Test Report

Applicant :

Address :

The following sample(s) and sample information was/were submitted and identified by/on behalf of the client

Sample Name	:	Rechargeable Lithium-ion Battery
Sample Model	:	702032/651723/802035/702035/651419/802025/802540/801855/952540/651522/702025/102538/502030/952951/902035
Sample Style	:	3.7V 300mAh 1.11Wh, 3.7V 150mAh 0.555Wh, 3.7V 400mAh 1.48Wh, 3.7V 350mAh 1.295Wh, 3.7V 100mAh 0.37Wh, 3.7V 200mAh 0.814Wh, 3.7V 600mAh 2.22Wh, 3.7V 700mAh 2.59Wh, 3.7V 800mAh 2.96Wh, 3.7V 135mAh 0.4995Wh, 3.7V 200mAh 0.814Wh, 3.7V 700mAh 2.59Wh, 3.7V 250mAh 0.925Wh, 3.7V 1200mAh 4.44Wh, 3.7V 500mAh 1.85Wh
Sample Lot	:	/
Sample Received Date	:	Mar 18,2021
Test Completed Date	:	Mar 24,2021
Test Requested	:	As specified by client, with reference to Directive 2006/66/EC and its amended Directive 2013/56/EU to determine Lead(Pb), Cadmium(Cd), Mercury(Hg) contents in the submitted sample.
Test Method	:	Refer to the next page(s).
Test Results	:	Refer to the next page(s).
Test Conclusion	:	Based upon the performed tests by submitted samples, the test results comply with the limits of the Directive 2006/66/EC and its amended Directive 2013/56/EU

Reviewed by: Lab Senior Engineer

Authorized Signature: Technology Manager

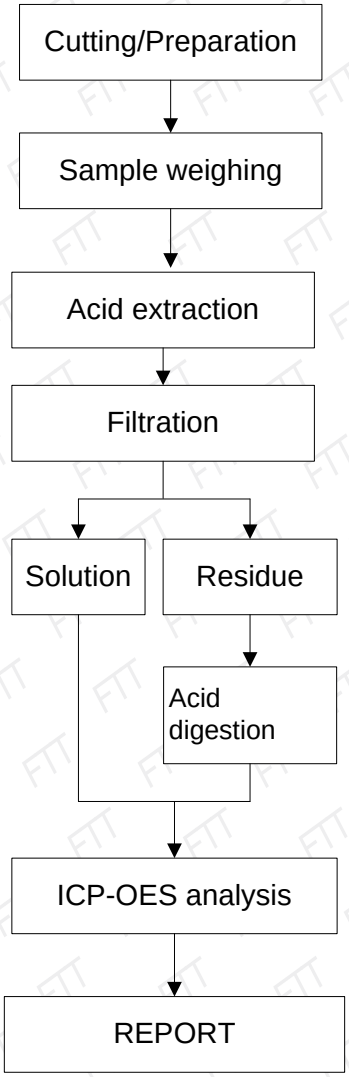
FLION TESTING TECHNOLOGIES
Add :Gangzi Industrial Park,Furong Industrial Area, Xinqiao Village, Shajing Town, Bao'an District, Shenzhen City
Tel : 86-0755-2724 8885 Fax : 86-0755-2746 0090 Http://www.cnftt.com

Test Results:

Test Item	Test method/Instrument	MDL (%)	Result (%)	Limit (%)
Lead(Pb)	EPA3050B&EPA3052/ICP-OES	0.0002	N.D.	--
Cadmium(Cd)	EPA3050B&EPA3052/ICP-OES	0.0002	N.D.	0.002
Mercury(Hg)	EPA3050B&EPA3052/ICP-OES	0.0002	N.D.	0.0005

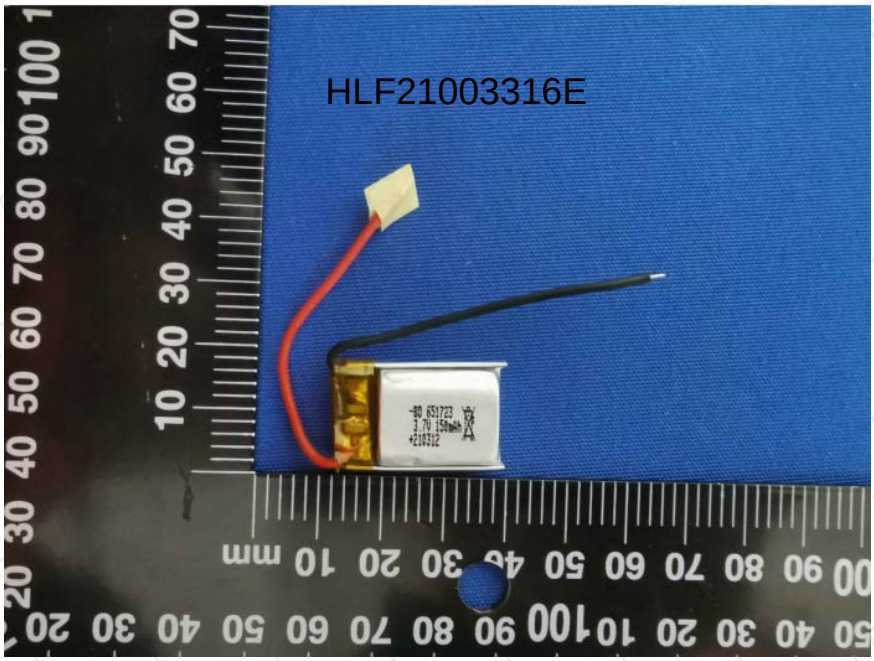
Note:
(1) 1 mg/kg = 1 ppm = 0.0001%
(2) N.D. = Not Detected (less than MDL)
(3) MDL = Method Detection Limit
(4) "--" = Not Regulated
(5) Remark: According to the Article 21(3) of Directive 2006/66/EC, Battery, accumulator and button cell shall include the chemical symbol Mercury when containing morn than 0.0005% of Hg, the chemical symbol Cadmium when containing more than 0.002% of Cd and the chemical symbol Pb when containing more than 0.004% of Pb
Remark: The test report is only used for customer research, teaching, internal quality control, product development and other purposes, for internal reference only.

Testing Flow Chart:



Test Part Description: Battery

Sample Photo



Note: The results shown in this report refer only to the sample(s) tested.

* * * * * End of Report * * * * *

三帕认证

中国认可
国际互认
检测
TESTING
CNAS L11167

TEST REPORT

Name of Sample:	Rechargeable Li-ion Battery
Model:	702032-300mAh
Ratings:	3.7Vd.c., 300mAh
Report No:	DGJH20200916IEC01

Guangzhou CP-UP Certification Technology Service Co., Ltd.

TEST REPORT
IEC 62133-2
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 – Part 2: Lithium systems

Report Number. .....:	DGJH20200916IEC01
Date of issue .....:	2020-10-12
Total number of pages.....:	26 pages
Tested by (name, signature).....:	Jack Yang
Reviewed by (name, signature)....:	Tracy Chen
Approved by (name, signature)....:	Leo Zhi
Name of Testing Laboratory preparing the Report.....:	Guangzhou CP-UP Certification Technology Service Co., Ltd.
Applicant's name.....:	
Address .....:	
Test specification:	
Standard .....:	IEC 62133-2:2017
Test procedure.....:	Entrust test
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC62133_2A
Test Report Form(s) Originator.....:	DEKRA
Master TRF.....:	Dated 2017-08-10
Test item description .....:	Rechargeable Li-ion Battery
Trade Mark .....:	N/A
Manufacturer.....:	Same as the applicant
Model/Type reference .....:	702032-300mAh
Ratings .....:	3.7Vd.c., 300mAh

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Tests are made with the number of samples specified in Table 1 of IEC 62133-2: 2017 (Edition 1.0). Cl. 7.2.1 Continuous charging at constant voltage (cells) Cl. 7.2.2 Case stress at high ambient temperature (battery) Cl. 7.3.1 External short circuit (cell) Cl. 7.3.2 External short circuit (battery) Cl. 7.3.3 Free fall Cl. 7.3.4 Thermal abuse (cells) Cl. 7.3.5 Crush (cells) Cl. 7.3.6 Over-charging of battery Cl. 7.3.7 Forced discharge (cells) Cl. 7.3.8.1 Vibration Cl. 7.3.8.2 Mechanical shock Cl. 7.3.9 Design evaluation – Forced internal short-circuit (cells) The samples comply with the requirements of IEC 62133-2: 2017 (Edition 1.0).	Guangzhou CP-UP Certification Technology Service Co., Ltd. No.1, Aigang 7th Lane, Yunxing Zhukeng Village, Shiqiao Street, Panyu District, Guangzhou City, China

Summary of compliance with National Differences (List of countries addressed):

The product fulfils the requirements of EN 62133-2:2017.

Copy of marking plate:

The artwork below may be only a draft.

Model: 702032-300mAh
Name: Rechargeable Li-ion Battery
Rating: 3.7V 300mAh 1.11Wh
Manufacturer:
CAUTION
-Do not disassemble or modify
-Do not short-circuit, dispose in fire
-Keep out of reach of children
Date: YYYY.MM
1ICP8/21/32

Date code: “YYYY.MM” represents the date of manufacturing.
YYYY=2017, 2018, 2019…is for the year.
MM=01, 02, 03…12 is for the month. “01” represents “January”, “02” represents “February”, “03” represents “March” …, “12” represents “December”.

Test item particulars .....:	
Classification of installation and use .....:	Use in portable applications
Supply Connection.....:	Supplied by connector.
Recommend charging method declared by the manufacturer.....:	Charge at constant current 150mA until the voltage reaches 4.20V, then charge at 4.20V till charge current is 3mA.
Discharge current (0,2 It A) .....:	60mA
Specified final voltage .....:	3.0V
Upper limit charging voltage per cell .....:	4.25V
Maximum charging current.....:	300mA
Charging temperature upper limit.....:	45°C
Charging temperature lower limit .....:	0°C
Polymer cell electrolyte type .....:	☐ gel polymer ☐ solid polymer ☒ N/A
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Testing ..... :	
Date of receipt of test item ..... :	2020-09-16
Date (s) of performance of tests..... :	2020-09-16 to 2020-09-29
General remarks:	
"(See appended table)" refers to a table appended to the report. **Throughout this report a ☐ comma / ☒ point is used as the decimal separator.**	
Name and address of factory (ies).....:	Same as the applicant

General product information and other remarks:

1. The Rechargeable Li-ion Battery, Model 702032-300mAh is used for portable appliance and consists of single cell, cell model: 702032-300mAh. The cell is tested with battery.

2. Additionally, detailed information of the cell and battery are as following:

Product name	Rechargeable Li-ion Cell	Rechargeable Li-ion Battery
Type/model	702032-300mAh	702032-300mAh
Nominal voltage	3.7Vd.c.	3.7Vd.c.
Rated capacity	300mAh	300mAh
Charging voltage declared by manufacturer	4.20V	4.2V
Upper limit charging voltage	4.25V	4.20V
Final voltage	3.0V	3.0V
Charging current declared by manufacturer	150mA	150mA
Maximum charging current	300mA	300mA
Charging temp. upper limit	45°C	45°C
Charging temp. lower limit	0°C	0°C
First charging procedure (20°C ± 5°C)	Charge at constant current 150mA until the voltage reaches 4.20V, then charge at 4.20V till charge current is 3mA.	Charge at constant current 150mA until the voltage reaches 4.2V, then charge at 4.2V till charge current is 3mA.
Second charging procedure	Store at -5°C for 4 hours and 45°C for 1 hour, then charge at constant current 300mA until the voltage reaches 4.25V, then charge at 4.25V till charge current is $0.05I_tA$ (15mA).	-
Dimensions	Max 7.5mm(T) ×Max 20.3mm (W) ×Max 32.0mm (H)	Max 7.5mm(T) ×Max 20.5mm (W) ×Max 33.5mm (H))
Weight	Approx.7.2g	Approx. 8.9g
Lower limit discharge voltage	2.32V	-
Discharging current declared by manufacturer	150mA	150mA
Maximum discharging current	6000mA	6000mA
Discharging temperature range	-20°C to 45°C	-20°C to 45C
Storage temperature	-5°C to 45°C (Less than 1 month), 0°C to 35°C (Less than 3 months), 23±5°C (Less than 1 year)	-5°C to 45°C (Less than 1 month), 0°C to 35°C (Less than 3 months), 23±5°C (Less than 1 year)
Cell Connection method	--	1S-1P

Note: The information above is from the documents provided by the applicant.

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
4	**PARAMETER MEASUREMENT TOLERANCES**		P
	Parameter measurement tolerances		P
5	**GENERAL SAFETY CONSIDERATIONS**		P
5.1	**General**		P
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		P
5.2	**Insulation and wiring**		P
	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 externally exposed metal surfaces	N/A
	Insulation resistance (MΩ)..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate clearance and creepage distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
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		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/A
5.4	**Temperature, voltage and current management**		P
	Batteries are designed such that abnormal temperature rise conditions are prevented		P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that specified chargers are designed to maintain charging within the temperature, voltage and current limits specified		P
5.5	**Terminal contacts**		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal contacts are arranged to minimize the risk of short-circuit		P
5.6	**Assembly of cells into batteries**		P
5.6.1	General		P
	Each battery have an independent control and protection for current, voltage, temperature and any other parameter required for safety and to maintain the cells within their operating region		P
	This protection may be provided external to the battery such as within the charger or the end devices		P
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		P
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions		N/A
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		P
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		N/A
	Protective circuit components added as appropriate and consideration given to the end-device application	Considered in end-device	N/A
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance		N/A
5.6.2	Design recommendation		P
	For the battery consisting of a single cell or a single cellblock, it is recommended that the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2		P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage 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/A
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		N/A
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N/A
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage		P
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		N/A
5.6.3	Mechanical protection for cells and components of batteries		N/A
	Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse		N/A
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product		N/A
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		N/A
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		N/A
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
5.8	**Battery safety components**		N/A
	According annex F		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
6	**TYPE TEST AND SAMPLE SIZE**		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old		P
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1		N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection		P
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test		P
7	**SPECIFIC REQUIREMENTS AND TESTS**		P
7.1	**Charging procedure for test purposes**		P
7.1.1	First procedure		P
	This charging procedure applies to subclauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage		P
7.1.2	Second procedure		P
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant voltage charging method		P
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)		P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer		P
	Results: No fire. No explosion. No leakage ..... :	(See appended table 7.2.1)	P
7.2.2	Case stress at high ambient temperature (battery)	The test is specially requested by Applicant.	P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Oven temperature (°C) ..... :	70 ºC ± 2 ºC	—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		P
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)		P
	The cells were tested until one of the following occurred:		P
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		P
	Results: No fire. No explosion .....:	(See appended table 7.3.1)	P
7.3.2	External short-circuit (battery)		P
	The batteries were tested until one of the following occurred:		P
	- 24 hours elapsed; or		P
	- The case temperature declined by 20 % of the maximum temperature rise		P
	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/A
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		P
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		P
	Results: No fire. No explosion .....:	(See appended table 7.3.2)	P
7.3.3	Free fall		P
	Results: No fire. No explosion		P
7.3.4	Thermal abuse (cells)		P
	Oven temperature (°C) ..... :	130°C±2°C	—
	Results: No fire. No explosion		P
7.3.5	Crush (cells)		P
	The crushing force was released upon:		P
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: No fire. No explosion .....:	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The supply voltage which is:		P
	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or		P
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		P
	Test was continued until the temperature of the outer casing:		P
	- Reached steady state conditions (less than 10 °C change in 30-minute period); or		N/A
	- Returned to ambient		P
	Results: No fire. No explosion .....:	(See appended table 7.3.6)	P
7.3.7	Forced discharge (cells)		P
	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A
	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration		P
	Results: No fire. No explosion .....:	(See appended table 7.3.7)	P
7.3.8	Mechanical tests (batteries)		P
7.3.8.1	Vibration		P
	Results: No fire, no explosion, no rupture, no leakage or venting.....:	(See appended table 7.3.8.1)	P
7.3.8.2	Mechanical shock		P
	Results: No leakage, no venting, no rupture, no explosion and no fire.....:	(See appended table 7.3.8.2)	P
7.3.9	Design evaluation – Forced internal short-circuit (cells)		P
	The cells complied with national requirement for..... :	France, Japan, Korea, Switzerland	—
	The pressing was stopped upon:		P
	- A voltage drop of 50 mV has been detected; or		P
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N	P
	Results: No fire.....:	(See appended table 7.3.9)	P
8	**INFORMATION FOR SAFETY**		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.1	**General**		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products		P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards		P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		P
8.2	**Small cell and battery safety information**		P
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		P
	- Keep small cells and batteries which are considered swallowable out of the reach of children		P
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		P
	- In case of ingestion of a cell or battery, seek medical assistance promptly		P

9	**MARKING**		P
9.1	**Cell marking**		N/A
	Cells marked as specified in IEC 61960, except coin cells		N/A
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		N/A
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		N/A
9.2	**Battery marking**		P
	Batteries marked as specified in IEC 61960, except for coin batteries	Battery marked as specified in IEC 61960.	P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity. Batteries also marked with an appropriate caution statement		N/A
	Terminals have clear polarity marking on the external surface of the battery		N/A
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		P
9.3	**Caution for ingestion of small cells and batteries**		N/A
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	**Other information**		P
	Storage and disposal instructions		P
	Recommended charging instructions		P
10	**PACKAGING AND TRANSPORT**		P
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3		N/A
	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 AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		P
A.1	**General**		P
A.2	**Safety of lithium ion secondary battery**		P
A.3	**Consideration on charging voltage**		P
A.3.1	General		P
A.3.2	Upper limit charging voltage		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		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
A.4	**Consideration of temperature and charging current**		P
A.4.1	General		P
A.4.2	Recommended temperature range		P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied		P
A.4.3	High temperature range		N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range		N/A
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		N/A
A.4.4	Low temperature range		N/A
A.4.4.1	General		N/A
A.4.4.2	Explanation of safety viewpoint		N/A
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range		N/A
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		N/A
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging current		P
A.5	**Sample preparation**		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle in cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		P
A.6.4	Damaged separator precaution		P
A.6.5	Caution for rewinding separator and electrode		P
A.6.6	Insulation film for preventing short-circuit		P
A.6.7	Caution when disassembling a cell		P
A.6.8	Protective equipment for safety		P
A.6.9	Caution in the case of fire during disassembling		P
A.6.10	Caution for the disassembling process and pressing the electrode core		P
A.6.11	Recommended specifications for the pressing device		P
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		P
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		N/A
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		N/A
D.1	**General**		N/A
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement.....:	(See appended table D.2)	N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A
ANNEX E	**PACKAGING AND TRANSPORT**		N/A
ANNEX F	**COMPONENT STANDARDS REFERENCES**		N/A

TABLE: Critical components information					
Object / part No.	**Manufacturer / trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
1. Rechargeable Li-ion Cell		702032	3.7Vd.c., 300mAh	IEC 62133-2: 2017	Tested with battery
-Electrolyte	ShenZhen Huachi New Energy Technology Co., Ltd	HC611	Composition: $LiPF_6$, EC, DMC, DEC Density(g/cm^3):1.22 Conductivity(mS/cm): 10.2	-	-
-Separator	Dongguan Li-Ju New Energy material Co., Ltd.	0.016μm thick	PE, Shutdown temperature: 135°C	-	-
-Positive electrode	Jiangmen Keheng Industrial Co., Ltd.	LCO-2	$LiCoO_2$	-	-
-Negative electrode	Shenzhen Ruifute Technology Co., Ltd.	AGF-6	Graphite	-	-
-Positive electrode tab	Shenzhen Hui Shi Electronics Co., Ltd.	0.1mm(Thickness)	Aluminum belt	-	-
-Negative electrode tab	Shenzhen Hui Shi Electronics Co., Ltd.	0.1mm(Thickness)	Nickel belt	-	-
-Aluminum plastic film	Shenzhen Hetongsheng Technology Co., Ltd.	DNP0.113mm(Thickness)	ON/AL/CPP	-	-
2. IC (U1)	HYCON Technology Co., Ltd.	DW01	Overcharge detection voltage: 4.28V, Overdischarge detection voltage: 2.4V, Overcurrent detection voltage: 0.255V, Short protection voltage:0.85V T_{opr}: -40°C to +85°C	-	-
3. MOSFETs (M1, M2)	Shenzhen Developer Microelectronics Co., Ltd	8205	V_{DS}:20V, V_{GS}:±12V, I_D:5A, T_J:-55°C to 150°C	-	-
4. PCB material	Dongguan YUANJIAN Electronics Co., Ltd.	16*45*0.8	130°C, V-0	-	-
5. Wiring	Shenzhen Jinfengsheng Electronics Co. LTD	3239/22#	22AWG, 150°C, 3KV	-	-
6. Connector	Shenzhen Jinfengsheng Electronics Co. LTD	JST-SMP	180℃	-	-

7. PVC	Shenzhen Yongjia wire heat shrink pipe Co., Ltd.	27*36*0.05mm	130°C , Min. thickness: 0.1mm	-	-
8. Fiber glue	Dongguan Xinda Electronics.	18mm	tolerance:180℃	-	-
Note: The information above is from the documents provided by the applicant.					

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (mA)**	**OCV before test (Vdc)**	**Results**
C1#	4.20	150	4.188	A, B
C2#	4.20	150	4.187	A, B
C3#	4.20	150	4.188	A, B
C4#	4.20	150	4.187	A, B
C5#	4.20	150	4.186	A, B

Supplementary information:

A- No fire or explosion
B- No leakage
C- Others (please explain)

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature(° C)**	**Results**
Samples charged at charging temperature upper limit					
C6#	55.3	4.236	84	104.7	A
C7#	55.3	4.233	85	102.9	A
C8#	55.3	4.233	89	105.1	A
C9#	55.3	4.237	88	101.7	A
C10#	55.3	4.238	88	104.8	A
Samples charged at charging temperature lower limit					
C11#	55.4	4.141	86	106.1	A
C12#	55.4	4.138	83	102.4	A
C13#	55.4	4.144	87	105.0	A
C14#	55.4	4.137	87	103.6	A
C15#	55.4	4.142	84	101.8	A

Supplementary information:

A- No fire or explosion
B- Others (please explain)

7.3.2	TABLE: External short-circuit (battery)					P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature(°C)**	**Component single fault condition**	**Results**
B1#	24.0	4.183	86	24.1	-	A
B2#	24.0	4.185	83	24.2	-	A
B3#	23.9	4.182	87	89.2	MOSFET(M1) was short circuited.	A
B4#	23.9	4.184	87	92.3	MOSFET(M1) was short circuited.	A
B5#	23.9	4.183	84	91.7	MOSFET(M1) was short circuited.	A
Supplementary information: A- No fire or explosion B- Others (please explain)						

7.3.5	TABLE: Crush (cells)		P
Sample no.	**OCV before test (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit			
C29#	4.230	13.04	A
C30#	4.237	13.06	A
C31#	4.236	13.02	A
C32#	4.232	13.02	A
C33#	4.238	13.04	A
Samples charged at charging temperature lower limit			
C34#	4.141	13.02	A
C35#	4.137	12.96	A
C36#	4.145	13.01	A
C37#	4.139	12.98	A
C38#	4.143	13.04	A
Supplementary information: A- No fire or explosion B- Others (please explain)			

7.3.6	TABLE: Over-charging of battery			P
Constant charging current (A).....:		0.6		—
Supply voltage (Vdc).....:		5.95		—
Sample no.	**OCV before charging (Vdc)**	**Maximum outer case temperature (°C)**		**Results**
B9#	3.346	27.9		A
B10#	3.338	28.4		A
B11#	3.341	29.1		A
B12#	3.336	28.2		A
B13#	3.339	28.6		A
Supplementary information: A- No fire or explosion B- Others (please explain)				

7.3.7	TABLE: Forced discharge (cells)			P
Sample no.	**OCV before application of reverse charge (Vdc)**	**Measured reverse charge I_t (mA)**	**Total Time for Reversed Charge Application(min)**	**Results**
C39#	3.047	300	90	A
C40#	3.032	300	90	A
C41#	3.042	300	90	A
C42#	3.048	300	90	A
C43#	3.039	300	90	A
Supplementary information: A- No fire or explosion B- Others (please explain)				

7.3.8.1	TABLE: Vibration				P
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
B14#	4.183	4.177	8.966	8.965	A, B, C, D
B15#	4.182	4.176	8.893	8.891	A, B, C, D
B16#	4.183	4.178	8.934	8.933	A, B, C, D

Supplementary information:

A- No fire or explosion
B- No rupture
C- No leakage
D- No venting
E- Others (please explain)

7.3.8.2	TABLE: Mechanical shock				P
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
B17#	4.182	4.180	8.889	8.888	A, B, C, D
B18#	4.184	4.183	8.933	8.933	A, B, C, D
B19#	4.182	4.181	8.951	8.951	A, B, C, D

Supplementary information:

A- No fire or explosion
B- No rupture
C- No leakage
D- No venting
E- Others (please explain)

7.3.9	TABLE: Forced internal short circuit (cells)					P
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location [1)]**	**Maximum applied pressure (N)**	**Voltage drop, mV**	**Results**
Samples charged at charging temperature upper limit						
C44#	45	4.236	1	400	13	A
C45#	45	4.232	1	400	15	A
C46#	45	4.237	1	400	16	A
C47#	45	4.238	1	400	11	A
C48#	45	4.231	1	400	17	A
Samples charged at charging temperature lower limit						
C49#	-5	4.145	1	400	16	A
C50#	-5	4.140	1	400	21	A
C51#	-5	4.142	1	400	13	A
C52#	-5	4.136	1	400	18	A
C53#	-5	4.139	1	400	15	A

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.

A- No fire or explosion

B- Others (please explain)

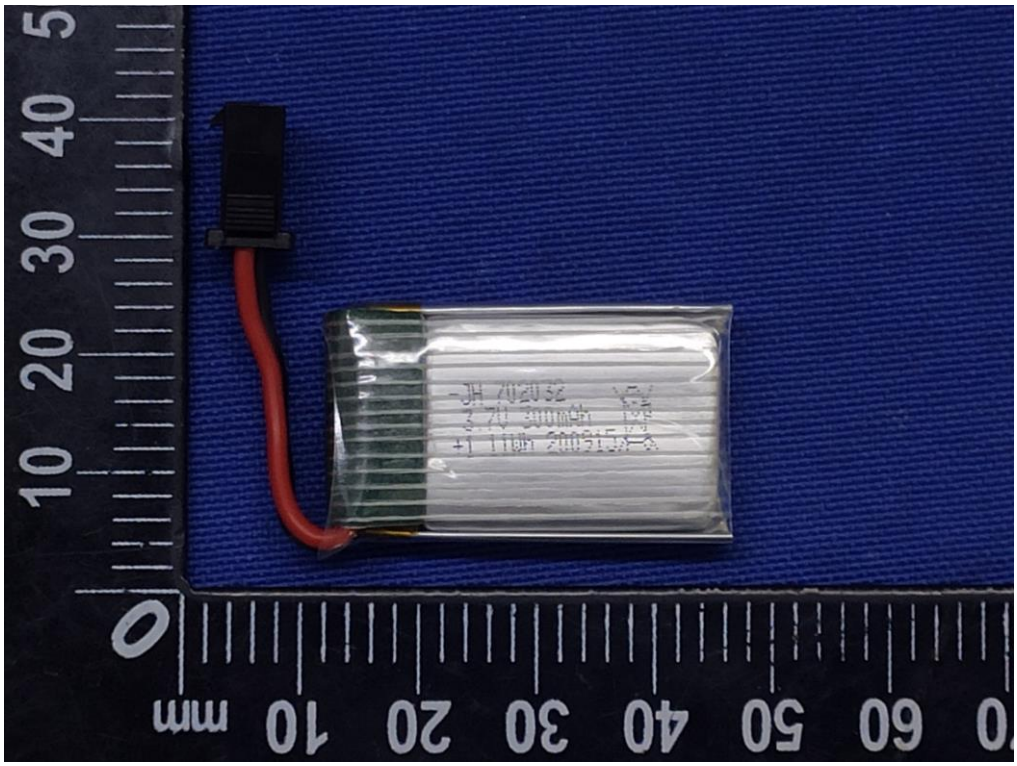
Remark: There is no Test Particle location 2 in this cell.

D.2	TABLE: Internal AC resistance for coin cells			N/A
Sample no.	**Ambient T (°C)**	**Store time (h)**	**Resistance Rac (Ω)**	**Results [1)]**
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

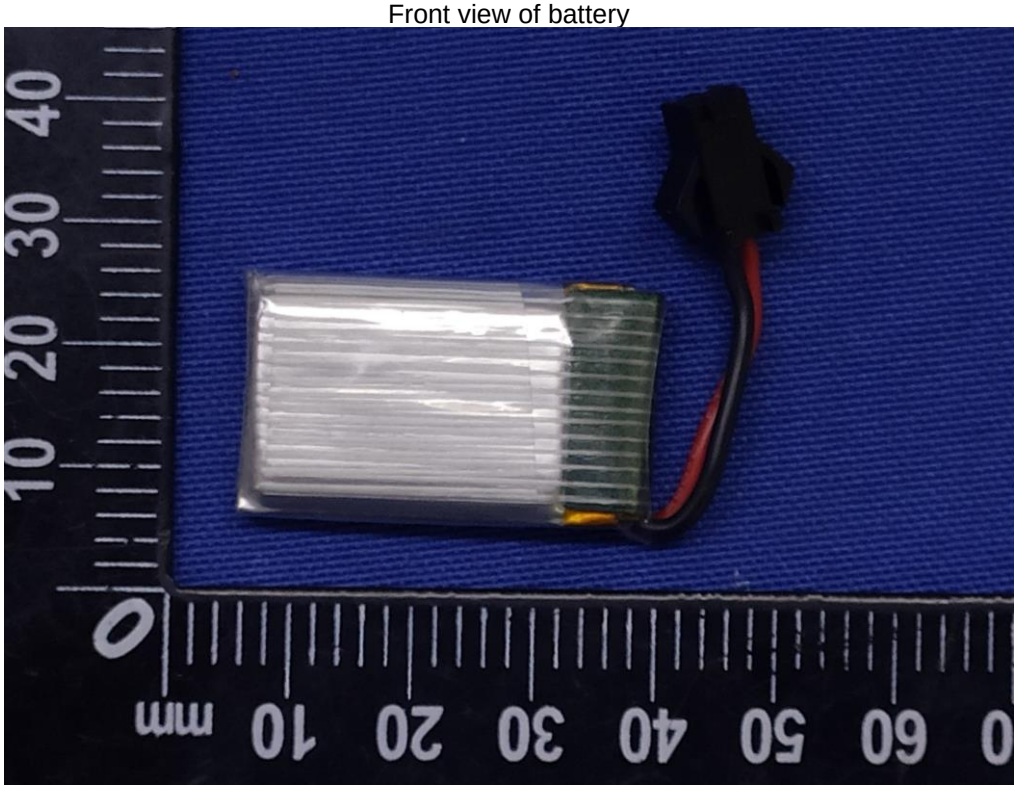
Supplementary information:

[1)] Coin cells with internal resistance less than or equal to 3 Ω, see test result on corresponding tables

Photos

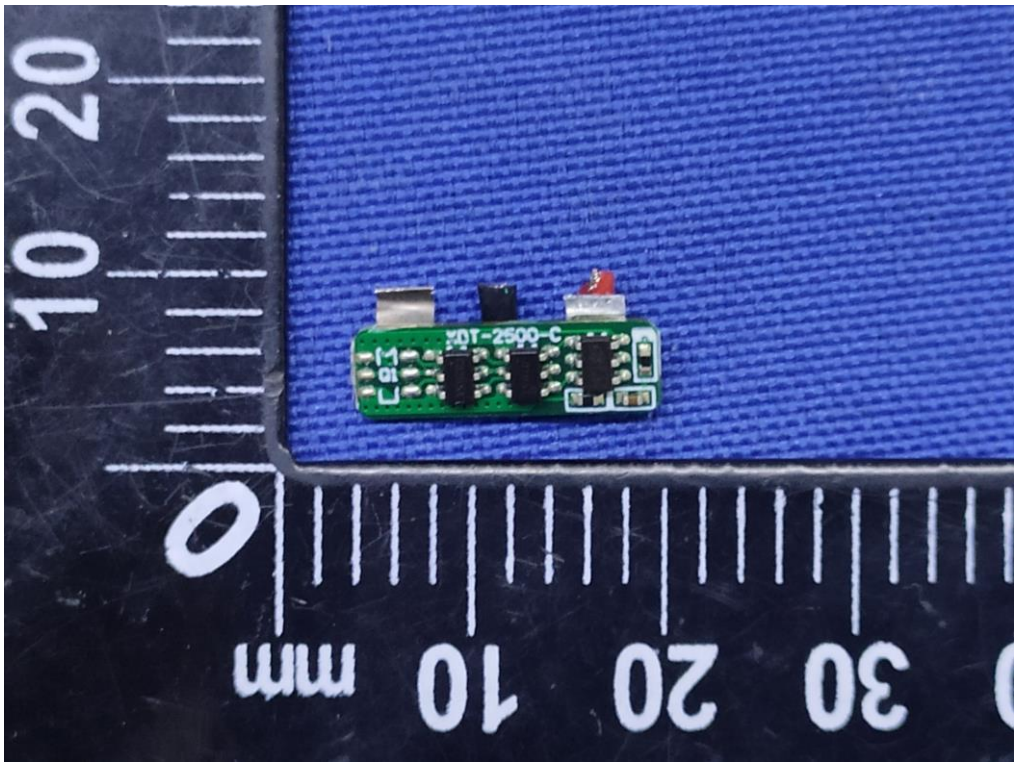


Front view of battery

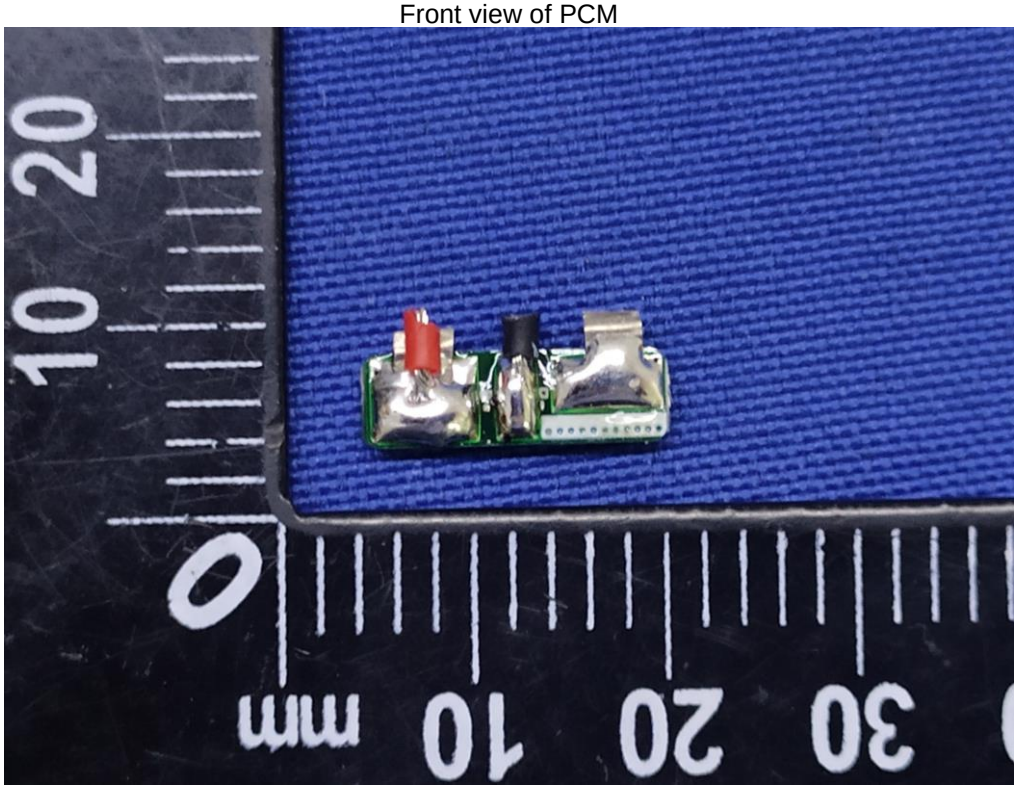


Back view of battery

Photos

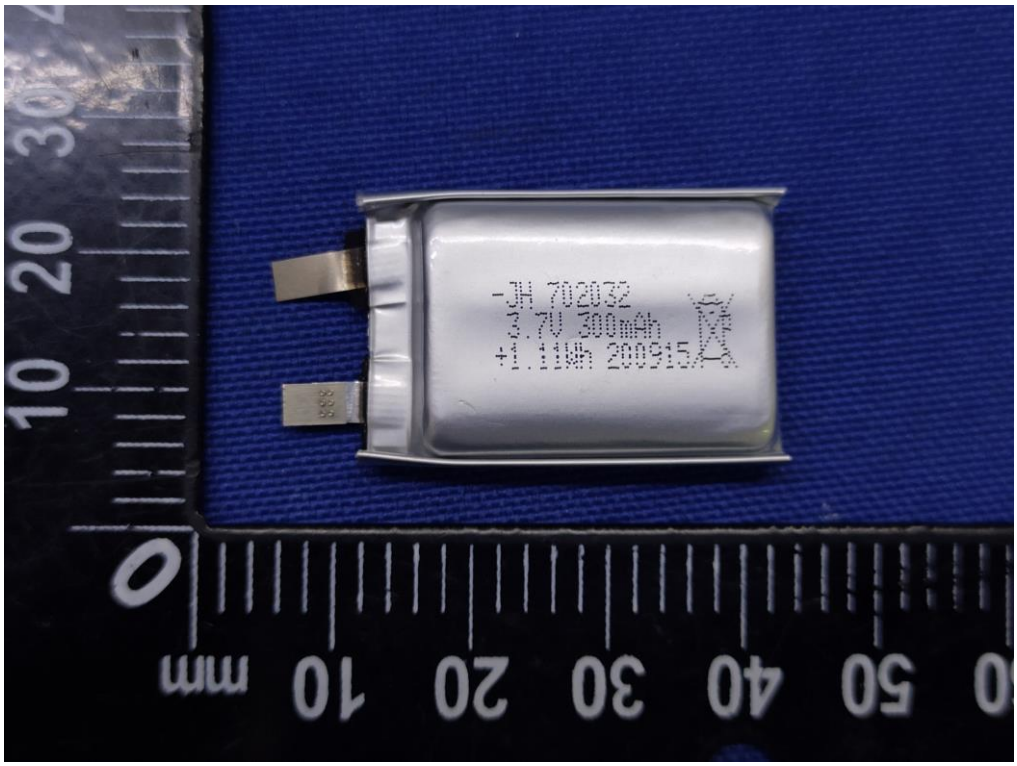


Front view of PCM



Back view of PCM

Photos



Front view of cell

Back view of cell

Notice

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2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of Guangzhou CP-UP Certification Technology Service Co., Ltd..
3. The test report is invalid without the signatures of Approver, Checker and Tester.
4. The test report is invalid if altered.
5. Objections to the test report must be submitted to Guangzhou CP-UP Certification Technology Service Co., Ltd. Within 15 days.
6. The test report is responsible for the tested samples only.
7. As for the test conclusion, “N/A” means “not applicable”, “P” means “pass” and “F” means “fail”.
8. Our lab shall not take any responsibility if the information provided by the applicant has the problem of authenticity, which may influence the validity of the testing result.

--End of report--