

ADD-OARQ4MU-P2-5M

Arista Networks® to MSA Compatible TAA 400GBase-CU OSFP to QSFP-DD Direct Attach Cable (Passive Twinax, 2.5m)

Features

- OSFP Module Compliant to OSFP MSA
- Transmission Data Rate up to 53.125Gbps Per Channel
- QSFP-DD Module Compliant to QSFP-DD MSA
- Built-In EEPROM Functions
- Operating Temperature Range: 0 to 70 Celsius
- Enable 400Gbps Transmission
- RoHS Compliant and Lead-Free



Applications

- 400GBase Ethernet

Product Description

This Arista Networks® to multiple OEM compatible 400GBase-CU OSFP to QSFP-DD active direct attach cable has a maximum reach of 2.5m (8.3ft). It is 100% Arista Networks® compatible and has been programmed to allow for connection to multiple OEMs. These OEMs include Avago, D-Link, Edge-core, F5 Networks, Finisar, Fortinet, Linksys, Mellanox, NetAPP, Zyxel and more. This cable will initialize and perform identically to Arista Networks® and the multiple OEM's individual cables and is built to meet or exceed OEM specifications. This product complies with MSA (Multi-Source Agreement) standards and is TAA (Trade Acts Agreement) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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."



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 | 8 | | 17.16 | dB |
| Return Loss | SDD11/22 | $\text{Return_loss}(f) \geq \begin{cases} 16.5-2vf & 0.05 \leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{cases}$ | | | dB |
| Differential to Common-Mode Return Loss | SCD11/22 | $\text{Return_loss}(f) \geq \begin{cases} 22-(20/25.78)f & 0.01 \leq f < 12.89 \\ 15-(6/25.78)f & 12.89 \leq f \leq 19 \end{cases}$ | | | 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 | | 2.5 | | M |
| Wire Gauge | | | 27 | | AWG |
| Jacket Material | | Plastic Braided Mesh, Silver Gray | | | |

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 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 | | |

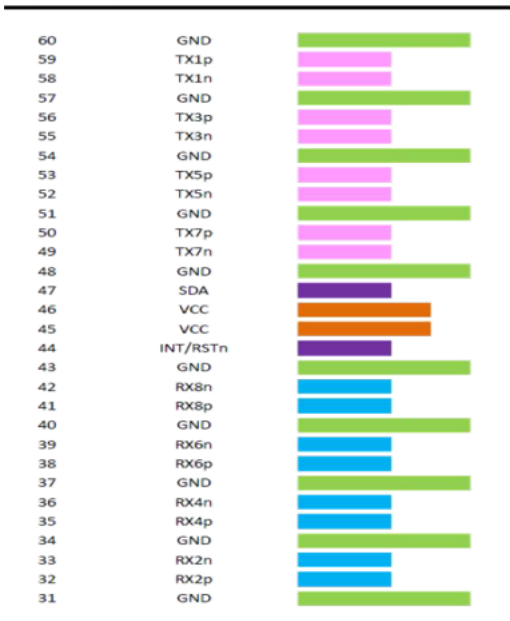
| | | | | | | |
|----|----------|--------------------------------|-------------|---|-----------------|---|
| 41 | Rx8+ | Receiver Data Non-Inverted. | CML-O | 3 | Output to Host | |
| 42 | Rx8- | Receiver Data Inverted. | CML-O | 3 | Output to Host | |
| 43 | GND | Module Ground. | | 1 | | |
| 44 | INT/RSTn | 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:

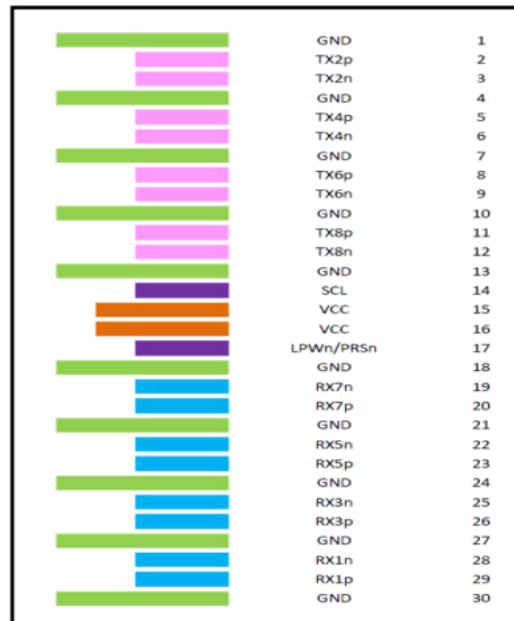
1. Open-drain with pull-up resistor on the host.
2. See pin assignments below for the required circuit.

Electrical Pin-Out Details - OSFP

Top Side (viewed from top)



Bottom Side (viewed from bottom)



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

Pin Descriptions for QSFP-DD

| Pin | Logic | Symbol | Name/Description | Plug Sequence | Notes |
|-----|-------------|---------------|--------------------------------------|---------------|-------|
| 1 | | GND | Module Ground. | 1B | 1 |
| 2 | CML-I | Tx2- | Transmitter Inverted Data Input. | 3B | |
| 3 | CML-I | Tx2+ | Transmitter Non-Inverted Data Input. | 3B | |
| 4 | | GND | Module Ground. | 1B | 1 |
| 5 | CML-I | Tx4- | Transmitter Inverted Data Input. | 3B | |
| 6 | CML-I | Tx4+ | Transmitter Non-Inverted Data Input. | 3B | |
| 7 | | GND | Module Ground. | 1B | 1 |
| 8 | LVTTL-I | ModSelL | Module Select. | 3B | |
| 9 | LVTTL-I | ResetL | Module Reset. | 3B | |
| 10 | | VccRx | +3.3V Receiver Power Supply. | 2B | 2 |
| 11 | LVC MOS-I/O | SCL | 2-Wire Serial Interface Clock. | 3B | |
| 12 | LVC MOS-I/O | SDA | 2-Wire Serial Interface Data. | 3B | |
| 13 | | GND | Module Ground. | 1B | 1 |
| 14 | CML-O | Rx3+ | Receiver Non-Inverted Data Output. | 3B | |
| 15 | CML-O | Rx3- | Receiver Inverted Data Output. | 3B | |
| 16 | | GND | Module Ground. | 1B | 1 |
| 17 | CML-O | Rx1+ | Receiver Non-Inverted Data Output. | 3B | |
| 18 | CML-O | Rx1- | Receiver Inverted Data Output. | 3B | |
| 19 | | GND | Module Ground. | 1B | 1 |
| 20 | | GND | Module Ground. | 1B | 1 |
| 21 | CML-O | Rx2- | Receiver Inverted Data Output. | 3B | |
| 22 | CML-O | Rx2+ | Receiver Non-Inverted Data Output. | 3B | |
| 23 | | GND | Module Ground. | 1B | 1 |
| 24 | CML-O | Rx4- | Receiver Inverted Data Output. | 3B | |
| 25 | CML-O | Rx4+ | Receiver Non-Inverted Data Output. | 3B | |
| 26 | | GND | Module Ground. | 1B | 1 |
| 27 | LVTTL-O | ModPrsL | Module Present. | 3B | |
| 28 | LVTTL-O | IntL/RxLOS | Interrupt/Optional RxLOS. | 3B | |
| 29 | | VccTx | +3.3V Transmitter Power Supply. | 2B | 2 |
| 30 | | Vcc1 | +3.3V Power Supply. | 2B | 2 |
| 31 | LVTTL-I | LPMode/Tx_Dis | Low-Power Mode/Optional Tx_Disable. | 3B | |
| 32 | | GND | Module Ground. | 1B | 1 |
| 33 | CML-I | Tx3+ | Transmitter Non-Inverted Data Input. | 3B | |
| 34 | CML-I | Tx3- | Transmitter Inverted Data Input. | 3B | |
| 35 | | GND | Module Ground. | 1B | 1 |
| 36 | CML-I | Tx1+ | Transmitter Non-Inverted Data Input. | 3B | |
| 37 | CML-I | Tx1- | Transmitter Inverted Data Input. | 3B | |
| 38 | | GND | Module Ground. | 1B | 1 |
| 39 | | GND | Module Ground. | 1A | 1 |
| 40 | CML-I | Tx6- | Transmitter Inverted Data Input. | 3A | |

| | | | | | |
|----|---------------|------------|--|----|---|
| 41 | CML-I | Tx6+ | Transmitter Non-Inverted Data Input. | 3A | |
| 42 | | GND | Module Ground. | 1A | 1 |
| 43 | CML-I | Tx8- | Transmitter Inverted Data Input. | 3A | |
| 44 | CML-I | Tx8+ | Transmitter Non-Inverted Data Input. | 3A | |
| 45 | | GND | Module Ground. | 1A | 1 |
| 46 | LVC MOS/CML-I | P/VS4 | Programmable/Vendor-Specific 4. | 3A | 5 |
| 47 | LVC MOS/CML-I | P/VS1 | Programmable/Vendor-Specific 1. | 3A | 5 |
| 48 | | VccRx1 | +3.3V Receiver Power Supply. | 2A | 2 |
| 49 | LVC MOS/CML-O | P/VS2 | Programmable/Vendor-Specific 2. | 3A | 5 |
| 50 | LVC MOS/CML-O | P/VS3 | Programmable/Vendor-Specific 3. | 3A | 5 |
| 51 | | GND | Module Ground. | 1A | 1 |
| 52 | CML-O | Rx7+ | Receiver Non-Inverted Data Output. | 3A | |
| 53 | CML-O | Rx7- | Receiver Inverted Data Output. | 3A | |
| 54 | | GND | Module Ground. | 1A | 1 |
| 55 | CML-O | Rx5+ | Receiver Non-Inverted Data Output. | 3A | |
| 56 | CML-O | Rx5- | Receiver Inverted Data Output. | 3A | |
| 57 | | GND | Module Ground. | 1A | 1 |
| 58 | | GND | Module Ground. | 1A | 1 |
| 59 | CML-O | Rx6- | Receiver Inverted Data Output. | 3A | |
| 60 | CML-O | Rx6+ | Receiver Non-Inverted Data Output. | 3A | |
| 61 | | GND | Module Ground. | 1A | 1 |
| 62 | CML-O | Rx8- | Receiver Inverted Data Output. | 3A | |
| 63 | CML-O | Rx8+ | Receiver Non-Inverted Data Output. | 3A | |
| 64 | | GND | Module Ground. | 1A | 1 |
| 65 | | NC | Not Connected. | 3A | 3 |
| 66 | | Reserved | For Future Use. | 3A | 3 |
| 67 | | VccTx1 | +3.3V Power Supply. | 2A | 2 |
| 68 | | Vcc2 | +3.3V Power Supply. | 2A | 2 |
| 69 | LVC MOS-I | ePPS/Clock | 1PPS PTP Clock or Reference Clock Input. | 3A | 6 |
| 70 | | GND | Module Ground. | 1A | 1 |
| 71 | CML-I | Tx7+ | Transmitter Non-Inverted Data Input. | 3A | |
| 72 | CML-I | Tx7- | Transmitter Inverted Data Input. | 3A | |
| 73 | | GND | Module Ground. | 1A | 1 |
| 74 | CML-I | Tx5+ | Transmitter Non-Inverted Data Input. | 3A | |
| 75 | CML-I | Tx5- | Transmitter Inverted Data Input. | 3A | |
| 76 | | GND | Module Ground. | 1A | 1 |

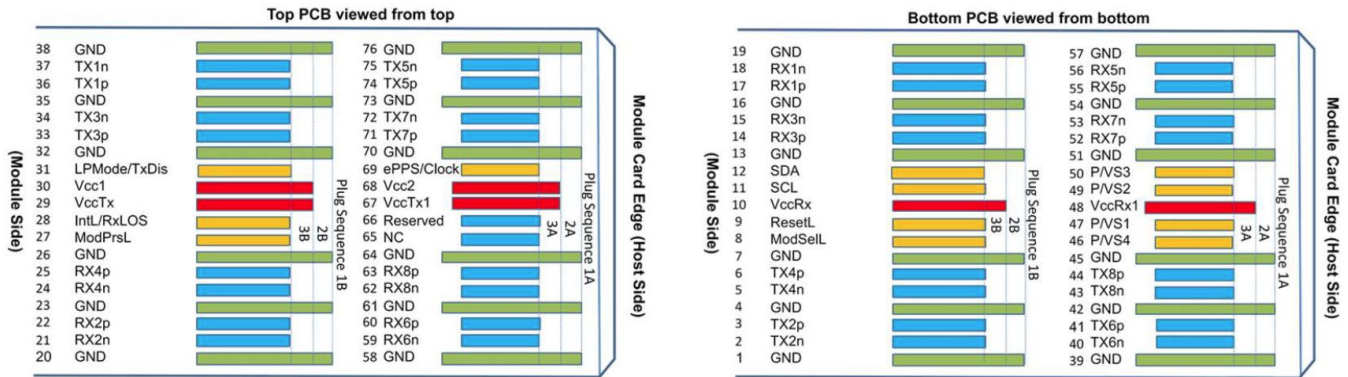
Notes:

1. QSFP-DD uses common ground (GND) for all signals and supply (power). All are common within the QSFP-DD 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, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 shall be applied concurrently. For power classes 4 and above the module differential loading of input voltage pads must not result in exceeding contact current limits.

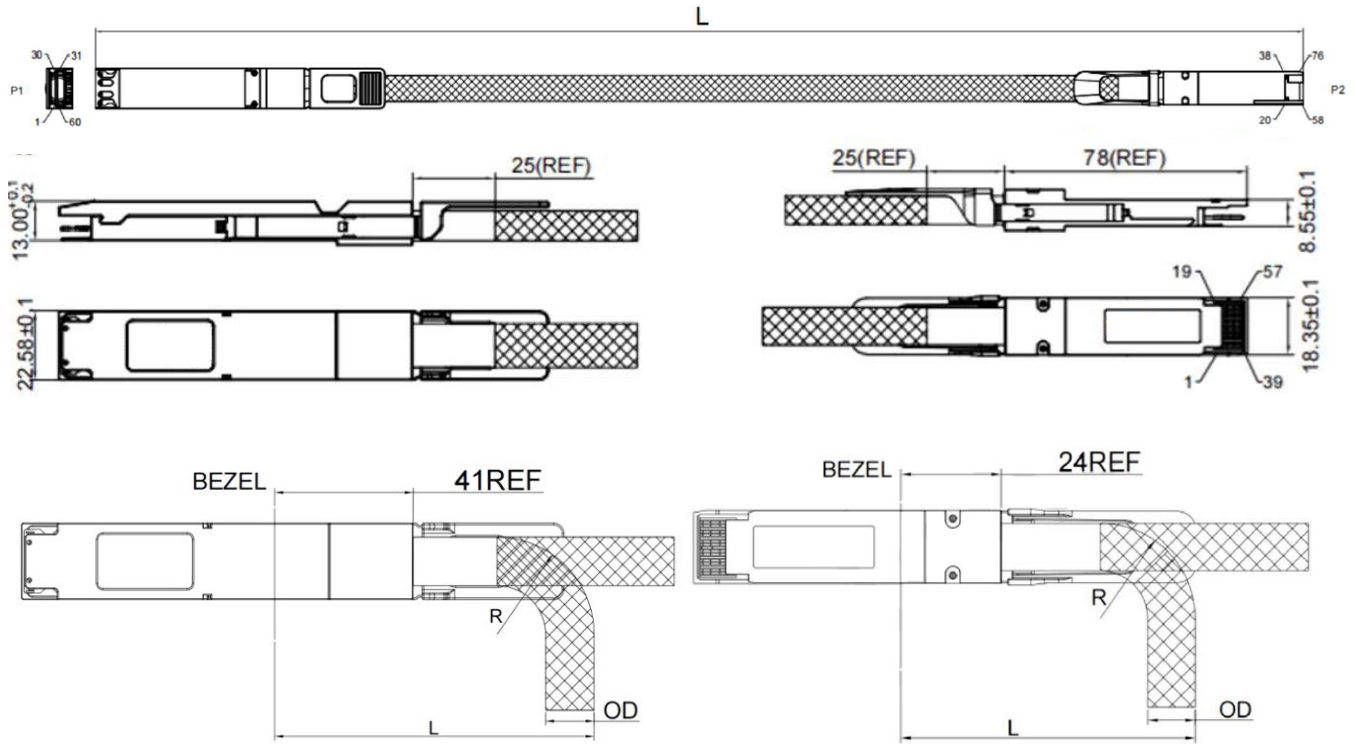
Each connector Vcc contact is rated for a maximum current of 1500mA.

- Reserved and Not Connected pads recommended to be terminated with 10kΩ to ground on the host. Pad 65 (Not Connected) shall be left unconnected within the module.
- Plug Sequence specifies the mating sequence of the host connector and module. The sequence is 1A, 2A, 3A, 1B, 2B, and 3B. Contact sequence A will make, then break contact with additional QSFP-DD pads. Sequence 1A, 1B will then occur simultaneously, followed by 2A, 2B, followed by 3A, 3B.
- Full definitions of the P/VSx signals are currently under development. On new designs not used, P/VSx signals are recommended to be terminated on the host with 10kΩ.
- ePPS/Clock, if not used, is recommended to be terminated with 50Ω to ground on the host.

Electrical Pin-Out Details – QSFP-DD



Mechanical Specifications



| OSFP | | | | QSFP-DD | | | |
|-------|--------|-----------------|----------------------|---------|--------|-----------------|----------------------|
| Gauge | OD | Bend Radius "R" | Min. Bend Radius "L" | Gauge | OD | Bend Radius "R" | Min. Bend Radius "L" |
| 27AWG | 10.7MM | 22MM | 75MM | 27AWG | 10.7MM | 22MM | 66MM |

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 engrained 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.



U.S. Headquarters

Email: sales@addonnetworks.com

Telephone: +1 877.292.1701

Fax: 949.266.9273

Europe Headquarters

Email: salesupportemea@addonnetworks.com

Telephone: +44 1285 842070