MULTI-BEAM XLE 270V CONNECTOR SYSTEM

1. INTRODUCTION

1.1 Purpose

Testing was performed on the TE Connectivity* MULTI-BEAM XLE* 270V connector system to determine its conformance to the requirements of Design Objective 108-163023, Rev. B.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the MULTI-BEAM XLE 270V connector system. Testing was performed at the Harrisburg Electrical Components Test Laboratory between March 18 and June 25, 2020. The Blowing Sand and Blowing Dust tests were performed at external laboratory E-Labs Incorporated between May 19 and May 20, 2020. All supporting test documentation is maintained by the Harrisburg Electrical Components Laboratory under test number EA20190505T.

1.3 Conclusion

The MULTI-BEAM XLE 270V connector system listed in paragraph 1.4 conformed to the electrical, mechanical, and environmental performance requirements of Design Objective 108-163023, Rev. B.

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1.4 Test Specimens

The test specimens were representative of a normal production lot, and specimens identified with the following part numbers were used for test:

Table 1 – Test Specimens

Test Group	Mated Pair Quantity	Part Number	Description
1	5	2332793-1	MULTI-BEAM XLE 270V Press-Fit Right Angle Header, VITA 62.1 3U P0
		2332795-1	MULTI-BEAM XLE 270V Press-Fit Vertical Receptacle, VITA 62.1 3U J0
		2313444-1	MULTI-BEAM XLE 270V Vertical Fin
		2313445-1	MULTI-BEAM XLE 270V Right Angle Fin
2	4	2313442-1	MULTI-BEAM XLE 270V Press-Fit Right Angle Header, VITA 62.2 3U P0
		2313441-1	MULTI-BEAM XLE 270V Press-Fit Vertical Receptacle, VITA 62.2 3U J0
		2313444-1	MULTI-BEAM XLE 270V Vertical Fin, VITA 62
		2313445-1	MULTI-BEAM XLE 270V Right Angle Fin, VITA 62
3	5	2332793-1	MULTI-BEAM XLE 270V Press-Fit Right Angle Header, VITA 62.1 3U P0
		2332795-1	MULTI-BEAM XLE 270V Press-Fit Vertical Receptacle, VITA 62.1 3U J0
		2313444-1	MULTI-BEAM XLE 270V Vertical Fin, VITA 62
		2313445-1	MULTI-BEAM XLE 270V Right Angle Fin, VITA 62
4	5	2313442-1	MULTI-BEAM XLE 270V Press-Fit Right Angle Header, VITA 62.2 3U P0
		2313441-1	MULTI-BEAM XLE 270V Press-Fit Vertical Receptacle, VITA 62.2 3U J0
		2313444-1	MULTI-BEAM XLE 270V Vertical Fin, VITA 62
		2313445-1	MULTI-BEAM XLE 270V Right Angle Fin, VITA 62
5	5	2348886-1	MULTI-BEAM XLE 270V Press-Fit Right Angle Header, VITA 62.2 6U P0
		2348888-1	MULTI-BEAM XLE 270V Press-Fit Vertical Receptacle, VITA 62.2 6U J0
		2313444-1	MULTI-BEAM XLE 270V Vertical Fin, VITA 62
		2313445-1	MULTI-BEAM XLE 270V Right Angle Fin, VITA 62

NOTE *Specimens in Test Sets 1 and 3 were mounted to printed circuit test boards 60-1953490-1, Rev. A, and 60-1953491-1, Rev. A. Specimens in Test Sets 2 and 4 were mounted to printed circuit test boards 60-1943233-1, Rev. A, and 60-1943234-1, Rev. A. Specimens in Test Set 5 were mounted to printed circuit test boards 60-1953490-1, Rev. A, and 60-1953491-2, Rev. A.*

1.5 Qualification Test Sequence

Table 2 – Qualification Test Sequence (d)

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial Examination of Product	1	1	1(c)	1(c)	1
Low Level Contact Resistance	2, 6	2, 4, 6, 8			2, 4
Insulation Resistance		9(c)	2, 5, 8	2, 8	
Dielectric Withstanding Voltage		10	3, 6, 9	3, 9	
Vibration	4	7			
Mechanical Shock	5				
Durability	3				
Operating Temperature				5	
Non-Operating Temperature				4	
Humidity			4		
Altitude				6	
Rapid Decompression				7	
Corrosion Resistance		5			
Sand and Dust					3
Fluid Contamination			7		
Temperature Cycling		3			
Final Examination of Product	7	11	10	10	5

NOTE

(a) See Paragraph 1.4.
(b) Numbers indicate sequence in which tests were performed.
(c) Test PCB’s modified to open the printed circuit traces between adjacent contacts.
(d) Tests performed on power contacts separated by dielectric barrier fins. Other contacts not tested in this sequence.

1.6 Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C
Relative Humidity: 20% to 80%

2. SUMMARY OF TESTING

2.1 Initial Examination of Product – All Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by Product Assurance. Where specified, specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2 Low Level Contact Resistance – Test Groups 1, 2, & 5

All low signal level contact resistance measurements taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than the maximum specified requirements of 10mΩ initial and 20 mΩ final for high power contacts, and 15 mΩ initial and 20 mΩ final for low power and signal contacts.

2.3 Insulation Resistance – Test Groups 2, 3, & 4

All insulation resistance measurements were greater than 1,000 Megohms (1.0 x 10^3 Megohms) when measured under ambient conditions, and greater than 10 Megohms (1.0 x 10^1 Megohms) when measured at high humidity.

2.4 Dielectric Withstanding Voltage (DWV) – Test Groups 2, 3, and 4

There was no evidence of dielectric breakdown or flashover, and leakage current measurements did not exceed 5 milliamperes. For testing at sea level, a test voltage of 2,500 Vdc was applied between contacts separated by fins, and 1,000 Vdc was applied between contacts and between contacts and hardware not separated by fins. For testing at altitude, a test voltage of 1,000 Vdc was applied between contacts separated by fins, and 500 Vdc was applied between contacts and between contacts and hardware not separated by fins.

2.5 Vibration – Test Groups 1 & 2

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of vibration testing, and no discontinuities greater than 1 microsecond were detected during vibration testing.

2.6 Shock – Test Group 1

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of shock testing, and no discontinuities greater than 1 microsecond were detected during shock testing.

2.7 Durability – Test Group 1

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of mating and unmating the specimens 250 times.

2.8 Operating Temperature – Test Group 4

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to operating temperature extremes of 85°C and -40°C. Insulation resistance and dielectric withstanding voltage testing performed at these temperature extremes met all specification requirements (see Paragraphs 2.3 and 2.4).

2.9 Non-Operating Temperature – Test Group 4

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to operating temperature extremes of 105°C and -55°C. Insulation resistance and dielectric withstanding voltage testing performed following exposure to these temperature extremes met all specification requirements (see Paragraphs 2.3 and 2.4).

2.10 Humidity – Test Group 3

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to cyclic temperature extremes of 30°C and 60°C at high humidity. Insulation resistance testing performed at high humidity following 5 and 10 cycles of exposure, and after 24 hours of post-exposure ambient conditioning, met all specification requirements (see Paragraph 2.3).

2.11 Altitude – Test Group 4

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to a simulated altitude of 70,000 feet. Dielectric withstanding voltage testing performed at altitude met all specification requirements (see Paragraph 2.4).

2.12 Rapid Decompression – Test Group 4

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of decompression from a simulated altitude of 8,000 feet to 70,000 feet. Dielectric withstanding voltage testing performed during decompression from a simulated altitude of 8,000 feet to 70,000 feet met all specification requirements (see Paragraph 2.4).

2.13 Corrosion Resistance – Test Group 2

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to a minimum of 500 hours of a salt spray environment.

2.14 Sand and Dust – Test Group 5

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to blowing sand and blowing dust environments.

2.15 Fluid Contamination – Test Group 3

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of fluid contamination testing.

2.16 Temperature Cycling – Test Group 2

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of exposure to a temperature cycling environment.

2.16 Final Examination of Product – All Test Groups

No evidence of defects detrimental to mechanical or electrical performance were visible as a result of testing.

3. TEST METHODS

3.1 Initial Examination of Product

Initial Examination of Product was performed in accordance with EIA 364-18B as per 108-163023, Rev. B. A Certification of Conformance was issued stating that all specimens in this test package have been produced, inspected, and accepted as conforming to product drawing requirements, and made using the same core manufacturing processes and technologies as production parts. Specimens were visually examined for evidence of physical damage detrimental to product performance with the unaided eye correction to normal vision.

3.2 Low Level Contact Resistance

Low Level Contact Resistance measurements were performed in accordance with EIA 364-23C as per 108-163023, Rev. B. Measurements were made using a four-terminal configuration. Voltage measurements were manually probed with pointed probes across the contact interfaces via access connector thru holes located on the backplane and daughtercard printed circuit test boards. Current was applied through series input traces on the boards. See Figure 1 and Figure 2 for photographs of the test setup.

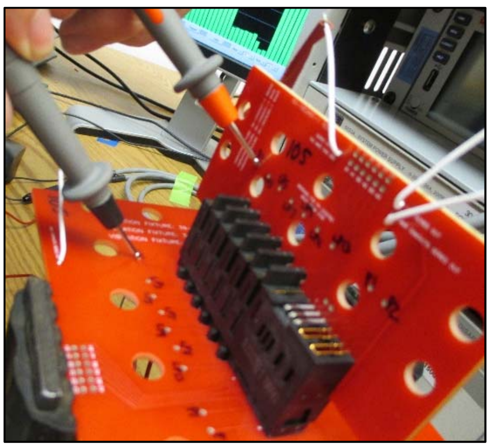

Figure 1 – Low Level Contact Resistance

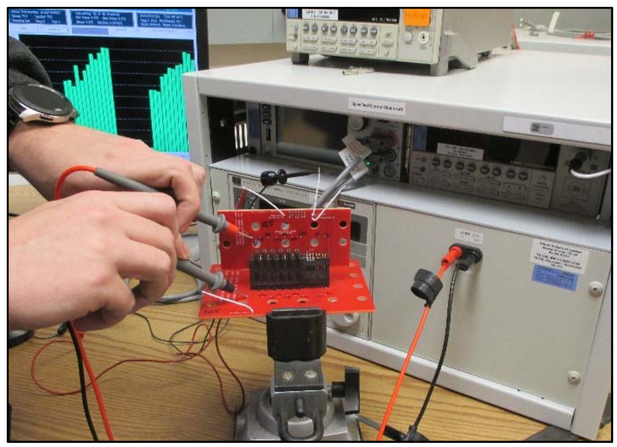

Figure 2 – Low Level Contact Resistance

3.3 Insulation Resistance

Insulation Resistance measurements were performed in accordance with EIA 364-21E as per 108-163023, Rev. B. The connectors were tested in the mated condition. Insulation resistance measurements were recorded between the circuits identified in Paragraph 2.3. Wires were soldered to the access points on the printed circuit boards, and clipped to the nut of the guide post where applicable. A 500 Vdc test potential was applied between circuits for a maximum of two minutes before the insulation resistance measurement was recorded. See Figures 3 through 7 for photographs of the test setups.

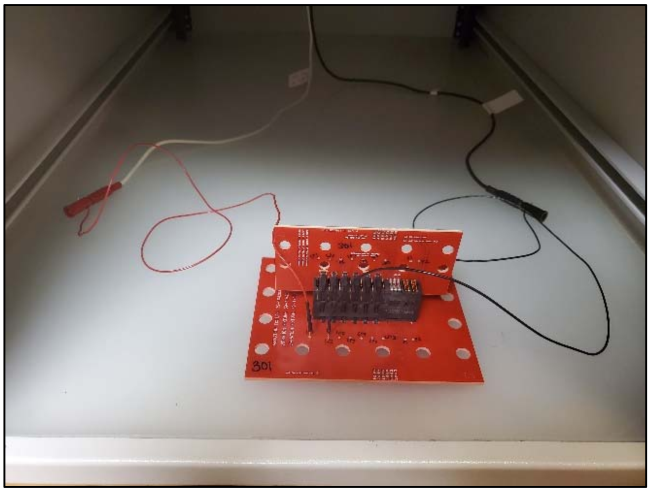

Figure 3 – Insulation Resistance Single Connector Measurements

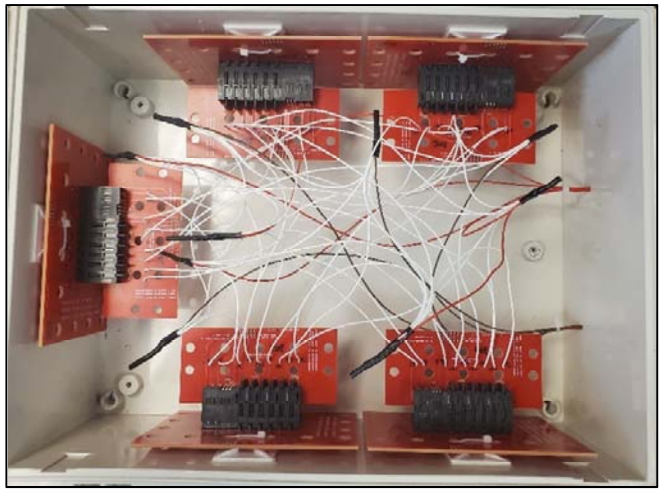

Figure 4 – Insulation Resistance Parallel Specimen Measurements

Figure 5 – Insulation Resistance Measurements at Ambient Condition

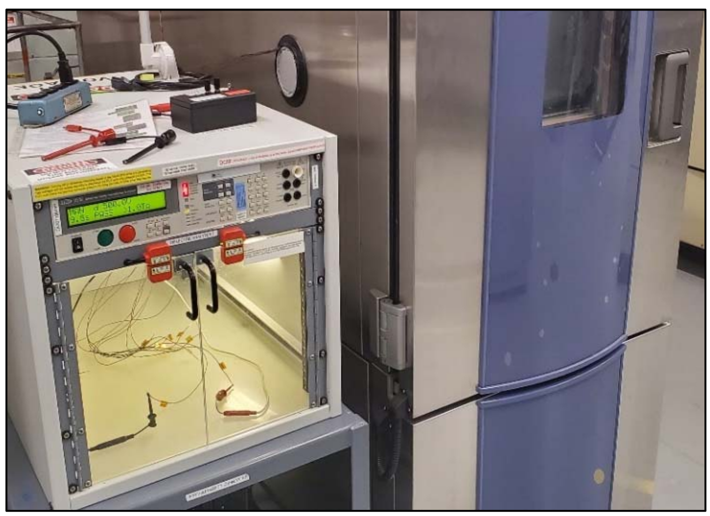

Figure 6 – Insulation Resistance Measurements at High/Low Temperature

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3.3 Insulation Resistance (cont.)

Figure 7 – Insulation Resistance Measurements at High Humidity

3.4 Dielectric Withstanding Voltage

Dielectric Withstanding Voltage testing was performed in accordance with EIA 364-20F, Condition I, as per 108-163023, Rev. B. The connectors were tested in the mated condition. Testing was performed between the circuits identified in Paragraph 2.4. Wires were soldered to the access points on the printed circuit boards, and clipped to the nut of the guide post where applicable. The specified test potential was applied between circuits at a rate of 500 volts per second, and maintained for a period of 60 seconds. See Figures 8 through 12 for photographs of the test setups.

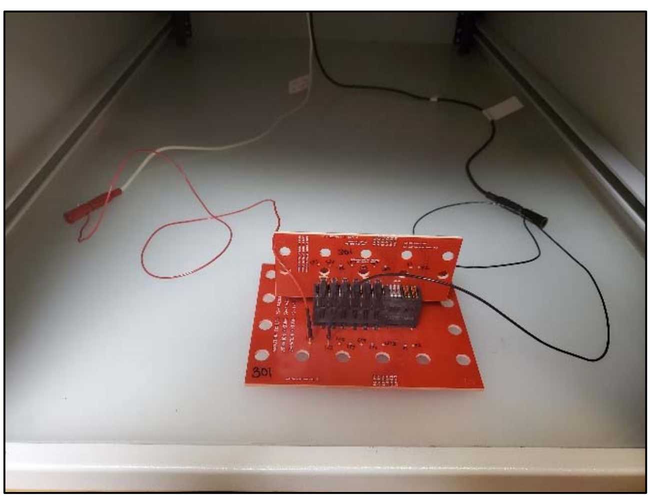

Figure 8 – Dielectric Withstanding Voltage Single Connector Testing

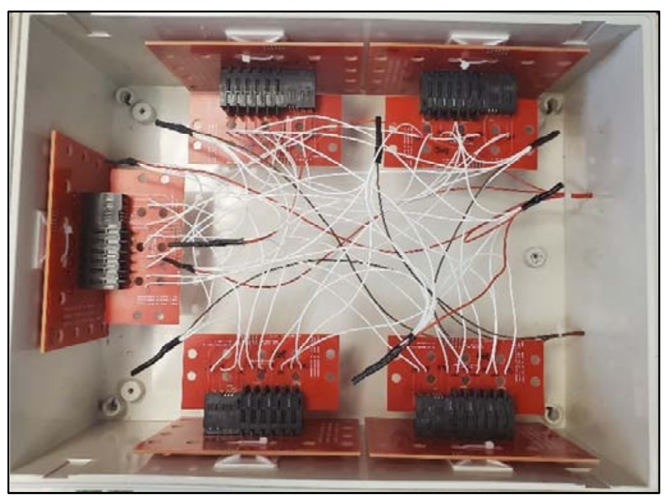

Figure 9 – Dielectric Withstanding Voltage Parallel Specimen Testing

3.4 Dielectric Withstanding Voltage (cont.)

Figure 10 – Dielectric Withstanding Voltage Testing at Ambient Condition

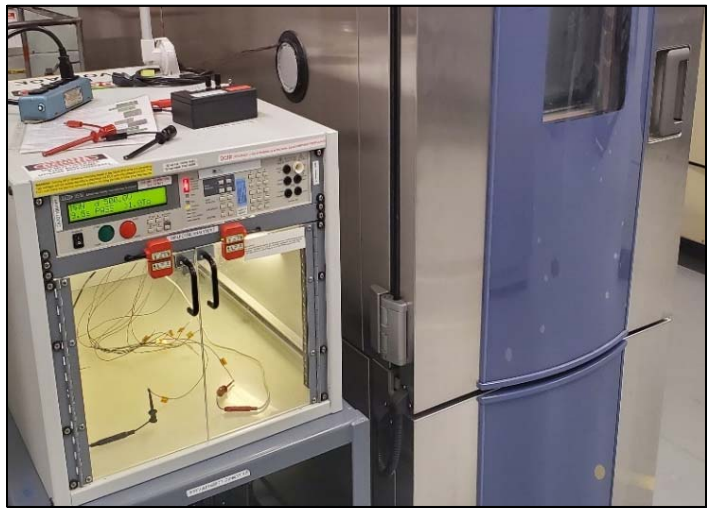

Figure 11 – Dielectric Withstanding Voltage Testing at High/Low Temperature

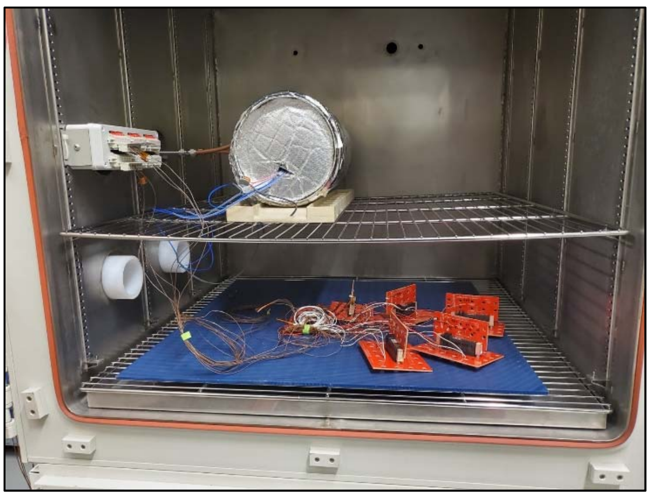

Figure 12 – Dielectric Withstanding Voltage Testing at Simulated Altitude

3.5 Vibration

Vibration testing was performed in accordance with VITA 47.1-2019, Section 4.4.3 (Vibration Class V3) and MIL-STD-810H, Method 514.8, Procedure I, as per 108-163023, Rev. B. The parameters of this test condition are specified by a random vibration spectrum with excitation frequency bounds of 50 and 2000 Hertz (Hz). The power spectral density (PSD) at 5 Hz is 0.005 G²/Hz. The spectrum slopes up at 3 dB per octave to a PSD of 0.10 G²/Hz at 100 Hz. The spectrum is flat at 0.10 G²/Hz from 100 Hz to the frequency of 1000 Hz. The spectrum slopes down at 3 dB per octave from 1000 Hz to a 2000 Hz. The root-mean square amplitude of the excitation was 12.82 GRMS. The test specimens were subjected to this test for 1 hour in each of the three mutually perpendicular axes, for a total test time of 3 hours per test specimen. The test specimens were monitored for discontinuities of 1 microsecond or greater using an energizing current of 100 milliamperes. See Figures 13 through 15 for photographs of the test setup.

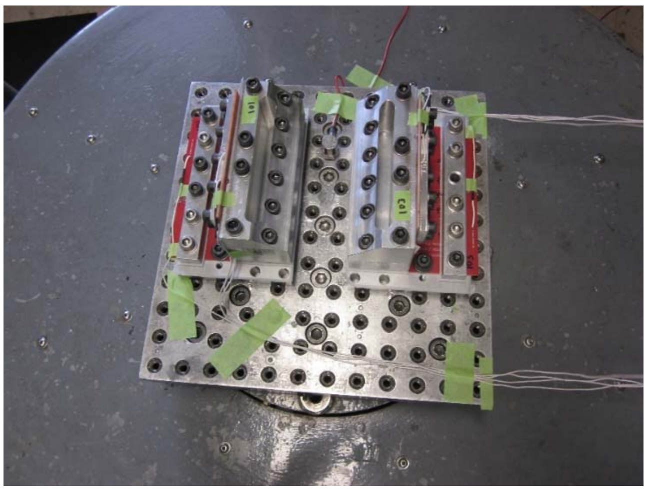

Figure 13 – Vibration
Vertical Axis

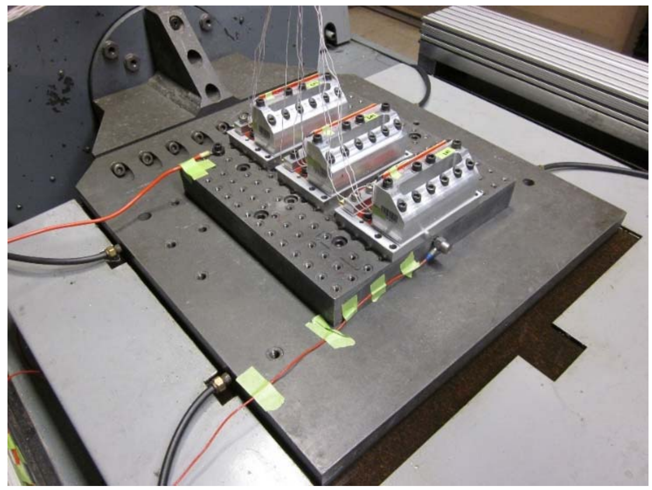

Figure 14 – Vibration
Lateral Axis

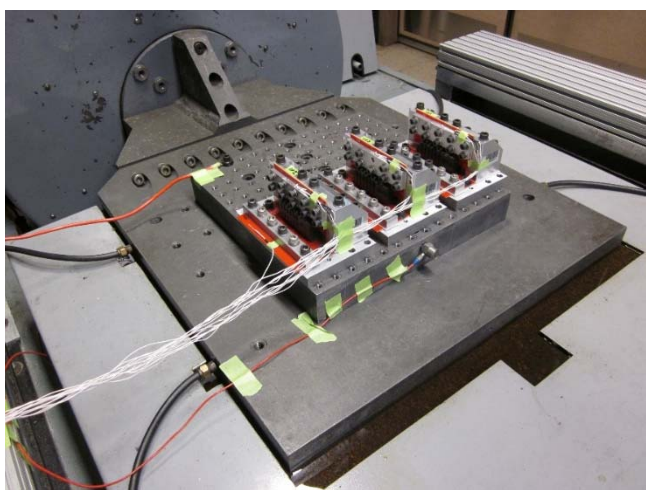

Figure 15 – Vibration
Longitudinal Axis

3.6 Shock

Shock testing was performed in accordance with VITA 47.1-2019, Section 4.5.2 (Operating Shock Class OS2) and MIL-STD-810H, Method 516.8, Procedure I, as per 108-163023, Rev. B. The parameters of this test condition are a half-sine waveform with an acceleration amplitude of 40 gravity units (g's peak) and a duration of 11 milliseconds (see Figure 16). Three shocks in each direction were applied along the three mutually perpendicular axes of the test specimens, for a total of eighteen shocks. The test specimens were monitored for discontinuities of 1 microsecond or greater using an energizing current of 100 milliamperes. See Figure 17 and Figure 18 for photographs of the test setup.

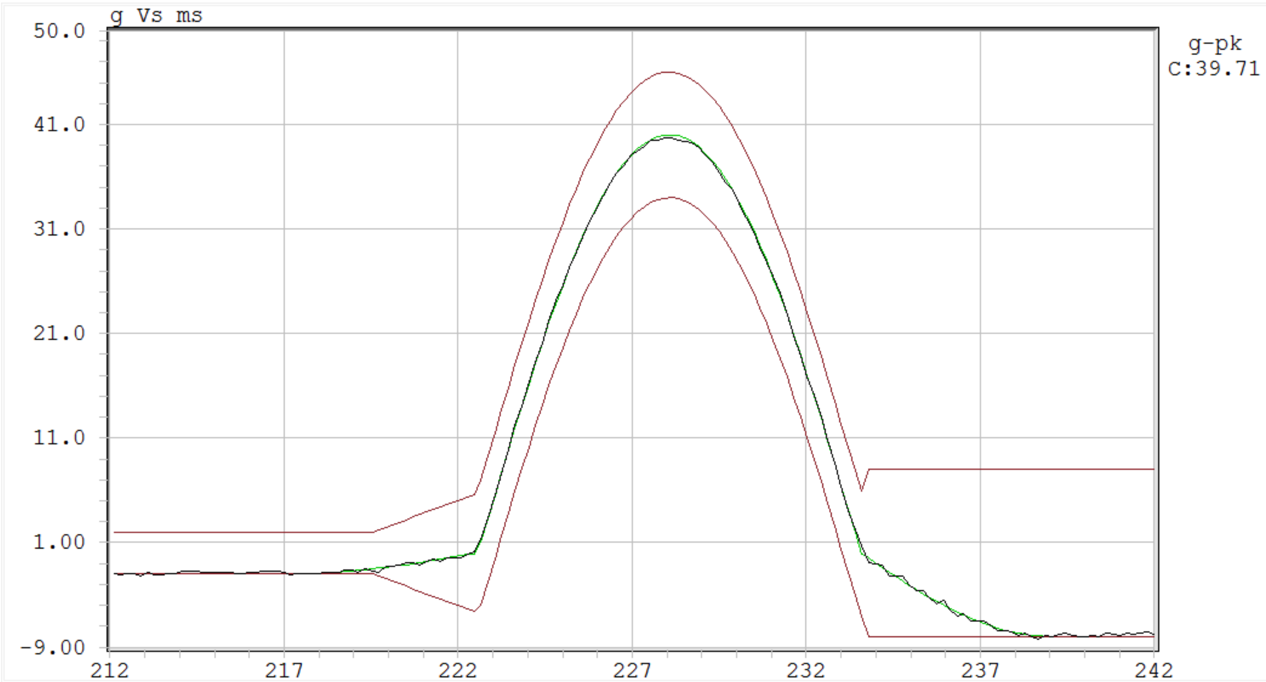

Figure 16 – Shock Pulse Profile

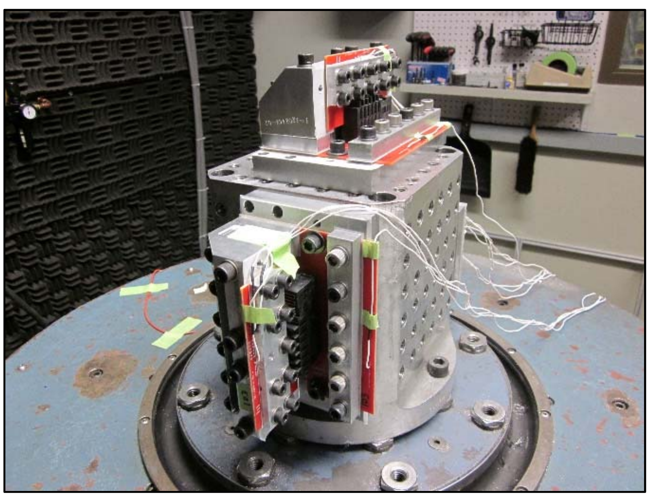

Figure 17 – Shock
Vertical and Longitudinal Axes

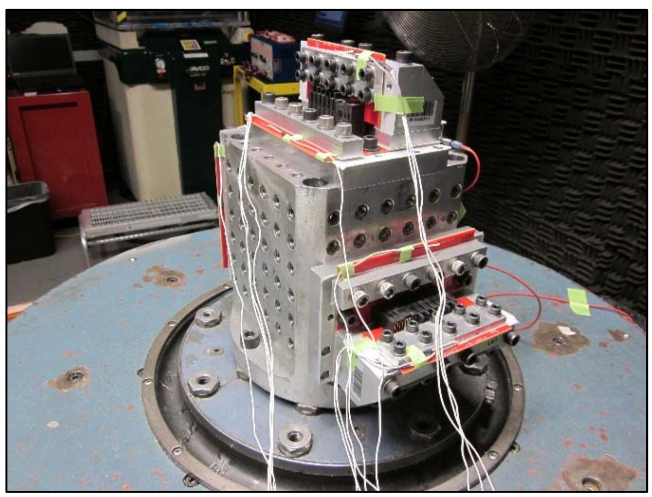

Figure 18 – Shock
Vertical and Lateral Axes

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3.7 Durability

Durability testing was performed in accordance with VITA 47.1-2019, Section 4.1.4 as per 108-163023, Rev. B. The daughter card connector was mounted to a right angle plate secured to the top of an automated durability test system. The corresponding backplane connector was secured to an floating X-Y-R table mounted to the base of the durability test system. Each connector was fully mated and unmated for 250 cycles at a rate of 500 cycles per hour. See Figure 19 and Figure 20 for photographs of the test setup.

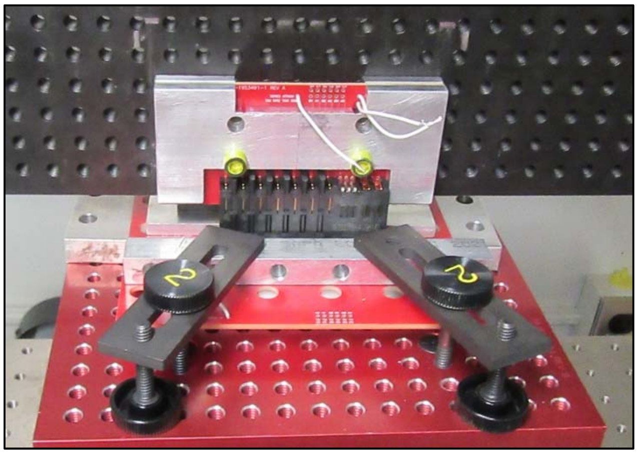

Figure 19 – Durability Test Setup

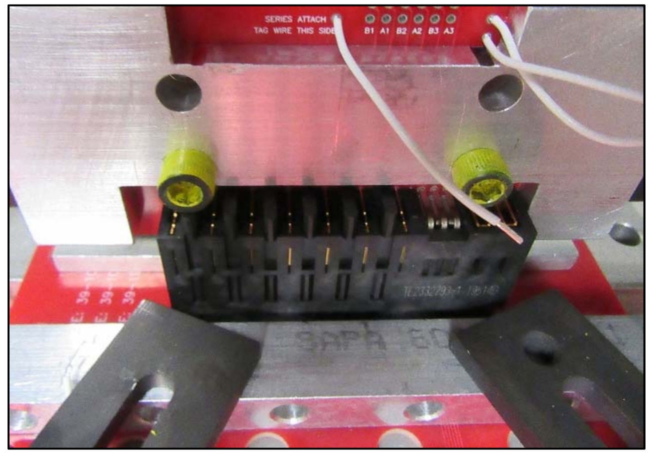

Figure 20 – Durability Test Setup

3.8 Operating Temperature

Operating Temperature testing was performed in accordance with VITA 47.1-2019, Section 4.1.2, Class CC4, and MIL-STD-810H, Methods 501.7 and 502.7, Procedure II, as per 108-163023, Rev. B. Mated specimens were subjected to temperature extremes of 85°C and -40°C for a minimum duration of 3 hours per extreme. At the conclusion of each 3 hour exposure duration, Insulation Resistance and Dielectric Withstanding Voltage testing was performed while at temperature.

3.9 Non-Operating Temperature

Non-Operating Temperature testing was performed in accordance with VITA 47.1-2019, Section 4.2, Class C4, and MIL-STD-810H, Methods 501.7 and 502.7, Procedure I, as per 108-163023, Rev. B. Mated specimens were subjected to temperature extremes of 105°C and -55°C for a minimum duration of 3 hours per extreme. At the conclusion of each 3 hour exposure duration, Insulation Resistance and Dielectric Withstanding Voltage testing was performed after the specimens had returned to room ambient conditions.

3.10 Humidity

Humidity testing was performed in accordance with VITA 47.3-2019, Section 4.7 and MIL-STD-810H, Method 507.6, Procedure II, as per 108-163023, Rev. B. The mated specimens were first preconditioned for 24 hours at a temperature of 23 ±2 °C and 50 ±5 percent RH prior to starting the humidity test. The mated specimens were then placed inside a simulated plug-in unit enclosure with drain holes (see Figure 21) and subjected to 10 humidity-temperature cycles. Each cycle consisted of a 24-hour cycle ranging from 30 to 60 ºC with humidity of 95 ±4 percent as indicated in Figure 22. At the end of cycle 5 and cycle 10, Insulation Resistance measurements were recorded while the specimens were in the humidity chamber at high humidity conditions. Upon completion of the exposure, the Insulation Resistance was again measured following a 24-hour ambient conditioning period.

3.10 Humidity (cont.)

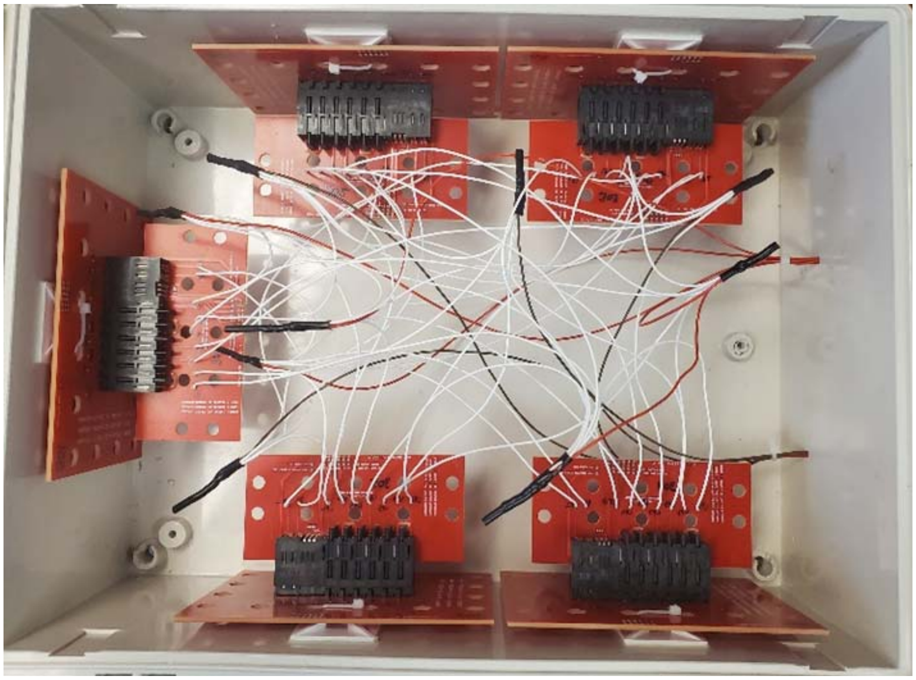

Figure 21 – Specimens Secured in Simulated Plug-In Unit Enclosure (Shown Without Enclosure Lid)

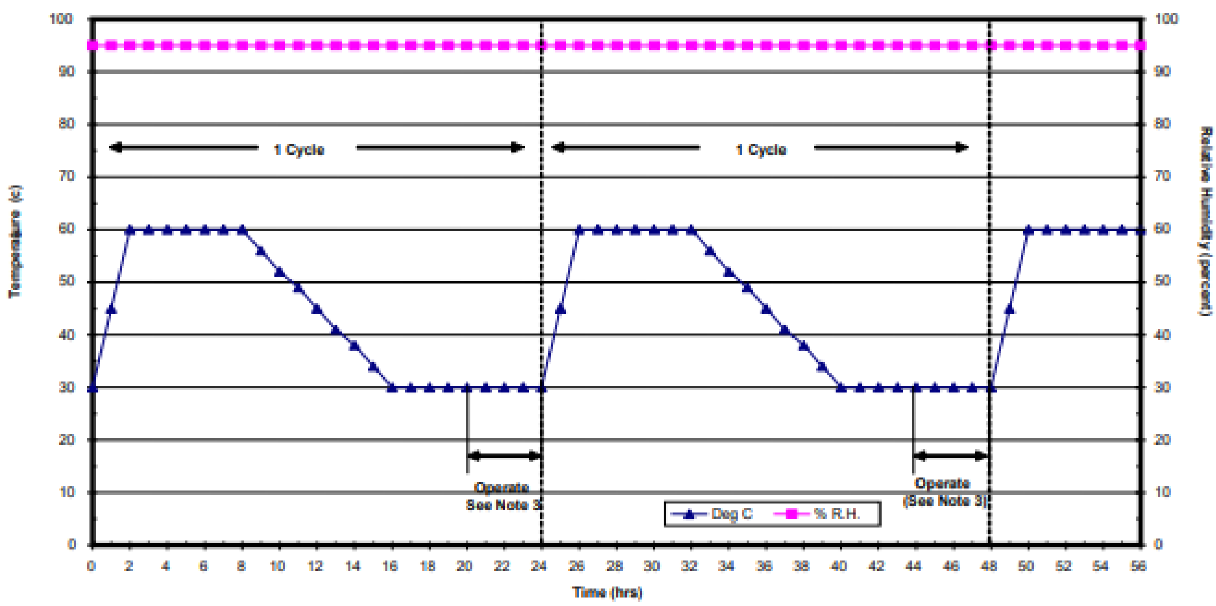

Figure 22 – Aggravated Temperature-Humidity Cycle (from MIL-STD-810H Figure 507.6-7)

3.11 Altitude

Altitude testing was performed in accordance with VITA 47.1-2019, Section 4.8, with the exception that the altitude was specified at 70,000 feet, and MIL-STD-810H, Methods 500.6, Procedure II, as per 108-163023, Rev. B. The mated specimens were wired in parallel to facilitate electrical testing of all specimens simultaneously and placed inside the altitude chamber. The pressure inside the chamber was then reduced to a simulated altitude of 70,000 feet. Following a 2-minute stabilization at altitude, the specified test potential was applied between circuits at a rate of 500 volts per second, and maintained for a period of 60 seconds. See Figure 23 and Figure 24 for photographs of the test setup.

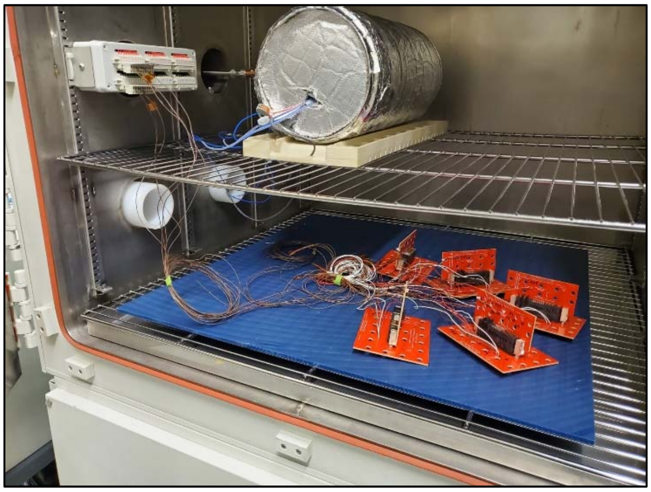

Figure 23 – Altitude Chamber Test Setup

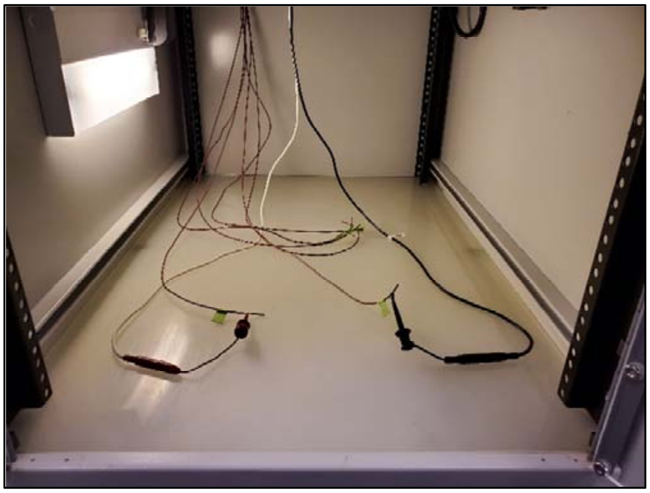

Figure 24 – Dielectric Analyzer Test Setup

3.12 Rapid Decompression

Rapid Decompression testing was performed in accordance with VITA 47.1-2019, Section 4.9, with the exception that the decompression was specified at take place from 8,000 feet to 70,000 feet in up to 4 minutes, and MIL-STD-810H, Methods 500.6, Procedure III, as per 108-163023, Rev. B. The mated specimens were wired in parallel to facilitate electrical testing of all specimens simultaneously and placed inside the altitude chamber. The pressure inside the chamber was then reduced to a simulated altitude of 8,000 feet. Following stabilization at 8,000 feet altitude, the specified test potential was applied between circuits at a rate of 500 volts per second. The pressure inside the chamber was then further reduced to a simulated altitude of 70,000 feet in approximately 2 minutes. The specified test potential was maintained through the decompression to high altitude, and for an additional 10 minutes following stabilization at 70,000 feet. See Figure 23 and Figure 24 for photographs of the test setup.

3.13 Corrosion Resistance

Corrosion Resistance testing was performed in accordance with VITA 47.1-2019, Section 4.6.2 and MIL-STD-810H, Method 509.7, as per 108-163023, Rev. B. The mated specimens were placed inside a simulated plug-in unit enclosure with drain holes (see Figure 25) and subjected to 500 hours of a salt fog exposure. Upon completion of the exposure, the enclosure was placed on a cart in the salt fog room to dry with no rinsing. The chamber operating parameters were as follows:

Salt Fog Chamber Operating Parameters:

- Chamber Temperature: 35°C.
- Aeration Tower temperature: 48°C.
- 5% Brine Solution Purity: Sodium Chloride with no more than .3% impurities.
- Aeration Tower Pressure: 22 PSI.
- Brine Solution pH Range: 6.5 to 7.2.
- Specific Gravity Range: 1.031 to 1.038.
- Collection rate: .5 to 3ml per hour.

Table 1 – Salt Fog Chamber Collection Data

DATE	TECHNICIAN	TOTAL HOURS	AIR PRESSURE	COLLECTION TOTAL (ml)		COLLECTION RATE (ml/hr)		PH		SPECIFIC GRAVITY		SOLUTION TEMP (°C)		COMMENTS
				L	R	L	R	L	R	L	R	L	R	
5/22/2020	ZUVICH	166	22	243	207	1.46	1.25	6.51	6.53	1.036	1.036	24.6	25.2	5/12/20 to 5/19/20
5/27/2020	ZUVICH	168	22	232	210	1.38	1.25	6.55	6.57	1.037	1.034	25.1	25.1	5/19/20 to 5/26/20
6/3/2020	ZUVICH	168	22	250	248	1.49	1.48	6.51	6.53	1.035	1.035	24.8	24.9	5/26/20 to 6/2/20

3.14 Sand and Dust

Sand and Dust testing was performed in accordance with VITA 47.3-2019, Section 4.15 and MIL-STD-810H, Method 510.7, Procedure I (Blowing Dust) and Procedure II (Blowing Sand), as per 108-163023, Rev. B. Testing was performed by E-Labs Incorporated in Fredericksburg, Virginia.

The Procedure I Blowing Dust testing was performed by first placing the specimens inside a simulated plug-in unit enclosure with drain holes (see Figure 25), then placing the enclosure, mounted vertically on a test frame (see Figure 26), inside the dust chamber with the front of the enclosure facing the airflow (see Figure 27). The chamber temperature was set to 23°C and allowed to stabilize. A GN_2 purge was fed into the chamber to maintain the humidity level below 30%. The air speed was adjusted to 8.9 meters per second, and the dust feed adjusted to deliver 10.6 grams per cubic meter of chamber volume. The enclosure was exposed to the blowing dust in this orientation for 3 hours. Upon completion of the first 3-hour exposure, the enclosure was rotated 180° with the back now facing the airflow (see Figure 28) and exposed to a second 3 hours at the conditions noted above, for a total exposure time of 6 hours.

The Procedure II Blowing Sand testing was performed by first placing the specimens inside a simulated plug-in unit enclosure with drain holes (see Figure 25), then placing the enclosure, mounted vertically on a test frame (see Figure 26), inside the sand chamber with the front of the enclosure facing the airflow (see Figure 29). The chamber temperature was set to 85°C and allowed to stabilize. The air speed was adjusted to 18.8 meters per second, and the sand feed adjusted to deliver 2.2 grams per cubic meter of chamber volume. The enclosure was exposed to the blowing sand in this orientation for 1.5 hours. Upon completion of the first 1.5-hour exposure, the enclosure was rotated 180° with the back now facing the airflow (see Figure 30) and exposed to a second 1.5 hours at the conditions noted above, for a total exposure time of 3 hours.

3.14 Sand and Dust (cont.)

Figure 25 – Specimens Secured In Simulated Plug-In Unit Enclosure

Figure 26 – Simulated Plug-In Unit Enclosure Secured to Test Frame

Figure 27 – Enclosure In Dust Chamber Orientation 1

Figure 28 – Enclosure in Dust Chamber Orientation 2

3.14 Sand and Dust (cont.)

Figure 29 – Enclosure In Sand Chamber Orientation 1

Figure 30 – Enclosure in Sand Chamber Orientation 2

3.15 Fluid Contamination

Fluid Contamination testing was performed in accordance with VITA 47.3-2019, Section 4.17 and MIL-STD-810H, Method 504.3, Procedure I, as per 108-163023, Rev. B. The mated specimens were subjected to immersion in the following sequence of fluids:

- Jet Fuel, JP8 – Intermittent Contamination
- Isopropyl Alcohol, TT-I-735 – Occasional Contamination
- Electronic Coolant Polyalphaolefin (PAO), MIL-PRF-87252 – Intermittent Contamination
- Jet Fuel, JP8 – Intermittent Contamination

The specimens were placed into a container filled with jet fuel (JP-8) until the specimens were fully immersed. After 8 hours of exposure, the specimens were removed from the jet fuel and allowed to drain/dry for 16 hours. The specimens were then immersed in isopropyl alcohol (TT-I-735) by for 5 minutes, and then allowed to dry for 8 hours. The specimens were next placed into a container filled with electronic coolant (MIL-PRF-87252) until the specimens were fully immersed. After 8 hours of exposure, the specimens were removed from the coolant and allowed to drain/dry for 16 hours. Visual inspection was done after drying. The specimens were then immersed in isopropyl alcohol (TT-I-735) by for 5 minutes, and then allowed to dry for 8 hours. A visual inspection of the specimens was performed following each drying cycle. See Figure 31 and Figure 32 for photographs of the test setup.

3.15 Fluid Contamination (cont.)

Figure 31 – Fluid Contamination Immersion

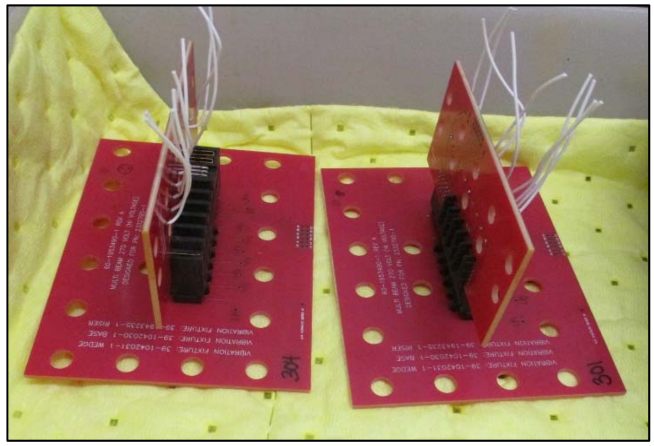

Figure 32 – Fluid Contamination Drying

3.16 Temperature Cycling

Temperature Cycling testing was performed in accordance with VITA 47.1-2019, Section 4.3, Class C4, and MIL-STD-202H, Method 107, as per 108-163023, Rev. B. The mated specimens were exposed to 500 cycles of the following test conditions:

Step 1 30 Minutes at -55°C
Step 2 5 minutes maximum transfer to step 3
Step 3 30 Minutes at 105°C
Step 4 5 minutes maximum transfer to step 1

Following the final test cycle, the specimens were allowed to return to room ambient conditions.

3.17 Final Examination of Product

Final Examination of Product was performed in accordance with EIA 364-18B as per 108-163023, Rev. B. Specimens were visually examined for evidence of physical damage detrimental to product performance with the unaided eye correction to normal vision.