LABORATORY DATA PACKAGE

Number of pages in this package __58__ **[** including additional pages ____ **]**
(Fill in when using printed copy as record)

TEST LOCATION:					
[X]UL or Affiliate	**[**WTDP	**[]**CTDP	**[]**TPTDP	**[]**TCP	**[]**PPP
	[]WMT	**[]**TMP	**[]**SMT		
Company Name	ULNBK				
Address					

CLIENT INFORMATION	
Company Name	AA Portable Power Corp
Address	825 S 19th Street, Richmond, CA 94804, US

AUDIT INFORMATION:				
Description of Tests	Per Standard No.	UN ST/SG/AC.10/11/	Edition/ Revision Date	Rev.5/ Amend.1
[X] Tests Conducted by +	Jesse Rodriguez		Jesse Rodriguez	
	Printed Name		Signature	
[] UL Staff conducting or witnessing testing (WTDP, TMP, WMT only) **[]** UL Staff supervising UL Staff in training				
[]Authorized Signatory (CTDP, TPTDP, TCP, PPP, SMT)	Printed Name		Signature, and include date for CTDP, TPTDP, TCP, PPP, WMT, TMP, SMT	
Reviewed and accepted by qualified Project Handler	Kiran Shah		*Kiran Shah*	
	Printed Name		Signature	

TESTS TO BE CONDUCTED:			
Test No.	Done+++	Test Name	**[]** Comments/Parameters **[]**Tests Conducted by ++
1	2013-08-22	T.1: ALTITUDE SIMULATION	
2	2013-09-02	T.2: THERMAL TEST	
3	2013-09-04	T.3: VIBRATION	
4	2013-09-04	T.4: SHOCK	
5		T.5: EXTERNAL SHORT CIRCUIT	
6	2013-09-16	T.7: OVERCHARGE	**Please use the manual power supplies due to high currents and voltages.**

Instructions -

+ - When all tests are conducted by one person, printed name and signature can be inserted here instead of including printed name and signature on each page containing data. Must indicate number of pages in the data package.
++ - When test conducted by more than one person, printed name and signature of person conducting the test can be inserted next to the test name instead of including printed name and signature on each page containing data. Must indicate number of pages in the data package.
+++ - Use of this field is optional and may be employed differently.

Special Instructions - Top off, if <29.4 V with 10 A, 500 mA end point charge current.

Top off instructions only apply to the samples before T1 testing and not to T2, T3, T4, and T5 test.

Tables are provided on the data sheets for recording of maximum temperature data. Charts, printouts or additional data showing the maximum or stabilized temperatures had been reached shall be included with this package.

No general environmental conditions are specified in the Standard(s) or have been identified that could affect the test results or measurements.

RISK ANALYSIS RELATED TO TESTING PERFORMANCE:

The following types of risks have been identified. Take necessary precautions. This list is not all inclusive.

[ ] Electric shock	**[ ]** Radiation
[X] Energy related hazards	**[X]** Chemical hazards
[X] Fire	**[ ]** Noise
[X] Heat related hazards	**[ ]** Vibration
[ ] Mechanical	**[X]** (Specify)_Explosion_

Please be careful and take precautions for any explosions or fires during overcharge test due to high currents and voltages.

Tested by: _____ Date _____

Printed Name Signature

TEST EQUIPMENT INFORMATION

Inst. ID No.	Instrument Type	Test Number +, Test Title or Conditioning	Function /Range	Last Cal. Date	Next Cal. Date

+ - If Test Number is used, the Test Number must be identified on the data sheet pages or on the Data Sheet Package cover page.

The following additional information is required when using client's or rented equipment, or when a UL ID Number for an instrument number is not used. The Inst. ID No. below corresponds to the Inst. ID No. above.

Inst. ID No.	Make/Model/Serial Number/Asset No.

[X]UL test equipment information is recorded on Meter Use in UL's Laboratory Project Management (LPM) database.

Tested by: _____ Date _____

Printed Name Signature

TEST SAMPLE IDENTIFICATION:

The table below is provided to provide correlation of sample numbers to specific product related information. Refer to this table when a test identifies a test sample by "Sample No." only.

Sample Card No.	Date Received	[X] Test No.+	Sample No.	Manufacturer, Product Identification and Ratings
1701056 NBK-6-BLDG 6 CAGE-1-J-7 (203783) 1701057 1701058 1701059 Please save the chargers for client's return.	08-19-2013	1-6	1-16	Secondary Li-ion Polymer Battery Pack CU-PL-9059156-7S-WR (25.9 V, 10.0 Ah/ 259 Wh) with 9059156 Li-ion Polymer Cells. 29.60 V max, 25.90 V nominal, 29.40 V normal Charge Voltage, 10 A max. charge current, 500 mA end point charge taper current 20 A Discharge Current Current limiting Polyswitch (30 V, 100 A): 9 A hold, 18 A trip @ 20 C. 3.3 lb (1497 grams) weight Battery Pack enclosure is made up of rubber PVC in 0.8 mm thickness.

+ - If Test Number is used, the Test Number or Numbers the sample was used in must be identified on the data sheet pages or on the Data Sheet Package cover page.

[] Sampling Procedure -

Tested by: _____ Date _____

Printed Name Signature

Specification Status: Released

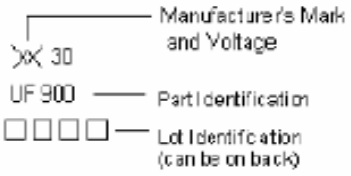
Maximum Electrical Rating at 20°C

30 V_{DC} /100 A_{DC}
30 V_{AC} /70 A_{RMS}

Insulating Material:
Cured, Flame Retardant Epoxy Polymer
meets UL94 V-0 Requirements

Lead Material:
20 AWG Tin Plated Copper

Marking:



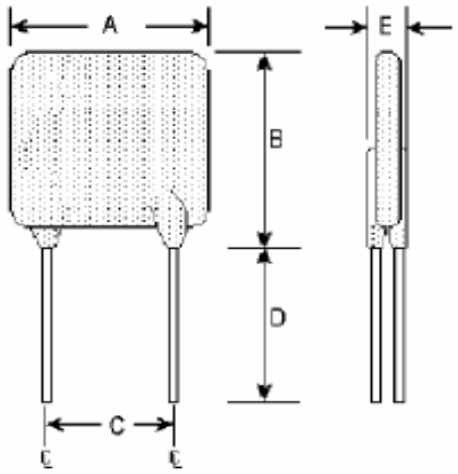


TABLE I. DIMENSIONS:

	A		B		C		D		E	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
mm:	--	24.1	--	29.0	9.4	10.9	7.6	--	--	3.0
in*:	--	(0.95)	--	(1.14)	(0.37)	(0.43)	(0.30)	--	--	(0.12)

*Rounded off approximation

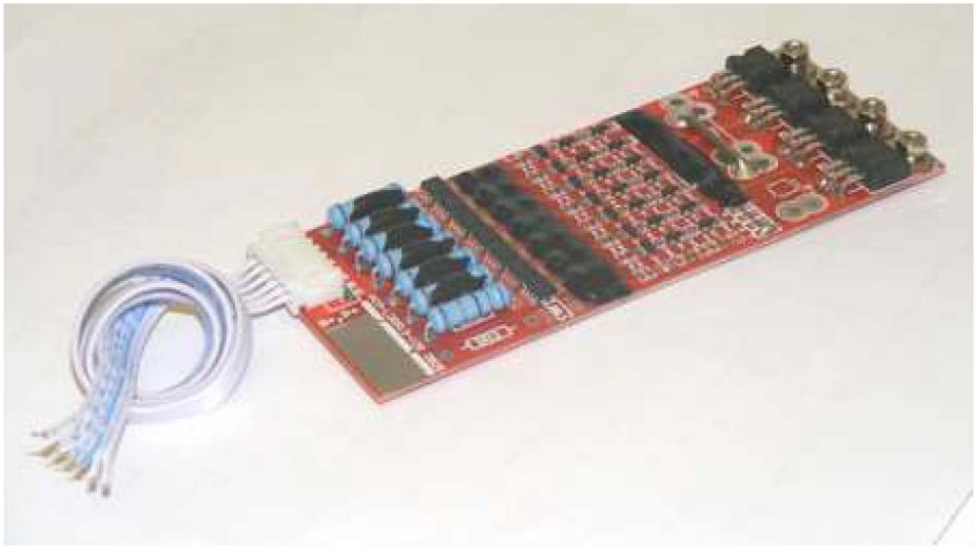
TABLE II. PERFORMANCE RATINGS:

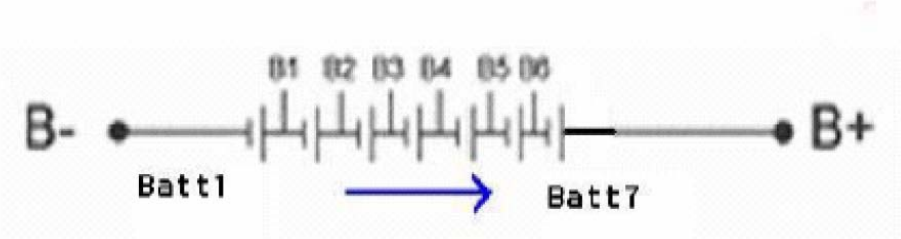
I HOLD	CURRENT RATINGS		TIME TO TRIP	RESISTANCE		ONE-HOUR POST-TRIP RESISTANCE STANDARD TRIP	NOMINAL TRIPPED POWER DISSIPATION
AMPS 20°C HOLD	AMPS AT 20°C		SECONDS AT 20°C, 45.0A	OHMS AT 20°C		OHMS AT 20°C	WATTS AT 20°C
	HOLD	TRIP	MAX	MIN	MAX	MAX	
9.00	9.00	18.00	20.0	0.005	0.01	0.02	4.2

Tested by: _____ Date _____

Printed Name Signature

P+ = Charge+/Discharge+ P- = Charge-/Discharge-





Tested by: _____ Date _____

Printed Name Signature

GENERAL

CELL SAFETY TESTING PRACTICES

Follow all battery SOPs when handling, testing, storing or disposing of battery samples. Follow appropriate procedures to prevent inadvertent shorting of battery and cell terminals during handling, storage and disposal of batteries. Follow MSDS sheets and battery SOPs when handling batteries where there is evidence of electrolyte leakage.

Some lithium batteries are capable of exploding when subjected to battery tests. It is important that personnel be protected from the flying fragments, explosive force, fire and sudden release of heat and noise that results from such explosions.

The test area is to be well ventilated to protect personnel from possible harmful fumes or gases that may be emitted during battery testing.

All personnel involved in the testing of lithium batteries are to be instructed never to approach a lithium battery while the surface temperature exceeds 90°C (194°F).

Tested by: _____ Date _____

Printed Name Signature

GENERAL (CONT'D):

DEFINITIONS

Component Cell - A cell contained in a battery.

Cycle - One sequence of fully charging and fully discharging a rechargeable cell or battery.

Disassembly – A vent or rupture where solid matter from any part of a cell or a battery penetrates a wire mesh screen (annealed aluminum wire with a diameter of 0.25 mm and grid density of 6 to 7 wires per cm) placed 25 cm away from the cells or battery.

Fire - Flames are emitted from the test cell or battery.

First Cycle - The initial cycle following completion of all manufacturing processes.

Fully Charged – A rechargeable cell or battery, which has been electrically charged to its design rated capacity.

Fully Discharged -

- Primary cell or battery – Electrically discharged to remove 100% of its rated capacity.

- Rechargeable cell or battery – Electrically discharged to its endpoint voltage as specified by the manufacturer.

Large Battery – A lithium metal battery or lithium ion battery with a gross mass of more than 12 kg.

Large Cell – A cell with a gross mass of more than 500 g.

Tested by: _____ Date _____

Printed Name Signature

GENERAL (CONT'D):

Leakage – The visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the mass loss exceeds the values in Table 1 below.

In order to quantity the mass loss the following procedure is provided:

Mass Loss (%) = (M1 – M2) / M1 x 100

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in the Table 1, it shall be considered as "no mass loss".

Table 1: Mass Loss Limit

Mass M of cell or battery	Mass Loss Limit
M < 1 g	0.5%
1 g </= M </= 75 g	0.2%
M > 75 g	0.1%

Rupture – The mechanical failure of a cell container or battery case induced by an internal or external cause, resulting in exposure or spillage but not ejection of solid materials.

Small Battery – A lithium metal battery or lithium ion battery with a gross mass of not more than 12 kg.

Small Cell – A cell with a gross mass of not more than 500 g.

Undischarged – A primary cell or battery that has not been wholly or partly discharged.

Venting – The release of excessive internal pressure from a cell or battery in a manner intended by design to preclude rupture or disassembly.

Tested by: _____ Date _____

Printed Name Signature

GENERAL (CONT'D):

TEST SEQUENCES AND SAMPLE NUMBERS

Primary Cells and Batteries –

Tests T.1 – T.5 are to be conducted on the same test samples in sequence.

Number of Cells / Component Cells Transported Separately from Battery	Tests	State of Charge (SOC)
10	T.1 - T.5	Undischarged
10	T.1 - T.5	Fully discharged
5	T.6	Undischarged
5	T.6	Fully discharged
10	T.8	Fully discharged

Number of Component Cells not Transported Separately from Battery	Tests	State of Charge (SOC)
5	T.6	Undischarged
5	T.6	Fully discharged
10	T.8	Fully discharged

Number of Small Batteries	Test	State of Charge (SOC)
4	T.1 - T.5	Undischarged
4	T.1 - T.5	Fully discharged

Number of Large Batteries	Test	State of Charge (SOC)
4	T.1 - T.5	Undischarged
4	T.1 - T.5	Fully discharged

Tested by: _____ Date _____

Printed Name Signature

GENERAL (CONT'D):

Rechargeable Cell and Batteries –

Tests T.1 – T.5 are to be conducted on the same test samples in sequence.

Number of Cells / Component Cells Transported Separately from Battery	Tests	Conditioning	State of Charge (SOC)
10	T.1 - T.5	First cycle	Fully Charged
5	T.6	First cycle	50% of Rated Capacity
10	T.8	First cycle	Fully discharged
10	T.8	50 cycles	Fully discharged

Number of Component Cells not Transported Separately from Battery	Tests	Conditioning	State of Charge (SOC)
5	T.6	First cycle	50% of Rated Capacity
10	T.8	First cycle	Fully discharged
10	T.8	50 cycles	Fully discharged

Number of Small Batteries	Tests	Conditioning	State of Charge (SOC)
4	T.1 - T.5	First cycle	Fully Charged
4	T.1 - T.5	50 cycles	Fully Charged
4	T.7	First cycle	Fully Charged
4	T.7	50 cycles	Fully Charged

Number of Large Batteries	Tests	Conditioning	State of Charge (SOC)
2	T.1 - T.5	First cycle	Fully Charged
2	T.1 - T.5	25 cycles	Fully Charged
2	T.7	First cycle	Fully Charged
2	T.7	25 cycles	Fully Charged

Tested by: _____ Date _____

Printed Name Signature

T.1: ALTITUDE SIMULATION

METHOD

The samples were subjected to this test in accordance with Sec. 38.3.4.1, Test T.1 of the Fifth Revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (Refer to ST/SG/AC.10/11/Rev.5/Amend.1).

The samples were stored for 6 hours at an absolute pressure of 11.6 kPa (1.68 psi) and a temperature of 20 ± 5°C (68 ± 9°F). The samples were weighed before and after the exposure. The cell/battery voltage was also determined before and after the test.

RESULTS

Battery Model	CU-PL-9059156-7S-WR

Sample No.	Sample Condition	Weight Before Test in Grams	Weight After Test In Grams	Percentage of Weight Loss	Voltage Before Test	Voltage After Test	Percent of Voltage Change	Comments
1	C	1412.07	1412.02	0.003	29.40	29.40	0.000	1,7,8
2	C	1414.33	1414.28	0.003	29.41	29.39	0.068	1,7,8
3	C	1411.43	1411.35	0.005	29.45	29.38	0.238	1,7,8
4	C	1416.56	1416.47	0.006	29.47	29.38	0.305	1,7,8
5	D	1406.43	1406.37	0.004	29.40	29.38	0.068	1,7,8
6	D	1417.27	1417.17	0.007	29.49	29.37	0.407	1,7,8
7	D	1411.15	1411.06	0.006	29.55	29.39	0.542	1,7,8
8	D	1411.33	1411.23	0.007	29.56	29.42	0.474	1,7,8

Tested by: _____ Date _____

Printed Name Signature

T.1: ALTITUDE SIMULATION (CONT'D)

Comments:
(1) Sample remained intact.
(2) Integrity of protective devices **[**was**]** **[**was not**]** maintained.
(3) Sample vented.
(4) Sample opened and leaked electrolyte.
(5) Sample exploded.
(6) Sample caught on fire.
(7) There was no mass loss, no leakage, no venting, no disassembly, no rupture and no fire.
(8) The open circuit voltage of each cell after testing was greater than 90%.
Condition
(A) Fully discharged state.
(B) Undischarged state.
(C) First cycle in fully charged state.
(D) After fifty cycles ending in fully charged state.
(E) After twenty five cycles ending in fully charged state.

[X] The samples **[**~~exploded or caught fire~~**]** **[**did not explode or catch fire**]**.

[X] The sample ~~**[**vented or leaked**]**~~ **[**did not vent or leak**]** more than **[**~~0.5 percent**]** **[**0.2 percent~~**]** **[**0.1 percent**]**.

[X] The samples **[**~~ruptured or disassembled~~**]** **[**did not rupture or disassemble**]**.

[X] The fully charged samples open circuit voltage after testing is **[**not less than**]** **[**~~less than~~**]** 90% of its voltage prior to testing.

Tested by: _____ Date _____

Printed Name Signature

T.2: THERMAL TEST

METHOD

The samples were subjected to this test in accordance with Sec. 38.3.4.2, Test T.2 of the Fifth Revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (Refer to ST/SG/AC.10/11/Rev.5/Amend.1).

The samples were subjected to temperature cycling consisting of the following. The samples were weighed before and after the exposure. The cell/battery voltage was also determined before and after the test.

Samples In: _2013-08-25___

The chamber temperature was raised to 72 ± 2°C (162 ± 4°F) within 30 minutes and maintained at this temperature for **[**6**]** hours.

The chamber temperature was reduced to -40 ± 2°C (-40 ± 4°F) within 30 minutes and maintained at this temperature for **[**6**]** hours.

Repeat the sequence for 9 additional cycles (total of 10 cycles).

Samples Out: __2013-09-02__

After the 10th cycle, store the batteries at ambient temperature 20 ± 5°C (68 ± 9°F) for 24 hours prior to examination.

Note: The duration of exposure to the test temperature extremes was determined as below:

- Small cells and small batteries: 6 hours;
- Large cells and large batteries: 12 hours.

Tested by: _____ Date _____

Printed Name Signature

T.2: THERMAL TEST (CONT'D)

RESULTS

Battery Model	CU-PL-9059156-7S-WR

Sample No.	Sample Condi-tion	Weight Before Test in Grams	Weight After Test In Grams	Percentage of Weight Loss	Voltage Before Test	Voltage After Test	Percent of Voltage Change	Comments
1	C	1412.02	1411.69	0.02	29.40	29.15	0.86	1,7,8
2	C	1414.28	1413.95	0.02	29.39	29.15	0.82	1,7,8
3	C	1411.35	1411.03	0.02	29.38	29.15	0.79	1,7,8
4	C	1416.47	1416.17	0.02	29.38	29.14	0.82	1,7,8
5	D	1406.37	1406.06	0.02	29.38	29.16	0.75	1,7,8
6	D	1417.17	1416.92	0.01	29.37	29.14	0.78	1,7,8
7	D	1411.06	1410.77	0.02	29.39	29.17	0.74	1,7,8
8	D	1411.23	1410.96	0.02	29.42	29.19	0.78	1,7,8

Comments
(1) Sample remained intact.
(2) Integrity of protective devices **[**was**] [**was not**]** maintained.
(3) Sample vented.
(4) Sample opened and leaked electrolyte.
(5) Sample exploded.
(6) Sample caught on fire.
(7) There was no mass loss, no leakage, no venting, no disassembly, no rupture and no fire.
(8) The open circuit voltage of each cell after testing was greater than 90%.

Tested by: _____ Date _____

Printed Name Signature

T.2: THERMAL TEST (CONT'D)

Condition
(A) Fully discharged state.
(B) Undischarged state.
(C) First cycle in fully charged state.
(D) After fifty cycles ending in fully charged state.
(E) After twenty five cycles ending in fully charged state.

[X] The samples **[**~~exploded or caught fire~~**] [**did not explode or catch fire**]**.

[X] The sample **[**~~vented or leaked~~**] [**did not vent or leak**]** more than **[**~~0.5 percent~~**] [**~~0.2 percent~~**] [**0.1 percent**]**.

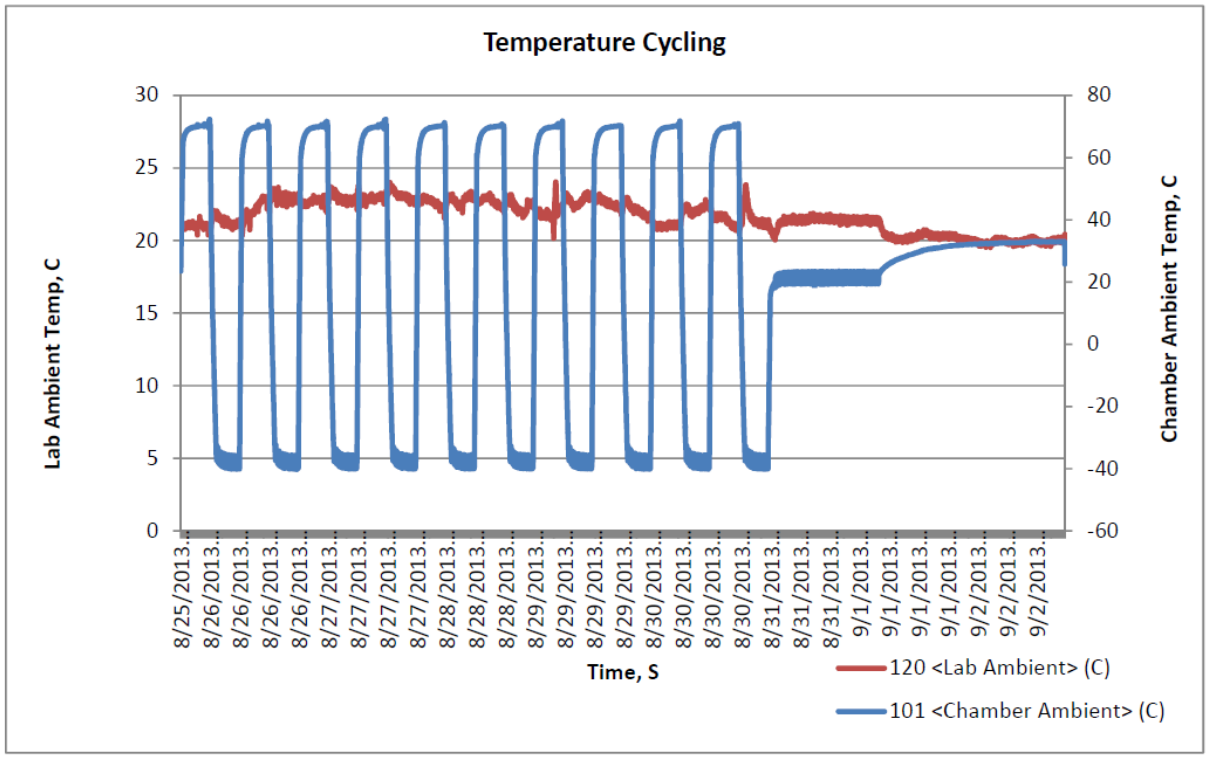
[X] The samples **[**~~ruptured or disassembled~~**] [**did not rupture or disassemble**]**.

[X] The fully charged samples open circuit voltage after testing is **[**not less than**] [**~~less than~~**]** 90% of its voltage prior to testing.

Engineering Note: Temperature cycling chamber programmed and done following the test method. Temperature reading from recorded thermocouple is for reference only. TAS 2013-09-20

Tested by: _____ Date _____

Printed Name Signature



Tested by: _____ Date _____

Printed Name Signature

T.3: VIBRATION

METHOD

The samples were subjected to this test in accordance with Sec. 38.3.4.3, Test T.3 of the Fifth Revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (Refer to ST/SG/AC.10/11/Rev.5/Amend.1).

The samples were subjected to vibration tests consisting of the following. The samples were weighed before and after the exposure. The cell/battery voltage was also determined before and after the test.

The samples were firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration was a 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 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration was perpendicular to the terminal face.

The logarithmic frequency sweep was as follows:

For cells and small batteries: From 7 Hz a peak acceleration of 1 g was maintained until 18 Hz is reached. The amplitude was then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g occurred (approximately 50 Hz). A peak acceleration of 8 g was then maintained until the frequency was increase to 200 Hz.

Tested by: _____ Date _____

Printed Name Signature

T.3: VIBRATION (CONT'D)

RESULTS

Battery Model CU-PL-9059156-7S-WR

Sample No.	Sample Condition	Weight Before Test in Grams	Weight After Test In Grams	Percentage of Weight Loss	Voltage Before Test	Voltage After Test	Percent of Voltage Change	Comments
1	C	1411.69	1411.73	0.003 (gain)	29.15	29.16	0.034 (gain)	1,7,8
2	C	1413.95	1413.98	0.002 (gain)	29.15	29.16	0.034 (gain)	1,7,8
3	C	1411.03	1411.07	0.003 (gain)	29.15	29.16	0.034 (gain)	1,7,8
4	C	1416.17	1416.21	0.003 (gain)	29.14	29.15	0.034 (gain)	1,7,8
5	D	1406.06	1416.10	0.714 (gain)	29.16	29.17	0.034 (gain)	1,7,8
6	D	1416.92	1416.93	0.000	29.14	29.15	0.034 (gain)	1,7,8
7	D	1410.77	1410.83	0.004	29.17	29.18	0.034 (gain)	1,7,8
8	D	1410.96	1411.00	0.003 (gain)	29.19	29.20	0.034 (gain)	1,7,8

Comments
(1) Sample remained intact.
(2) Integrity of protective devices **[**was**]** **[**was not**]** maintained.
(3) Sample vented.
(4) Sample opened and leaked electrolyte.
(5) Sample exploded.
(6) Sample caught on fire.
(7) There was no mass loss, no leakage, no venting, no disassembly, no rupture and no fire.
(8) The open circuit voltage of each cell after testing was greater than 90%.

Tested by: _____ Date _____

Printed Name Signature

T.3: VIBRATION (CONT'D)

Condition
(A) Fully discharged state.
(B) Undischarged state.
(C) First cycle in fully charged state.
(D) After fifty cycles ending in fully charged state.
(E) After twenty five cycles ending in fully charged state.

[X] The samples ~~[exploded or caught fire] [~~did not explode or catch fire.

[X] The samples ~~[vented or leaked] [~~did not vent or leak more than 0.1 percent.~~] more than [0.5 percent] [0.2 percent] [0.1 percent]~~.

[X] The samples ~~[ruptured or disassembled] [~~did not rupture or disassemble.

[X] The fully charged samples open circuit voltage after testing is not less than~~] [less than]~~ 90% of its voltage prior to testing.

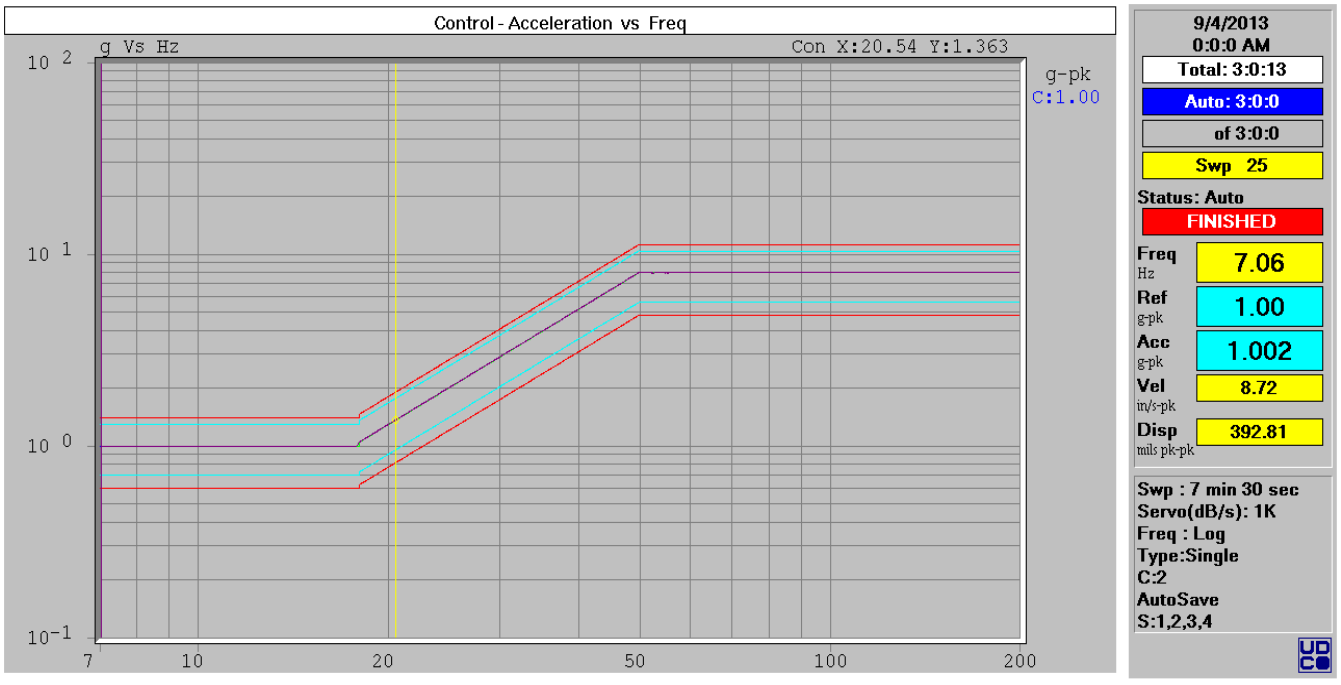
Tested by: _____ Date _____
Printed Name Signature

Swept Sine Test Report

SETUP NAME: UL Battery test
SETUP DESC: 7 hz to 200 hz logarithmic sweep
SETUP LAST CHANGED: 12/2/2010 8:49:22 PM
RUN NAME: run37
SAVE NUMBER: 1

STATUS INFORMATION

TEST EVENT TIME: Wednesday, September 04, 2013 at 12:00:00 AM
TEST STATUS: FINISHED
TEST MODE: AUTO
TOTAL TIME ELAPSED (HH:MM:SS): 3:0:13
AUTO TIME ELAPSED (HH:MM:SS): 3:0:0
SWEEP #: 25
FREQUENCY: 7.06 Hz
REFERENCE: 1.00 g pk
CONTROL ACCELERATION: 1.00 g pk
CONTROL VELOCITY: 8.72 in/s pk
CONTROL DISPLACEMENT: 392.81 mil pp



Tested by: _____ Date _____
Printed Name Signature

CONTROL PARAMETERS

CONTROL CHANNEL(S): 2
CONTROL TYPE: SINGLE
SWEEP TIME: 7 min, 30 sec
SWEEP TYPE: LOG
STARTING SWEEP DIRECTION: UP
STARTING FREQUENCY: 7.00 Hz
LOWER FREQUENCY: 7.00 Hz
UPPER FREQUENCY: 200.00 Hz
SERVO SPEED: 1K dB/s

INPUT CHANNEL PARAMETERS

Chan (#)	Sensitivity (mV/g)	Coupling (AC/DC)	Max.Range (g pk)
1	10.00	AC	100.00
2	100.00	AC	100.00
3	10.00	AC	100.00
4	10.00	AC	100.00

REFERENCE SEGMENT TABLE

Seg #	Freq Hz	Type DAVS	Disp mil pp	Accel g pk	Vel in/s pk	Alarm- (-%)	Alarm+ (+%)	Abort- (-%)	Abort+ (+%)
1	7.00	A	399.173	1.000	8.778	30.00	30.00	40.00	40.00
2	18.00	D	63.000	1.044	3.563	30.00	30.00	40.00	40.00
3	50.00	A	62.590	8.000	9.832	30.00	30.00	40.00	40.00
4	200.00	A	3.912	8.000	2.458	30.00	30.00	40.00	40.00

ALARM/ABORT PARAMETERS

MAXIMUM DRIVE OUTPUT PEAK VOLTAGE (+/-): 5.00 volts

TEST STARTUP & SCHEDULE PARAMETERS

START LEVEL: -12.00 dB, (25.12% of full level)
TEST DURATION (HH:MM:SS): 3:0:0
CHANNELS TO SAVE: 1,2,3,4
AUTO DATA SAVES: Save First and Last Sweep

Tested by: _____ Date _____

Printed Name Signature

SHAKER/AMPLIFIER SYSTEM SPECS

MAXIMUM ACCELERATION: 100.00 g pk
MAXIMUM VELOCITY: 70.00 in/s pk
MAXIMUM DISPLACEMENT: 2000.00 mil pp
MAXIMUM PERFORMANCE INPUT VOLTAGE: 5.00 Volts
DRIVE SCALING FACTOR: 18.75
ARMATURE WEIGHT: 135.00 lbs, LOAD WEIGHT: 315.00 lbs

UNHOLTZ-DICKIE Vwin II Version 3.00

Tested by: _____ Date _____

Printed Name Signature

Swept Sine Test Report

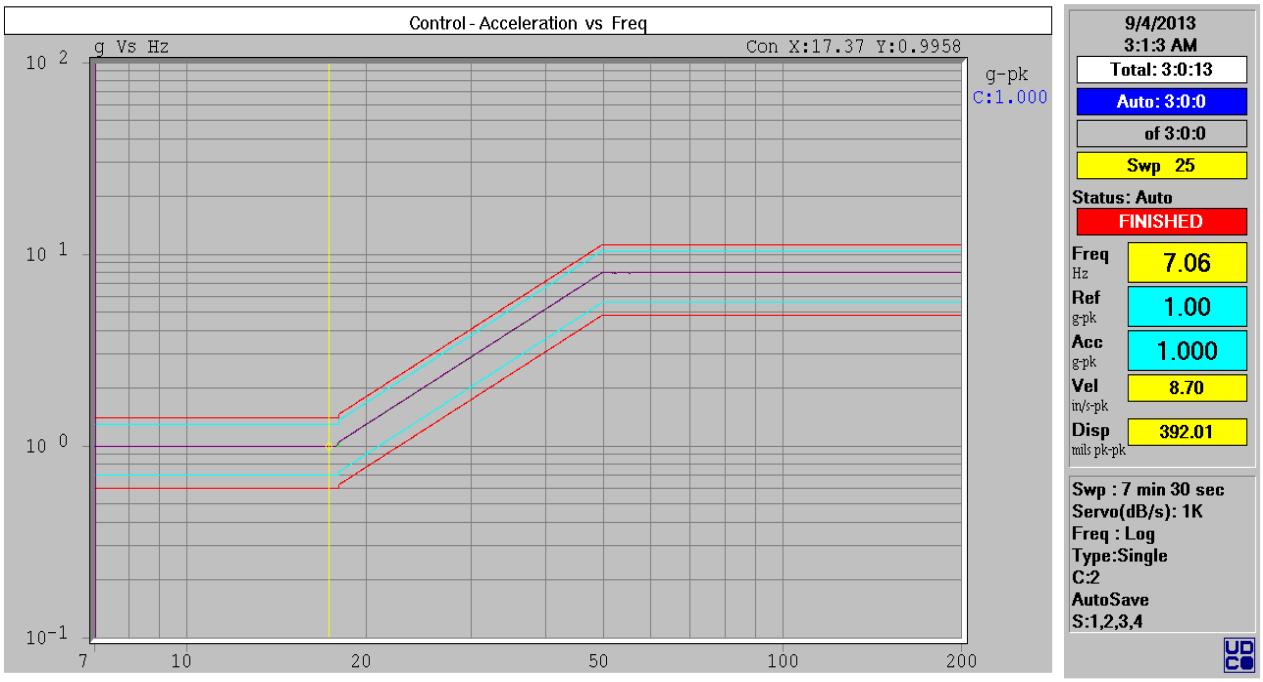
SETUP NAME: UL Battery test
SETUP DESC: 7 hz to 200 hz logarithmic sweep
SETUP LAST CHANGED: 12/2/2010 8:49:22 PM
RUN NAME: run38
SAVE NUMBER: 1

STATUS INFORMATION

TEST EVENT TIME: Wednesday, September 04, 2013 at 03:01:03 AM
TEST STATUS: FINISHED
TEST MODE: AUTO
TOTAL TIME ELAPSED (HH:MM:SS): 3:0:13
AUTO TIME ELAPSED (HH:MM:SS): 3:0:0
SWEEP #: 25
FREQUENCY: 7.06 Hz
REFERENCE: 1.00 g pk
CONTROL ACCELERATION: 1.00 g pk
CONTROL VELOCITY: 8.70 in/s pk
CONTROL DISPLACEMENT: 392.01 mil pp

Tested by: _____ Date _____

Printed Name Signature



CONTROL PARAMETERS

CONTROL CHANNEL(S): 2
CONTROL TYPE: SINGLE
SWEEP TIME: 7 min, 30 sec
SWEEP TYPE: LOG
STARTING SWEEP DIRECTION: UP
STARTING FREQUENCY: 7.00 Hz
LOWER FREQUENCY: 7.00 Hz
UPPER FREQUENCY: 200.00 Hz
SERVO SPEED: 1K dB/s

INPUT CHANNEL PARAMETERS

Chan (#)	Sensitivity (mV/g)	Coupling (AC/DC)	Max.Range (g pk)
1	10.00	AC	100.00
2	100.00	AC	100.00
3	10.00	AC	100.00
4	10.00	AC	100.00

Tested by: _____ Date _____
Printed Name Signature

REFERENCE SEGMENT TABLE

Seg #	Freq Hz	Type DAVS	Disp mil pp	Accel g pk	Vel in/s pk	Alarm- (-%)	Alarm+ (+%)	Abort- (-%)	Abort+ (+%)
1	7.00	A	399.173	1.000	8.778	30.00	30.00	40.00	40.00
2	18.00	D	63.000	1.044	3.563	30.00	30.00	40.00	40.00
3	50.00	A	62.590	8.000	9.832	30.00	30.00	40.00	40.00
4	200.00	A	3.912	8.000	2.458	30.00	30.00	40.00	40.00

ALARM/ABORT PARAMETERS

MAXIMUM DRIVE OUTPUT PEAK VOLTAGE (+/-): 5.00 volts

TEST STARTUP & SCHEDULE PARAMETERS

START LEVEL: -12.00 dB, (25.12% of full level)
TEST DURATION (HH:MM:SS): 3:0:0
CHANNELS TO SAVE: 1,2,3,4
AUTO DATA SAVES: Save First and Last Sweep

SHAKER/AMPLIFIER SYSTEM SPECS

MAXIMUM ACCELERATION: 100.00 g pk
MAXIMUM VELOCITY: 70.00 in/s pk
MAXIMUM DISPLACEMENT: 2000.00 mil pp
MAXIMUM PERFORMANCE INPUT VOLTAGE: 5.00 Volts
DRIVE SCALING FACTOR: 18.75
ARMATURE WEIGHT: 135.00 lbs, LOAD WEIGHT: 315.00 lbs

UNHOLTZ-DICKIE Vwin II Version 3.00

Tested by: _____ Date _____

Printed Name Signature

Swept Sine Test Report

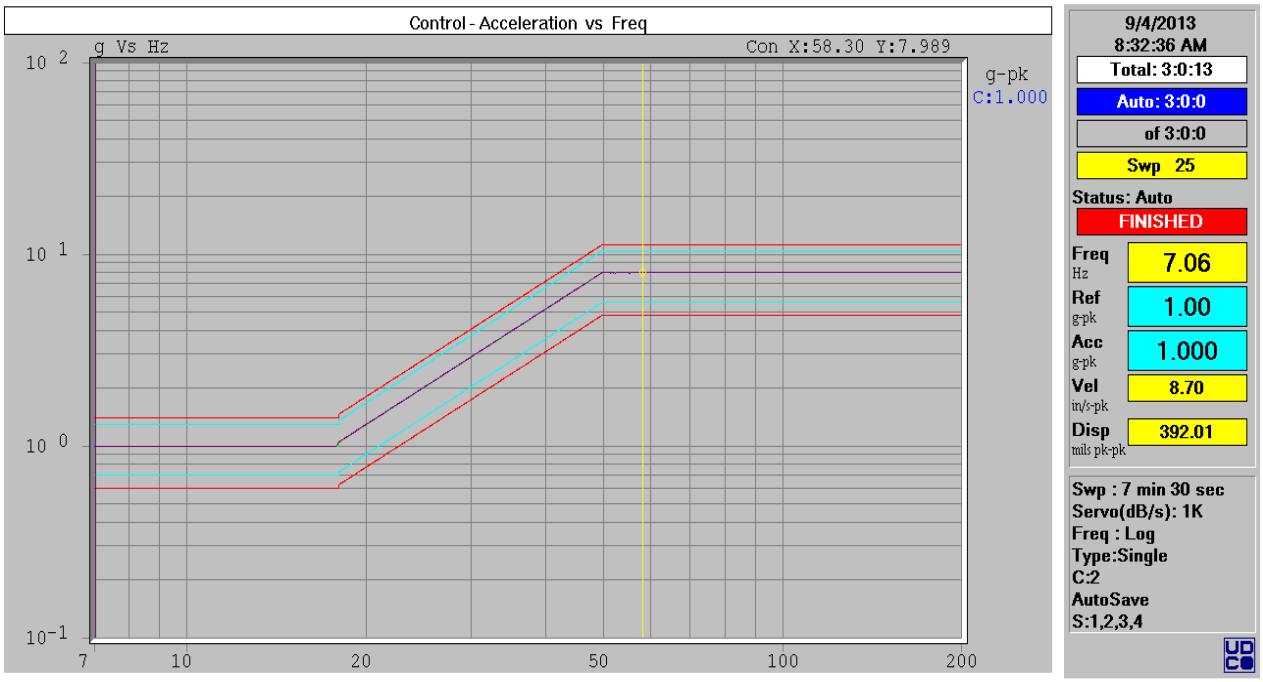
SETUP NAME: UL Battery test
SETUP DESC: 7 hz to 200 hz logarithmic sweep
SETUP LAST CHANGED: 12/2/2010 8:49:22 PM
RUN NAME: run39
SAVE NUMBER: 1

STATUS INFORMATION

TEST EVENT TIME: Wednesday, September 04, 2013 at 08:32:36 AM
TEST STATUS: FINISHED
TEST MODE: AUTO
TOTAL TIME ELAPSED (HH:MM:SS): 3:0:13
AUTO TIME ELAPSED (HH:MM:SS): 3:0:0
SWEEP #: 25
FREQUENCY: 7.06 Hz
REFERENCE: 1.00 g pk
CONTROL ACCELERATION: 1.00 g pk
CONTROL VELOCITY: 8.70 in/s pk
CONTROL DISPLACEMENT: 392.01 mil pp

Tested by: _____ Date _____

Printed Name Signature



CONTROL PARAMETERS

CONTROL CHANNEL(S): 2
CONTROL TYPE: SINGLE
SWEEP TIME: 7 min, 30 sec
SWEEP TYPE: LOG
STARTING SWEEP DIRECTION: UP
STARTING FREQUENCY: 7.00 Hz
LOWER FREQUENCY: 7.00 Hz
UPPER FREQUENCY: 200.00 Hz
SERVO SPEED: 1K dB/s

INPUT CHANNEL PARAMETERS

Chan (#)	Sensitivity (mV/g)	Coupling (AC/DC)	Max.Range (g pk)
1	10.00	AC	100.00
2	100.00	AC	100.00
3	10.00	AC	100.00
4	10.00	AC	100.00

Tested by: _____ Date _____

Printed Name Signature

REFERENCE SEGMENT TABLE

Seg #	Freq Hz	Type DAVS	Disp mil pp	Accel g pk	Vel in/s pk	Alarm- (-%)	Alarm+ (+%)	Abort- (-%)	Abort+ (+%)
1	7.00	A	399.173	1.000	8.778	30.00	30.00	40.00	40.00
2	18.00	D	63.000	1.044	3.563	30.00	30.00	40.00	40.00
3	50.00	A	62.590	8.000	9.832	30.00	30.00	40.00	40.00
4	200.00	A	3.912	8.000	2.458	30.00	30.00	40.00	40.00

ALARM/ABORT PARAMETERS

MAXIMUM DRIVE OUTPUT PEAK VOLTAGE (+/-): 5.00 volts

TEST STARTUP & SCHEDULE PARAMETERS

START LEVEL: -12.00 dB, (25.12% of full level)
TEST DURATION (HH:MM:SS): 3:0:0
CHANNELS TO SAVE: 1,2,3,4
AUTO DATA SAVES: Save First and Last Sweep

SHAKER/AMPLIFIER SYSTEM SPECS

MAXIMUM ACCELERATION: 100.00 g pk
MAXIMUM VELOCITY: 70.00 in/s pk
MAXIMUM DISPLACEMENT: 2000.00 mil pp
MAXIMUM PERFORMANCE INPUT VOLTAGE: 5.00 Volts
DRIVE SCALING FACTOR: 18.75
ARMATURE WEIGHT: 135.00 lbs, LOAD WEIGHT: 315.00 lbs

UNHOLTZ-DICKIE Vwin II Version 3.00

Tested by: _____ Date _____

Printed Name Signature

T.4: SHOCK

METHOD

The samples were subjected to this test in accordance with Sec. 38.3.4.4, Test T.4 of the Fifth Revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (Refer to ST/SG/AC.10/11/Rev.5/Amend.1).

The samples were subjected to shock. The samples were weighed before and after the exposure. The cell/battery voltage was also determined before and after the test. The sample cell was secured to the testing machine by means of a rigid mount, which supports all mounting surfaces of the sample. Each sample was subjected to a half-sine shock as below:

For small cells and small batteries: Peak acceleration of 150 g and pulse duration of 6 milliseconds.

Each sample was subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell for a total of 18 shocks.

RESULTS

Battery Model	CU-PL-9059156-7S-WR

Sample No.	Sample Condition	Weight Before Test in Grams	Weight After Test In Grams	Percentage of Weight Loss	Voltage Before Test	Voltage After Test	Percent of Voltage Change	Comments
1	C	1411.73	1411.78	0.004 (gain)	29.16	29.16	0.000	1,7,8
2	C	1413.98	1414.04	0.004 (gain)	29.16	29.16	0.000	1,7,8
3	C	1411.07	1411.13	0.004 (gain)	29.16	29.16	0.000	1,7,8
4	C	1416.21	1416.28	0.005 (gain)	29.15	29.15	0.000	1,7,8
5	D	1416.10	1406.16	0.702 (gain)	29.17	29.17	0.000	1,7,8
6	D	1416.93	1416.99	0.004 (gain)	29.15	29.15	0.000	1,7,8
7	D	1410.83	1410.89	0.004 (gain)	29.18	29.18	0.000	1,7,8
8	D	1411.00	1411.06	0.004 (gain)	29.20	29.20	0.000	1,7,8

Tested by: _____ Date _____

Printed Name Signature

Comments
(1) Sample remained intact.
(2) Integrity of protective devices **[**was**] [**was not**]** maintained.
(3) Sample vented.
(4) Sample opened and leaked electrolyte.
(5) Sample exploded.
(6) Sample caught on fire.
(7) There was no mass loss, no leakage, no venting, no disassembly, no rupture and no fire.
(8) The open circuit voltage of each cell after testing was greater than 90%.
Condition
(A) Fully discharged state.
(B) Undischarged state.
(C) First cycle in fully charged state.
(D) After fifty cycles ending in fully charged state.
(E) After twenty five cycles ending in fully charged state.

[X] The sample **[**~~exploded or caught fire~~**] [**did not explode or catch fire**]**.

[X] The sample ~~**[**vented or leaked~~**] [**did not vent or leak**]** more than **[**~~0.5 percent~~**] [**~~0.2 percent~~**] [**0.1 percent**]**.

[X] The samples **[**~~ruptured or disassembled~~**] [**did not rupture or disassemble**]**.

[X] The fully charged samples open circuit voltage after testing is **[**not less than**] [**~~less than~~**]** 90% of its voltage prior to testing.

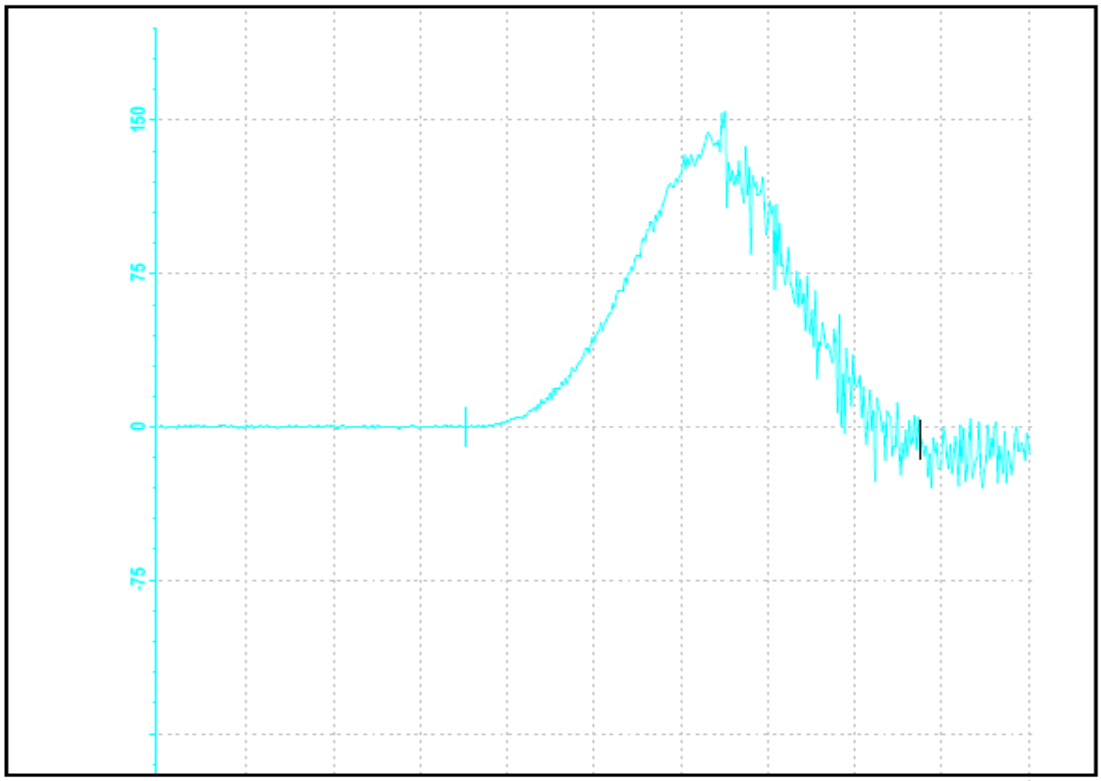
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 11:12	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.34 mS	-6.37 g's	156.72 g's	110.41 In/s	53.51 g's	1 mS	32	2

Remarks:

Project: 13CA43218
File: E308310
Position: 1
Drop: 1
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

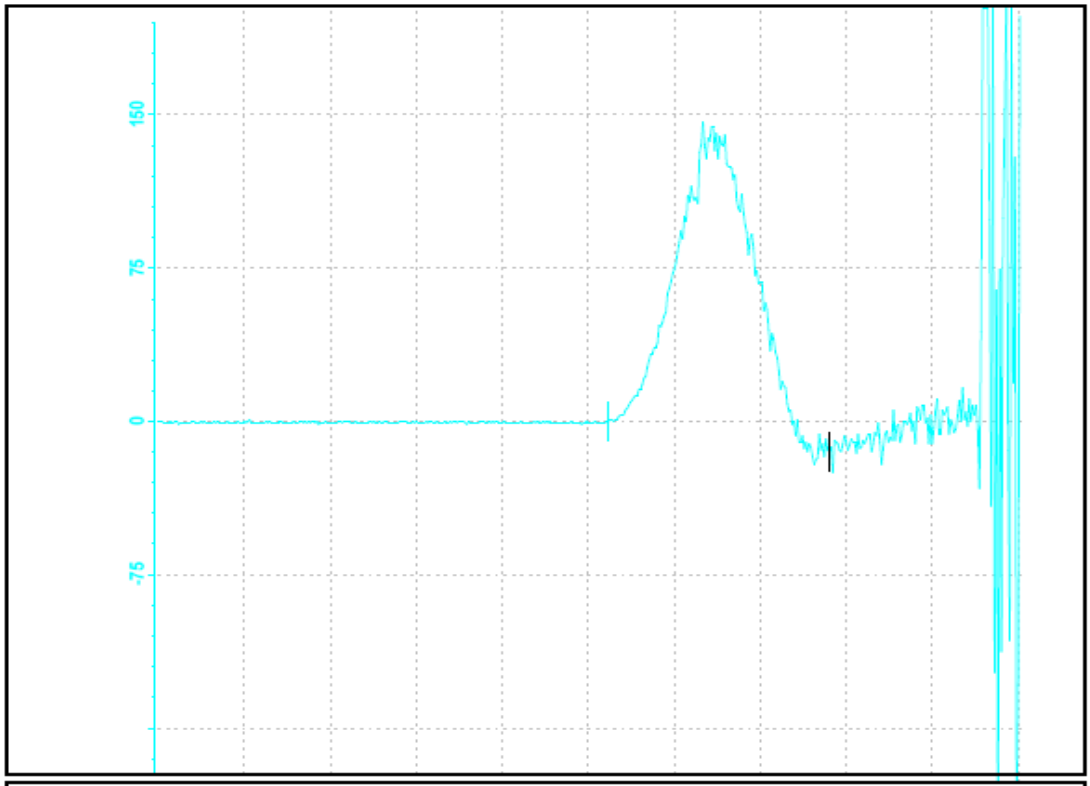
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:07	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.24 mS	-14.37 g's	146.17 g's	106.26 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 1
Drop: 2
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

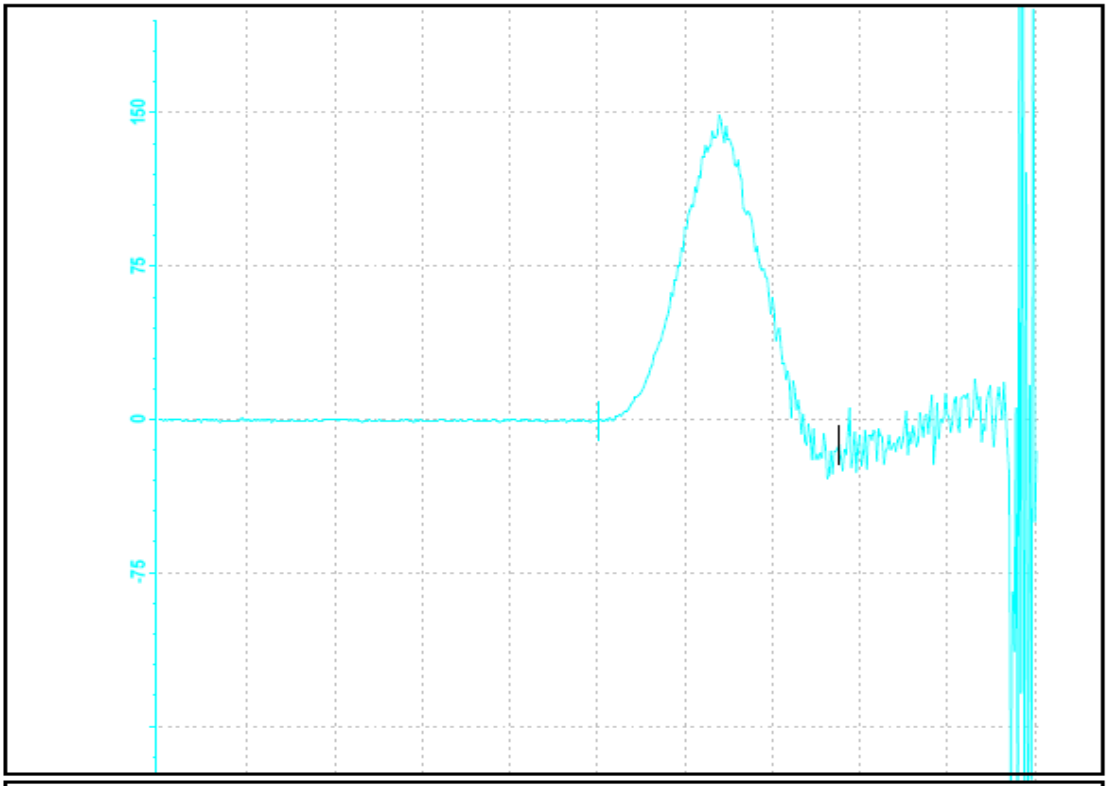
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:08	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.60 mS	-11.79 g's	150.13 g's	108.34 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 1
Drop: 3
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

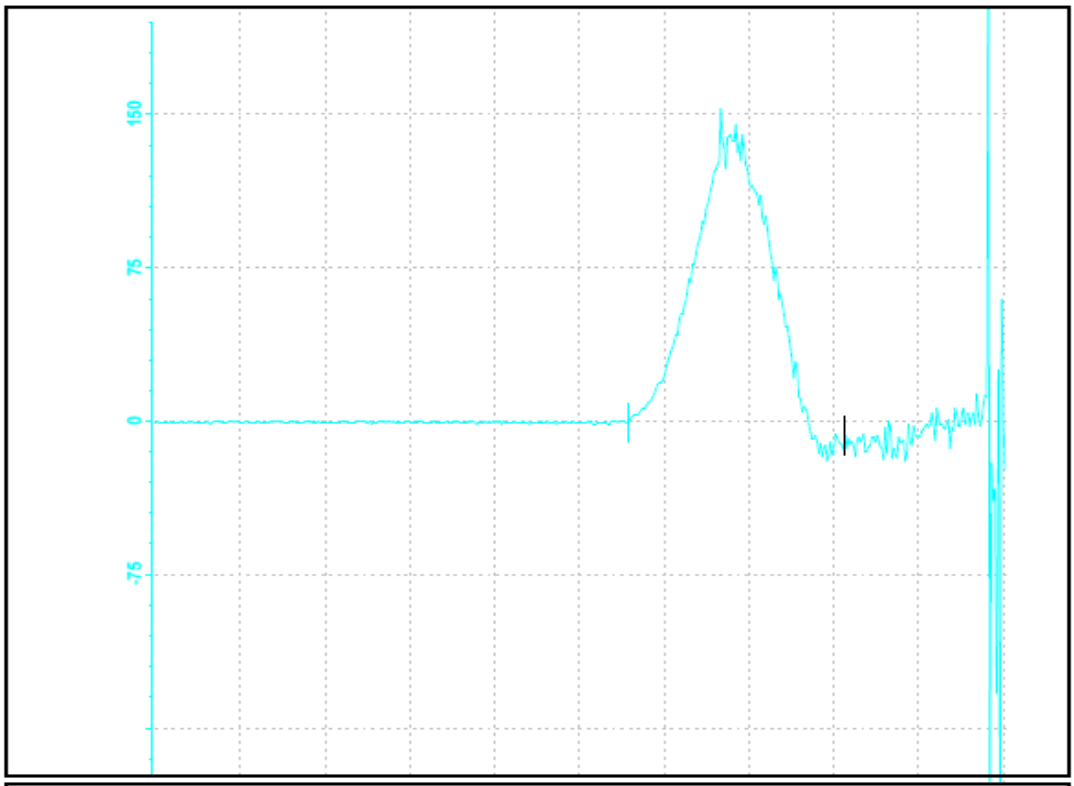
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:14	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.24 mS	-6.62 g's	153.54 g's	108.66 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 2
Drop: 4
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

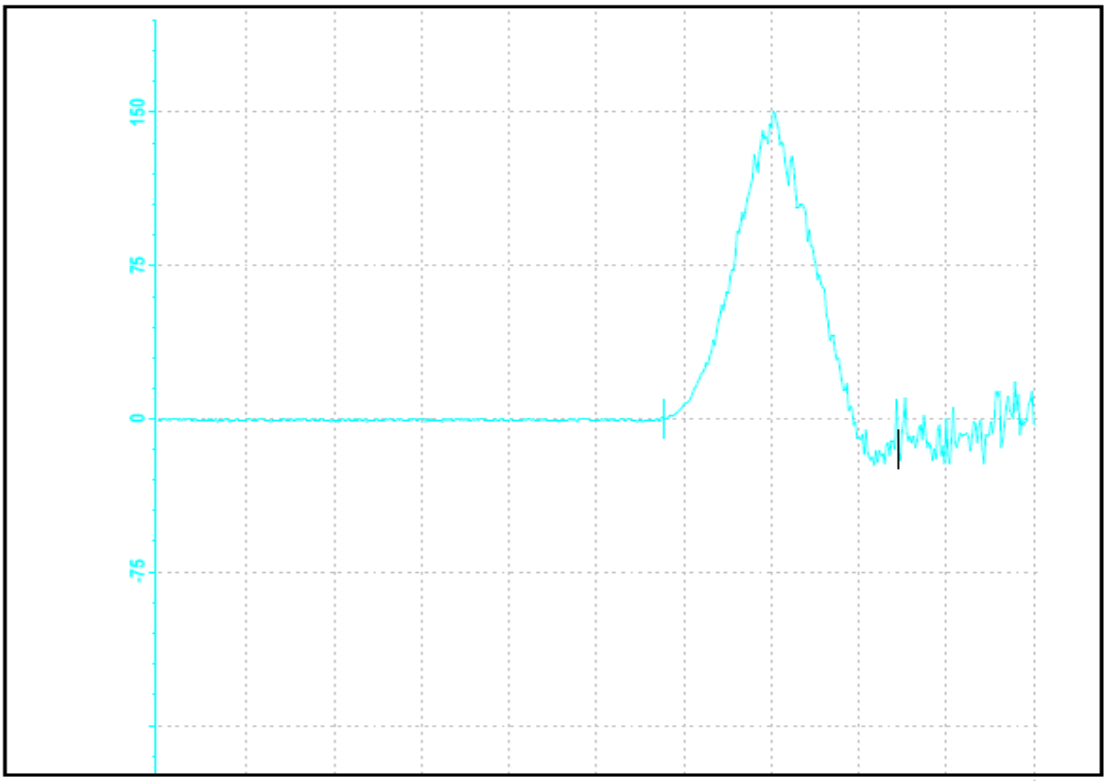
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:15	Test Engineer:	Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type :	SHOCK
Test Spec	:	UN T4	Test Machine :	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.48 mS	-14.25 g's	152.35 g's	106.86 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 2
Drop: 5
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

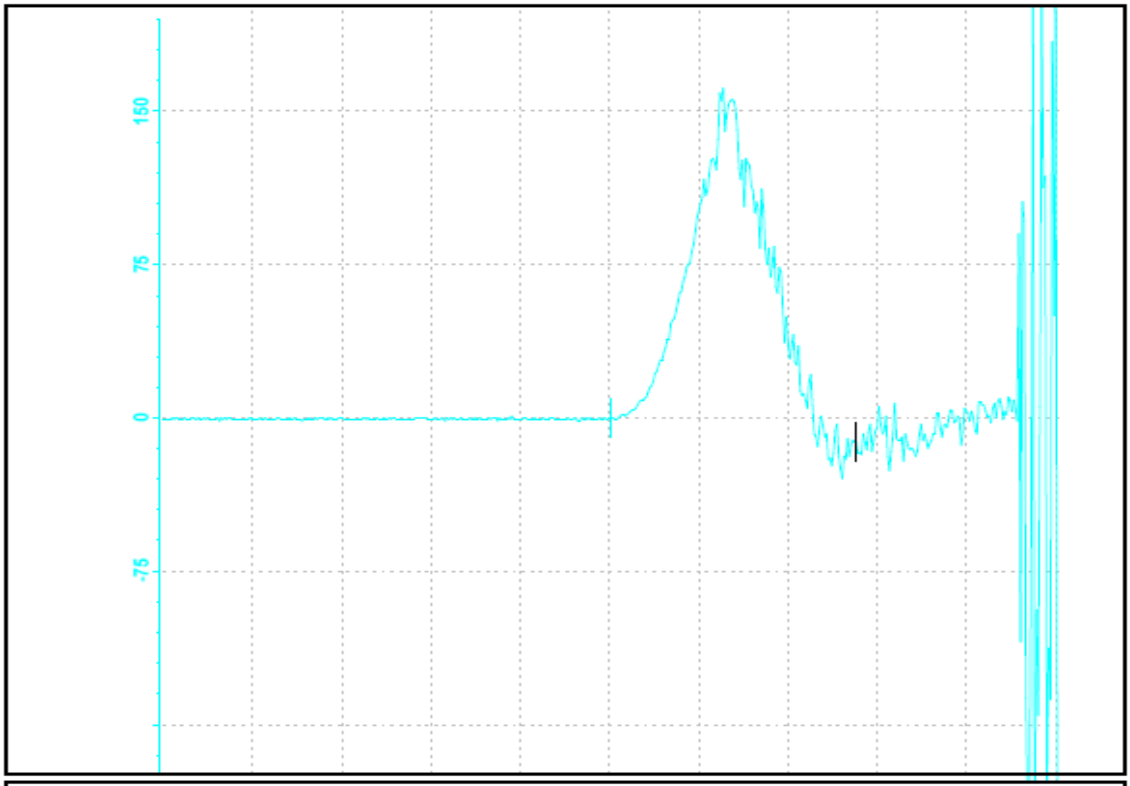
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:15	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.60 mS	-11.60 g's	161.25 g's	109.17 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 2
Drop: 6
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

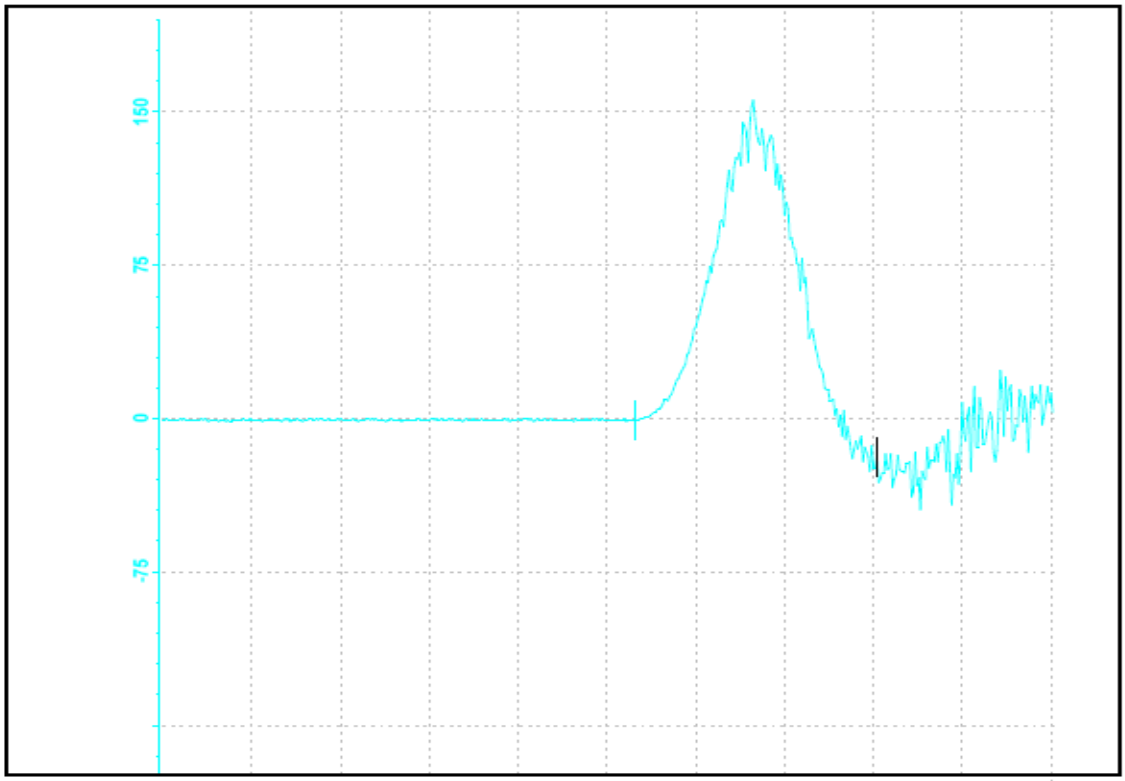
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:19	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.86 mS	-18.58 g's	166.28 g's	110.68 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 3
Drop: 7
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

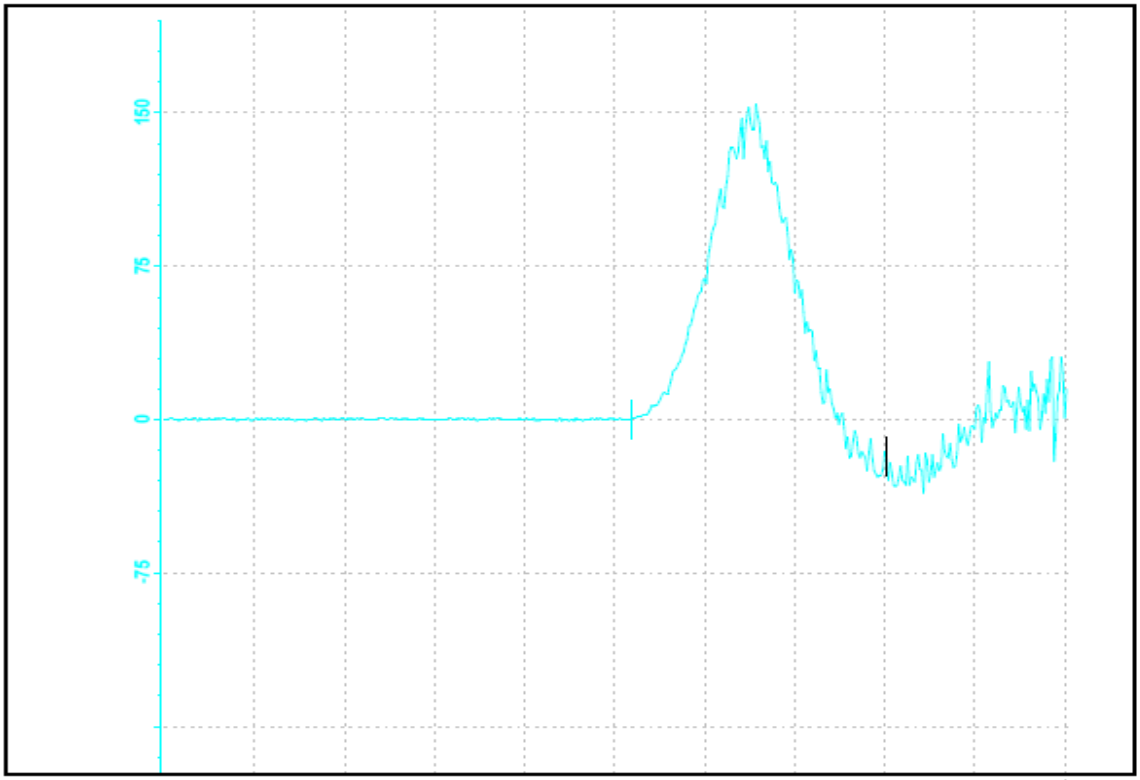
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:19	Test Engineer:	Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type :	SHOCK
Test Spec	:	UN T4	Test Machine :	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.80 mS	-18.40 g's	153.86 g's	109.79 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 3
Drop: 8
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

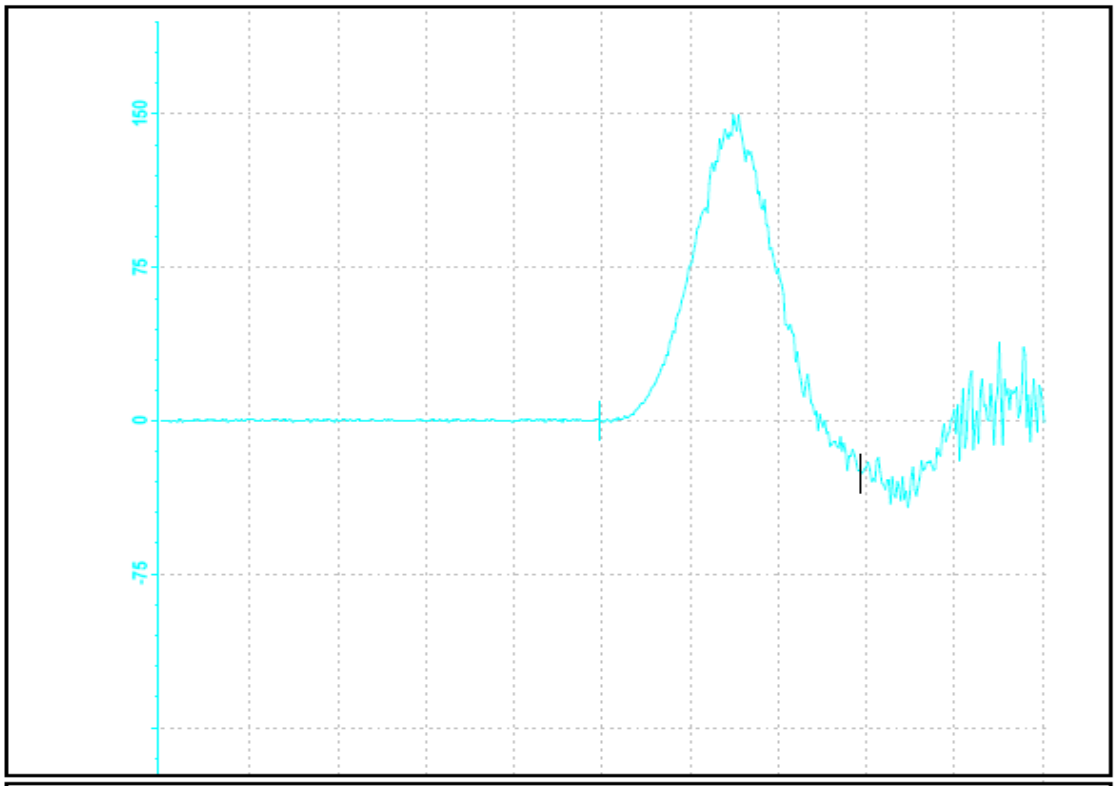
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:20	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	6.04 mS	-28.85 g's	151.01 g's	113.16 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 3
Drop: 9
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

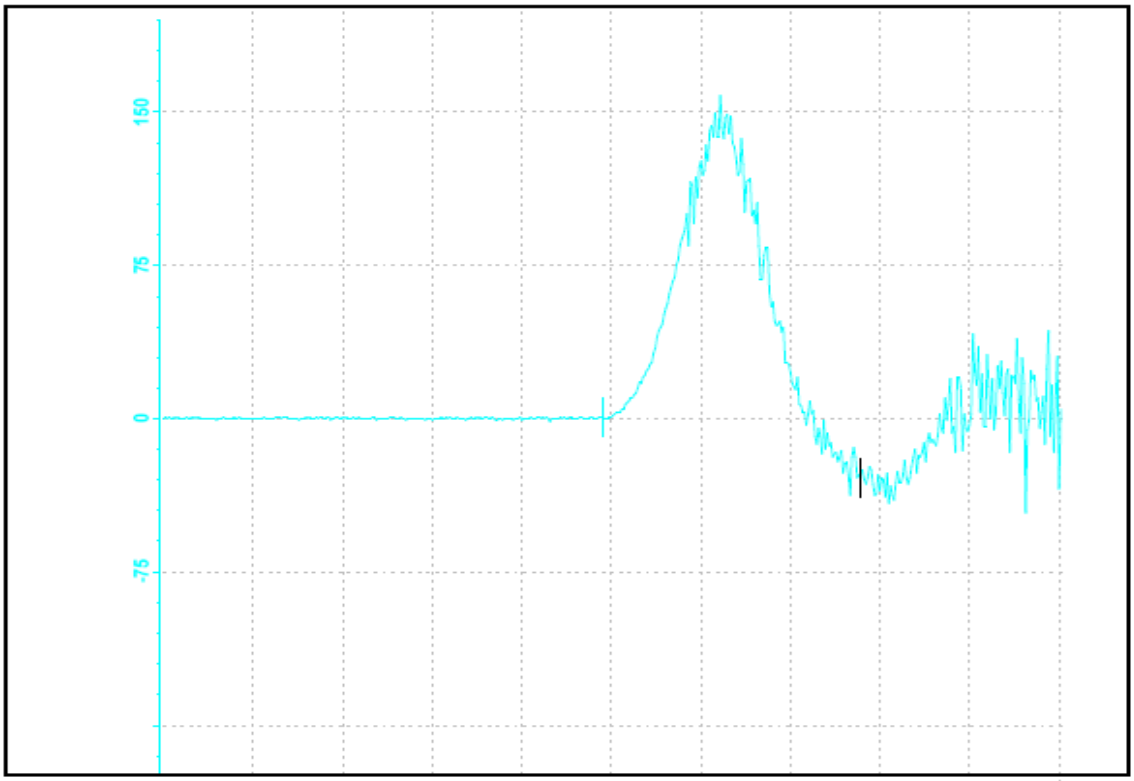
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:43	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.80 mS	-29.38 g's	157.82 g's	110.27 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 4
Drop: 10
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

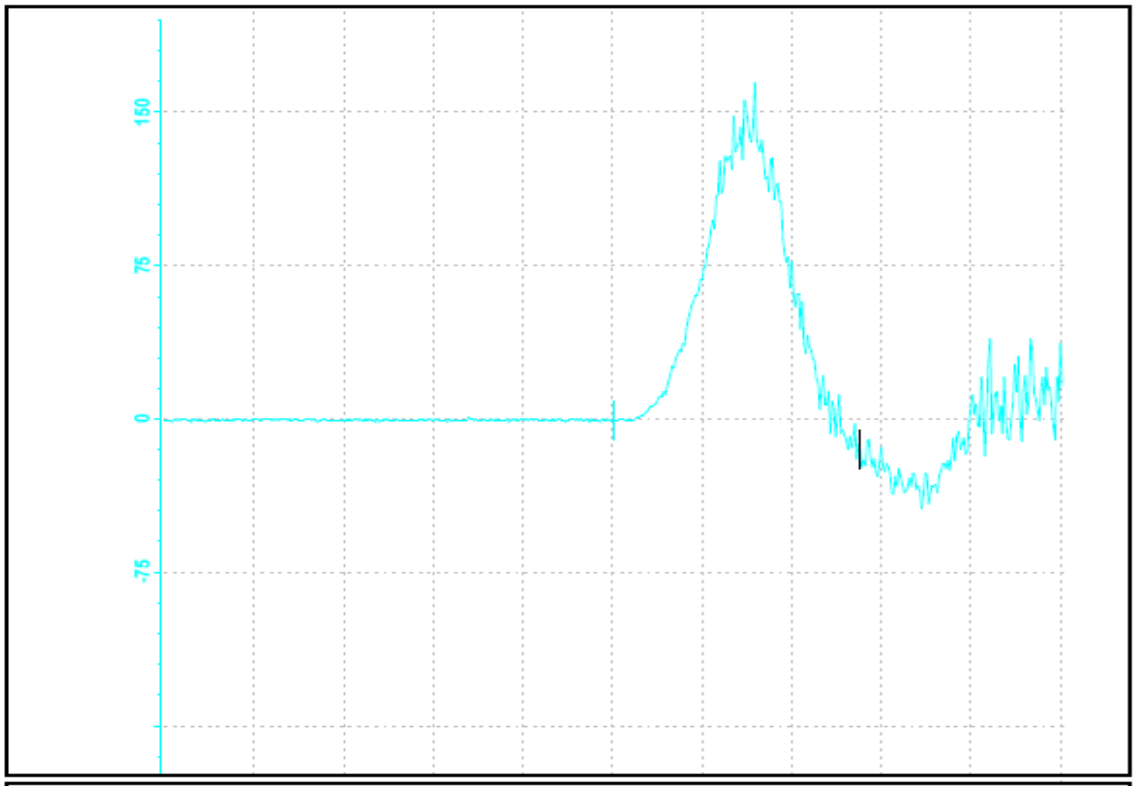
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:44	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.60 mS	-14.48 g's	166.19 g's	113.96 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 4
Drop: 11
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

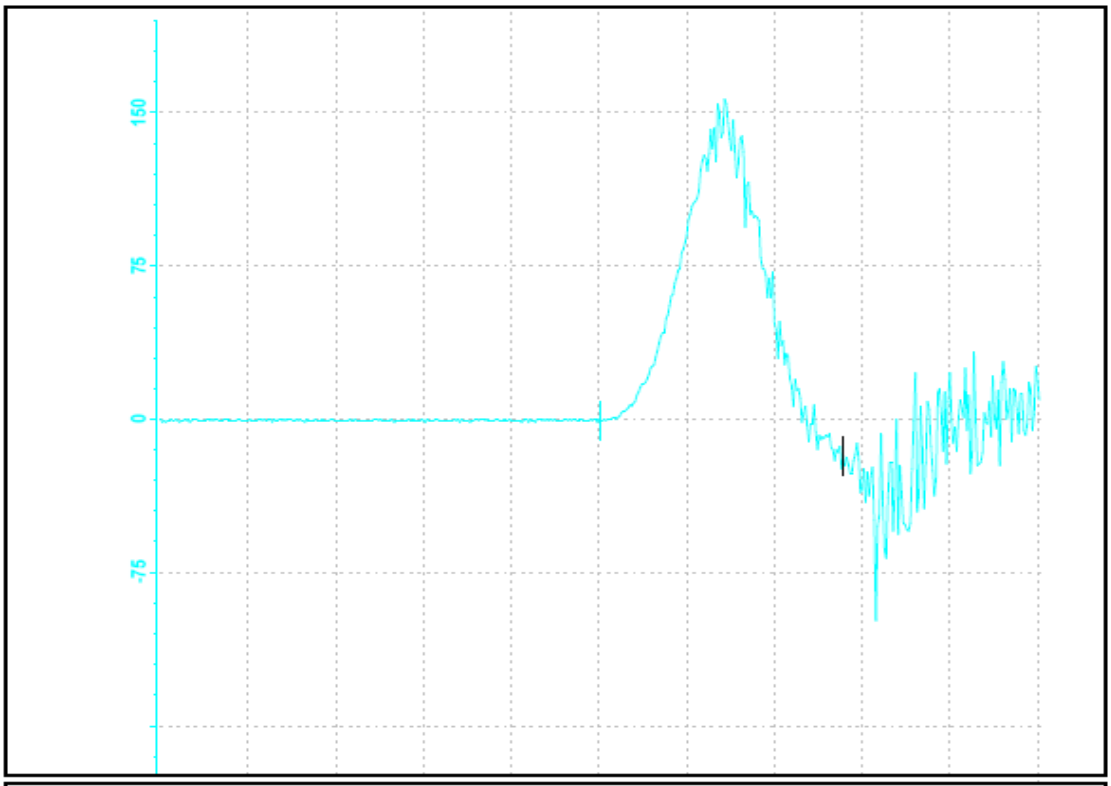
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:44	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.64 mS	-17.75 g's	156.27 g's	112.75 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 4
Drop: 12
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

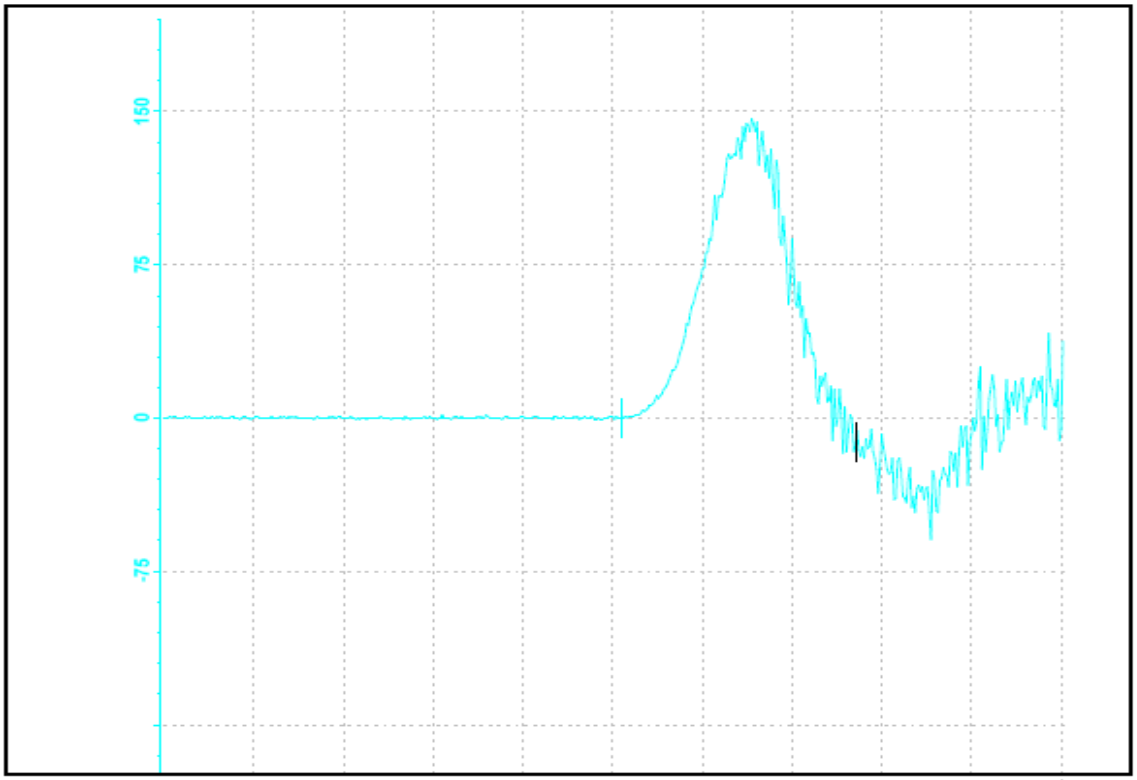
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:45	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.32 mS	-12.23 g's	159.25 g's	115.26 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 5
Drop: 13
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

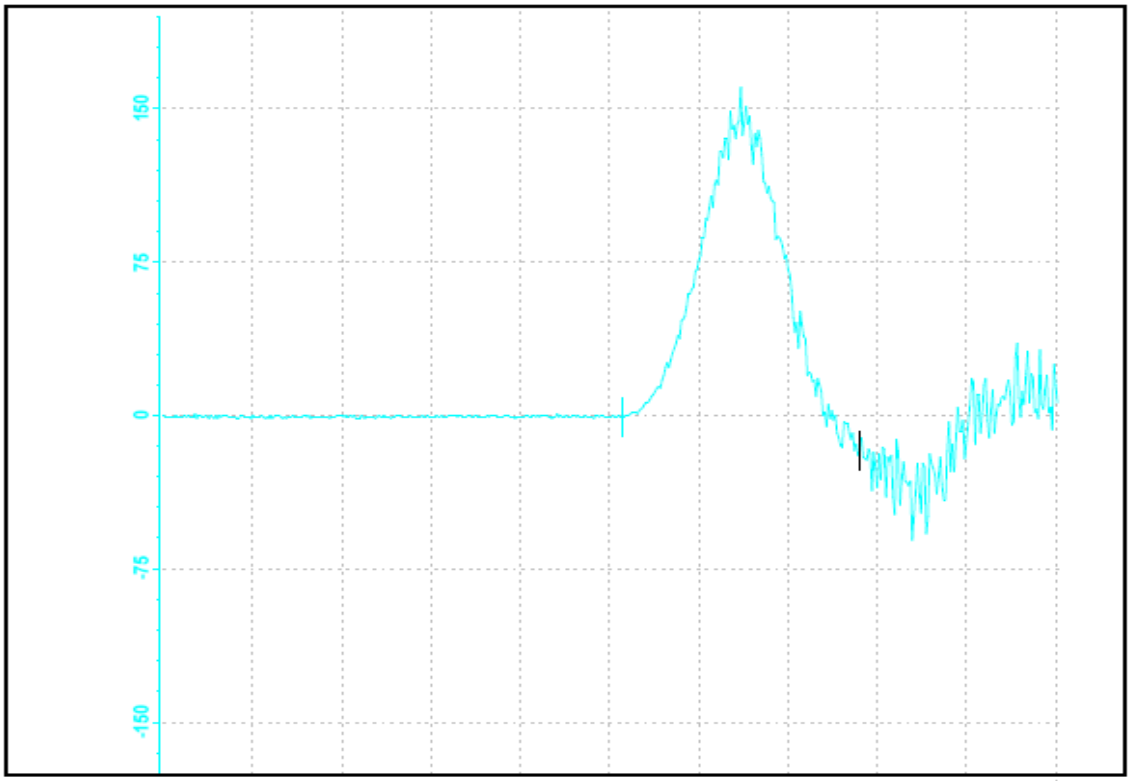
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:46	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.44 mS	-17.07 g's	160.38 g's	114.81 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 5
Drop: 14
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

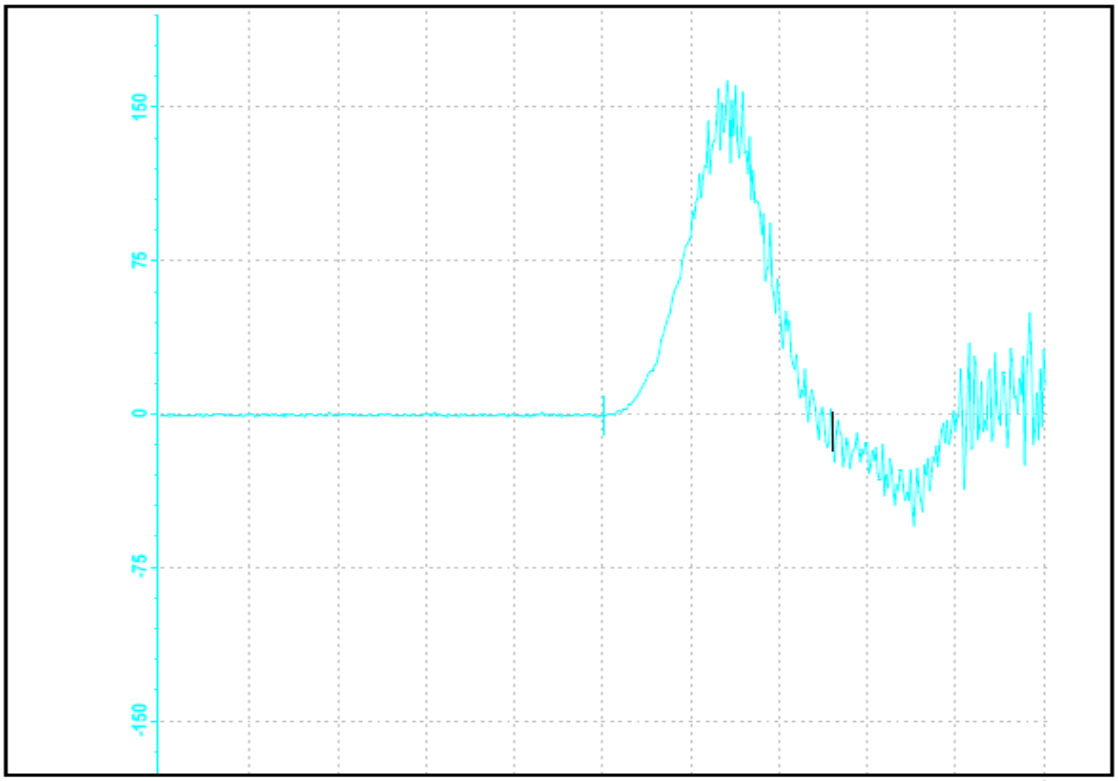
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:46	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.20 mS	-8.44 g's	162.66 g's	117.87 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 5
Drop: 15
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

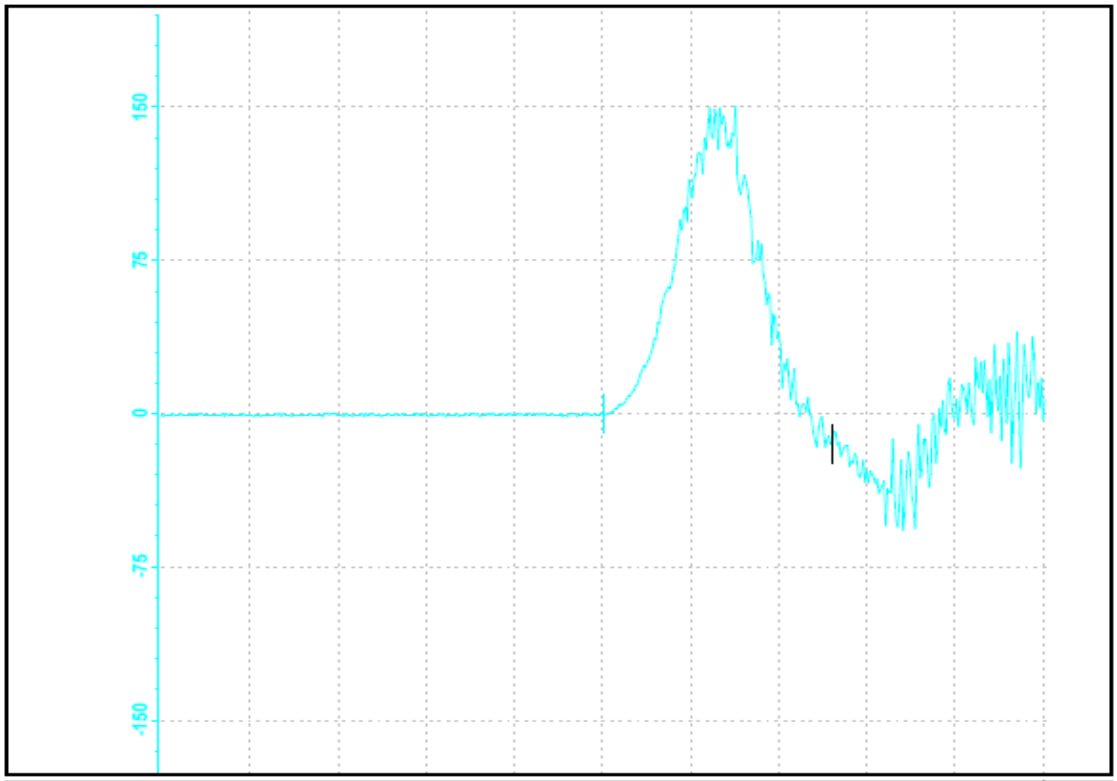
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:47	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.28 mS	-14.86 g's	177.44 g's	113.92 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 6
Drop: 16
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

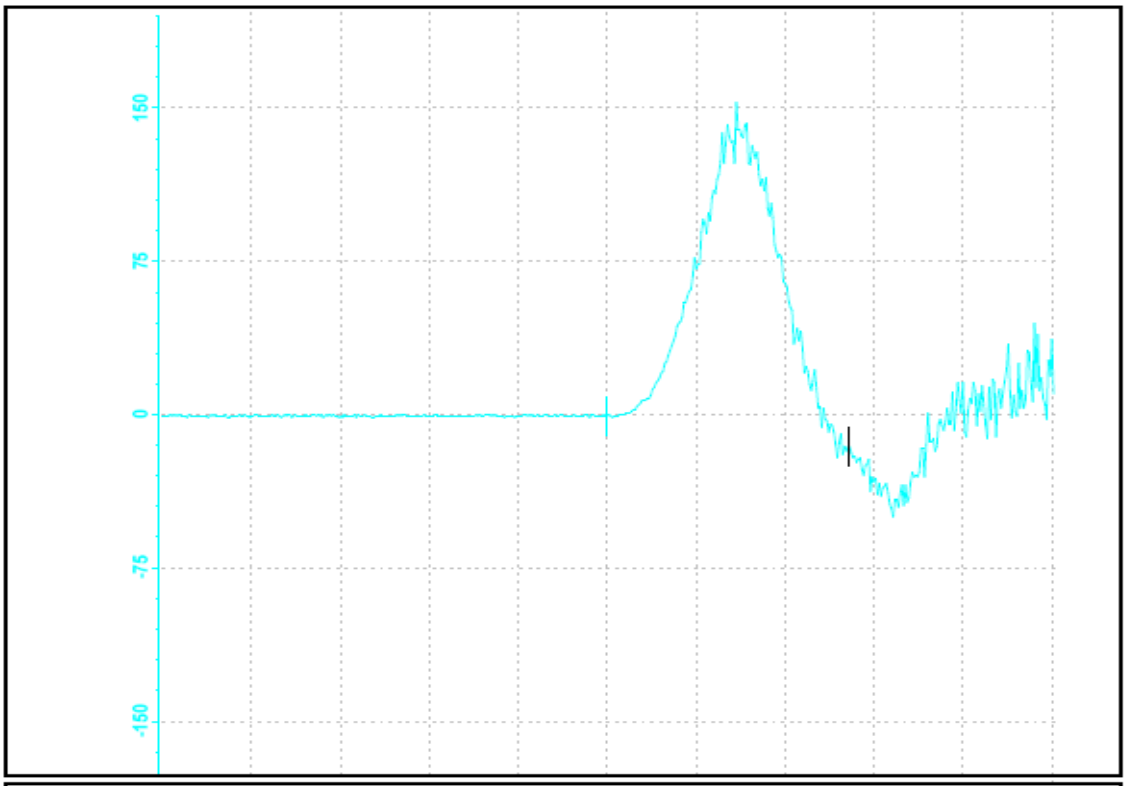
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:48	Test Engineer:	Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type :	SHOCK
Test Spec	:	UN T4	Test Machine :	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.56 mS	-15.33 g's	152.84 g's	109.96 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 6
Drop: 17
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

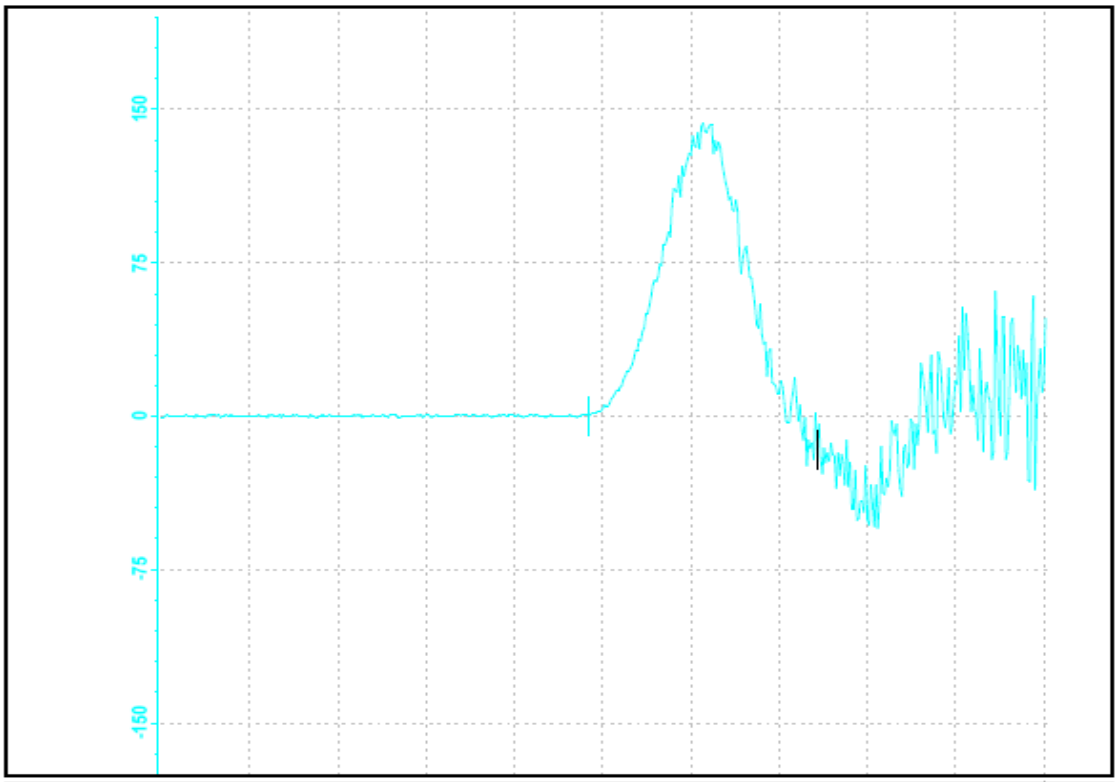
Tested by: _____ Date _____

Printed Name Signature

Waveform Test Report

Produced on GHI CAT SYSTEM

Time	:	Sep 4 2013 21:49	Test Engineer:		Jesse Rodriguez
Test Item	:	cu-pl-9059156	Test Type	:	SHOCK
Test Spec	:	UN T4	Test Machine	:	GHI Systems



Ch.	Time	Curr Amp	Peak Amp	1st Int	Average G's	Time/Div	Hexp	Vexp
1	5.20 mS	-16.55 g's	147.13 g's	113.14 In/s		2 mS	16	2

Remarks:

Project: 13CA43218
File: E308310
Position: 6
Drop: 18
Samples:1-8

GHI SYSTEMS, INC. CAT SYSTEM

Tested by: _____ Date _____

Printed Name Signature

T.5: EXTERNAL SHORT CIRCUIT

METHOD

The samples were subjected to this test in accordance with Sec. 38.3.4.5, Test T.5 of the Fifth Revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (Refer to ST/SG/AC.10/11/Rev.5/Amend.1).

The samples were temperature stabilized so that its external case temperature reached 55 ± 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 ± 2°C. This short circuit condition was continued for at least one hour after the cell or battery external case temperature returned to 55 ± 2°C.

RESULTS

Battery Model	CU-PL-9059156-7S-WR

Sample No.	Condition	Voltage Before Test	Maximum Temperature, °C	Comments
1	C	29.16	56	1,8
2	C	29.16	56	1,8
3	C	29.16	56	1,8
4	C	29.15	56	1,8
5	D	29.17	56	1,8
6	D	29.15	56	1,8
7	D	29.18	56	1,8
8	D	29.20	56	1,8

Tested by: _____ Date _____

Printed Name Signature

T.5: EXTERNAL SHORT CIRCUIT (CONT'D)

Comments	Condition
(1) Sample remained intact.	(A) Fully discharged state.
(2) Sample bulged.	(B) Undischarged state.
(3) Sample vented.	(C) First cycle in fully charged state.
(4) Sample opened and leaked electrolyte.	(D) After fifty cycles ending in fully charged state.
(5) Sample exploded.	(E) After twenty five cycles ending in fully charged state.
(6) Sample caught on fire.	-
(7) (Other)	-
(8) No disassembly and no fire within six hours of the test.	-

[X] The maximum temperature measured on the exterior surface of the ~~**[**metal cell casings**]**~~ or **[**plastic pack casings**]** are noted above.

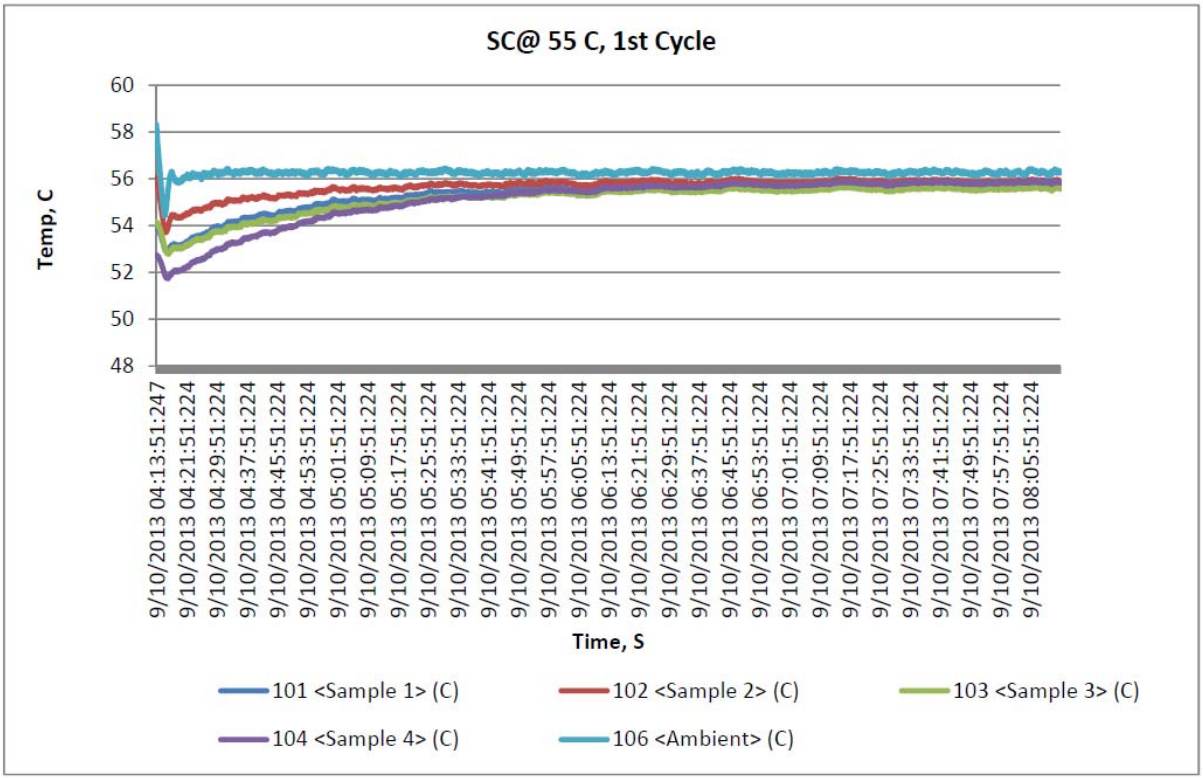
[X] The maximum temperature ~~**[**exceeded**]**~~ **[**did not exceed**]** 170°C.

[X] The samples ~~**[**exploded or caught fire**]**~~ **[**did not explode or catch fire**]** within six hours of test.

[X] The samples **[**~~ruptured or disassembled~~**]** **[**did not rupture or disassemble**]** within six hours of test.

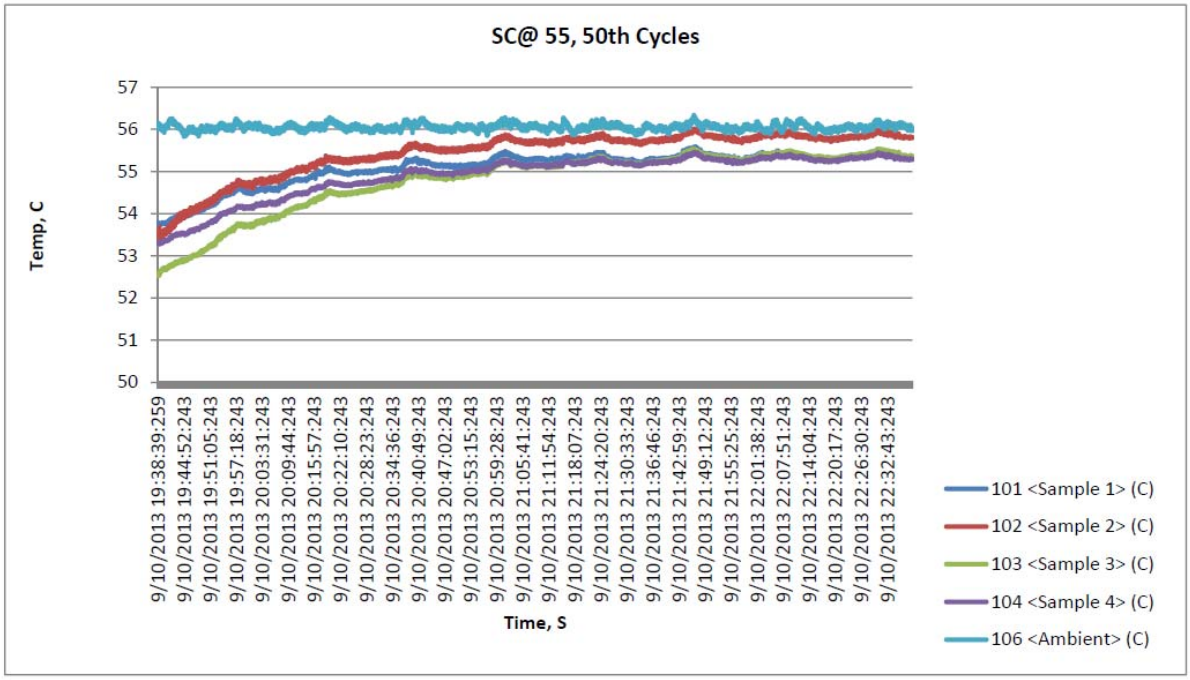
Tested by: _____ Date _____

Printed Name Signature



Tested by: _____ Date _____

Printed Name Signature



Tested by: _____ Date _____

Printed Name Signature

T.7: OVERCHARGE

METHOD

The rechargeable batteries were subjected to this test in accordance with Section 38.3.4.7, Test T.7 of the Fifth Revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (Refer to ST/SG/AC.10/11/Rev.5/Amend.1).

Batteries were subjected to a charge current of twice the manufacturer's recommended maximum continuous charge current.

The minimum voltage of the test was as follows:

- When the manufacturer's recommended charge voltage is not more than 18 V, the minimum voltage of the test was the lesser of 2 times the maximum charge voltage of the battery or 22 V.
- When the manufacturer's recommended charge voltage is more than 18 V, the minimum voltage of the test was 1.2 times the maximum charge voltage.

Tests were conducted at ambient temperature. The duration of the test was 24 hours.

RESULTS

Battery Model	CU-PL-9059156-7S-WR
Overcharge Current	20 A
Overcharge Voltage	35.20 V

Sample No.	Condition	Test Voltage, V	Test Current, A	Measured Overcharge Current, ~~m~~A	Comments
9	A	35.20	20	20	1,7
10	A	35.20	20	20	1,7
11	A	35.20	20	20	1,7
12	A	35.20	20	20	1,7
13	B	35.20	20	20	1,7
14	B	35.20	20	20	1,7
15	B	35.20	20	20	1,7
16	B	35.20	20	20	1,7

Tested by: _____ Date _____

Printed Name Signature

T.7: OVERCHARGE (CONT'D)

Comments	Condition
(1) Sample remained intact.	(A) First cycle in fully charged state.
(2) The battery's protective circuitry activated and the current was reduced to about _____ A.	(B) After fifty cycles ending in fully charged state.
(3) Sample vented.	(C) After twenty five cycles ending in fully charged state.
(4) Sample opened and leaked electrolyte.	-
(5) Sample exploded.	-
(6) Sample caught on fire.	-
(7) No disassembly and no fire within seven days of the test.	-

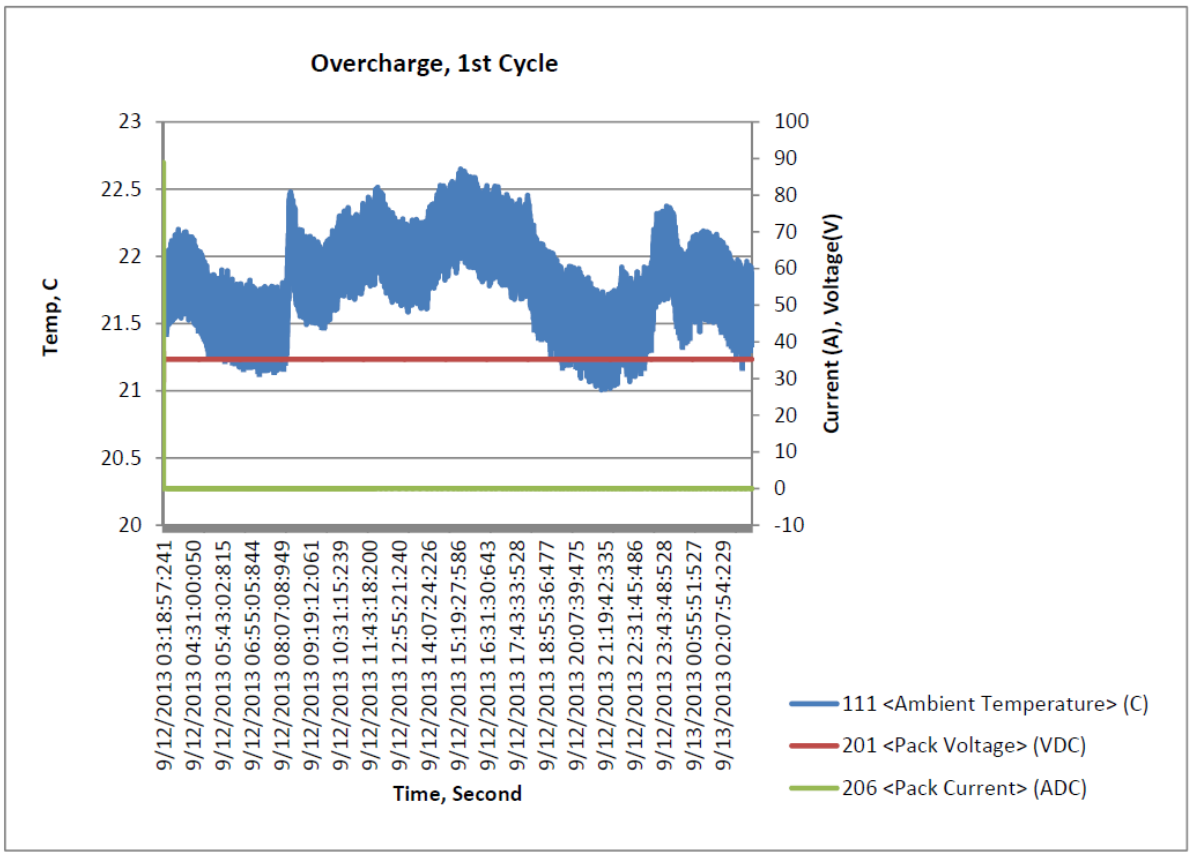
[X] The samples **[**~~exploded or caught fire~~**]** **[**did not explode or catch fire**]** within seven days of test.

[X] The samples **[**~~disassembled~~**]** **[**did not disassemble**]** within seven days of test.

Note: The tests were based on a 29.3V maximum charging voltage. TAS 20130920

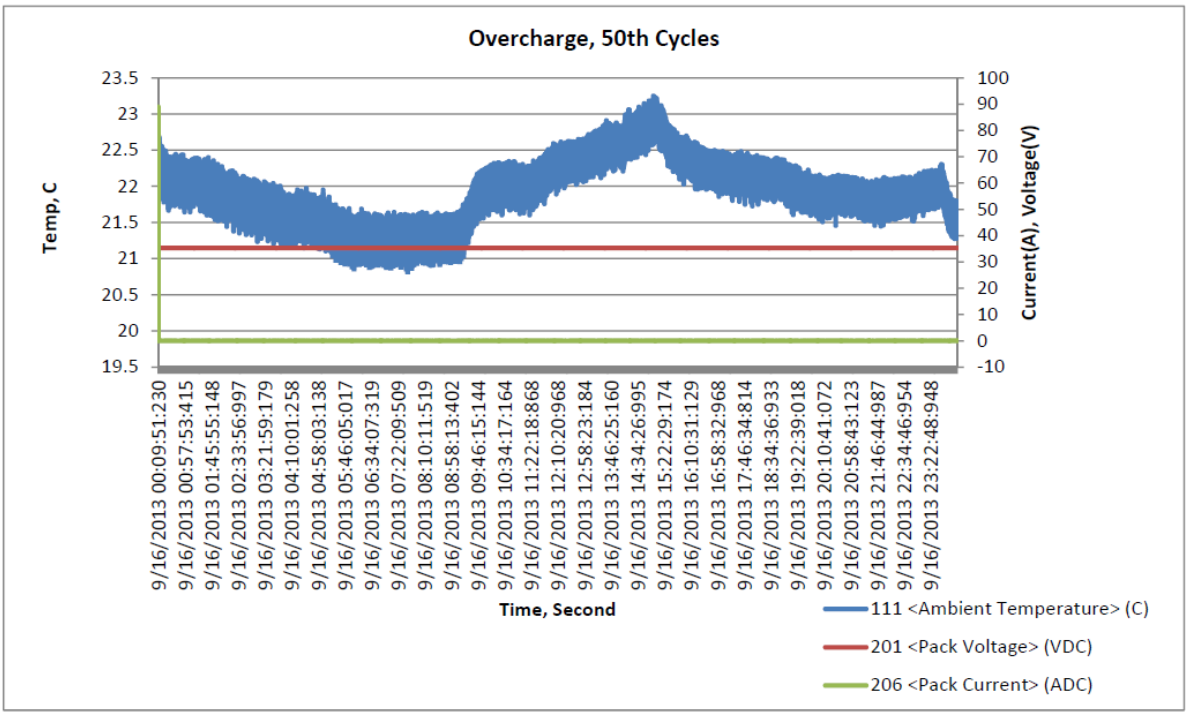
Tested by: _____ Date _____

Printed Name Signature



Tested by: _____ Date _____

Printed Name Signature



Tested by: _____ Date _____

Printed Name Signature

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