

Product Features

- Compliant with IEEE 802.3cu-2021 2x400GBASE-FR4 Optical Interface
- Compliant with IEEE P802.3ck D2.2 2x400GAUI-4 C2M Electrical Interface
- Compliant with OSFP CMIS Rev 4.0
- Dual duplex LC receptacles
- Single +3.6V Power Supply
- DDM Function Implemented
- Hot-pluggable OSFP Form Factor
- Up to 2km Transmission on Single Mode Fiber
- Maximum Power Consumption 16w
- Operating Case Temperature Range: 0°C ~ +70 °C

Application

- 800G Ethernet
- 2x 400GBASE-FR4
- Data Center
- Cloud Networks

Description

The 800GBASE-2FR4 OSFP Optical Transceiver Module is designed for 800GBASE Ethernet throughput up to 2km over single- mode fiber (SMF) with duplex LC connectors. The 800 Gigabit Ethernet signal is carried over four wavelengths at 1271,1291,1311,1331 nm. This transceiver is compliant with IEE802.3ck, IEEE 802.3cu, OSFP MSA. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. It is suitable for 800G Ethernet, Breakout 2x 400G FR4, Data Center, Cloud Networks.

Absolute Maximum Ratings

Parameter	Unit	Min	Max
Storage Temperature Range	°C	-40	85
Supply Voltage	V	-0.5	3.6
Relative Humidity (non-condensing)	%	5	95
Data Input Voltage Differential	V		1
Control Input Voltage	V	-0.3	VCC+0.5

Recommended Operating Conditions

Parameter	Min	Typ.	Max	Unit
Operating Case Temperature	0		70	°C
Power Supply Voltage	3.135	3.3	3.465	V
Maximum Power Dissipation			16	W
Signaling Speed per Lane		53.125		GBd
Control Input Voltage High	VCC*0.7		VCC+0.3	V
Control Input Voltage Low	-0.3		VCC*0.3	V
Two Wire Serial Interface Clock Rate			400	kHz
Power Supply Noise 1 kHz - 1 MHz (p-p)			66	mVpp
Operating Distance	2		2000	m

Optical Characteristics

Parameter	Unit	Min	Typ.	Max	Notes
Wavelength Assignment	nm	1264.5	1271	1277.5	
	nm	1284.5	1291	1297.5	
	nm	1304.5	1311	1317.5	
	nm	1324.5	1331	1337.5	
Transmitter (per Lane)					
Side Mode Suppression Ratio	dB	30			
Total average launch power (max)				10.4	
Average Launch Power, each lane	dBm	-3.2		4.4	1
Outer Optical Modulation Amplitude (OMA _{outer}), each Lane for TDECQ < 1.4 dB for 1.4 dB ≤ TDECQ ≤ 3.4 dB	dBm	-0.2 -1.6 + TDECQ		3.7	
Difference in launch power between any two lanes (OMA _{outer}) (max)	dB			3.9	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	dB			3.4	
TDECQ – TECQ	dB			2.5	
Over/under-shoot	%			22	
Transmitter power excursion	dBm			1.8	

Average Launch Power of OFF Transmitter, each lane	dBm			-30	
Extinction Ratio	dB	3.5			
Transmitter transition time (max)	ps			17	
RIN17.1OMA (max)	dB/Hz			-136	
Optical Return Loss Tolerance	dB			17.1	
Transmitter Reflectance	dB			-26	2
Receiver (Per lane)					
Damage Threshold, each Lane	dBm	5.4			
Average Receive Power, each Lane	dBm	-7.2		4.4	
Receive Power (OMAouter), each Lane	dBm			3.7	
Difference in receive power between any two lanes (OMAouter) (max)				4.1	
Receiver Reflectance	dB			-26	
Receiver sensitivity (OMAouter), each lane for TECQ < 1.4 dB for 1.4 dB ≤ TECQ ≤ 3.4 dB	dBm			-4.6 -6 + TECQ	
Stressed Receiver Sensitivity (OMAouter), each Lane	dBm			-2.6	3
Conditions of stressed receiver sensitivity test:					
Stressed eye closure for PAM4 (SECQ), lane under test	dB		3.4		
OMAouter of each aggressor lane	dBm		1.4		

Notes:

- 1: Average launch power, each lane (min) is informative and not the principal indicator of signal strength
- 2: Transmitter reflectance is defined looking into the transmitter
- 3: Measured with conformance test signal at TP3 for the BER = 2.4x10⁻⁴

Electrical Specifications

Parameter	Unit	Min	Typ.	Max	Notes
Transmitter (per Lane)					
Differential pk-pk input Voltage tolerance (TP1a)	mV	900			
AC common-mode RMS voltage tolerance (TP1a)	mV	25			

Differential to common-mode return loss	dB	802.3ck 120G-2		
Effective return loss, ERL	dB	8.5		
Differential termination mismatch	%			10
Single-ended voltage tolerance range	V	-0.4		3.3
DC common-mode voltage tolerance	V	-0.35		2.85
Receiver (per Lane)				
AC common-mode output Voltage (RMS)	mV			25
Differential peak-to-peak output voltage	mV			600
Short mode	mV			900
Long mode	mV			
Eye height, differential	mV	15		
Vertical eye closure	dB			12
Common-mode to differential return loss	dB	802.3ck 120G-1		
Effective return loss, ERL	dB	8.5		
Differential termination mismatch	%			10
Transition time (20% to 80%)	ps	8.5		
DC common-mode voltage	mV	-350		2850

Pin Definition and Description

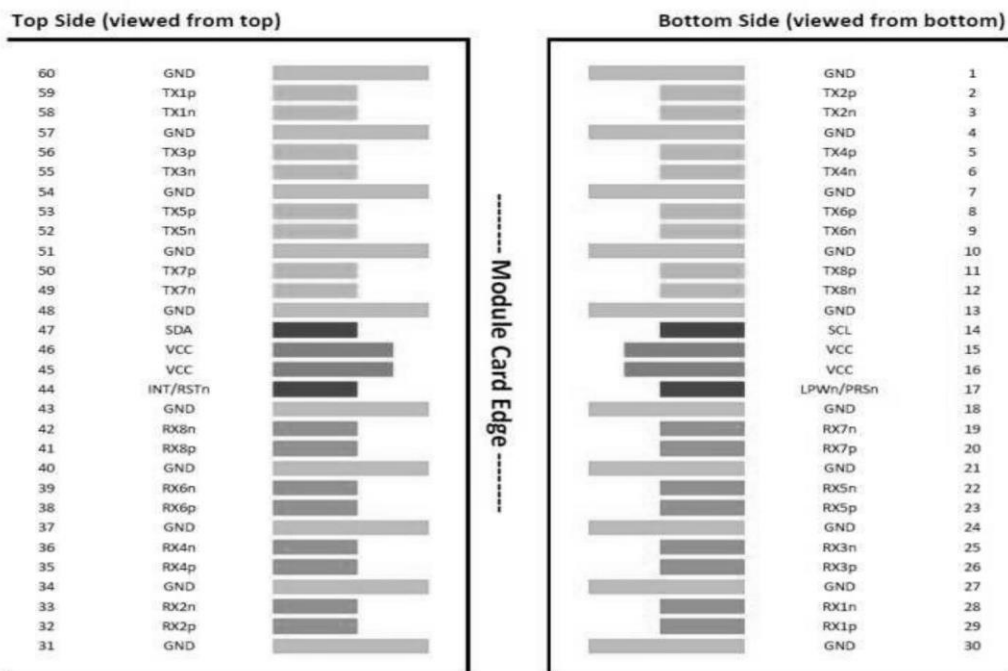


Table 1. Pin definition and descriptions

Pin	Symbol	Logic	Description	Note
1	GND		Ground	
2	TX2p	CML-I	Transmitted Data Non-Inverted	
3	TX2n	CML-I	Transmitted Data Inverted	
4	GND		Ground	
5	TX4p	CML-I	Transmitted Data Non-Inverted	
6	TX4n	CML-I	Transmitted Data Inverted	
7	GND		Ground	
8	TX6p	CML-I	Transmitted Data Non-Inverted	
9	TX6n	CML-I	Transmitted Data Inverted	
10	GND		Ground	
11	TX8p	CML-I	Transmitted Data Non-Inverted	
12	TX8n	CML-I	Transmitted Data Inverted	
13	GND		Ground	
14	SCL	LVC MOS-I/O	2-wire Serial Interface Clock	1
15	VCC		+3.3V Power	
16	VCC		+3.3V Power	
17	LPWn/PRSn	Multi-Level	Low-Power Mode / Module Present	2
18	GND		Ground	
19	RX7n	CML-O	Receiver Data Inverted	
20	RX7p	CML-O	Receiver Data Non-Inverted	
21	GND		Ground	
22	RX5n	CML-O	Receiver Data Inverted	
23	RX5p	CML-O	Receiver Data Non-Inverted	
24	GND		Ground	
25	RX3n	CML-O	Receiver Data Inverted	
26	RX3p	CML-O	Receiver Data Non-Inverted	
27	GND		Ground	
28	RX 1n	CML-O	Receiver Data Inverted	
29	RX 1p	CML-O	Receiver Data Non-Inverted	
30	GND		Ground	
31	GND		Ground	
32	RX2p	CML-O	Receiver Data Non-Inverted	
33	RX2n	CML-O	Receiver Data Inverted	
34	GND		Ground	

35	RX4p	CML-O	Receiver Data Non-Inverted	
36	RX4n	CML-O	Receiver Data Inverted	
37	GND		Ground	
38	RX6p	CML-O	Receiver Data Non-Inverted	
39	RX6n	CML-O	Receiver Data Inverted	
40	GND		Ground	
41	RX8p	CML-O	Receiver Data Non-Inverted	
42	RX8n	CML-O	Receiver Data Inverted	
43	GND		Ground	
44	INT/RSTn	Multi-Level	Module Interrupt / Module Reset	2
45	VCC		+3.3V Power	
46	VCC		+3.3V Power	
47	SDA	LVC MOS-I/O	2-wire Serial Interface Clock	1
48	GND		Ground	
49	TX7n	CML-I	Transmitted Data Inverted	
50	TX7p	CML-I	Transmitted Data Non-Inverted	
51		GND	Ground	
52	TX5n	CML-I	Transmitted Data Inverted	
53	TX5p	CML-I	Transmitted Data Non-Inverted	
54		GND	Ground	
55	TX3n	CML-I	Transmitted Data Inverted	
56	TX3p	CML-I	Transmitted Data Non-Inverted	
57		GND	Ground	
58	TX 1n	CML-I	Transmitted Data Inverted	
59	TX 1p	CML-I	Transmitted Data Non-Inverted	
60		GND	Ground	

Notes:

1. Open-Drain with pull up resistor on Host.
2. See pin description for required circuit.

Digital Diagnostic Specification

Parameter	Units	Min	Typical	Max	Notes
Transceiver Case Temperature	°C	-3		+3	Over operating temp
Supply voltage monitor absolute error	V	-3%		+3%	Full operating range

Channel RX power monitor absolute	dB	-3		+3	Per channel
Channel Bias current monitor	mA	- 10%		+10%	Per channel
Channel TX power monitor absolute	dB	-3		+3	Per channel

Mechanical Dimensions

