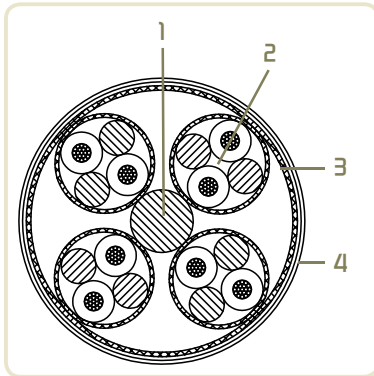


Low Mass 28AWG SpaceWire

Making use of AXON's CELLOFLON® expanded PTFE, alveolar a-PTFE dielectrics and AXON's patented AXALU® silver plated aluminium shields, the new **Low Mass SpaceWire** cable saves almost half the weight compared to conventional SpaceWire.

CONSTRUCTION

AXON's Low Mass 28AWG SpaceWire cable according to the **ESCC 3902/004.01** requirements (AXON' part number: P551259) consists of 4 shielded twisted pairs covered by an overall shield and outer jacket, as shown in the specification.



1 - CELLOFLON® expanded PTFE filler

- Diameter: 1.35 mm nom.

2 - 4 x 100 Ω 28AWG BUS Lines

CONDUCTOR AWG 2819

- Stranded silver plated copper alloy (2 μ m minimum).
- 19 x 0.079 mm strands.
- Diameter: 0.395 mm nominal.
- Cross section: 0.093 mm² nominal.
- Resistance: 23 Ω /100 m nominal.

DIELECTRIC: Alveolar PTFE.

- Colour: blue / white.

INNER BRAIDED SHIELD

- Material: silver plated aluminium (2 μ m minimum).
- Strand diameter: 0.079 mm.

3 - Braided shield (in electrical contact with the inner braided shields)

- Material: silver plated aluminium (2 μ m minimum).
- Strand diameter: 0.100 mm.

4 - Outer jacket

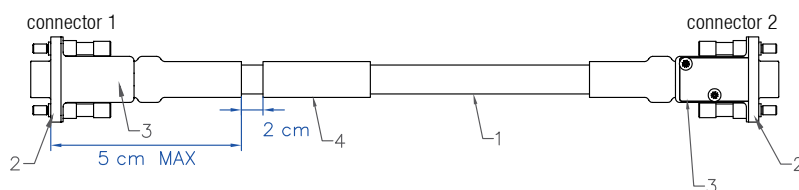
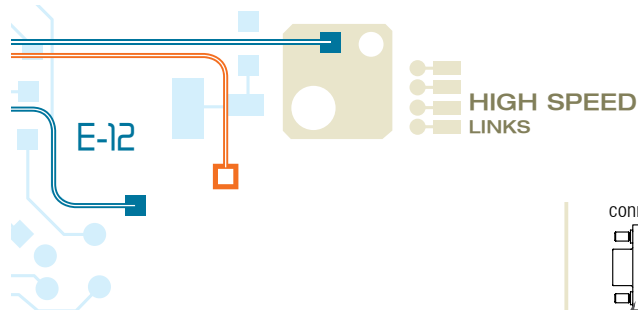
- Material: Expanded PTFE tape (CELLOFLON®) under a Polyimide tape.

MAIN CHARACTERISTICS

- Outer diameter: 6.5 mm maximum.
- Bend radius: 25 mm minimum for fully static applications.
- Weight: 42 g/m maximum.
- Operating temperature: -100 / +150°C.
- Impedance (between wires of a pair): 100 Ω ($\pm 6 \Omega$) at 400 MHz.
- All inner shields are in contact with overall shield.

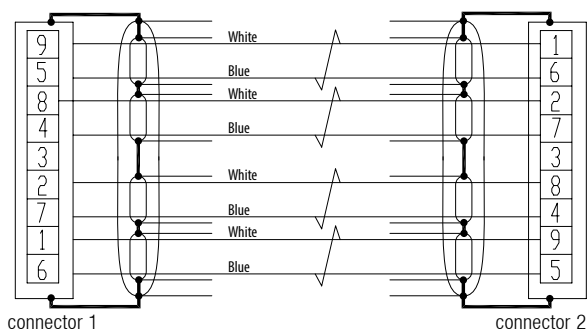
MAIN ADVANTAGES COMPARED TO THE ESCC3902/003 VARIANT 01

- Smaller bend radius (routing made easier)
- Approximately half the weight
- Reduced intra-pair and inter-pair skews
- Improved resistance to radiations (evaluation performed up to 300 Mrad)



Part list

- 1 - Low Mass SpaceWire cable (P551259)
- 2 - Micro-D plug connector (MDSA209P000B: 9 ways / high phosphorous nickel plated)
- 3 - High phosphorous nickel plated backshell and stainless steel 2-56 UNC-2A fastners
- 4 - Marking sleeve



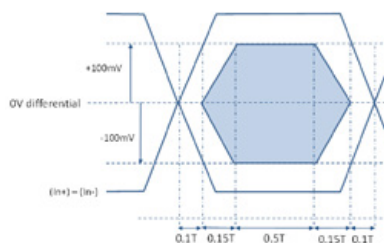
WIRING DIAGRAM (PINS ALLOCATION)

ESCC	3902.003/01	3902.004/01
PART NUMBER	P532242	P551259
WEIGHT	85 g/m	42 g/m
DIAMETER	7 mm max.	6.5 mm max.

Cable shield connection: All shields are terminated to the shell of the Micro-D connectors. Alternatively, the shields can also be connected to pin 3 at both ends on request.

Skew inter pair: 0.1 ns/m maximum. / **Skew intra pair:** 0.05 ns/m maximum.

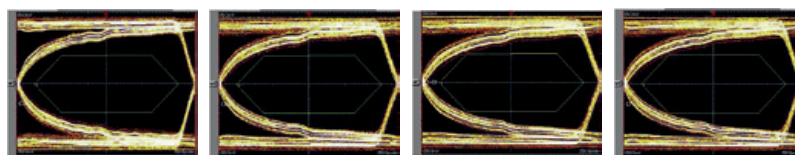
Depending on the required frequency and data rate, this assembly can be up to 10 meters long without exceeding the 6 dB attenuation limit. This limit is measured at the 5th harmonic of the fundamental equivalent frequency of the LVDS signal (250MHz for 100Mb/s; 500MHz for 200Mb/s or 1GHz for 400Mb/s). The real requirement is to be outside the mask (see above). Please contact us for more details.



SPACEWIRE PERFORMANCES MASK FOR EYE PATTERN MEASUREMENT.
EYE PATTERN MODEL GIVEN FOR THE NEXT ISSUE OF THE ECSS-E-ST-50-12 STANDARD. THE SIGNALS FROM THE CABLE ASSEMBLY SHALL REMAIN OUTSIDE THE MASK AT RECEIVER END.

Test and measurements

- **Eye pattern measurements (up to 10 Gb/s):** Jitter measurements, Eye height and width, Q factor and Skew.
- **TDR (Time Domain Reflectometry) analysis:** Impedance analysis and Skew.
- **BER test (Bit Error Rate):** PRBS (Pseudo Random Binary Sequence) generation and analysis.
- **Crosstalk**



EYE PATTERN DIAGRAM MEASUREMENT AT 400 Mb/s FOR EACH PAIR OF A LIGHTWEIGHT SPACEWIRE ON A 4.5 m ASSEMBLY. WORST CASE OF AMPLITUDE (250 mV peak).