



## SHIFT AEC SPECIFICATION

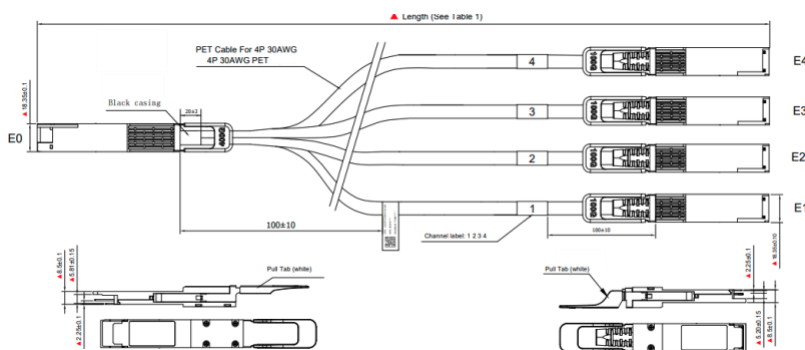
# PLUG & PLAY ACTIVE ELECTRICAL CABLE for Speed Shifting Ethernet Applications

## 400G QSFP-DD to 4x100G QSFP28

Credo's ZeroFlap HiWire™ SHIFT Active Electrical Cable (AEC) is a lower power, lower cost solution to DR4 to 4xDR1 transceiver solutions for PAM4 to NRZ conversion. Powered by Credo's best-in-class signal processing technology, this Plug & Play cable provides connectivity between PAM4 and NRZ ports with speed shifting and FEC termination in-cable over thin copper cables without using any optical components.

With improved reach and signal integrity, these AECs deliver zero soft link flaps to support the lossless backend RDMA network that AI clusters are built on. The ZeroFlap AEC enables the full host to switch connectivity for leading GPU clusters

Designed for telecom and data center use. The 400G cable breaks out from one 400G (8x56G-PAM4) QSFP-DD end into four 100G (4x28G-NRZ) QSFP ends with built-in gearbox feature. The use and replacement of ZeroFlap AEC is simple and straightforward as it adopts standard QSFP-DD type 2/QSFP form factors and complies to MSA specifications.



## Applications

- Recognizable, purple Mesh braided jacket
- 400G to 4x100G with gearbox function
- SFF-8636 compliant
- Single 3.3V power supply
- Low power consumption:
  - Typ. 4.5W power dissipation (QSFP-DD end)
  - Typ. 2.5W power dissipation (QSFP end)
- BER < 10<sup>-15</sup> (post FEC)
- Hot pluggable
- RoHS2 compliant
- I2C management interface
- Operating case temperature range: 0 to +70°C

## Supported Standards and Interfaces

- Common Management Interface Specification (CMIS 5.0)
- QSFP28 (SFF-8636)

## Key Features

Parameter	Value
Module Form Factor	QSFP-DD Type 2 and QSFP28
Number of Data Lanes	QSFP-DD 8 TX and 8 RX per Module (PAM4) QSFP28 Line Side: 2 TX and 2 RX per module (PAM) Host side: 4 TX and RX per module
Maximum Aggregate Data Rate	400Gbps
Nominal Data Rate per Lane	QSFP-DD: 56Gbps (PAM4), KP4 FEC must be enabled QSFP28: 28Gbps (NRZ), KR4 FEC must be enabled
Electrical Interface and Pin-out	76-pin edge connector (QSFP-DD) and 38-pin edge connector (QSFP28)
Pin Description	Per QSFP-DD Hardware Specification (QSFP-DD) and per SFF-8679 (QSFP28)
Management Interface	I2C, serial, timing per Common Management Interface Specification 5.0 for 8X/16X Pluggable Transceivers I2C, serial, timing per SFF-8636 (QSFP)
Length of Copper AEC	1.0m – 5.0m
BER (Pre-FEC)*	Typ. $<10^{-8}$
BER (Post-FEC)*	$<10^{-15}$

\* Tested with QPRBS31 pattern

## Product Selections

Part Number	Length	Tolerance	CMIS	Weight
CAC41X301D4P-D1-HW	1.0m	$\pm 50\text{mm}$	CMIS 4.0	400g
CAC42X301D4P-D1-HW	2.0m	$\pm 50\text{mm}$	CMIS 4.0	600g
CAC43X301D4P-D1-HW	3.0m	$\pm 50\text{mm}$	CMIS 4.0	800g
CAC45X301D4P-D1-HW	5.0m	$\pm 50\text{mm}$	CMIS 4.0	1000g

## About Credo

Credo's mission is to advance high-speed connectivity solutions that deliver optimized performance, reliability, energy efficiency, and security for the next generation of AI driven applications, cloud computing, and hyperscale networks. Optimized for both optical and electrical applications, our solutions support port speeds up to 1.6Tb. At the core of our technology is our proprietary Serializer/Deserializer (SerDes) IP. Our diverse solutions portfolio includes system-level products such as Active Electrical Cables (AECs), a range of Integrated Circuits, including Retimers, Optical DSPs, SerDes chipsets, and SerDes IP Licensing.

For more information please visit [www.credosemi.com](http://www.credosemi.com)  
or email [sales@credosemi.com](mailto:sales@credosemi.com)