

CFP4-100GB-SR4-C

MSA and TAA 100GBase-SR4 CFP4 Transceiver (MMF, 850nm, 150m, MPO, DOM)

Features:

- CFP MSA 1.1 Compliance
- MPO Connector
- Multi-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



Applications:

- 100GBase Ethernet
- Access and Enterprise

Product Description

This MSA Compliant CFP4 transceiver provides 100GBase-SR4 throughput up to 150m over multi-mode fiber (MMF) using a wavelength of 850nm via an MPO connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	85	°C
Relative Humidity (non-condensation)	RH		85	%
Operating Case Temperature	TOP	0	70	°C
Supply Voltage	Vcc	-0.5	3.6	V
Voltage on LVTTTL Input	Vilvttl	-0.5	VCC3+0.3	V
LVTTTL Output Current	Iolvttl		15	mA
Voltage on Open Collector Output	Voco	0	6	V
Damage Threshold, each Lane	THd	3.4		dBm

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Data Rate, each Lane			25.78125		Gb/s	
Data Rate Accuracy		-100		100	ppm	
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Power Supply Noise	Vrip			2	%	
				3	%	1-10MHz
Link Distance (OM3 MMF)	D1			70	m	
Link Distance (OM4 MMF)	D2			100	m	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption				3.5	W	
Supply Current	I _{cc}			1.06	A	
Low Power Mode Power				1.0	W	
Transmitter						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (V _{cm})	TP1	-350		2850	mV	1
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
Differential Return Loss (SDD11)	TP1			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1			See CEI-28G-VSR Equation 13-20	dB	
Stressed Input Test	TP1a	See CEI-28G-VSR section 13.3.11.2.1				
Receiver						
Differential Voltage, pk-pk	TP4			900	mV	
Common Mode Voltage (V _{cm})	TP4	-350		2850	mV	
Common Mode Noise, RMS	TP4			175	mV	
Differential Termination	TP4			10	%	At 1MHz
Differential Return Loss (SDD22)	TP4			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and differential to Common Mode conversion (SDC22, SCD22)	TP4			See CEI-28G-VSR Equation 13-21	dB	
Common Mode Return Loss (SCC22)	TP4			-2	dB	2
Transition Time, 20 to 80%	TP4	9.5			ps	
Vertical Eye Closure (VEC)	TP4			5.5	dB	
Eye Width at 10 ⁻¹⁵ probability (EW15)	TP4	0.57			UI	
Eye height at 10 ⁻¹⁵ probability (EW15)	TP4	228			mV	

Notes:

1. V_{cm} is generated by the host. Specification includes effects of ground offset voltage.
2. From 250MHz to 30GHz

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_c	840	850	860	nm	
RMS Spectral Width	$\Delta\lambda_{rms}$			0.6	nm	
Average Launch Power, each Lane	P _{AVG}	-8.4		2.4	dBm	
Optical Modulation Amplitude (OMA), each Lane	P _{OMA}	-6.4		3.0	dBm	
Launch Power in OMA minus TDEC, each Lane		-7.3			dBm	
Transmitter and Dispersion Eye Closure (TDEC)				4.3	dB	
Extinction Ratio	ER	2.0			dB	
Optical Return Loss Tolerance	TOL			12	dB	
Average Launch Power OFF Transmitter, each Lane	P _{off}			-30	dBm	
Encircled Flux						
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}						
Receiver						
Center Wavelength	λ_c	840	850	860	nm	
Damage Threshold, each Lane	TH _d	3.4			dBm	
Average Receive Power, each Lane		-10.3		2.4	dBm	
Receive Power (OMA), each Lane				3.0	dBm	
Receiver Sensitivity (OMA), each Lane	SEN			-9.2	dBm	For BER = 5x10 ⁻⁵
Stressed Receiver Sensitivity (OMA)				-5.2	dBm	4
Receiver Reflectance	R _R			-12	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-assert	LOSD			-12	dBm	
Los Hysteresis	LOSH	0.5			dB	
Conditions of Stress Receiver Sensitivity Test (note5)						
Stressed Eye Closure (SEC), Lane under Test			4.3		dB	
Stressed Eye J2 Jitter, Lane under Test			0.39		UI	
Stressed eye J4 Jitter, Lane under Test				0.53	UI	
OMA of each Aggressor Lane			3		dBm	
Stressed Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}, Hit ratio 5x10 ⁻⁵ hits per sample		{0.28, 0.5, 0.5, 0.33, 0.33, 0.4}				

Notes:

1. If the TDP < 0.9 dB, the OMA min must exceed the minimum value specified here.
2. Hit ratio 1.5×10^{-3} hits per sample.
3. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
4. Measured with conformance test signal at receiver input for BER = 5×10^{-5}
5. Vertical eye closure penalty, stressed eye J2 jitter, stressed eye J4 jitter, and stressed receiver eye mask definition are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Digital Diagnostic Monitoring Interface

Parameter	Symbol	Min.	Max.	Unit	
Temperature monitor absolute error	DMI_Temp	-3	3	°C	Over operating Temperature range
Supply voltage monitor absolute error	DMI_VCC	-0.15	0.15	V	Over full operating range
Channel RX power monitor absolute error	DMI_RX_Ch	-2	2	dB	1
Channel Bias current monitor	DMI_Ibias_ch	-10%	10%	mA	Ch1~Ch4
Channel TX power monitor absolute error	DMI_YX_Ch	-2	2	dB	1

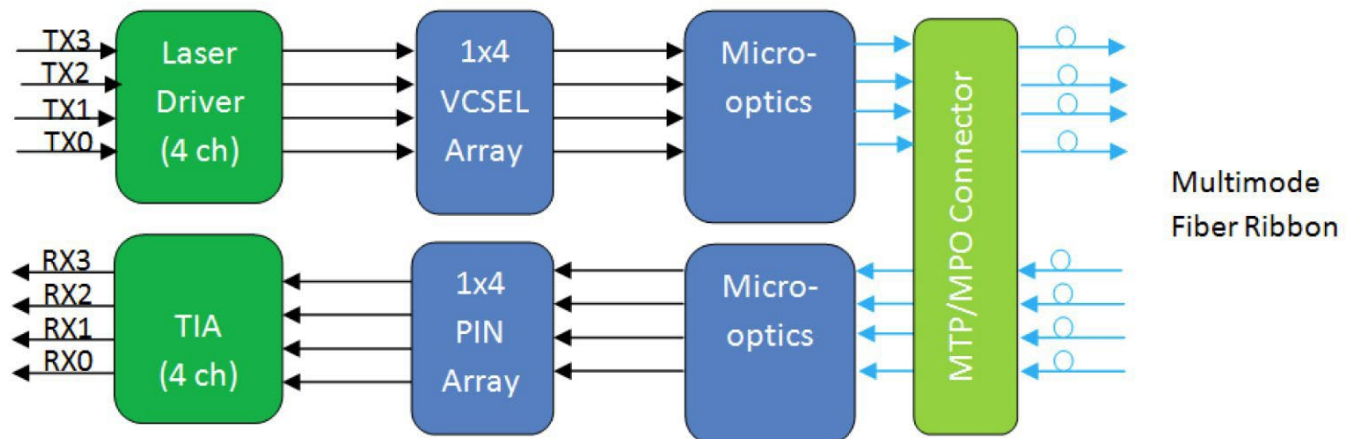
Notes:

1. Due to measurement accuracy of different single mode fibers, there could be an additional +/-1 dB fluctuation, or a +/-3 dB total accuracy.

Side Pins from Pin 1 through Pin 28

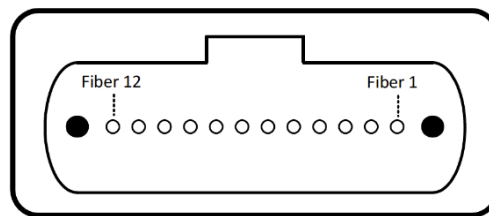
PIN	Name	I/O	Logic	Description
1	3.3V_GND			3.3V Module Supply Voltage Return Ground, can be separated or tied together with Signal Ground
2	3.3V_GND			
3	3.3V			
4	3.3V			
5	3.3V			
6	3.3V			3.3V Module Supply Voltage
7	3.3V_GND			
8	3.3V_GND			
9	VIND_IO_A	I/O		Module Vendor I/O A. Do Not Connect
10	VIND_IO_B	I/O		Module Vendor I/O B. Do Not Connect
11	TX_DIS (PRG_CNT L1)	I	LVC MOS w/PUR	Transmitter Disable for all lanes. "1" or NC: Transmitter disabled; "0": transmitter enabled. (Optionally configurable as Programmable Control1 after Reset)
12	RX_LOS (PRG_ALR M1)	O	LVC MOS w/PUR	Receiver Loss of Optical Signal. "1": low optical signal; "0": normal condition (Optionally configurable as Programmable Alarm1 after Reset)
13	GLB_ALR M	O	LVC MOS	Global Alarm. "0": alarm condition in any MDIO Alarm register; "1": no alarm condition, Open Drain, Pull up Resistor on Host
14	MOD_LOP WR	I	LVC MOS w/PUR	Module Low Power Mode. "1" or NC: module in low power (safe) mode; "0": power-on enabled
15	MOD_ABS	O	GND	Module Absent. "1" or NC: module absent; "0": module present, Pull up resistor on Host
16	MOD_RSTn	I	LVC MOS w/PDR	Module Reset. "0": resets the module; "1" or NC: module enabled, Pull down Resistor in Module
17	MDC	I	1.2V CMOS	Management Data Clock (electrical specs as per IEEE Std 802.3-2012)
18	MDIO	I/O	1.2V CMOS	Management Data I/O bi-directional data (electrical specs as per IEEE Std 802.3ae-2008 and ba-2010)
19	PRTADR0	I	1.2V CMOS	MDIO Physical Port address bit 0
20	PRTADR1	I	1.2V CMOS	MDIO Physical Port address bit 1
21	PRTADR2	I	1.2V CMOS	MDIO Physical Port address bit 2
22	VND_IO_C	I/O		Module Vendor I/O C. Do Not Connect
23	VND_IO_D	I/O		Module Vendor I/O D. Do Not Connect
24	VND_IO_E	I/O		Module Vendor I/O E. Do Not Connect
25	GND			
26	(MCLKn)	O	CML	For optical waveform testing. Not for normal use
27	(MCLKp)	O	CML	For optical waveform testing. Not for normal use
28	GND			

Transceiver Block Diagram



Optical Interface Lances and Assignment

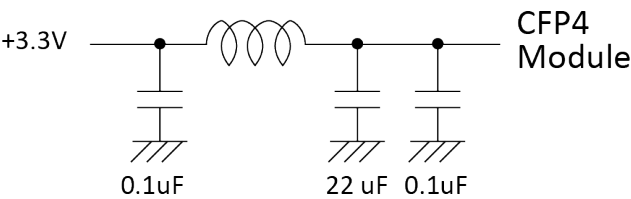
Orientation of the multi-mode fiber facets of optical connector



Lane Assignment

Parameter	Lane Assignment
1	RX0
2	RX1
3	RX2
4	RX3
5,6,7,8	Not Used
9	TX3
10	TX2
11	TX1
12	TX0

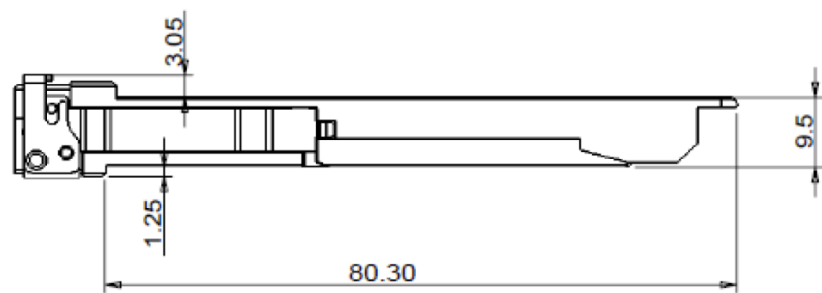
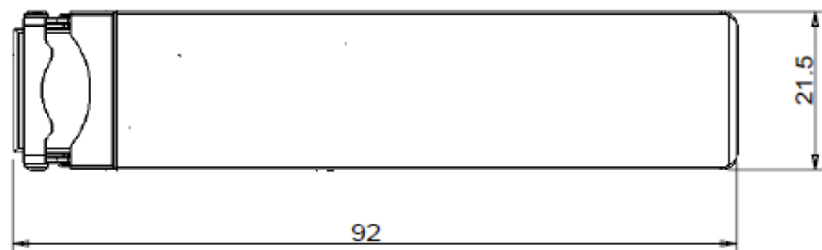
Recommended Power Supply Filter



Definition of the Bottom

CFP4		CFP4	
Bottom		Top	
1	3.3V GND	56	GND
2	3.3V GND	55	TX3n
3	3.3V	54	TX3p
4	3.3V	53	GND
5	3.3V	52	TX2n
6	3.3V	51	TX2p
7	3.3V GND	50	GND
8	3.3V GND	49	TX1n
9	VND IO A	48	TX1p
10	VND IO B	47	GND
11	TX DIS (PRG CNTL1)	46	TX0n
12	RX LOS (PRG ALRM1)	45	TX0p
13	GLB ALRMn	44	GND
14	MOD LOPWR	43	(REFCLKn)
15	MOD ABS	42	(REFCLKp)
16	MOD RSTn	41	GND
17	MDC	40	RX3n
18	MDIO	39	RX3p
19	PRTADR0	38	GND
20	PRTADR1	37	RX2n
21	PRTADR2	36	RX2p
22	VND IO C	35	GND
23	VND IO D	34	RX1n
24	VND IO E	33	RX1p
25	GND	32	GND
26	(MCLKn)	31	RX0n
27	(MCLKp)	30	RX0p
28	GND	29	GND

Mechanical Dimension



About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



Contact Information

ProLabs US

Email: sales@prolabs.com

Telephone: 952-852-0252

ProLabs UK

Email: salesupport@prolabs.com

Telephone: +44 1285 719 600