

### **SP-CABLE-FS-SFP+6-C**

Fortinet® SP-CABLE-FS-SFP+6 Compatible TAA Compliant 10GBase-CU SFP+ Direct Attach Cable (Passive Twinax, 6m)

#### **Features:**

- Up to 10 Gbps bi-directional data links
- Compliant with 10GFC
- Compliant with SFF-8431
- AC coupled inputs and outputs
- 100 Ohm differential impedance
- Enhanced EMI design
- Single 3.3V power supply
- Operating Temperature Range: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



#### **Applications:**

- 10G Ethernet
- 10G Fibre Channel
- Serial Data Transmission

#### **Product Description**

This is a Fortinet® Compatible 10GBase-CU SFP+ to SFP+ direct attach cable that operates over passive copper with a maximum reach of 6m. 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.

ProLabs' 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 |
|-----------------------|--------|------|---------|------------|------|-------|
| Data Rate             | DR     |      | 10.3125 |            | Gbps | 1     |
| Bit Error Rate        | BER    |      |         | $10^{-12}$ |      |       |
| Operating Temperature | Tc     | 0    |         | 70         | °C   | 2     |
| Storage Temperature   | Tstg   | -40  |         | 85         | °C   | 3     |
| Power Supply Voltage  | Vcc    | 3.14 | 3.30    | 3.46       | V    | 4     |

### Notes:

1. IEEE 802.3ae.
2. Case Temperature.
3. Ambient Temperature.
4. For the electrical power interface.

## Cable Specifications

| Parameter              | Symbol | Min. | Typ.  | Max. | Unit     |
|------------------------|--------|------|-------|------|----------|
| Wire Gauge             |        |      | 24AWG |      | AWG      |
| Cable Impedance        | Z      | 90   | 100   | 110  | $\Omega$ |
| Cable Diameter         | OD     |      | 6.0   |      | mm       |
| Minimum Bending Radius | R      |      | 28    |      | mm       |
| Tolerance Range $\pm$  |        |      | 6     |      | cm       |

## Pin Descriptions

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

### 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



## Block Diagram of Transceiver



Weight

| Parameter            | Symbol | Typ. | Unit  | Notes |
|----------------------|--------|------|-------|-------|
| 24AWG Product Weight | GD24   | 96   | g/PCS | 1     |
| 24AWG Cable Weight   | GC24   | 50   | g/M   |       |
| Dust Cap Weight      | GS     | 0.80 | g/PCS |       |

Notes:

1. For example, the weight of a 6m cable with 24AWG is  $96+50*(6-1) + 0.80*2=347.6g$ .

Mechanical Specifications



All Dimensions are ±0.2mm Unless Otherwise Specified  
Unit: mm

## About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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