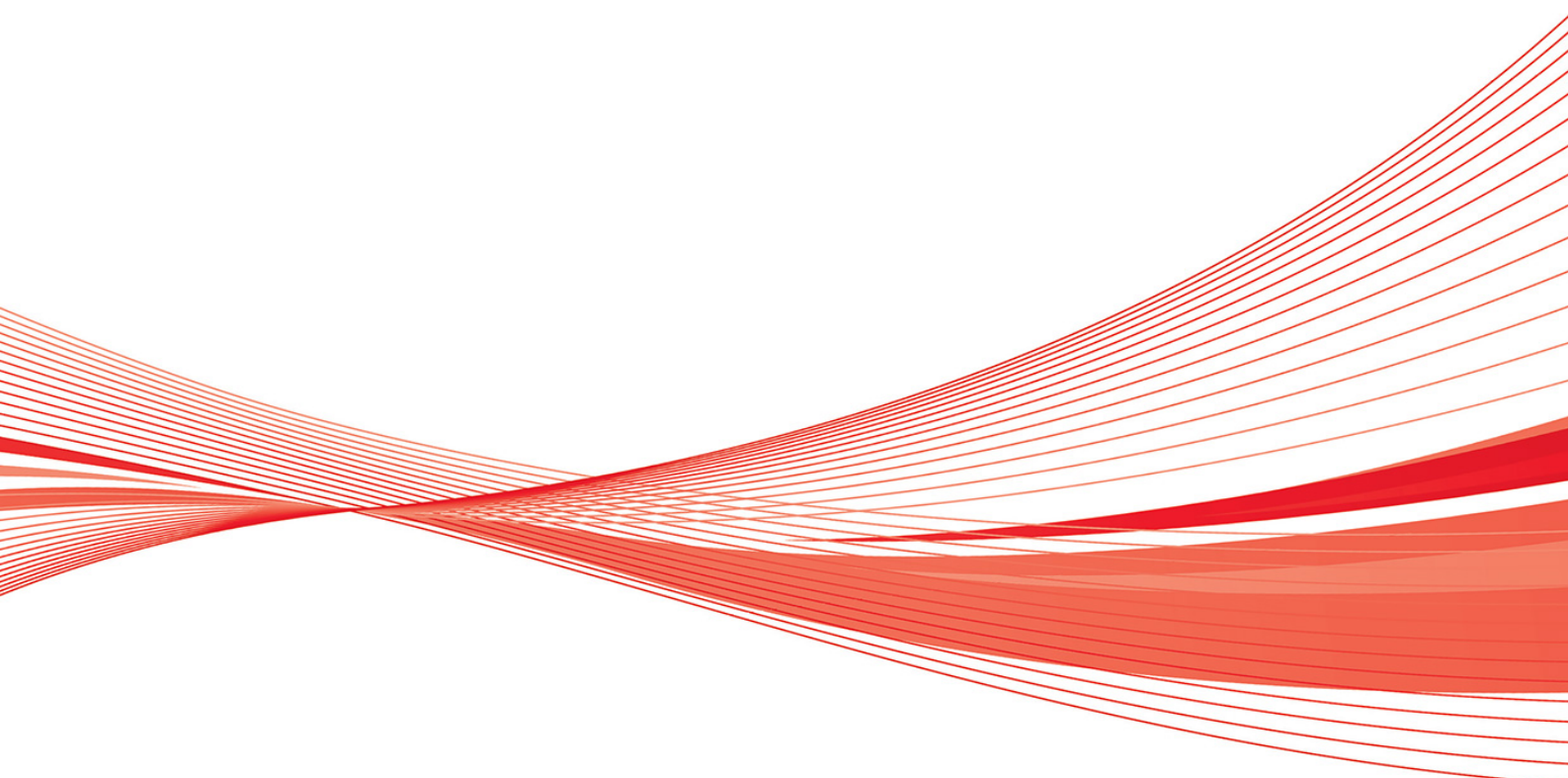




Harwin Test Report Summary

HT07301

**Gecko-SL Horizontal
Electrical, Mechanical & Environmental Testing**



1. **Introduction**

1.1. **Description and Purpose**

The new Gecko-SL Horizontal connector combines the 1.25mm pitch Gecko signal connector system with horizontal through-board technology, allowing for lower board profiles to be achieved. Stainless steel jackscrews are available in both standard and reverse-fix, ensuring a secure connection. 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 1987 & 1988. The tests indicate that the Gecko-SL horizontal range performs as required to the existing G125 Component Specifications.

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:

Testing Standard	Description of Test	Section	Page No.
EIA-364-06C: 2006	Contact Resistance	3.1	3
EIA-364-70A: 1998	Power Rating	3.2	3
EIA-364-09C: 1999	Durability	3.3	4
EIA-364-05B: 1998	Contact Insertion & Retention	3.4	6
EIA-364-28D: 1999 (BS EN 60068-2-6: 2008)	Vibration	3.5	7
EIA-364-27B: 1996 (BS EN 60068-2-27: 2009)	Mechanical Shock	3.6	8
EIA-364-20C: 2004	Withstand Voltage	3.7	9
EIA-364-21C: 2000	Insulation Resistance	3.7	9

2.2. **List of Connectors & Contacts**

The following components/connectors are used throughout the testing:

- G125-MH1XX05M3P – Gecko-SL Horizontal Male Connector Assembly
- G125-MH1XX05M4P – Gecko-SL Horizontal Male Connector Assembly
- G125-224XX9600 – Gecko-SL Female Crimp Connector Assembly (No hardware)
- G125-224XX96F1 – Gecko-SL Female Crimp Connector Assembly

3. **Test Results**

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

Specification: 20mΩ max. per contact.

Methodology: 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 G125-0010005 contacts. 200mm lengths of 26AWG wire with custom PCBs used to complete the circuit. Initial contact resistance was measured across G125-MH1XX05MXP assemblies mated with G125-224XX9600 connector halves. 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-MH10605MXP	G125-224069600	145.8	6.97
2	G125-MH12005MXP	G125-224209600	441.0	7.75
3	G125-MH15005MXP	G125-224509600	1052.0	7.52

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

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

Methodology: The test demonstrates the current carrying capability of the Gecko-SL-Horizontal connector system, the test was carried out in accordance with EIA-364-70A, Method 2. The mated connector pairing was wired in a series circuit. To complete the circuit 200mm lengths of 26AWG wire and custom PCBs were used. 2A was passed through the contacts and the temperature rise above ambient was recorded.

Power (Current vs Temp.) – 2A			
Test Setup	Connector Assembly Part Numbers		Temperature Rise (°C)
1	G125-MH10605MXP	G125-224069600	17.3
2	G125-MH12005MXP	G125-224209600	29.3
3	G125-MH15005MXP	G125-224509600	39.8

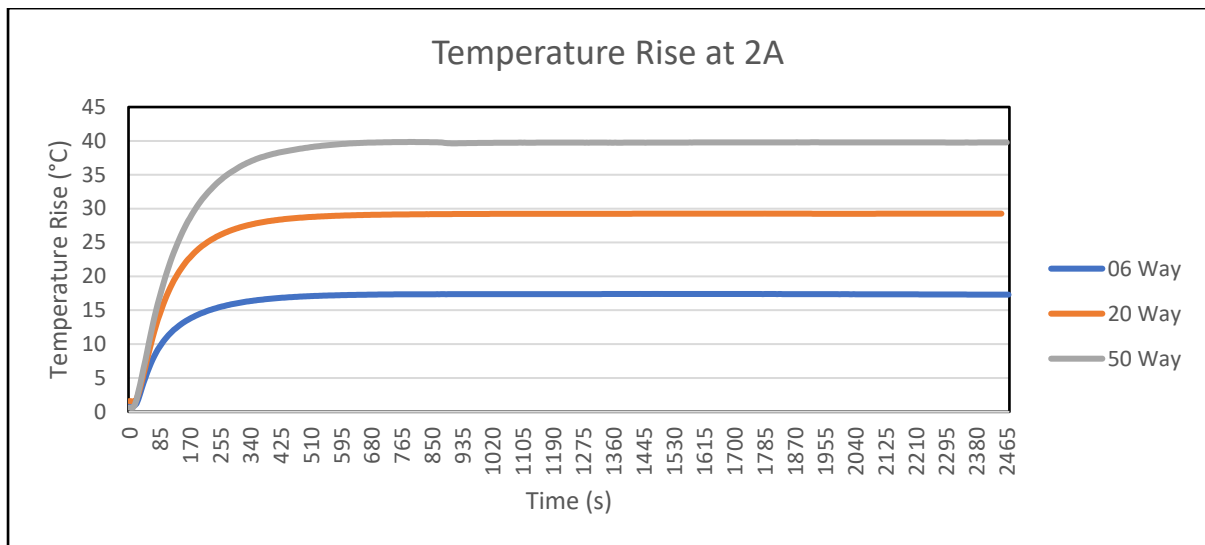


Figure 1: Graph of temperature rise in response to 2A current.

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

Specification:

- 2.8N maximum contact insertion force (using mating contact).
- 0.2N minimum contact withdrawal force (using mating contact).
- 1000 Mechanical Operations.

Methodology: For this test, fully-assembled connector pairs were mated at a speed of 25.4mm/min for 1500 cycles, in accordance with EIA-364-09C. 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. Average insertion and withdrawal forces are detailed below:

Durability Testing – Insertion Forces						
Connector Part No.		Connector Insertion Forces (N)			Contact Insertion Forces (N)	
		Initial	Max.	Final	Initial	Max.
G125-MH10605M3P	G125-224069600	10.16	12.99	12.99	1.69	2.17
G125-MH10605M4P	G125-224069600	9.71	13.96	13.59	1.62	2.45
G125-MH11005M3P	G125-224109600	23.05	24.40	23.89	2.31	2.44
G125-MH11005M4P	G125-224109600	19.85	24.47	23.63	1.99	2.45
G125-MH11205M3P	G125-224129600	21.71	25.14	24.77	1.81	2.10
G125-MH11205M4P	G125-224129600	23.28	26.56	25.81	1.94	2.21
G125-MH11605M3P	G125-224169600	22.46	28.27	28.27	1.40	1.77
G125-MH11605M4P	G125-224169600	24.99	33.27	32.48	1.56	2.08
G125-MH12005M3P	G125-224209600	25.81	43.03	39.36	1.29	2.15
G125-MH12005M4P	G125-224209600	34.91	45.87	44.38	1.75	2.29
G125-MH12605M3P	G125-224269600	18.95	41.09	33.79	0.73	1.58
G125-MH12605M4P	G125-224269600	18.28	46.91	46.09	0.70	1.80
G125-MH13405M3P	G125-224349600	28.57	52.72	51.53	0.84	1.55
G125-MH13405M4P	G125-224349600	38.64	58.54	58.17	1.14	1.72
G125-MH15005M3P	G125-224509600	34.68	95.22	95.22	0.69	1.90
G125-MH15005M4P	G125-224509600	30.43	97.16	91.22	0.61	1.94
Average					1.38	2.04

Durability Testing – Withdrawal Forces						
Connector Part No.		Connector Withdrawal Forces (N)			Contact Withdrawal Forces (N)	
		Initial	Max.	Final	Initial	Max.
G125-MH10605M3P	G125-224069600	2.99	7.24	5.68	0.50	1.21
G125-MH10605M4P	G125-224069600	4.70	5.68	3.49	0.78	0.95
G125-MH11005M3P	G125-224109600	4.78	10.01	8.42	0.48	1.00
G125-MH11005M4P	G125-224109600	6.12	12.62	7.25	0.61	1.26
G125-MH11205M3P	G125-224129600	4.85	13.37	9.56	0.40	1.11
G125-MH11205M4P	G125-224129600	6.05	14.49	10.53	0.50	1.21
G125-MH11605M3P	G125-224169600	8.14	17.92	15.46	0.51	1.12
G125-MH11605M4P	G125-224169600	8.74	20.31	13.01	0.55	1.27
G125-MH12005M3P	G125-224209600	14.34	24.57	18.06	0.72	1.23
G125-MH12005M4P	G125-224209600	14.19	25.99	20.06	0.71	1.30
G125-MH12605M3P	G125-224269600	13.07	27.93	17.10	0.55	1.07
G125-MH12605M4P	G125-224269600	14.78	30.02	19.27	0.57	1.15
G125-MH13405M3P	G125-224349600	28.57	52.72	31.21	0.72	1.05
G125-MH13405M4P	G125-224349600	20.53	34.27	30.99	0.60	1.01
G125-MH15005M3P	G125-224509600	29.79	58.24	41.07	0.60	1.16
G125-MH15005M4P	G125-224509600	26.43	56.15	34.48	0.53	1.12
Average					0.58	1.14

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

Specification:

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

Methodology: Contact retention in the housing was tested to EIA-364-05. 6 contacts were removed from the assemblies and forces measured; 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			
Part No.	Retention Force (N)		
	Max.	Min.	Average
G125-MH10605MXP	16.43	11.42	13.73
G125-MH11005MXP	14.18	10.75	12.45
G125-MH11205MXP	18.21	11.20	14.66
G125-MH11605MXP	14.18	8.66	11.41
G125-MH12005MXP	15.52	9.71	12.96
G125-MH12605MXP	13.96	8.66	11.08
G125-MH13405MXP	14.33	7.77	11.43
G125-MH15005MXP	14.33	8.44	11.78
Average			12.44

Non-Destructive Insert Retention in Housing		
Part No.	Retention (Pass/Fail)	
	G125-MH1XX05M3P	G125-MH1XX05M4P
G125-MH10605MXP	PASS	PASS
G125-MH11005MXP	PASS	PASS
G125-MH11205MXP	PASS	PASS
G125-MH11605MXP	PASS	PASS
G125-MH12005MXP	PASS	PASS
G125-MH12605MXP	PASS	PASS
G125-MH13405MXP	PASS	PASS
G125-MH15005MXP	PASS	PASS

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

Specification: 10Hz to 2kHz, 20gn pk or 1.52mm peak to peak (whichever is less), 196.1m/s² (20G), 20 mins per sweep cycle, 12 sweeps per axis, 4 hours per axis.

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. 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.

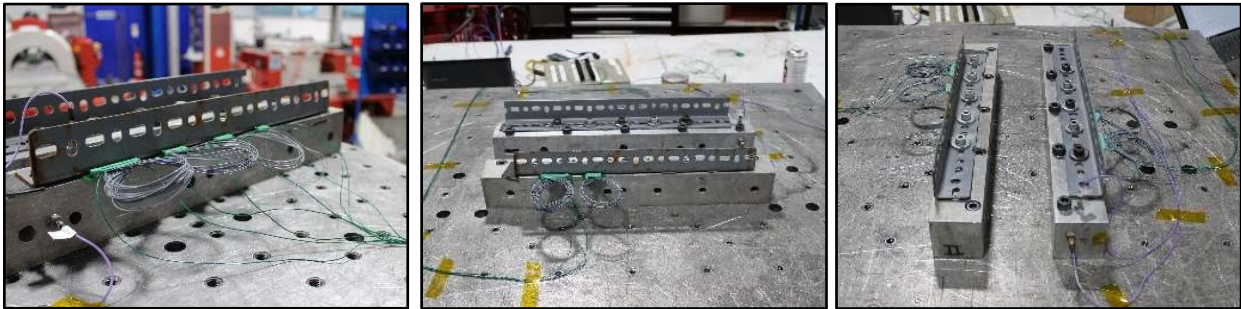


Figure 2: Samples mounted in the lateral, longitudinal and vertical axis

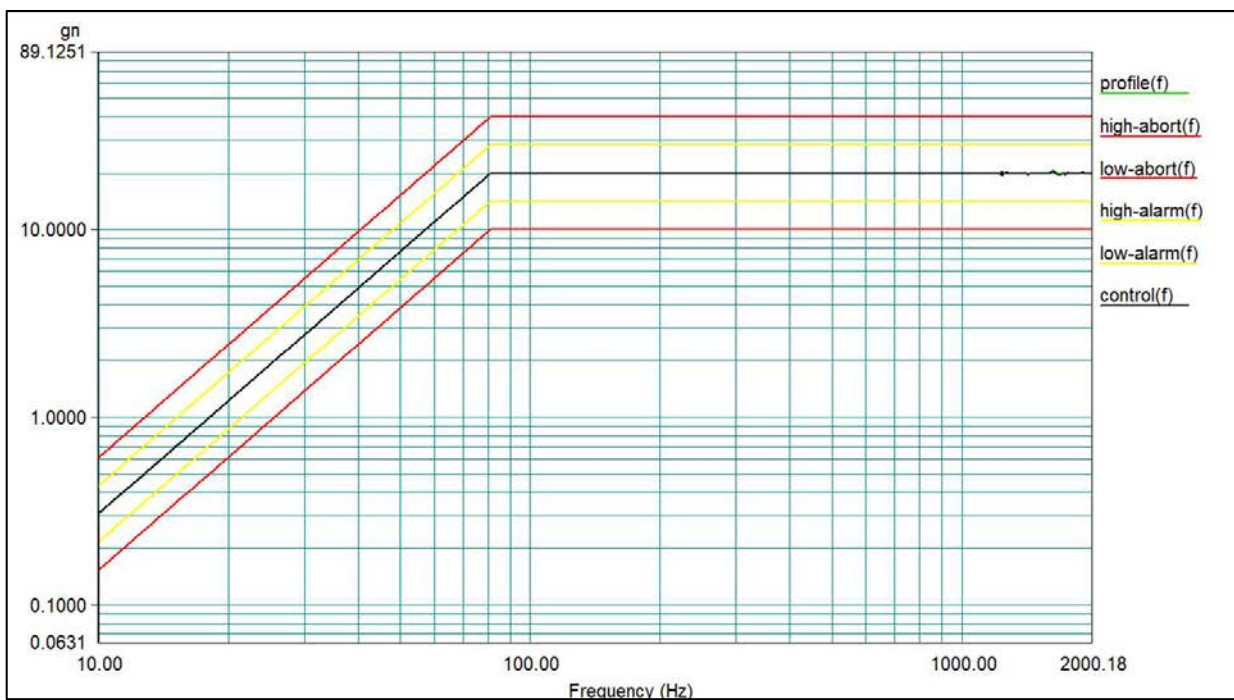


Figure 3: Sine sweep vibration response generated during sample testing

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

Specification: Acceleration: 100g pk, Shock Duration: 3ms, Half sine wave, 3 pulses per 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.

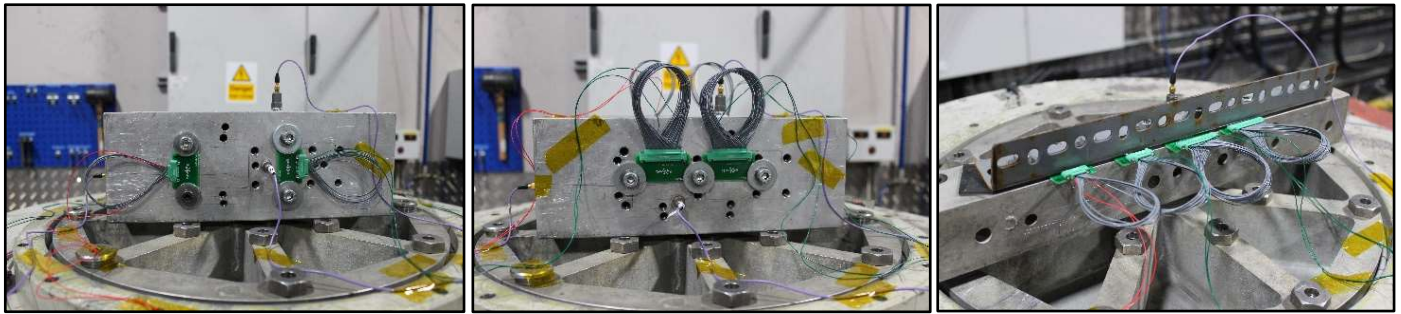


Figure 4: Samples mounted in the lateral, longitudinal and vertical

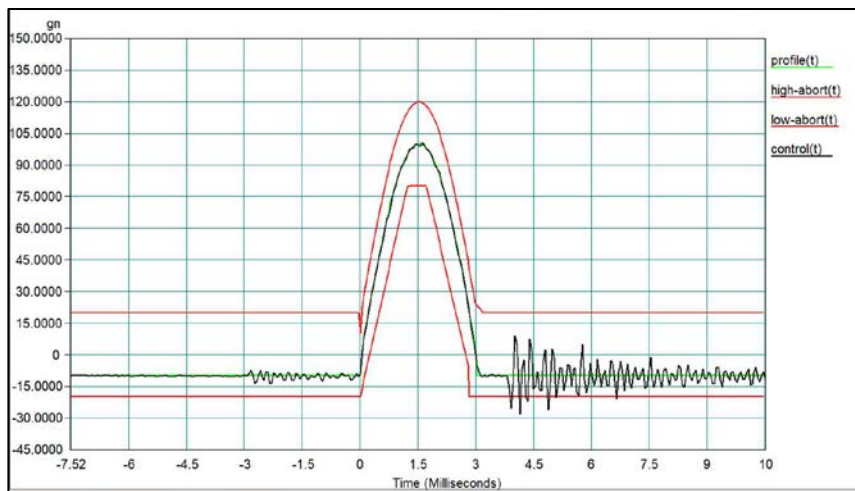


Figure 5: Positive shock pulse plot generated during mechanical shock testing

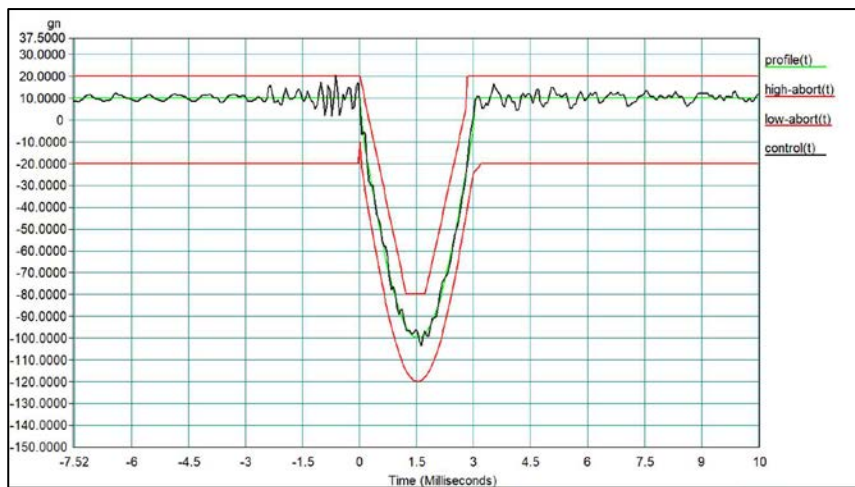


Figure 6: Negative shock pulse plot generated during mechanical shock testing

3.7. Withstand Voltage to EIA-364-20C: 2004

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 circuits to determine whether breakdown or flashover occurred. Current leakage was measured during the test. Samples were visually inspected following the test, with no obvious changes to the connectors occurring.

Insulation Resistance to EIA-364-21C: 2000:

Specification: Initial – 10GΩ min. Post-conditioning - 1GΩ min.

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

Connector Part No.		Ambient Pressure	
		Voltage Breakdown (5mA)	Insulation Resistance (10GΩ)
G125-MH10605MXP	G125-224069600	PASS	PASS
G125-MH11005MXP	G125-224109600	PASS	PASS
G125-MH11205MXP	G125-224129600	PASS	PASS
G125-MH11605MXP	G125-224169600	PASS	PASS
G125-MH12005MXP	G125-224209600	PASS	PASS
G125-MH12605MXP	G125-224269600	PASS	PASS
G125-MH13405MXP	G125-224349600	PASS	PASS
G125-MH15005MXP	G125-224509600	PASS	PASS