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Qualification Test Report

SpaceNXT™ Aurora COTS+ for Connector Assemblies,

Aurora 110 Position, Type A, No Peg-Straight male, R/A

QTR Summary Only, QTR 2018-07-009-RPT-C

Revision A.01, 13th July 2018

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Customer Approval

Revision Letter	Page Number	Paragraph / Appendix	Description of Revision	Approval Date
A.1	-	-	Original Draft	13/07/2018

1. Scope

The purpose of this document is to show the test results for complete qualification of Smiths Interconnects, Connector Assemblies, 110 pin straight male, 110 pin 90deg female, Press-fit, as shown in **Table 1**. All tests were carried out by following the requirements of ESA 3401 Issue 7, Rev B. Except group 1 which was mostly carried out with the connectors unmated as this is seen as a worst case scenario.

2. Order of Precedence

In case of a conflict between the text of this document and the applicable referenced documents, the text of this document shall take precedence.

3. Description of Tested connectors

Table 1: Description of Tested connectors

Smiths Interconnect Part Number	Quantity	Description
K3SA110FROP1430	16	Aurora PCI Connector (2mm), 110 contacts Female, R/A, Press-fit
K3SA110MSOP1230	16	Aurora PCI Connector (2mm), 110 contacts Male, Straight, Press-fit

4. Standard Atmospheric Test Conditions

All tests and examinations specified by this qualification test procedure will be continued under any combination of conditions within the ranges stated in this paragraph, unless specified otherwise.

Temperature: 15°C to 35°C
Relative Humidity: 25% to 75%
Barometric Pressure: 86 kPa to 106 kPa

5. References

European Space Agency (ESA)/European Space Components Coordination (ESCC)

ESCC 3401, Issue 7, Rev B, April 1999	Connectors, Electrical, Non-Filtered, Circular and Rectangular ESA/SCC Generic Specification No. 3401
ESA 20500	External Visual Inspection
ESA 24800	Resistance to solvents of marking Materials and finishes
IEC 512-2	Electromechanical Components for electronic equipment: basic testing procedures and measuring methods.
IEC 512-4	Electromechanical Components for electronic equipment: basic testing procedures and measuring methods.
IEC 68-2-2	Basic Environmental Testing Procedures (Dry Heat)
IEC 68-2-30	Basic Environmental Testing Procedures (Damp Heat)
IEC 68-2-1	Environmental Testing (Cold)
IEC 68-2-13	Basic Environmental Testing Procedure (Low air pressure)
IEC 512-6 test 11d	Basic testing procedure and measuring methods for electromechanical components for electronic equipment (Rapid change of temp)

Smiths Interconnect

QTP-2018-018-TP5 REVA5	Qualification Test Plan Aurora COTS+ for Connector Assemblies, Aurora 110 Position, Type A, No Peg-Straight male, R/A Female.

6. Test Equipment and Facilities

6.1. Test Equipment

Table 2 lists the equipment used during the performance testing of the connectors for this qualification / QTR.

Table 2 Test Equipment

Manufacturer	Description and Model	Smiths Interconnect Serial Number
Cropico	Digital Ohmmeter D04A	00387
QuadTech	Sentry 30plus AC/DC/IR Hipot tester	00388
Mecmesin	Tensile tester	HQC 420
Mecmesin	Load Cell	00839
Lloyd	Tensile tester	HQC 183
Lloyd	Load Cell	HQC 183A
Pico	Data Logger TC-08	HQC 473 & 778
Keithly	Source Meter 2410	HQC 723 & 639
TTI	Power Supply EL302RD	HQC 777
Fluke	87v True RMS multimeter	HQC 627&609
Gallenkamp	PL33-34/9298	HAF 221
WEISS Technik	Cycle Chamber	HQC 455
Xantrex	PSU XDC 10-1200	HQC 474
Espec	Oven / Chamber	IDI 35-0843
Thermotron	Cold Chamber 3200 S-1.2	35-0873
Hypot Ultra	Hi Pot tester	SI ID 11662
Data Logger	Omega HH309A	SI ID 35-907
Vacuum chamber	Pressure Transducer PX409-015AUSBH	469626
Unholtz- Dickie	Shaker H560B-12	8568
Accelerometer	Accelerometer	LW188713/ LW217535 LW188714
Mertronics	Discontinuity Meter	A/N 2945 and 1017-3

6.2. Facilities

Smiths Interconnect (SI) used its own facilities to perform all tests for this qualification.

7. Calibration and Source Inspection

7.1. Calibration

All test equipment used in the performance of the tests required herein is calibrated and traceable. Records of all equipment is maintained and made available for review. Unless otherwise specified, Smiths Interconnects Quality Assurance will verify that all test data and collection methods are accurate and reliable.

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8. Test Sequence / Conclusion

The test process for qualification was based on 16 samples. The 16 samples consist of the parts in **Table 1** of this document.

All parts used in this qualification were traceable with a First Article Inspection Report (FAIR) prior to the qualification being carried out.

The samples were subjected to the below test sequence in the order specified. All results meet or exceed ESA 3401 test requirements as tested to the below sequence of tests.

Table 3 Test Sequence /RESULT / Conclusion

Test Procedure	Pass / Fail	Pass/Fail/ Action Criteria
Group 1		**Pass/Fail/ Action Criteria**
WIRING (ESA 3401, Para9.10) LLCR	Pass	≤ 20mΩ
Vibration (3401 para 9.11) sine and Random	Pass	No Disconnects/ No physical damage
Shock (3401 para 9.12)	Pass	No Disconnects/ No physical damage
Climatic (ESA 3401 para 9.13)		
Dry Heat (+125C) IR	Pass	>10,000MΩ @ 500Vac
Damp Heat, Accelerated, First Cycle	Pass	Action
Cold Test	Pass	Action
Low Air Pressure, DWV	Pass	0.5mA max @ 200V @ 33000 meters simulated
Damp Heat, 5 cycles +55C, IR	Pass	>10,000MΩ @ 500Vac
Visual Inspection to ESA 20500	Pass	No Physical Damage
IR	Pass	>10,000MΩ @ 500Vac
DWV	Pass	0.5mA max @ 750Volts
Group 2		**Pass/Fail Criteria**
WIRING (ESA 3401, Para9.10) LLCR	Pass	≤ 20mΩ
Rapid Change of Temp (ESA 3401, Para 9.16)	Pass	Action
Visual Inspection	Pass	No Physical damage
IR	Pass	>10,000MΩ @ 500Vac
DWV	Pass	0.5mA max @ 750Volts
Contact Retention (ESA 3401, Para 9.17)	Pass	8 Newton minimum

Mate un-mate force (Full connector)	Pass	82.5 Newton's max mate 16.5 Newton's min un-mate
LLCR	Pass	≤ 20mΩ
Endurance (ESA 3401, 9.18)	Pass	500 mates
Inspection (visual)	Pass	Visually no damage
Mate un-mate force (full connector)	Pass	82.5 Newton's max mate 16.5 Newton's min un-mate
LLCR (drift)	Pass	Record result
IR	Pass	>10,000MΩ @ 500Vac
DWV	Pass	0.5mA max @ 750Volts
Permanence of marking (ESA Para9.19) ESA 24800.	Pass	Visually no damage to text
Group 3		**Pass/Fail Criteria**
WIRING (ESA 3401, Para9.10) LLCR	Pass	≤ 20mΩ
Mating/un-mating forces (ESA 3401 9.20), 4 cycles, record first and last	Pass	82.5 Newton's max mate 16.5 Newton's min un-mate
LLCR all points	Pass	≤ 20mΩ
High Temp Storage (ESA 3401, 9.21) +125C / 1000hrs	Pass	Action
Visual Inspection	Pass	Visually no damage
Mate / un-mate force	Pass	
LLCR drift	Pass	Record
Rated current contact resistance	Pass	≤ 20mΩ
IR	Pass	>10,000MΩ @ 500Vac
DWV	Pass	0.5mA max @ 750Volts
Group 4		**Pass/Fail Criteria**
WIRING (ESA 3401, Para9.10) LLCR	Pass	≤ 20mΩ
High Temperature measurement (ESA 3401, Para 9.25)	Pass	Action
IR at max temp (+125C)	Pass	>10,000MΩ @ 500Vac
Overload Test (ESA 3401, Para 9.26)	Pass	Action
Internal temperature of connector	Pass	Record result
Rated current contact resistance	Pass	≤ 20mΩ
IR	Pass	>10,000MΩ @ 500Vac
DWV	Pass	0.5mA max @ 750Volts