



CFP4-100GB-LR4-SKY

MSA Compliant 100GBase-LR4 CFP4 Transceiver (SMF, 1310nm, 10km, LC, DOM)

Product Description

This MSA compliant CFP4 transceiver provides 100GBase-LR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

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



Applications:

- 100GBase Ethernet
- Access and Enterprise
- ITU-T OTU4

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	0		70	°C	
Storage Temperature	Tstg	-40		85	°C	
Power Supply Voltage	Vcc	-0.3		4	V	
Signal Input Voltage		Vcc-0.3		Vcc+0.3	V	
Relative Humidity	RH	5		95	%	
Receive Input Optical Power (Damage Threshold)	Pdmg			5.0	dBm	
Signaling Rate Per Lane			25.78125		Gbps	

Low-Speed Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.2	3.3	3.4	V	1
Power Supply Current	Icc			1.8	A	
Power Dissipation	PD			6.0	W	
Power Dissipation (Low-Power Mode)	PDLP			1.0	W	
Low-Speed Control and Sense Signals (3.3V LVCMOS)						
Output Low Voltage	VOL	0.3		0.2	V	IOH = 100μA
Output High Voltage	VOH	Vcc-0.2		Vcc+0.3	V	IOH = -100μA
Input Low Voltage	VIL	-0.3		0.8	V	
Input High Voltage	VIH	2		Vcc3+ 0.3	V	
Input Leakage Current	Iin	-10		10	μA	
Low-Speed Control and Sense Signals (1.2V LVCMOS)						
Output Low Voltage	VOL	-0.3		0.2	V	
Output High Voltage	VOH	1.0		1.5	V	
Output Low Current	Iol	4			mA	
Output High Current	Ioh			-4	mA	
Input Low Voltage	VIL	-0.3		0.36	V	
Input High Voltage	VIH	0.84		1.5	V	
Input Leakage Current	Iin	-100		100	μA	
Input Capacitance	C			10	pF	
MDC Clock Rate		0.1		4	MHz	

Notes:

1. With respect to the GND.

High-Speed Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Electrical Input from Host						
Differential Voltage Pk-Pk		100		1200	mV	
Common-Mode Noise (RMS)				17.5	mV	
Differential Termination Mismatch				10	%	
Transition Time		10			ps	20-80%
Common-Mode Voltage		-0.3		2.8	V	
Receiver Electrical Output from Host						
Differential Voltage Pk-Pk		100		1200	mV	
Common-Mode Noise (RMS)				17.5	mV	
Differential Termination Mismatch				10	%	
Transition Time		9.5			ps	20-80%

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_0	1294.53	1295.56	1296.59	nm	
	λ_1	1299.02	1300.05	1301.09	nm	
	λ_2	1303.54	1304.58	1305.63	nm	
	λ_3	1308.09	1309.14	1310.19	nm	
Rate Tolerance		-100		100	ppm	1
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Output Power	POUT			10.5	dBm	
Average Launch Power Per Lane		-4.3		4.5	dBm	
Extinction Ratio	ER	4			dB	
Optical Modulation Amplitude Per Lane	OMA	-1.3		4.5	dBm	
Difference in Launch Power Between Any Two Lanes	OMA			5	dB	
Transmitter and Dispersion Penalty Per Lane	TDP			2.2	dB	
Average Launch Power Off Per Lane	Poff			-30	dBm	
Relative Intensity Noise	RIN ₂₀ OMA			-130	dB/Hz	
Transmitter Reflectance				-120dB		
Output Eye Mask Definitions: {X1, X2, X3, Y1, Y2, Y3}	{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}					
Receiver						
Center Wavelength	λ_0	1294.53	1295.56	1296.59	nm	

	$\lambda 1$	1299.02	1300.05	1301.09	nm	
	$\lambda 2$	1303.54	1304.58	1305.63	nm	
	$\lambda 3$	1308.09	1309.14	1310.19	nm	
Rate Tolerance		-100		100	ppm	1
Average Receiver Power Per lane	Pavg	-10.6		4.5	dBm	
Receiver Power (OMA) Per Lane	RXPx			4.5	dBm	
Difference in Launch Power Between Any Two Lanes				5.5	dB	
Receiver Sensitivity (OMA) Per Lane	RxSENS			-8.6	dBm	2
Stressed Receiver Sensitivity (OMA) Per Lane	SRS			-6.8	dBm	
Stressed Receiver Sensitivity Test Conditions						
Vertical Eye Closure Penalty Per Lane	VECP		1.8		dB	
Stressed Eye J2 Jitter Per Lane			0.3		UI	3
Stressed Eye J9 Jitter Per Lane			0.47		UI	3
Receiver Reflectance	RR			-26	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-12	dBm	
LOS Hysteresis	LOSH	0.5		-26	dB	

Notes:

1. From the normal rate.
2. Receiver sensitivity OMA per lane is informative.
3. Vertical Eye Closure Penalty, Stressed Eye J2 Jitter, and Stressed Eye J9 Jitter test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Pin Descriptions

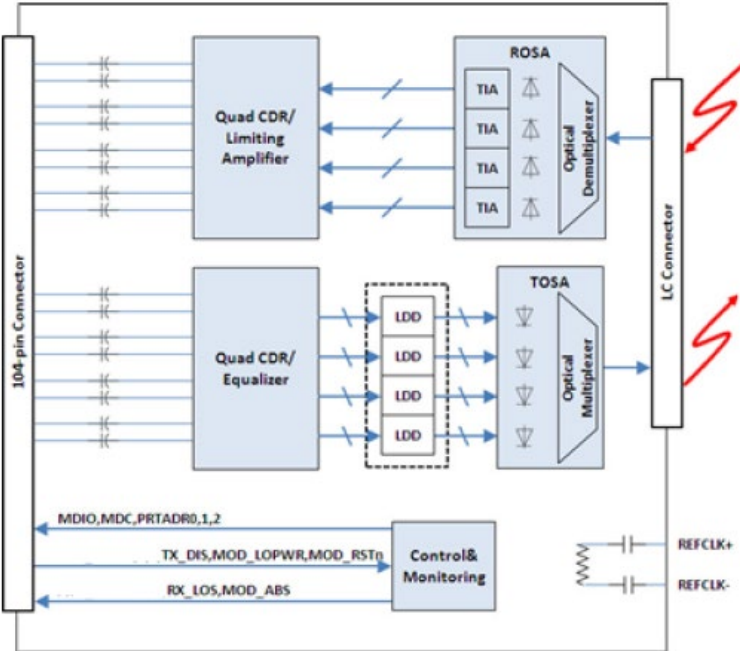
Pin	Symbol	Name/Description
1	3.3V_GND	3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground.
2	3.3V_GND	3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground.
3	3.3V	3.3V Module Supply Voltage.
4	3.3V	3.3V Module Supply Voltage.
5	3.3V	3.3V Module Supply Voltage.
6	3.3V	3.3V Module Supply Voltage.
7	3.3V_GND	3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground.
8	3.3V_GND	3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground.
9	NUC	Module Vendor I/O. Must not connect at the host board.
10	NUC	Module Vendor I/O. Must not connect at the host board.
11	Tx_DIS	Transmitter Disable for All Lanes. "1" or NC = transmitter disabled. "0" = transmitter enabled.
12	Rx_LOS	Receiver Loss of Optical Signal. "1" = low optical signal. "0" = normal condition.
13	GLB_ALRMn	Global Alarm. "0" = alarm condition in any MDIO alarm register. "1" = no alarm condition. Open drain. Pull-up resistor on the host.
14	MOD_LOPWR	Module Low-Power Mode. "1" or NC = module in low-power (safe) mode. "0" = power-on enabled.
15	MOD_ABS	Module Absent. "1" or NC = module absent. "0" = module present. Pull-up resistor on the host.
16	MOD_RSTn	Module Reset. "0" resets the module. "1" or NC = module enabled. Pull-down resistor in the module.
17	MDC	Management Data Clock. Electrical specs as per 802.3ae and 802.3ba.
18	MDIO	Management Data I/O Bi-Directional Data. Electrical specs as per 802.3ae and 802.3ba).
19	PRTADR0	MDIO Physical Port Address Bit 0.
20	PRTADR1	MDIO Physical Port Address Bit 1.
21	PRTADR2	MDIO Physical Port Address Bit 2.
22	NUC	Module Vendor I/O. Must not connect at the host board.
23	NUC	Module Vendor I/O. Must not connect at the host board.
24	NUC	Module Vendor I/O. Must not connect at the host board.
25	GND	
26	Tx_MCLKn	Tx Monitor Clock Output (Positive).
27	Tx_MCLKp	Tx Monitor Clock Output (Negative).
28	GND	
29	GND	
30	Rx0+	Lane 0 Receiver Output (Positive).
31	Rx0-	Lane 0 Receiver Output (Negative).
32	GND	
33	Rx1+	Lane 1 Receiver Output (Positive).
34	Rx1-	Lane 1 Receiver Output (Negative).
35	GND	

36	Rx2+	Lane 2 Receiver Output (Positive).
37	Rx2-	Lane 2 Receiver Output (Negative).
38	GND	
39	Rx3+	Lane 3 Receiver Output (Positive).
40	Rx3-	Lane 3 Receiver Output (Negative).
41	GND	
42	REFCLKp(NUC)	Reference Clock Input (Positive) (Optional).
43	REFCLKn(NUC)	Reference Clock Input (Negative) (Optional).
44	GND	
45	Tx0+	Lane 0 Transmitter Input (Positive).
46	Tx0-	Lane 0 Transmitter Input (Negative).
47	GND	
48	Tx1+	Lane 1 Transmitter Input (Positive).
49	Tx1-	Lane 1 Transmitter Input (Negative).
50	GND	
51	Tx2+	Lane 2 Transmitter Input (Positive).
52	Tx2-	Lane 2 Transmitter Input (Negative).
53	GND	
54	Tx3+	Lane 3 Transmitter Input (Positive).
55	Tx3-	Lane 3 Transmitter Input (Negative).
56	GND	

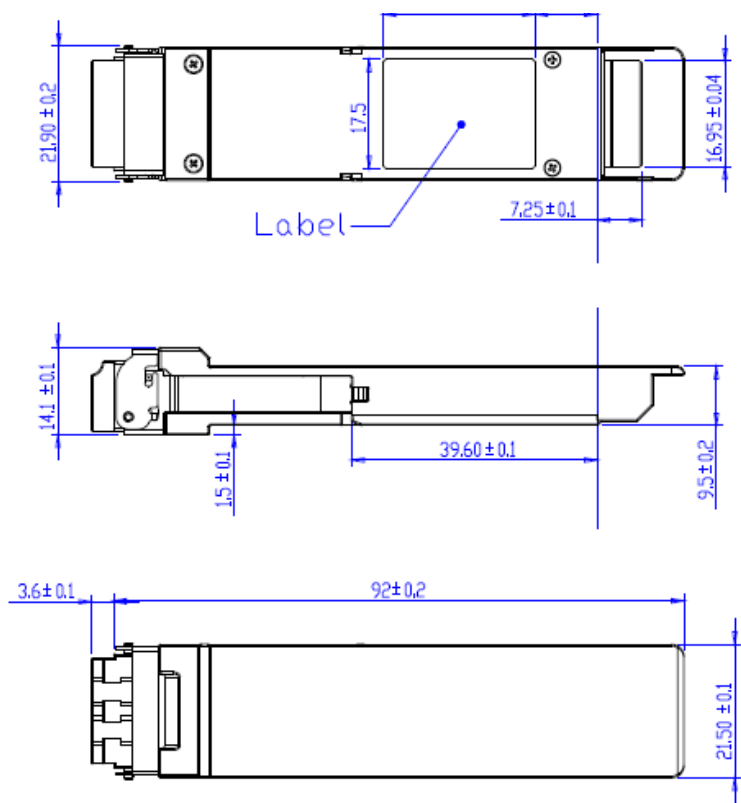
Pin Definitions

Top Row		Bottom Row	
PIN#	Name	PIN#	Name
56	GND	1	3.3V_GND
55	TX3n	2	3.3V_GND
54	TX3p	3	3.3V
53	GND	4	3.3V
52	TX2n	5	3.3V
51	TX2p	6	3.3V
50	GND	7	3.3V_GND
49	TX1n	8	3.3V_GND
48	TX1p	9	NUC
47	GND	10	NUC
46	TX0n	11	TX_DIS
45	TX0p	12	RX_LOS
44	GND	13	GLB_ALRMn
43	(REFCLKn)	14	MOD_LOPWR
42	(REFCLKp)	15	MOD_ABS
41	GND	16	MOD_RSTn
40	RX3n	17	MDC
39	RX3p	18	MDIO
38	GND	19	PRTADR0
37	RX2n	20	PRTADR1
36	RX2p	21	PRTADR2
35	GND	22	NUC
34	RX1n	23	NUC
33	RX1p	24	NUC
32	GND	25	GND
31	RX0n	26	TX_MCLKn
30	RX0p	27	TX_MCLKp
29	GND	28	GND

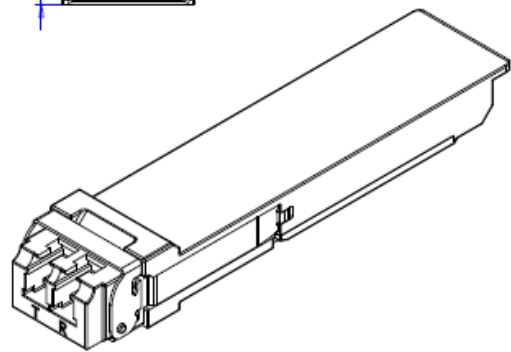
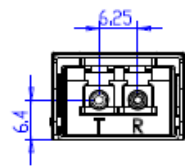
Block Diagram



Mechanical Specifications



Units in mm



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

