

800Gb/s OSFP 2xSR4 850nm 50m Optical Transceiver

Features

- 8-channels of 100G-PAM4 electrical modulation
- Two ports of 4-channel 100G-PAM4 optical modulation
- Up to 50m transmission distance on OM4 MMF
- 850nm VCSEL and PIN receiver
- Two MPO-12/APC optical connectors
- +3.3V power supply
- Power consumption less than 12W
- Operating case temperature: 0~70°C
- IIC rate up to 1MHz

Applications

- 800G Ethernet
- Data Center
- Cloud Networks

Compliance

- OSFP MSA
- IEEE 802.3ck
- CMIS Rev4.0
- RoHS compliance

Description

The OSFP-800G-2xSR4 is an Ethernet 800Gb/s 2x400Gb/s Twin-port OSFP, 2xSR4 multimode, parallel, 8-channel transceiver using two, 4-channel MPO-12/APC optical connectors at 400Gb/s each. The parallel multimode, short reach 8-channel (2xSR4) uses 100G-PAM4 modulation and has a maximum fiber reach of 50-meters using 8 multimode fibers.

Absolute Maximum Ratings

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TS	-40		+85	°C	
Operating Relative Humidity (non-condensing)	R _H	5		85	%	
Supply Voltage	V _{CC}	3.1		3.6	V	
Optical Input Power	PIN			10	dBm	

Recommended Operating Conditions

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	Top	0		+70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Supply Current	ICC			4000	mA	
Module Power Dissipation	P			12	W	

Optical, Electrical Characteristic

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Data Rate per channel (PAM4)	DR		53.125		GBd	
Frequency tracking	F _t	-100		100	Ppm	
Center Wavelength	λ _C		850		nm	
RMS Spectral Width				0.6	nm	Note1
Laser Off Power	P _{off}			-30	dBm	
Average Optical Power	P _{avg}	-4.6		4	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter and dispersion eye closure	TDECQ			4.4	dBm	
Outer Optical Modulation Amplitude	OMA _{outer}	-2.6		3.5		Note2

Encircled flux, each lanec	dB	$\geq 86\% @ 19 \mu m$ $\leq 30\% @ 4.5 \mu m$				Note3
Optical Return Loss Tolerance				12	dB	

Notes:

- [1] RMS spectral width is the standard deviation of the spectrum.
- [2] Even if the TDECQ<51.8dB, the OMA (min) must exceed this value.
- [3] If measured into type A1a.2, type A1a.3 or type A1a.4, 50 μm fiber, in accordance with IEC 61280-1-4.

Receiver Operating Characteristic-Optical, Electrical

Table4-Receiver Operating Characteristic-Optical, Electrical						
Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Data Rate per channel (PAM4)	DR		53.125		GBd	
Frequency tracking	Ft	-100		100	Ppm	
Center Wavelength	λ_r	840	850	860	nm	
Damage threshold		5			dBm	
Average receive power		-4.6		4	dBm	Note1
Receiver Reflectance				-15	dB	
Differential Data Output Voltage Peak to Peak Swing	Vopp			845	mV	
Eye height	EH	15			mV	
Vertical eye closure	VEC			12	dB	
Differential output Impedance	Zos	90	100	110	Ohms	
Common-Mode to differential-mode return loss	RLdc		Note2			
Transition Time, 20 to 80%	Tr, Tf	8.5			ps	

Notes:

- [1] Average receive power, each lane (min) 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. Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.6 dB.

[2]
$$RL_{dc}(f) \geq \begin{cases} 25 - 22(f/53.125) & 0.05 \leq f \leq 26.56 \\ 19 - 10(f/53.125) & 26.56 < f \leq 50 \end{cases}$$

Digital Diagnostic Functions

Parameter	Symbols	Min.	Max.	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	°C	
Tx power monitor absolute error	DMI_TX	-3	3	dB	
Rx power monitor absolute error	DMI_RX	-3	3	dB	
Supply voltage monitor absolute error	DMI_VCC	-3	3	%	
Bias current monitor absolute error	DMI_Ibias	-10	10	%	

Control and Status I/O Timing Characteristics

Parameter	Symbols	Min.	Typ	Max.	Unit	Notes
Mgmt Init Duration	Max MgmtInit Duration		TBD		ms	Note1
ResetL Assert Time	t_reset_init		TBD		μs	Note2
IntL Assert Time	ton_IntL		TBD		ms	Note3
IntL Deassert Time	toff_IntL		TBD		μs	Note4
Rx LOS Assert Time	ton_los		TBD		ms	Note5
Flag Assert Time	ton_flag		TBD		ms	Note6
Mask Assert Time	ton_mask		TBD		ms	Note7
Mask Deassert Time	toff_mask		TBD		ms	Note8

Notes:

- [1] Time from power on, hot plug or rising edge of reset until completion of the MgmtInit State.
- [2] Minimum pulse time on the ResetL signal to initiate a module reset.
- [3] Time from occurrence of condition triggering IntL until Vout:IntL=Vol.
- [4] Time from clear on read operation of associated flag until Vout:IntL=Voh.This includes deassert times for Rx LOS, Tx Fault and other flag bits.
- [5] Time from Rx LOS state to Rx LOS bit set (value = 1b) and IntL asserted.
- [6] Time from occurrence of condition triggering flag to associated flag bit set (value=1b) and IntL asserted.
- [7] Time from mask bit set (value=1b) until associated IntL assertion is inhibited.
- [8] Time from mask bit cleared (value=0b) until associated IntL operation resumes.

Pin Description

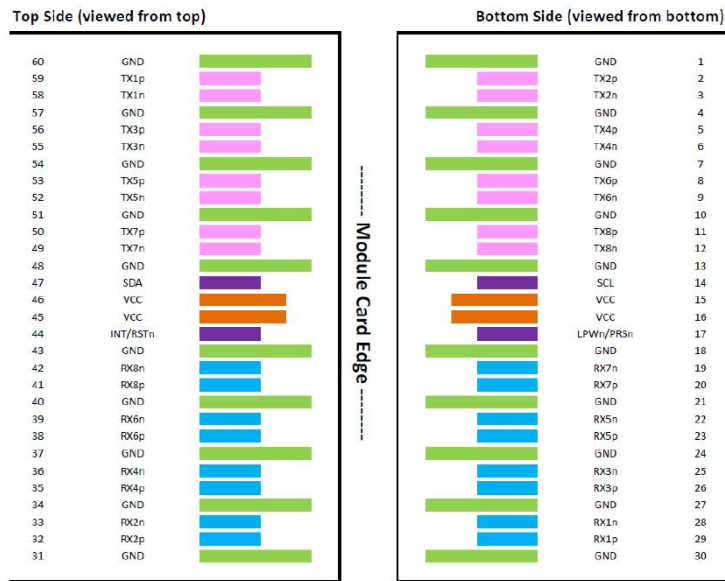


Figure 1 Pinout definitions of OSFP module inputs/outputs

Pin Function Definitions

Table7-Pin Function Definitions					
Pin	Symbol	Description	Logic	Plug Sequence	Notes
1	GND	Ground		1	
2	TX2p	Transmitter Data Non-Inverted	CML-I	3	
3	TX2n	Transmitter Data Inverted	CML-I	3	
4	GND	Ground		1	
5	TX4p	Transmitter Data Non-Inverted	CML-I	3	
6	TX4n	Transmitter Data Inverted	CML-I	3	
7	GND	Ground		1	
8	TX6p	Transmitter Data Non-Inverted	CML-I	3	
9	TX6n	Transmitter Data Inverted	CML-I	3	
10	GND	Ground		1	
11	TX8p	Transmitter Data Non-Inverted	CML-I	3	
12	TX8n	Transmitter Data Inverted	CML-I	3	
13	GND	Ground		1	
14	SCL	2-wire Serial interface clock	LVC MOS-I/O	3	
15	VCC	+3.3V Power		2	
16	VCC	+3.3V Power		2	
17	LPWn/PRS _n	Low-Power Mode / Module Present	Multi-Level	3	

18	GND	Ground		1	
19	RX7n	Receiver Data Inverted	CML-0	3	
20	RX7p	Receiver Data Non-Inverted	CML-0	3	
21	GND	Ground		1	
22	RX5n	Receiver Data Inverted	CML-0	3	
23	RX5p	Receiver Data Non-Inverted	CML-0	3	
24	GND	Ground		1	
25	RX3n	Receiver Data Inverted	CML-0	3	
26	RX3p	Receiver Data Non-Inverted	CML-0	3	
27	GND	Ground		1	
28	RX1n	Receiver Data Inverted	CML-0	3	
29	RX1p	Receiver Data Non-Inverted	CML-0	3	
30	GND	Ground		1	
31	GND	Ground		1	
32	RX2p	Receiver Data Non-Inverted	CML-0	3	
33	RX2n	Receiver Data Inverted	CML-0	3	
34	GND	Ground		1	
35	RX4p	Receiver Data Non-Inverted	CML-0	3	
36	RX4n	Receiver Data Inverted	CML-0	3	
37	GND	Ground		1	
38	RX6p	Receiver Data Non-Inverted	CML-0	3	
39	RX6n	Receiver Data Inverted	CML-0	3	
40	GND	Ground		1	
41	RX8p	Receiver Data Non-Inverted	CML-0	3	
42	RX8n	Receiver Data Inverted	CML-0	3	
43	GND	Ground		1	
44	INT/RSTn	Module Interrupt / Module Reset	Multi- Level	3	
45	VCC	+3.3V Power		2	
46	VCC	+3.3V Power		2	
47	SDA	2-wire Serial interface data	LVCM OS-I/O	3	
48	GND	Ground		1	
49	TX7n	Transmitter Data Inverted	CML-I	3	
50	TX7p	Transmitter Data Non-Inverted	CML-I	3	
51	GND	Ground		1	
52	TX5n	Transmitter Data Inverted	CML-I	3	
53	TX5p	Transmitter Data Non-Inverted	CML-I	3	
54	GND	Ground		1	
55	TX3n	Transmitter Data Inverted	CML-I	3	
56	TX3p	Transmitter Data Non-Inverted	CML-I	3	
57	GND	Ground		1	

58	TX1n	Transmitter Data Inverted	CML-I	3	
59	TX1p	Transmitter Data Non-Inverted	CML-I	3	
60	GND	Ground		1	

Block Diagram of Transceiver

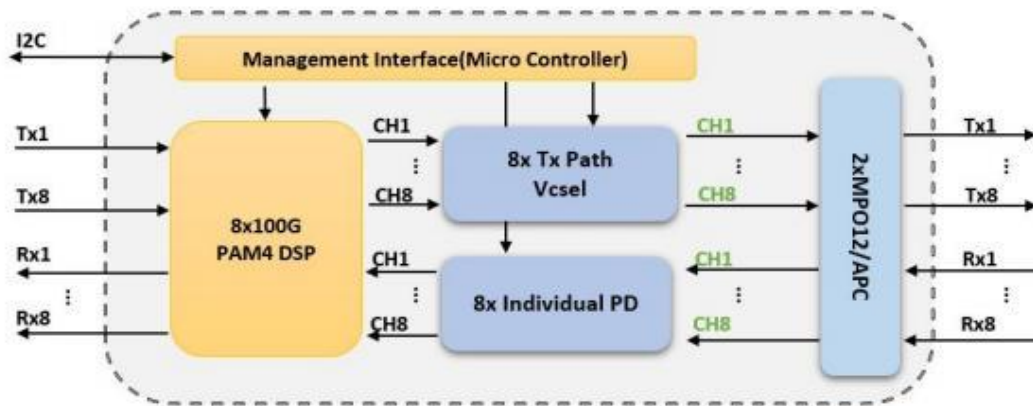


Figure 2 Block Diagram of Transceiver

Recommended Interface Circuit Dimensions

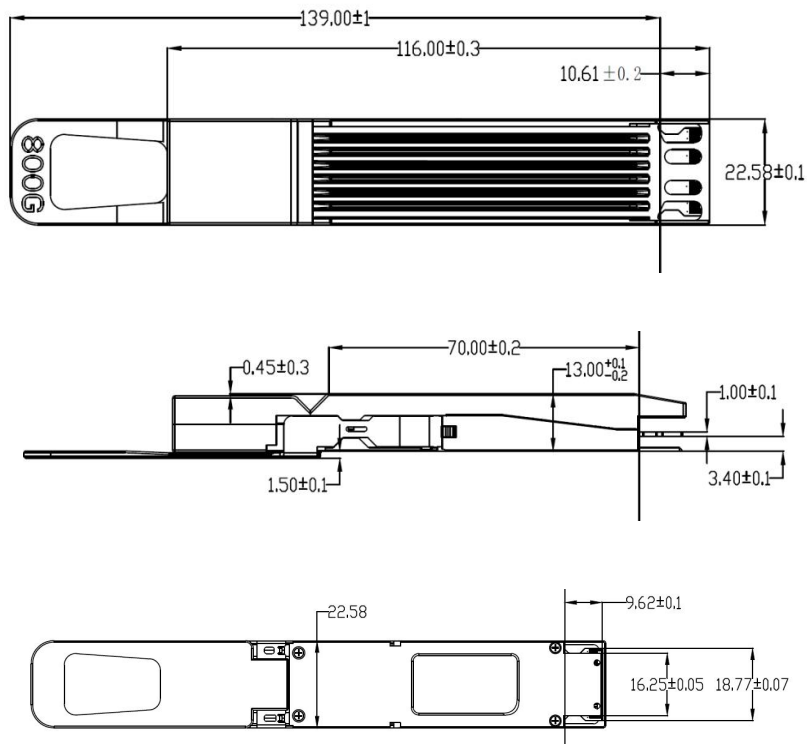


Figure 3 Recommended Interface Circuit Dimensions

Digital Diagnostic Memory Map

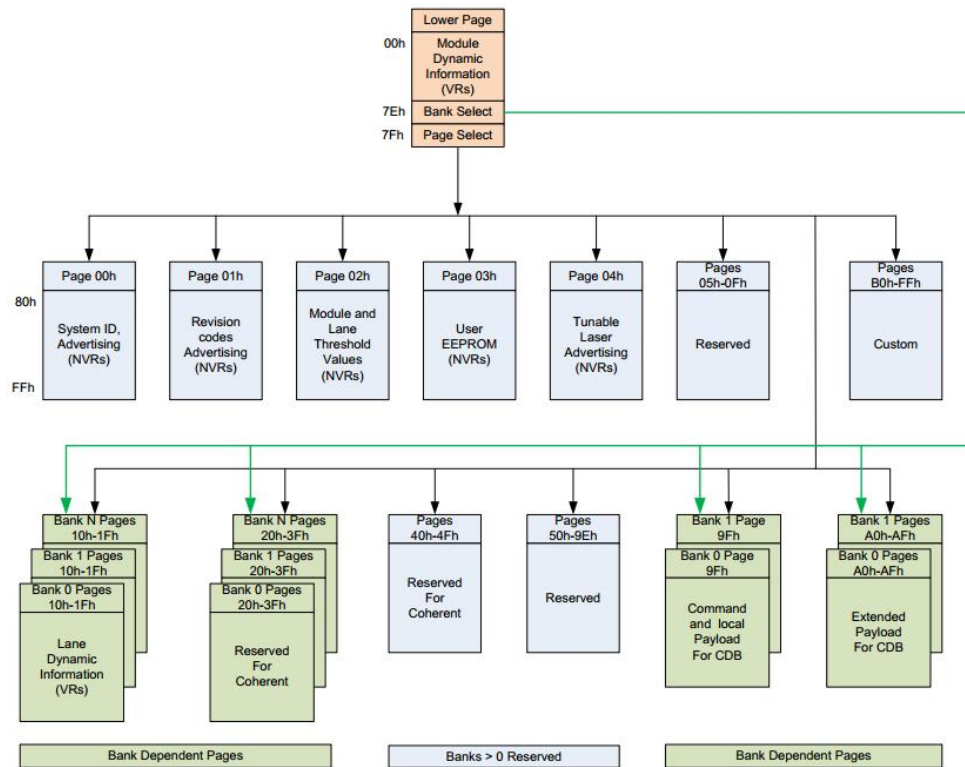


Figure 4 Digital Diagnostic Memory Map

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