APPLICATION FOR IEC REPORT
On Behalf of

Model: SH103035

Prepared For :

Prepared By : **Shenzhen Anbotek Compliance Laboratory Limited**
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Date of Test: Jan. 17, 2017 to Feb. 13, 2017
Date of Report: Feb. 13, 2017
Report Number: R0117011259B

TEST REPORT

IEC 62133:2012

Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Report	
Reference No.:	R0117011259B
Compiled by (+ signature):	Fannie Zhu / Project Engineer
Approved by (+ signature):	Mark Zhu / Project Manager
Date of issue:	Feb. 13, 2017
Contents:	21 pages(including 1 pages of photos)
Testing laboratory	
Name:	Shenzhen Anbotek Compliance Laboratory Limited
Address:	East of 4/F., Building A, Hourui No.3 Industrial Zone, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
Testing location:	Shenzhen Anbotek Compliance Laboratory Limited
Client	
Name:	
Address:	
Test specification	
Standard:	IEC 62133: 2012
Test procedure:	Compliance with IEC 62133: 2012
Procedure deviation:	N.A.
Non-standard test method:	N.A.
Test item	
Description:	Li-Polymer Cell
Trademark:	N.A.
Model and/or type reference:	SH103035
Serial number:	N.A.
Manufacturer:	
Address:	
Rating(s):	Cell: 3.7V, 1000mAh

Particulars: test item vs. test requirements

Ambient temperature·····: 20 °C ± 5 °C.

Test case verdicts

Test case does not apply to the test object····· : N(.A.)

Test item does meet the requirement·····: P(ass)

Test item does not meet the requirement····· : F(ail)

Testing

Date of receipt of test item ·····: Jan. 17, 2017

Date(s) of performance of test·····: Jan. 17, 2017 to Feb. 13, 2017

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item tested.

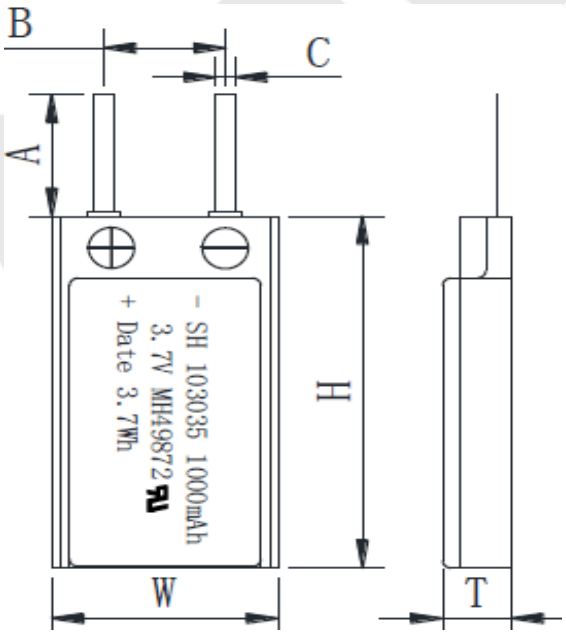
"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a dot is used as the decimal separator.

Comments:

1. If no otherwise specified, all tests performed at the model: SH103035
2. The cell construction of model SH103035, as following:



test item	technical specification
T	Max 9.8mm
W	Max 29.5mm
H	Max 33.5mm
A	6.0±2mm
B	13±2mm
C	3.0±0.1mm

The cell consists of the positive electrode plate, negative electrode plate, separator, electrolyte and case.
The positive and negative electrode plates are housed in the case in the state being separated by the separator.

The main features of the cells are show as below(clause 8.1.1)

Model	Nominal Capacity	Nominal Voltage	Nominal Charge Current	Nominal Discharge Current	Max. Charge Current	Max. Discharge Current	Max. Charge Voltage	Cut-off Voltage
SH103035	1000mAh	3.7V	200mA	200mA	1000mA	1000mA	4.2V	3.0V

The main features of the cells are show as below(clause 8.1.2)

Model	Upper limit Charge Voltage	Taper-off Current	Lower Charge temperature	Upper Charge temperature
SH103035	4.25V	50mA	0℃	45℃

Copy of marking:

Li-ion Cell
Model number: SH103035
ICP10/27/26
3.7Vdc, 1000mAh, 3.7Wh
(+), (-),

2017.01.13
CAUTION
-Do not disassemble or modify
-Do not short-circuit
-Do not dispose in fire
-Do not expose to high temperature

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
4	**Parameter measurement tolerances**		**P**
	Parameter measurement tolerances		P
5	**General safety considerations**		**P**
5.1	General		P
5.2	Insulation and wiring		N
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ	No metal case exists.	N
	Insulation resistance (MΩ)..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		N
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		N
5.3	Venting		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Venting line exists on the metal case of the cell.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N
5.4	Temperature/voltage/current management	Cell only	N
	Batteries are designed such that abnormal temperature rise conditions are prevented		N
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		N
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified		N
5.5	Terminal contacts		P
	Terminals have a clear polarity marking on the external surface of the battery	The “+” and “-” polarity explicitly marked on surface of the cell.	P

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Complied.	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	Complied.	P
	Terminal contacts are arranged to minimize the risk of short circuits	Complied.	P
5.6	Assembly of cells into batteries	Cell only	N
5.6.1	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N
	Each battery has an independent control and protection		N
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		N
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate separate circuitry to prevent the cell reversal caused by uneven discharges		N
	Protective circuit components are added as appropriate and consideration given to the end-device application		N
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N
5.6.2	Design recommendation for lithium systems only		N
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Clause 8.1.2, Table 4; or	Cell only	N
	- Charging voltage of the cell does not exceed the different upper limit of the charging voltage determined through Clause 8.1.2, NOTE 1.		N

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, by monitoring the voltage of every single cell or the single cellblocks; or		N
	- The voltages of any one of the single cells or single cellblocks does not exceed the different upper limit of the charging voltage, determined through Clause 8.1.2, NOTE 1, by monitoring the voltage of every single cell or the single cellblocks		N
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or		N
	- Charging is stopped when the upper limit of the different charging voltage, determined through Clause 8.1.2, NOTE 1, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N
5.7	Quality plan		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery		P
6	**Type test conditions**		**P**
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old	Complied. Table 2 for Lithium system.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	Tests are carried out at 20°C ± 5°C.	P
7	**Specific requirements and tests (nickel systems)**		**N**
7.1	Charging procedure for test purposes	Lithium system.	N
7.2	Intended use		N
7.2.1	Continuous low-rate charging (cells)		N

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
	Results: No fire. No explosion		N
7.2.2	Vibration		N
	Results: No fire. No explosion. No leakage	(See Table 7.2.2)	N
7.2.3	Moulded case stress at high ambient temperature		N
	Oven temperature (°C)..... :		—
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N
7.2.4	Temperature cycling		N
	Results: No fire. No explosion. No leakage.		N
7.3	Reasonably foreseeable misuse		N
7.3.1	Incorrect installation cell		N
	The test was carried out using: - Four fully charged cells of the same brand, type, size and age connected in series, with one of them reversed; or		N
	- A stabilized dc power supply.		N
	Results: No fire. No explosion..... :	(See Table 7.3.1)	N
7.3.2	External short circuit		N
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		N
	- The case temperature declined by 20% of the maximum temperature rise		N
	Results: No fire. No explosion..... :	(See Table 7.3.2)	N
7.3.3	Free fall		N
	Results: No fire. No explosion.		N
7.3.4	Mechanical shock (crash hazard)		N
	Results: No fire. No explosion. No leakage.		N
7.3.5	Thermal abuse		N
	Oven temperature (°C)..... :		—
	Results: No fire. No explosion.		N
7.3.6	Crushing of cells		N
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		N
	Results: No fire. No explosion..... :	(See Table 7.3.6)	N
7.3.7	Low pressure		N
	Chamber pressure (kPa)..... :		—
	Results: No fire. No explosion. No leakage.		N
7.3.8	Overcharge		N
	Results: No fire. No explosion..... :	(See Table 7.3.8)	N
7.3.9	Forced discharge		N
	Results: No fire. No explosion..... :	(See Table 7.3.9)	N
8	**Specific requirements and tests (lithium systems)**		**P**
8.1	Charging procedures for test purposes		P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2		P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9		P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5 °C for the upper limit and minus 5 °C for the lower limit	Charge temperature 0-45°C declared.	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1)..... :		N
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4,25 V), the applied upper limit charging voltage and upper limit charging temperatures were adjusted accordingly	Lithium Polymer cobalt oxide system only.	N
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1)..... :		N
8.2	Intended use		P
8.2.1	Continuous charging at constant voltage (cells)	Test complied.	P
	Results: No fire. No explosion..... :	(See Table 8.2.1)	P

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
8.2.2	Moulded case stress at high ambient temperature (battery)	No moulded case existed.	N
	Oven temperature (°C)..... :		—
	Results: No physical distortion of the battery casing resulting in exposure of internal components		N
8.3	Reasonably foreseeable misuse		P
8.3.1	External short circuit (cell)		P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion..... :	(See Table 8.3.1)	P
8.3.2	External short circuit (battery)	Cell only	N
	The batteries were tested until one of the following occurred: - 24 hours elapsed; or		N
	- The case temperature declined by 20% of the maximum temperature rise		N
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N
	Results: No fire. No explosion..... :	(See Table 8.3.2)	N
8.3.3	Free fall		P
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.4	Thermal abuse (cells)		P
	The cells were held at 130°C ± 2°C for: - 10 minutes; or	Test complied.	P
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)		N
	Oven temperature (°C)..... :	130°C	—
	Gross mass of cell (g)..... :	<500g, small cell.	P
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.5	Crush (cells)		P
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or	Test complied.	P

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Clause	Requirement – Test	Result - Remark	Verdict
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N
	- 10% of deformation has occurred compared to the initial dimension		N
	Results: No fire. No explosion..... :	(See Table 8.3.5)	P
8.3.6	Over-charging of battery	Cell only	N
	Test was continued until the temperature of the outer casing: - Reached steady state conditions (less than 10°C change in 30-minute period); or		N
	- Returned to ambient		N
	Results: No fire. No explosion..... :	(See Table 8.3.6)	N
8.3.7	Forced discharge (cells)	Test complied.	P
	Results: No fire. No explosion..... :	(See Table 8.3.7)	P
8.3.8	Transport tests		P
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods	(See Table 8.3.8)	P
8.3.9	Design evaluation – Forced internal short circuit (cells)		N
	The cells complied with national requirement for.....:	France, Japan, Korea and Switzerland.	—
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		N
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N	N
	Results: No fire..... :		N
9	**Information for safety**		**P**
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	Cell specifications provided.	P
	The manufacturer of batteries ensures that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards.		N
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user.....:		N
10	**Marking**		**P**
10.1	Cell marking		P
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.	See marking plate on page 4.	P
10.2	Battery marking		N
	Batteries marked in accordance with the requirements for the cells from which they are assembled.		N
	Batteries marked with an appropriate caution statement.		N
10.3	Other information		P
	Storage and disposal instructions marked on or supplied with the battery.		P
	Recommended charging instructions marked on or supplied with the battery.	Information for recommended charging instructions mentioned in manufacturer's specifications.	P
11	**Packaging**		**P**
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants.		P
Annex A	**Charging range of secondary lithium ion cells for safe use**		**P**
A.1	General		P
A.2	Safety of lithium-ion secondary battery	Complied.	P
A.3	Consideration on charging voltage	Complied.	P
A.3.1	General	Charging voltage is 4.2V	P
A.3.2	Upper limit charging voltage	4.25V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.25V applied.	N
A.4	Consideration of temperature and charging current		P

IEC 62133:2012			
Clause	Requirement – Test	Result - Remark	Verdict
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature declared by client is: 0-45°C	P
A.4.3	High temperature range	Not higher than the temperature range specific in this standard.	N
A.4.3.1	General		N
A.4.3.2	Explanation of safety viewpoint		N
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		N
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		N
A.4.4	Low temperature range	Lower than the temperature range specific in this standard.	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	-5°C applied.	P
A.4.5	Scope of the application of charging current		P
A.5	Sample preparation		P
A.5.1	General		N
A.5.2	Insertion procedure for nickel particle to generate internal short		P
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		N
A.5.5.1	Insertion of nickel particle to winding core		N
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N
A.5.6	Insertion of nickel particle to prismatic cell		N

	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Cell	SHENZHEN SUNHE ENERGY CO.,LTD.	SH103035	3.7V, 1000mAh	IEC62133:2012	Test with appliance
1) An asterisk indicates a mark which assures the agreed level of surveillance.					

8.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample No.	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (mA)**	**OCV at start of test, (Vdc)**	**Results**
Cell- 01	4.200	200	4.191	No fire or explosion, No leakage
Cell- 02	4.200	200	4.194	
Cell- 03	4.200	200	4.192	
Cell- 04	4.200	200	4.197	
Cell- 05	4.200	200	4.192	
Supplementary information: - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain)				

8.3.1	TABLE: External short circuit (cell)				P
Sample No.	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (mΩ)**	**Maximum case temperature (°C)**	**Results**
Charging temperature: -5℃					
Cell- 06	24.41	4.117	82.4	102.65	No fire or explosion
Cell- 07	24.41	4.123	61.7	98.49	
Cell- 08	24.41	4.128	75.2	106.37	
Cell- 09	24.41	4.114	86.3	104.29	
Cell- 10	24.41	4.123	71.4	109.81	
Charging temperature: 45℃					
Cell- 11	24.26	4.206	82.4	104.36	No fire or explosion
Cell- 12	24.26	4.197	61.7	110.21	
Cell- 13	24.26	4.204	75.2	106.19	

Cell- 14	24.26	4.191	86.3	108.73	
Cell- 15	24.26	4.201	71.4	106.54	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

8.3.3	TABLE: Free fall		P
Sample No.	**OCV at start of test, (Vdc)**	**OCV at removal of thermal free fall, (Vdc)**	**Results**
Cell- 16	4.167	4.167	No fire or explosion
Cell- 17	4.173	4.173	
Cell- 18	4.161	4.161	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

8.3.4	TABLE: Thermal abuse (cells)			P
Sample No.	**OCV at start of test, (Vdc)**	**Ambient, (°C)**	**Temperature raised at a rate(°C)**	**Results**
Charging temperature: -5℃				
Cell- 19	4.125	130±2	5℃/min	No fire or explosion
Cell- 20	4.113	130±2	5℃/min	
Cell- 21	4.113	130±2	5℃/min	
Cell- 22	4.124	130±2	5℃/min	
Cell- 23	4.125	130±2	5℃/min	
Charging temperature: 45℃				
Cell- 24	4.191	130±2	5 °C/min	No fire or explosion
Cell- 25	4.198	130±2	5 °C/min	
Cell- 26	4.204	130±2	5 °C/min	

Cell- 27	4.198	130±2	5 °C/min	
Cell- 28	4.202	130±2	5 °C/min	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

8.3.5	TABLE: Crush（cells）				P
Sample No.	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Width/ diameter of cell before crush, (mm)**	**Required deformation for crush, (mm)**	**Results**
A prismatic cell was crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus. Test only the wide side of prismatic cells					
Charging temperature: 45℃					
Cell- 34	4.192	4.192	9.96	9.94	No fire or explosion
Cell- 35	4.208	4.208	10.04	10.01	
Cell- 36	4.191	4.191	9.91	9.89	
Cell- 37	4.194	4.193	9.94	9.91	
Cell- 38	4.206	4.206	9.89	9.87	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

8.3.7	TABLE: Forced discharge (cells)			P
Sample No.	**OCV before application of reverse charge, (Vdc)**	**Measured Reverse charge I_t, (mA)**	**Time for reversed charge, (minutes)**	**Results**
Cell- 39	3.337	1000	90	No fire or explosion
Cell- 40	3.345	1000	90	
Cell- 41	3.337	1000	90	
Cell- 42	3.348	1000	90	

Cell- 43	3.331	1000	90	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

8.3.8 Table for datail data

1. Altitude simulation

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
Cell- 39	16.534	4.162	16.534	4.161	0.00	0.01	N
Cell- 40	16.517	4.161	16.517	4.161	0.00	0.00	N
Cell- 41	16.483	4.167	16.483	4.167	0.00	0.00	N
Cell- 42	16.556	4.165	16.554	4.165	0.01	0.00	N
Cell- 43	16.491	4.164	16.491	4.163	0.00	0.01	N
Cell- 44	16.447	4.162	16.447	4.162	0.00	0.00	N
Cell- 45	16.414	4.163	16.414	4.163	0.00	0.00	N
Cell- 46	16.508	4.167	16.508	4.167	0.00	0.00	N
Cell- 47	16.546	4.166	16.546	4.165	0.00	0.01	N
Cell- 48	16.452	4.164	16.451	4.164	0.01	0.00	N

2. Thermal test

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
Cell- 39	16.534	4.161	16.524	4.144	0.06	0.42	N
Cell- 40	16.517	4.161	16.511	4.147	0.04	0.34	N
Cell- 41	16.483	4.167	16.474	4.149	0.05	0.43	N
Cell- 42	16.554	4.165	16.545	4.149	0.05	0.38	N
Cell- 43	16.491	4.163	16.481	4.145	0.06	0.44	N
Cell- 44	16.447	4.162	16.441	4.149	0.04	0.31	N
Cell- 45	16.414	4.163	16.408	4.148	0.04	0.36	N
Cell- 46	16.508	4.167	16.498	4.149	0.06	0.43	N
Cell- 47	16.546	4.165	16.538	4.149	0.05	0.39	N
Cell- 48	16.451	4.164	16.441	4.149	0.06	0.36	N

3. Vibration

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
Cell- 39	16.524	4.144	16.524	4.144	0.00	0.00	N
Cell- 40	16.511	4.147	16.511	4.146	0.00	0.01	N
Cell- 41	16.474	4.149	16.472	4.148	0.01	0.01	N
Cell- 42	16.545	4.149	16.545	4.149	0.00	0.00	N
Cell- 43	16.481	4.145	16.481	4.145	0.00	0.00	N
Cell- 44	16.441	4.149	16.441	4.149	0.00	0.00	N
Cell- 45	16.408	4.148	16.406	4.148	0.01	0.00	N
Cell- 46	16.498	4.149	16.498	4.148	0.00	0.01	N
Cell- 47	16.538	4.149	16.538	4.149	0.00	0.00	N
Cell- 48	16.441	4.149	16.441	4.149	0.00	0.00	N

4. Shock

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
Cell- 39	16.524	4.144	16.524	4.144	0.00	0.00	N
Cell- 40	16.511	4.146	16.511	4.146	0.00	0.00	N
Cell- 41	16.472	4.148	16.472	4.148	0.00	0.00	N
Cell- 42	16.545	4.149	16.545	4.148	0.00	0.01	N
Cell- 43	16.481	4.145	16.481	4.145	0.00	0.00	N
Cell- 44	16.441	4.149	16.439	4.149	0.01	0.00	N
Cell- 45	16.406	4.148	16.406	4.147	0.00	0.01	N
Cell- 46	16.498	4.148	16.498	4.148	0.00	0.00	N
Cell- 47	16.538	4.149	16.538	4.149	0.00	0.00	N
Cell- 48	16.441	4.149	16.441	4.148	0.00	0.01	N

8.3.9	TABLE: Forced internal short circuit (cells)				N
Sample No.	**Chamber ambient, (°C)**	**OCV at start of test, (Vdc)**	**Particle location**	**Maximum applied pressure, (N)**	**Results**
Charging temperature: -5℃					
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Charging temperature: 45℃					
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Supplementary information:

1) Identify one of the following:

1: Nickel particle inserted between positive and negative (active material) coated area.

2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

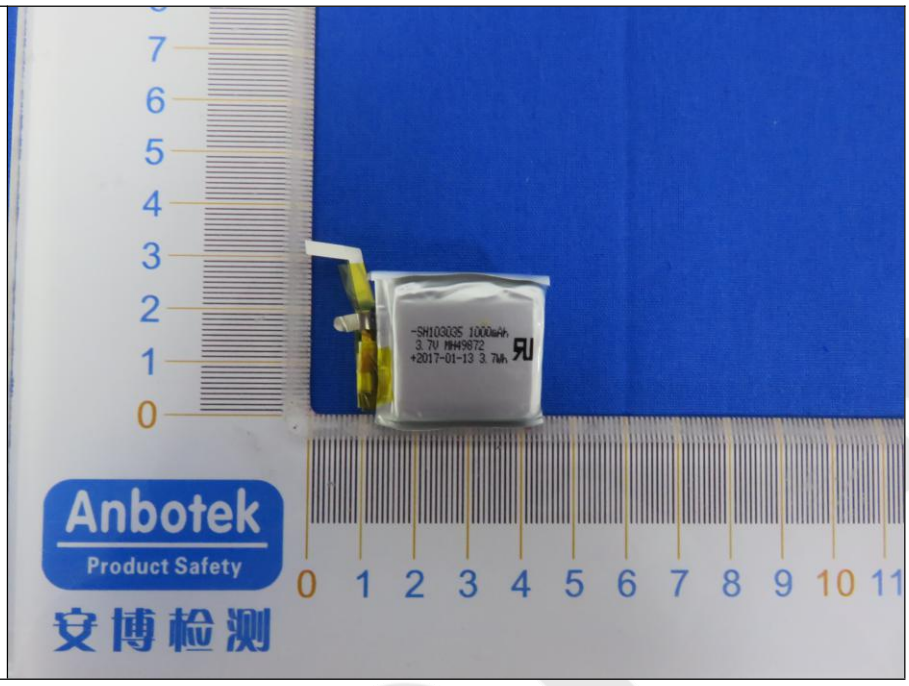
Photo 1 [√] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photo 2 [ ] front [√] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

End of the report