
Battery Test Report

Report No.: LA2025B1147002

Samples	Li-ion Battery
Model	LX 11500
Applicant	Dongguan LIXING Battery Co., Ltd.
Issue Date	2025-06-18

深圳市莱恩瑞斯科技有限公司
Shenzhen Lionaces Technology Co., Ltd.

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021

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 Reference No..... : LA2025B1147002

Tested by (+ signature)..... : Li Wen

Li Wen

Reviewed by (+ signature) : Allen Zeng

Allen Zeng

Approved by (+signature) : Liu haibin

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Date of issue..... : 2025-06-18

Contents..... : Total 26 pages.

Testing laboratory

Name..... : Shenzhen Lionaces Technology Co., Ltd.

Address..... : 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China

Testing location..... : Same as above.

Applicant

Name..... : Dongguan LIXING Battery Co., Ltd.

Address..... : Room 201, Building 2, No. 42 Longyuan road, Yanwu Dalingshan town, Dongguan, Guangdong, P.R.China

Manufacturer

Name..... : Dongguan LIXING Battery Co., Ltd.

Address..... : Room 201, Building 2, No. 42 Longyuan road, Yanwu Dalingshan town, Dongguan, Guangdong, P.R.China

Test specification

Standard..... : IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021

Test procedure : Type test

Procedure deviation..... : N/A

Non-standard test method..... : N/A

Test Report Form/blank test report

Test Report Form No..... : IEC62133_2C

Test Report Form(s) Originator..... : Lionaces

Master TRF..... : Dated 2022-07

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Test item				
Product designation.....		Li-ion Battery		
Brand name.....		N/A		
Test model.....		LX 11500		
Rating(s).....		3.7V, 500mAh, 1.85Wh		
Test item particulars				
Classification of installation and use.....		N/A		
Supply connection.....		DC Lead wire		
Recommend charging method declared by the manufacturer.....		Charge at constant current 100mA until the voltage reaches 4.2V, then charge at 4.2V till charge current is 10mA at ambient 20°C±5°C.		
Discharge current(0.2I _A).....		100mA		
Specified final voltage		3.0V		
Chemistry		☐ nickel systems ☒ lithium systems		
Recommend of charging limit for lithium system				
Upper limit charging voltage per cell.....		4.2V		
Maximum charging current.....		500mA		
Charging temperature upper limit.....		45°C		
Charging temperature lower limit.....		0°C		
Polymer cell electrolyte type.....		☐ gel polymer ☐ solid polymer ☒ N/A		
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		2025-05-26		
Date(s) of performance of test.....		2025-05-26 to 2025-06-12		
Attachment				
Attachment A.....		Photos of product		
General remarks:				
This 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 point is used as the decimal separator.				
☒ The product fulfils the requirements of IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021. and EN 62133-2:2017/A1:2021.				
When differences exist; they shall be identified in the General product information section.				
Name and address of factory (ies)		Same as Manufacturer.		
Report Revise Record:				
Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2025-06-18	Valid	Original report

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General product information

	Cell	Battery
Model	11500	LX 11500
Nominal capacity	500mAh	500mAh
Nominal voltage	3.7V	3.7V
Nominal charge current	100mA	100mA
Nominal discharge current	100mA	100mA
Maximum charge current	500mA	500mA
Maximum discharge current	500mA	500mA
Limited Charging Voltage	4.2V	4.2V
Upper limited charging voltage	4.2V	4.2V
Cut-off voltage	3.0V	3.0V
Charging temp. Range	0-45°C	0-45°C

Copy of marking plate

This is reference label, final label should be including the content of it.

Red(+)	Black(-)
Lithium-ion battery	LX 11500
3.7V, 500mAh, 1.85Wh	11NR12/49
Made in China	Date: YYMMDD
Dongguan LIXING Battery Co., Ltd.	
Warning: Risk of Fire and Burns.	
Follow Manufacturer's Instructions.	

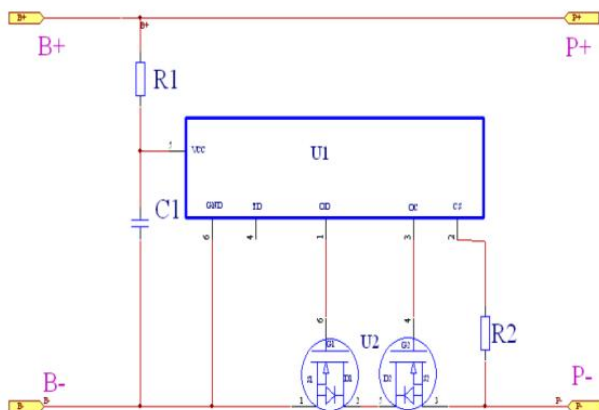
Remark: Date code: YYMMDD YY=Year, MM=Month, DD=Day.

Caution for ingestion of small cells and batteries

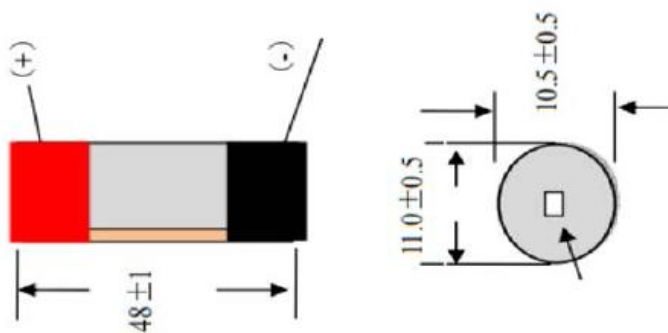
- Keep small cells and batteries which are considered swallowable out of the reach of children.
- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion.
- In case of ingestion of a cell or battery, seek medical assistance promptly.

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Circuit diagram:



Construction:



Cell (Unit: mm)



T=13.35mm (Max) H=50.0mm (Max)

Battery

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
4	PARAMETER MEASUREMENT TOLERANCES		P
	Parameter measurement tolerances	Comply with relevant requirements.	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 metal case exists.	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	Venting mechanism exists on the side of cylindrical 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/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	Overcharge, over discharge, over current and short-circuit proof circuit used in this battery. See tests of clause 7.	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	The charging limits specified in the user manual.	P

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
5.5	Terminal contacts		P
	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		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 has 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		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 has 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		N/A
	Protective circuit components are 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		P

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
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 are not 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 are not discharged beyond the cell manufacturer's specified final voltage	Not exceed the final voltage specified by cell manufacturer.	P
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry are 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 are provided to prevent damage as a result of intended use and reasonably foreseeable misuse	Mechanical protection for cell connections and control circuits provided.	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	Build-in batteries, mechanical protection for cells should be provided by end product.	N/A
	The battery case and compartments housing cells are designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer	To be evaluated in final system.	N/A
	For batteries intended for building into a portable end product, testing with the battery installed within the end product is considered when conducting mechanical tests		N/A
5.7	Quality plan		P

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
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	Complied.	P
5.8	Battery safety components		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		P
	The internal resistance of coin cells are measured in accordance with Annex D. Coin cells with internal resistance less than or equal to 3 Ω are tested in accordance with Table 1		N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C $\pm$ 5 °C	Tests are carried out at 20°C $\pm$ 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 is 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	See clause 7.3.2.	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 $\pm$ 5 °C, using the method declared by the manufacturer	See page 3.	P
	Prior to charging, the battery has been discharged at 20 °C $\pm$ 5 °C at a constant current of 0,2 It A down to a specified final voltage	See page 3.	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 to 4 h, at an ambient		P

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
	temperature of the highest test temperature and the lowest test temperature, respectively, 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 current to constant voltage charging method		
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)	Tested complied.	P
	Oven temperature (°C)..... :	70	—
	Results: no physical distortion of the battery case resulting in exposure of internal protective components and cells	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)	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)	Tested 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		N/A
	A single fault in the discharge protection circuit is conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test	Single fault conducted on 4 samples.	P
	A single fault applies to protective component parts		P

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
	such as MOSFET (metal oxide semiconductor field-effect transistor), fuse, thermostat or positive temperature coefficient (PTC) thermistor		
	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	No fire. No explosion	P
7.3.4	Thermal abuse (cells)	Tested complied.	P
	Oven temperature (°C).....:	130°C	—
	Results: no fire, no explosion	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		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)	Tested complied.	P
	Discharge a single cell to the lower limit discharge voltage specified by the cell manufacturer		P
	The discharged cell is then subjected to a forced discharge at 1 It A to the negative value of the upper limit charging voltage		P

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
	- 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
	- 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	Tested complied.	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	Tested complied.	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)	Tested complied.	P
	The cells complied with national requirement for.....:	France, Japan, Republic of Korea and 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	800N	P
	Results: no fire.....:	(See appended table 7.3.9)	P

8	INFORMATION FOR SAFETY		P
8.1	General		P
	Manufacturers of secondary cells provides information about current, voltage and temperature limits of their products	Information for safety mentioned in manufacturer's specifications.	P
	Manufacturers of batteries provides information regarding how to minimize and mitigate hazards to equipment manufacturers or end-users	Information for safety mentioned in manufacturer's specifications.	P
	Systems analyses are 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 is		N/A

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
	provided to the end user		
8.2	Small cell and battery safety information	Small cell and battery	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 are marked as specified in IEC 61960, except coin cells	The final product is battery.	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 are marked as specified in IEC 61960, except for coin batteries	See marking plate on page 4.	P
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity	Not coin batteries.	N/A
	Batteries are marked with an appropriate caution statement		P
	- Terminals have clear polarity marking on the external surface of the battery, or		P
	- 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		P
	Coin cells and batteries identified as small batteries include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
	Small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion is given on the immediate package	Small cell and battery	P
9.4	Other information		P
	The following information are marked on or supplied with the battery:		P
	- Storage and disposal instructions	Information for disposal instructions mentioned in manufacturer's specifications.	P
	- Recommended charging instructions	Information for recommended charging instructions mentioned in manufacturer's specifications.	P

10	PACKAGING AND TRANSPORT		N/A
	Packaging for coin cells are not be small enough to fit within the limits of the ingestion gauge of Figure 3		N/A

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	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	4.2V	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	4.2V applied.	N/A
A.4	Consideration of temperature and charging current		P
A.4.1	General		P
A.4.2	Recommended temperature range	Charging temperature declared by client is: 0-45°C.	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	Charging high temperature declared by client is: 45°C.	N/A

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
Clause	Requirement – Test	Result – Remark	Verdict
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	45°C applied.	N/A
A.4.4	Low temperature range	Charging low temperature declared by client is: 0°C.	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 the low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	0°C applied.	P
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		P
A.5.5.1	Insertion of nickel particle in winding core		P
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		P
A.5.6	Insertion of nickel particle in prismatic cell		N/A
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

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IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021			
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	N/A
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ANNEX C	RECOMMENDATIONS TO THE END-USERS	N/A
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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	N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing.....	(See appended table D.2) N/A
	Coin cells with an internal resistance less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1	N/A

ANNEX E	PACKAGING AND TRANSPORT	N/A
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ANNEX F	COMPONENT STANDARDS REFERENCES	N/A
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Table: Critical components information					P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard 2)	Mark(s) of Conformity ¹⁾
PCB	SHENZHEN CITY JIAWANTONGDA CIRCUIT CO LTD	JWTD-1	V-0,130°C	UL796	UL E492187
Protection IC (U1)	Vimicro Corp	VA7020	Overcharge Protection Voltage: 4.3V±0.05V, Over discharge Protection Voltage: 2.5V±0.075V, Topr:-40°C~+85°C	--	Tested with appliance
MOSFET (U2)	ShenZhen Developer Microelectronics Co., LTD	8205A	V _{DS} :20V, V _{GS} :±12V, I _D :5A, T _J :-55°C-150°C	--	Tested with appliance
Wire	Interchangeable	Interchangeable	28AWG, 30V, 80°C	--	Tested with appliance
Cell	Dongguan Guihang Battery Technology Co, Ltd	11500	3.7V,500mAh	IEC 62133-2:2017, IEC 62133-2:2017/AM D1:2021	Tested with appliance
-Electrolyte	Zhu Hai GuangRui New Material Co. Ltd	GR-A0804	LiPF ₆ +DEC+EC	--	--
-Separator	Shenzhen Yutu New Materials Industry Co.,Ltd	16µm	PE, Shutdown Temperature: 132°C	--	--
-Positive Electrode	YiBin Libode new materials Co.,Ltd	M511	Li(Ni _{0.5} CO _{0.2} Mn _{0.3})O ₂	--	--
-Negative Electrode	Dalian Hongguang Lithium Industry Co.,Ltd	HG-8C	Graphite	--	--
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-2039. 2) License available upon request.					

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7.2.1 Table: Continuous charging at constant voltage (cells)				P
Sample no.	Recommended charging voltage Vc (Vdc)	Recommended charging current I _{rec} (A)	OCV before test (Vdc)	Results
C001	4.2	0.1	4.172	P
C002	4.2	0.1	4.175	P
C003	4.2	0.1	4.174	P
C004	4.2	0.1	4.175	P
C005	4.2	0.1	4.178	P
Supplementary information: - No fire or explosion - No leakage				

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: 45°C					
C006	55.4	4.173	85.5	119.2	P
C007	55.4	4.178	80.6	116.9	P
C008	55.4	4.178	79.6	118.8	P
C009	55.4	4.172	77.2	114.4	P
C010	55.4	4.177	80.5	117.8	P
Samples charged at charging temperature lower limit: 0°C					
C011	55.2	4.134	80.3	114.1	P
C012	55.2	4.136	80.1	117.7	P
C013	55.2	4.136	82.5	118.8	P
C014	55.2	4.131	81.0	115.5	P
C015	55.2	4.138	81.9	114.0	P
Supplementary information: - No fire or explosion					

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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
B001	22.4	4.176	83.3	117.8	MOS U2 S-C	P
B002	22.4	4.174	78.0	115.2	MOS U2 S-C	P
B003	22.4	4.177	81.1	115.7	MOS U2 S-C	P
B004	22.4	4.177	82.6	118.5	MOS U2 S-C	P
B005	22.4	4.179	81.4	22.9	--	P
Supplementary information: - No fire or explosion						

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: 45°C					
C016	4.173	4.170	13	P	
C017	4.179	4.176	13	P	
C018	4.173	4.171	13	P	
C019	4.175	4.173	13	P	
C020	4.175	4.173	13	P	
Samples charged at charging temperature lower limit: 0°C					
C021	4.138	4.136	13	P	
C022	4.133	4.131	13	P	
C023	4.134	4.131	13	P	
C024	4.139	4.136	13	P	
C025	4.135	4.132	13	P	
Supplementary information:					
- No fire or explosion					

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7.3.6	Table: Over-charging of battery				P
Constant charging current (A).....:		1			—
Supply voltage (Vdc).....:		5.88			—
Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature rise ΔT (°C)	Results	
B006	3.347	81	23.3	P	
B007	3.341	81	23.5	P	
B008	3.345	81	23.2	P	
B009	3.337	81	23.2	P	
B010	3.344	81	23.3	P	
Supplementary information:					
- No fire or explosion					

7.3.7	Table: Forced discharge (cells)				P
Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_t (A)	Lower limit discharge voltage (Vdc)	Results	
C026	3.345	0.5	3.0	P	
C027	3.342	0.5	3.0	P	
C028	3.338	0.5	3.0	P	
C029	3.338	0.5	3.0	P	
C030	3.341	0.5	3.0	P	
Supplementary information: - No fire or explosion					

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	
B011	4.175	4.167	10.236	10.229	P	
B012	4.177	4.169	10.182	10.174	P	
B013	4.174	4.166	10.255	10.247	P	
Supplementary information: - No fire or explosion - No rupture - No leakage - No venting						

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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
B014	4.176	4.174	10.149	10.147	P
B015	4.173	4.170	10.207	10.203	P
B016	4.178	4.176	10.249	10.246	P
Supplementary information: - No fire or explosion - No rupture - No leakage - No venting					

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: 45°C					
C031	45	4.173	1	800	P
C032	45	4.179	1	800	P
C033	45	4.175	1	800	P
C034	45	4.173	1	800	P
C035	45	4.174	1	800	P
Samples charged at charging temperature lower limit: 0°C					
C036	0	4.135	1	800	P
C037	0	4.139	1	800	P
C038	0	4.132	1	800	P
C039	0	4.135	1	800	P
C040	0	4.133	1	800	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 fire Remark: There is no particle location 2 for this cell.					

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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.				

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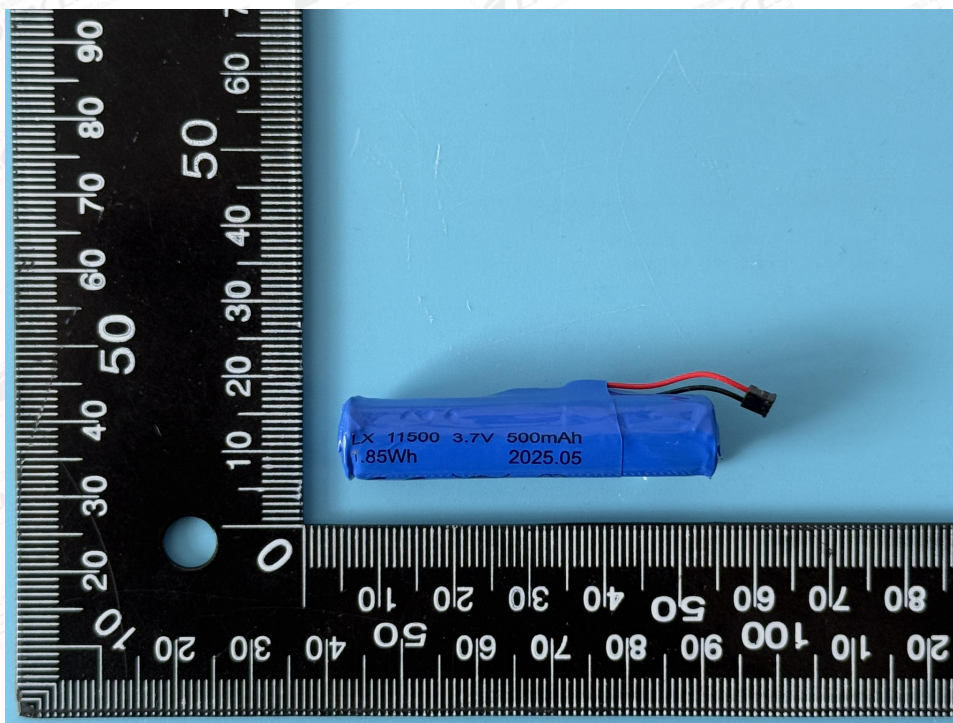
Shenzhen Lionaces Technology Co., Ltd.

Add: 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China.

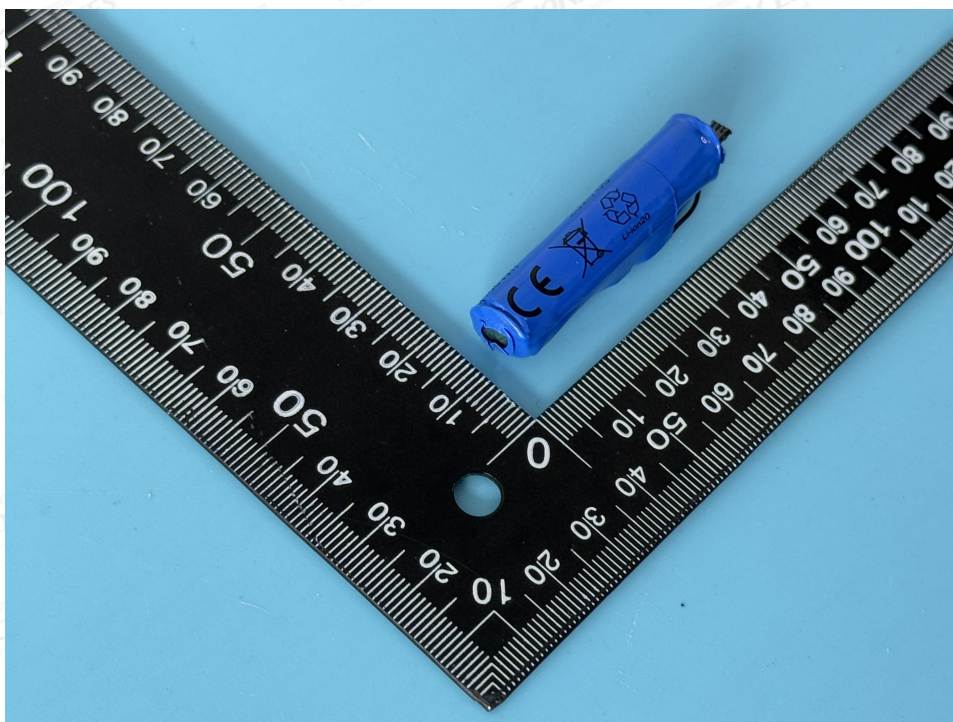
Website: www.lionaces.com E-mail: service@lionaces.com LA-FO-BG00001-B/0

Tel: (86-755)-28280690

Attachment A
Photos of product



Front view of battery



Back view of battery

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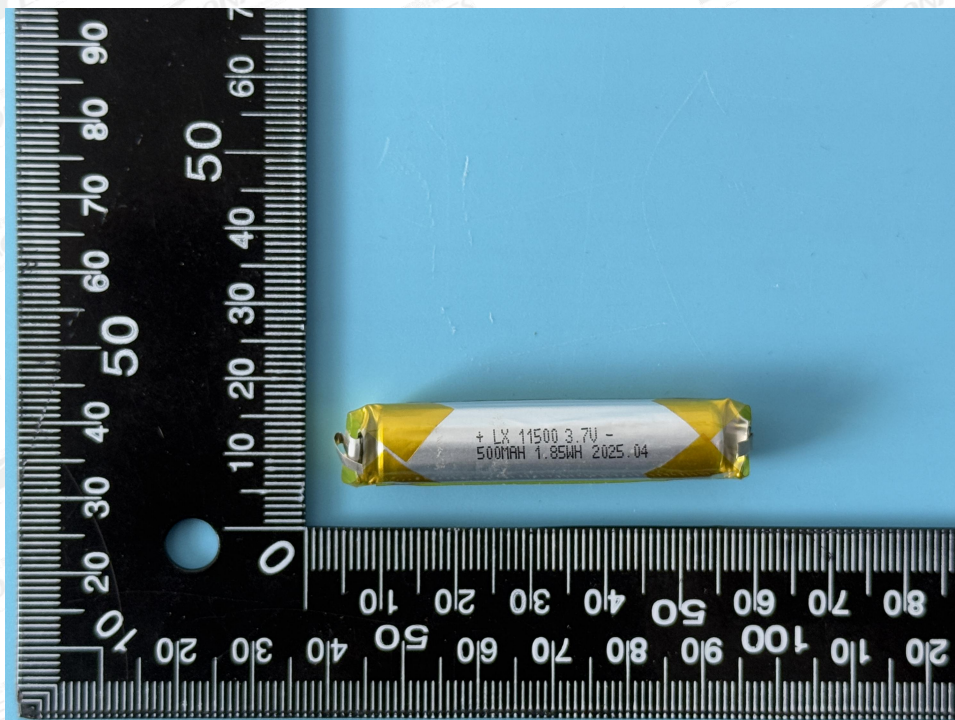
Add: 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China.

Website: www.lionaces.com

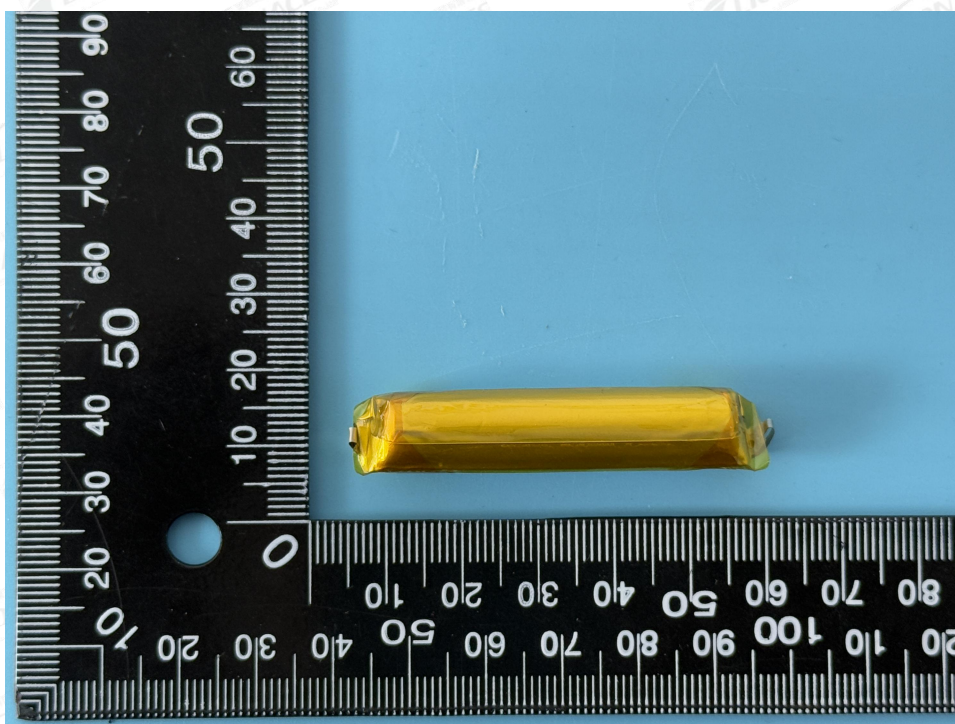
E-mail: service@lionaces.com

Tel: (86-755)-28280690

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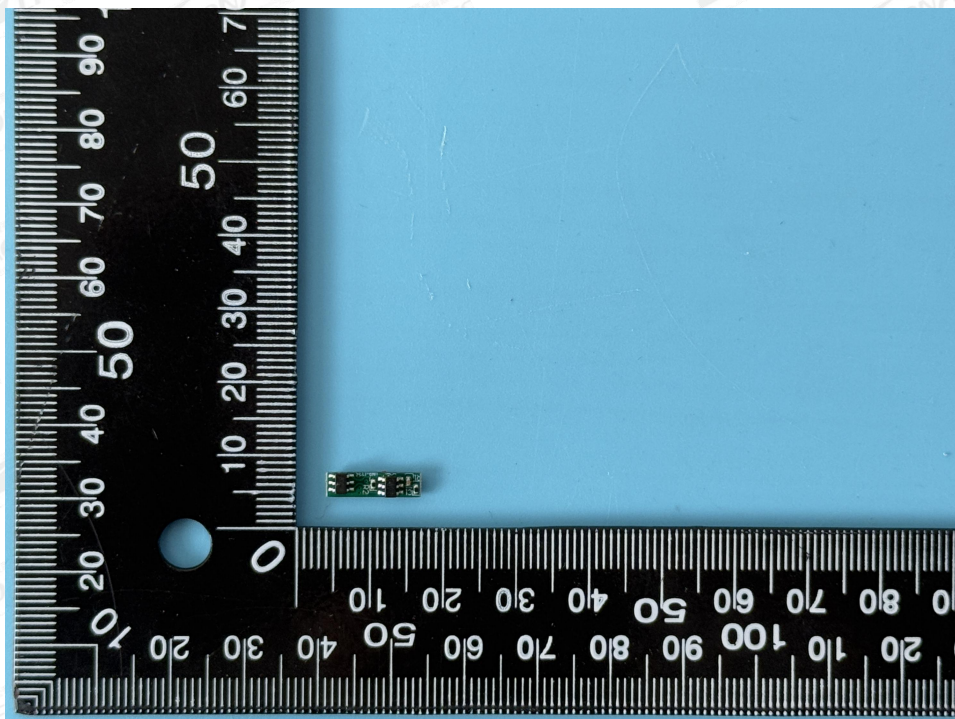


Front view of cell

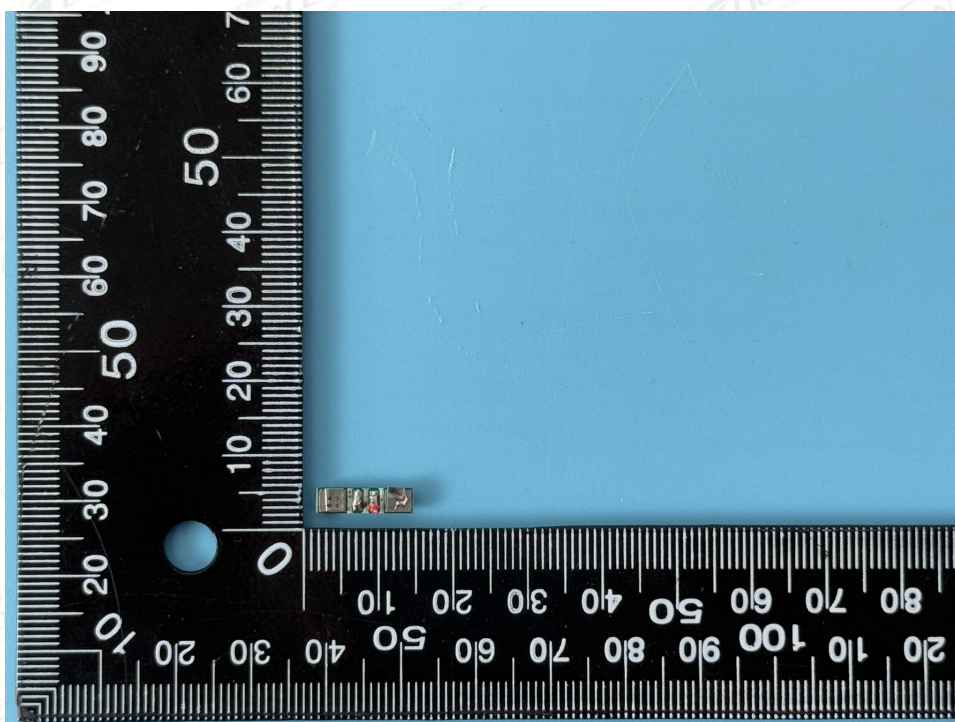


Back view of cell

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Front view of PCB



Back view of PCB

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Test Equipment

No	Name	Model specifications	Device Number	Calibration validity	Using (√)
1	Battery forced internal testing machine	FH-07	LA-BT-E006	2025-12-02	√
2	Drop test system	FH-03	LA-BT-E010	2025-12-02	√
3	Electromagnetic vibration testing machine	EV203VT640	LA-BT-E013	2025-12-02	√
4	Electronic balance	UTP-313	LA-BT-E069	2025-12-02	√
5	Battery crush test instrument	GX-5067-CSM	LA-BT-E084	2025-12-02	√
6	Battery thermal shock test box	GX-3020-B	LA-BT-E085	2025-12-02	√
7	Mechanical impact tester	HSKT10	LA-BT-E086	2025-12-02	√
8	Gauge	H:57.1*h:25.4*R:31.7m m	LA-BT-E077	2025-12-04	√
9	DC power supply	UTP1306S	LA-BT-E079 LA-BT-E080 LA-BT-E081 LA-BT-E082 LA-BT-E083	2025-12-02	√
10	Digital temperature recorder	GL240	LA-BT-E096	2026-03-12	√
11	Battery short circuit tester	GX-055-B50	LA-BT-E097	2026-03-12	√
12	High-performance battery detection system	CT-4008-5V6A-S1	LA-BT-E070	2025-12-02	√
13	Programmable fast temperature change test box	GX-3000-150LT	LA-BT-E072	2025-12-02	√

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