



Q1213010C00D000

MSA and TAA 400GBase-LR4 QSFP112 Transceiver (SMF, 1310nm, 10km, LC, CMIS 5.2)

Product Description

This MSA compliant QSFP112 transceiver provides 400GBase-LR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC 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. 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:

- Compliant with 400GBASE-LR4
- Single 3.3V Power Supply
- Up to 10km over SMF with FEC
- Compliant with QSFP-DD MSA
- Duplex LC Connector
- Compliant with IEEE802ck and IEEE802cu Standards
- 4 CWDM EML and PIN Array design
- CMIS 5.2
- Operating Temperature: 0 to 70 Celsius
- Class 1 Laser
- RoHS Compliant and Lead-Free



Applications:

- 400GBase Ethernet

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
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Relative Humidity	RH	5		85	%	
Supply Voltage	Vcc	-0.5		3.6	V	
Signaling Rate Per Lane			53.125 ± 100ppm		Gbd	PAM4
Damage Threshold Per Lane		5			dBm	
Link Distance with G.652	D	0.002		10	km	
Modulation Format		PAM4				

Electrical Characteristics

Parameter		Symbol / Test Point	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Power Consumption		PC			10	W	
Transmitter							
Differential Pk-Pk Input Voltage Tolerance		TP1a	750			mV	
AC Common-Mode RMS Voltage Tolerance		TP1a	25			mV	
Single-Ended Voltage Tolerance		TP1a	-0.4		3.3	V	
DC Common-Mode Voltage Tolerance		TP1	-0.35		2.85	V	
Receiver							
AC Common-Mode Output Voltage (RMS)		TP4			25	mV	
Differential Pk-Pk Output Voltage	Short-Mode	TP4			600	mV	
	Long-Mode				845		
Eye Height		TP4	15			mV	
DC Common-Mode Voltage Tolerance		TP4	-0.35		2.85	V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λC	1264.5	1271	1277.5	nm	
		1284.5	1291	1297.5		
		1304.5	1311	1317.5		
		1324.5	1331	1337.5		
Total Average Launch Power	POUT			11.1	dBm	

Average Launch Power Per Lane		P	-27		5.1	dBm	1
OMOuter Per Lane	TDECQ < 1.4dB	POMA	-0.3		4.4	dBm	
	1.4dB ≤ TDECQ ≤ 3.4dB		-1.1 + TDECQ		4.4		
Difference in Launch Power Between Any Two Lanes (OMOuter)		DP			4	dB	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane		TDECQ			3.4	dB	
Transmitter Eye Closure for PAM4 (TECQ) Per Lane		TECQ			3.4	dB	
TDECQ - TECQ					2.5	dB	
Side-Mode Suppression Ratio		SMSR	30			dB	
Extinction Ratio		ER	3.5			dB	
Average Launch Power of Off Transmitter Per Lane		Poff			-16	dBm	
RIN _{15.6} OMA		RIN			-136	dB/Hz	
Optical Return Loss Tolerance		ORLT			15.6	dB	
Transmitter Reflectance		TR			-26	dB	2
Receiver							
Center Wavelength		λC	1264.5	1271	1277.5	nm	
			1284.5	1291	1297.5		
			1304.5	1311	1317.5		
			1324.5	1331	1337.5		
Damage Threshold Per Lane			6.1			dBm	3
Average Receive Power Per Lane			9		5.1	dBm	4
Receive Power (OMOuter) Per Lane		ROMA			4.4	dBm	
Difference in Receive Power Between Any Two Lanes (OMOuter)					4.3	dB	
Receiver Reflectance					-26	dB	
Recevier Sensitivity (OMOuter) Per Lane		SEN	Max. (-6.8, TECQ - 8.2)			dBm	
LOS Assert			-26			dBm	
LOS De-Assert					-8	dBm	
LOS Hysteresis			0.5			dBm	

Notes:

1. Average launch power, per lane (minimum), is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Transmitter reflectance is defined looking into the transmitter.
3. The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level.
4. Average receive power, per lane (minimum), is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

Pin Descriptions

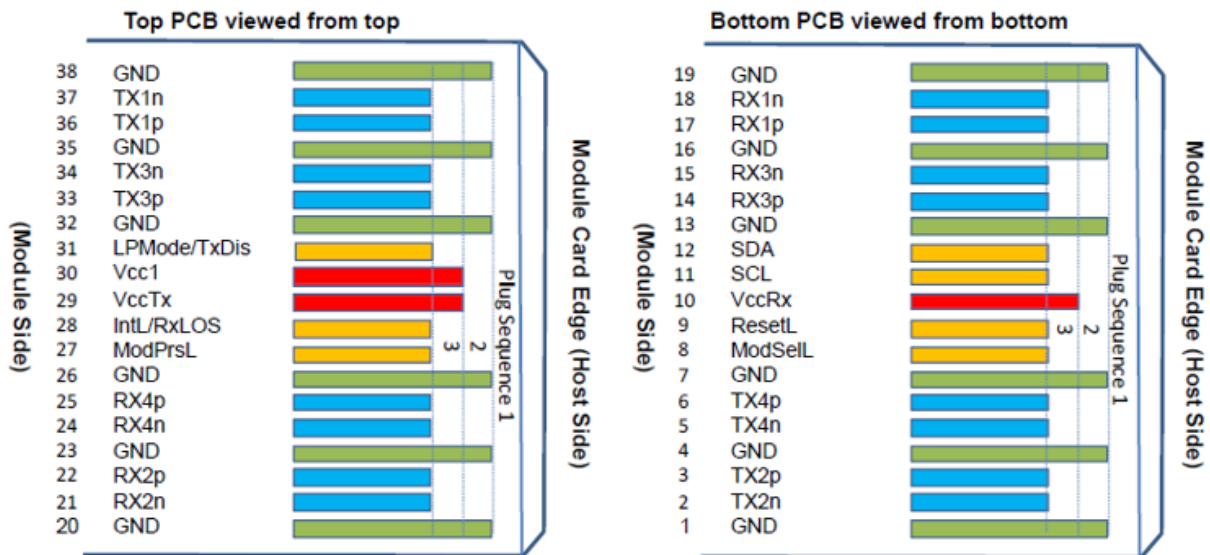
Pin	Symbol	Logic	Name/Description	Plug Sequence	Notes
1	GND		Module Ground.	1	1
2	Tx2-	CML-I	Transmitter Inverted Data Input.	3	
3	Tx2+	CML-I	Transmitter Non-Inverted Data Input.	3	
4	GND		Module Ground.	1	1
5	Tx4-	CML-I	Transmitter Inverted Data Input.	3	
6	Tx4+	CML-I	Transmitter Non-Inverted Data Input.	3	
7	GND		Module Ground.	1	1
8	ModSelL	LVTTL-I	Module Select.	3	
9	ResetL	LVTTL-I	Module Reset.	3	
10	VccRx		+3.3V Receiver Power Supply.	2	2
11	SCL	LVC MOS-I/O	2-Wire Serial Interface Clock.	3	
12	SDA	LVC MOS-I/O	2-Wire Serial Interface Data.	3	
13	GND		Module Ground.	1	1
14	Rx3+	CML-O	Receiver Non-Inverted Data Output.	3	
15	Rx3-	CML-O	Receiver Inverted Data Output.	3	
16	GND		Module Ground.	1	1
17	Rx1+	CML-O	Receiver Non-Inverted Data Output.	3	
18	Rx1-	CML-O	Receiver Inverted Data Output.	3	
19	GND		Module Ground.	1	1
20	GND		Module Ground.	1	1
21	Rx2-	CML-O	Receiver Inverted Data Output.	3	
22	Rx2+	CML-O	Receiver Non-Inverted Data Output.	3	
23	GND		Module Ground.	1	1
24	Rx4-	CML-O	Receiver Inverted Data Output.	3	
25	Rx4+	CML-O	Receiver Non-Inverted Data Output.	3	
26	GND		Module Ground.	1	1
27	ModPrsL	LVTTL- O	Module Present.	3	
28	IntL/RxLOS	LVTTL- O	Interrupt/Optional RxLOS.	3	
29	VccTx		+3.3V Transmitter Power Supply.	2	2
30	Vcc1		+3.3V Power Supply.	2	2
31	LPMoDe/TxDis	LVTTL- I	Low-Power Mode/Optional Tx_Disable.	3	
32	GND		Module Ground.	1	1
33	Tx1+	CML-I	Transmitter Non-Inverted Data Input.	3	
34	Tx1-	CML-I	Transmitter Inverted Data Input.	3	
35	GND		Module Ground.	1	1

36	Tx1+	CML-I	Transmitter Non-Inverted Data.	3	
37	Tx1-	CML-I	Transmitter Inverted Data Input.	3	
38	GND		Module Ground.	1	1

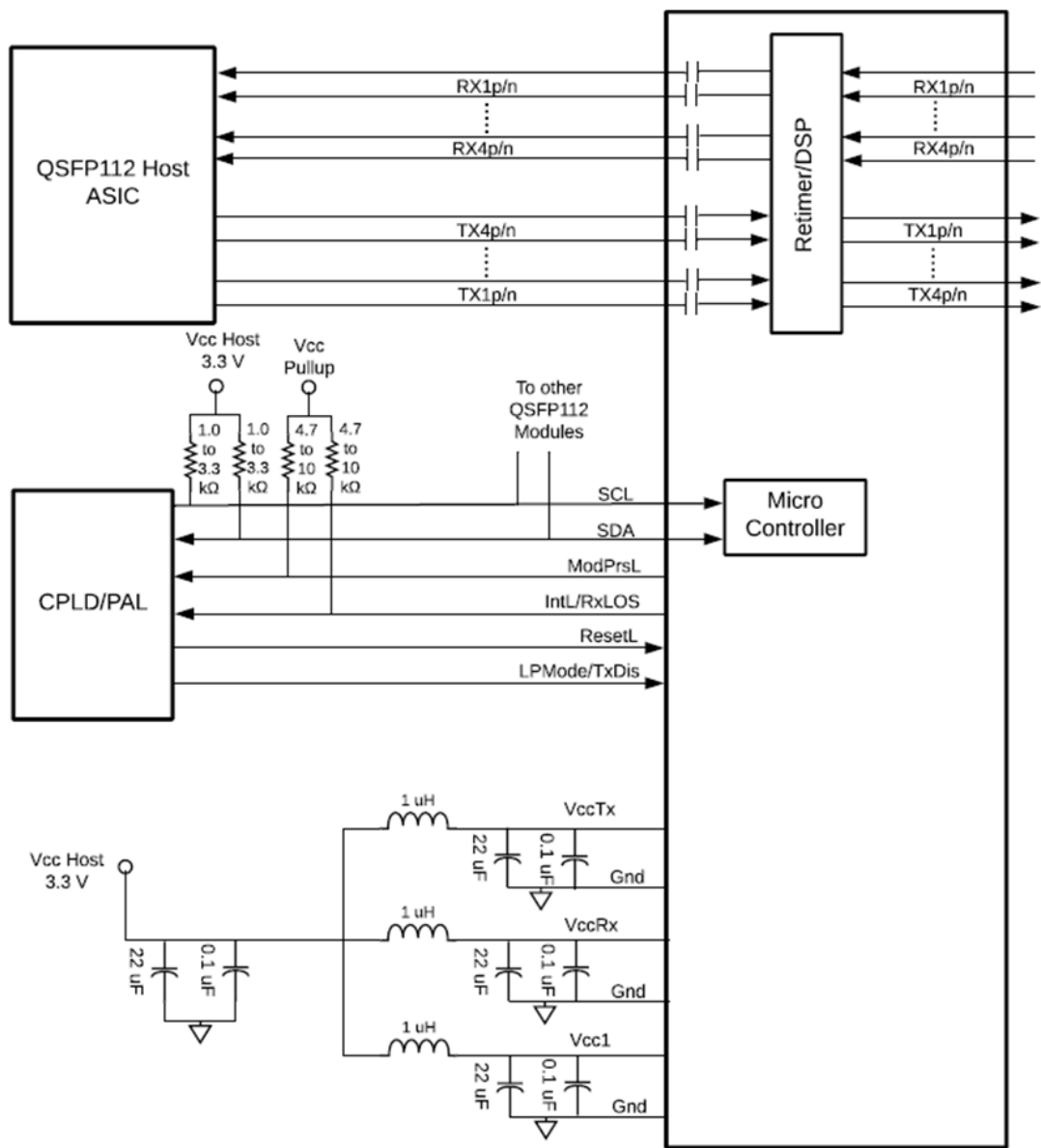
Notes:

1. GND is the symbol for signal and supply (power) common for the QSFP112 module. All are common within the QSFP112 module, and all voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. VccRx, Vcc1, and VccTx may be internally connected within the QSFP112 module in any combination. The connector pins are each rated for a maximum current of 1.5A (maximum current of 2.0A is required for a high module power of 15-20W).

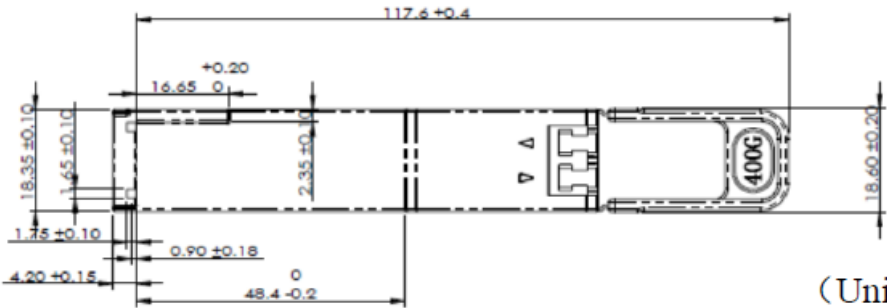
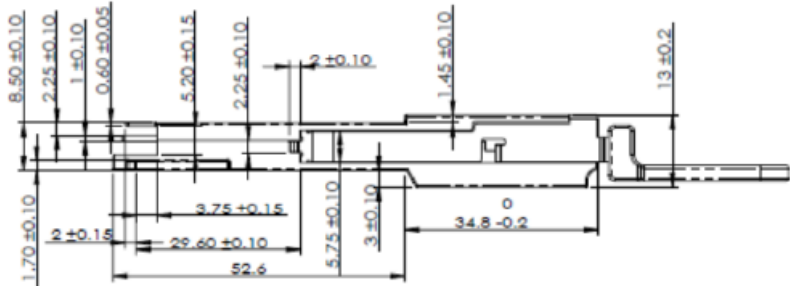
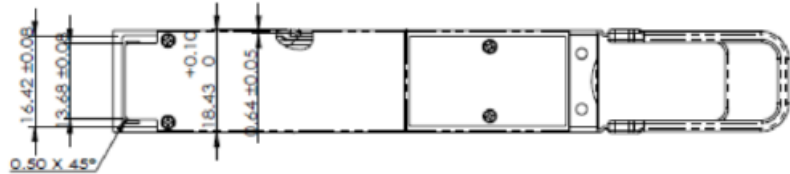
Pin-Out Details



Recommended Host Board Schematic



Mechanical Specifications



(Unit: 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.

