



## OSFP-2XQ112-800GB-PDAC1-5M-SKY

MSA Compliant 800GBase-CU OSFP to 2xQSFP112 Direct Attach Cable (Passive Twinax, 1.5m)

### Product Description

This MSA compliant 800GBase-CU OSFP to 2xQSFP112 direct attach cable operates over passive copper with a maximum reach of 1.5m (4.9ft). 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 Module Compliant to MSA Standards
- Transmission Data Rate Up to PAM4 106.25Gbps Per Channel
- QSFP112 Module Compliant to MSA Standards
- Built-In EEPROM Functions with Write Protection
- Operating Temperature Range: 0 to 70 Celsius
- Enable 800Gbps to 2x400Gbps Transmission
- RoHS Compliant and Lead-Free



### Applications:

- 800GBase Ethernet

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*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.*

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## 1General Specifications

| Parameter                   | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------------|--------|------|------|------|------|
| Storage Temperature         | Tstg   | -40  |      | 85   | °C   |
| Operating Case Temperature  | Tc     | 0    |      | 70   | °C   |
| Supply Voltage              | Vcc    | 3.13 | 3.3  | 3.47 | V    |
| Relative Operating Humidity | RH     | 5    |      | 85   | %    |
| Data Rate                   | DR     |      | 800  |      | Gbps |

## Physical Characteristics

| Parameter       | Symbol | Min.                                             | Typ. | Max. | Unit | Notes |
|-----------------|--------|--------------------------------------------------|------|------|------|-------|
| Length          | L      |                                                  |      | 1.5  | M    |       |
| AWG             |        |                                                  | 26   |      | AWG  |       |
| Jacket Material |        | Plastic Braided Mesh Technology Net, Silver Gray |      |      |      |       |

## Electrical Specifications

| Parameter                                    | Symbol      | Min.                                                                                                                         | Typ. | Max. | Unit | Notes |
|----------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------|------|------|------|-------|
| Resistance                                   | Rcon        |                                                                                                                              |      | 3    | Ω    |       |
| Insulation Resistance                        | Rins        |                                                                                                                              |      | 10   | MΩ   |       |
| Raw Cable Impedance                          | Zca         | 95                                                                                                                           |      | 110  | Ω    |       |
| Mated Connector Impedance                    | Zmated      | 85                                                                                                                           |      | 115  | Ω    |       |
| Maximum Insertion Loss @26.56GHz             | SDD21       | 11                                                                                                                           |      | 18   | dB   |       |
| Differential- to Common-Mode Return Loss     | SDD11/22    | $RL_{cd}(f) \geq \begin{cases} 22 - 10(f/26.56) & 0.05 \leq f < 26.56 \\ 15 - 3(f/26.56) & 26.56 \leq f \leq 40 \end{cases}$ |      |      | dB   | 1     |
| Differential- to Common-Mode Conversion Loss | SCD21-SDD21 | $Conversion\_loss(f) - \begin{cases} 10 & 0.05 \leq f < 12.89 \\ 14 - 0.3108f & 12.89 \leq f \leq 40 \end{cases}$            |      |      | dB   | 1     |
| Common-Mode to Common-Mode Return Loss       | SCC11-22    | $RL_{cc}(f) \geq 1.08$                                                                                                       |      |      | dB   | 1     |
| Minimum COM                                  | COM         | 3                                                                                                                            |      |      | dB   |       |

### Notes:

1. For  $0.05 \leq f \leq 40$ GHz, where f is the frequency in GHz.

## Pin Descriptions for OSFP

| 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 from Host |       |
| 20  | Rx7+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 21  | GND       | Module Ground.                 |             | 1             |                  |       |
| 22  | Rx5-      | Receiver Data Inverted.        | CML-O       | 3             | Output from Host |       |
| 23  | Rx5+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 24  | GND       | Module Ground.                 |             | 1             |                  |       |
| 25  | Rx3-      | Receiver Data Inverted.        | CML-O       | 3             | Output from Host |       |
| 26  | Rx3+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 27  | GND       | Module Ground.                 |             | 1             |                  |       |
| 28  | Rx1-      | Receiver Data Inverted.        | CML-O       | 3             | Output from Host |       |
| 29  | Rx1+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 30  | GND       | Module Ground.                 |             | 1             |                  |       |
| 31  | GND       | Module Ground.                 |             | 1             |                  |       |
| 32  | Rx2+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 33  | Rx2-      | Receiver Data Inverted.        | CML-O       | 3             | Output from Host |       |
| 34  | GND       | Module Ground.                 |             | 1             |                  |       |
| 35  | Rx4+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 36  | Rx4-      | Receiver Data Inverted.        | CML-O       | 3             | Output from Host |       |
| 37  | GND       | Module Ground.                 |             | 1             |                  |       |
| 38  | Rx6+      | Receiver Data Non-Inverted.    | CML-O       | 3             | Output from Host |       |
| 39  | Rx6-      | Receiver Data Inverted.        | CML-O       | 3             | Output from Host |       |

|    |          |                                |             |   |                  |   |
|----|----------|--------------------------------|-------------|---|------------------|---|
| 40 | GND      | Module Ground.                 |             | 1 |                  |   |
| 41 | Rx8+     | Receiver Data Non-Inverted.    | CML-O       | 3 | Output from Host |   |
| 42 | Rx8-     | Receiver Data Inverted.        | CML-O       | 3 | Output from 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.  | LVCMOS-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 below for required circuit.

#### Electrical Pin-Out Details for OSFP



## Pin Descriptions for QSFP112

| 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  |             | Vcc     | +3.3V Transmitter Power Supply.      | 2             | 2     |
| 30  |             | Vcc     | +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 |

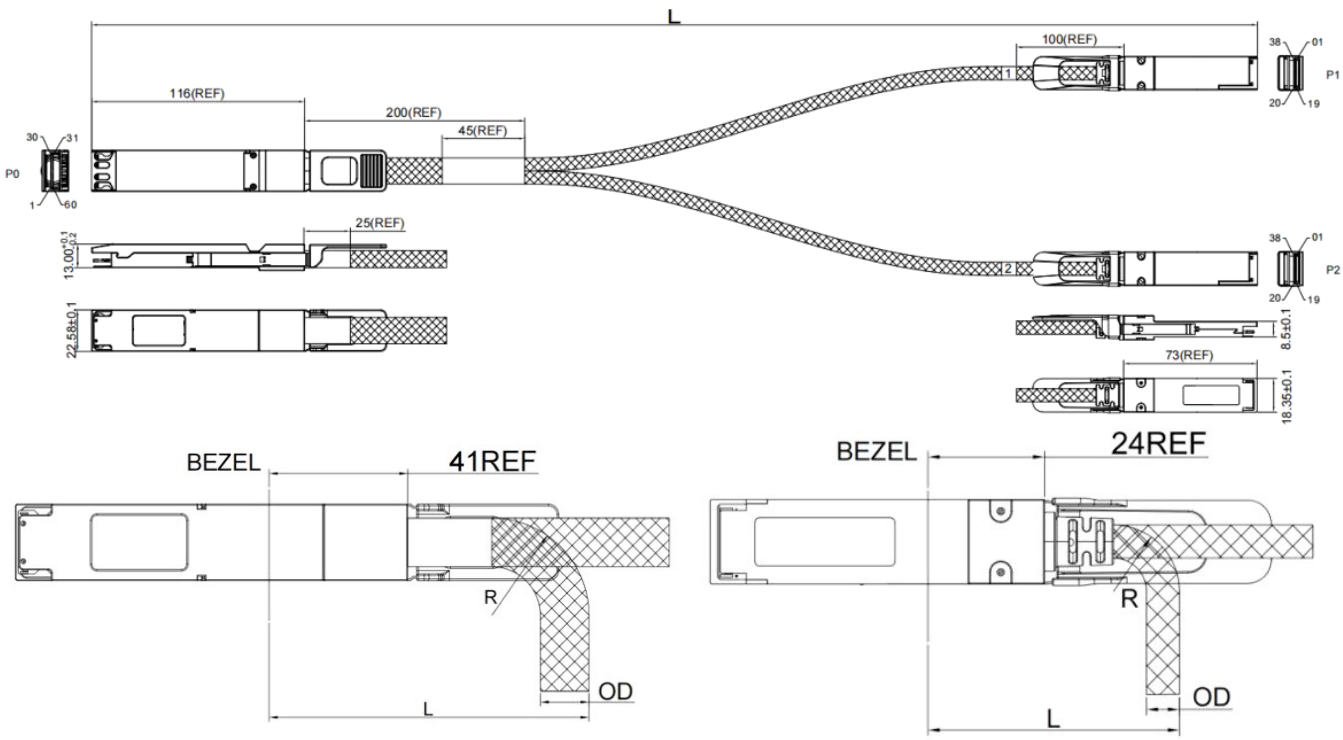
#### Notes:

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 for QSFP112



Mechanical Specifications



| 800G OSFP |        |                    |                         | QSFP112 |       |                    |                         |
|-----------|--------|--------------------|-------------------------|---------|-------|--------------------|-------------------------|
| Gauge     | OD     | Bend Radius<br>"R" | Min. Bend Radius<br>"L" | Gauge   | OD    | Bend Radius<br>"R" | Min. Bend Radius<br>"L" |
| 26AWG     | 12.1MM | 25MM               | 70MM                    | 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.

