400G Twin-port OSFP Multimode SR4 50m Transceiver

Features

- OSFP Serial Optical Interface
- 8x50G PAM4 retimed 400GAUI-8 electrical interface
- Dual MPO-12 APC connector
- 8 channel VCSEL arrays and 8 channels PIN photo detector arrays
- Maximum link length of 50m
- Hot Pluggable OSFP form factor
- Compliant to OSFP Module Specification Rev 5.0
- Compliant with CMIS 5.2
- Compliant with IEEE 802.3cm
- Less than 14W in temperature range of 0 to 70℃

Applications

- 400GBASE-SR8 400G Ethernet and InfiniBand
- Data center

Description

400G OSFP 2xSR4 is an Eight-Channel, Parallel, Pluggable, Fiber-Optic OSFP for 400Gigabit Ethernet and InfiniBand applications. This transceiver is a high performance module for short- range data communication and interconnect application. It integrates eight data lanes in each direction with 8x26.5625GBd. The length of OSFP 2xSR4 is up to 50 meters over OM4 MMF. This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm.

Absolute Maximum Specifications

Absolute maximum ratings are those beyond which damage to the device may occur.

Prolonged operation between the operational specifications and absolute maximum ratings is not intended and may cause permanent device degradation.

Table1-Absolute Maximum Specifications

Parameter	Min.	Typical	Max.	Unit	Note
Storage Temperature	-40		+85	°C	
Supply voltage	-0.5		3.6	V	
Relative Humidity (non- condensing)	15		85	%	
Control input voltage	-0.3		Vcc+0.5	V	
Operating Case Temperature	0		70	°C	
Receiver Damage Threshold, per Lane	5			dBm	

Recommended Operating Conditions and Power Supply Requirements

Table2-Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max.	Units
Operating Case Temperature	Top	0		70	℃
Relative Humidity(non-condensing)	RH	15		85	%
Power Supply Voltage	Vcc	3.135		3.465	V
Total Power Consumption	Pc			14	W
Supply Current				4.465	A
Bit Rate	BR			425	Gbps
Fiber Length on OM4 MMF				50	m
I^2C Clock Frequency		0		400	kHz

Electrical Specifications

Table3-Electrical Specifications

Parameter	Min.	Typical	Max.	Unit	Note
Supply voltage	3.135		3.465	V	
Supply Current			4.465	A	

Input differential impedance	90	100	110	Ω	
Differential data input swing			880	mVpp	
Differential data output swing			900	mVpp	
Bit Error Rate			2.4E-4		
Input Logic Level High	2		Vcc	V	
Input Logic Level Low	0		0.8	V	
Output Logic Level High	Vcc-0.5		Vcc	V	
Output Logic Level Low	0		0.4	V	

Optical Specifications

Table4-Optical Specifications

Parameter		Symbol	Min.	Typical	Max.	Unit	Note
Transceiver							
Data rate per lane		DR		26.5625		GBd	
Modulation format				PAM4			
Center Wavelength		λ	840	860	868	nm	1
RMS spectral width		σ			0.6	nm	
Average Launch power, each lane		P_{avg}	-6.5		4	dBm	
Optical Power OMA, each Lane，max		P_{OMA}	-4.5		3	dBm	
Transmitter and dispersion eye closure (TDECQ), each lane		TDECQ			4.5	dB	
Transmitter eye closure for PAM4 (TECQ), each lane		TECQ			4.4	dB	
Extinction ratio		ER	3			dB	
Optical Return Loss Tolerance		ORLT			12	dB	
Optical Power for TX DISABLE					-30	dBm	
Receiver							
Data rate per lane		BR		26.5625			Gbd
Modulation format				PAM4			
Center Wavelength		λ	842	850	948	nm	
Damage threshold			5			dBm	
Average receive power, each lane			-8.4		4	dBm	
Receiver reflectance		Rr			-12	dB	
Receiver sensitivity, each lane			RS = max (-6 , TECQ – 7.9)			dBm	
Stressed receiver sensitivity, each lane					-3.4	dBm	
Rx LOS	Assert		-30			dBm	
	De-assert				-9	dBm	
	Hysteresis		0.5		5	dB	

Notes:

[1] Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ. Measured with conformance test signal

at TP3 for BER = 2.4E-4 Pre-FEC.

Pin Description

The device is OSFP MSA Specification for OSFP Octal Small Form Factor Pluggable Module Rev. 1.12 compliant, see www.osfpmsa.org.

Table5-Pin Description

Pin	Symbol	Description	Pin	Symbol	Description
1	GND	Ground	31	GND	Ground
2	Tx2p	Transmitter Non-Inverted Data Input	32	Rx2p	Receiver Non-Inverted Data Output
3	Tx2n	Transmitter Inverted Data Input	33	Rx2n	Receiver Inverted Data Output
4	GND	Ground	34	GND	Grounds
5	Tx4p	Transmitter Non-Inverted Data Input	35	Rx4p	Receiver Non-Inverted Data Output
6	Tx4n	Transmitter Inverted Data Input	36	Rx4n	Receiver Inverted Data Output
7	GND	Ground	37	GND	Ground
8	Tx6p	Transmitter Non-Inverted Data Input	38	Rx6p	Receiver Non-Inverted Data Output
9	Tx6n	Transmitter Inverted Data Input	39	Rx6n	Receiver Inverted Data Output
10	GND	Ground	40	GND	Ground
11	Tx8p	Transmitter Non- Inverted Data input	41	Rx8p	Receiver Non-Inverted Data Output
12	Tx8n	Transmitter Inverted Data Input	42	Rx8n	Receiver Inverted Data Output
13	GND	Ground	43	GND	Ground
14	SCL	2-wire serial interface clock	44	INT / RSTn	Module Interrupt / Module Reset
15	VCC	+3.3V Power	45	VCC	+3.3V Power
16	VCC	+3.3V Power	46	VCC	+3.3V Power
17	LPWn / PRSn	Low-Power Mode / Module Present	47	SDA	2-wire Serial interface data
18	GND	Ground	48	GND	Ground
19	Rx7n	Receiver Inverted Data Output	49	Tx7n	Transmitter Inverted Data Input
20	Rx7p	Receiver Non-Inverted Data Output	50	Tx7p	Transmitter Non-Inverted Data Input
21	GND	Ground	51	GND	Ground
22	Rx5n	Receiver Inverted Data Output	52	Tx5n	Transmitter Inverted Data Input
23	Rx5p	Receiver Non-Inverted Data Output	53	Tx5p	Transmitter Non-Inverted Data Input
24	GND	Ground	54	GND	Ground
25	Rx3n	Receiver Inverted Data Output	55	Tx3n	Transmitter Inverted Data Input
26	Rx3p	Receiver Non-Inverted Data Output	56	Tx3p	Transmitter Non-Inverted Data Input

27	GND	Ground	57	GND	Ground
28	Rx1n	Receiver Inverted Data Output	58	Tx1n	Transmitter Inverted Data Input
29	Rx1p	Receiver Non-Inverted Data Output	59	Tx1p	Transmitter Non-Inverted Data Input
30	GND	Ground	60	GND	Ground

OSFP Module Pad Layout

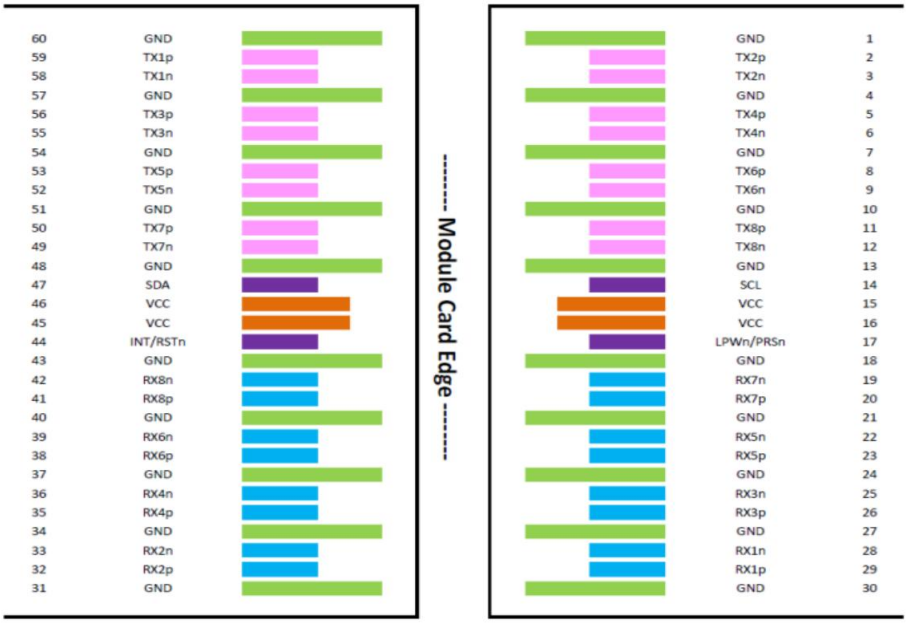
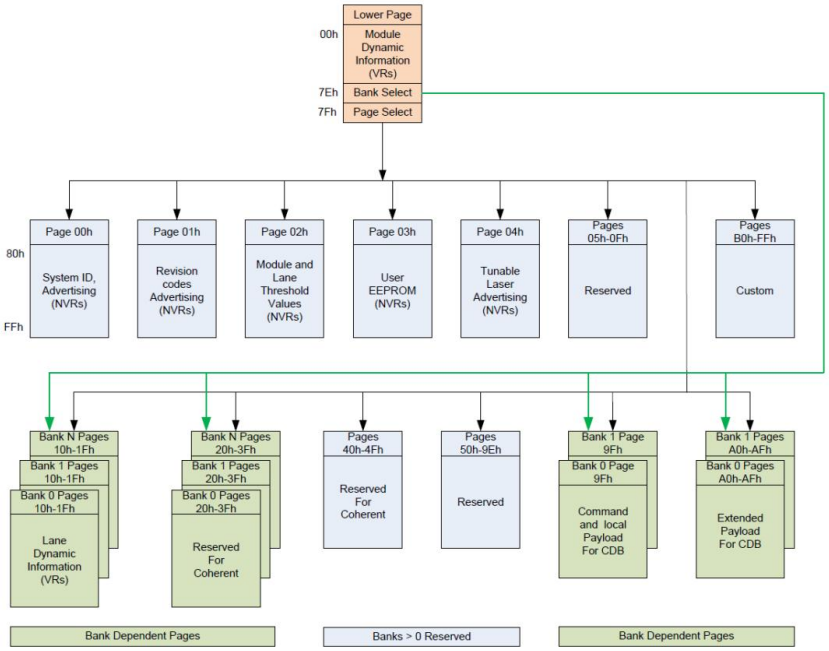


Figure 1 MSA Compliant Connector

Management Interface



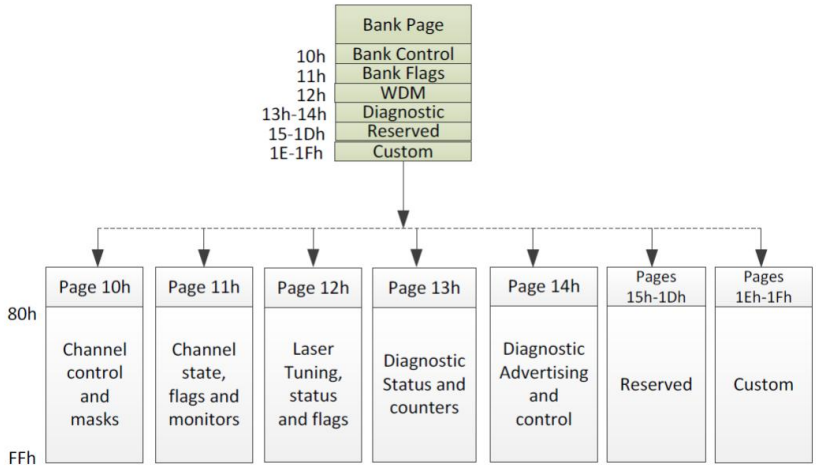


Figure 2 CMIS Module Memory Map

Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions.

Table6-Digital Diagnostic Monitor Accuracy

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	℃
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

Optical interface requirement

The optical port is Dual MPO12 APC as follows

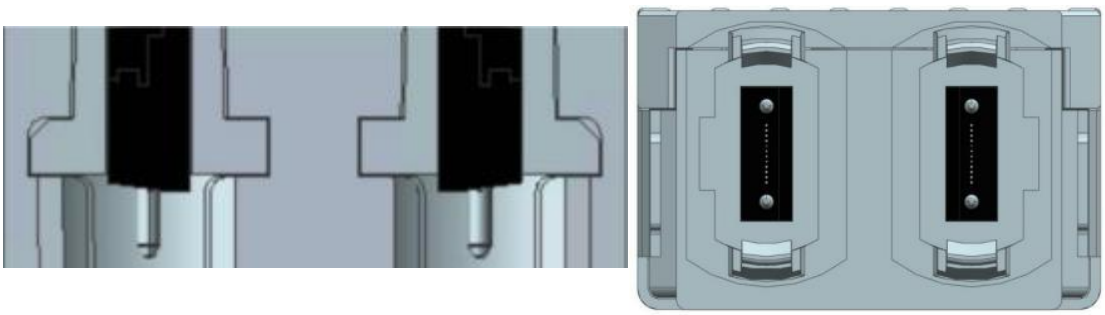


Figure 3Dual MPO12 APC interface

Mechanical Drawing

Figure 4 Dual MPO12 Module appearance

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