45000 Helm Street
Suite 150
Plymouth Twp., MI 48170

Telephone: 734-582-2900
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www.intertek.com

Test Report for:

Bluefin Robotics Corporation
Attn: Mr. Nate Gonzales

UN 38.3 BATTERY TESTING
Model Number: HE2608
Lithium Battery Packs

Client PO No.: 14-1612

Scott Souter	Nick Diamond
Associate Engineer	Sr. Associate Engineer
April 24, 2015	
Report No.: 101950236DET-001	Page 1 of 35

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Suite 150
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TEST VERIFICATION OF CONFORMANCE

TEST METHOD: UN Manual of Tests and Criteria "Recommendations on the Transport of Dangerous Goods," section 38.3 "Lithium Batteries"
Document number ST/SG/AC.10/11/Rev.5, Amend 1
Revision #: 5th Edition, Amendment 1
Effective Date: April 2012

SAMPLE DESCRIPTION: Eight (8) HE2608 8.7Ah Lithium Battery Packs

MANUFACTURER: Bluefin Robotics Corporation

SPECIFICATION SECTIONS T1 through T5:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

SPECIFICATION SECTION T7:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 9

Condition of Test Sample: Production

DATE RECEIVED: 01/07/2015 and 02/11/2015
DATES TESTED: 02/19/2015 through 04/24/2015

RESULT SUMMARY: The tested samples met the test requirements. See below breakout for tests performed.

Specification Section	Test Description	Results
T1	Altitude Simulation	Conforms
T2	Thermal Test	Conforms
T3	Vibration	Conforms
T4	Shock	Conforms
T5	External Short Circuit	Conforms
T7	Overcharge	Conforms

Scott Souter	Nick Diamond
Associate Engineer	Sr. Associate Engineer
April 24, 2015	
Report No.: 101950236DET-001	

Attn: Mr. Nate Gonzales
Bluefin Robotics Corporation
553 South Street
Quincy, MA 02169
Phone: (615) 715-7020
E-mail Address: ngonzales@bluefinrobotics.com

DATE RECEIVED: 01/07/2015 and 02/11/2015
DATE TESTED: 02/19/2015 through 04/24/2015

WORK REQUESTED / APPLICABLE DOCUMENTS:

Per the client's request and in accordance with UN 38.3 and our quotation number 500551788, dated 09/08/2014; perform Battery Testing as described below:

- T1 Test – Altitude Simulation
- T2 Test – Thermal Test
- T3 Test – Vibration
- T4 Test – Shock
- T5 Test – External Short Circuit
- T7 Test – Overcharge

DESCRIPTION OF TEST SAMPLES:

Eight (8) HE2608 8.7Ah Lithium Battery Packs

SPECIFICATION SECTIONS T1 through T5:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

SPECIFICATION SECTION T7:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 9

Condition of Test Sample: Production

EQUIPMENT LIST:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
160468	MULTIMETER	Fluke	12	68151007	12/09/2014	12/09/2015
376-003	PRECISION BALANCE	A&D COMPANY	GF-4000	T0338281	07/01/2014	07/01/2015
160808	DATA ACQUISITION / SWITCH UNIT	AGILENT	34970A	US37046210	09/23/2014	09/23/2015
160272	DC POWER SUPPLY	AMREL	LPS101	392663	VBU	VBU
161279	ALTITUDE CABINET	ENTELA	N/A	N/A	VBU	VBU
161279.1	PRESSURE TRANSDUCER FOR ALTITUDE CABINET 0-30 PSI	FAIRCHILD INDUSTRIAL	TA870212A	366027	11/21/2014	11/21/2015
162188P	ENVIRONMENTAL CHAMBER	ENVIROTRONICS	SSH32c-ac	01046091	VBU	VBU
162188.1	F4 CONTROLLER	WaTLOW	F4DHKKKK01RG	018908	03/09/2015	03/09/2016
162595	DATA ACQUISITION SWITCH UNIT	AGILENT	34972A	MY49008360	10/10/2014	10/10/2015
375-009	ACCELEROMETER	DYTRAN	3035B	9901	05/09/2014	05/09/2015
375-020	VIBRATION CONTROLLER	VIBRATION RESEARCH	VR9500	950D89A2	07/17/2014	07/17/2015
375-020.1	CoMPUTER	HEWETT PACKARD	PAVILION S5-1224	3CR223104F	VBU	VBU
160122	VIBRATION SHAKER	UNHOLTZ-DICKIE	# 560	290	VBU	VBU
160112	VIBRATION AMP	UNHOLTZ-DICKIE	TA-117SA-560	1987	VBU	VBU
376-002	ICP SHOCK SENSOR	PCB	350B04	44164	05/03/2014	05/03/2015
161197	SHOCK MACHINE (asset for controller is 375-042)	AVCO	SM-220 MP	HP-0011	VBU	VBU
375-042	VIBRATION CONTROLLER	VIBRATION RESEARCH	VR9500	951394BE	01/20/2015	01/20/2016
161294	ENVIRONMENTAL CHAMBER - NO HUMIDITY	THERMOTRON	S-1.2c	22607	06/11/2014	06/11/2015
162596	DATA ACQUISITION SWITCH UNIT	AGILENT	34972A	MY49008371	03/11/2015	03/11/2016
161342	SWITCHING POWER SUPPLY	BK PRECISION	1692	S940035793	VBU	VBU
162606	DATA ACQUSITION SWITCH UNIT	AGILENT	34972A	MY49008151	03/11/2015	03/11/2016
160638	POWER SUPPLY	XANTREX	XFR 0-600V 46A	54432	VBU	VBU
160639	POWER SUPPLY	XANTREX	XFR 0-600V 46A	54463	VBU	VBU
160640	POWER SUPPLY	XANTREX	XFR 0-600V 46A	55253	VBU	VBU
160641	POWER SUPPLY	XANTREX	XFR 0-600V 46A	55252	VBU	VBU
160160	D.C. AMMETER SHUNT, 0-50 AMPS.	EMPRO	HA-50-50	none	10/16/2014	10/16/2015
162101	CURRENT SHUNT	EMPRO	HA-50-100	none	VBU	VBU
162152	CURRENT SHUNT	EMPRO	HA-50-50	none	VBU	VBU
162026	CURRENT SHUNT	RAM METER	A100A100MV	none	02/01/2010	02/01/2013

T1 – ALTITUDE SIMULATION

Date Received: 01/07/2015 and 02/11/2015
Date(s) Tested: 02/20/2015

Description of Samples:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

Purpose:
This test simulates air transport under low-pressure conditions.

Test Procedure:
Prior to testing the voltage and mass were measured on each sample. The samples were then placed into an altitude cabinet, stored at a pressure of 11.6 kPa or less for six (6) hours at ambient temperature. After testing, the voltage and mass were measured on each sample.

Acceptance Criteria:
Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

Results:
The test samples conformed to the acceptance criteria; there was no mass loss, no leakage, no venting, no disassembly, no rupture, no fire and the open circuit voltage of each test sample after testing was not less than 90% of its voltage immediately prior to this procedure.

T1 - Altitude Simulation

Sample No.	Pre Conditioning Cycles	Voltage Pre Test (VDC)	Voltage Post Test (VDC)	%Change (Not Greater Than 10%)	Weight Pre Test (Grams)	Weight Post Test (Grams)	%Change (Not Greater Than 0.1%)	Meets requirement
1	50	27.76	27.71	0.18	1273.62	1273.55	0.01	Pass
2	50	29.31	29.28	0.10	1286.99	1286.90	0.01	Pass
3	50	29.21	29.18	0.10	1274.23	1274.15	0.01	Pass
4	50	29.14	29.12	0.07	1278.56	1278.48	0.01	Pass
5	1	25.81	25.77	0.15	1277.07	1277.00	0.01	Pass
6	1	26.37	26.31	0.23	1280.58	1280.51	0.01	Pass
7	1	29.04	28.99	0.17	1279.01	1278.95	0.00	Pass
8	1	26.40	26.33	0.27	1284.87	1284.81	0.00	Pass

Appendix:
Appendix A – Photograph
Appendix B – Altitude Simulation Graph

Disposition of Test Samples:
At the completion of testing, the samples continued to T2 – Thermal Testing.

T2 – THERMAL TEST

Date Received: 01/07/2015 and 02/11/2015
Date(s) Tested: 02/20/2015 through 02/27/2015

Description of Samples:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

Purpose:
This test assesses cell and battery seal integrity and internal electrical connections. The test is conducted using rapid and extreme temperature changes.

Test Procedure:
Prior to testing the voltage and mass were measured on each sample. The samples were placed into an environmental chamber and stored for six (6) hours at 72°C ± 2°C, followed by storage of equal time at a temperature of -40°C ± 2°C. The maximum time interval between test temperature extremes was 30 minutes. This procedure was repeated 10 times, after which all samples were stored for 24 hours at ambient temperature. After testing the voltage and mass were measured on each sample.

Acceptance Criteria:
Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

Results:
The test samples conformed to the acceptance criteria; there was no mass loss, no leakage, no venting, no disassembly, no rupture, no fire and the open circuit voltage of each test sample after testing was not less than 90% of its voltage immediately prior to this procedure.

T2 - Thermal Test								
Sample No.	Pre Conditioning Cycles	Voltage Pre Test (VDC)	Voltage Post Test (VDC)	%Change (Not Greater Than 10%)	Weight Pre Test (Grams)	Weight Post Test (Grams)	%Change (Not Greater Than 0.1%)	Meets requirement
1	50	27.71	27.23	1.73	1273.55	1273.32	0.02	Pass
2	50	29.28	28.38	3.07	1286.90	1286.68	0.02	Pass
3	50	29.18	28.38	2.74	1274.15	1273.89	0.02	Pass
4	50	29.12	28.32	2.75	1278.48	1278.22	0.02	Pass
5	1	25.77	25.50	1.05	1277.00	1276.75	0.02	Pass
6	1	26.31	25.84	1.79	1280.51	1280.26	0.02	Pass
7	1	28.99	28.26	2.52	1278.95	1278.74	0.02	Pass
8	1	26.33	25.85	1.82	1284.81	1284.56	0.02	Pass

T2 – THERMAL TEST (cont'd)

Appendix:
Appendix A – Photograph
Appendix C – Thermal Test Graph

Disposition of Test Samples:
At the completion of testing, the samples continued to T3 – Vibration Testing.

T3 – VIBRATION

Date Received: 01/07/2015 and 02/11/2015
Date(s) Tested: 03/10/2015

Description of Samples:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

Purpose:
This test simulates vibration during transport.

Test Procedure:
Prior to testing the voltage and mass were measured on each sample. The samples were firmly secured to the platform of the vibration machine without distorting the packs in such a manner as to faithfully transmit the vibration. The test samples were subjected to sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle was repeated 12 times for a total of three (3) hours for each of the three (3) mutually perpendicular mounting positions of the sample. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1g is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8g occurs (approximately 50 Hz). A peak acceleration of 8g is then maintained until the frequency is increased to 200 Hz. After testing the voltage and mass were measured on each sample.

Acceptance Criteria:
Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

Results:
The test samples conformed to the acceptance criteria; there was no leakage, no venting, no disassembly, no rupture and no fire and the open circuit voltage of each test cell or battery after testing was not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T3 - Vibration

Sample No.	Pre Conditioning Cycles	Voltage Pre Test (VDC)	Voltage Post Test (VDC)	%Change (Not Greater Than 10%)	Weight Pre Test (Grams)	Weight Post Test (Grams)	%Change (Not Greater Than 0.1%)	Meets requirement
1	50	26.88	26.83	0.19	1273.58	1273.56	0.00	Pass
2	50	27.91	27.86	0.18	1286.96	1286.95	0.00	Pass
3	50	28.03	27.98	0.18	1274.16	1274.14	0.00	Pass
4	50	27.93	27.88	0.18	1278.55	1278.53	0.00	Pass
5	1	25.34	25.32	0.08	1277.03	1277.01	0.00	Pass
6	1	25.62	25.59	0.12	1280.53	1280.52	0.00	Pass
7	1	27.89	27.85	0.14	1279.04	1279.03	0.00	Pass
8	1	25.61	25.59	0.08	1284.85	1284.83	0.00	Pass

T3 – VIBRATION TEST (cont'd)

Appendices:
Appendix A – Photographs
Appendix D – Vibration Plots

Disposition of Test Samples:
At the completion of testing, the samples continued to T4 – Shock Test.

T4 – SHOCK

Date Received: 01/07/2015 and 02/11/2015
Date(s) Tested: 03/11/2015

Description of Samples:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

Purpose:
This test simulates possible impacts during transport.

Test Procedure:
Prior to testing the voltage and mass were measured on each sample. The samples were secured to the testing machine by means of a rigid mount with support on all mounting surfaces of each test battery. Each sample was subjected to a half-sine shock with a peak acceleration of 150G's and pulse duration of six (6) milliseconds. Each sample was subjected to three (3) shocks in the positive direction followed by three (3) shocks in the negative direction of the three mutually perpendicular mounting positions. After testing the voltage and mass were measured on each sample.

Acceptance Criteria:
Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

Results:
The test samples conformed to the acceptance criteria; there was no leakage, no venting, no disassembly, no rupture and no fire and the open circuit voltage of each test cell or battery after testing was not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T4 - Shock								
Sample No.	Pre Conditioning Cycles	Voltage Pre Test (VDC)	Voltage Post Test (VDC)	% Change (Not Greater Than 10%)	Weight Pre Test (Grams)	Weight Post Test (Grams)	% Change (Not Greater Than 0.1%)	Meets requirement
1	50	26.83	26.83	0.00	1273.56	1276.55	-0.23	Pass
2	50	27.86	27.85	0.04	1286.95	1286.94	0.00	Pass
3	50	27.98	27.98	0.00	1274.14	1274.14	0.00	Pass
4	50	27.88	27.87	0.04	1278.53	1278.53	0.00	Pass
5	1	25.32	25.31	0.04	1277.01	1277.01	0.00	Pass
6	1	25.59	25.59	0.00	1280.52	1280.51	0.00	Pass
7	1	27.85	27.84	0.04	1279.03	1279.03	0.00	Pass
8	1	25.59	25.59	0.00	1284.83	1284.84	0.00	Pass

T4 – SHOCK TEST (cont'd)

Appendices:
Appendix A – Photographs
Appendix E – Shock Plots

Disposition of Test Samples:
At the completion of testing, the samples continued to T5 – External Short Circuit Testing.

T5 – EXTERNAL SHORT CIRCUIT

Date Received: 01/07/2015 and 02/11/2015
Date(s) Tested: 03/13/2015, 03/26/2015, and 04/06/2015

Description of Samples:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 8

Purpose:
This test simulates an external short circuit.

Test Procedure:
The samples were temperature stabilized until the external case temperature reached 55°C ± 2°C and then the samples were subjected to a short circuit condition with a total external resistance of less than 0.1 Ohm at 55°C ± 2°C. This short circuit condition continued for one (1) hour after the sample's external case temperature returned to 55°C ± 2°C. The samples were observed for a further six (6) hours for the test to be concluded.

Acceptance Criteria:
Cells and batteries meet this requirement if their external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire within six hours of this test.

Results:
The test samples conformed to the acceptance criteria; at the completion of testing the cells and batteries external temperature did not exceed 170°C and there was no disassembly, no rupture or fire within six hours of this test.

Appendices:
Appendix A – Photograph
Appendix F – External Short Circuit Graphs

Disposition of Test Samples:
At the completion of testing, the samples continued to T7 – Overcharge.

T7 – OVERCHARGE

Date Received: 01/07/2015 and 02/11/2015
Date(s) Tested: 04/17/2015 through 04/24/2015

Description of Samples:
Eight (8) HE2608 8.7Ah Lithium Battery Packs, sample numbers:

50 Cycle
- SN 1
- SN 2
- SN 3
- SN 4

1 cycle
- SN 5
- SN 6
- SN 7
- SN 9

Purpose:
This test evaluates the ability of a rechargeable battery to withstand an overcharge condition.

Test Procedure:

Test Parameters:	
Number of Samples:	8
Manufacturer's Maximum Charge Current:	4.2A
Manufacturer's Maximum Charge Voltage:	29.2Vdc
Test Charge Current: (Two Times the Manufacturer's Charge Current)	8.4A
Test Charge Voltage: (If less than 18V: The lessor of twice the Maximum Charge Voltage or 22V, If more than 18V: 1.2 time the Maximum Charge Voltage)	35.04Vdc
Duration:	24 Hours

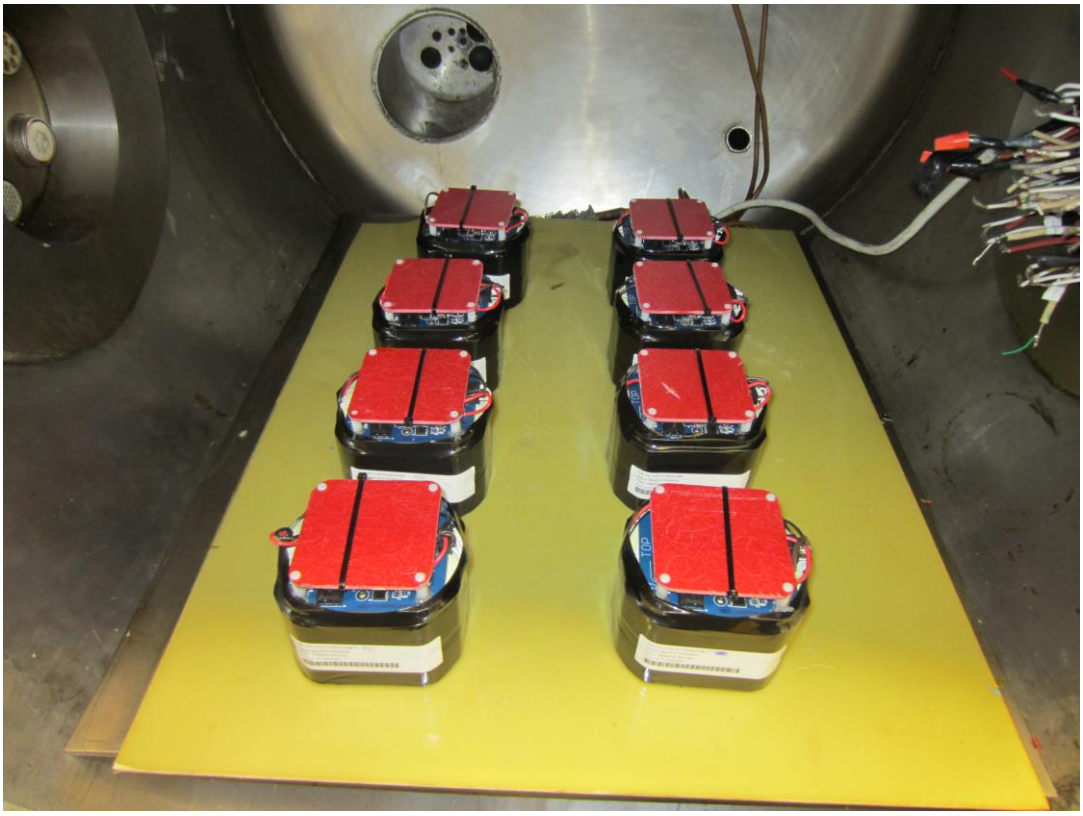
Acceptance Criteria:
Rechargeable batteries meet this requirement if there is no disassembly and no fire within seven (7) days of the test.

Results:
The test samples conformed to the acceptance criteria; there was no disassembly and no fire within seven days of the test.

Appendices:
Appendix A – Photograph
Appendix G – Overcharge Graphs

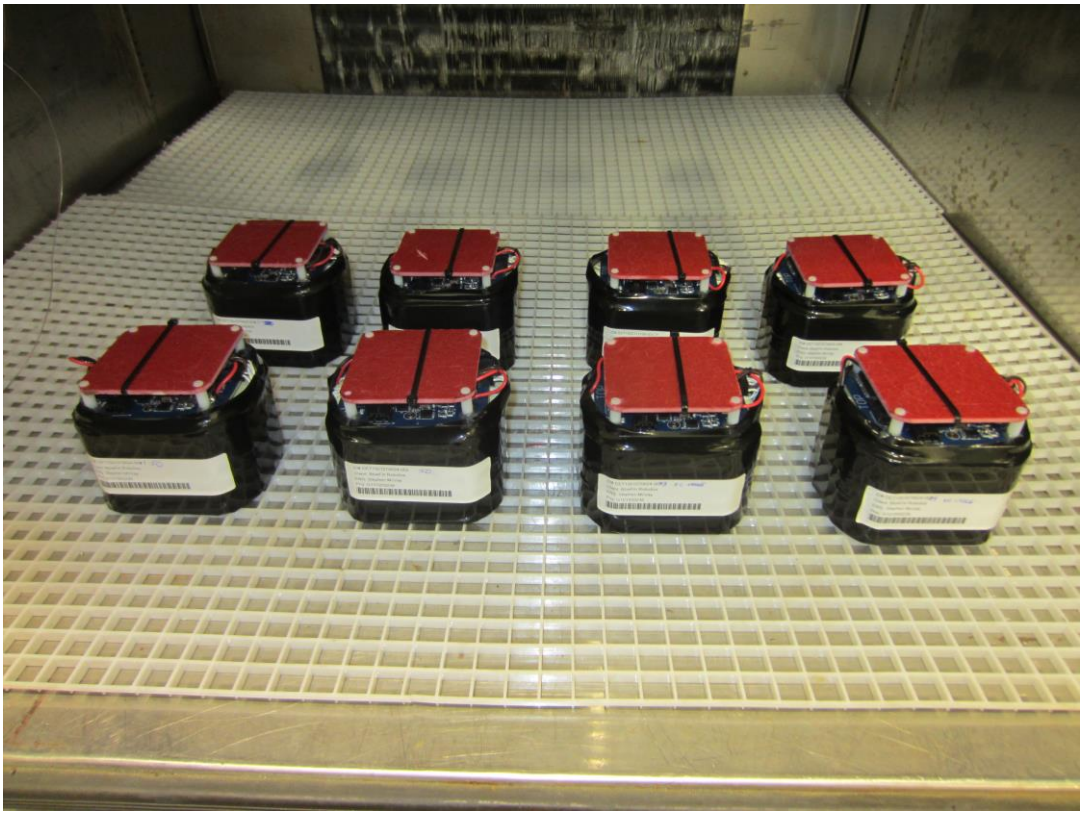
Disposition of Test Samples:
At the completion of testing, the samples were returned to the client.

APPENDIX A – PHOTOGRAPHS
T1 – Altitude Simulation Test



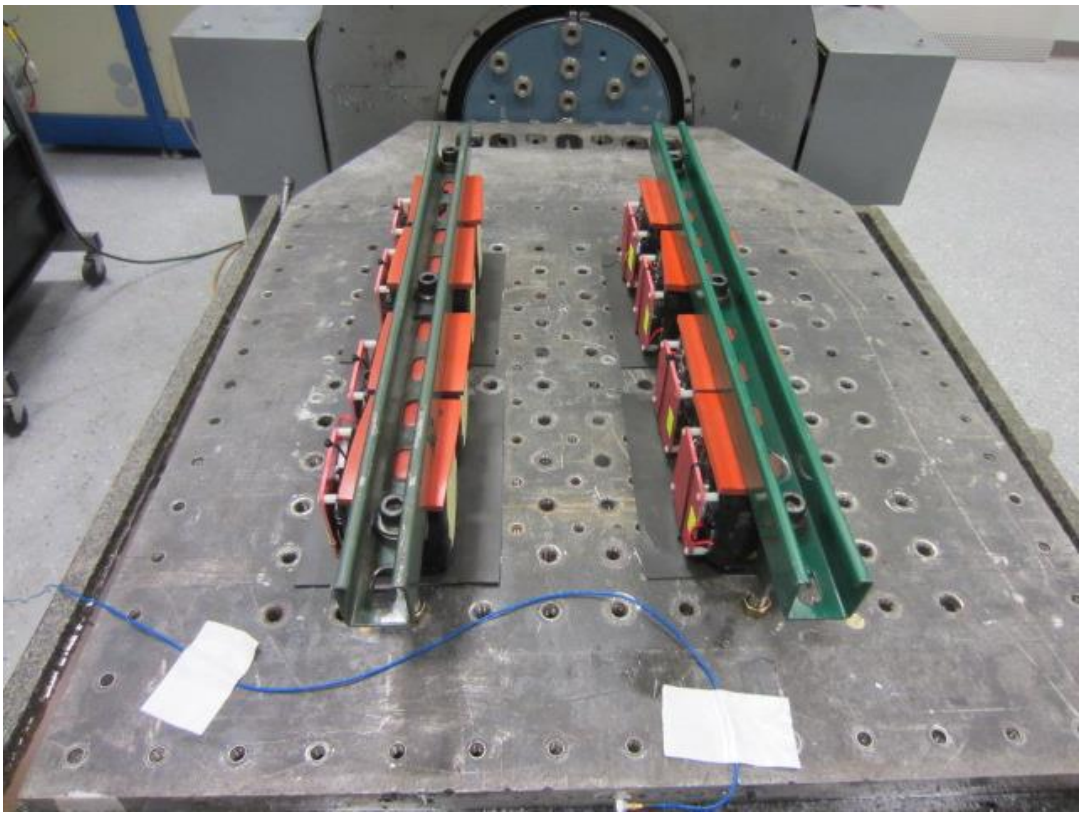
Photograph 1: Altitude Simulation Setup

APPENDIX A – PHOTOGRAPHS (cont'd)
T2 – Thermal Test

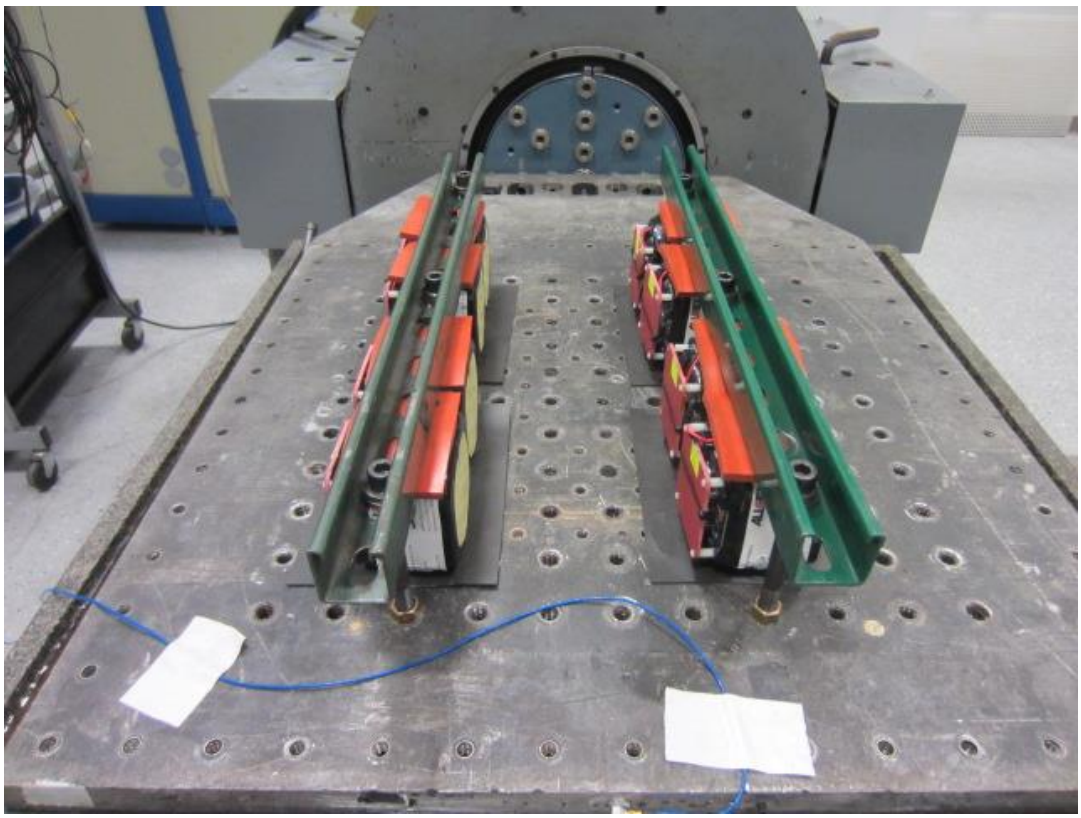


Photograph 2: Thermal Test Setup

APPENDIX A – PHOTOGRAPHS (cont'd)
T3 – Vibration Test

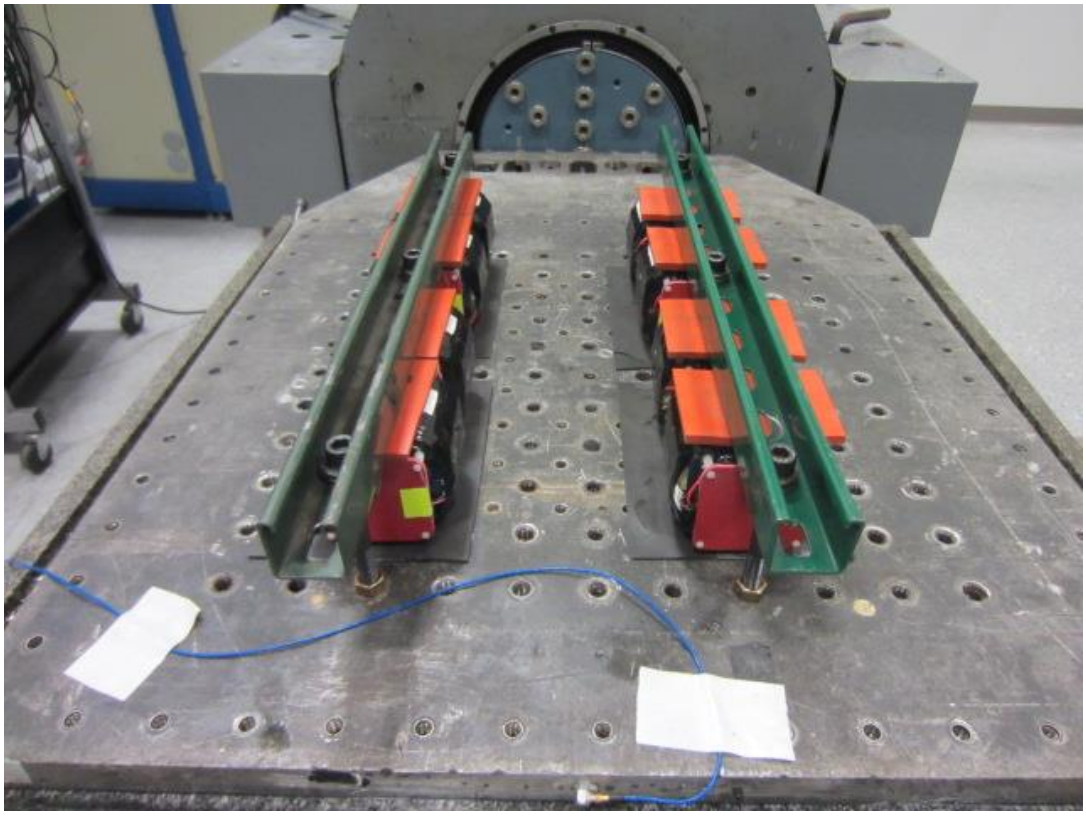


Photograph 3: Vibration Test Setup – Fore/Aft Direction



Photograph 4: Vibration Test Setup – Lateral Direction

APPENDIX A – PHOTOGRAPHS (cont'd)
T3 – Vibration Test



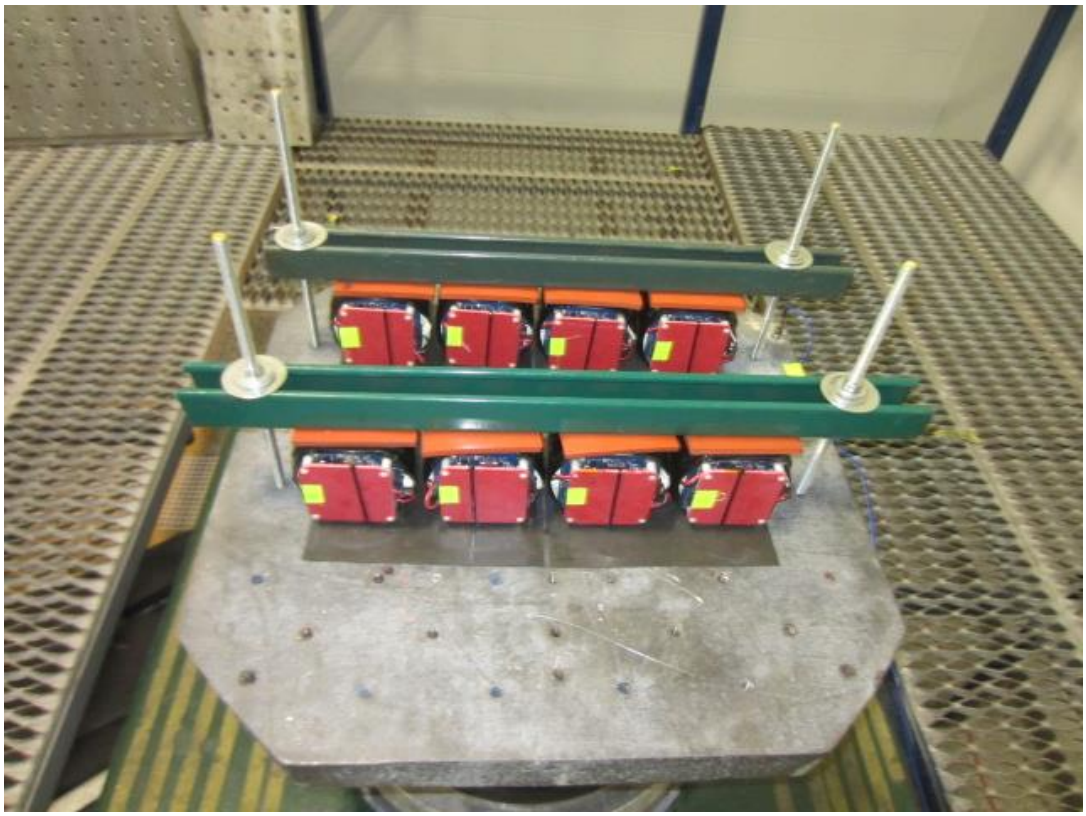
Photograph 5: Vibration Test Setup – Vertical Direction

APPENDIX A – PHOTOGRAPHS (cont'd)
T4 – Shock Test

Photograph 6: Shock Test Setup – Fore/Aft, Positive Direction

Photograph 7: Shock Test Setup – Fore/Aft, Negative Direction

APPENDIX A – PHOTOGRAPHS (cont'd)
T4 – Shock Test

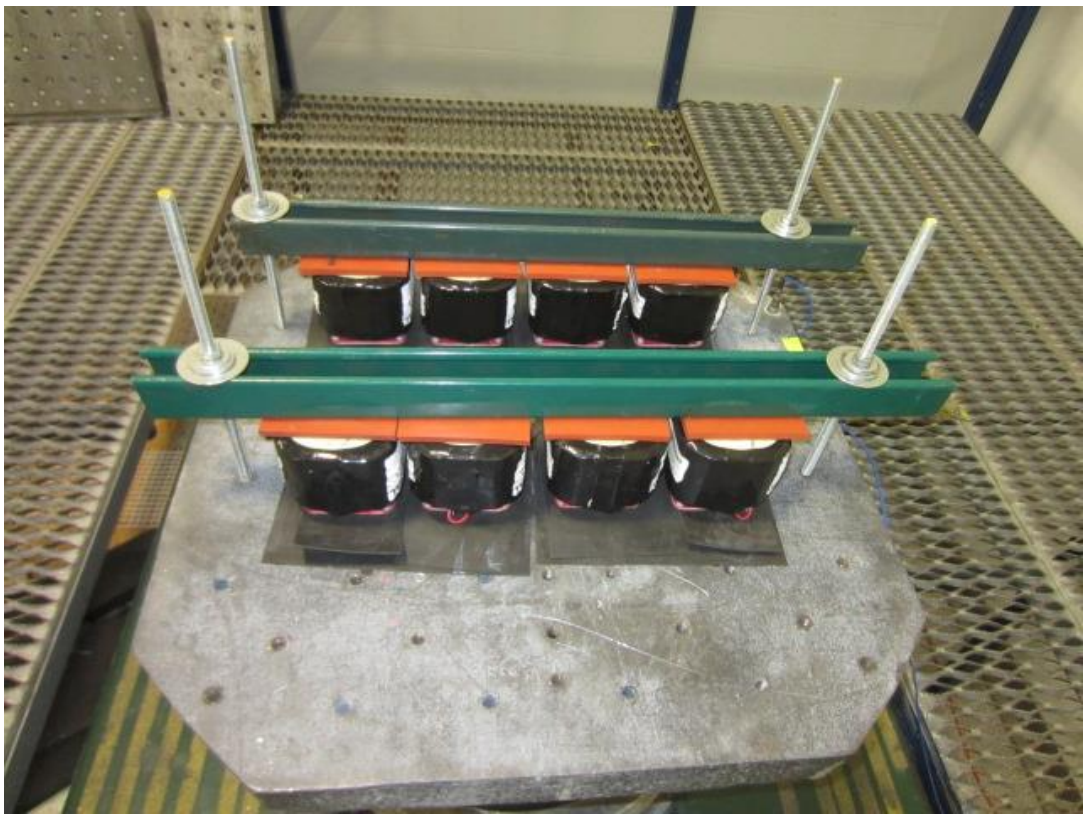


Photograph 8: Shock Test Setup – Lateral, Positive Direction

Photograph 9: Shock Test Setup – Lateral, Negative Direction

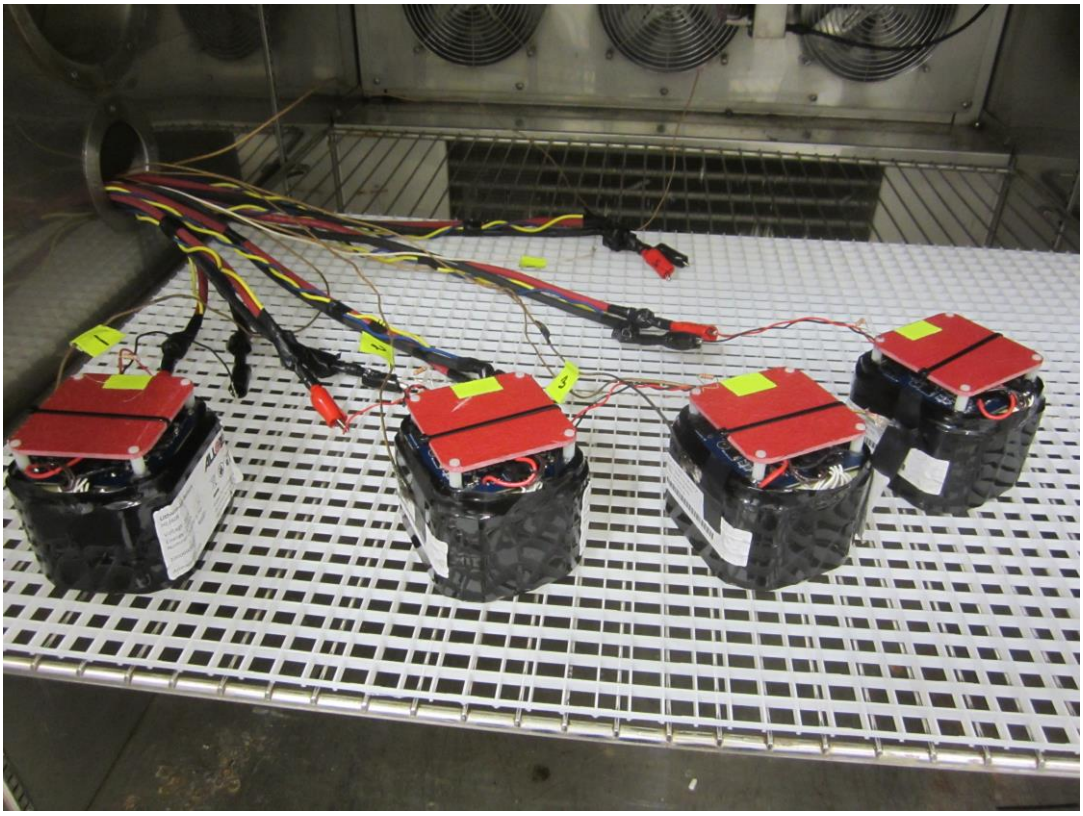
APPENDIX A – PHOTOGRAPHS (cont'd)
T4 – Shock Test

Photograph 10: Shock Test Setup – Vertical, Positive Direction



Photograph 11: Shock Test Setup – Vertical, Negative Direction

APPENDIX A – PHOTOGRAPHS (cont'd)
T5 – External Short Circuit



Photograph 12: External Short Circuit Test Setup

APPENDIX A – PHOTOGRAPHS (cont'd)
T7 – Overcharge

Photograph 13: Overcharge Test Setup

APPENDIX B – ALTITUDE SIMULATION GRAPH

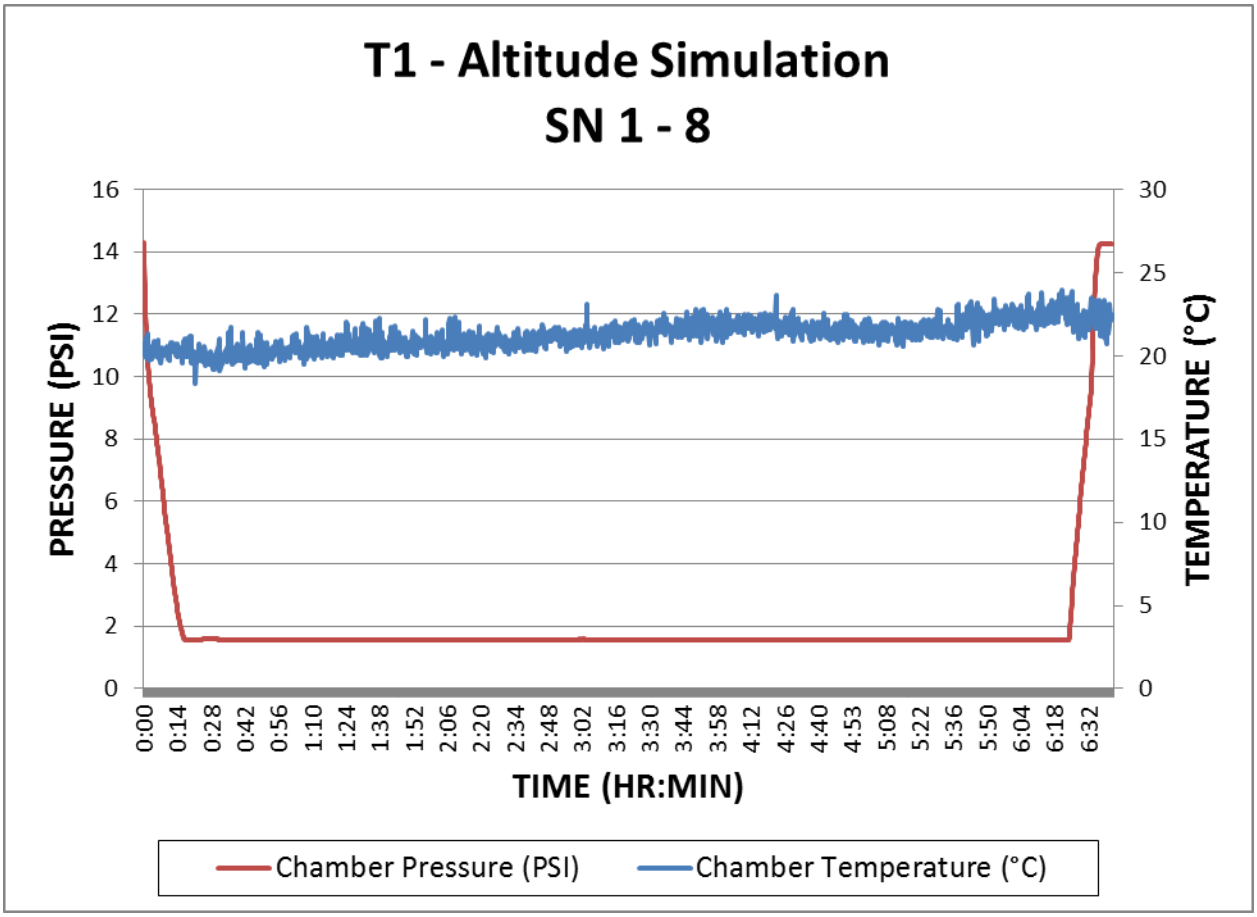


Figure 1: Altitude Simulation Graph; SN 1 - 8

APPENDIX C – THERMAL TEST GRAPH

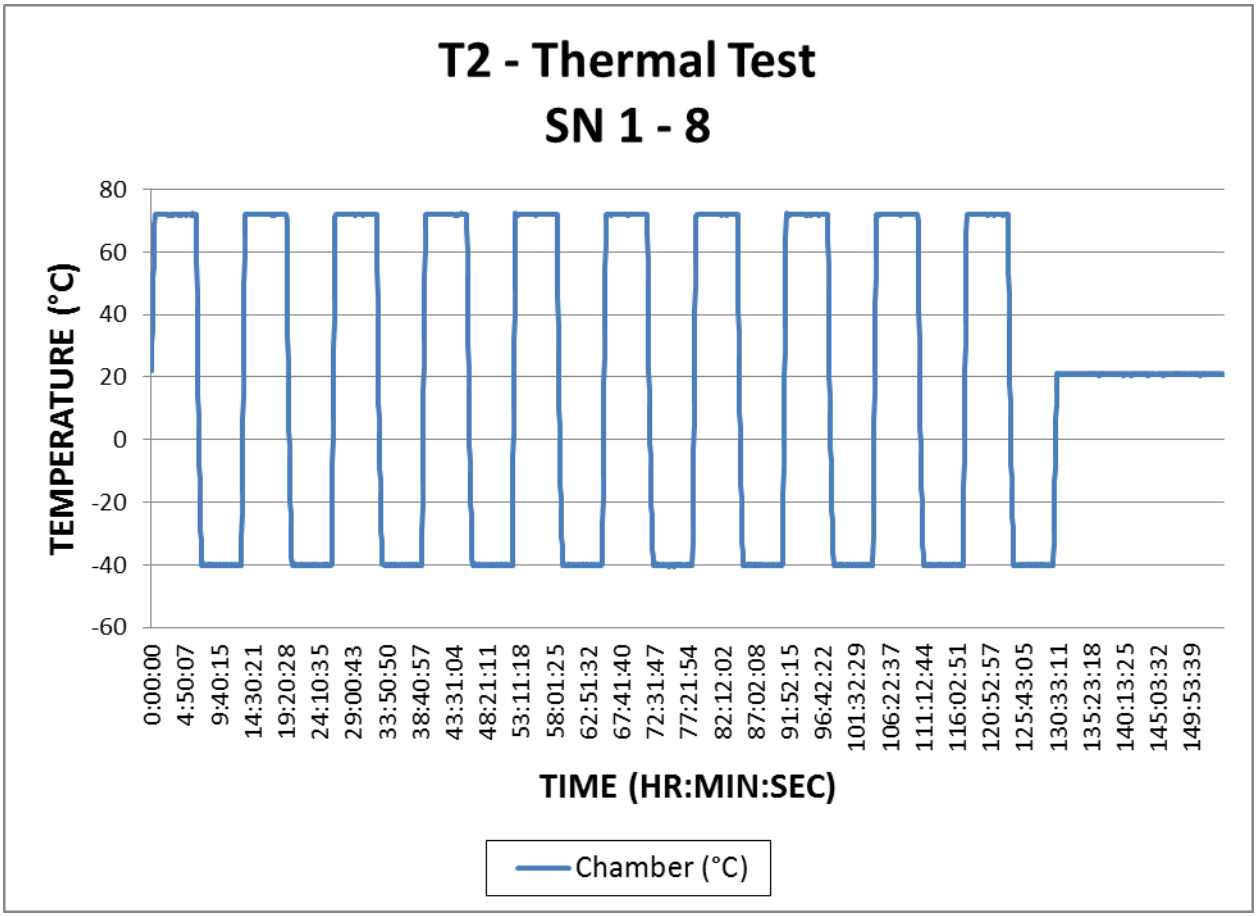


Figure 2: Thermal Test Graph; SN 1 - 8

APPENDIX B – VIBRATION PLOTS

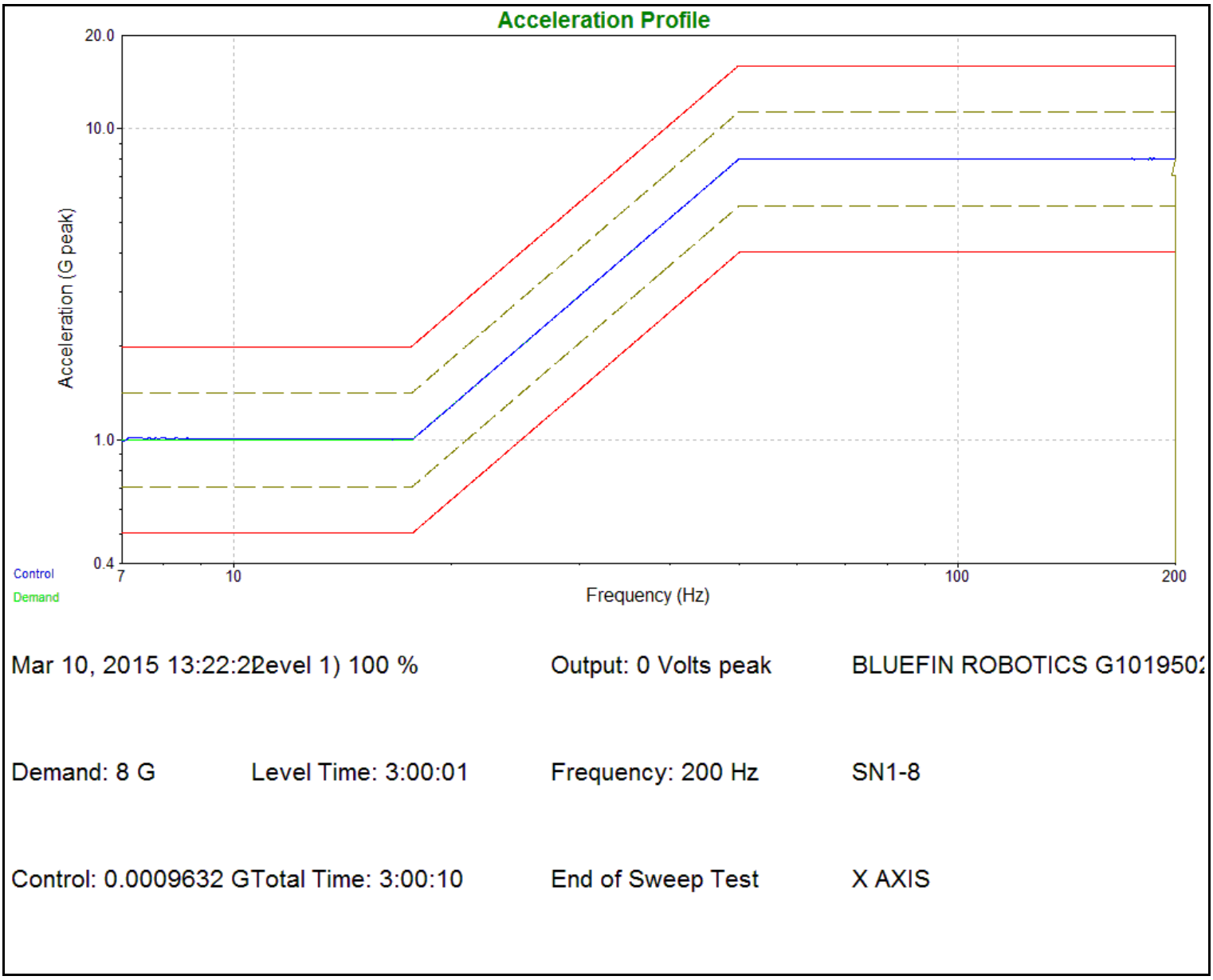


Figure 3: Vibration Plot – Fore/Aft Direction; SN 1 - 8

APPENDIX D –VIBRATION PLOTS (cont'd)

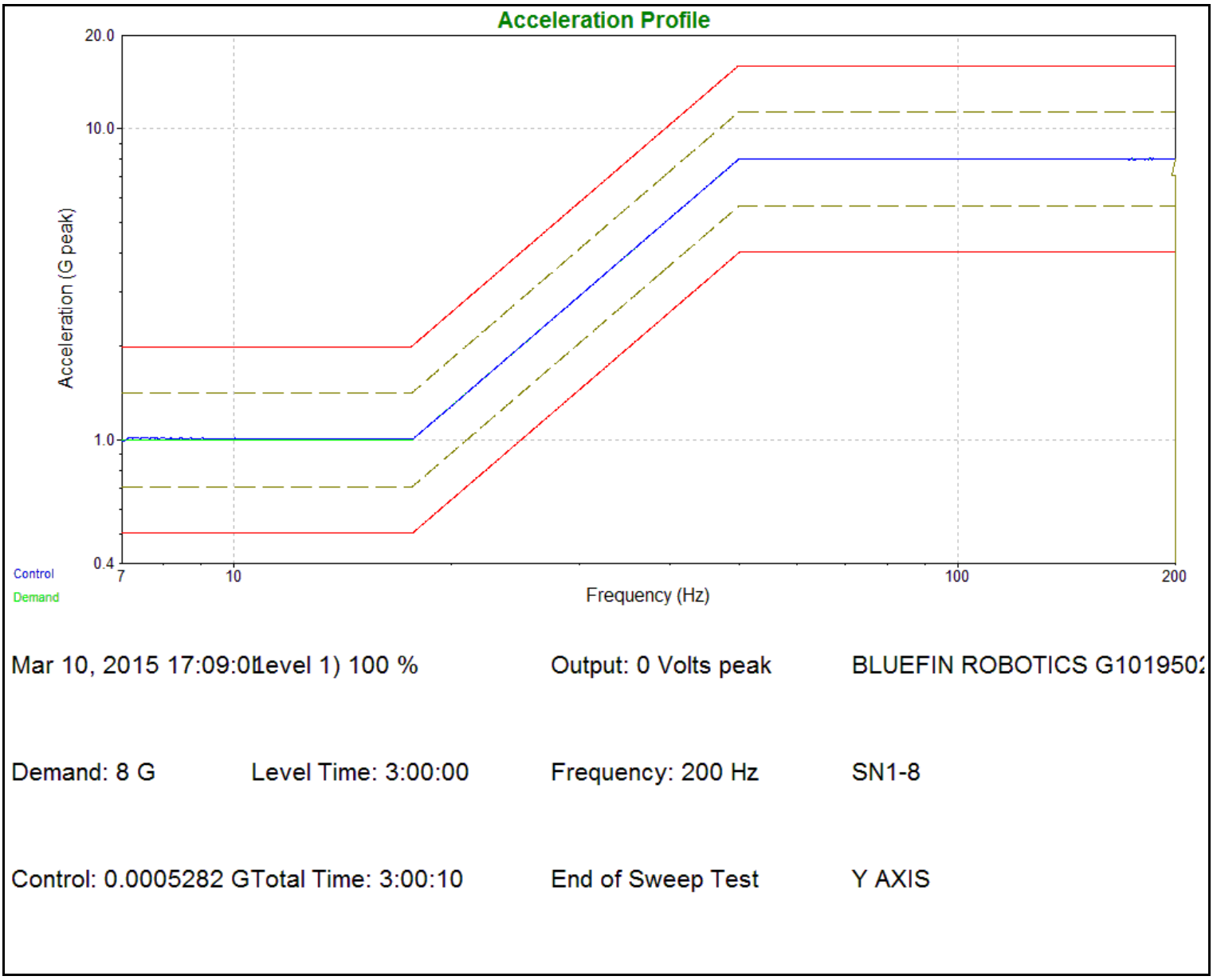


Figure 4: Vibration Plot – Lateral Direction; SN 1 - 8

APPENDIX D –VIBRATION PLOTS (cont'd)

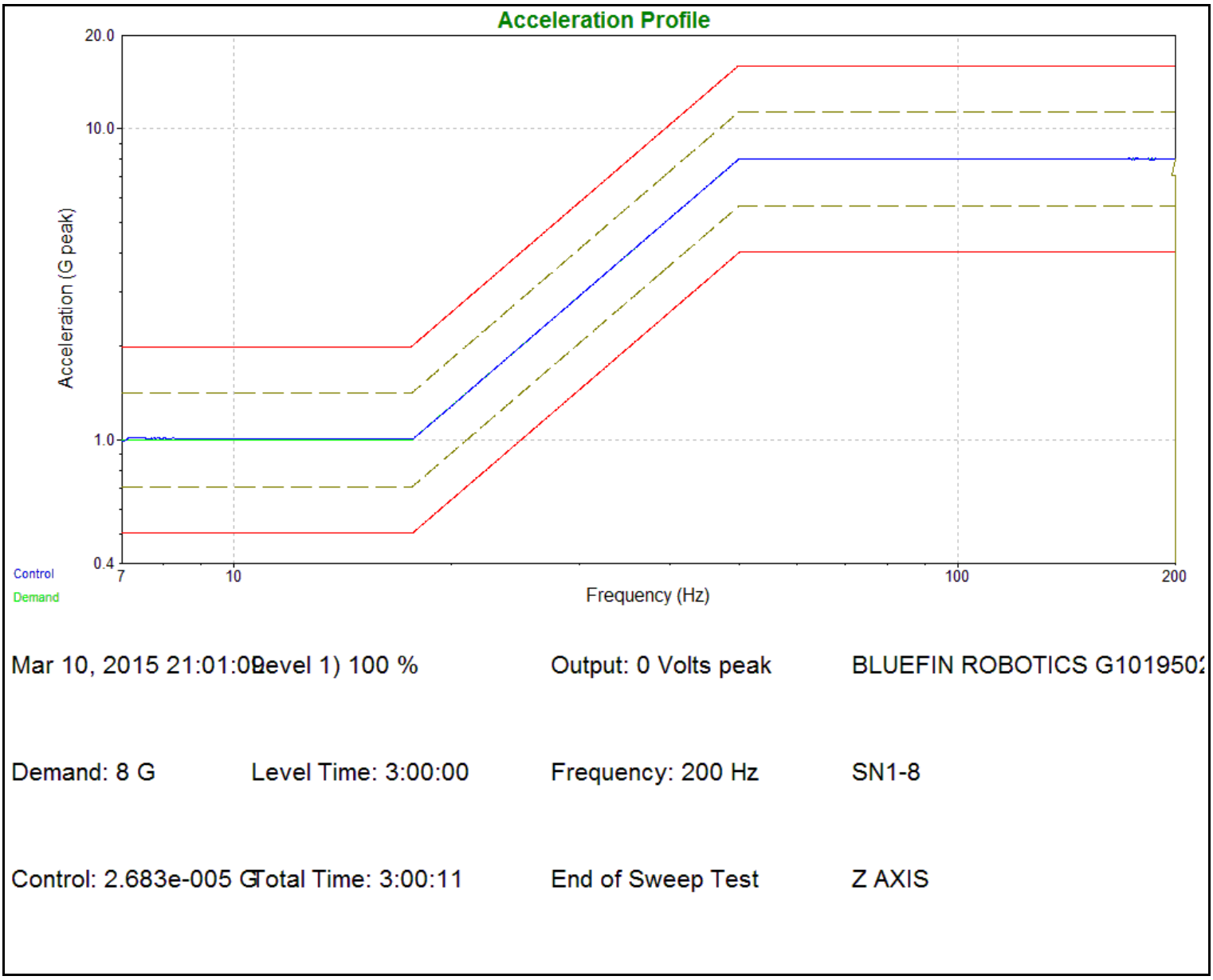


Figure 5: Vibration Plot – Vertical Direction; SN 1 - 8

APPENDIX E – MECHANICAL SHOCK PLOTS

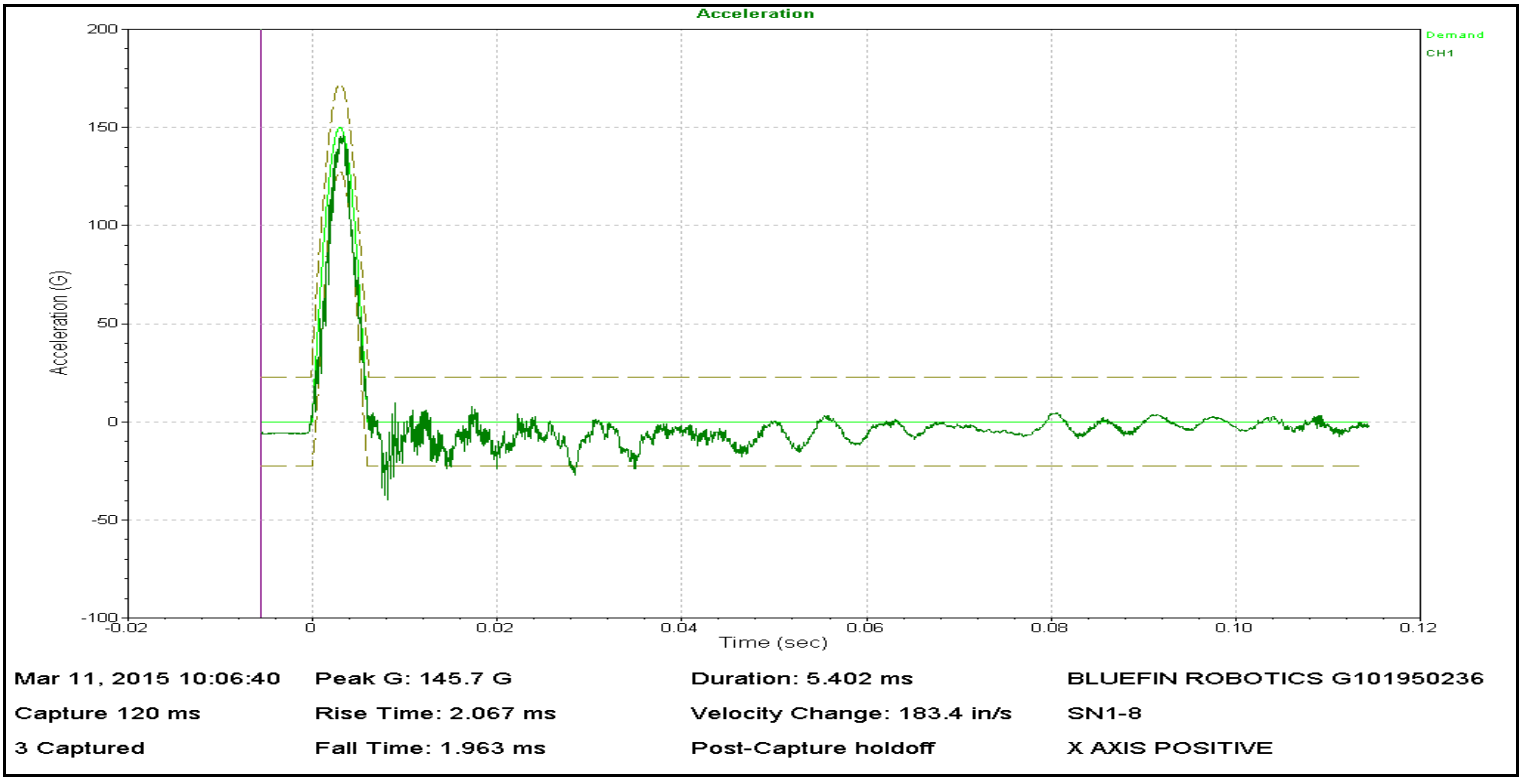


Figure 6: Shock Plot –Fore/Aft, Positive Direction; SN 1 - 8

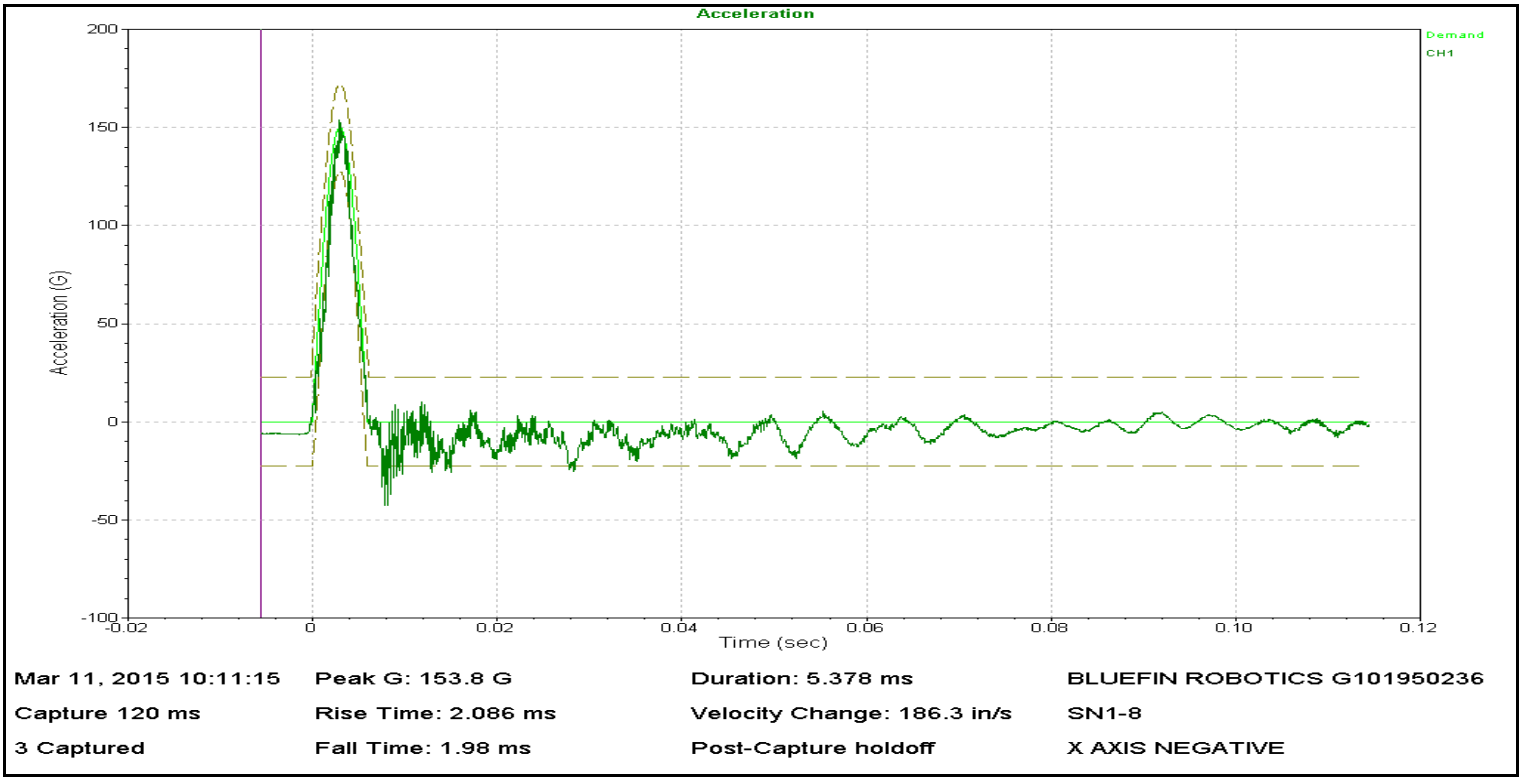


Figure 7: Shock Plot –Fore/Aft, Negative Direction; SN 1 - 8

APPENDIX E – MECHANICAL SHOCK PLOTS (cont'd)

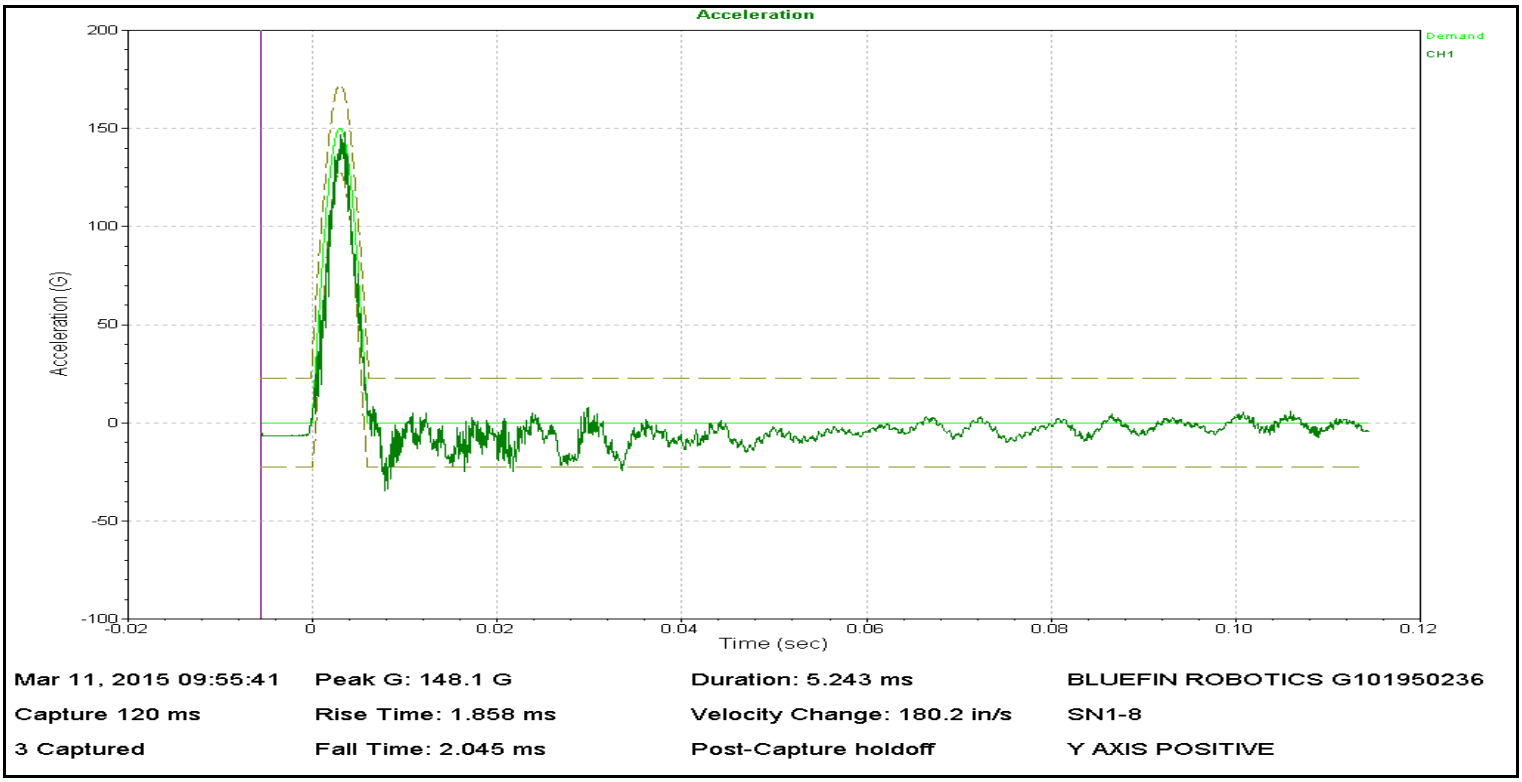


Figure 8: Shock Plot – Lateral, Positive Direction; SN 1 - 8

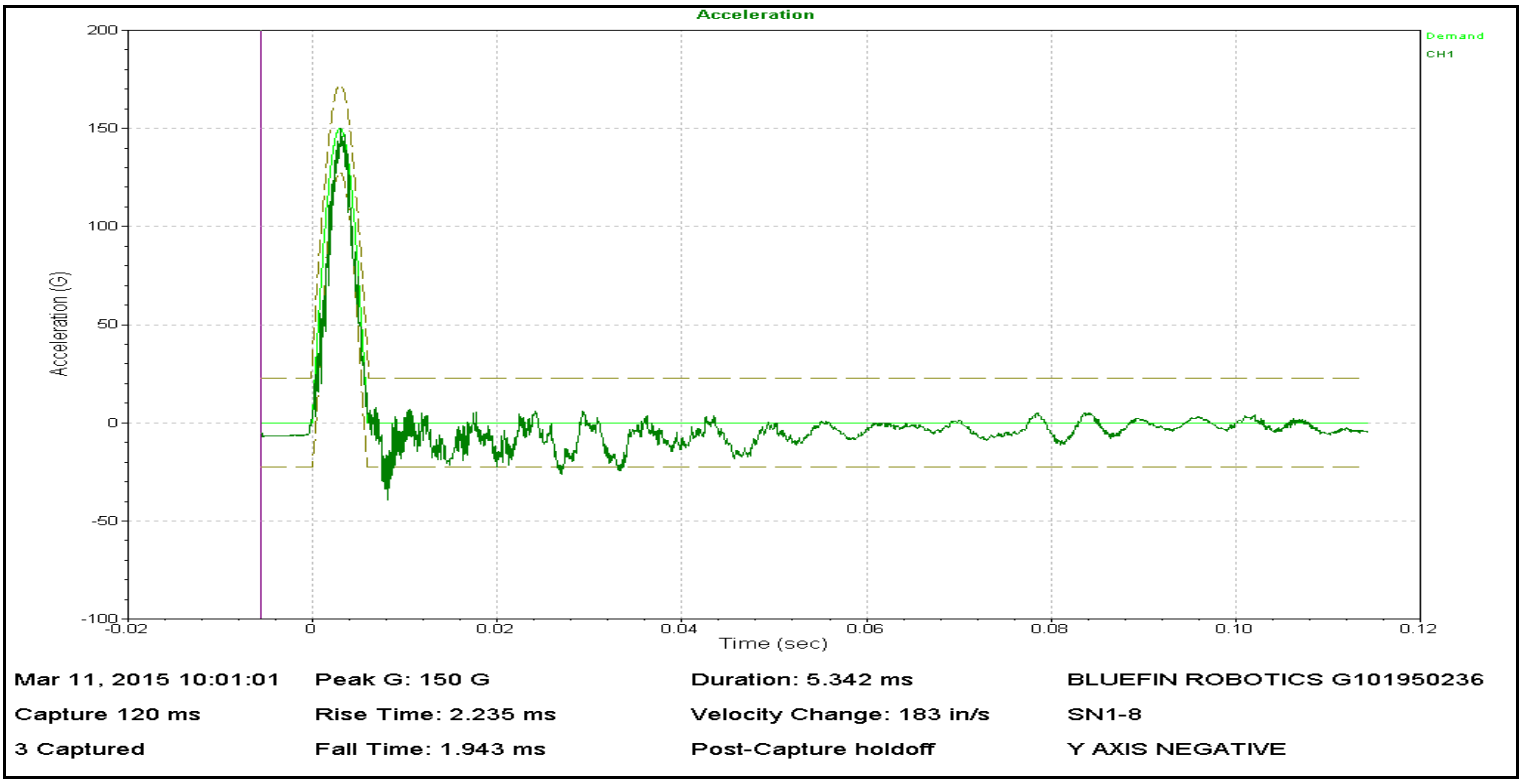


Figure 9: Shock Plot – Lateral, Negative Direction; SN 1 - 8

APPENDIX E – MECHANICAL SHOCK PLOTS (cont'd)

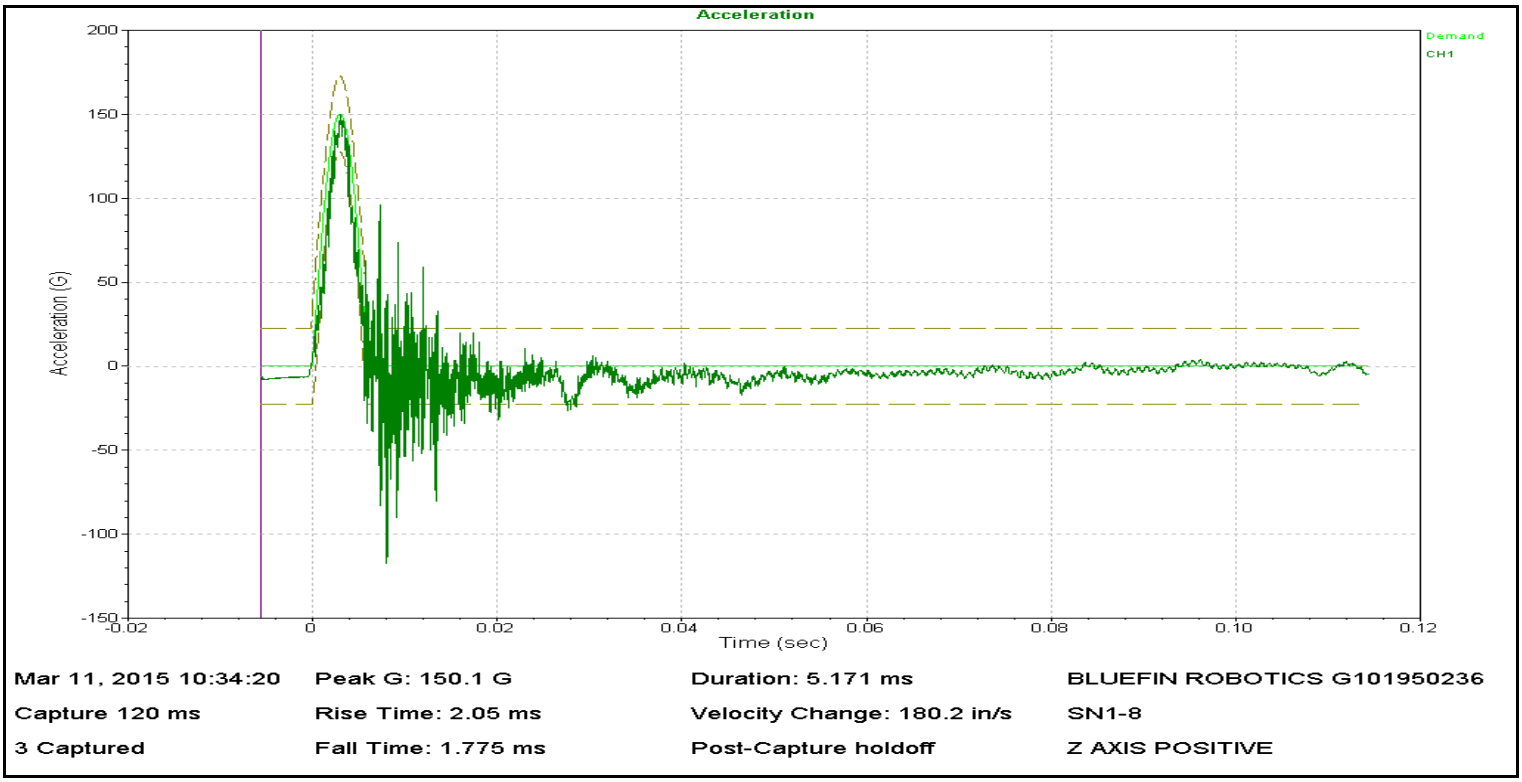


Figure 10: Shock Plot – Vertical, Positive Direction; SN 1 - 8

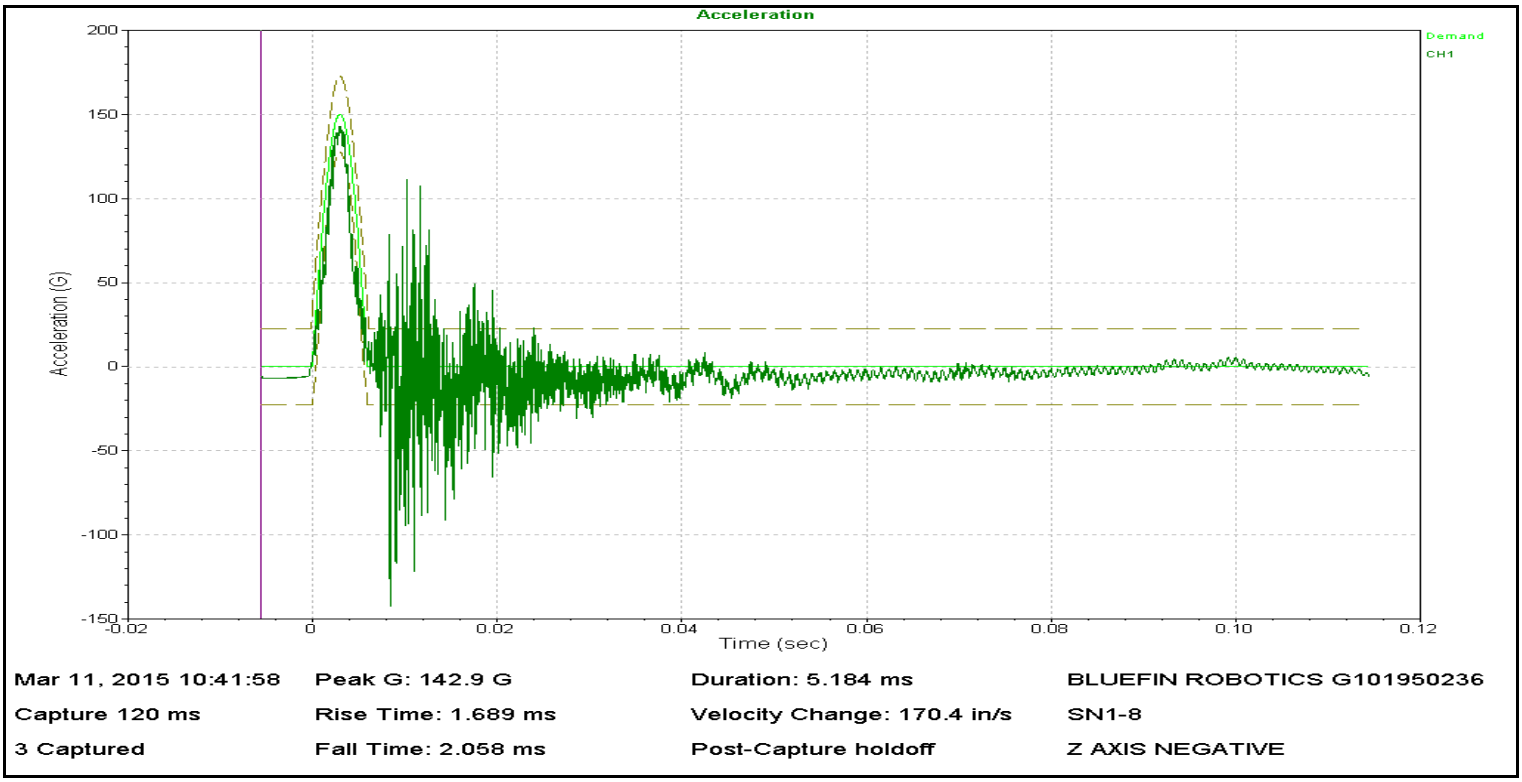


Figure 11: Shock Plot – Vertical, Negative Direction; SN 1 - 8

APPENDIX F – EXTERNAL SHORT CIRCUIT GRAPHS

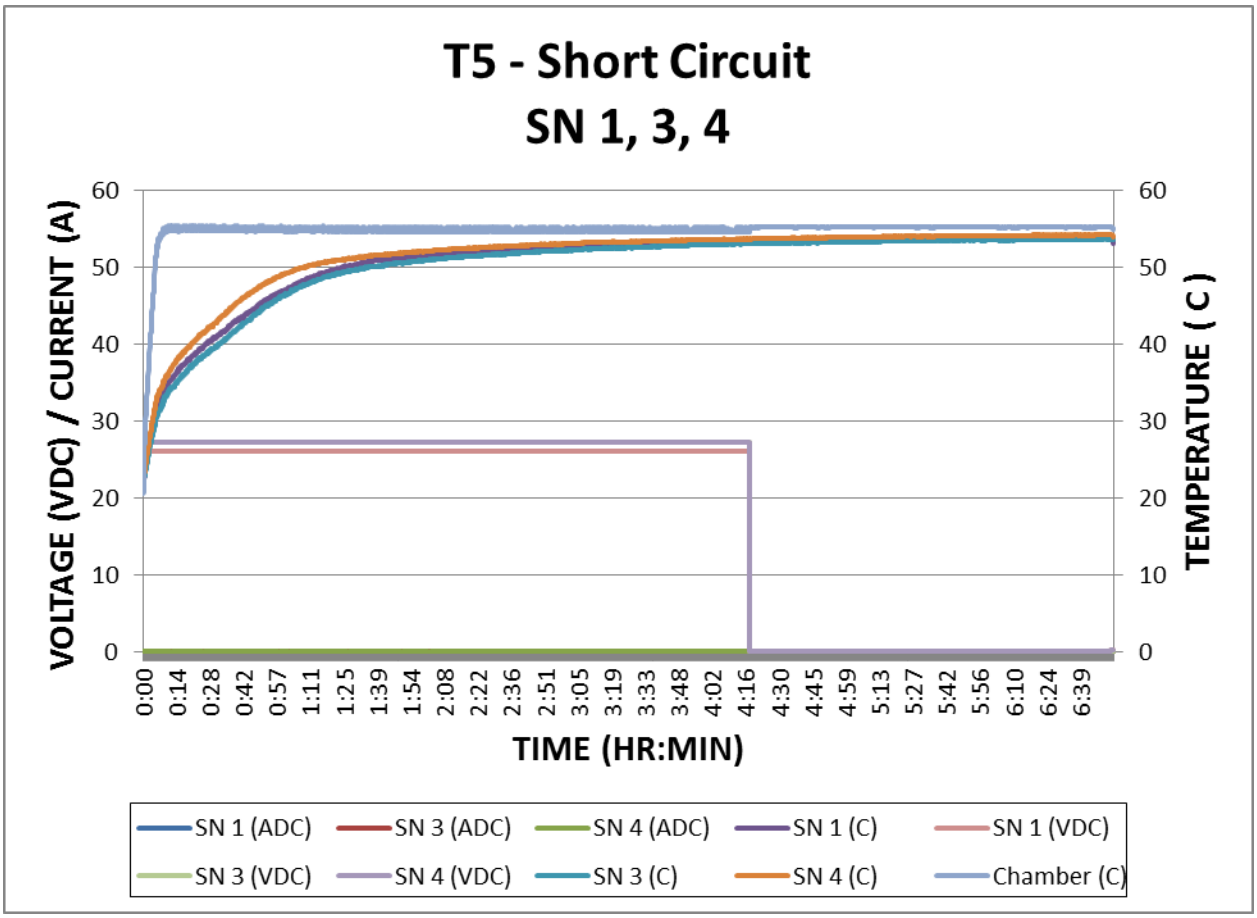


Figure 12: External Short Circuit Graph – Voltage / Current / Temperature vs. Time; SN 1, 3 – 4

APPENDIX F – EXTERNAL SHORT CIRCUIT GRAPHS (Cont'd)

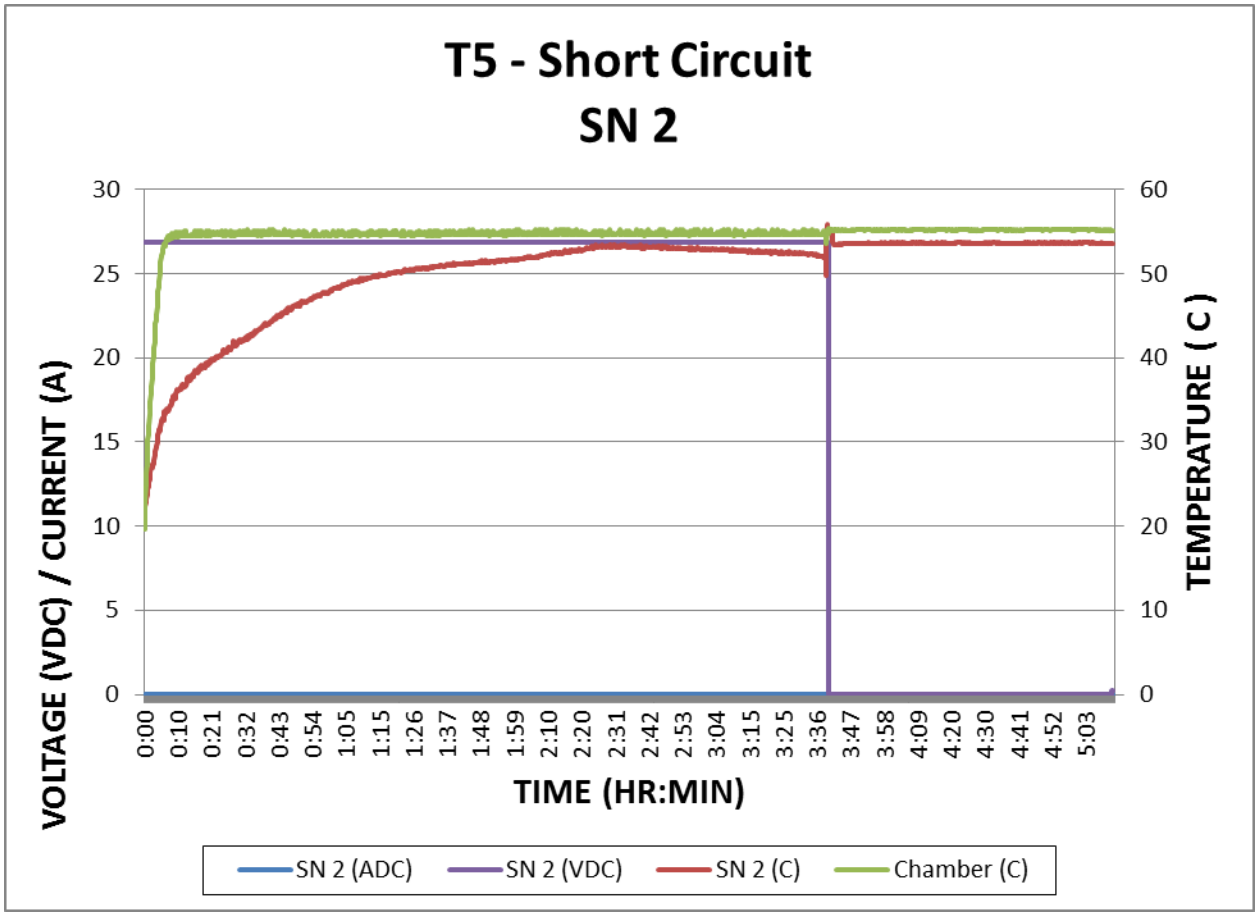


Figure 13: External Short Circuit Graph – Voltage / Current / Temperature vs. Time; SN 1, 3 – 4

APPENDIX F – EXTERNAL SHORT CIRCUIT GRAPHS (Cont'd)

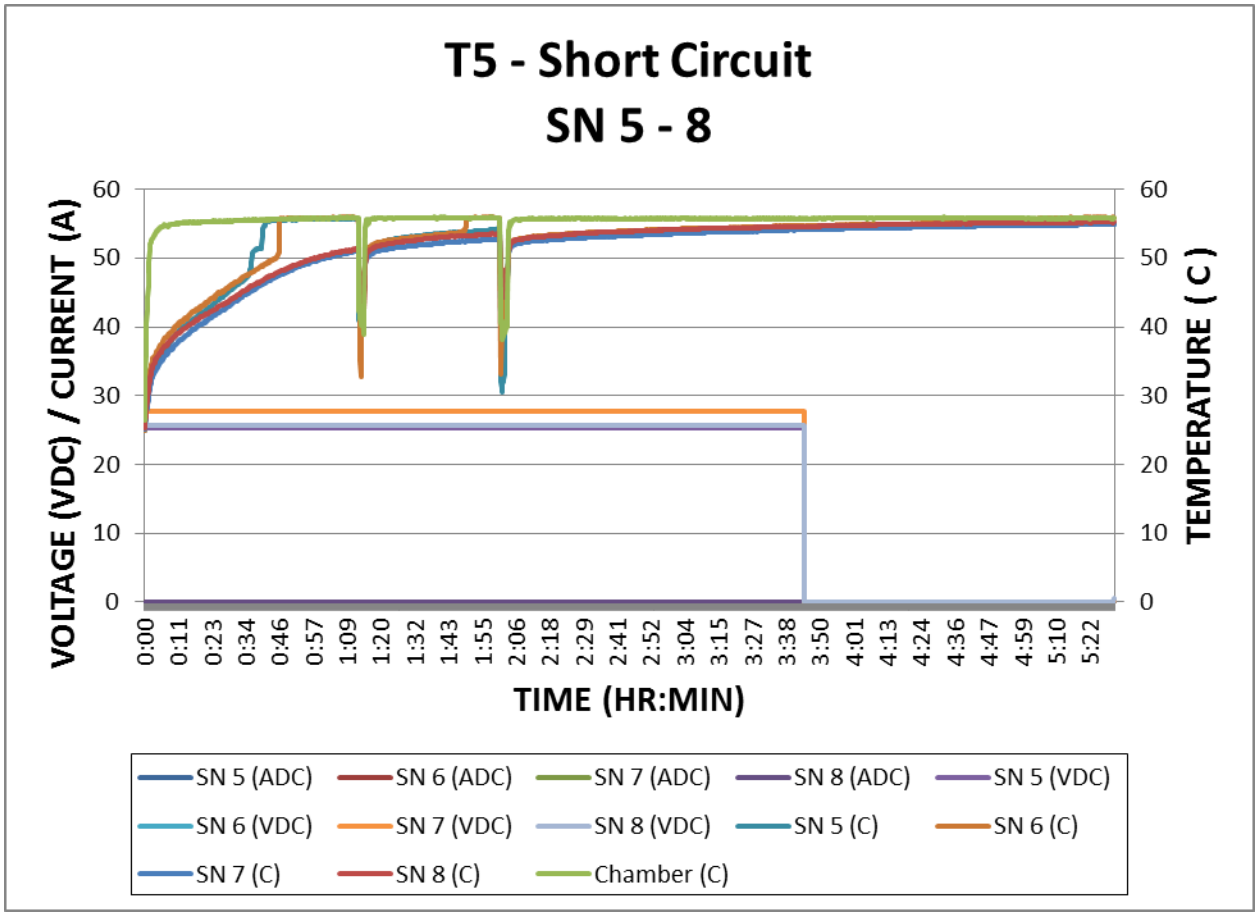


Figure 14: External Short Circuit Graph – Voltage / Current / Temperature vs. Time; SN 5 – 8

APPENDIX G – OVERCHARGE GRAPHS

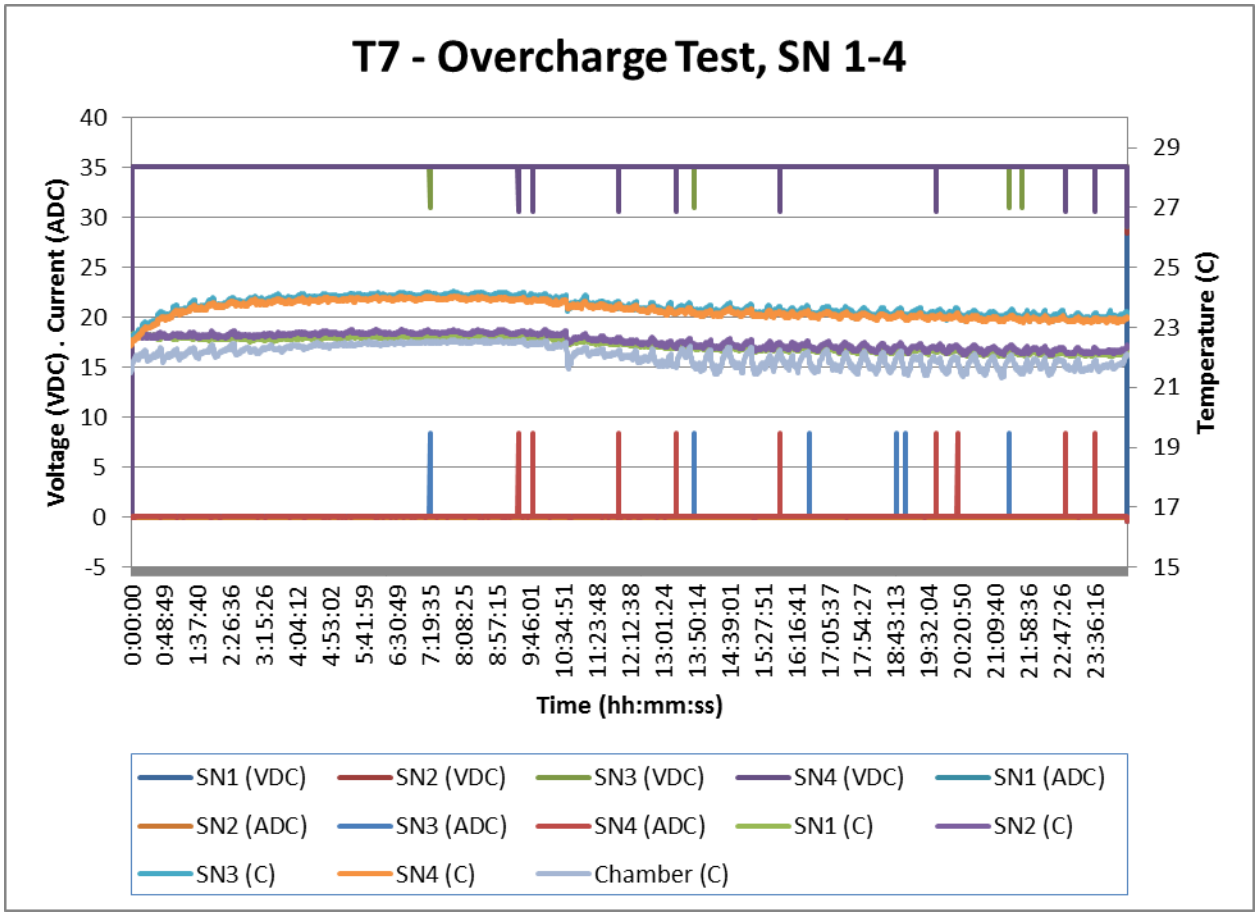


Figure 15: Overcharge Graph – Current, Temperature and Voltage vs. Time, SN 1 – 4

APPENDIX G – OVERCHARGE GRAPHS (Cont'd)

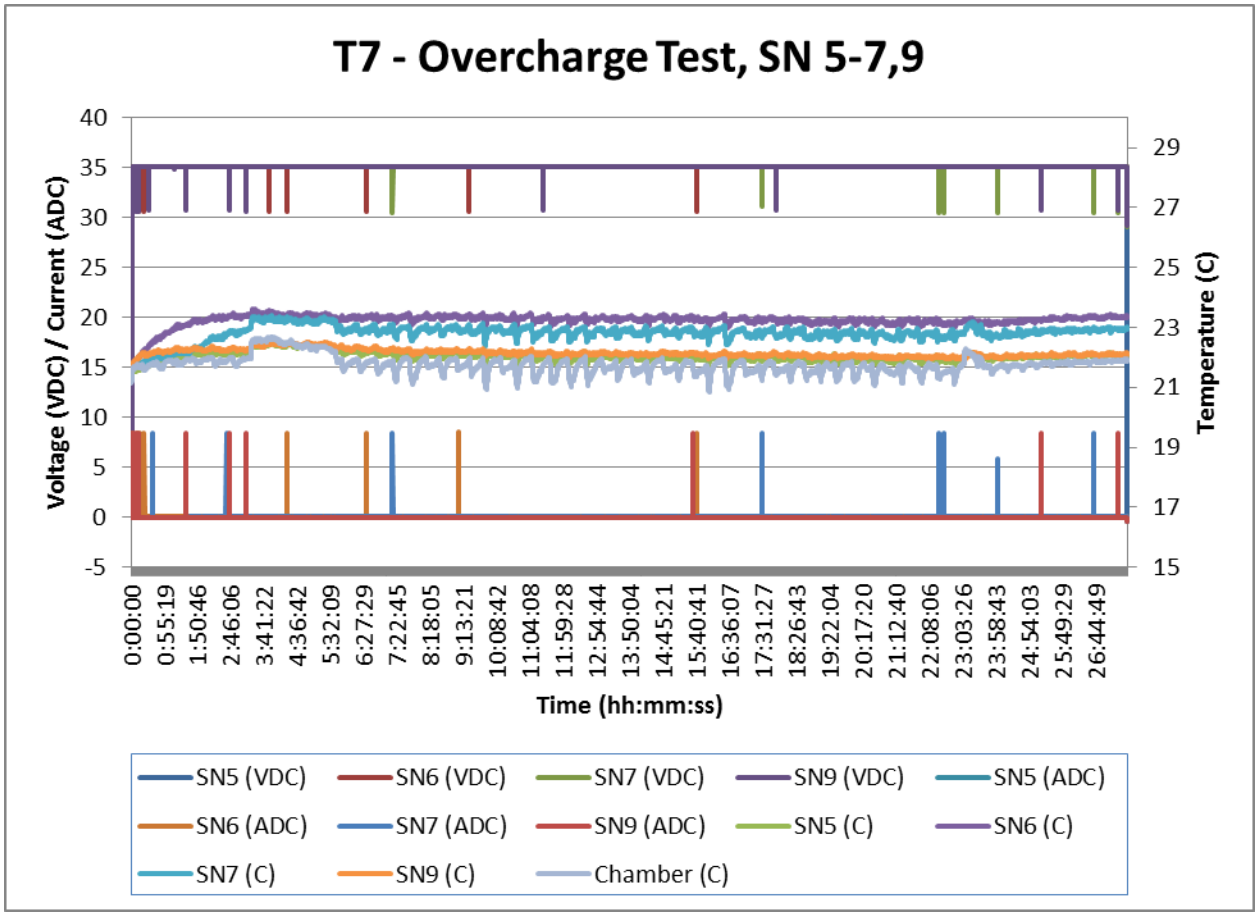


Figure 16: Overcharge Graph – Current, Temperature and Voltage vs. Time, SN 5 – 7, 9