WESTERN OPTRONICS



CP-OSFP-1.6T-2DR4

1.6T OSFP 2×DR4 Silicon Photonics Optical Transceiver

The Western Optronics CP-OSFP-1.6T-2DR4 is a 1.6 Tb/s OSFP224 silicon photonics optical transceiver designed for optical links up to 500 m over single-mode fiber. The module converts eight channels of 200 Gb/s PAM4 electrical input data into eight parallel optical channels for an aggregate data rate of 1.6 Tb/s. On the receiver side, it converts eight 200 Gb/s optical channels into eight 200 Gb/s PAM4 electrical output channels. The optical interface uses dual MPO-12/APC receptacles.

Product Selection

Part Number	Operating case temperature	DDMI	Package
CP-OSFP-1.6T-2DR4	Commercial (0 to 70°C)	Yes	OSFP IHS

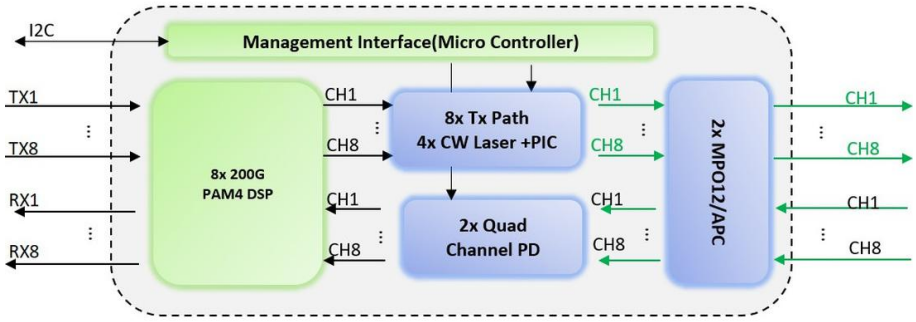
Regulatory Compliance

• 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

Transceiver Block Diagram



FEATURES

Compliant with OSFP MSA

CMIS-compliant management interface

106.25 GBd PAM4 × 8-channel 1.6T electrical interface

106.25 GBd PAM4 × 8-channel 2×DR4 optical interface

Up to 500 m reach on SMF

Dual MPO-12/APC optical interface

Single 3.3 V power supply

Maximum power consumption: 32 W

Case temperature: 0 to 70°C

APPLICATION

2×800GBASE-DR4 optical links

Data center interconnect



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Pin Descriptions

Pin	Symbol	Description	Logic	Plug Sequence
1	GND	Ground	Ground	1
2	TX2p	Transmitter Data Non-Inverted	CML-I	3
3	TX2n	Transmitter Data Inverted	CML-I	3
4	GND	Ground	Ground	1
5	TX4p	Transmitter Data Non-Inverted	CML-I	3
6	TX4n	Transmitter Data Inverted	CML-I	3
7	GND	Ground	Ground	1
8	TX6p	Transmitter Data Non-Inverted	CML-I	3
9	TX6n	Transmitter Data Inverted	CML-I	3
10	GND	Ground	Ground	1
11	TX8p	Transmitter Data Non-Inverted	CML-I	3
12	TX8n	Transmitter Data Inverted	CML-I	3
13	GND	Ground	Ground	1
14	SCL	2-wire Serial interface clock	LVCMOS-I/O	3
15	VCC	+3.3V Power		2
16	VCC	+3.3V Power		2
17	LPWn/PRSn	Low-Power Mode / Module Present	Multi-Level	3
18	GND	Ground	Ground	1
19	RX7n	Receiver Data Inverted	CML-O	3
20	RX7p	Receiver Data Non-Inverted	CML-O	3
21	GND	Ground	Ground	1
22	RX5n	Receiver Data Inverted	CML-O	3
23	RX5p	Receiver Data Non-Inverted	CML-O	3
24	GND	Ground	Ground	1
25	RX3n	Receiver Data Inverted	CML-O	3
26	RX3p	Receiver Data Non-Inverted	CML-O	3
27	GND	Ground	Ground	1
28	RX1n	Receiver Data Inverted	CML-O	3
29	RX1p	Receiver Data Non-Inverted	CML-O	3
30	GND	Ground	Ground	1



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Pin Descriptions (continued)

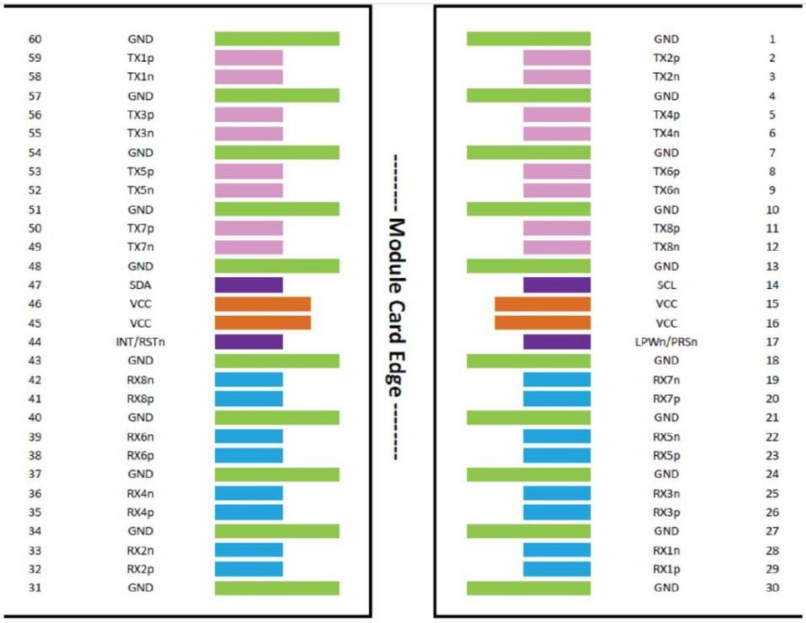
Pin	Symbol	Description	Logic	Plug Sequence
31	GND	Ground	Ground	1
32	RX2p	Receiver Data Non-Inverted	CML-O	3
33	RX2n	Receiver Data Inverted	CML-O	3
34	GND	Ground	Ground	1
35	RX4p	Receiver Data Non-Inverted	CML-O	3
36	RX4n	Receiver Data Inverted	CML-O	3
37	GND	Ground	Ground	1
38	RX6p	Receiver Data Non-Inverted	CML-O	3
39	RX6n	Receiver Data Inverted	CML-O	3
40	GND	Ground	Ground	1
41	RX8p	Receiver Data Non-Inverted	CML-O	3
42	RX8n	Receiver Data Inverted	CML-O	3
43	GND	Ground	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	LVCMOS-I/O	3
48	GND	Ground	Ground	1
49	TX7n	Transmitter Data Inverted	CML-I	3
50	TX7p	Transmitter Data Non-Inverted	CML-I	3
51	GND	Ground	Ground	1
52	TX5n	Transmitter Data Inverted	CML-I	3
53	TX5p	Transmitter Data Non-Inverted	CML-I	3
54	GND	Ground	Ground	1
55	TX3n	Transmitter Data Inverted	CML-I	3
56	TX3p	Transmitter Data Non-Inverted	CML-I	3
57	GND	Ground	Ground	1
58	TX1n	Transmitter Data Inverted	CML-I	3
59	TX1p	Transmitter Data Non-Inverted	CML-I	3
60	GND	Ground	Ground	1



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Pin-out of Connector Block on Host Board



OSFP Control Pins

Parameter	Function	Description
SCL	BiDir	2-wire serial clock signal. Requires a pull-up resistor to 3.3 V on the host.
SDA	BiDir	2-wire serial data signal. Requires a pull-up resistor to 3.3 V on the host.
LPWn/PRSn	Input/output	Dual-function signal. Low Power mode is an active-low input. Module Present is implemented by a module pull-down and is detected as an active-low output by the host.
INT/RSTn	Input/output	Dual-function signal. Reset is an active-low input. Interrupt is an active-high output.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Storage Temperature	Ts	-40		+85	°C	
Operating Case Temperature	TOP	0		+70	°C	
Power Supply Voltage	VCC	-0.5		3.6	V	
Relative Humidity	RH	0		85	%	Non-condensing



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Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Case Operating Temperature	TOP	0		+70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Maximum Power Consumption				32	W	
Data Rate, each Lane			106.25		GBd	PAM4
Data Rate Accuracy		-100		+100	ppm	
Pre-FEC Bit Error Ratio				1×10^{-6}		
Post-FEC Bit Error Ratio				1×10^{-12}		FEC provided by host
Link Distance	D			500	m	FEC required at maximum reach

Electrical Characteristics

Parameter	Test Point	Min	Typ	Max	Unit	Notes
Module Input (each Lane)						
Differential pk-pk input voltage tolerance	TP1	750	–	–	mV	
Differential termination mismatch	TP1	–	–	10	%	
Single-ended voltage tolerance range	TP1	-0.4	–	3.3	V	
DC common-mode voltage	TP1	-350		2850	mV	
Module Output (each Lane)						
Peak-to-peak AC common-mode voltage	TP4	–	–	32	mV	
Common-mode voltage	TP4	-350			mV	
Peak-to-peak AC common-mode voltage, low frequency	TP4			80	mV	
Differential output voltage, long mode	TP4	–	–	845	mV	
Differential output voltage, short mode	TP4	–	–	600	mV	
Eye height, differential	TP4	15	–	–	mV	
Differential termination mismatch	TP4	–	–	10	%	



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Optical Characteristics - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Center Wavelength	λc	1304.5	1311	1317.5	nm	
Data Rate, each Lane		106.25 ± 100 ppm	106.25 ± 100 ppm	106.25 ± 100 ppm	GBd	
Modulation Format			PAM4			
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each lane	AOPL	-3.3		4	dBm	1, 2
Outer Optical Modulation Amplitude (OMAouter), each lane	TOMA	-0.3 (max < 0.9 dB) -1.2 + max(TECQ,TDECQ)		4.2	dBm	
Transmitter and Dispersion Eye Closure for PAM4, each lane	TDECQ			3.4	dB	
Transmitter Eye Closure for PAM4, each lane	TECQ			3.4	dB	
|TDECQ - TECQ|				2.5	dB	
Transmitter overshoot/undershoot				22	%	
Average Launch Power of OFF Transmitter, each lane	TOFF			-15	dBm	
Extinction Ratio, each lane	ER	3.5			dB	
Transmitter transition time	Tt			8	ps	
RIN21.4OMA	RIN			-139	dB/Hz	
Optical Return Loss Tolerance	ORL			21.4	dB	
Transmitter Reflectance	TR			-26	dB	3



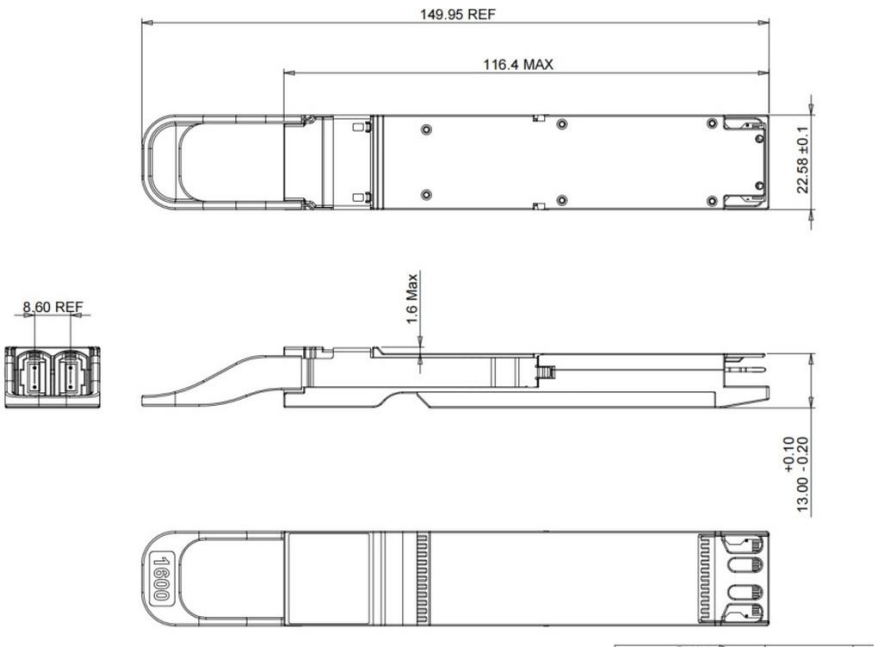
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Optical Characteristics - Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Receiver						
Data Rate, each Lane		106.25 ± 100 ppm	106.25 ± 100 ppm	106.25 ± 100 ppm	GBd	
Modulation Format			PAM4			
Damage Threshold, average optical power, each lane	AOPD	5			dBm	4
Average Receive Power, each lane	AOPR	-6.3		4	dBm	5
Receive Power (OMAouter), each lane	OMA-R			4.2	dBm	
Receiver Reflectance	RR			-26	dB	
Receiver Sensitivity (OMAouter), each lane	SOMA			Max(-3.4, -4.3 + TECQ)	dBm	6
Stressed Receiver Sensitivity (OMAouter), each lane	SRS			-0.9	dBm	6
Conditions of Stressed Receiver Sensitivity Test						
Stressed Eye Closure for PAM4 (SECQ)			3.4		dB	
OMAouter of each aggressor lane			2.9		dBm	

Mechanical Specifications





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Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitoring accuracy.

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3		3	°C	Operating range
Supply voltage monitor absolute error	DMI_VCC	-0.1		0.1	V	Full range
Channel RX power monitor absolute error	DMI_RX_Ch	-2		2	dB	1
Channel bias current monitor	DMI_Ibias_Ch	-10		10	%	
Channel TX power monitor absolute error	DMI_TX_Ch	-2		2	dB	1

SAFETY AND OPERATING INSTRUCTIONS

1. This product emits laser radiation. Do not look directly into an optical port or exposed fiber end.

2. This product is electrostatic-discharge sensitive. Operate in an ESD-protected area and ensure that personnel and tools making direct contact with the device are properly grounded.

3. Fit the dust cap immediately after testing or inspection to protect the optical connector from contamination.

4. Absolute maximum ratings are stress limits. Prolonged exposure to these limits, or exposure to multiple maximum ratings simultaneously, may damage the device or reduce reliability. Use the recommended operating conditions for normal operation.

5. Provide adequate airflow and thermal management for the OSFP IHS package. Keep the module case temperature within the specified operating range.

6. Do not overstretch or sharply bend the optical fiber.



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DOCUMENT CONTROL

CONTROL FIELD	VALUE
Document Title	CP-OSFP-1.6T-2DR4 - 1.6T OSFP 2×DR4 Silicon Photonics Optical Transceiver
Document ID	WO-1.6T-2DR4
Revision	V2.0
Effective Date	2026-09-23
Status	Controlled Document

REVISION	DATE	CHANGE DESCRIPTION
V2.0	2026-09-23	Initial Western Optronics controlled release

SUPPORT

Western Optronics provides product-selection, setup, and application support. Specifications and availability are subject to change without notice.