

## 10446-AO

Extreme Networks® 10446 Compatible TAA Compliant 100GBase-CU QSFP28 to 2xQSFP28 Direct Attach Cable (Passive Twinax, 5m)

### Features

- QSFP28 End: Compliant with QSFP28 MSA specifications
- 4 independent duplex channels operating at 25Gbps
- SFP28 End: Compliant with SFP28 MSA specifications
- 100 Ohm differential impedance
- All-metal housing for superior EMI performance
- AC coupled inputs and outputs
- Operating temperature range: 0 to 70 Celsius
- Single power supply 3.3V, low power consumption
- RoHS Compliant and Lead Free



### Applications

- Serial Data Transmission
- 100Gigabit Ethernet
- Infiniband EDR

### Product Description

This is a Extreme Networks® 10446 Compatible 100GBase-CU QSFP28 to 2xQSFP28 direct attach cable that operates over passive copper with a maximum reach of 5m. It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. We stand behind the quality of our products and proudly offer a limited lifetime warranty. This cable is TAA (Trade Agreements Act) compliant and is built to comply with MSA (Multi-Source Agreement) standards.

AddOn's 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."



## General Specifications

| Parameter                  | Symbol | Min. | Typ. | Max.       | Unit  | Notes |
|----------------------------|--------|------|------|------------|-------|-------|
| Bit Error Rate             | BER    |      |      | $10^{-12}$ |       |       |
| Operating Temperature      | Tc     | 0    |      | 70         | °C    | 1     |
| Storage Temperature        | Tstg   | -40  |      | 85         | °C    | 2     |
| Input Voltage              | Vcc    | 3.14 | 3.3  | 3.46       | V     |       |
| Product Weight             | Gd     |      | 320  |            | g/PCS |       |
| Cable Weight               | Gc     |      | 175  |            | g/M   | 3     |
| SFP28 End Dust Cap Weight  | Gs     |      | 0.80 |            | g/PCS |       |
| QSFP28 End Dust Cap Weight | Gq     |      | 1.40 |            | g/PCS |       |
| Cable Impedance            | Z      | 90   | 100  | 110        | Ω     |       |

### Notes:

1. Case temperature.
2. Ambient temperature.
3. The weight of unit length cable (four sticks). For example, the weight of a 5m cable is  $320+175*(5-1)+0.80*4+1.40=1024.6\text{g}$ .

## Cable Specifications

| Cable Length | Wire Gauge AWG | Insertion Loss Level |
|--------------|----------------|----------------------|
| 5m           | 26AWG          | CA-25G-L             |

## QSP28 Pin Descriptions

| Pin | Symbol  | Name/Description                                                                      | Notes |
|-----|---------|---------------------------------------------------------------------------------------|-------|
| 1   | GND     | Module Ground.                                                                        | 5     |
| 2   | Tx2-    | Transmitter Inverted Data Input. LAN2.                                                |       |
| 3   | Tx2+    | Transmitter Non-Inverted Data Input. LAN2.                                            |       |
| 4   | GND     | Module Ground.                                                                        | 5     |
| 5   | Tx4-    | Transmitter Inverted Data Input. LAN4.                                                |       |
| 6   | Tx4+    | Transmitter Non-Inverted Data Input. LAN4.                                            |       |
| 7   | GND     | Module Ground.                                                                        | 5     |
| 8   | ModselL | Module Select Pin. The module responds to 2-wire serial communication when low level. | 1     |
| 9   | ResetL  | Module Reset.                                                                         | 2     |
| 10  | VccRx   | +3.3V Receiver Power Supply.                                                          |       |
| 11  | SCL     | 2-Wire Serial Interface Clock.                                                        |       |
| 12  | SDA     | 2-Wire Serial Interface Data.                                                         |       |
| 13  | GND     | Module Ground.                                                                        | 5     |
| 14  | Rx3+    | Receiver Non-Inverted Data Output. LAN3.                                              |       |
| 15  | Rx3-    | Receiver Inverted Data Output. LAN3.                                                  |       |
| 16  | GND     | Module Ground.                                                                        | 5     |
| 17  | Rx1+    | Receiver Non-Inverted Data Output. LAN1.                                              |       |
| 18  | Rx1-    | Receiver Inverted Data Output. LAN1.                                                  |       |
| 19  | GND     | Module Ground.                                                                        | 5     |
| 20  | GND     | Module Ground.                                                                        | 5     |
| 21  | Rx2-    | Receiver Inverted Data Output. LAN2.                                                  |       |
| 22  | Rx2+    | Receiver Non-Inverted Data Output. LAN2.                                              |       |
| 23  | GND     | Module Ground.                                                                        | 5     |
| 24  | Rx4-    | Receiver Inverted Data Output. LAN4.                                                  |       |
| 25  | Rx4+    | Receiver Non-Inverted Data Output. LAN4.                                              |       |
| 26  | GND     | Module Ground.                                                                        | 5     |
| 27  | ModPrsL | The module is inserted into the indicate pin and grounded within the module.          | 3     |
| 28  | IntL    | Interrupt.                                                                            | 4     |
| 29  | VccTx   | +3.3V Transmitter Power Supply.                                                       |       |
| 30  | Vcc1    | +3.3V Power Supply.                                                                   |       |
| 31  | LPMode  | Low-Power Mode.                                                                       | 5     |
| 32  | GND     | Module Ground.                                                                        | 5     |
| 33  | Tx3+    | Transmitter Non-Inverted Data Input. LAN3.                                            |       |
| 34  | Tx3-    | Transmitter Inverted Data Input. LAN3.                                                |       |

|    |      |                                            |   |
|----|------|--------------------------------------------|---|
| 35 | GND  | Module Ground.                             | 5 |
| 36 | Tx1+ | Transmitter Non-Inverted Data Input. LAN1. |   |
| 37 | Tx1- | Transmitter Inverted Data Input. LAN1.     |   |
| 38 | GND  | Module Ground.                             | 5 |

**Notes:**

1. ModSelL is the input pin. The module responds to 2-wire serial communication commands when it is held “low” by the host. ModSelL allows multiple QSFP modules to be used on a single 2-wire interface bus. If ModSelL is “high,” the module will not respond to any 2-wire interface communication from the host. ModSelL has internal pull-up resistors in the module.
2. The module restart pin, when the low level on the ResetL pin lasts longer than the minimum pulse length, resets the module and restores all user modules to their default state. When performing reset device, the host should ignore all status bits. Until the module reset interrupt is completed, please note that, during hot plugging, the module will issue this information to complete the reset interrupt without resetting.
3. This pin is active “high,” indicating that the module is running under a low-power module. The signal has no effect on the functionality of this product.
4. IntL is the output pin, which is the open collector output and must be pulled up to Vcc with a 4.7kΩ to 10kΩ resistor on the motherboard. When it is “low,” it indicates that the module may malfunction. The host uses a 2-wire serial interface to identify the interrupt source.
5. The circuit ground is internally isolated from the chassis ground.

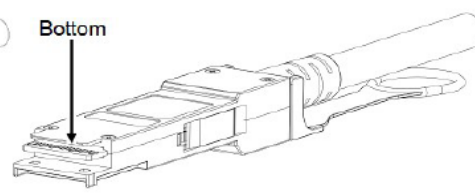
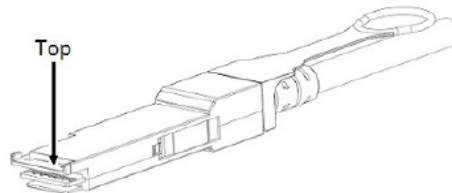
## Electrical Pad Layout (QSFP28 End)

|                                |      |
|--------------------------------|------|
| GND                            | ← 20 |
| RX2n                           | ← 21 |
| RX2p                           | ← 22 |
| GND                            | ← 23 |
| RX4n                           | ← 24 |
| RX4p                           | ← 25 |
| GND                            | ← 26 |
| ModPrsL                        | ← 27 |
| IntL                           | ← 28 |
| V <sub>cc</sub> T <sub>x</sub> | ← 29 |
| V <sub>cc</sub> L              | ← 30 |
| LPMode                         | ← 31 |
| GND                            | ← 32 |
| TX3p                           | ← 33 |
| TX3n                           | ← 34 |
| GND                            | ← 35 |
| TX1p                           | ← 36 |
| TX1n                           | ← 37 |
| GND                            | ← 38 |

Top of Board

|                                |      |
|--------------------------------|------|
| GND                            | ← 1  |
| TX2n                           | ← 2  |
| TX2p                           | ← 3  |
| GND                            | ← 4  |
| TX4n                           | ← 5  |
| TX4p                           | ← 6  |
| GND                            | ← 7  |
| ModselL                        | ← 8  |
| ResetL                         | ← 9  |
| V <sub>cc</sub> R <sub>x</sub> | ← 10 |
| SCL                            | ← 11 |
| SDA                            | ← 12 |
| GND                            | ← 13 |
| RX3p                           | ← 14 |
| RX3n                           | ← 15 |
| GND                            | ← 16 |
| RX1p                           | ← 17 |
| RX1n                           | ← 18 |
| GND                            | ← 19 |

Bottom of Board



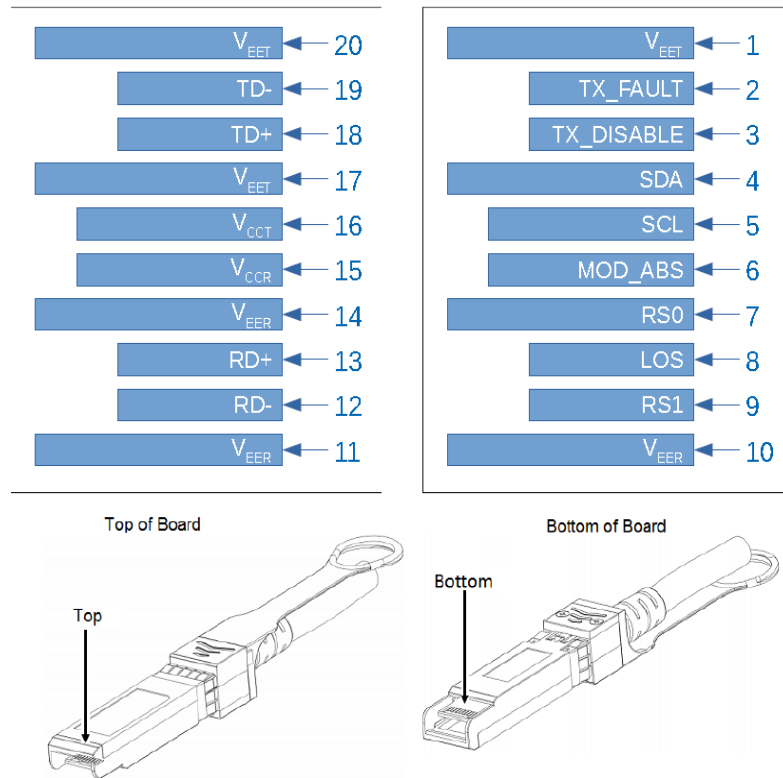
### SFP28 Pin Descriptions

| Pin | Symbol     | Name/Description                                                                   | Notes |
|-----|------------|------------------------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground (Common with Receiver Ground).                                  |       |
| 2   | Tx_Fault   | Not Used. Transmitter Failure Alarm.                                               | 1     |
| 3   | Tx_Disable | Not Used. The signal turns off the module transmitter when it is “high” or “open.” | 2     |
| 4   | SDA        | Data Line for Serial ID.                                                           |       |
| 5   | SCL        | Clock Line for Serial ID.                                                          |       |
| 6   | MOD_ABS    | Module Absent. Grounded within the module.                                         |       |
| 7   | RS0        | No Connection Required.                                                            | 1     |
| 8   | LOS        | Loss of Signal Indication. “Logic 0” indicates normal operation.                   | 2     |
| 9   | RS1        | No Connection Required.                                                            | 1     |
| 10  | VeeR       | Receiver Ground (Common with Transmitter Ground).                                  |       |
| 11  | VeeR       | Receiver Ground (Common with Transmitter Ground).                                  |       |
| 12  | RD-        | Receiver Inverted Data Out. AC Coupled.                                            |       |
| 13  | RD+        | Receiver Non-Inverted Data Out. AC Coupled.                                        |       |
| 14  | VeeR       | Receiver Ground (Common with Transmitter Ground).                                  |       |
| 15  | VccR       | Receiver Power Supply.                                                             |       |
| 16  | VccT       | Transmitter Power Supply.                                                          |       |
| 17  | VeeT       | Transmitter Ground (Common with Receiver Ground).                                  |       |
| 18  | TD+        | Transmitter Non-Inverted Data In. AC Coupled.                                      |       |
| 19  | TD-        | Transmitter Inverted Data In. AC Coupled.                                          |       |
| 20  | VeeT       | Transmitter Ground (Common with Receiver Ground).                                  |       |

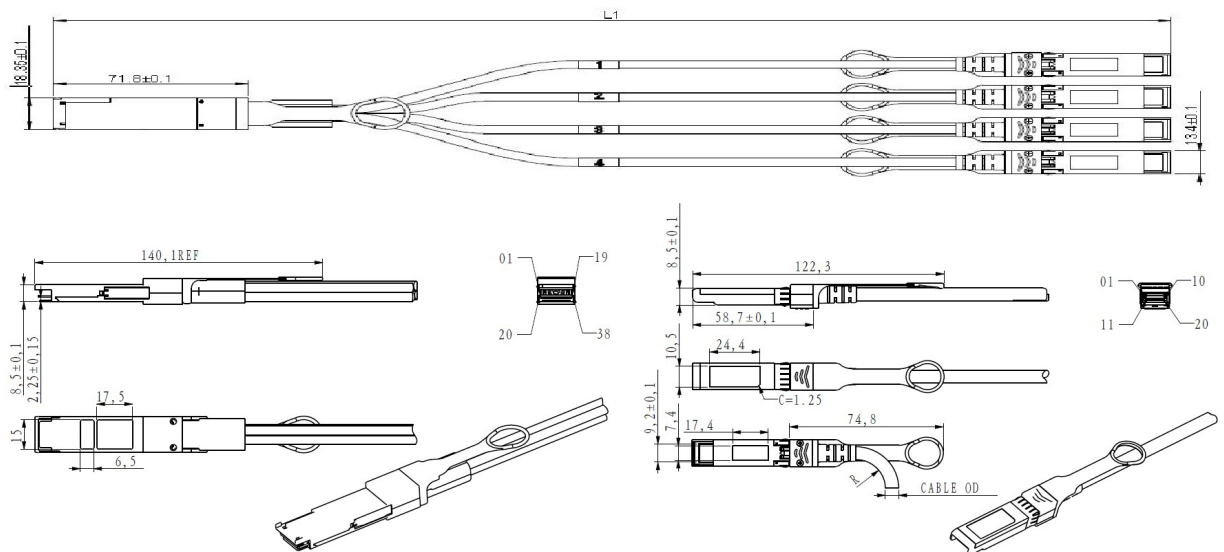
#### Notes:

1. The circuit ground is isolated from the chassis ground.
2. Should be pulled up with 4.7k $\Omega$  to 10k $\Omega$  on the host board to a voltage between 2V and 3.6V.

### Electrical Pad Layout (SFP28 End)



## Mechanical Dimensions



All Dimensions Are  $\pm 0.2\text{mm}$  Unless Otherwise Specified  
Unit: mm

## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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