM5 and 30m on OM3 with FEC
- ✓ Dual optical ports of MPO-12/APC
- ✓ Single 3.3V power supply
- ✓ Power dissipation <15W
- ✓ Case temperature range of 0 to 70°C

APPLICATIONS

- ✓ 800GBASE-SR8 Ethernet
- ✓ InfiniBand
- ✓ Data center network

COMPLIANCE

- ✓ ESD compatible with MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM)
- ✓ Laser Eye Safety compatible with FDA 21CFR 1040.10 and EN (IEC) 60825-1
- ✓ RoHS compliance

OSFP-2280050MS895AD-ARH is an 800Gb/s Octal Small Form-factor Pluggable optical module designed for 50m OM4/OM5 optical communication applications. On the transmitter side, the module converts 8 channels of 100Gb/s (PAM4) electrical input data to 8 channels of parallel optical signals, each capable of 100Gb/s operation for an aggregate data rate of 800Gb/s. On the receiver side, the module converts 8 channels of parallel optical signals of 100Gb/s each channel for an aggregate data rate of 800Gb/s into 8 channels of 100Gb/s (PAM4) electrical output data.

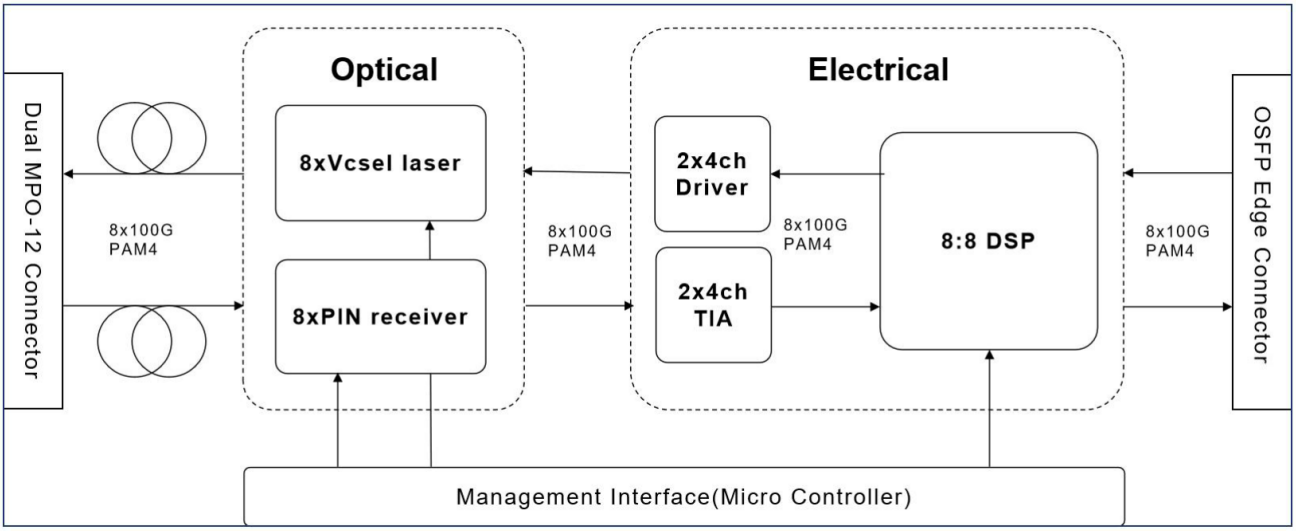
ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Min.	Typical	Max.	Unit
Storage Temperature	$T_{Storage}$		-40		+85	℃
Relative Humidity	R_H	Non-condensing	0		+85	%
Supply Voltage	V_{CC}		-0.5		3.5	V

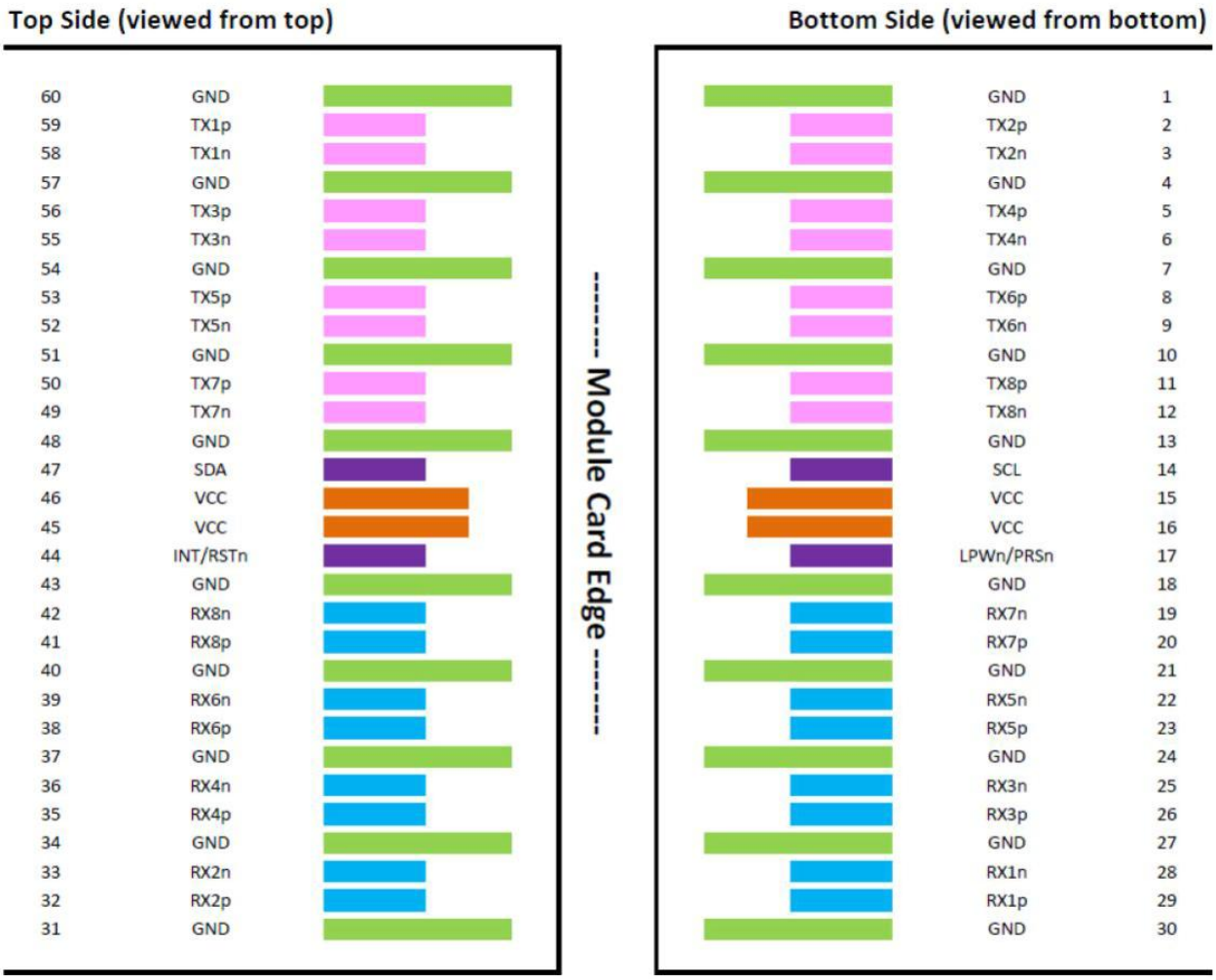
RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Conditions	Min.	Typical	Max.	Unit
Case Operating Temperature	T_C		0		+70	℃
Power Supply Voltage	V_{CC}		3.135	3.3	3.465	V
Power Consumption					15	W
Power Dissipation, Low Power Mode (Max.)					1.5	W
Two Wire Serial Interface Clock Rate			100		1000	kHz
Power Supply Noise Tolerance		10Hz-10MHz	66			mV
Rx Differential Data Output Load				100		ohm
Data Rate, Each Lane		PAM4		53.125		GBd
Link Distance (OM4/OM5)					50	m
Link Distance (OM3)					30	m

TRANSCEIVER BLOCK DIAGRAM



PIN-OUT OF CONNECTOR BLOCK ON HOST BOARD



PIN DESCRIPTIONS

Pin	Symbol	Name/Description
1	GND	Ground
2	TX2p	Transmitter Data Non-Inverted
3	TX2n	Transmitter Data Inverted
4	GND	Ground
5	TX4p	Transmitter Data Non-Inverted
6	TX4n	Transmitter Data Inverted
7	GND	Ground
8	TX6p	Transmitter Data Non-Inverted
9	TX6n	Transmitter Data Inverted
10	GND	Ground
11	TX8p	Transmitter Data Non-Inverted
12	TX8n	Transmitter Data Inverted
13	GND	Ground
14	SCL	2-wire Serial interface clock
15	VCC	+3.3V Power
16	VCC	+3.3V Power
17	LPWn/PRSn	Low-Power Mode / Module Present
18	GND	Ground
19	RX7n	Receiver Data Inverted
20	RX7p	Receiver Data Non-Inverted
21	GND	Ground
22	RX5n	Receiver Data Inverted
23	RX5p	Receiver Data Non-Inverted
24	GND	Ground
25	RX3n	Receiver Data Inverted
26	RX3p	Receiver Data Non-Inverted
27	GND	Ground
28	RX1n	Receiver Data Inverted
29	RX1p	Receiver Data Non-Inverted
30	GND	Ground
31	GND	Ground
32	RX2p	Receiver Data Non-Inverted
33	RX2n	Receiver Data Inverted
34	GND	Ground
35	RX4p	Receiver Data Non-Inverted
36	RX4n	Receiver Data Inverted
37	GND	Ground
38	RX6p	Receiver Data Non-Inverted
39	RX6n	Receiver Data Inverted
40	GND	Ground
41	RX8p	Receiver Data Non-Inverted

42	RX8n	Receiver Data Inverted
43	GND	Ground
44	INT/RSTn	Module Interrupt / Module Reset
45	VCC	+3.3V Power
46	VCC	+3.3V Power
47	SDA	2-wire Serial interface data
48	GND	Ground
49	TX7n	Transmitter Data Inverted
50	TX7p	Transmitter Data Non-Inverted
51	GND	Ground
52	TX5n	Transmitter Data Inverted
53	TX5p	Transmitter Data Non-Inverted
54	GND	Ground
55	TX3n	Transmitter Data Inverted
56	TX3p	Transmitter Data Non-Inverted
57	GND	Ground
58	TX1n	Transmitter Data Inverted
59	TX1p	Transmitter Data Non-Inverted
60	GND	Ground

OSFP CONTROL PINS

Symbol	Function	Description
SCL	BiDir	2-wire serial clock signal. Requires pull-up resistor to 3.3V on host
SDA	BiDir	2-wire serial data signal. Requires pull-up resistor to 3.3V on host.
LPWn/PRSn	Input/output	Dual Function Signal • Low Power mode is an active-low input signal • Module Present is controlled by a pull-down resistor on the module which gets converted to an active-low output logic signal
INT/RSTn	Input/output	Dual Function Signal • Reset is an active-low input signal • Interrupt is an active-high output signal

ELECTRICAL CHARACTERISTICS

Module input (each Lane)

Parameter		Symbol	Min.	Typical	Max.	Unit	Note
Signaling Rate, Each Lane			53.125±100ppm			GBd	
Single-Ended Voltage Tolerance			-0.4		3.3	V	
Dc Common-Mode Voltage Tolerance			-350		2850	mV	
Ac Common-Mode Voltage Tolerance	Low-Frequency, VCMLF		32			mV	
	Full-Band, VCMFB		80				
Differential Voltage Pk-Pk Tolerance			750			mV	
Differential-Mode to Common-Mode Return Loss			IEEE 802.3ck D3.3 Equation 120G-2			dB	
Effective Return Loss, ERL			8.5			dB	
Differential Termination Mismatch					10	%	
Module Stressed Input Tolerance			IEEE 802.3ck D3.3 120G.3.4.3				

Module output (each Lane)

Parameter		Symbol	Min.	Typical	Max.	Unit	Note
Signaling Rate, Each Lane			53.125±100ppm			GBd	
Peak-To-Peak AC Common-Mode Voltage	Low-Frequency, VCMLF				32	mV	
	Full-Band, VCMFB				80		
Differential Peak-To-Peak Output Voltage	Short Mode				600	mV	
	Long Mode				845		
Eye Height			15			mV	
Vertical Eye Closure, VEC					12	dB	
Common-Mode to Differential Return Loss, RLDC			IEEE 802.3ck Equation 120G-1			dB	
Effective Return Loss, ERL			8.5			dB	
Differential Termination Mismatch					10	%	
Transition Time (20% To 80%)			8.5			ps	
DC Common-Mode Output Voltage			--350		2850	mV	

OPTICAL CHARACTERISTICS

Transmitter						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Data Rate, Each Lane		53.125 ± 100 ppm			GBd	
Modulation Format		PAM4				
Lane Wavelength		844	850	863	nm	
RMS spectral width				0.6	nm	
Average Launch Power, Each Lane		-1		4	dBm	*1
Outer Optical Modulation Amplitude (OMA outer), Each Lane		-2.1		3.5	dBm	*2
Transmitter And Dispersion Eye Closure for PAM4, Each Lane	TDECQ			4.4	dB	
Extinction Ratio	ER	2.5		3.5	dB	
Average Launch Power of OFF Transmitter				-30	dBm	
RIN14OMA			-148		dB/Hz	
Optical Return Loss Tolerance				14	dB	
Transmitter Reflectance				-26	dB	*3
Receiver						
Data Rate, Each Lane		53.125 ± 100 ppm			GBd	
Modulation Format		PAM4				
Lane Wavelength		842	850	948	nm	
Damage Threshold, Each Lane		5			dBm	
Average Receive Power, Each Lane		-6.3		4	dBm	
Receive Power (OMA outer), Each Lane				3.5	dBm	
Receive Reflectance				-20	dB	
Receiver Sensitivity (OMA Outer), Each Lane				-4.6	dBm	*4
Stressed Receiver Sensitivity (OMA Outer), Each Lane				-2	dBm	*5
LOS Assert		-17			dBm	
LOS De-assert				-8	dBm	
LOS Hysteresis		0.5			dB	
Conditions of Stress Receiver Sensitivity Test						
Stressed Eye Closure for PAM4 (SECQ), Lane Under Test			4.4		dB	
OMA Outer of Each Aggressor Lane			3.5		dBm	

Notes:

*1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength.

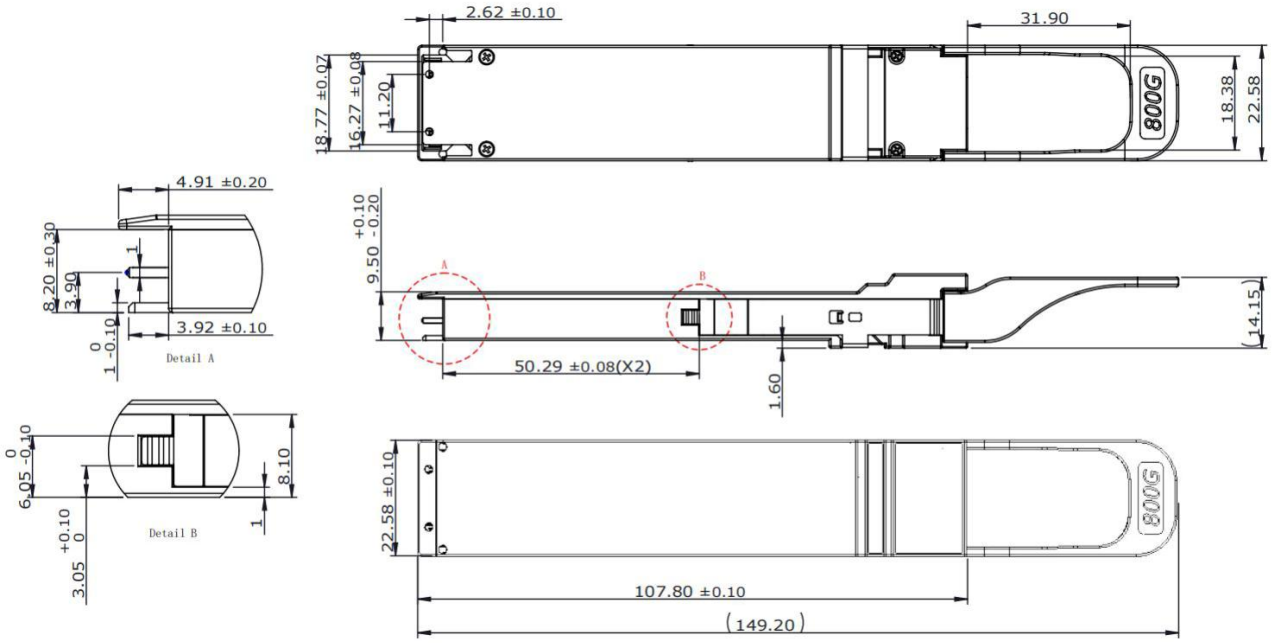
*2. Even if max(TECQ,TDECQ) < 1.8dB, OMAouter (min) must exceed this value.

*3. Transmitter reflectance is defined looking into the transmitter.

*4. Receiver sensitivity (OMAouter), each lane (max) is informative and is defined for a transmitter with TDECQ<=1.8 dB

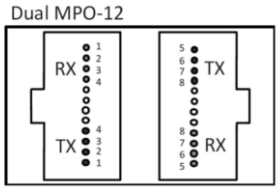
*5. Measured with conformance test signal at TP3 for the BER equal to $2.4x10^{-4}$.

OUTLINE DIMENSIONS



OPTICAL PORT DESCRIPTION

The optical interface port is dual MPO-12 APC receptacle. The transmit and receive optical lanes shall occupy the positions depicted in following figure when looking into the MDI receptacle with the connector keyway feature on top.



DIGITAL DIAGNOSTIC MONITORING INTERFACE

Five transceiver parameter values are monitored. The following table defines the Monitory parameter's accuracy.

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Temperature Monitor Absolute Error	DMI_Temp	-3		3	℃	
Supply Voltage Monitor Absolute Error	DMI_VCC	-3		3	%	
Bias Current Monitor Absolute Error	DMI_I Bias	-10		10	%	
Tx Power Monitor Absolute Error	DMI_TX	-3		3	dB	
Rx Power Monitor Absolute Error	DMI_RX	-3		3	dB	

Warnings

Handing Precautions:

This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Please follow guidelines according to proper ESD procedures.

Laser Safety:

Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

