HRi RANGE EZi RANGE BBi RANGE

HARWiN

Test Report Summary

HT07204

Electrical, Mechanical & Environmental Testing
Gecko-MT

gecko

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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

Testing Standard	Description of Test	Section	Page No.
EIA-364-06C: 2006	Contact Resistance	3.1	3-4
EIA-364-70A: 1998	Power Rating	3.2	4-7
EIA-364-09C: 1999	Durability	3.3	8
EIA-364-17B: 1999	Temperature Life (without loading)	3.4	9
EIA-364-05B: 1998	Contact Retention in Housing	3.5	10
EIA-364-35C: 2012	Insert Retention	3.6	11
EIA-364-08B: 1998	Crimp Strength	3.7	12
EIA-364-32C: 2000 (BS EN 60068-2-14: 2009)	Thermal Shock (Temperature Cycling)	3.8	13
EIA-364-26B: 1999 (BS EN 60068-2-11: 1999)	Salt Spray	3.9	14
EIA-364-31B: 1999 (BS EN 60068-2-78: 2013)	Humidity	3.10	15
EIA-364-28D: 1999 (BS EN 60068-2-6: 2008)	Vibration	3.11	16
EIA-364-27B: 1996 (BS EN 60068-2-27: 2009)	Mechanical Shock	3.12	17
EIA-364-20C: 2004	Withstand Voltage	3.13	18-19
EIA-364-21C: 2000	Insulation Resistance		

2.2. List of Test Samples

- 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: EIA-364-06C: 2006

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 then measured separately and subtracted from the results. Test Setups were numbered as follows:

1. G125-22496F1-01-08-01 to G125-32496M1-01-08-01
2. G125-22496F1-01-08-01 to G125-MH10805M4-1AD1ADP
3. G125-FV10805F1-1AB1ABP to G125-MH10805M4-1AD1ADP
4. G125-22496F2-02-08-02 to G125-32496M3-02-08-02
5. G125-32496M3-02-08-02 to G125-FV10805F3-2AB2ABP
6. G125-FV10805F3-2AB2ABP to G125-MH10805M3-2AD2ADP

Specification: 20mΩ max. per contact (initial), 25mΩ max. per contact (post conditioning)
Results: Contact resistance was measured on samples pre- and post-conditioning, and power testing.

Test			Contact Resistance (mΩ)						Average (mΩ)
			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
	1,000hrs	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
	56 days	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 1,500 cycles. The results below are the summary for five different contact pairs.

Part Numbers	Contact Conditioning	Maximum (mΩ)	Minimum (mΩ)	Average (mΩ)
G125-1500005 & G125-0500005	Initial	0.93	0.83	0.88
	Post-Cycling (1,500 cycles)	2.70	1.20	1.96

3.2. Power Rating (Current v Temperature Rise): EIA-364-70A: 1998, Method 2

Methodology 1: 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. The test setups were numbered as per section 3.1.

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.

Specification: Current Rating (when all contacts are electrically loaded):

- Power = 10.0A max
- Signal = 2.0A max

Results: Final current (A) reached for a 30°C temperature rise above ambient. Graphs on following pages.

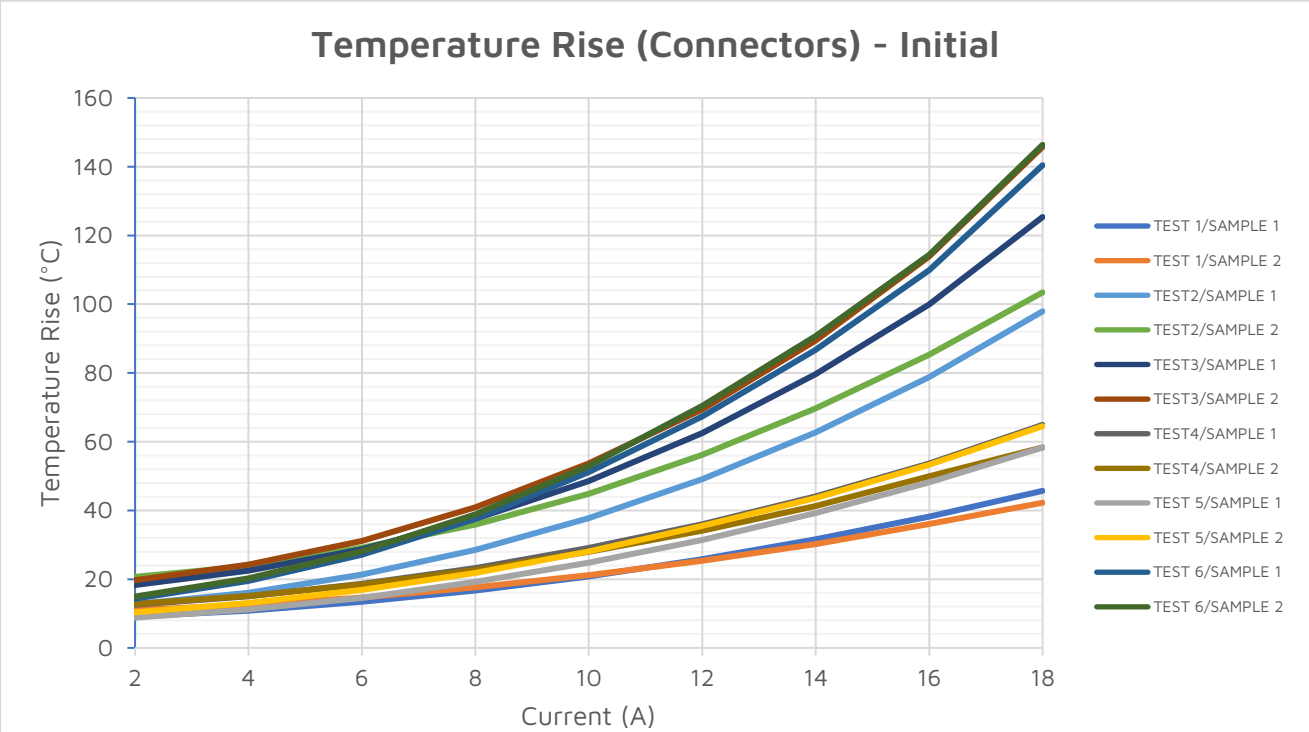
Test Condition			Current (A)						Average (A)
			1	2	3	4	5	6	
Initial		30°C rise	18	12	10	12	12	10	12
Temp Life	96hrs	30°C rise	14	10	10	12	12	8	11
	250hrs	30°C rise	8	8	8	8	8	8	8
	1,000hrs	30°C rise	10	4	6	8	6	4	6
Thermal Shock		30°C rise	10	8	8	10	8	8	9
Salt Spray		30°C rise	14	8	8	12	10	8	10
Humidity	96 hrs	30°C rise	8	-	8	-	10	-	9
	56 days	30°C rise	-	12	-	14	-	10	12

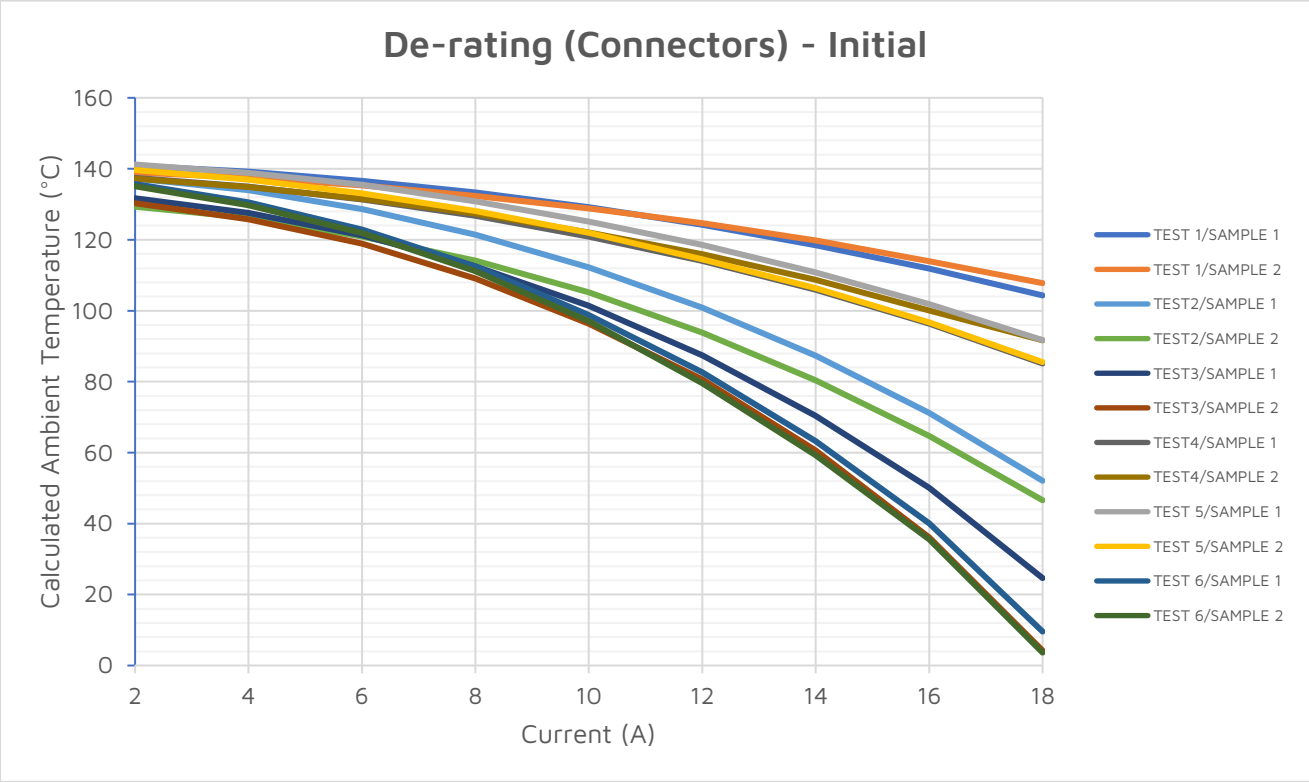
Methodology 2: To determine the thermal performance under load of individual contact pairs, power contacts G125-0500005 & G125-1500005 were mated and wired into a circuit using 200mm lengths of 18AWG wire. A current was applied across the mated pair and increased in 2A increments, with the temperature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

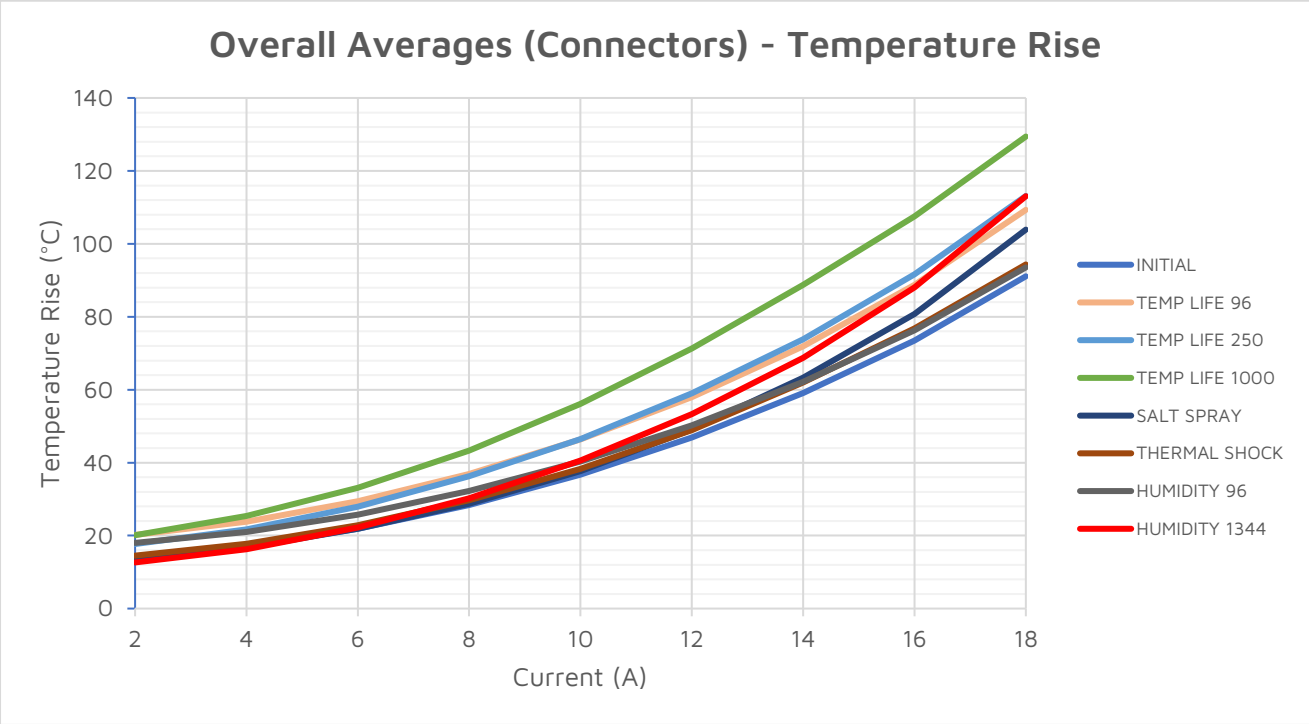
Specification: Current Rating (across mated power contact pair) = 10.0A max

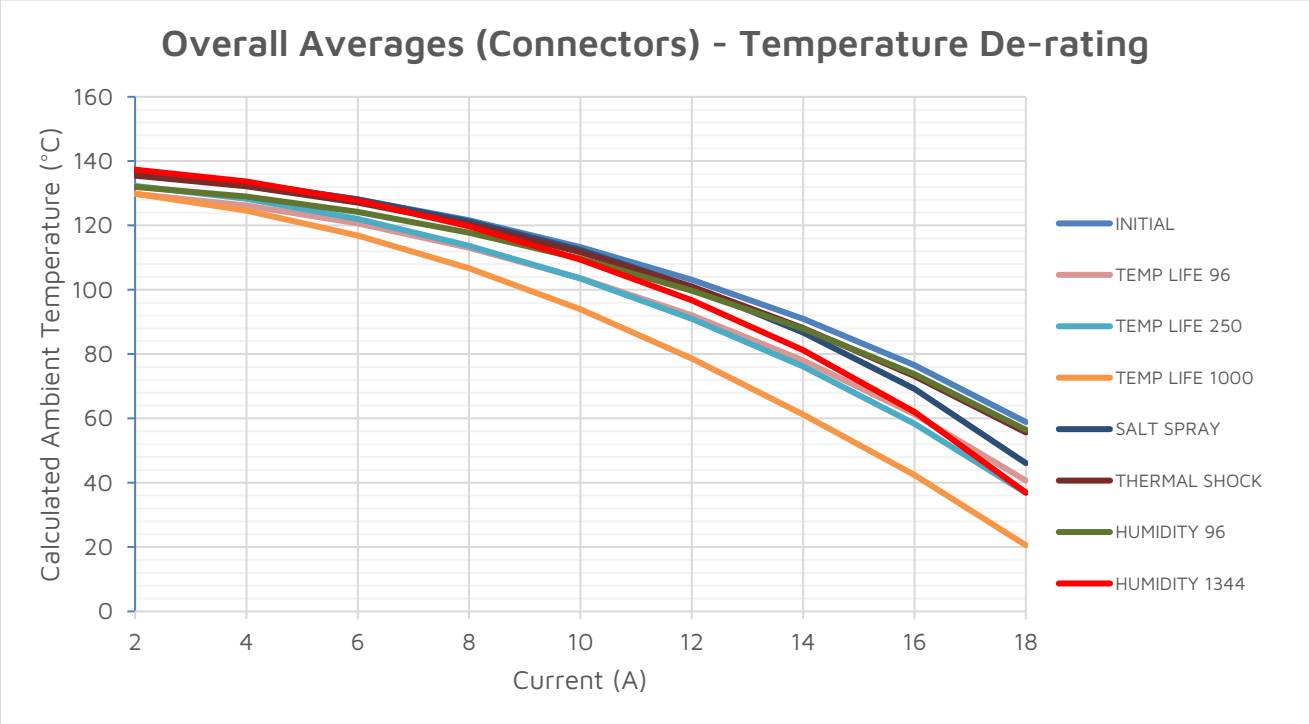
Results: Final current (A) reached for a 30°C temperature rise above ambient. Graphs on following pages.

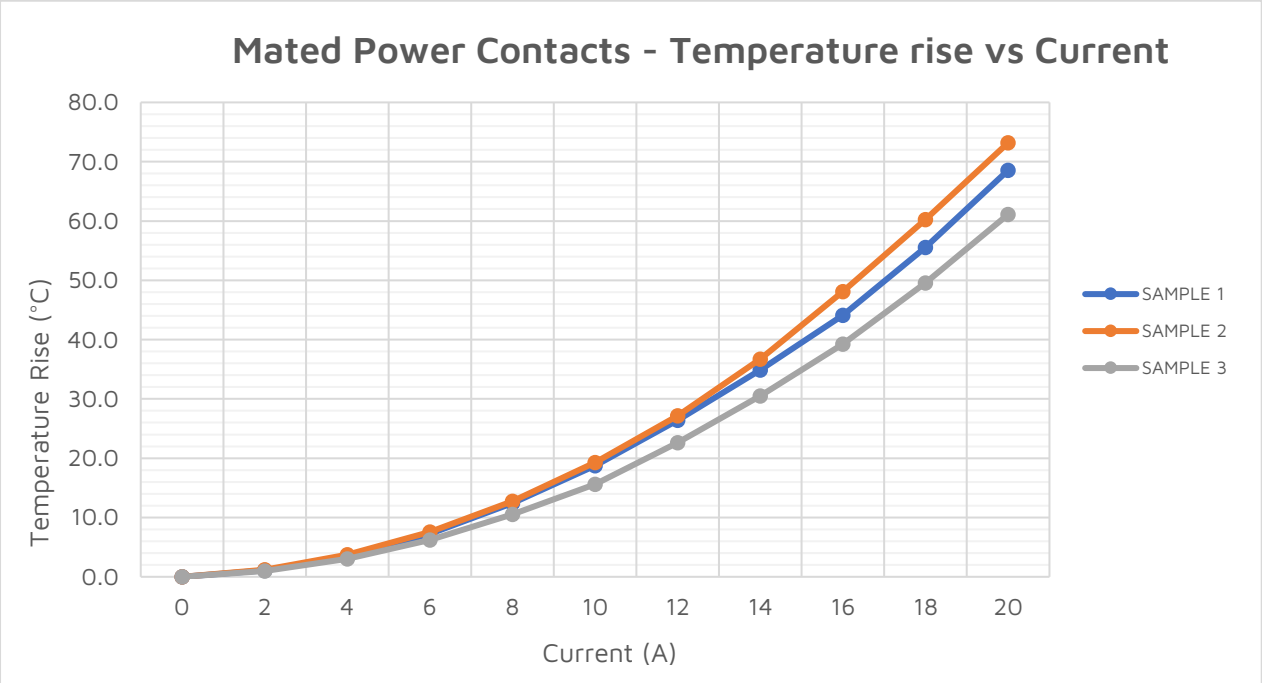
Part Numbers	Sample No.	Temp. (°C)	Current (A)
G125-0500005 & G125-1500005	1	30°C rise	12
	2	30°C rise	12
	3	30°C rise	14

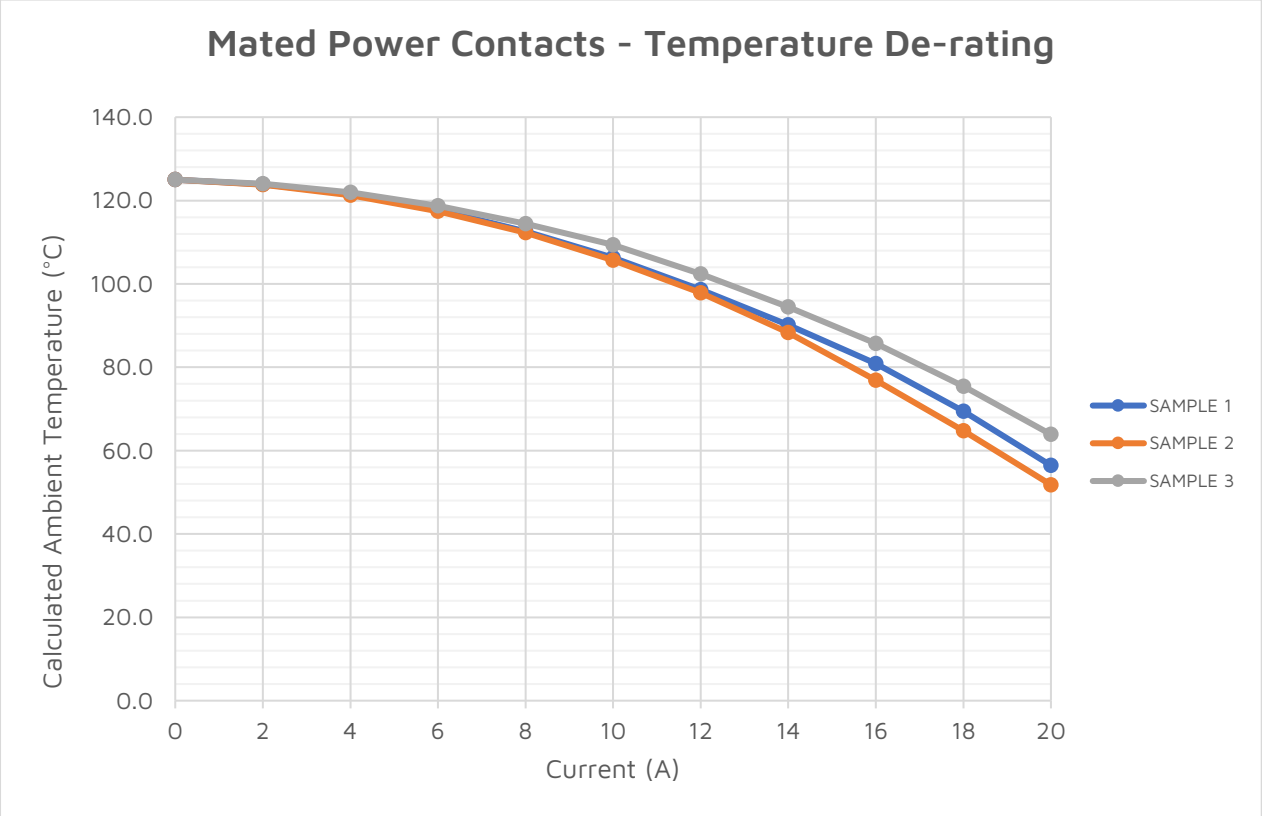

Temperature Rise (Connectors) - Initial
Temperature Rise (°C)
0
20
40
60
80
100
120
140
160
2
4
6
8
10
12
14
16
18
Current (A)
TEST 1/SAMPLE 1
TEST 1/SAMPLE 2
TEST2/SAMPLE 1
TEST2/SAMPLE 2
TEST3/SAMPLE 1
TEST3/SAMPLE 2
TEST4/SAMPLE 1
TEST4/SAMPLE 2
TEST 5/SAMPLE 1
TEST 5/SAMPLE 2
TEST 6/SAMPLE 1
TEST 6/SAMPLE 2


De-rating (Connectors) - Initial
Calculated Ambient Temperature (°C)
0
20
40
60
80
100
120
140
160
2
4
6
8
10
12
14
16
18
Current (A)
TEST 1/SAMPLE 1
TEST 1/SAMPLE 2
TEST2/SAMPLE 1
TEST2/SAMPLE 2
TEST3/SAMPLE 1
TEST3/SAMPLE 2
TEST4/SAMPLE 1
TEST4/SAMPLE 2
TEST 5/SAMPLE 1
TEST 5/SAMPLE 2
TEST 6/SAMPLE 1
TEST 6/SAMPLE 2


Overall Averages (Connectors) - Temperature Rise
Temperature Rise (°C)
0
20
40
60
80
100
120
140
2
4
6
8
10
12
14
16
18
Current (A)
INITIAL
TEMP LIFE 96
TEMP LIFE 250
TEMP LIFE 1000
SALT SPRAY
THERMAL SHOCK
HUMIDITY 96
HUMIDITY 1344

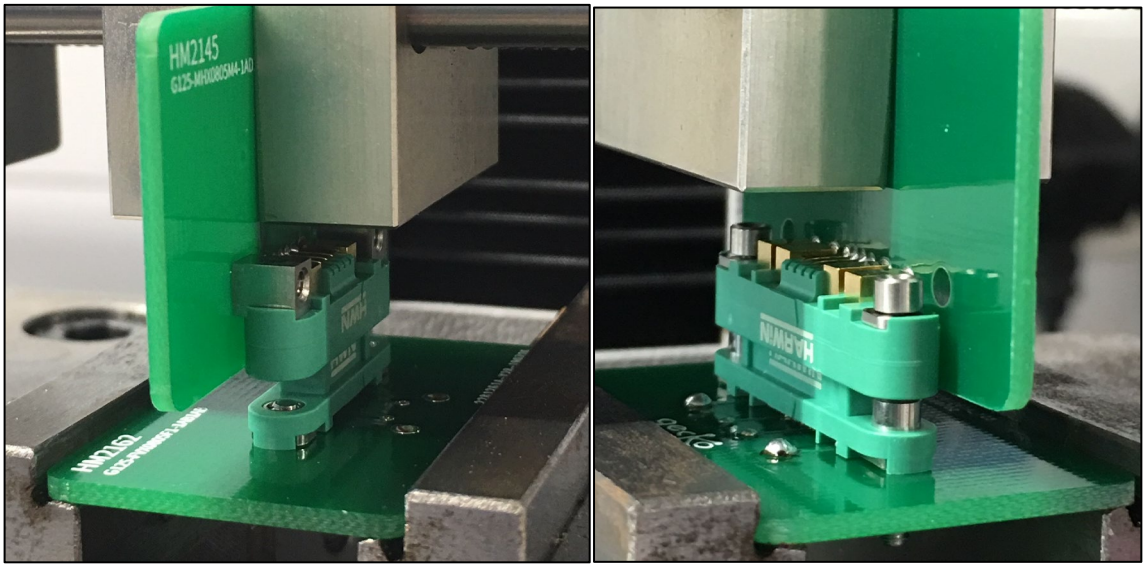

Overall Averages (Connectors) - Temperature De-rating
Calculated Ambient Temperature (°C)
0
20
40
60
80
100
120
140
160
2
4
6
8
10
12
14
16
18
Current (A)
INITIAL
TEMP LIFE 96
TEMP LIFE 250
TEMP LIFE 1000
SALT SPRAY
THERMAL SHOCK
HUMIDITY 96
HUMIDITY 1344


Mated Power Contacts - Temperature rise vs Current
Temperature Rise (°C)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
2
4
6
8
10
12
14
16
18
20
Current (A)
SAMPLE 1
SAMPLE 2
SAMPLE 3


Mated Power Contacts - Temperature De-rating
Calculated Ambient Temperature (°C)
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
0
2
4
6
8
10
12
14
16
18
20
Current (A)
SAMPLE 1
SAMPLE 2
SAMPLE 3

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

Methodology: For this test, both individual power contacts and fully-assembled connector pairs were mated at a speed of 25.4mm/min for 1,500 cycles. Fully assembled connectors were tested using cable-to-cable, cable-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 1,500 cycles.



Examples of the setups for board-to-board durability testing using an automatic force gauge

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)
- 1,000 Mechanical Operation cycles

Results: 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.

Contact Part Numbers	Insertion Force (N)					Withdrawal Force (N)				
	Initial	Max	Min	Final	Average	Initial	Max	Min	Final	Average
G125-0500005 & G125-1500005	3.09	4.59	1.90	3.50	3.25	1.11	4.85	0.90	3.11	2.32
G125-0500005 & G125-1600005	2.18	4.42	1.02	3.24	2.77	0.87	3.98	0.39	2.67	1.91
G125-0700005 & G125-1500005	1.69	4.06	1.14	2.69	2.26	1.06	4.28	0.45	2.63	2.00
G125-0700005 & G125-1600005	2.04	4.38	1.12	2.85	2.47	1.63	4.83	0.50	3.40	2.57

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

Conditioning Test		Connector Insertion Force (N)				Connector Withdrawal Force (N)			
		Initial	Max	Final	Average	Initial	Max	Final	Average
Initial		17.57	37.41	34.82	29.93	8.21	21.71	15.04	14.98
Temp Life	96hrs	13.08	28.21	27.78	23.02	8.49	17.60	12.17	12.75
	250hrs	13.13	25.54	24.57	21.08	8.71	15.91	11.43	12.02
	1,000hrs	18.87	27.42	18.51	21.60	9.05	16.52	14.83	13.46
Thermal Shock		13.98	36.54	13.76	21.43	10.81	25.33	18.32	18.15
Salt Spray		18.83	44.71	17.48	27.01	11.72	30.37	20.18	20.75
Humidity	96hrs	15.43	43.78	43.33	34.18	12.40	26.96	21.73	20.36
	56 days	14.13	36.32	32.25	27.57	7.29	19.99	13.61	13.63

3.4. Temperature Life (without load): EIA-364-17B: 1999, Condition 10, Method A

Methodology: Mated pairs of connectors were subjected to 96 hours, 250 hours and 1,000 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.

Individual connectors and mated assemblies in the oven for 96, 250 and 1,000 hours

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

Results:

Part Numbers	Duration in Temperature Testing Oven		
	96hrs at +150°C	250hrs at +150°C	1,000hrs at +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

3.5. Contact Retention: EIA-364-05B: 1998

Methodology: Contact retention in the housing was tested for both pre-conditioned and post-conditioned samples. All power contacts and 6 signal contacts were removed from each assembly, measuring the force required.

Contact removal testing from assembly on automatic force gauge

Specification: Contact Retention in Housing = 6.0N min

Results: Pre-Conditioned samples

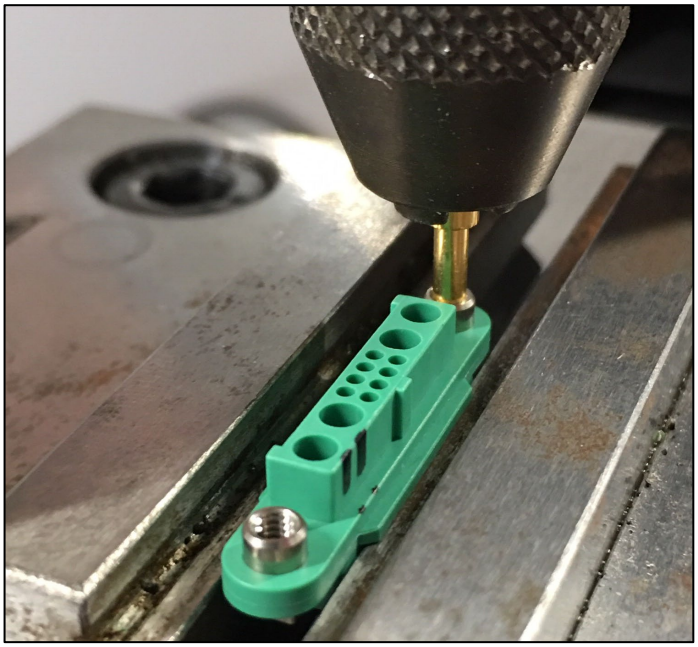
Part Numbers	Power Contact (N)			Signal Contact (N)
	Max	Min	Average	Average
G125-22496F1-01-08-01	107.30	49.52	87.09	21.73
G125-22496F1-02-08-02	103.72	40.58	74.48	19.57
G125-22496F2-01-08-01	113.56	73.68	93.02	20.58
G125-22496F2-02-08-02	101.48	39.38	75.32	23.17
G125-32496M1-01-08-01	131.53	106.63	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

Results: Post-Conditioned samples

Condition	Power Contact (N)			Signal Contact (N)
	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 – 1,000 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 – 56 days	148.30	51.61	106.90	25.58

3.6. Insert Retention: EIA-364-35C: 2012

Methodology: Insert retention was tested on both pre and post conditioned samples. Samples were loaded into the automatic 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.



Insert retention testing on crimp assembly using the automatic force gauge

Specification: Insert retention = 20N

Results:

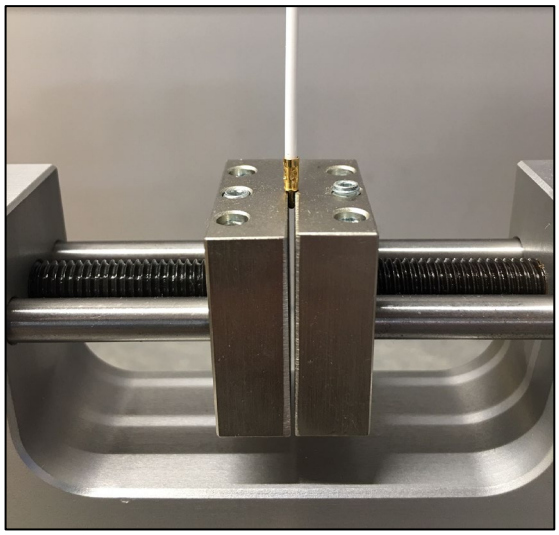
Part No.	Initial	Post-Conditioning Retention Forces (Pass/Fail)						
		Temperature Life			Thermal Shock	Salt Spray	Humidity	
		96hrs	250hrs	1,000hrs			96hrs	56 days
G125-22496F1-01-08-01	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-22496F1-02-08-02	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
G125-22496F2-01-08-01	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

3.7. Crimp Strength: EIA-364-08B: 1998

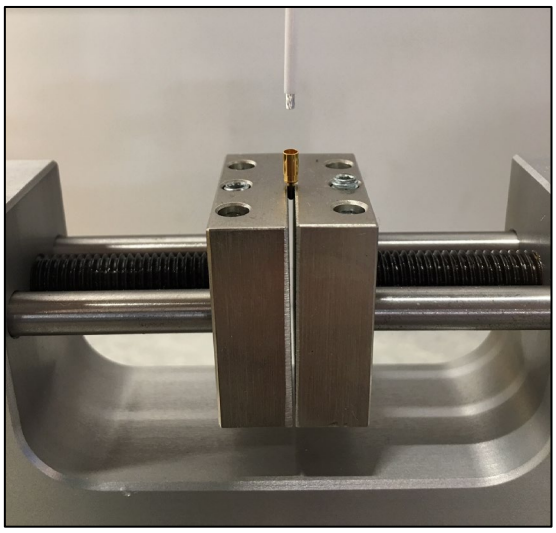
Methodology: 200mm samples of 18AWG PTFE wire were crimped into their respective contacts using crimp tool Z125-903 (fitted with positioner Z125-904). Force was then applied to the wire at a speed of 25.4mm/min, and the resultant force required to achieve separation of wire from contact recorded, with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

Specification: 18AWG = 45N min

Contact Part Number	Crimp Force (N)		
	Max	Min	Average
G125-0500005	176.80	129.20	151.10
G125-1500005	187.50	116.90	169.70



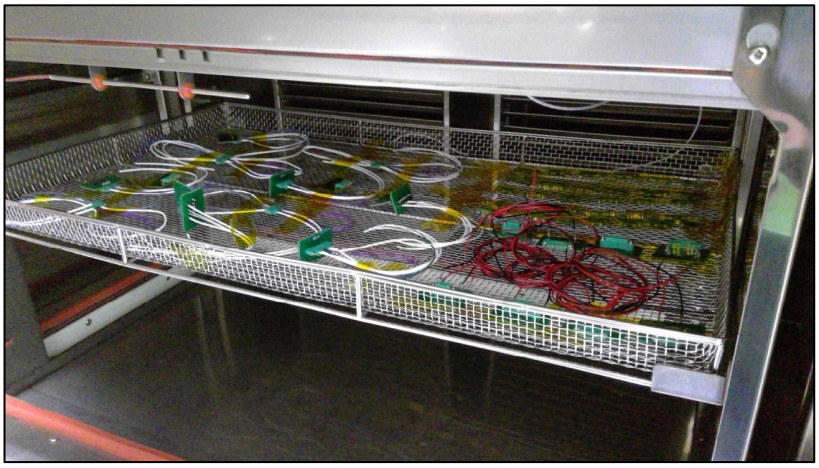
Male power contact crimped to 18AWG wire, mounted in the automatic force gauge vice



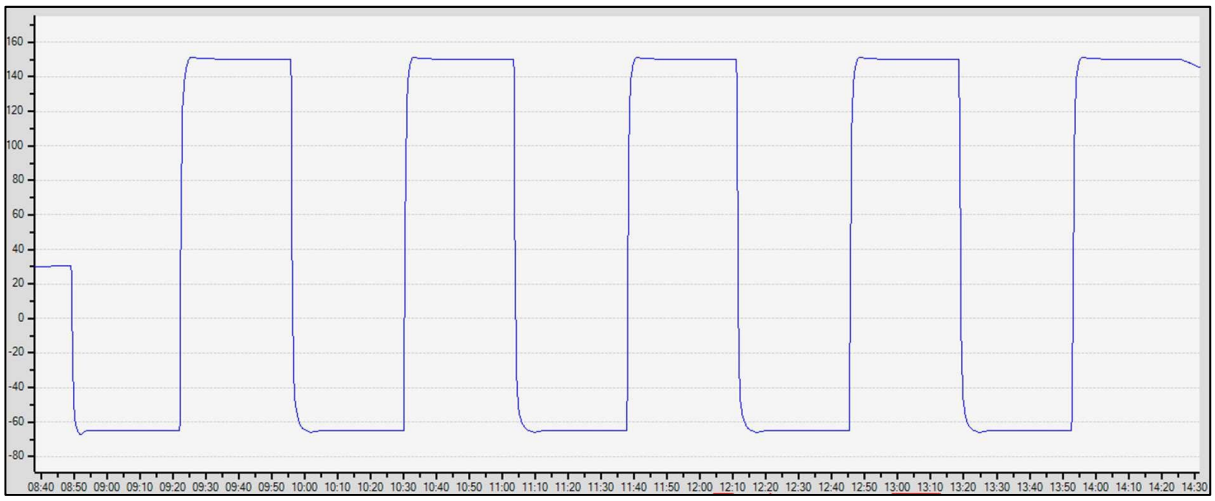
18AWG test sample with the wire being pulled from the crimp area

3.8. Thermal Shock (Temp. Cycling): EIA-364-32C: 2000 / BS EN 60068-2-14: 2009, Test Condition 4

Methodology: 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.



Samples in thermal shock chamber

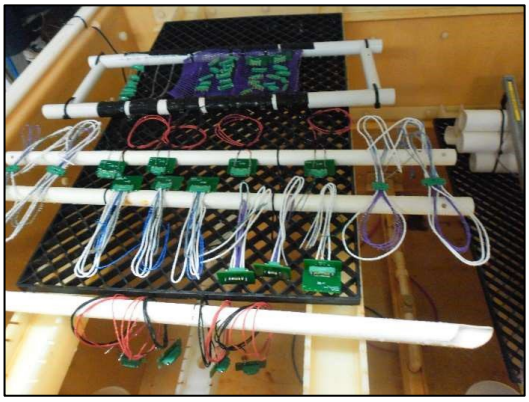


Chamber temperature response plot during testing

Specification: -65°C to +150°C
Result: No obvious changes to the samples.

3.9. Salt Spray: EIA-364-26B: 1999, Test Condition B / BS EN 60068-2-11: 1999, Test Ka

Methodology: The samples were placed into the salt mist chamber for 96hrs and measured for contact resistance, power, voltage breakdown, insulation resistance and durability, as well as visual inspection post-testing.

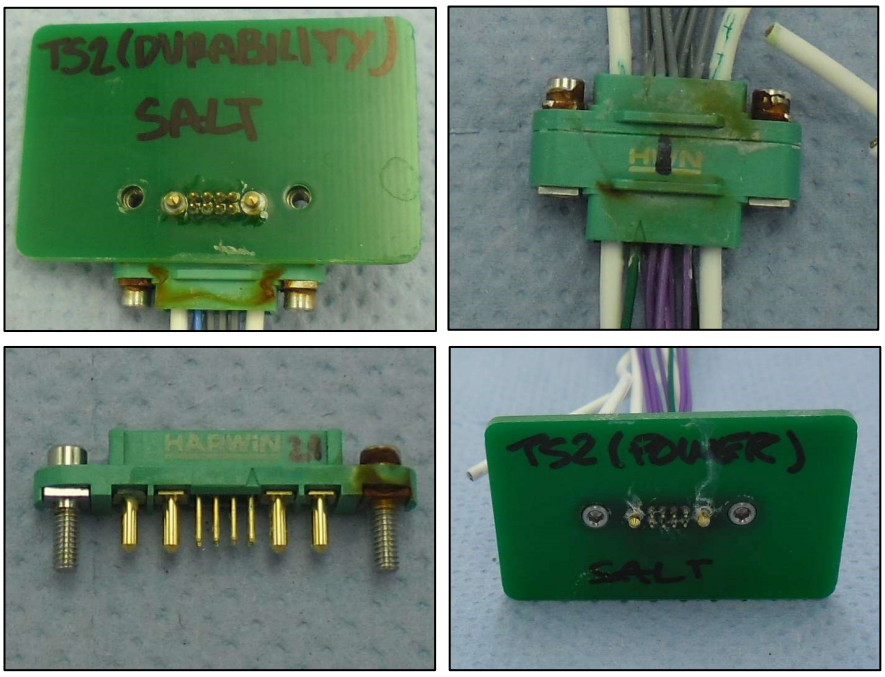


Samples in salt mist chamber

Specification:

- Duration = 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 at 35°C

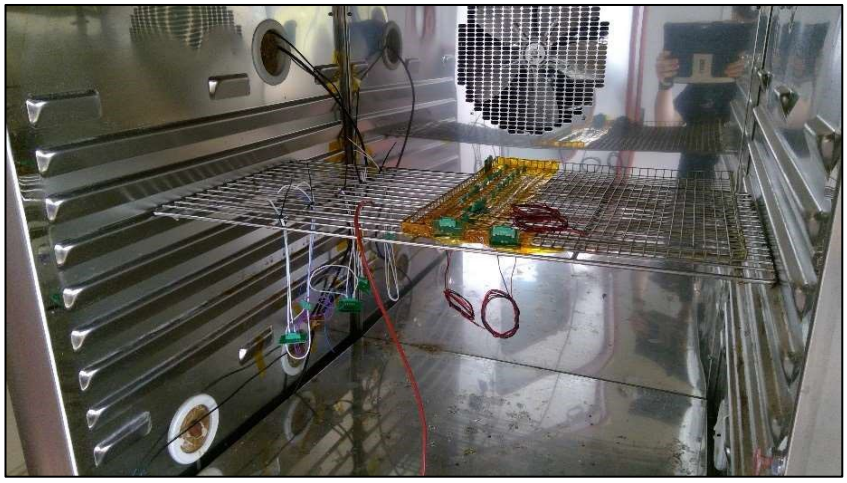
Result: Some changes were noted during the visual inspection and insulation resistance testing (see section 3.12).



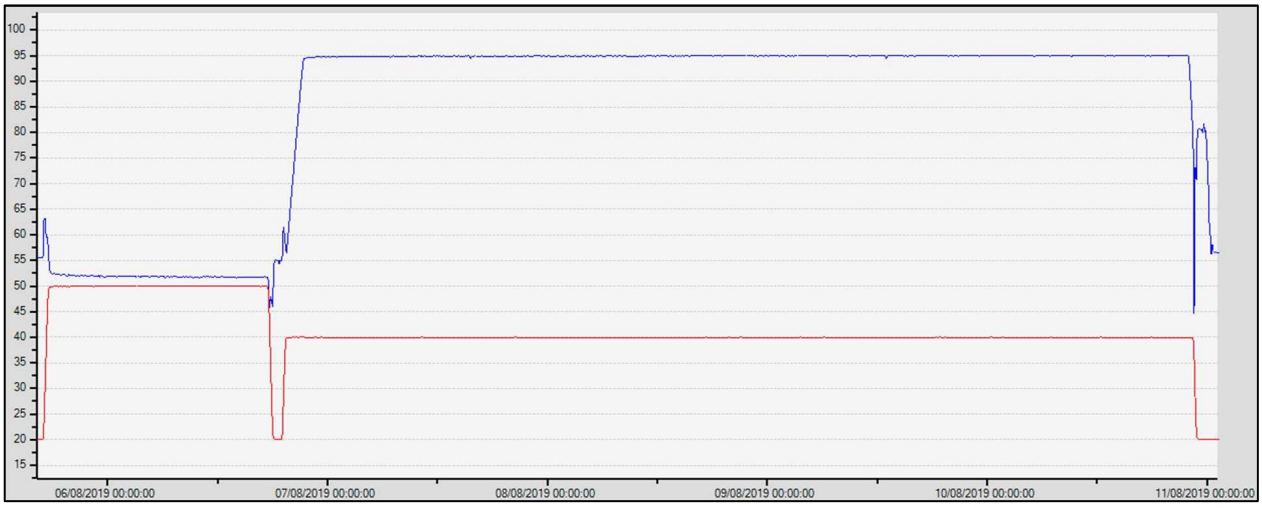
Samples after salt spray testing

3.10. Humidity: EIA-364-31B: 1999, Method 2, Test Condition A / BS EN 60068-2-78: 2013, Test Cab

Methodology: The samples were preconditioned for 24 hours at 50°C then suspended in a humidity chamber for 96 hours and 56 days 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.



Samples in humidity chamber



Humidity chamber response plot during testing

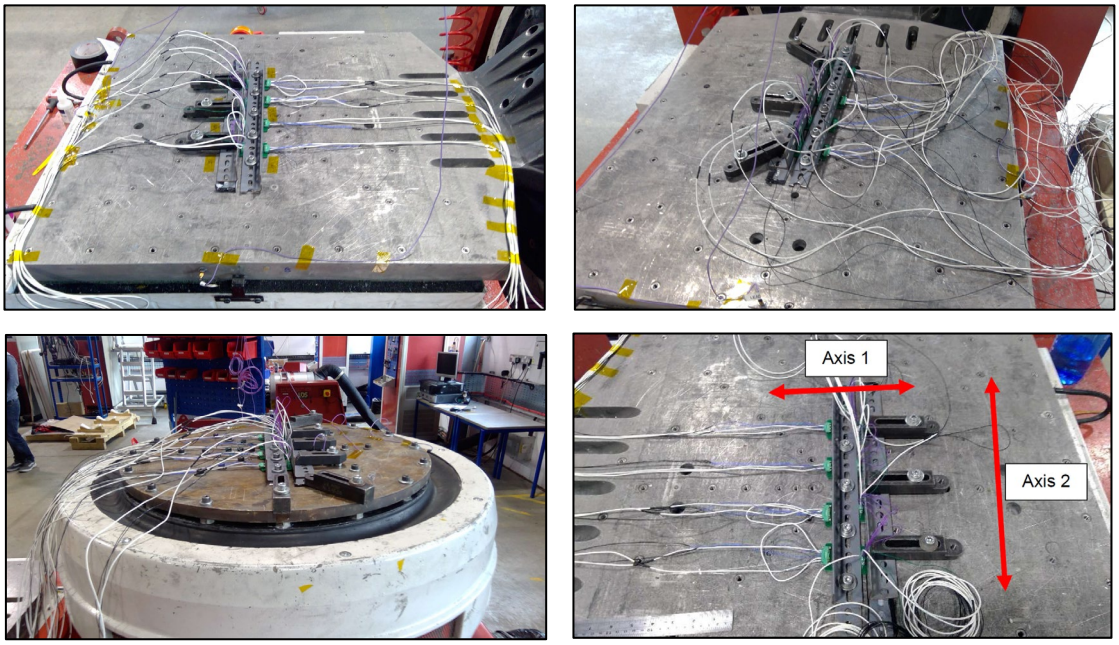
Specification:

- 24hrs pre-conditioning at +50°C
- Humidity = 90-95%
- Temperature = 40°C
- Duration = 96 hours and 56 days (1,344 hours)

Result: No obvious changes to the samples.

3.11. Vibration: EIA-364-28D: 1999, Test Condition 4 / BS EN 60068-2-6: 2008, Test Fc

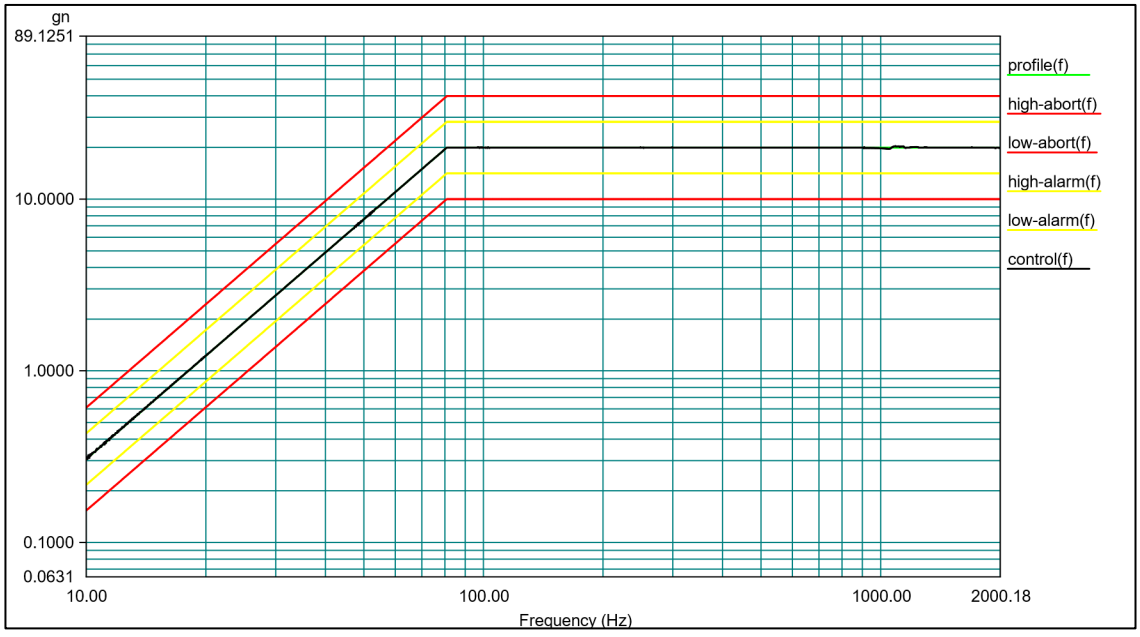
Methodology: The samples were subjected to a Swept Sine Test with continuous monitoring at ≥1 microsecond. Each sample was subjected to voltage breakdown and insulation resistance tests post-vibration.



Samples mounted in the lateral, longitudinal and vertical axis

Specification: 10Hz to 2,000Hz, 1.52mm pk-pk displacement or 20gn pk (whichever is less), 198m/s^2 (20G), 12 cycles per axis, 20 minutes per cycle.

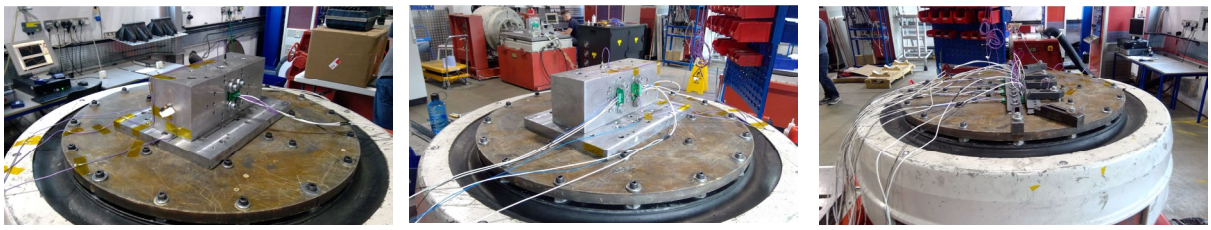
Results: During testing in Axis 1 and 3, triggers were noted on the white cable output of sample S4; no triggers were noted during Axis 2. No triggers were noted on any other sample during the test process. Upon completion of testing the samples were visually inspected, no obvious changes to the samples were noted.



Sine sweep vibration response generated during sample testing

3.12. Mechanical Shock: EIA-364-27B: 1996 / BS EN 60068-2-27: 2009

Methodology: Samples were wired with two series circuits, one through the power contacts and the other through the signal. The shock 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. Upon completion of testing the samples were visually inspected. Each sample was subjected to voltage breakdown and insulation resistance tests after vibration.

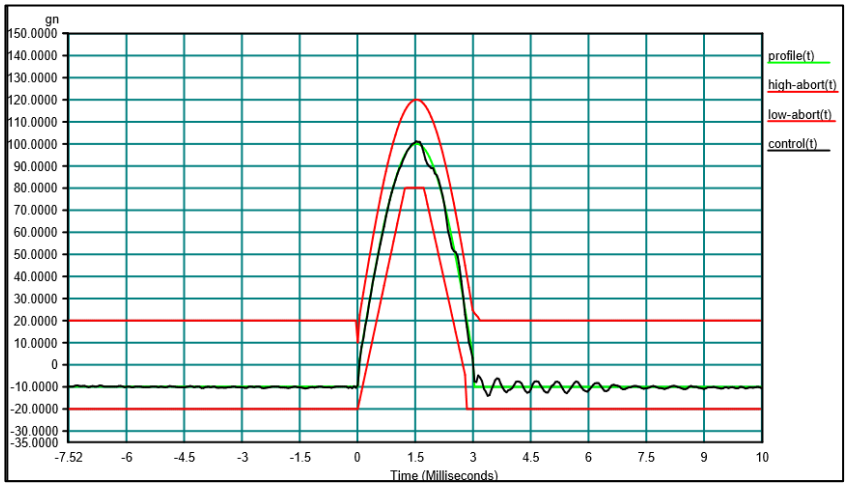


Samples mounted in the lateral, longitudinal and vertical axis

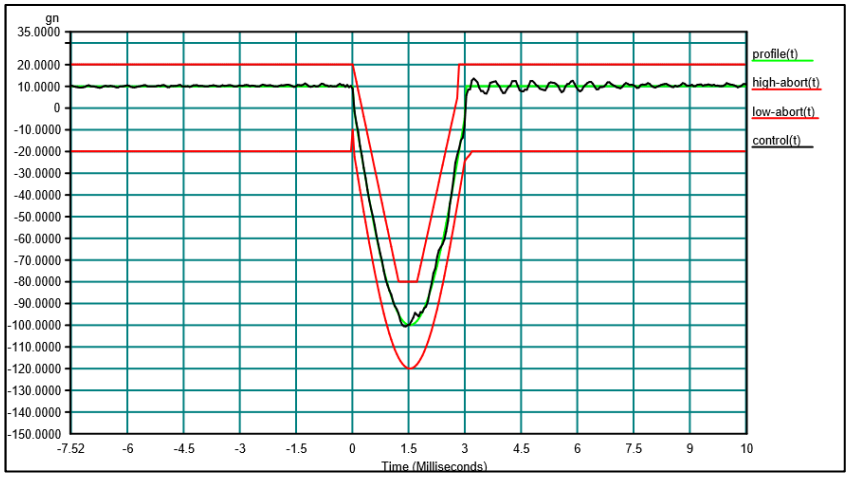
Specification:

- Acceleration = 100gn
- Shock Duration = 3ms
- Shock Shape = Half Sine Pulse, 3 shocks in each axis

Results: No triggers were noted on any sample during the test process, no obvious visual changes to the samples were noted.



Positive shock pulse plot generated during mechanical shock testing



Negative shock pulse plot generated during mechanical shock testing

3.13. Withstand Voltage: EIA-364-20C: 2004; Insulation Resistance: EIA-364-21C: 2000

Test Connectors:

1. G125-32496M3-01-08-01 to G125-FV10805F3-1AB1ABP
2. G125-22496F2-01-08-01 to G125-MH10805M3-1AD1ADP
3. G125-32496M3-02-08-02 to G125-FV10805F3-2AB2ABP
4. G125-22496F1-02-08-02 to G125-MH10805M4-2AD2ADP

Methodology 1 - Withstand Voltage at sea level (ambient pressure): 600V DC was applied to connector pairs wired in two series circuits to determine whether breakdown or flashover occurred. Current leakage was measured during the test. Samples were visually inspected following the test.

Methodology 2 - Withstand Voltage at 70,000ft (simulated with reduced pressure):Samples were then put into a vacuum chamber to simulate 70,000ft, with 350V DC applied to connector pairs wired in two series to determine whether breakdown or flashover occurred. Current leakage was measured during the test. Samples were visually inspected following the test.

Methodology 3 - Insulation Resistance: 500V DC was applied to connector pairs wired in two series for two minutes to determine whether the resistance satisfies the required specification values. Samples were visually inspected following the test.

Specification:

- Voltage Proof (sea level) = 600V DC/AC for 60 seconds
- Voltage Proof (70,000ft) = 350V DC/AC for 60 seconds
- Current leakage: 5mA max
- Insulation Resistance (initial) = 10GΩ min
- Insulation Resistance (post-conditioning excluding salt mist) = 1GΩ min

Result: No obvious changes to the connectors.

Voltage Breakdown (mA) at Sea Level (ambient pressure)

Condition		Sample number								Average
		1a	1b	2a	2b	3a	3b	4a	4b	
Initial		0.009	0.008	0.009	0.008	0.011	0.006	0.007	0.006	0.008
Thermal Shock		0.006	0.006	0.006	0.007	0.006	0.007	0.007	0.006	0.006
Temperature Life	96hrs	0.005	0.006	0.010	0.010	0.010	0.006	0.005	0.011	0.008
	250hrs	0.012	0.011	0.011	0.011	0.013	0.010	0.006	0.012	0.011
Salt Mist		0.006	0.007	0.006	0.006	0.007	0.007	0.006	0.005	0.006
Humidity	96hrs	0.010	-	0.010	-	0.012	-	0.014	-	0.012
	56 days	0.006	-	0.007	-	0.008	-	0.007	-	0.007

Voltage Breakdown (mA) at 70,000ft (simulated with reduced pressure)

Condition		Sample number								Average
		1a	1b	2a	2b	3a	3b	4a	4b	
Initial		0.003	0.003	0.002	0.002	0.002	0.004	0.002	0.004	0.003
Thermal Shock		0.002	0.003	0.002	0.003	0.003	0.004	0.003	0.004	0.003
Temp. Life	96hrs	0.003	0.002	0.003	0.003	0.003	0.001	0.002	0.002	0.002
	250hrs	0.002	0.003	0.003	0.002	0.002	0.003	0.002	0.002	0.002
Salt Mist		0.003	0.003	0.003	0.004	0.004	0.003	0.004	0.004	0.004
Humidity	96hrs	0.003	-	0.003	-	0.002	-	0.004	-	0.003
	56 days	0.003	-	0.003	-	0.004	-	0.003	-	0.003

Insulation Resistance (MΩ) at Sea Level (ambient pressure)

Condition		Sample number								Average
		1a	1b	2a	2b	3a	3b	4a	4b	
Initial		>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999
Thermal Shock		>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999
Temp. Life	96hrs	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999
	250hrs	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999	>9,999
Salt Mist		>9,999	>9,999	316	395	5,917	1,698	421	213	3,620
Humidity	96hrs	>9,999	-	>9,999	-	>9,999	-	>9,999	-	>9,999
	56 days	>9,999	-	4,851	-	6,567	-	6,993	-	7,103