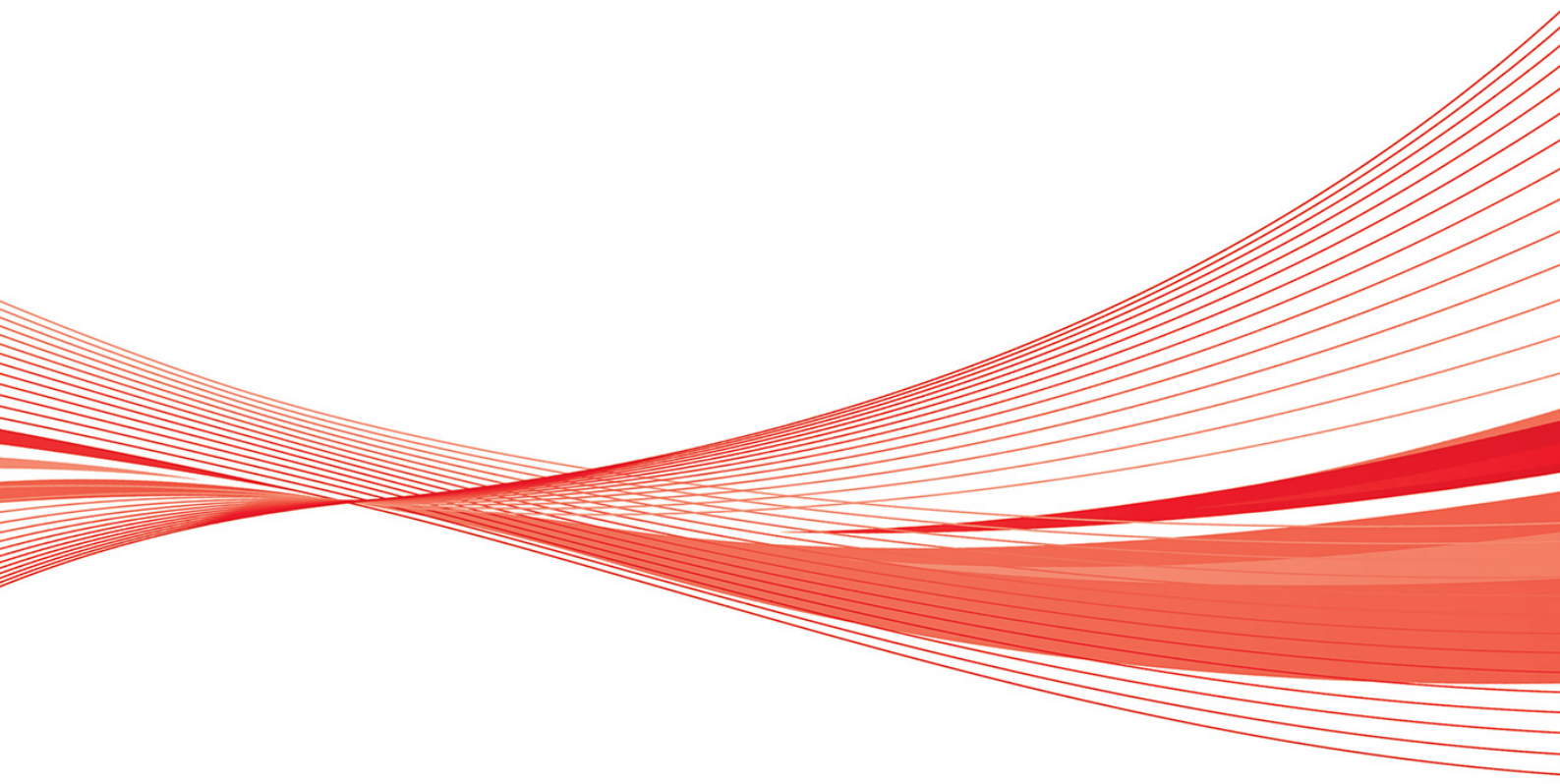
Harwin Test Report Summary

HT07203

Gecko-MT
Electrical, Mechanical & Environmental Testing



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1. Introduction

1.1. Description and Purpose

The new Gecko-MT range combines the 1.25mm pitch Gecko signal connector system with mixed technology layouts, adding 10A power contacts to the range. The smallest and lightest mixed-layout connector available for high-performance applications, Gecko is the ideal choice when SWaP matters most.

Featuring cable-to-board, board-to-board and cable-to-cable options, the initial launch includes pin-layouts of 1+8+1 or 2+8+2 contact configurations. Stainless steel jackscrews are available in both standard or reverse-fix, ensuring secure connection, and lightweight metal hoods give additional cable protection and shielding. The following tests were carried out to specify and confirm the Component Specification requirements.

1.2. Conclusion

The following data has been collated from Harwin test reports 1741, 1870, 1912, 1913, and 1917. The results were used to expand Component Specification C125XX for Gecko, to include the Gecko-MT range. The tests indicate that the Gecko-MT range performs as required to the existing G125 Component Specifications; whilst specifying the new power contacts for a usage of up to 10A current.

2. Test Method and Requirements

2.1. Specification Parameters

Tests were either carried out in general accordance with EIA-364 standards and BS EN 60068. The list of tests covered in this summary are as follows:

2.2. List of Connectors

The following components/connectors are used throughout the testing:

- G125-0500005 – Female Power Crimp Contact
- G125-0700005 – Female Power PCB Throughboard Contact (piece part)
- G125-1500005 – Male Power Crimp Contact
- G125-1600005 – Male Power PCB Throughboard Contact (piece part)
- G125-22496F1-01-08-01 – Female Cable Housing, 1+8+1 configuration, standard fixing
- G125-22496F2-02-08-02 – Female Cable Housing, 2+8+2 configuration, reverse fixing
- G125-32496M1-01-08-01 – Male Cable Housing, 1+8+1 configuration, standard fixing
- G125-32496M3-02-08-02 – Male Cable Housing, 2+8+2 configuration, reverse fixing
- G125-FV10805F1-1AB1ABP – Female Vertical Throughboard, 1+8+1 configuration, standard fixing
- G125-FV10805F3-2AB2ABP – Female Vertical Throughboard, 2+8+2 configuration, reverse fixing
- G125-MH10805M3-2AD2ADP – Male Horizontal Throughboard, 2+8+2 configuration, reverse fixing
- G125-MH10805M4-1AD1ADP – Male Horizontal Throughboard, 1+8+1 configuration, standard fixing

3. Test Results

3.1. Contact Resistance to EIA-364-06C: 1999

Specification: 20mΩ max. per contact (initial), 25mΩ max. per contact (post conditioning).

Methodology: Power contacts on each connector were measured for resistance prior to any electrical, mechanical or environmental testing. The mated connector pairing was wired in series using G125-0500005 / G125-1500005 and G125-0700005 / G125-1600005 contacts. 200mm lengths of 26AWG and 18AWG wire and custom PCBs were used to complete the circuit. The total resistance of the complete circuit was measured, the resistance of the wires and PCB was measured separately and subtracted from the results.

Connector Assembly Initial Resistance				
Test Setup	Connector Assembly Part Numbers		Connector Resistance (mΩ)	
			Total	Per Contact
1	G125-22496F1-01-08-01	G125-32496M1-01-08-01	3.11	1.56
2	G125-22496F1-01-08-01	G125-MH10805M4-1AD1ADP	1.75	0.88
3	G125-FV10805F1-1AB1ABP	G125-MH10805M4-1AD1ADP	0.59	0.30
4	G125-22496F2-02-08-02	G125-32496M3-02-08-02	7.10	1.78
5	G125-32496M3-02-08-02	G125-FV10805F3-2AB2ABP	6.30	1.58
6	G125-FV10805F3-2AB2ABP	G125-MH10805M3-2AD2ADP	4.03	1.01

Contact resistance was then measured on samples post-conditioning and power testing. The results below are an average of the six test setups detailed above.

Connector Assembly Initial Resistance									
Test			Test Setup						Average
			1	2	3	4	5	6	
Initial		Total	3.11	1.75	0.59	7.10	6.30	4.03	-
		Per contact	1.56	0.88	0.30	1.78	1.58	1.01	1.18
Durability (No power)		Total	3.60	*	*	*	*	*	*
		Per Contact	1.55	*	*	*	*	*	*
Temp Life	96hrs	Total	3.10	1.95	0.57	9.30	5.50	4.60	-
		Per contact	1.55	0.98	0.29	2.33	1.38	1.15	1.28
	250hrs	Total	3.89	2.39	0.60	7.50	17.20	-	-
		Per contact	1.95	1.20	0.30	1.88	4.30	-	1.92
	1000hrs	Total	6.45	3.80	2.38	10.30	21.10	9.00	-
		Per contact	3.23	1.90	1.19	2.58	5.28	2.25	2.74
Thermal Shock		Total	1.98	2.24	0.42	5.20	7.20	5.62	-
		Per contact	0.99	1.12	0.21	1.30	1.80	1.41	1.14
Salt Spray		Total	2.15	2.84	1.04	5.50	5.50	10.70	-
		Per contact	1.08	1.42	0.52	1.38	1.38	2.68	1.41
Humidity	96hrs	Total	1.86	-	0.92	-	4.91	-	-
		Per contact	0.93	-	0.46	-	1.23	-	0.87
	1344hrs	Total	-	14.58	-	25.80	-	16.99	-
		Per contact	-	7.29	-	6.45	-	4.25	6.00

* Durability test setups 2-6 differed from power samples listed in the table. Measurements from the further 5 durability samples were taken with no change noted.

Contact resistance was also measured on a single contact pairing without wiring before and after mechanical insertion/withdrawal of 1500 cycles. The results below are the max, min and averages of five different contact pairs.

Contact Resistance – Post-Durability				
Contact Pair	Contact Conditioning	Maximum (mΩ)	Minimum (mΩ)	Average (mΩ)
G125-1500005 & G125-0500005	Initial	0.93	0.83	0.88
	Post-Cycling (1500 cycles)	2.70	1.20	1.96

3.2. Power Rating (Current versus Temperature Rise) to EIA-364-70A: 1998

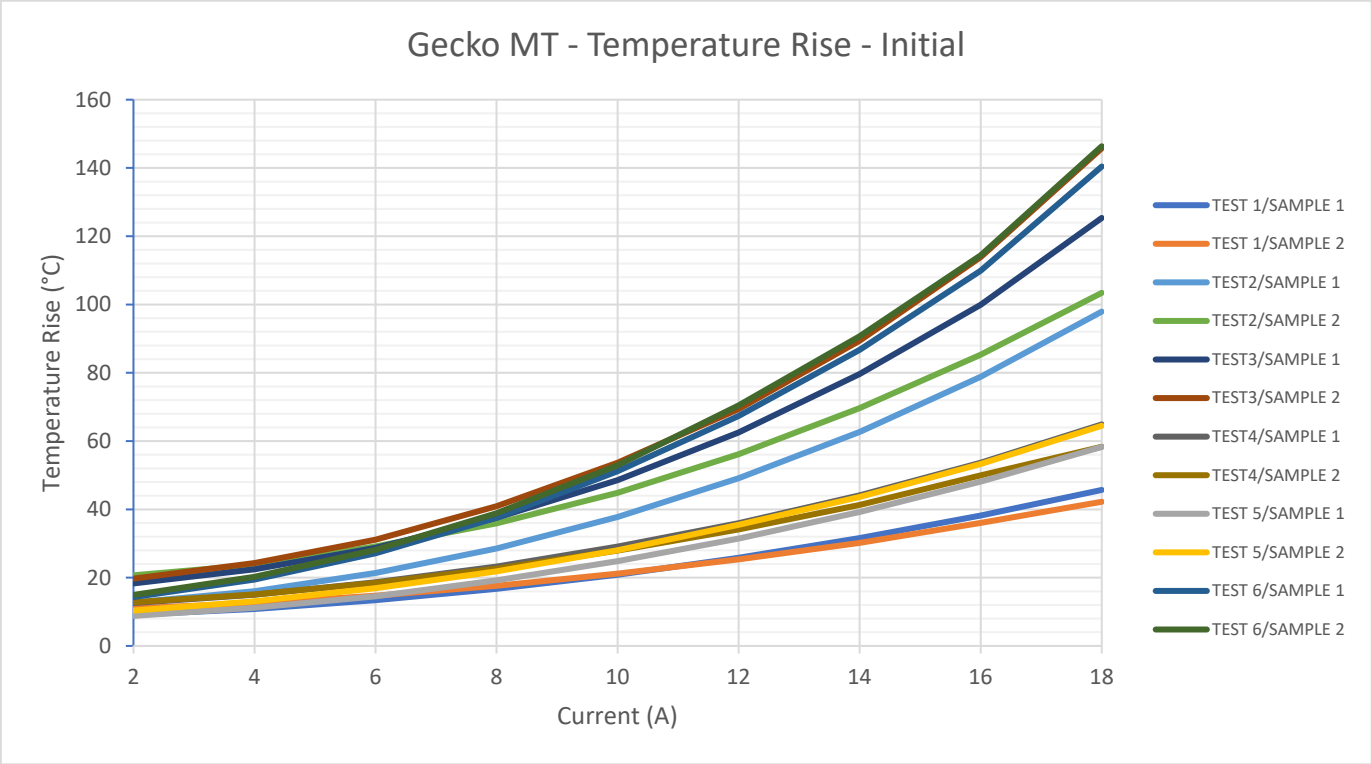
Specification: Current Rating (when all contacts are electrically loaded) = Power - 10.0A max. Signal - 2.0A max.

Methodology: The test demonstrates the current carrying capability of the Gecko-MT connector system, both pre and post-environmental conditioning and is carried out in accordance with EIA-364-70A, Method 2. The mated connector pairing was wired with two series circuits, one circuit running through the power contacts and the other through the signal contacts. To complete the circuit 200mm lengths of 26AWG and 18AWG wire and custom PCBs were used.

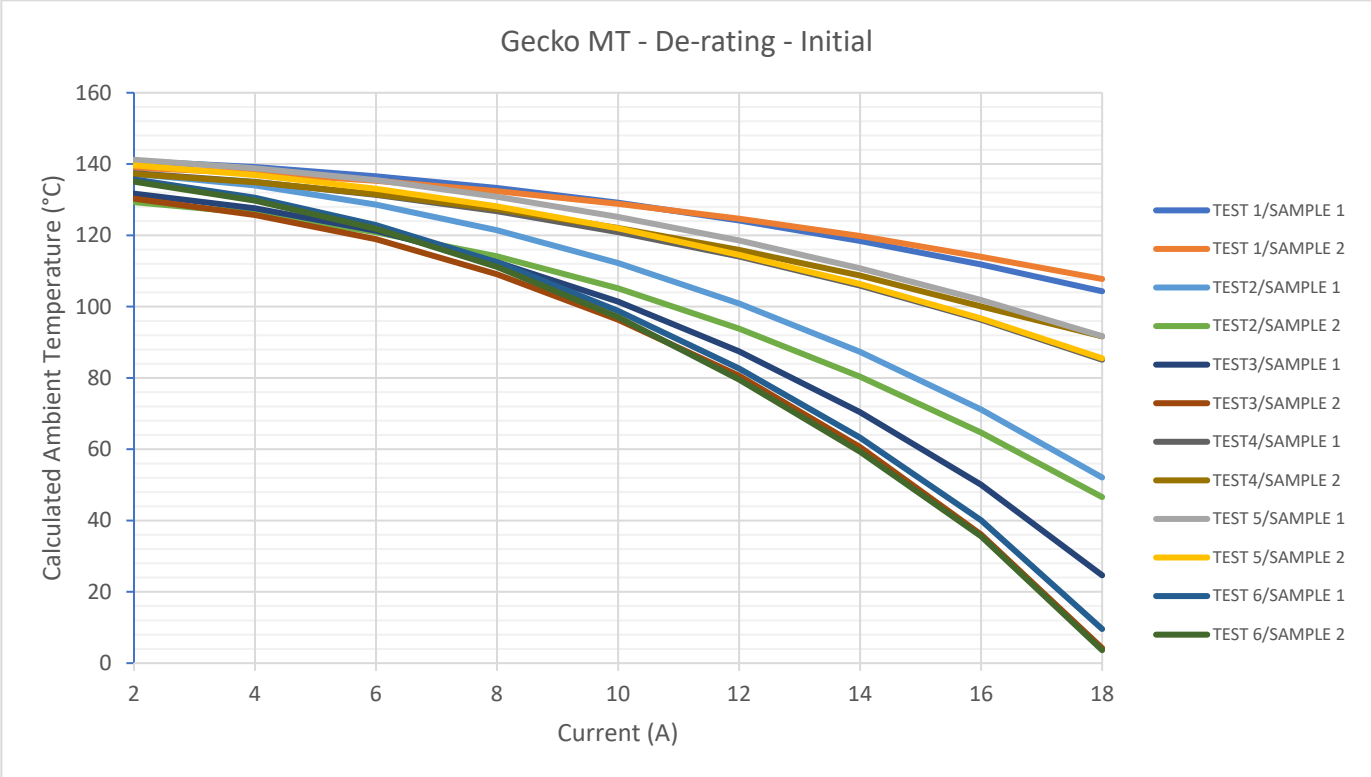
2A increments were applied to the power contacts and the temperature rise above ambient recorded in each case. The test was performed up to 20A (at an ambient temperature of 25±2°C). 2A was then passed through the signal contacts and the temperature rise above ambient was recorded. The signal contact temperature rise was added to the power contact temperature rise to give a calculated result for the whole Gecko-MT system.

Test Setup	Connector Assembly Part Numbers	
1	G125-22496F1-01-08-01	G125-32496M1-01-08-01
2	G125-22496F1-01-08-01	G125-MH10805M4-1AD1ADP
3	G125-FV10805F1-1AB1ABP	G125-MH10805M4-1AD1ADP
4	G125-22496F2-02-08-02	G125-32496M3-02-08-02
5	G125-32496M3-02-08-02	G125-FV10805F3-2AB2ABP
6	G125-FV10805F3-2AB2ABP	G125-MH10805M3-2AD2ADP

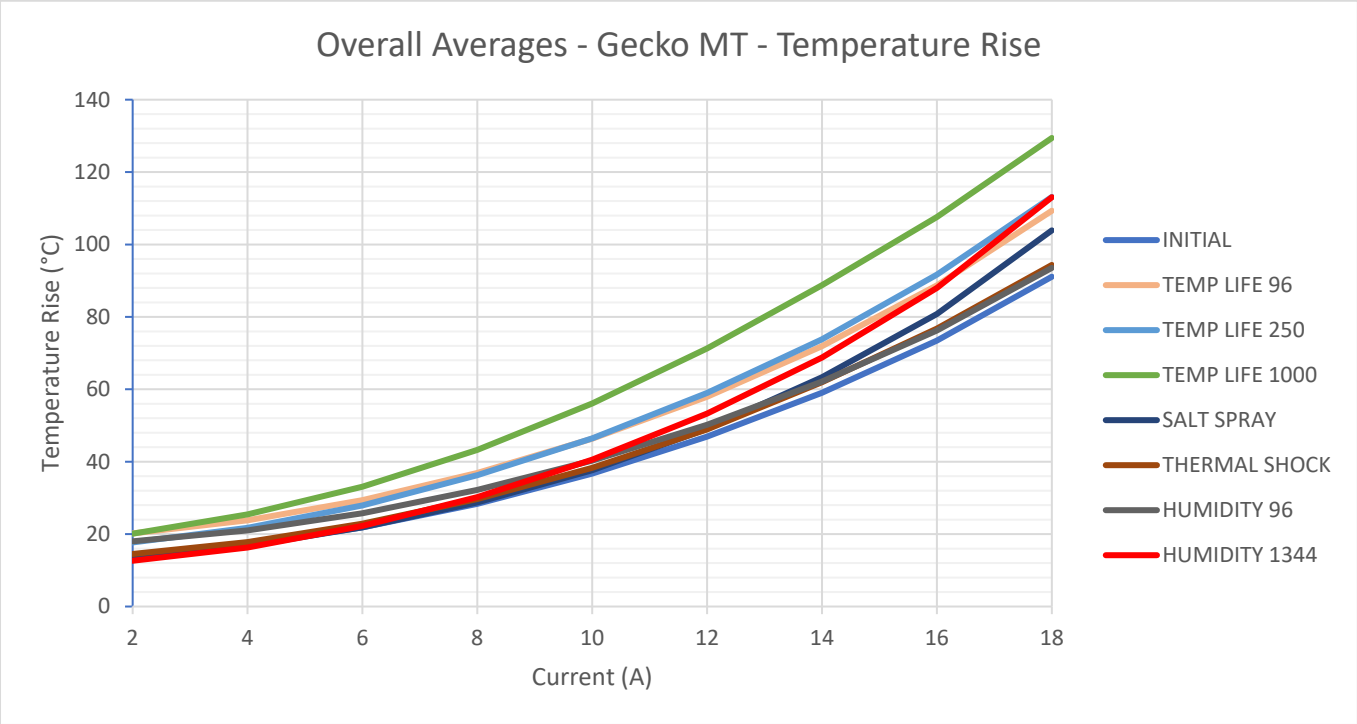
Power (Current vs Temp) – Connector Assembly									
Test Condition			Test Setup – Current (A)						Average
			1	2	3	4	5	6	
Initial		30°C rise	18	12	10	12	12	10	12
Temp Life	96hrs	30°C rise	14	10	10	12	12	8	11
	250hrs	30°C rise	8	8	8	8	8	8	8
	1000hrs	30°C rise	10	4	6	8	6	4	6
Thermal Shock		30°C rise	10	8	8	10	8	8	9
Salt Spray		30°C rise	14	8	8	12	10	8	10
Humidity	96 hrs	30°C rise	8	-	8	-	10	-	9
	1344 hrs	30°C rise	-	12	-	14	-	10	12



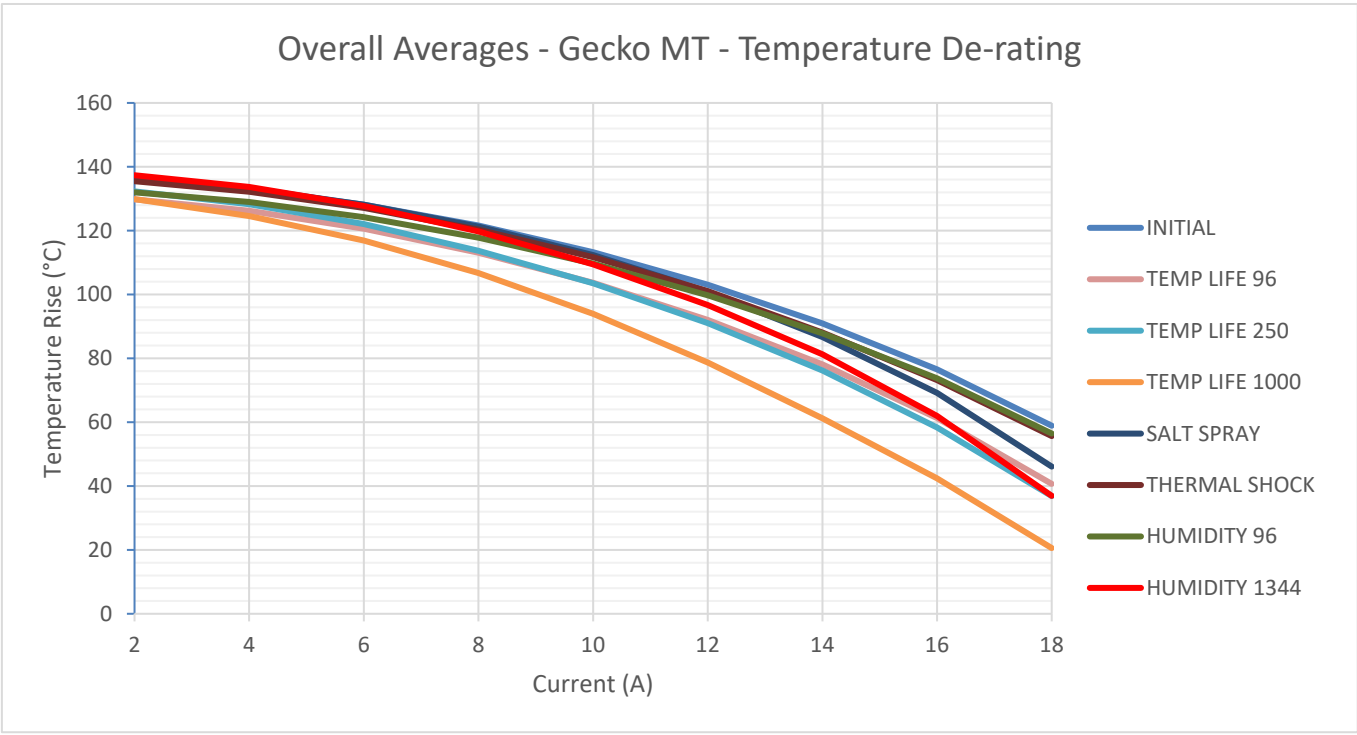
Graph 1: Initial Temperature Rise



Graph 2: Initial Temperature De-Rating



Graph 3: Post Conditioning Temperature Rise (Averages)



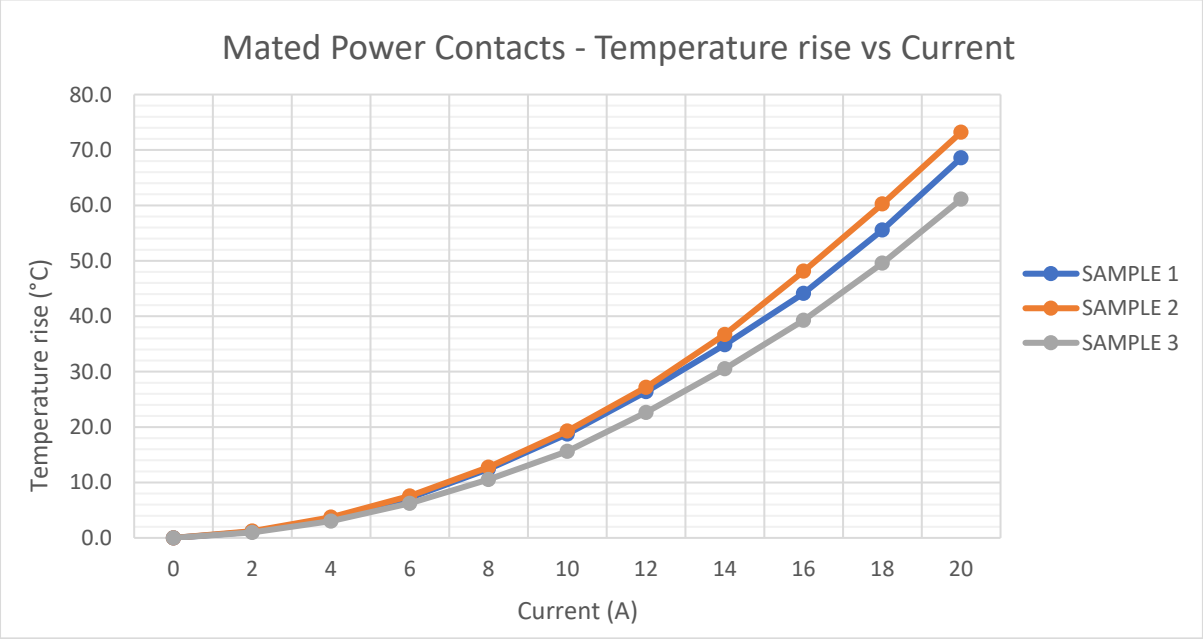
Graph 4: Post Conditioning Temperature De-rating (Averages)

3.2. Power Rating (Current versus Temperature Rise) to EIA-364-70A: 1998 Continued

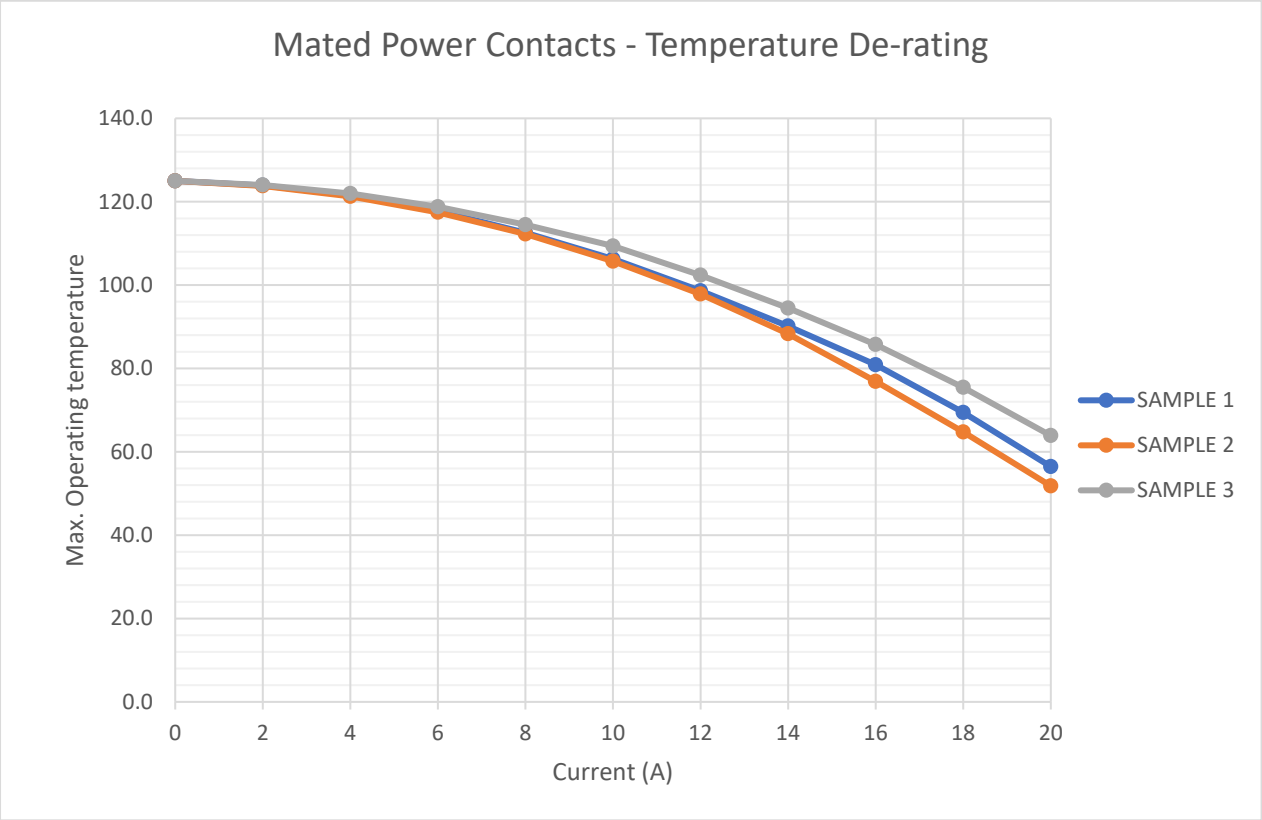
Specification: Current Rating (across mated contact pair) = Power - 10.0A max.

Methodology: To determine the thermal performance under load of individual contact pairs, power contacts G125-0500005 & G125-1500005 were mated and wired into a circuit using 200mm lengths of 18AWG wire. A current was applied across the mated pair and increased in 2A increments, with the temperature rise above ambient being recorded in each case. The test was performed up to 20A (at an ambient temperature of 25±2°C).

Power (Current vs Temp) (A) – Mated Power Contacts			
Part No.'s	**Sample No.**	**Temp. (°C)**	**Current (A)**
G125-0500005 & G125-1500005	1	30°C rise	12
	2	30°C rise	12
	3	30°C rise	14



Graph 5: Mated Power Contacts Temperature Rise



Graph 6: Mated Power Contacts Temperature De-Rating

3.3. Durability to EIA-364-09C: 1999

Specification:

- 7.0N maximum contact insertion force (per Power contact, using mating contact).
- 0.2N minimum contact withdrawal force (per Power contact, using mating contact).
- 1000 Mechanical Operations.

Methodology: For this test, both individual power contacts and fully-assembled connector pairs were mated at a speed of 25.4mm/min for 1500 cycles, in accordance with EIA-364-09C. Fully assembled connectors were tested using crimp-to-crimp, crimp-to-board, and board-to-board configurations. Post-conditioning samples were also cycled on the force gauge to compare the effect certain conditions have on insertion and withdrawal forces over 1500 cycles.

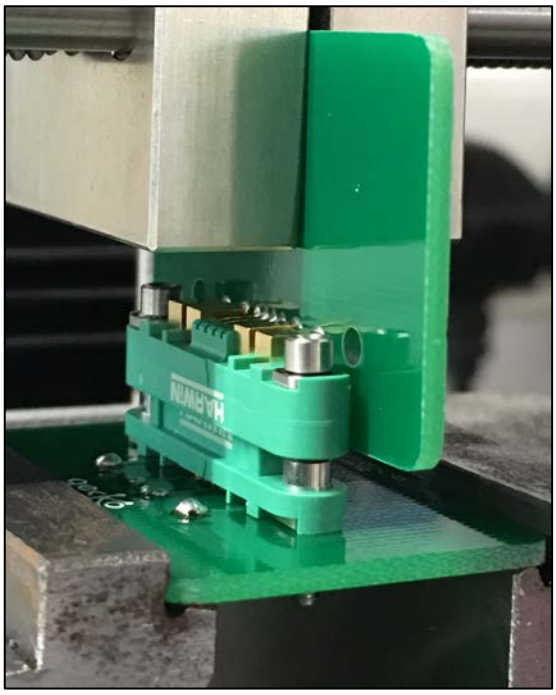
Connector forces displayed are averages taken from multiple samples in each test set-up. Inspection of the contact plating was performed post-cycling, and little contact wear was observed.

Durability – Single Power Contact Insertion Forces (N)					
Contact Part No.	Initial	Maximum	Minimum	Final	Average
G125-0500005 & G125-1500005	3.09	4.59	1.90	3.50	3.25
G125-0500005 & G125-1600005	2.18	4.42	1.02	3.24	2.77
G125-0700005 & G125-1500005	1.69	4.06	1.14	2.69	2.26
G125-0700005 & G125-1600005	2.04	4.38	1.12	2.85	2.47
				Average	**2.69**
Durability – Single Power Contact Withdrawal Forces (N)					
Contact Part No.	Initial	Maximum	Minimum	Final	Average
G125-0500005 & G125-1500005	1.11	4.85	0.90	3.11	2.32
G125-0500005 & G125-1600005	0.87	3.98	0.39	2.67	1.91
G125-0700005 & G125-1500005	1.06	4.28	0.45	2.63	2.00
G125-0700005 & G125-1600005	1.63	4.83	0.50	3.40	2.57
				Average	**2.20**

Average insertion and withdrawal forces for the post-conditioned samples compared against the initial samples are detailed below:

Durability – Post-Conditioning Connector Insertion Forces					
Conditioning Test		Average Connector Insertion Forces (N)			
		Initial	Maximum	Final	Average
Initial		17.57	37.41	34.82	29.93
Temperature Life	96 hours	13.08	28.21	27.78	23.02
	250 hours	13.13	25.54	24.57	21.08
	1000 hours	18.87	27.42	18.51	21.60
Thermal Shock		13.98	36.54	13.76	21.43
Salt Spray		18.83	44.71	17.48	27.01
Humidity	96 hours	15.43	43.78	43.33	34.18
	1344 hours	14.13	36.32	32.25	27.57

Durability – Post-Conditioning Connector Withdrawal Forces					
Conditioning Test		Average Connector Withdrawal Forces (N)			
		Initial	Maximum	Final	Average
Initial		8.21	21.71	15.04	14.98
Temperature Life	96 hours	8.49	17.60	12.17	12.75
	250 hours	8.71	15.91	11.43	12.02
	1000 hours	9.05	16.52	14.83	13.46
Thermal Shock		10.81	25.33	18.32	18.15
Salt Spray		11.72	30.37	20.18	20.75
Humidity	96 hours	12.40	26.96	21.73	20.36
	1344 hours	7.29	19.99	13.61	13.63



Figures 1 & 2: Examples of the test setups for board-to-board durability testing using an automatic force gauge (HWN 4162).

3.4. Temperature Life (without load) to EIA-364-17B: 1999

Specification: Operating temperature = -65°C to +150°C

Methodology: The test was carried out to EIA-364-17B, condition 10, method A; mated pairs of connectors were subjected to 96 hours, 250 hours and 1000 hours at 150±5°C. The change in contact resistance must be less than 10mΩ, and the connectors must show no evidence of physical damage.

Samples were also inspected post-conditioning for any significant visual changes.

Assembly No.	Duration in Temperature Testing Oven		
	96hrs @ +150°C	250hrs @ +150°C	1000hrs @ +150°C
G125-22496F1-01-08-01	Pass	Pass	Pass
G125-22496F1-02-08-02	Pass	Pass	Pass
G125-22496F2-01-08-01	Pass	Pass	Pass
G125-22496F2-02-08-02	Pass	Pass	Pass
G125-32496M1-01-08-01	Pass	Pass	Pass
G125-32496M1-02-08-02	Pass	Pass	Pass
G125-32496M3-01-08-01	Pass	Pass	Pass
G125-32496M3-02-08-02	Pass	Pass	Pass
G125-FV10805F1-1AB1ABP	Pass	Pass	Pass
G125-FV10805F1-2AB2ABP	Pass	Pass	Pass
G125-FV10805F3-1AB1ABP	Pass	Pass	Pass
G125-FV10805F3-2AB2ABP	Pass	Pass	Pass
G125-MH10805M3-1AD1ADP	Pass	Pass	Pass
G125-MH10805M3-2AD2ADP	Pass	Pass	Pass
G125-MH10805M4-1AD1ADP	Pass	Pass	Pass
G125-MH10805M4-2AD2ADP	Pass	Pass	Pass

Figure 3: Individual connectors and mated assemblies arranged within the testing oven (HWN 3592) for 96hrs, 250hrs and 1000hrs temperature life.

3.5. Contact & Insert Retention to EIA-364-05B: 1998

Specification:

- Contact Retention in Housing = 6.0N min.
- Contact Insertion in Housing = 0.5N min.
- Insert retention = 20N.

Methodology: Contact retention in the housing was tested to EIA-364-05B for both pre-conditioned and post-conditioned samples. All power contacts were removed from each assembly, measuring the force required to do so. 6 signal contacts were also removed from the assemblies; average results are displayed below.

Insert retention was tested to EIA-364-35C for both pre and post conditioned samples. Samples were loaded into the auto force gauge where an axial load of 20.0N was applied at a rate of 69kPa, this was held for 10 seconds. Samples were then visually inspected and given a pass or fail.

Contact Retention in Housing (N) – Pre-Conditioning				
Part No.	Power Contact Forces (N)			Signal Contact Forces (N)
	Max.	Min.	Average	Average
G125-22496F1-01-08-01	107.30	49.52	87.09	21.73
G125-22496F1-02-08-02	103.72	40.58	74.48	19.57
G125-22496F2-01-08-01	113.56	73.68	93.02	20.58
G125-22496F2-02-08-02	101.48	39.38	75.32	23.17
G125-32496M1-01-08-01	131.53	106.63	117.45	22.73
G125-32496M1-02-08-02	136.15	80.16	113.27	24.27
G125-32496M3-01-08-01	122.88	102.30	112.92	20.63
G125-32496M3-02-08-02	137.27	88.14	107.60	23.11
G125-FV10805F1-1AB1ABP	135.25	96.12	119.76	16.59
G125-FV10805F1-2AB2ABP	138.68	103.64	120.06	15.40
G125-FV10805F3-1AB1ABP	127.58	103.12	110.83	18.35
G125-FV10805F3-2AB2ABP	138.83	103.72	124.38	13.04
G125-MH10805M3-1AD1ADP	81.35	60.70	72.08	8.33
G125-MH10805M3-2AD2ADP	84.63	55.41	70.01	7.83
G125-MH10805M4-1AD1ADP	81.58	63.98	72.64	8.44
G125-MH10805M4-2AD2ADP	77.18	40.73	66.48	7.91
Average			96.09	16.98

Contact Retention in Housing (N) – Post-Conditioning				
Part No.	Power Contact Forces (N)			Signal Contact Forces
	Max.	Min.	Average	Average
Temperature Life – 96 hours	221.21	56.68	111.84	26.99
Temperature Life – 250 hours	135.47	60.03	95.94	29.26
Temperature Life – 1000 hours	122.36	55.93	85.56	26.19
Thermal Shock	136.67	53.10	90.70	23.68
Salt Spray	148.30	52.50	102.47	24.74
Humidity – 96 hours	145.54	49.37	105.97	26.24
Humidity – 1344 hours	148.30	51.61	106.90	25.58

Insert Retention in Housing								
Part No.	Initial	Post-Conditioning Retention Forces (Pass/Fail)						
		Temperature Life			Thermal Shock	Salt Spray	Humidity	
		96hrs	250hrs	1000hrs			96hrs	1344hrs
G125-22496F1-01-08-01	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-22496F1-02-08-02	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-22496F2-01-08-01	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-22496F2-02-08-02	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-32496M1-01-08-01	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-32496M1-02-08-02	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-32496M3-01-08-01	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-32496M3-02-08-02	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-FV10805F1-1AB1ABP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-FV10805F1-2AB2ABP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-FV10805F3-1AB1ABP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-FV10805F3-2AB2ABP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-MH10805M3-1AD1ADP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-MH10805M3-2AD2ADP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-MH10805M4-1AD1ADP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-MH10805M4-2AD2ADP	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Figure 1: Pin used for contact removal testing from PCT assembly on automatic force gauge (HWN 4162).

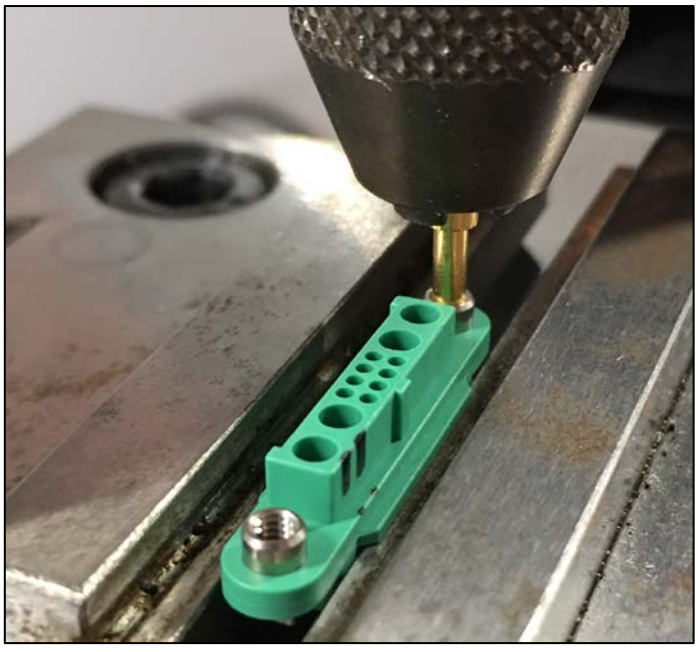


Figure 2: Insert retention testing on crimp assembly using the automatic force gauge (HWN 4162).

3.6. Crimp Strength to EIA-364-08B: 1998

Specification: 18AWG = 45N min.

Methodology: 200mm samples of 18AWG PTFE wire were crimped into their respective contacts using crimp tool Z125-903 fitted with contact locator (Z125-904). The wire was then separated from the contact at a speed of 25.4mm/min, and the force required to achieve separation of wire from contact recorded, as well as the type of separation (either wire break inside or outside of crimp area, or wire pulled out from the crimp area).

Crimp Retention Forces		
Contact Part No.	**Retention Force (N)**	
G125-0500005	Maximum	176.80
	Minimum	129.20
	Average	151.10
G125-1500005	Maximum	187.50
	Minimum	116.90
	Average	169.70
	Average	**160.40**

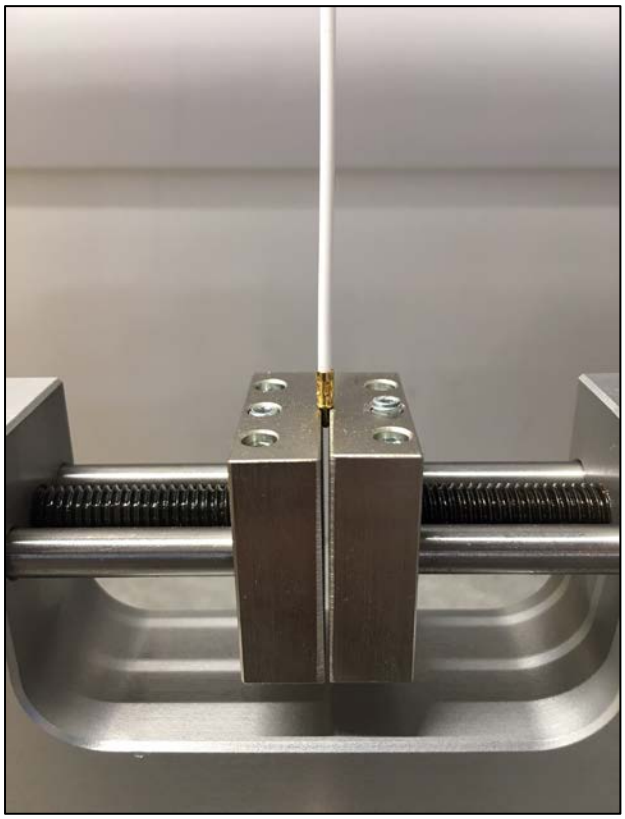


Figure 3: Male power contact crimped to 18AWG wire mounted in the automatic force gauge (HWN 4162) vice.

Figure 4: 18AWG test sample with the wire being pulled from the crimp area.

3.7. Thermal Shock (Temperature Cycling) to EIA-364-32C: 2000 & BS EN 60068-2-14: 2009

Specification: -65°C to +150°C.

Methodology: Samples were tested in general accordance with BS EN 60068-2-14: 2009 and EIA-364-32C: 2000 Test Condition 4. This test was conducted using automated transfer between climatic chambers at the two temperature extremes (-65°C to +150°C). The connectors were measured for contact resistance, power, voltage break down, insulation resistance and durability, as well as a visual inspection after testing. The were no obvious changes as a result.

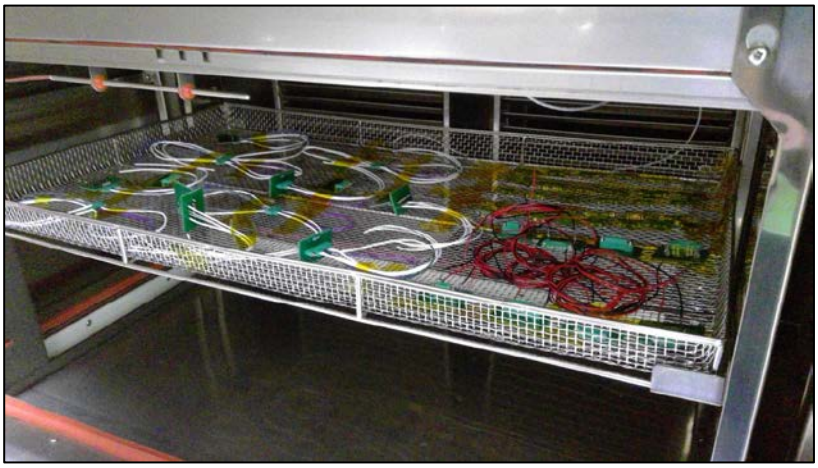


Figure 5: Samples in thermal shock chamber

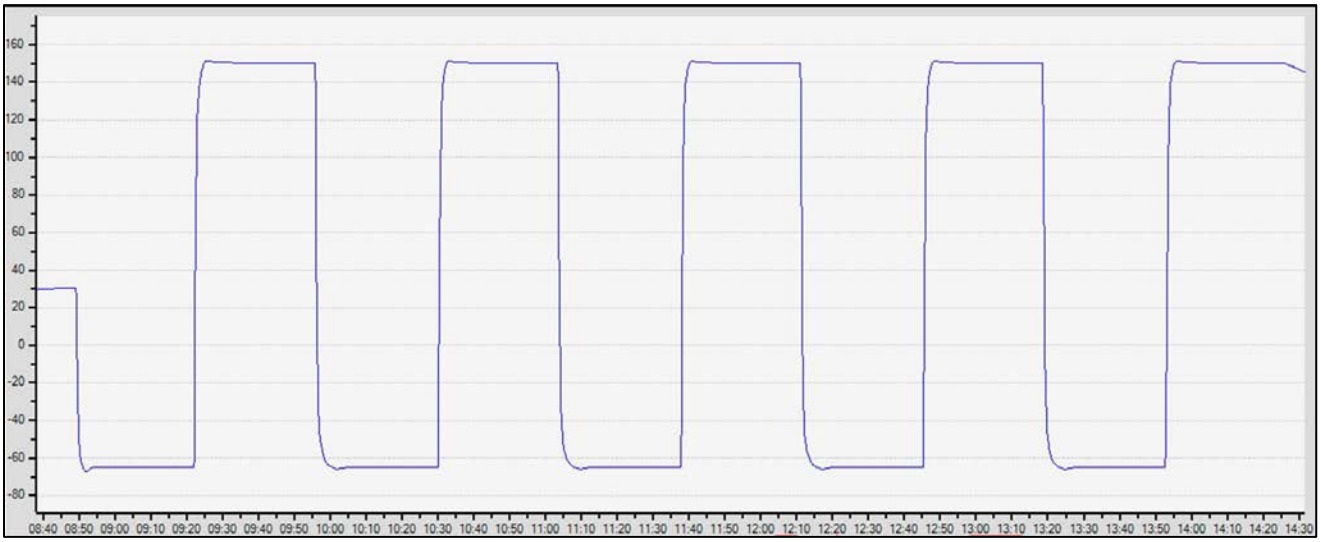


Figure 6: Chamber temperature response plot during testing

3.8. Salt Spray to EIA-364-26B: 1999 & BS EN 60068-2-11: 1999

Specification: 96hrs continuous salt spray, Salt Solution: 5% NaCl, Salt Mist Chamber Temp.: +35°C, Fallout rates: 0.5-3ml/hr, Ph level: 6.5-7.2 @ 35°C.

Methodology: Samples were tested in general accordance with BS EN 60068-2-11: 1999 Test Ka and EIA-364-26B Test Condition B. The samples were placed into the salt mist chamber for 48hrs and measured for contact resistance, power, voltage breakdown, insulation resistance and durability, as well as visual inspection post-testing. Some changes were noted during the visual inspection and insulation resistance testing (see section 3.11).

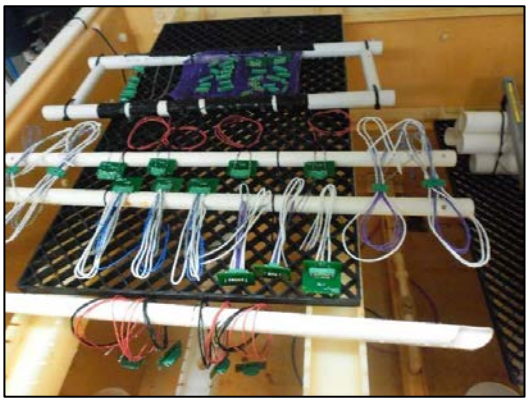


Figure 7: Samples in salt mist chamber

Figure 8: Samples after salt spray testing

3.9. Humidity to EIA-364-31B: 1999 & BS EN 60068-2-78: 2013

Specification: 24hrs pre-conditioning at +50°C, Humidity: 90-95%, Temperature: +40°C, Duration: 96hrs + 1344hrs

Methodology: Samples were tested in general accordance with BS EN 60068-2-78: 2013 Test Cab and EIA-364-31B: 1999 Method 2 Test Condition A. The samples were preconditioned for 24 hours at 50°C then suspended in a humidity chamber for 96 and 1344 hours at 40°C with 90-95% relative humidity. The connectors were measured for contact resistance, power and durability, as well as a visual inspection post-testing. There were no obvious changes as a result.

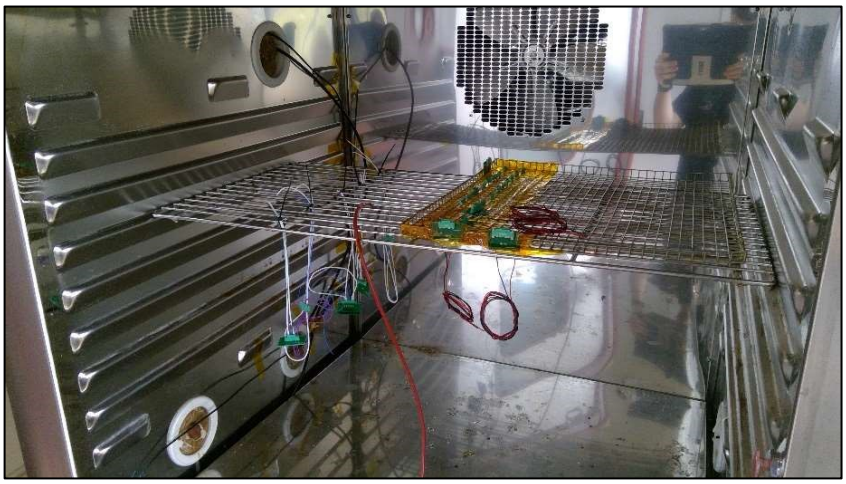


Figure 9: Samples in humidity chamber

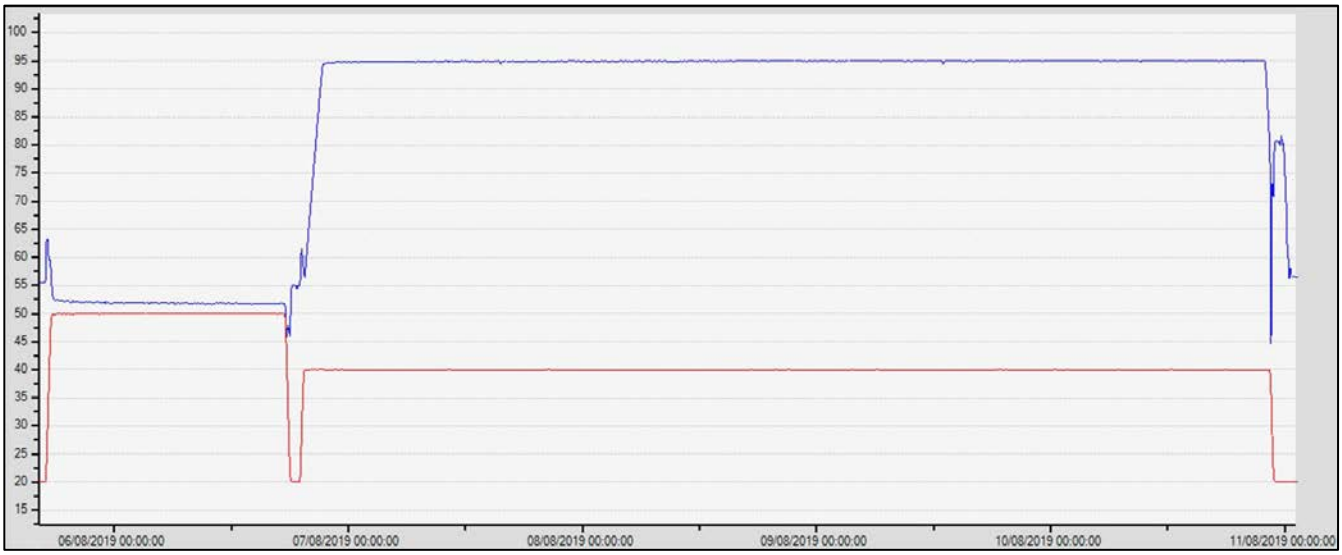


Figure 10: Humidity chamber response plot during testing

3.10. Vibration to EIA-364-28D: 1999 & BS EN 60068-2-6: 2008

Specification: 10Hz to 2kHz, 1.52mm pk-pk displacement or 20gn pk (whichever is less), 198m/s² (20G), 12 cycles per axis, 20 minutes per cycle.

Methodology: Samples were tested in general accordance with BS EN 60068-2-6: 2008 Test Fc and EIA-364-28D Test Condition 4. The samples were subjected to a Swept Sine Test with continuous monitoring at ≥1 microsecond. During testing in Axis 1 and 3, triggers were noted on the white cable output of sample S4; no triggers were noted during Axis 2. No triggers were noted on any other sample during the test process. Upon completion of testing the samples were visually inspected, no obvious changes to the samples were noted. Each sample was subjected to voltage breakdown and insulation resistance tests post-vibration.

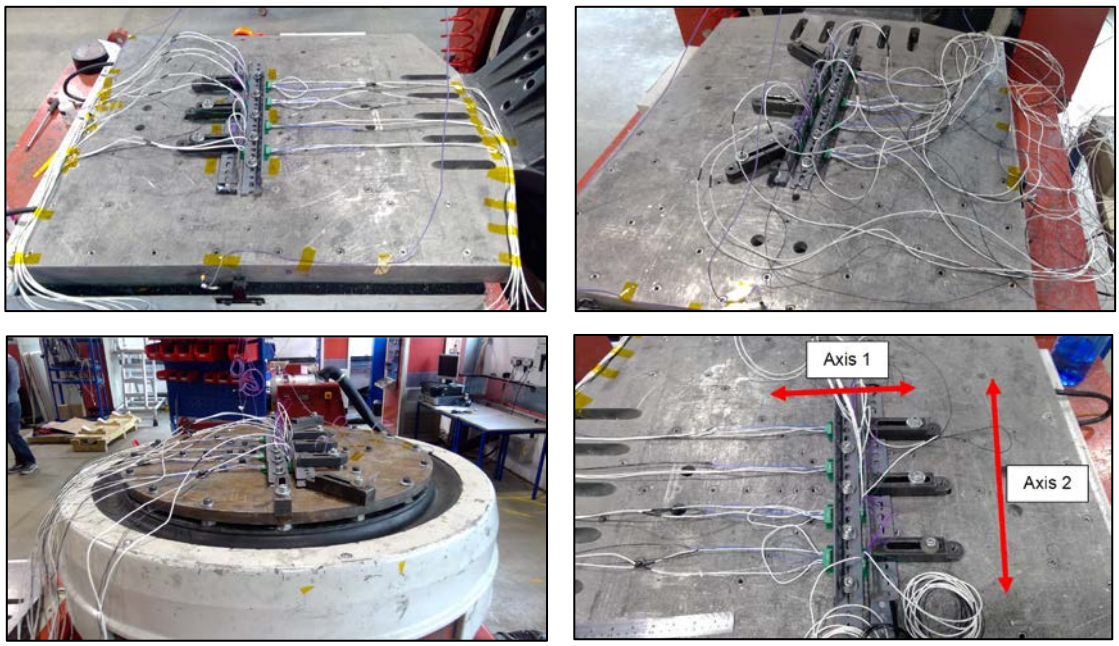


Figure 11: Samples mounted in the lateral, longitudinal and vertical axis

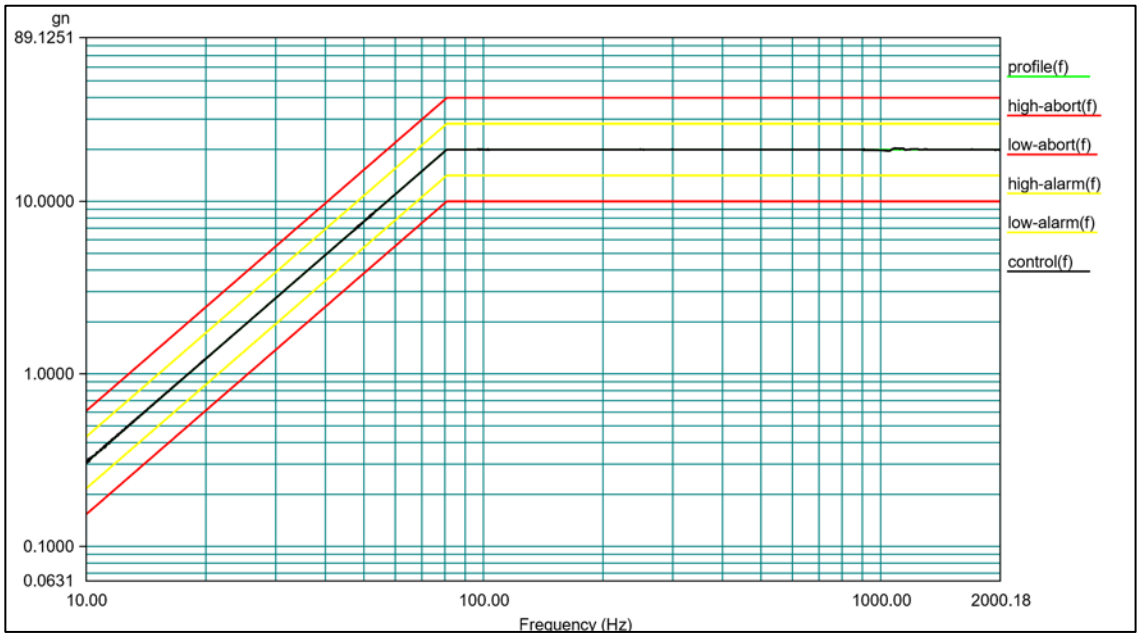


Figure 12: Sine sweep vibration response generated during sample testing

3.11. Mechanical Shock to EIA-364-27B: 1996 & BS EN 60068-2-27: 2009

Specification: Acceleration: 100gn, Shock Duration: 3ms, Shock Shape: Half Sine Pulse, 3 shocks in each axis.

Methodology: Samples were wired with two series circuits, one through the power contacts and the other through the signal. Shock Test Sequence was carried out on all samples. During the test, the samples were monitored continuously for discontinuities of ≥1 microsecond, using a constant current source of 100mA. No triggers were noted on any sample during the test process. Upon completion of testing the samples were visually inspected, no obvious changes to the samples were noted. Each sample was subjected to voltage breakdown and insulation resistance tests post vibration.

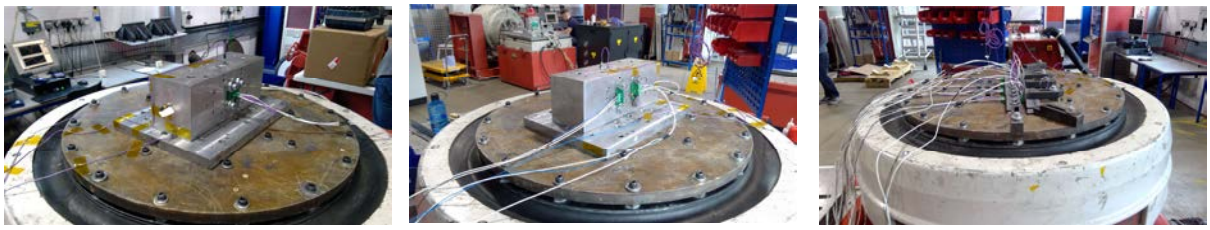


Figure 13: Samples mounted in the lateral, longitudinal and vertical

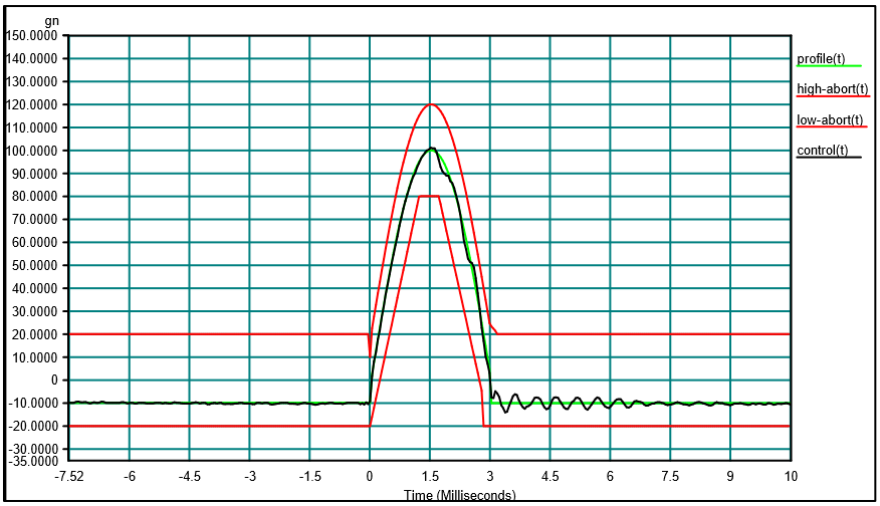


Figure 14: Positive shock pulse plot generated during mechanical shock testing

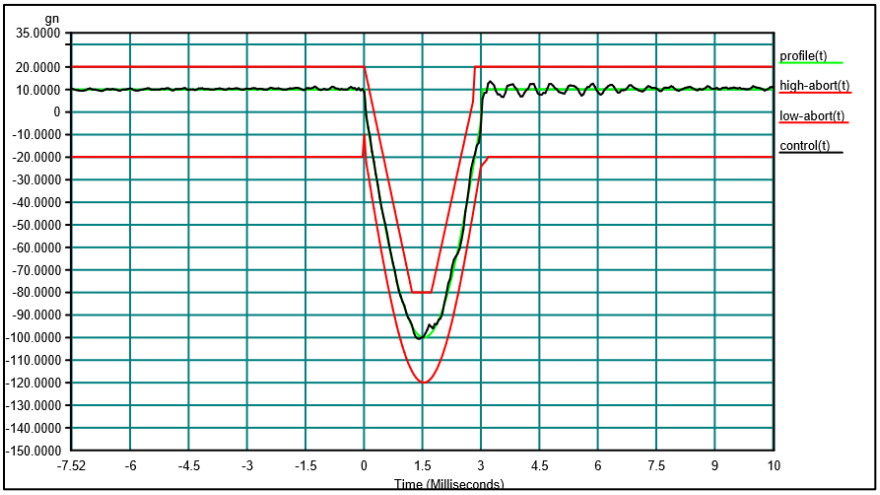


Figure 15: Negative shock pulse plot generated during mechanical shock testing

3.12. Withstand Voltage to EIA-364-20C: 2004 & Insulation Resistance to EIA-364-21C: 2000

Withstand Voltage:

Specification: Working voltage (Sea level): 600Vdc/ac for 60 seconds, Voltage Proof (70,000 feet): 350Vdc/ac for 60 seconds, Current leakage: 5mA max.

Methodology: 600Vdc voltage was applied to connector pairs wired in two series cicuits to determine whether breakdown or flashover occurred. Samples were then put into a vaccuum chamber to simulate 70,000ft, a 350Vdc voltage was applied to connector pairs wired in two series to determine whether breakdown or flashover occurred. Current leakage was meaasured during the test. Samples were visually inspected following the test, with no obvious changes to the connectors occuring.

Insulation Resistance:

Specification: Initial – 10GΩ min. Post-conditioning - 1GΩ min (Excluding salt mist conditioning).

Methodology: 500Vdc voltage was applied to connector pairs wired in two series for two minutes to determine whether the resistance satisfies the required specifcation values of >10GΩ. Samples were visually inspected following the test, with no obvious changes to the connectors occuring.

Test Set Up	Connector Assembly Part Numbers	
1	G125-32496M3-01-08-01	G125-FV10805F3-1AB1ABP
2	G125-22496F2-01-08-01	G125-MH10805M3-1AD1ADP
3	G125-32496M3-02-08-02	G125-FV10805F3-2AB2ABP
4	G125-22496F1-02-08-02	MH10805M4-2AD2ADP

Voltage Breakdown and Insulation Resistance			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1 (1)	0.009	>9999	0.003
TS1 (2)	0.008	>9999	0.003
TS2 (1)	0.009	>9999	0.002
TS2 (2)	0.008	>9999	0.002
TS3 (1)	0.011	>9999	0.002
TS3 (2)	0.006	>9999	0.004
TS4 (1)	0.007	>9999	0.002
TS4 (2)	0.006	>9999	0.004

Thermal Shock			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1 (1)	0.006	>9999	0.002
TS1 (2)	0.006	>9999	0.003
TS2 (1)	0.006	>9999	0.002
TS2 (2)	0.007	>9999	0.003
TS3 (1)	0.006	>9999	0.003
TS3 (2)	0.007	>9999	0.004
TS4 (1)	0.007	>9999	0.003
TS4 (2)	0.006	>9999	0.004

Temperature Life (96 hours +150°C)			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1 (1)	0.005	>9999	0.003
TS1 (2)	0.006	>9999	0.002
TS2 (1)	0.01	>9999	0.003
TS2 (2)	0.01	>9999	0.003
TS3 (1)	0.01	>9999	0.003
TS3 (2)	0.006	>9999	0.001
TS4 (1)	0.005	>9999	0.002
TS4 (2)	0.011	>9999	0.002

Temperature Life (250 hours +150°C)			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1 (1)	0.012	>9999	0.002
TS1 (2)	0.011	>9999	0.003
TS2 (1)	0.011	>9999	0.003
TS2 (2)	0.011	>9999	0.002
TS3 (1)	0.013	>9999	0.002
TS3 (2)	0.01	>9999	0.003
TS4 (1)	0.006	>9999	0.002
TS4 (2)	0.012	>9999	0.002

Salt Mist Testing			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1 (1)	0.006	>9999	0.003
TS1 (2)	0.007	>9999	0.003
TS2 (1)	0.006	316	0.003
TS2 (2)	0.006	395	0.004
TS3 (1)	0.007	5917	0.004
TS3 (2)	0.007	1698	0.003
TS4 (1)	0.006	421	0.004
TS4 (2)	0.005	213	0.004

96 hours Humidity			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1	0.01	>9999	0.003
TS2	0.01	>9999	0.003
TS3	0.012	>9999	0.002
TS4	0.014	>9999	0.004

1344 hours Humidity			
Sample	Ambient Pressure		70,000ft
	Voltage Breakdown (mA)	Insulation Resistance (MΩ)	Voltage Breakdown (mA)
TS1	0.006	>9999	0.003
TS2	0.007	4851	0.003
TS3	0.008	6567	0.004
TS4	0.007	6993	0.003