



OFPO5M02E00D000

MSA Compliant 400GBase-CU OSFP to 2xQSFP56 Direct Attach Cable Direct Attach Cable (Passive Twinax, 2m)

Product Description

This is an MSA compliant 400GBase-CU OSFP to 2xQSFP56 direct attach cable that operates over passive copper with a maximum reach of 2m. It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This direct attach cable is built to comply with MSA (Multi-Source Agreement) standards. 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:

- OSFP MSA and QSFP MSA Compliant
- Transmission Data Rate Up to 53.125Gbps Per Channel
- Infiniband HDR Compatible
- Operating Temperature Range: 0 to 70 Celsius
- RoHS Compliant and Lead-Free
- Enable 400Gbps to 2x200Gbps Transmission



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
Supply Voltage	Vcc	3.13	3.3	3.47	V
Storage Temperature	Tstg	-40		85	°C
Operating Case Temperature	Tc	0		70	°C
Relative Humidity	RH	5		85	%
Data Rate			400		Gbps

Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Resistance	Rcon			3	Ω
Insulation Resistance	Rins			10	MΩ
Raw Cable Impedance	Zca	95	100	110	Ω
Mated Connector Impedance	Zmated	85	100	110	Ω
Insertion Loss @13.28GHz	SDD21	6		14	dB
Return Loss	SDD11/22	$\text{Return_loss}(f) \geq \begin{cases} 11 & 0.05 \leq f < 26.5625/7.5 \\ 6.0-9.2 \lg(15f/5.5*7 \ 26.5625) & 26.5625/7.5 \leq f \leq 26.5 \end{cases}$			dB
Differential to Common-Mode Return Loss	SCD11/22	$\text{Return_loss}(f) \geq \begin{cases} -25+(20/26.5625)f & 0.05 \leq f < 26.5625/2 \\ -18+(6/26.5625) & 26.5625 \leq f \leq 26.5625 \end{cases}$			dB
Differential to Common-Mode Conversion Loss	SCD21-SDD21	$\text{Conversion_loss}(f) - \text{IL}(f) \geq \begin{cases} 10 & 0.01 \leq f < 12.89 \\ 27-(29/22)f & 12.89 \leq f < 15.7 \\ 6.3 & 15.7 \leq f \leq 19 \end{cases}$			dB
Minimum COM	COM	3			dB

Physical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Length	L		2		M
Wire Gauge			26		AWG
Jacket Material		Plastic Braided Mesh, Silver Gray			

Pin Descriptions (OSFP End)

Pin	Symbol	Name/Description	Logic	Plug Sequence	Direction	Notes
1	GND	Module Ground.		1		
2	Tx2+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
3	Tx2-	Transmitter Data Inverted.	CML-I	3	Input from Host	
4	GND	Module Ground.		1		
5	Tx4+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
6	Tx4-	Transmitter Data Inverted.	CML-I	3	Input from Host	
7	GND	Module Ground.		1		
8	Tx6+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
9	Tx6-	Transmitter Data Inverted.	CML-I	3	Input from Host	
10	GND	Module Ground.		1		
11	Tx8+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
12	Tx8-	Transmitter Data Inverted.	CML-I	3	Input from Host	
13	GND	Module Ground.		1		
14	SCL	2-Wire Serial Interface Clock.	LVC MOS-I/O	3	Bi-Directional	1
15	Vcc	+3.3V Power.		2	Power from Host	
16	Vcc	+3.3V Power.		2	Power from Host	
17	LPWn/PRSn	Low-Power Mode/Module Present.	Multi-Level	3	Bi-Directional	2
18	GND	Module Ground.		1		
19	Rx7-	Receiver Data Inverted.	CML-O	3	Output to Host	
20	Rx7+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
21	GND	Module Ground.		1		
22	Rx5-	Receiver Data Inverted.	CML-O	3	Output to Host	
23	Rx5+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
24	GND	Module Ground.		1		
25	Rx3-	Receiver Data Inverted.	CML-O	3	Output to Host	
26	Rx3+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
27	GND	Module Ground.		1		
28	Rx1-	Receiver Data Inverted.	CML-O	3	Output to Host	
29	Rx1+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
30	GND	Module Ground.		1		
31	GND	Module Ground.		1		
32	Rx2+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
33	Rx2-	Receiver Data Inverted.	CML-O	3	Output to Host	
34	GND	Module Ground.		1		

35	Rx4+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
36	Rx4-	Receiver Data Inverted.	CML-O	3	Output to Host	
37	GND	Module Ground.		1		
38	Rx6+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
39	Rx6-	Receiver Data Inverted.	CML-O	3	Output to Host	
40	GND	Module Ground.		1		
41	Rx8+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
42	Rx8-	Receiver Data Inverted.	CML-O	3	Output to Host	
43	GND	Module Ground.		1		
44	INT/RSTn	Module Interrupt/Module Reset.	Multi-Level	3	Bi-Directional	2
45	Vcc	+3.3V Power.		2	Power from Host	
46	Vcc	+3.3V Power.		2	Power from Host	
47	SDA	2-Wire Serial Interface Data.	LVC MOS-I/O	3	Bi-Directional	1
48	GND	Module Ground.		1		
49	Tx7-	Transmitter Data Inverted.	CML-I	3	Input from Host	
50	Tx7+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
51	GND	Module Ground.		1		
52	Tx5-	Transmitter Data Inverted.	CML-I	3	Input from Host	
53	Tx5+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
54	GND	Module Ground.		1		
55	Tx3-	Transmitter Data Inverted.	CML-I	3	Input from Host	
56	Tx3+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
57	GND	Module Ground.		1		
58	Tx1-	Transmitter Data Inverted.	CML-I	3	Input from Host	
59	Tx1+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
60	GND	Module Ground.		1		

Notes:

1. Open-drain with pull-up resistor on the host.
2. See pin assignments below for the required circuit.

Electrical Pin-Out Details - OSFP

Top Side (viewed from top)

60	GND	
59	TX1p	
58	TX1n	
57	GND	
56	TX3p	
55	TX3n	
54	GND	
53	TX5p	
52	TX5n	
51	GND	
50	TX7p	
49	TX7n	
48	GND	
47	SDA	
46	VCC	
45	VCC	
44	INT/RSTn	
43	GND	
42	RX8n	
41	RX8p	
40	GND	
39	RX6n	
38	RX6p	
37	GND	
36	RX4n	
35	RX4p	
34	GND	
33	RX2n	
32	RX2p	
31	GND	

----- Module Card Edge -----

Bottom Side (viewed from bottom)

	GND	1
	TX2p	2
	TX2n	3
	GND	4
	TX4p	5
	TX4n	6
	GND	7
	TX6p	8
	TX6n	9
	GND	10
	TX8p	11
	TX8n	12
	GND	13
	SCL	14
	VCC	15
	VCC	16
	LPWn/PRSn	17
	GND	18
	RX7n	19
	RX7p	20
	GND	21
	RX5n	22
	RX5p	23
	GND	24
	RX3n	25
	RX3p	26
	GND	27
	RX1n	28
	RX1p	29
	GND	30

Pin Descriptions (QSFP End)

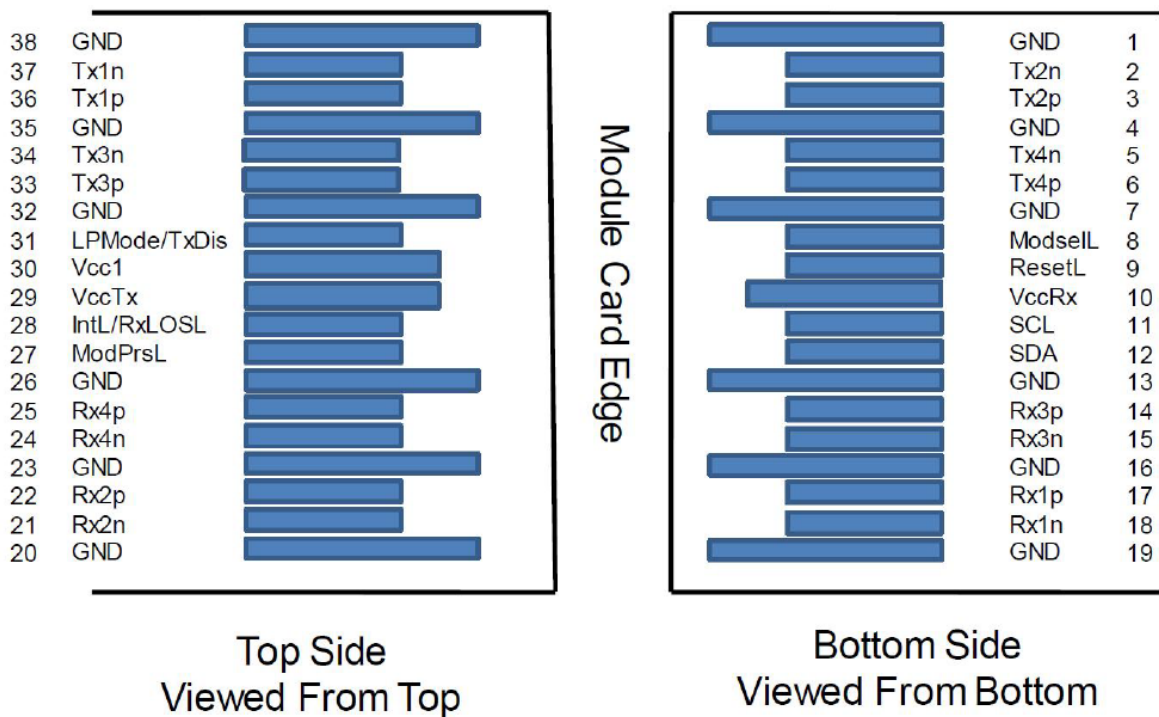
Pin	Logic	Symbol	Name/Description	Plug Sequence	Notes
1		GND	Module Ground.	1	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	3	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	3	
4		GND	Module Ground.	1	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	3	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	3	
7		GND	Module Ground.	1	1
8	LVTTL-I	ModSelL	Module Select.	3	
9	LVTTL-I	ResetL	Module Reset.	3	
10		VccRx	+3.3V Receiver Power Supply.	2	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock.	3	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data.	3	
13		GND	Module Ground.	1	1
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	3	
15	CML-O	Rx3-	Receiver Inverted Data Output.	3	
16		GND	Module Ground.	1	1
17	CML-O	Rx1+	Receiver Non-Inverted Data Output.	3	
18	CML-O	Rx1-	Receiver Inverted Data Output.	3	
19		GND	Module Ground.	1	1
20		GND	Module Ground.	1	1
21	CML-O	Rx2-	Receiver Inverted Data Output.	3	
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	3	
23		GND	Module Ground.	1	1
24	CML-O	Rx4-	Receiver Inverted Data Output.	3	
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	3	
26		GND	Module Ground.	1	1
27	LVTTL-O	ModPrsL	Module Present.	3	
28	LVTTL-O	IntL	Interrupt.	3	
29		VccTx	+3.3V Transmitter Power Supply.	2	2
30		Vcc1	+3.3V Power Supply.	2	2
31	LVTTL-I	LPMODE	Low-Power Mode.	3	
32		GND	Module Ground.	1	1
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	3	
34	CML-I	Tx3-	Transmitter Inverted Data Input.	3	

35		GND	Module Ground.	1	1
36	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	3	
37	CML-I	Tx1-	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 QSFP+ module. All are common within the QSFP module, and all module 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 QSFP transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

Electrical Pin-Out Details - QSFP



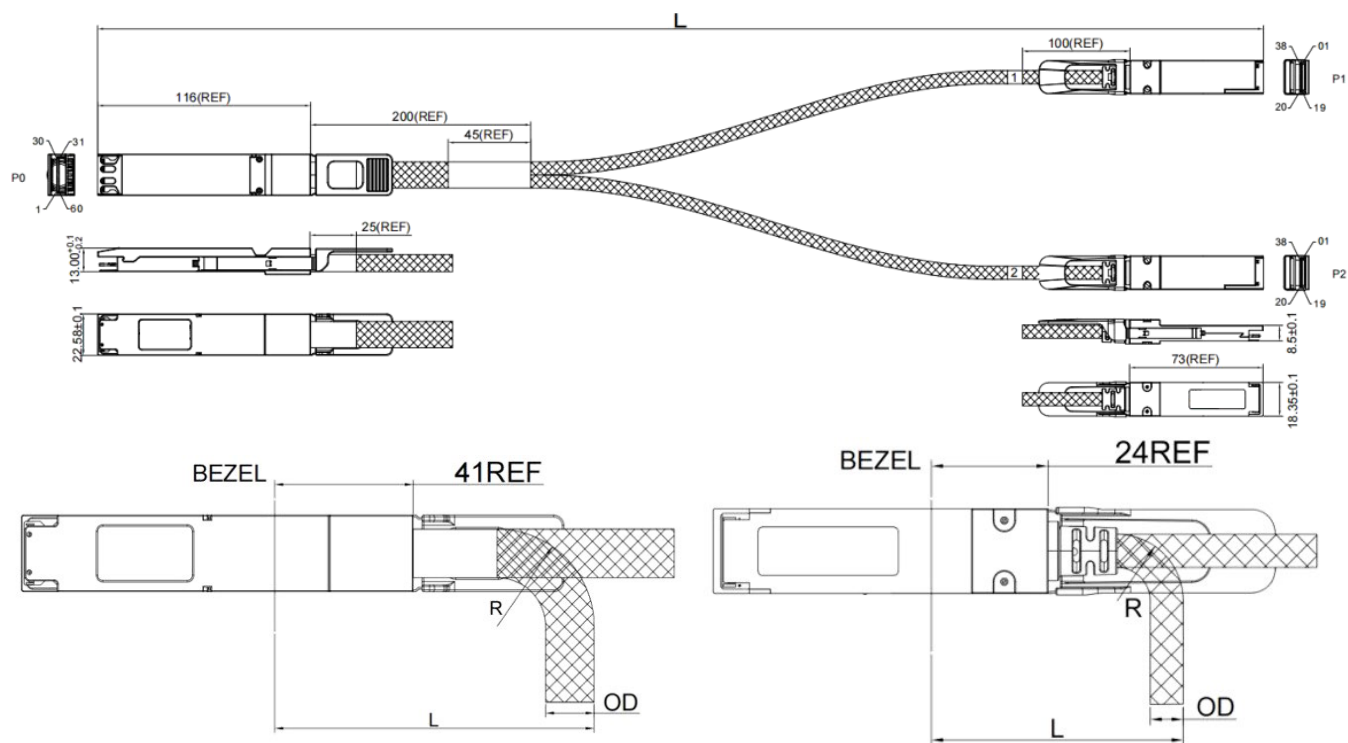
Wiring Table

WIRING TABLE

P0			P1	
	GND		GND	
58	TX1n	→	RX1n	18
59	TX1p	→	RX1p	17
	GND		GND	
29	RX1p	←	TX1p	36
28	RX1n	←	TX1n	37
	GND		GND	
03	TX2n	→	RX2n	21
02	TX2p	→	RX2p	22
	GND		GND	
32	RX2p	←	TX2p	03
33	RX2n	←	TX2n	02
	GND		GND	
55	TX3n	→	RX3n	15
56	TX3p	→	RX3p	14
	GND		GND	
26	RX3p	←	TX3p	33
25	RX3n	←	TX3n	34
	GND		GND	
06	TX4n	→	RX4n	24
05	TX4p	→	RX4p	25
	GND		GND	
35	RX4p	←	TX4p	06
36	RX4n	←	TX4n	05
	GND		GND	
SHELL		SHEILD	SHELL	

P0			P2	
	GND		GND	
52	TX5n	→	RX1n	18
53	TX5p	→	RX1p	17
	GND		GND	
23	RX5p	←	TX1p	36
22	RX5n	←	TX1n	37
	GND		GND	
09	TX6n	→	RX2n	21
08	TX6p	→	RX2p	22
	GND		GND	
38	RX6p	←	TX2p	03
39	RX6n	←	TX2n	02
	GND		GND	
49	TX7n	→	RX3n	15
50	TX7p	→	RX3p	14
	GND		GND	
20	RX7p	←	TX3p	33
19	RX7n	←	TX3n	34
	GND		GND	
12	TX8n	→	RX4n	24
11	TX8p	→	RX4p	25
	GND		GND	
41	RX8p	←	TX4p	06
42	RX8n	←	TX4n	05
	GND		GND	
SHELL		SHEILD	SHELL	

Mechanical Specifications



OSFP				QSFP			
Gauge	OD	Bend Radius "R"	Min. Bend Radius "L"	Gauge	OD	Bend Radius "R"	Min. Bend Radius "L"
26AWG	12.1MM	25MM	86MM	26AWG	8.3MM	17MM	55MM

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.

