

## SPECIFICATIONS

Microcoupler  
MIL-STD-1553B (STANAG 3838)  
SSQ 21676 (NASA-BOEING)  
PID (CNES), SPE-J-403-A-0070

Testing  
AS-SAE-4115

Resistor  
MIL-R-39007  
MIL-PRF-39017

Solder  
ECSS-Q-ST-70-08,  
MIL-STD-2000, NHB 5300.4.

Derating  
ECSS-Q-ST-30-11

Potting material  
ECSS-Q-ST-70-02, ASTM E595,  
and ECSS-Q-ST-70-29  
or NHB 8060.1.

Connector assemblies  
ECSS-Q-ST-70-26  
or NHB 5300.4.

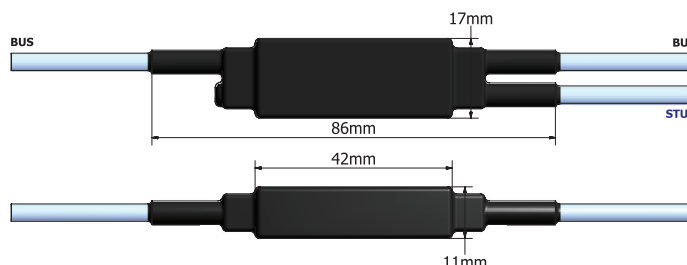
Transformer  
JN1081 approved  
DDP-J-403-A-022  
ESA approved  
(COF-BCS-PAD01)

All processes, materials  
and components are  
approved by CNES  
(see CNES-PID-02-AXON\*)  
and BOEING/NASA.

ESA: European Space Agency  
CNES: French Space Agency  
PID: Part Identification Document

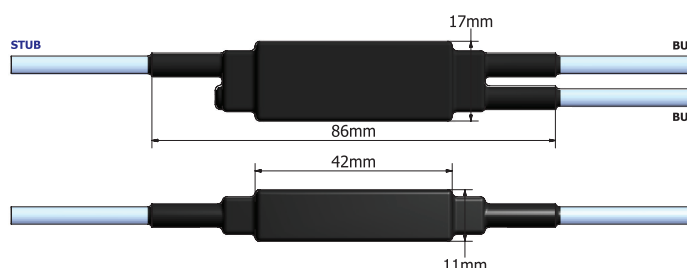
## AMB / S - C1 - XX - X ESD

Version with bus lines on opposite sides of the coupler.



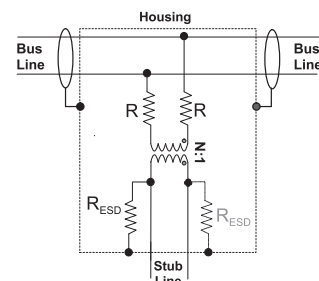
## AMB / S - C11 - XX - X ESD

Version with bus lines on same side of the coupler.



## Electrical scheme

$N = 1.41 \pm 3\%$   
 $R = \text{fault protection resistance}$   
 $R = 0.75 Z_0 = 57.6 \Omega \pm 1\%$   
 $R_{ESD} = 2 \text{ M}\Omega$



Possibility to have 1 or 2 bleed off resistors of 2 MΩ for each stub line.

## Identification code

AMB /	S	CX	XX	X ESD
AXON' MICROBUS	S: SPACE VERSION	1: 1 WAY IN-LINE COUPLER Version with bus lines on opposite sides of the coupler.	<b>CABLE REFERENCES</b> <b>40: TWINAX BUS AWG 24 SB</b> (single braid) according to SSQ 21655 (NASA qualified). <b>41: TWINAX BUS AWG 24 DB</b> (double braid). <b>43: TWINAX BUS AWG 26 SB</b> (single braid). <b>44: TWINAX BUS AWG 26 DB</b> (double braid). <b>45: TWINAX BUS AWG 22 SB</b> (single braid) according to SSQ 21655 (NASA qualified). <b>80: TWINAX BUS AWG 24 SB</b> (single braid) according to ESCC 3902.002.20.	<b>1:</b> One bleed off resistor for each stub line. <b>2:</b> Two bleed off resistors for each stub line.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).

## Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 $\Omega$	77 $\Omega$
Turn ratio	1.41 $\pm 3\%$	1.41 $\pm 3\%$
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 3000 $\Omega$ in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 3000 $\Omega$
Fault protection insulation resistors in series on each bus winding connection	0.75 $Z_o \pm 2\%$	57.6 $\Omega \pm 1\%$
Stub line bleed off resistor		2 M $\Omega \pm 2\%$
Insulation resistance between:		
- bus / stub	100 M $\Omega$	> 1 000 M $\Omega$ at 250 V <sub>DC</sub>
- bus / shield	100 M $\Omega$	> 1 000 M $\Omega$ at 500 V <sub>DC</sub>
Transfer impedance	-	plot available
Shield continuity	-	10 m $\Omega$ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength:		
- between shield and bus line	500 V <sub>RMS</sub>	500 V <sub>RMS</sub>
- between outer insulation and shield	500 V <sub>RMS</sub>	500 V <sub>RMS</sub>

\* Impedance: seen from the stub when the bus line is loaded with  $Z_o$  at both sides of the coupler.

## Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCN < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0.000027% CVCN = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m <sup>3</sup> volume per coupler* MLW (#) = 2112 for 65 m <sup>3</sup> volume*
MTBF according to MIL HDBK-217	-	5.11 x 10 <sup>7</sup> hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.

\* Typical values obtained by AMB/S-C1 coupler during qualification phase.

## Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	$\leq 18$ g
Life test	-	1000 hrs at 120°C
Shocks	-	15 g's in all directions
Acceleration	-	20 g's in all directions
Random vibrations	MIL-STD-810, Method 514.5	Functional at 120°C = 16.35 g <sub>RMS</sub> Endurance at 20°C = 33.23 g <sub>RMS</sub>

Other mechanical and environmental tests available on request.

## Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE	
		NOMINAL VALUE	REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-	Over 195°C
Turn ratio	$\sqrt{2} \pm 3\%$	$\sqrt{2} \pm 3\%$	$\sqrt{2} \pm 3\%$
Secondary DC resistance	$R_s < 5 \Omega$	$R_s = 2 \Omega$	$R_s < 2.5 \Omega$
Insulation resistance (winding to winding)	$R_i > 100 \text{ M}\Omega$	-	$R_i > 1 000 \text{ M}\Omega$ with a 250 V <sub>DC</sub> test voltage
Transformer open circuit impedance	$ Z  > 3 \text{ k}\Omega$ on full temperature operating range	$ Z  > 10 \text{ k}\Omega$ at 25°C $ Z  > 4.8 \text{ k}\Omega$ at -65°C $ Z  > 4 \text{ k}\Omega$ at -85°C	$ Z  > 9.4 \text{ k}\Omega$ at 25°C***
Primary parallel inductance	-	22 mH	> 20 mH
Primary parallel capacitance	-	10 pF	< 11.4 pF
Inter-winding capacitance	-	45 pF	-
Primary leakage inductance	-	-	< 6.0 $\mu\text{H}$
Droop*	< 20%	4.5%**	< 20%**
Overshoot and ringing*	$\pm 1$ V	0.30 V**	< $\pm 1$ V**

\* Tested with a 250 kHz square waveform of 27 V<sub>PP</sub> with 100 ns rise and fall times through a 360  $\pm 5\%$   $\Omega$  resistor.

\*\* Average values taken during the JN1081N qualification.

\*\*\* 9.4 k $\Omega$  at 25°C guarantees 3 k $\Omega$  from -65°C to +150°C