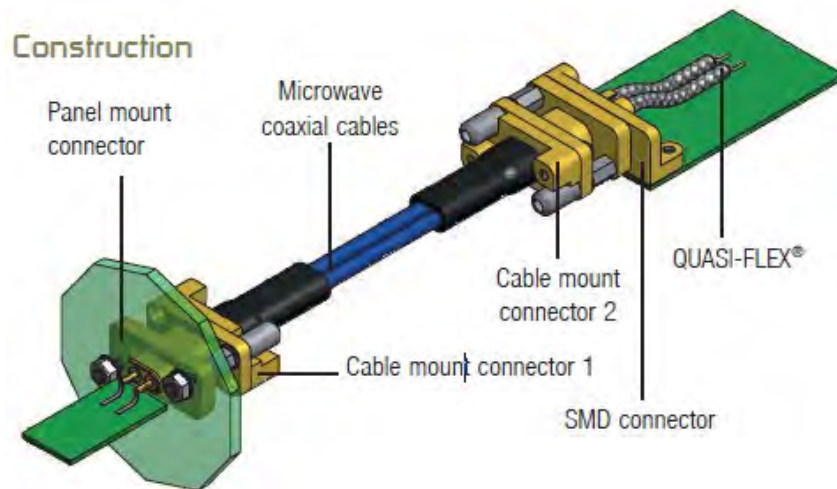


AXOMACH® SpaceFibre links

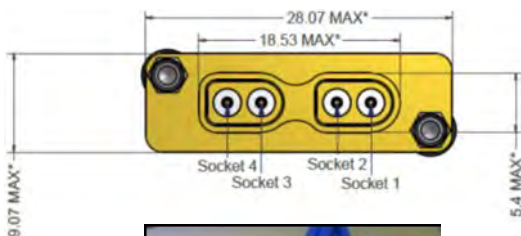
HIGH DATA RATE LINKS FOR FASTER DATA TRANSMISSION

Axon' widens its range of AXOMACH® high data rate links with **AXOMACH® SpaceFibre** links, composed of a low loss and low skew microwave coaxial cable and different connector types (cable mount, panel mount, SMD), designed for compatibility with the new ECSS-E-ST-50-11C SpaceFibre standard.

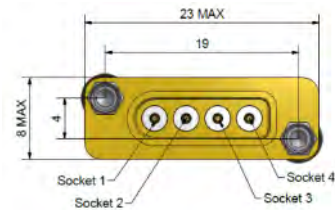


AXOMACH® SpaceFibre links were developed in collaboration with **ESA and University of Dundee** during the SpaceFibre Demonstrator project achieved in 2018. The main idea of the project was to develop a condensed AXOMACH® solution compatible with the new SpaceFibre standard. The original AXOMACH® products benefit from a large heritage of tests and evaluations that can be applicable to the AXOMACH® SpaceFibre products by similarity of design and components selection.

AXOMACH®



AXOMACH® SpaceFibre



NEW ESCC STANDARDS

With support of CNES, Axon' worked on a new set of ESCC generic and detail specifications dedicated to high data rate cable assemblies and compatible equipment connectors which is now available on ESCIES website (ESCIES.org). This new set of ESCC specifications is based on Axon' space grade high data rate AXOMACH® series connectors and links, including SpaceFibre links.

EQUIPMENT CONNECTOR	CABLE ASSEMBLY
<ul style="list-style-type: none">▪ Panel mount connector▪ SMD connector	Cable mount connector + Microwave coaxial cable
ESCC Generic Specification no. 3401	ESCC Generic Specification no. 3409
ESCC Detail Specification no. 3401-089	ESCC Detail Specification no. 3409-001

QUALIFICATION IN PROGRESS

Based on the new set of ESCC specifications, **Axon' is now working on the ESCC qualification and QPL entrance of AXOMACH® high data rate complete link solutions** – including the link and the equipment connectors.

AXOMACH® and AXOMACH® SpaceFibre cable assemblies and equipment connectors are **not ESCC qualified yet**, but benefit from a large heritage of evaluations. The new set of ESCC specifications was written building on this heritage and on the current AXOMACH® procurement specification, insuring AXOMACH® and AXOMACH® SpaceFibre solutions to be fully compliant to the ESCC requirements.

AXOMACH® SPACEFIBRE PROCUREMENT

At the time of publication Axon's qualification to the ESCC specifications is in progress. Customers may request quotations using ESCC references. At point of quotation Axon' will confirm the qualification status of the product, and will quote the reference using the appropriate series designator (ESCC or not). To get any additional information on AXOMACH® SpaceFibre solutions and procurement, contact sales@axon-cable.com.

On the following pages AXOMACH® SpaceFibre solutions are described in detail.

CABLE MOUNT CONNECTORS

Special 100Ω insert for the transmission line

Interfacial seal / connector to backshell interface seals: conductive silicone based rubber

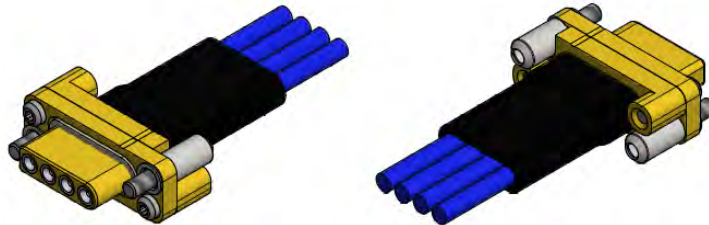
Shrinkable strain relief: fluoro-polymer.

Materials:

- Body: 2.54μm gold over 25μm nickel plating on aluminium alloy
- Dielectric: PTFE
- Pin contact: 1.27μm gold over 1.27μm nickel plating on copper alloy
- Socket contact: 1.27μm gold over 1.27μm nickel plating on copper alloy

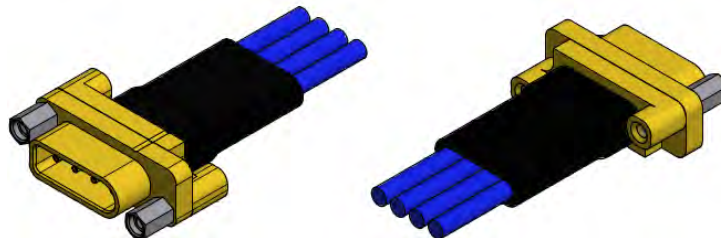
SpaceFibre HDR, Male, In-line Plug

P555778 – ESCC 3409-001 Connector code 10



SpaceFibre HDR, Female, In-line Jack

P555777 – ESCC 3409-001 Connector code 11



PANEL MOUNT CONNECTOR

Materials:

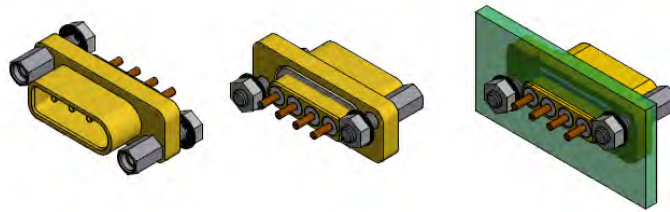
- Body: 2.54µm gold over 25µm nickel plating on aluminium alloy
- Dielectric: PTFE
- Contact: 1.27µm gold over 1.27µm nickel plating on copper alloy
- Termination: 1.27µm gold over 1.5µm nickel plating on copper alloy

Mechanical:

- Torque screw-nut: 0.35 N.m
- Nut thickness: 1.6mm
- Washer dimensions (e x D): 0.3 x Ø4.7mm
- Nuts and washers are included

SpaceFibre HDR, Female, Panel Mount Receptacle with Pin PCB Terminations

P555780 – ESCC 3401-089 Variant 04 (compatible with ESCC 3409-001 Connector code 10)



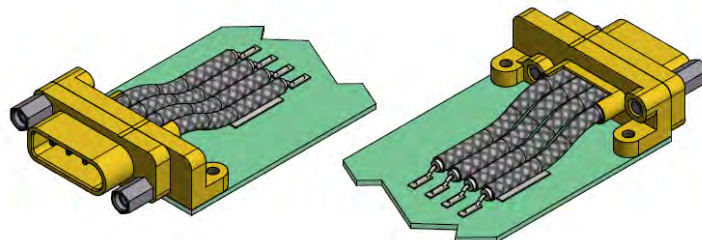
SMD CONNECTORS

Materials:

- Body: 2.54µm gold over 25µm nickel plating on aluminium alloy
- Dielectric: PTFE
- Contact: 1.27µm gold over 1.27µm nickel plating on copper alloy

SpaceFibre HDR, Female, SMD Receptacle with Hand-formable Coaxial Cable PCB Terminations

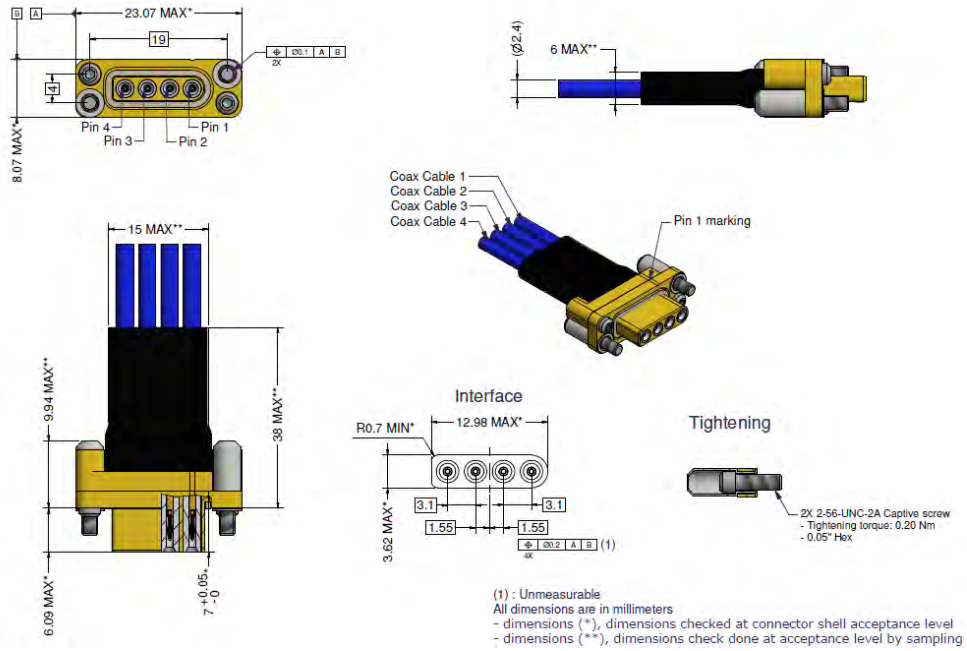
P552560 – ESCC 3401-088 Variant 08 (compatible with ESCC 3409-001 Connector code 10)



DETAILED CONNECTOR SPECIFICATIONS

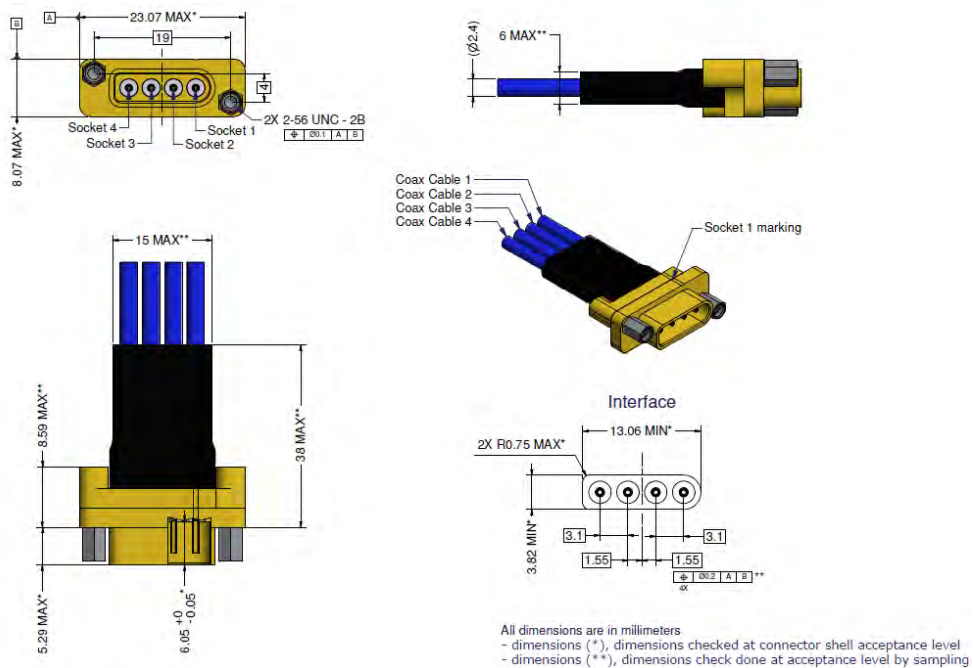
Two way male In Line SpaceFibre connector

P555778 – ESCC 3409-001 Connector code 10



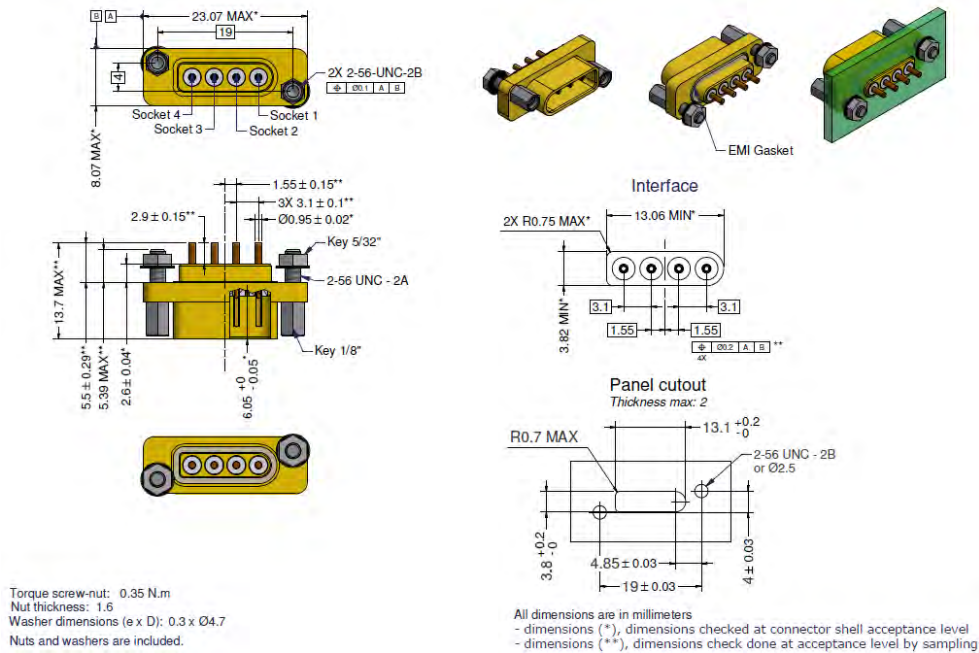
Two way female In Line SpaceFibre connector

P555777 – ESCC 3409-001 Connector code 11



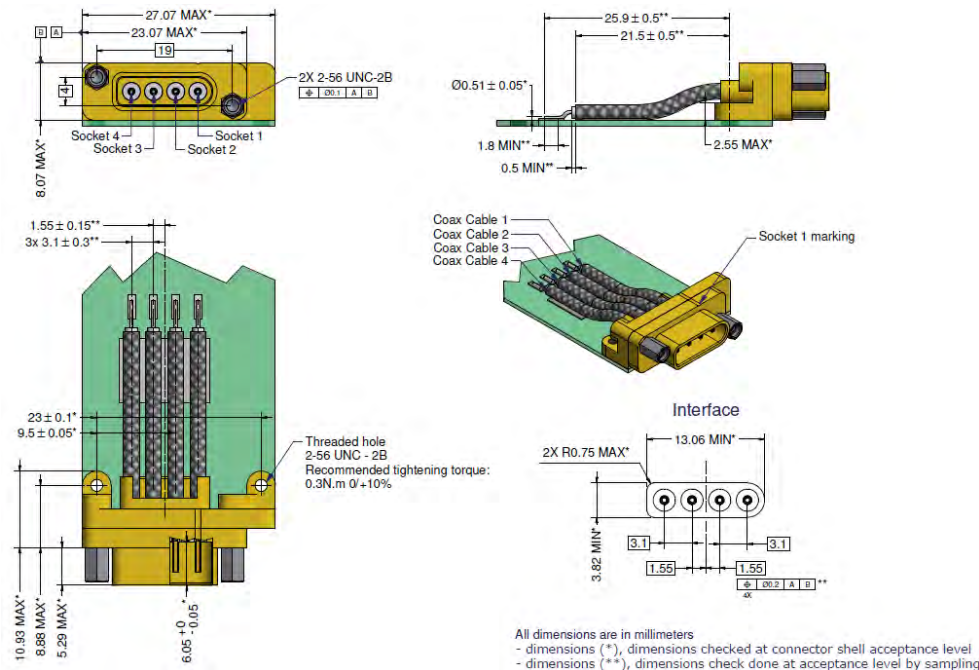
SpaceFibre HDR, Female, Panel Mount Receptacle with Pin PCB Terminations

P555780 – ESCC 3401-089 Variant 04



SpaceFibre HDR, Female, SMD Receptacle with Hand-formable Coaxial Cable PCB Terminations

P552560 – ESCC 3401-089 Variant 08



WIRING

The SpaceFibre standard requires indirect, or crossover, wiring, so when ordering a SpFi assembly, **indirect wiring** should be chosen. Typically, this is most likely to be with a male to male link.

INDIRECT (CROSSOVER) WIRING

Variant	Connector	Pin numbers			
ESCC 3409-001 variant 10 & 11	1 st connector, e.g. variant 10 (male)	1	2	3	4
	2 nd connector, e.g. variant 10 (male)	4	3	2	1

However, if ordering a SpFi extension cable, to extend the length of an existing SpFi cable, for example, when entering a TVAC chamber, **direct wiring** should be chosen, so as not to negate the crossover effect from the cable already in situ. Typically, this may be with a female to male link.

DIRECT WIRING

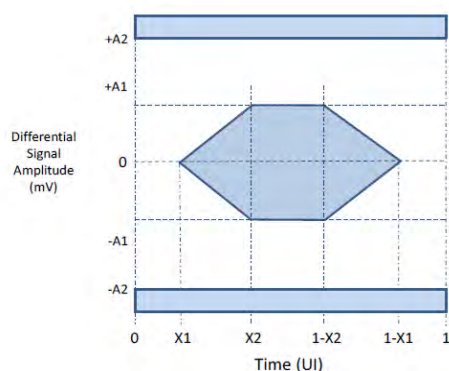
Variant	Connector	Pin numbers			
ESCC 3409-001 variant 10 & 11	1 st connector, e.g. variant 11 (female)	1	2	3	4
	2 nd connector, e.g. variant 10 (male)	1	2	3	4

ELECTRICAL CHARACTERISTICS

Maximum rating for a 1 metre link terminated with two dual way cable mount connectors at room temperature:

CHARACTERISTICS	VALUE	
Characteristic impedance (Zc)	90 Ω < Zc < 110 Ω	
Skew (Sk) between coaxial cables	Maximum 20 ps	
Jitter PP (at 1, 3, 5, 6, 8 and 10 Gb/s)	Maximum 20 ps	
Jitter RMS (at 1, 3, 5, 6, 8 and 10 Gb/s)	Maximum 5 ps	
Insertion loss (IL)	0 to 5 GHz	Maximum -1 dB
	0 to 10 GHz	Maximum -2 dB
Crosstalk far end (xTf)	0 to 5 GHz	Maximum -45 dB
	0 to 10 GHz	Maximum -35 dB
Crosstalk near end (xTn)	0 to 5 GHz	Maximum -45 dB
	0 to 10 GHz	Maximum -35 dB

SpaceFibre Specification mask test:



Data signaling rates	1 Gbps to 3.125 Gbps		3.125 Gbps to 6.25 Gbps		Units
	Near-End Value	Far-End Value	Near-End Value	Far-End Value	
X1	0,175	0,275	0,15	0,3	UI
X2	0,390	0,400	0,4	0,5	UI
A1	400	100	400	100	mV
A2	800	600	800	600	mV

NOTE: The near-end values are measured at the transmitter outputs and the far-end values are measured at the receiver inputs.

MECHANICAL CHARACTERISTICS

CHARACTERISTICS	VALUE
Maximum cable weight (AXOWAVE 2.4)	15 g/m per cable (30 g/m per way)
Maximum cable weight (QUASI-FLEX)	17 g/m per cable
Mating force	< 11.2 N (2.8 N per contact)
Demating force	0.8 N < demating force < 11.2 N
Operating and storage temperature	-55°C to +125°C

ESCC Standard	Connector Code or Variant	Nom. Connector weight (g)
Cable mount connectors		
3409-001	10	23 g* / 7 g without cable
	11	24 g* / 8 g without cable
Panel mount and SMD connectors		
3401-089	04	4 g
	08	10.8 g** / 7.4 g

(*) Value specified for a Ax2.4S cable length of 300 mm

(**) Includes the weight of the connector plus the cable terminations (0.85g max each)