

Test Report

Report No. : TCT250721B125

Date : Jul. 21, 2025

Page No.: 1 of 3

Applicant:

Address:

The following sample was submitted and identified by/on behalf of the client as:

Sample Name: Li-ion Polymer Battery

Model No.: 701230

Sample Received Date: 2025.07.14

Testing Period: 2025.07.14 - 2025.07.18

Test Requested: Accordance with Directive (EU)2023/1542, to determine the Lead (Pb), Cadmium (Cd), Mercury (Hg) contents of the submitted sample(s).

Test Method: Please refer to the following page(s).

Test Result(s): Please refer to the following page(s).

Conclusion: Test results of submitted sample(s) comply with (EU)2023/1542.

Checked by

Sin Lu

Sin Lu

Signed for and on behalf of TCT

Noel Yin

Noel Yin

Technical Manager



Test Report

Report No. : TCT250721B125

Date : Jul. 21, 2025

Page No.: 2 of 3

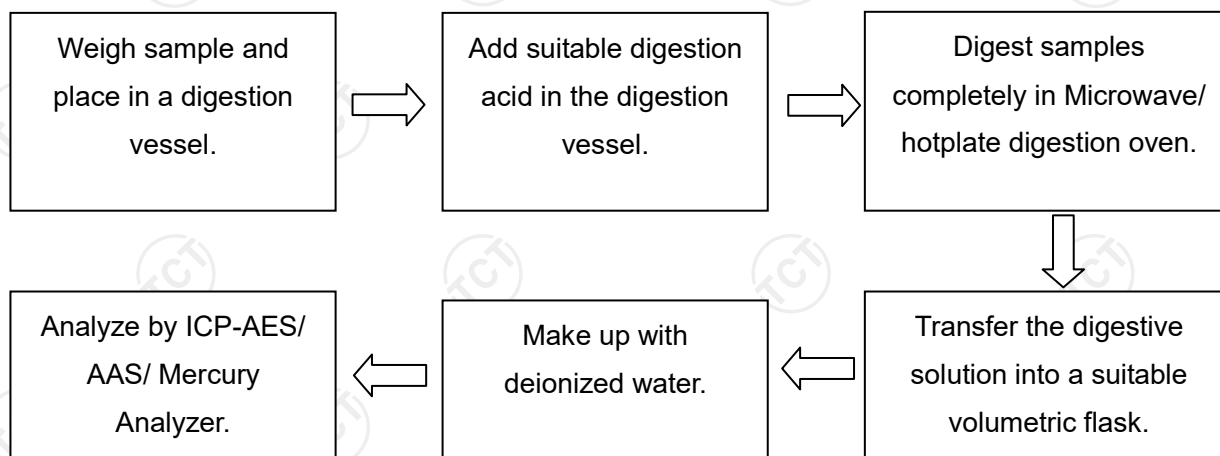
Test Results:

Lead, Cadmium and Mercury Content(s)

Test Items	Test Method	Unit	Test Results	MDL	Labelling Requirement [#]	Permissible Limit
Lead (Pb)	With reference to GB/T 20155-2018, Analysis was performed by ICP-OES	%(w/w)	N.D.	0.0010	>0.004	--
Cadmium (Cd)			N.D.	0.0010	>0.002	0.002 ^{##}
Mercury (Hg)			N.D.	0.0001	>0.0005	0.0005

- Note :
- MDL = Method Detection Limit
 - N.D. = Not detected, less than MDL.
 - [#] = According to the article 21.3, batteries, accumulators and button cells containing more than 0,0005 % mercury, more than 0,002 % cadmium or more than 0,004 % lead, shall be marked with the chemical symbol for the metal concerned: Hg, Cd or Pb.
 - ^{##} = Not apply to portable batteries and accumulators intended for use in:
 - (a) emergency and alarm systems, including emergency lighting;
 - (b) medical equipment; or
 - (c) cordless power tools.
 - Results shown is/are of total weight of the battery sample.
 - "--" = Not Regulated.
 - According to the article 21.1, all batteries, accumulators and battery packs should be appropriately marked with the crossed-out wheeled bin symbol.

Test Process:



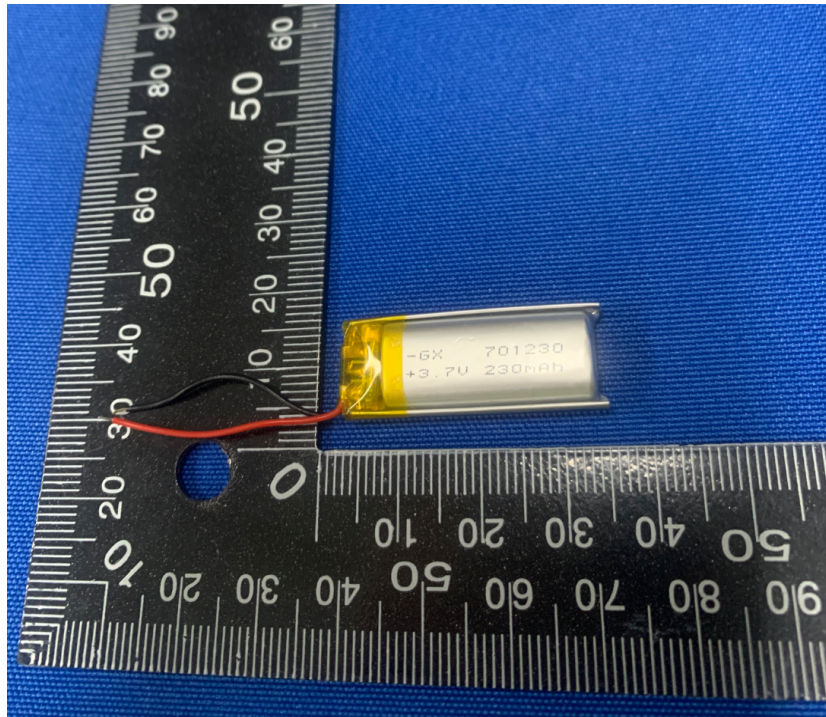
Test Report

Report No. : TCT250721B125

Date : Jul. 21, 2025

Page No.: 3 of 3

Photo(s) of the sample(s)



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

Remark: This report is considered invalidated without the Special Seal for Inspection of the TCT. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of TCT, this test report shall not be copied except in full and published as advertisement.



中国认可
国际互认
检测
TESTING
CNAS L5138



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.....: TSZ24100189-P03-R01 Date of issue.....: 2024-10-25 Total number of pages.....: 22		
Name of Testing Laboratory preparing the Report.....: Shenzhen Tiansu Calibration and Testing Co.,Ltd		
Applicant's name.....: Address.....:		
Test specification: Standard.....: IEC 62133-2:2017		
General disclaimer: The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing Laboratory.		
Test item description.....:	Polymer Li-ion Battery	
Trade Mark.....:	N/A	
Manufacturer.....:		
Model/Type reference.....:	GX701230	
Ratings.....:	3.7V, 230mAh, 0.851Wh	
Responsible Testing Laboratory and testing location(s):		
<input checked="" type="checkbox"/>	Testing Laboratory:	Shenzhen Tiansu Calibration and Testing Co.,Ltd
Testing location/ address.....:		B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China
Tested by (name, function, signature).....:		Dragon Xu Test Engineer
Approved by (name, function, signature)...:		Diamond Duan Technology supervisor



List of Attachments (including a total number of pages in each attachment):

- Page 1 to 22 for IEC 62133 TRF (main report)
- Attachment 1 (1 Page): Circuit diagram
- Attachment 2 (3 Pages): Product Photos

Summary of testing:**Tests performed (name of test and test clause):****Testing for cell:** GX701230

7.2.1 Continuous charging at constant voltage (cells);

7.3.1 External short circuit (cell);

7.3.3 Free fall

7.3.4 Thermal abuse (cells);

7.3.5 Crush (cells);

7.3.7 Forced discharge (cells);

7.3.9 Design evaluation – Forced internal short circuit (cells)

Testing for battery: GX701230

7.3.2 External short-circuit (battery)

7.3.3 Free fall

7.3.6 Over-charging of battery

7.3.8 Mechanical tests (batteries)

7.3.8.1 Vibration

7.3.8.2 Mechanical shock

Tests are made with the number of in IEC 62133-2: 2017 Table 1.

Testing location:

Shenzhen Tiansu Calibration and Testing Co.,Ltd
B/1,4, NO.2 Jinlong Road, Longgang District,
Shenzhen, China

Copy of marking plate:

The artwork below may be only a draft.

Polymer Li-ion Battery

Model: GX701230

3.7V 230mAh 0.851Wh 1INP7/13/30

Red wire “+” Black wire “-”

Made in China YYYYMMDD

Caution: Risk of Fire and Burns

Follow Manufacturer's Instructions



Remark:

The code “YYYYMMDD” represents that:

“YYYY” means year of production,

“MM” means month of production,

“DD” means day of production.

Test item particulars..... :	
Classification of installation and use.....:	To be defined in final product
Supply Connection.....:	Lead wire
Recommend charging method declared by the manufacturer.....:	115mA constant current charge to 4.2V, then constant voltage 4.2V charge till charge current declines to 11.5mA.
Discharge current (0,2 It A).....:	46mA
Specified final voltage..... :	3.0V
Upper limit charging voltage per cell.....:	4.2V
Maximum charging current..... :	230mA
Charging temperature upper limit.....:	45°C
Charging temperature lower limit..... :	0°C
Polymer cell electrolyte type.....:	<input type="checkbox"/> gel polymer <input type="checkbox"/> solid polymer <input checked="" type="checkbox"/> 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..... :	10.08, 2024
Date (s) of performance of tests..... :	10.08, 2024 to 10.20, 2024
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report.</p> <p>"(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
Name and address of factory (ies)..... :	

General product information and other remarks:

The product covered by this report is Polymer Li-ion Battery (model: GX701230) consists of Polymer Li-ion cell (model: GX701230) in 1S1P which tested with appliance as per IEC 62133-2:2017 in the report.

The main features of the battery are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Final Voltage
GX701230	230mAh	3.7V	115mA	46mA	230mA	230mA	4.2V	3.0V

The main features of the cell in the battery pack are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
GX701230	230mAh	3.7V	115mA	46mA	230mA	230mA	4.2V	3.0V

The main features of the cell are shown as below (clause 7.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
GX701230	4.2V	11.5mA	0°C	45°C

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		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		P
5.4	Temperature, voltage and current management	See below	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	Cell specification and battery specification have been provided. The design of the battery refers to the parameters of the cell	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	Battery specifications have been provided.	P
5.5	Terminal contacts		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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	Protective circuit equipped on battery	P
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	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	Current, voltage and temperature limits specified by cell manufacturer.	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	Battery without selective discharge function.	N/A
	Protective circuit components added as appropriate and consideration given to the end-device application		P
	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	Cell upper limit of the charging voltage: 4.2V	P

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 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
	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		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
5.8	Battery safety components		N/A
	According annex F		N/A

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	Tests are performed according to specified in Table 1 of this standard. The samples are not more than six months old.	P
	Coin cells with resistance $\leq 3 \Omega$ (measured according annex D) are tested according table 1		N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of $20^\circ\text{C} \pm 5^\circ\text{C}$		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		N/A
	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 $20^\circ\text{C} \pm 5^\circ\text{C}$, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at $20^\circ\text{C} \pm 5^\circ\text{C}$ 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

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	Charging temperature specified by client is 0-45°C, 45°C and 0°C were used as highest test temperature and lowest test temperature during tests. The upper limit charging voltage is 4.20V. The maximum charging current is 230mA.	P
7.2	Intended use		P
7.2.1	Continuous charging at constant voltage (cells)	Tested complied.	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)	No moulded case exists	N/A
	Oven temperature (°C)..... :		—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		N/A
7.3	Reasonably foreseeable misuse		P
7.3.1	External short-circuit (cell)	Tested complied.	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)	Test complied.	P
	The batteries 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
	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		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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	Tested complied.	P
	Results: No fire. No explosion		P
7.3.4	Thermal abuse (cells)	Tested complied.	P
	Oven temperature (°C)..... :	130	—
	Results: No fire. No explosion		P
7.3.5	Crush (cells)	Tested complied.	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	Tested complied.	P
	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	5.88V used for test.	P
	- 1,2 times the upper limit charging voltage presented 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	0.46A used for test.	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)	Tested complied.	P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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)	Tested complied.	P
7.3.8.1	Vibration		P
	Results: No fire, no explosion, no rupture, no leakage or venting..... :		P
7.3.8.2	Mechanical shock	Tested complied.	P
	Results: No leakage, no venting, no rupture, no explosion and no fire..... :		P
7.3.9	Design evaluation – Forced internal short-circuit (cells)	Tested complied.	P
	The cells complied with national requirement for..... :	France, Japan, Republic of Korea, Switzerland	—
	The pressing was stopped upon:		P
	- A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N for prismatic cells.	P
	Results: No fire..... :	(See appended table 7.3.9)	P

8	INFORMATION FOR SAFETY		P
8.1	General		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	Information for safety mentioned in manufacturer's specifications	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	Information for safety mentioned in manufacturer's specifications	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

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
8.2	Small cell and battery safety information	Not small batteries	N/A
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		N/A
	- Keep small cells and batteries which are considered swallowable out of the reach of children		N/A
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		N/A
	- In case of ingestion of a cell or battery, seek medical assistance promptly		N/A

9	MARKING		P
9.1	Cell marking	The final product is battery.	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	The battery is marked in according with IEC 61960.	P
	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	Not coin battery.	N/A
	Terminals have clear polarity marking on the external surface of the battery		P
	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		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
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	Upper limit charging voltage of cell is 4.2V.	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied		N/A
A.4	Consideration of temperature and charging current		P
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	N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
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
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

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
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	P
----------------	---	---

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
----------------	--------------------------------	-----

IEC 62133-2					
Clause	Requirement + Test			Result - Remark	Verdict
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⁾
Supplementary information: ¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039. Client did not provided relevant information.					

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 rise ΔT (°C)	Results	
Samples charged at charging temperature upper limit ¹⁾						
C06#	55.2	4.167	72	55.2	P	
C07#	55.2	4.168	74	56.3	P	
C08#	55.2	4.167	79	54.6	P	
C09#	55.2	4.166	81	56.5	P	
C10#	55.2	4.168	69	58.0	P	
Samples charged at charging temperature lower limit ²⁾						
C11#	55.0	4.074	74	53.9	P	
C12#	55.0	4.071	68	57.3	P	
C13#	55.0	4.074	81	55.1	P	
C14#	55.0	4.072	80	59.4	P	
C15#	55.0	4.070	79	55.9	P	
Supplementary information:						
- No fire or explosion						
¹⁾ Cells charged at 45°C						
²⁾ Cells charged at 0°C						

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

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 rise ΔT (°C)	Component single fault condition	Results
B01#	22.9	4.186	79	1.2	Normal	P
B02#	22.9	4.183	86	86.3	SC U2	P
B03#	22.9	4.185	72	88.5	SC U2	P
B04#	22.9	4.184	80	85.0	SC U2	P
B05#	22.9	4.185	81	86.1	SC U2	P
Supplementary information: - No fire or explosion - SC means short-circuit						

7.3.5	TABLE: Crush (cells)				P
Sample no.	OCV before test (Vdc)	OCV at removal of crushing force (Vdc)	Maximum force applied to the cell during crush (kN)	Results	
Samples charged at charging temperature upper limit ¹⁾					
C29#	4.165	4.163	13.07	P	
C30#	4.169	4.168	13.12	P	
C31#	4.168	4.166	13.09	P	
C32#	4.167	4.165	13.14	P	
C33#	4.167	4.166	13.09	P	
Samples charged at charging temperature lower limit ²⁾					
C34#	4.071	4.069	13.03	P	
C35#	4.069	4.068	13.07	P	
C36#	4.074	4.072	13.11	P	
C37#	4.075	4.073	13.02	P	
C38#	4.072	4.070	13.13	P	
Supplementary information: - No fire or explosion 1) Cells charged at 45°C 2) Cells charged at 0°C - The ambient temperature is 23.0°C					

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.6	TABLE: Over-charging of battery			P
Constant charging current (A).....:		0.46		—
Supply voltage (Vdc).....:		5.88		—
Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
B09#	3.367	120	35.4	P
B10#	3.366	120	34.1	P
B11#	3.369	120	36.5	P
B12#	3.363	120	32.9	P
B13#	3.365	120	34.4	P
Supplementary information: - No fire or explosion - The ambient temperature is 23.0°C				

7.3.7	TABLE: Forced discharge (cells)			P
Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_r (A)	Lower limit discharge voltage (Vdc)	Results
C39#	3.361	0.23	3.0	P
C40#	3.360	0.23	3.0	P
C41#	3.358	0.23	3.0	P
C42#	3.362	0.23	3.0	P
C43#	3.362	0.23	3.0	P
Supplementary information: - No fire or explosion - The ambient temperature is 22.8°C				

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#	4.186	4.184	4.331	4.330	P
B15#	4.184	4.183	4.333	4.332	P
B16#	4.186	4.185	4.334	4.332	P
Supplementary information: - No fire or explosion - No rupture - No leakage - No venting - The ambient temperature is 22.7°C					

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#	4.187	4.186	4.333	4.331	P	
B18#	4.185	4.184	4.332	4.330	P	
B19#	4.184	4.183	4.334	4.332	P	
Supplementary information:						
- No fire or explosion - No rupture - No leakage - No venting - The ambient temperature is 22.6°C						

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)	Results	
Samples charged at charging temperature upper limit ²⁾						
C44#	45.0	4.169	1	400	P	
C45#	45.0	4.167	1	400	P	
C46#	45.0	4.166	1	400	P	
C47#	45.0	4.167	1*	400	P	
C48#	45.0	4.171	1*	400	P	
Samples charged at charging temperature lower limit ³⁾						
C49#	0.0	4.070	1	400	P	
C50#	0.0	4.074	1	400	P	
C51#	0.0	4.072	1	400	P	
C52#	0.0	4.071	1*	400	P	
C53#	0.0	4.071	1*	400	P	

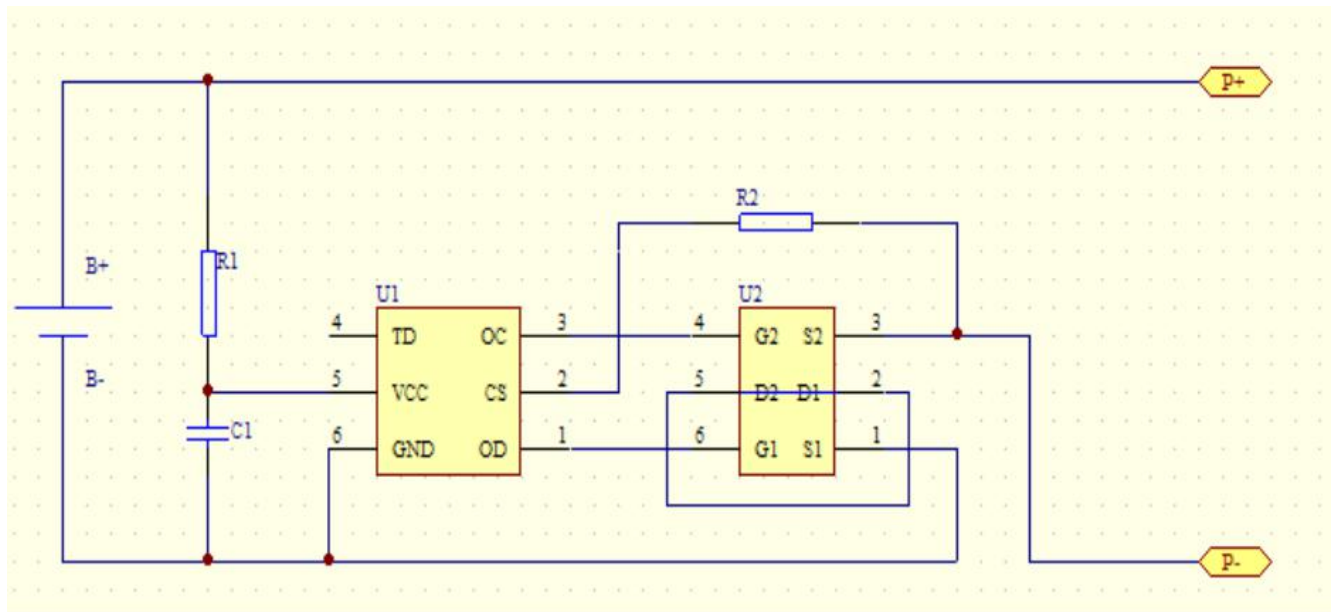
Supplementary information:

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 location 2 exists.

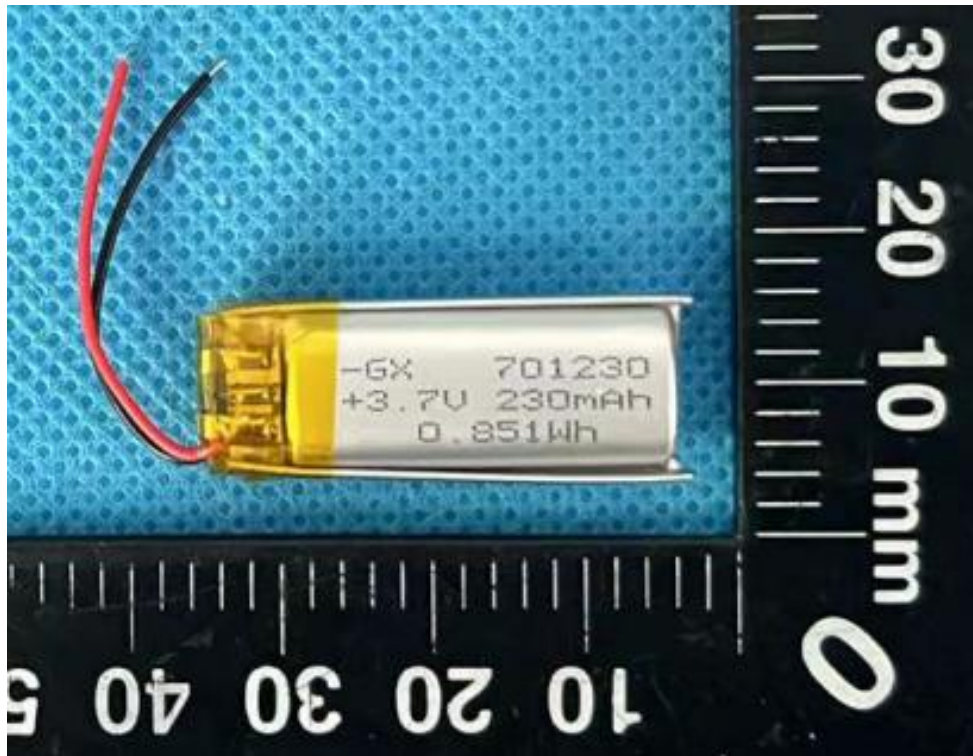
2) Cells charged at 45°C

3) Cells charged at 0°C

IEC 62133-2				
Clause	Requirement + Test		Result - Remark	Verdict
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				



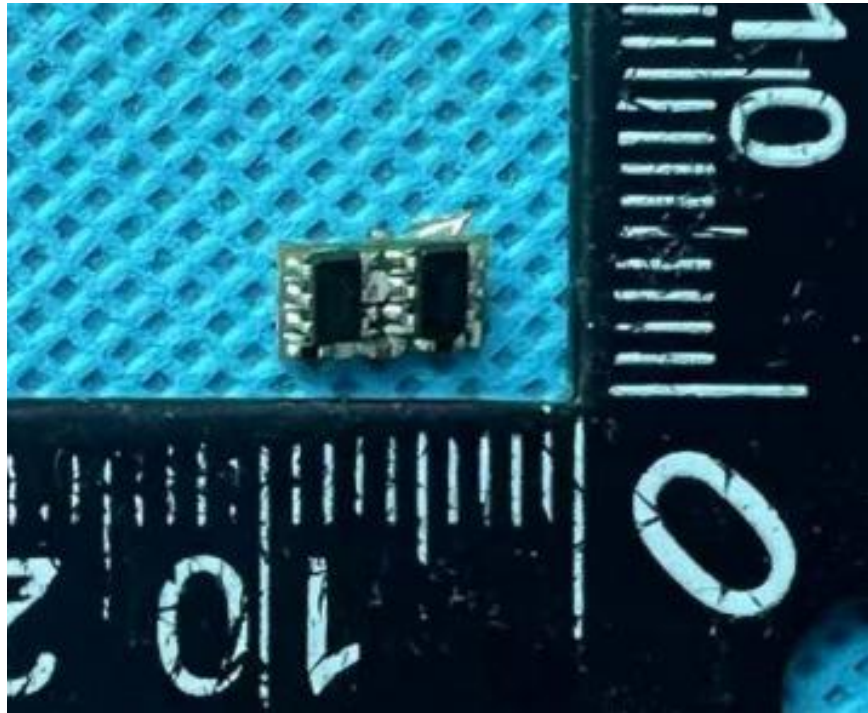
Circuit diagram



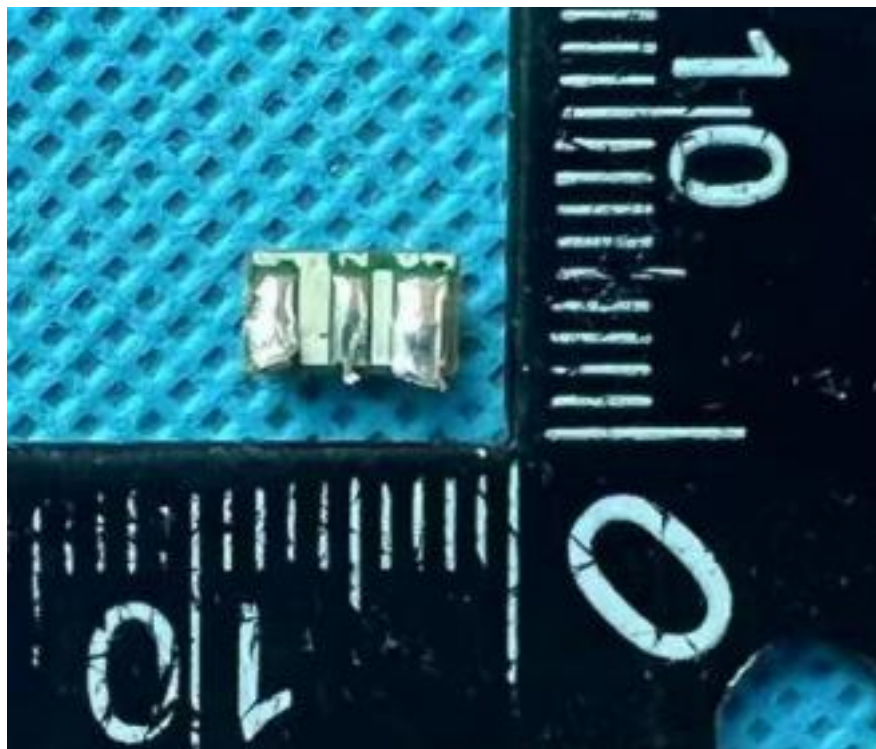
Front View of the battery



Back View of the battery



Front view of PCM



Back view of PCM



Front View of the cell



Back View of the cell