

## 400G (8x56G) QSFP-DD PAM4 to Four 100G (4x28G) QSFP28 NRZ

Plug & Play Active Electrical Cable for Speed Shifting Ethernet Applications

### Description

Credo's HiWire™ SHIFT Active Electrical Cable (SHIFT 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.

Credo's CAC4XXXX1D4P-A0-HW HiWire SHIFT AEC is 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) QSFP28 ends with built-in gearbox feature. The use and replacement of CAC4XXXX1D4P-A0-HW AEC is simple and straightforward as it adopts standard QSFP-DD type 2/QSFP28 form factors and complies to MSA specifications.

### Product Features

The following are the key features of the HiWire SHIFT cable:

- Recognizable, purple PVC jacket (with fire retardant coating)
- 400G to 4x100G with gearbox function
- SFF-8636 compliant
- Single 3.3V power supply
- Low power consumption:
  - Typ 8.5W power dissipation (QSFP-DD end)
  - Typ 3.5W power dissipation (QSFP28 end)
- BER < 10<sup>-15</sup> (post FEC)
- Hot pluggable
- RoHS2 compliant
- I<sup>2</sup>C management interface
- Operating case temperature range: 0° to +70°C



1:4 Breakout SHIFT AEC

### Product Selections

Part Number	Length	AWG	Weight
CAC43X301D4P-A0-HW	3 meters	30	810g
CAC45X301D4P-A0-HW	5 meters	30	1,210g

### Mechanicals

Parameter	Cable Type	Typical
Diameter	4P 30AWG	5.3mm
<b>QSFP-DD End</b>		
Minimum bend radius	4P 30AWG x 4	90.0mm
<b>QSFP28 End</b>		
Minimum bend radius	4P 30AWG	54.5mm

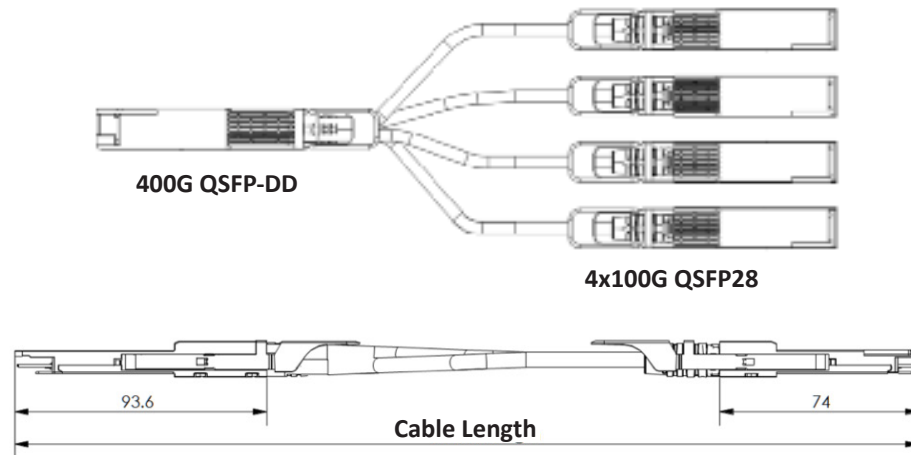
### Supported Standards

The following are the key features of the HiWire cable:

- SNIA SFF-8636 Management Interface for 4 Lane Modules and Cables
- SNIA SFF-8679 QSFP28 Electrical Specification
- Common Management Interface Specification (CMIS) v3.0
- QSFP-DD MSA v3.0

## General Product Characteristics

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 (PAM4) Host Side: 4 TRX and 4 RX per module (NRZ)
Maximum Aggregate Data Rate	400Gbps
Nominal Data Rate per Lane	QSFP-DD: 53.125Gbps (PAM4), KP4 FEC must be enabled
	QSFP28: 25.78125Gbps (NRZ), KP4 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	I <sup>2</sup> C, serial, timing per Common Management Interface Specification for 8X/16X Pluggable Transceivers (QSFP-DD) I <sup>2</sup> C, serial, timing per SFF-8636 (QSFP28)
Length of Copper AEC	3m, 5m
BER (Pre-FEC)*	<10 <sup>-8</sup> * Tested with QPRBS31 pattern
BER (Post-FEC)*	<10 <sup>-15</sup> * Tested with QPRBS31 pattern



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

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