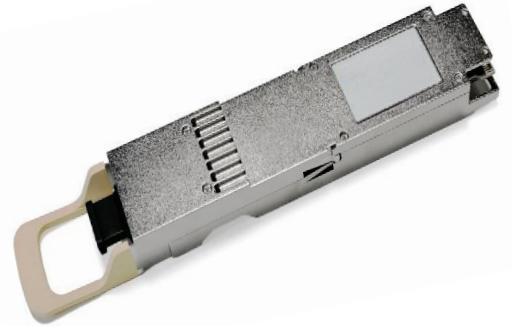


Product Features

- Compliant with IEEE Std 802.3df on 800Gb/s Optical interfaces
- Compliant with IEEE Std 802.3ck on 800Gb/s Electrical interfaces
- Compliant with OSFP MSA
- Compliant with CMIS5.0 specifications
- MPO-16 APC male connector receptacle
- 8 channels 850nm VCSEL array
- 8 channels PIN photo detector array
- 8*53.125GBd PAM4 electrical interface
- Single +3.3V power supply
- Commercial operating temperature:0°C to +70°C
- Up to 60m on OM3 MMF and 100m on OM4 and OM5 MMF
- RoHS Compliant



Applications

- 800G BASE-SR8 Ethernet
- Data Center

Descriptions

XN9311CDR transceiver is designed for using in 800Gb/s network applications. The maximum transmission distance is 100m in OM4 and OM5 MMF. XN9311CDR is a fully integrated optical transceiver modulated using PAM4 format that transmits and receives optical signals with aggregated data rate of 8*53.125GBd over 8 lanes 850nm. It is compliant with the OSFP MSA and 800GBASE-SR8 optical specifications.

XN9311CDR is compliant with RoHS.

Ordering Information

Table 1. Ordering Information

Part Number	Transmitter	Average Launch Power	OMAouter	Receiver	OMA Sensitivity	Reach	Temp	DDM	RoHS
XN9311CDR	850nm VCSEL	-4.6~+4dBm	-2.6~+3.5dBm	PIN	< -4.6dBm	100m	0~70 °C	Available	Compliant

Pin Description

Table 2. Pin Description

Pin	Name	Function/Description	Logic	Direction	Plug Sequence	Notes
1	GND	Ground			1	
2	TX2p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
3	TX2n	Transmitter Data Inverted	CML-I	Input from Host	3	
4	GND	Ground			1	
5	TX4p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
6	TX4n	Transmitter Data Inverted	CML-I	Input from Host	3	
7	GND	Ground			1	
8	TX6p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
9	TX6n	Transmitter Data Inverted	CML-I	Input from Host	3	
10	GND	Ground			1	
11	TX8p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
12	TX8n	Transmitter Data Inverted	CML-I	Input from Host	3	
13	GND	Ground			1	
14	SCL	2-wire Serial interface clock	LVC MOS-I/O	Bi-directional	3	1
15	VCC	+3.3V Power		Power from Host	2	
16	VCC	+3.3V Power		Power from Host	2	
17	LPWn/PRSn	Low-Power Mode / Module Present	Multi-Level	Bi-directional	3	2
18	GND	Ground			1	
19	RX7n	Receiver Data Inverted	CML-O	Output to Host	3	
20	RX7p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
21	GND	Ground			1	
22	RX5n	Receiver Data Inverted	CML-O	Output to Host	3	
23	RX5p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
24	GND	Ground			1	
25	RX3n	Receiver Data Inverted	CML-O	Output to Host	3	
26	RX3p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
27	GND	Ground			1	
28	RX1n	Receiver Data Inverted	CML-O	Output to Host	3	
29	RX1p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
30	GND	Ground			1	
31	GND	Ground			1	
32	RX2p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
33	RX2n	Receiver Data Inverted	CML-O	Output to Host	3	
34	GND	Ground			1	
35	RX4p	Receiver Data Non-Inverted	CML-O	Output to Host	3	

XN9311CDR
800G 100m OSFP SR8 Transceiver
800GBASE-SR8

36	RX4n	Receiver Data Inverted	CML-O	Output to Host	3	
37	GND	Ground			1	
38	RX6p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
39	RX6n	Receiver Data Inverted	CML-O	Output to Host	3	
40	GND	Ground			1	
41	RX8p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
42	RX8n	Receiver Data Inverted	CML-O	Output to Host	3	
43	GND	Ground			1	
44	INT/RSTn	Module Interrupt / Module Reset	Multi-Level	Bi-directional	3	2
45	VCC	+3.3V Power		Power from Host	2	
46	VCC	+3.3V Power		Power from Host	2	
47	SDA	2-wire Serial interface data	LVC MOS-I/O	Bi-directional	3	1
48	GND	Ground			1	
49	TX7n	Transmitter Data Inverted	CML-I	Input from Host	3	
50	TX7p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
51	GND	Ground			1	
52	TX5n	Transmitter Data Inverted	CML-I	Input from Host	3	
53	TX5p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
54	GND	Ground			1	
55	TX3n	Transmitter Data Inverted	CML-I	Input from Host	3	
56	TX3p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
57	GND	Ground			1	
58	TX1n	Transmitter Data Inverted	CML-I	Input from Host	3	
59	TX1p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
60	GND	Ground			1	

Notes:

1. Open-Drain with pull-up resistor on host.
2. See pin description of OSFP MSA for required circuit.

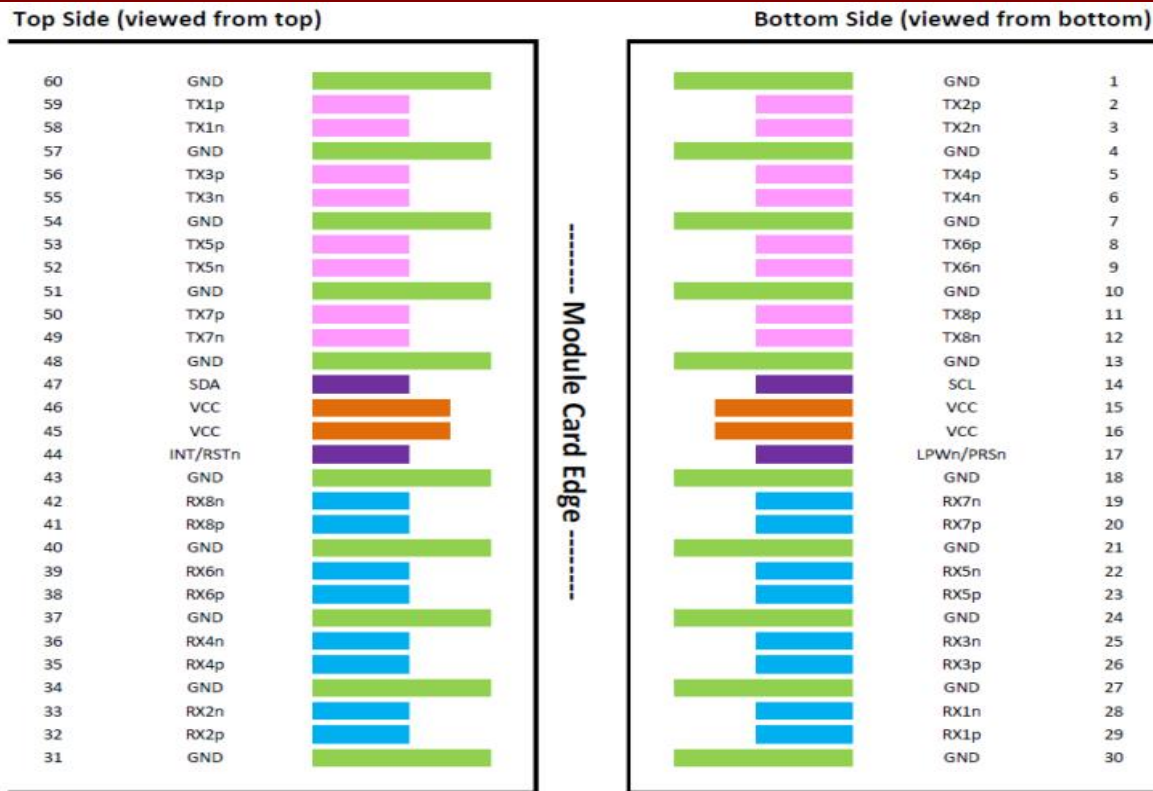


Figure 1. Host PCB OSFP pad assignment

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Table 3. Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T _s	-40	85	°C
Relative Humidity	RH	15	85	%
Supply Voltage	V _{cc}	-0.5	3.6	V

Recommended Operating Conditions

Table 4. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _c	0	25	70	°C
Supply Voltage	V _{cc}	3.135	3.3	3.465	V
Data Rate PER Channel	-	-	53.125	-	Gbaud
Modulation format	-	-	PAM4	-	-

Transceiver Electrical Characteristics

Table 5. Transceiver Electrical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Module Supply Current	I _{cc}	-	-	4.78	A	-
Power Dissipation	P _D	-	-	15	W	-
Transmitter						
Input Differential Impedance	Z _{IN}	-	100	-	Ω	-
Differential Data Input Swing	V _{IN, P-P}	180	-	900	mV _{P-P}	-
Receiver						
Output Differential Impedance	Z _O	-	100	-	Ω	-
Differential Data Output Swing	V _{OUT, P-P}	-	-	800	mV _{P-P}	1

Notes:

- Internally AC coupled, but requires an external 100Ω differential load termination.

Transmitter Optical Characteristics

Table 6. Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Signaling rate, each lane	\	53.125 ± 100 ppm			GBd	
Average launch power, each lane	P _o	-4.6	-	+4	dBm	1
OMA _{outer} max (TECQ, TDECQ) < 1.8 dB		-2.6				2
OMA _{outer} 1.8 < max (TECQ, TDECQ) < 4.4 dB	OMA	-4.4+ max (TECQ, TDECQ)		+3.5	dBm	2
Center Wavelength	λ _c	844		863	nm	
Extinction Ratio	EX	2.5	-		dB	
RMS spectral width	Δλ	-	-	0.6	nm	
Transmitter and dispersion eye closure for PAM4	TDECQ	-	-	4.4	dB	2
Transmitter eye closure for PAM4	TECQ			4.4	dB	2
Average launch power of OFF transmitter	P _{off}	-	-	-30	dBm	
Optical Return Loss Tolerance	ORLT	-	-	14	dB	
Encircled flux	\	≥ 86% at 19 μm			\	
		≤ 30% at 4.5 μm			\	
TX Disable Assert Time	T _{off}	-	-	100	ms	
TX Disable De-assert Time	T _{on}	-	-	400	ms	

Notes:

- The optical power is launched into OM3 MMF
- Measured with a SSPRQ test pattern @ 53.125Gbaud PAM4 format.

Receiver Optical Characteristics

Table 7. Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Signaling rate, each lane			53.125 ± 100 ppm		GBd	
Center Wavelength	λ_c	844		863	nm	
Receiver Sensitivity (OMA_{outer}) For $TECQ \leq 1.8db$ For $1.8 < TECQ < 4.4db$	S	-	-	-4.6 -6.4+TECQ	dBm dBm	1
Stressed receiver sensitivity (OMA_{outer})	$S_{stressed}$			-2.0	dBm	1
Receiver Overload (P_{avg})	P_{OL}	4	-	-	dBm	
Damage Threshold	P_{OL}	5	-	-	dBm	
Optical Reflectance	ORL	-	-	-15	dB	
LOS De-Assert	LOS_D	-	-	-9	dBm	
LOS Assert	LOS_A	-20	-	-	dBm	
LOS Hysteresis	-	0.5	-	-	dB	

Notes:

1. Measured with PRBS31Q test pattern, 53.125GBd, PAM4, BER<2.4E-4.

Recommended Host Board Power Supply Filter Network

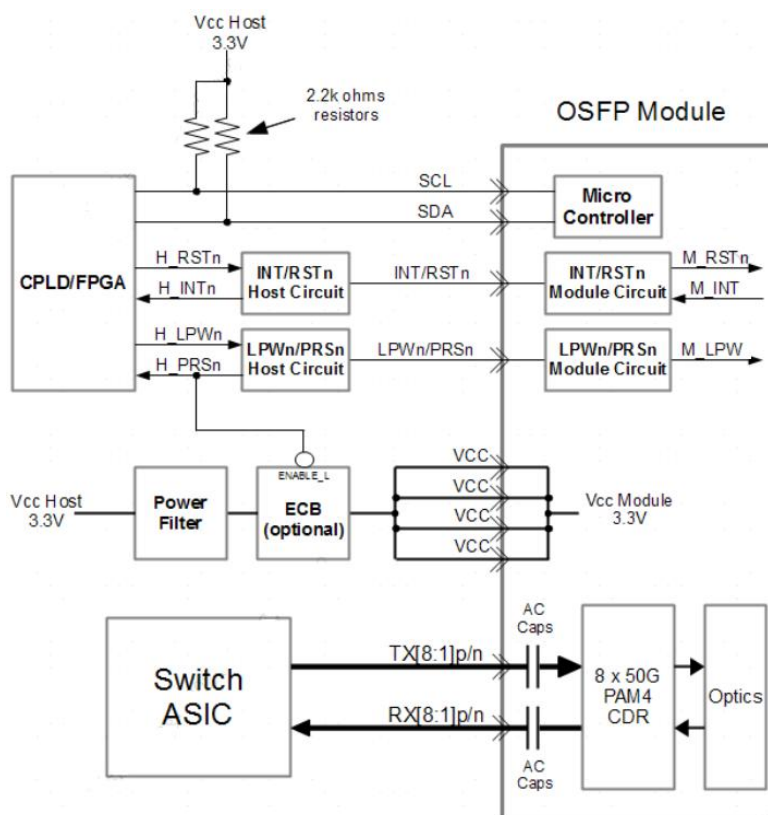


Figure 2. Recommended Host Board Power Supply Filter Network

Mechanical specifications

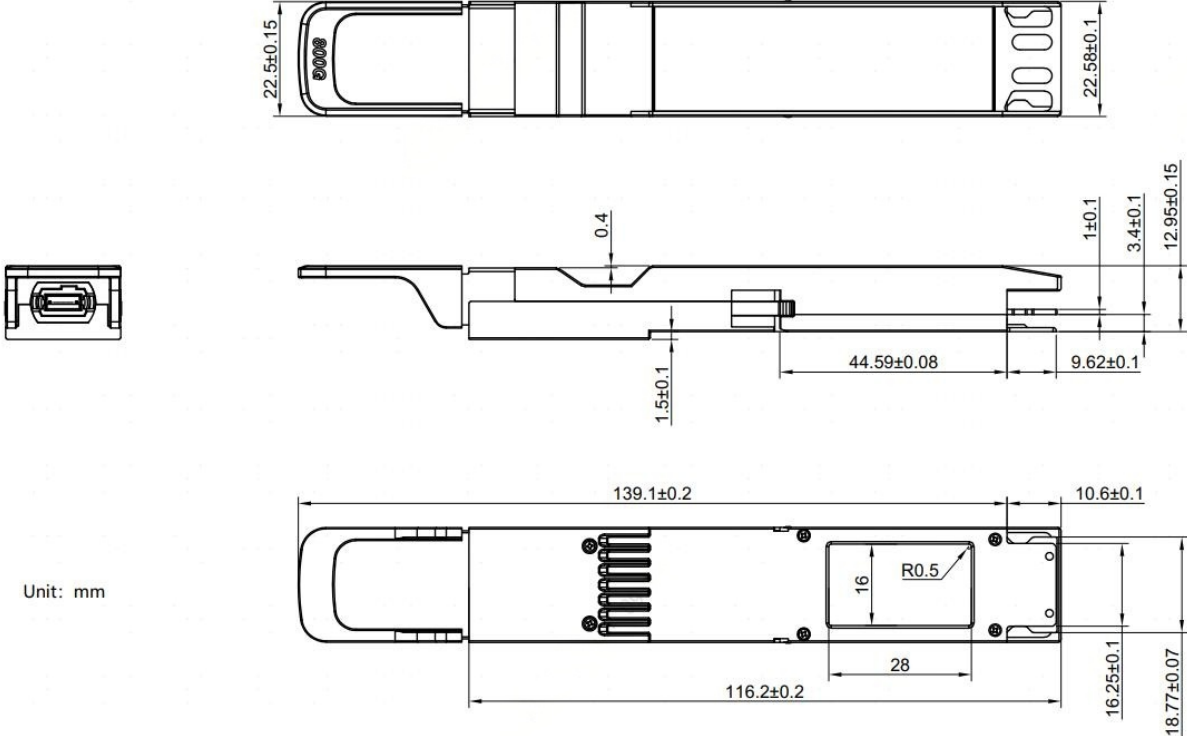


Figure 3. Outline Drawing

MPO-16 APC interface specifications

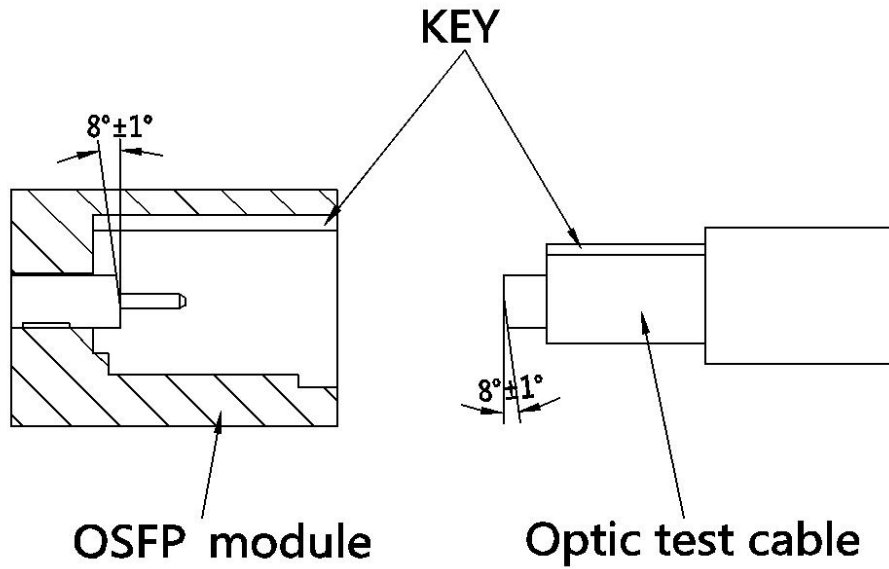


Figure 4. OSFP Module and MPO-16 Test cable contact angle specifications

MPO-16 optical interface

XN9311CDR module used a male MPO-16 connector, and channel orientation of the optical interface is shown as Figure 5.

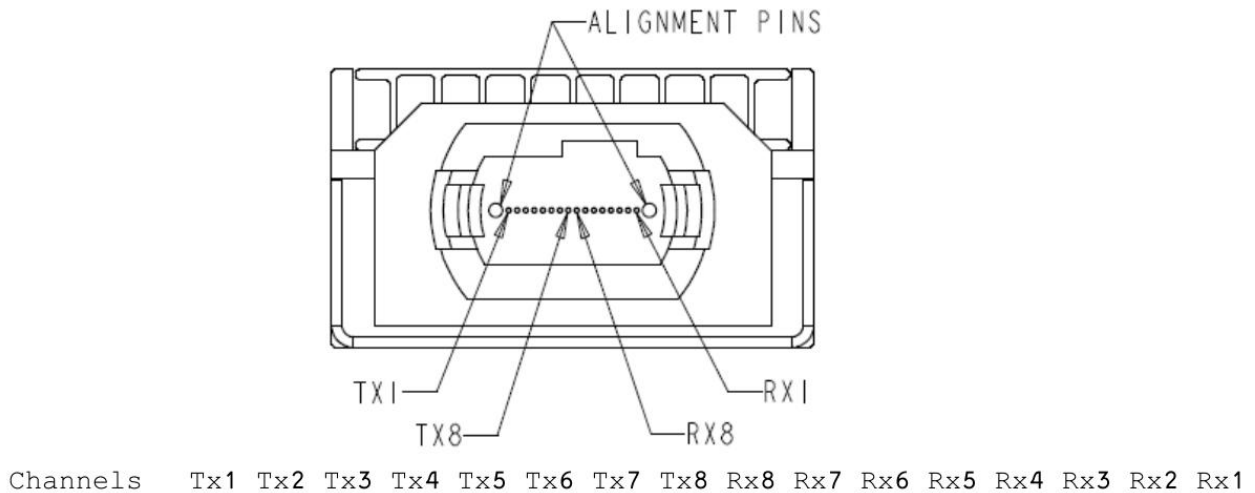


Figure 5. Optical receptacle and channel orientation for MPO-16 connector

Revision History

Date	Rev	Description	Modified By
3/27/2025	V1.0	First Release.	Hui Song
3/2/2026	V1.1	Updated the Center Wavelength	Hui Song