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 reference No. ..... :	DSP25050463-1
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Date of issue ..... :	2025-06-12
Total number of pages ..... :	25 Pages.
Name of Testing Laboratory preparing the Report ..... :	Dongguan ZRLK Testing Technology Co., Ltd. Building 2, No.1, Technology 10th Road, Songshan Lake Park, Dongguan, Guangdong, China
Applicant's name ..... :	Dongguan Baijiaying Electronic Technology Co., Ltd.
Address ..... :	No. 4, Xin'an Jufu Road, Chang'an Town, Dongguan City, Guangdong, P.R. China
Manufacturer's name ..... :	Dongguan Baijiaying Electronic Technology Co., Ltd.
Address ..... :	No. 4, Xin'an Jufu Road, Chang'an Town, Dongguan City, Guangdong, P.R. China
Test specification .....:	
Standard ..... :	IEC 62133-2:2017/AMD1:2021
Test procedure ..... :	Type approved
Procedure deviation ..... :	N/A
Non-standard test method ..... :	N/A
This test report is specially limited to the above client company and product model only, It may not be duplicated without prior written consent of Dongguan ZRLK Testing Technology Co., Ltd.	
Test item description ..... :	Li-ion Battery
Trade Mark .....:	N/A
Model/type reference .....:	14500 500mAh
Ratings .....:	3.7V, 500mAh, 1.85Wh

Particulars: test item vs. test requirements

Classification of installation and use	To be defined in final product
Supply connection	DC connector
Discharge current (0,2 It A)	100mA
Upper limit charging voltage per cell	4.20V
Charging temperature upper limit	45°C
Charging temperature lower limit	0°C
Shape of Cell	☒Prismatic ☐Pouch ☐Coin/button ☒Cylindrical
Polymer cell electrolyte type	☐gel polymer ☐solid polymer ☒Other

Possible test case verdicts:

- test case does not apply to the test object	N/A
- test object does meet the requirement	P(ass)
- test object does not meet the requirement	F(ail)

Testing:

Date of receipt of test item	2025-05-14
Date(s) of performance of test	2025-05-14 to 2025-05-24

General remarks:

"(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 comma is used as the decimal separator,
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 testing laboratory,
Clause numbers between brackets refer to clauses in IEC 62133-2:2017/AMD1:2021 (Optional remark).

Name and address of factory (ies)	Dongguan Baijiaying Electronic Technology Co., Ltd. No. 4, Xin'an Jufu Road, Chang'an Town, Dongguan City, Guangdong, P.R. China

General product information:

The Li-ion Battery is constructed with one Cylindrical Lithium-ion Rechargeable Cell, and has overcharge, over-discharge, over current and short-circuits protection circuit.

The cell (model: IMR14500-500mAh) inside the battery is CB approved according to IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021 by TUV Rheinland (CB Certificate No.: JPTUV-139100 & JPTUV-139100-M1 & JPTUV-139100-M2 & JPTUV-139100-A1/M2, Report No.: CN22NCNY 001 & CN22NCNY 002 & CN22NCNY 003 & CN22NCNY 004).

Details information of the battery, as following:

Product	Li-ion Battery
Model No.	14500 500mAh

Nominal voltage	3.7V
Rated capacity	500mAh
Recommend charging method declared by the manufacturer	Charging the battery with 0.2C (100mA) constant current, 4.2V constant voltage until current reaches 0.02C (10mA)
Maximum charging current	250mA
Maximum discharge current	250mA
Maximum charging voltage	4.20V
Specified final voltage	3.0V

Summary of testing:

Tests Performed (name of test and test clause):

Tests are made with the number of samples specified in Table 1 of IEC 62133-2:2017/AMD1:2021.

Test items:

cl.5.6.2 Design recommendation;

cl.7.1 Charging procedure for test purposes;

cl.7.2.2 Case stress at high ambient temperature (batteries);

cl.7.3.2 External short circuit (batteries);

cl.7.3.3 Free fall (batteries);

cl.7.3.6 Over-charging of battery;

cl.7.3.8.1 Vibration;

cl.7.3.8.2 Mechanical shock;

cl.8.2 Small cell and battery safety information.

The cell (model: IMR14500-500mAh) inside the battery is CB approved according to IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021 by TUV Rheinland (CB Certificate No.: JPTUV-139100 & JPTUV-139100-M1 & JPTUV-139100-M2 & JPTUV-139100-A1/M2, Report No.: CN22NCNY 001 & CN22NCNY 002 & CN22NCNY 003 & CN22NCNY 004).

☒ **The product fulfils the requirements of EN 62133-2:2017/A1:2021**

Testing location:

Dongguan ZRLK Testing Technology Co., Ltd.

Building 2, No.1, Technology 10th Road, Songshan Lake Park, Dongguan, Guangdong, China

Test conclusion:

The Li-ion Battery submitted by Dongguan Baijiaying Electronic Technology Co., Ltd. are tested according to 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.

Test result: Pass.

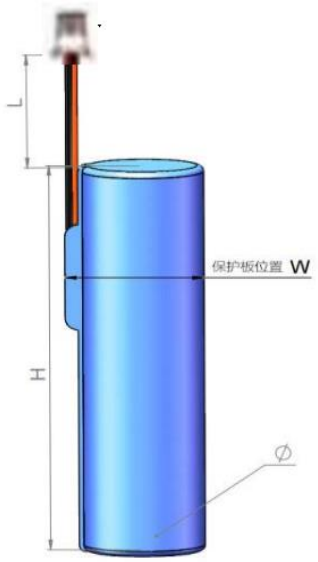
Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Li-ion Battery
14500 500mAh
3.7V, 1.85Wh 1IMR15/50 YYMMDD
Dongguan Baijiaying Electronic Technology Co., Ltd.
Caution: Do not short circuit.

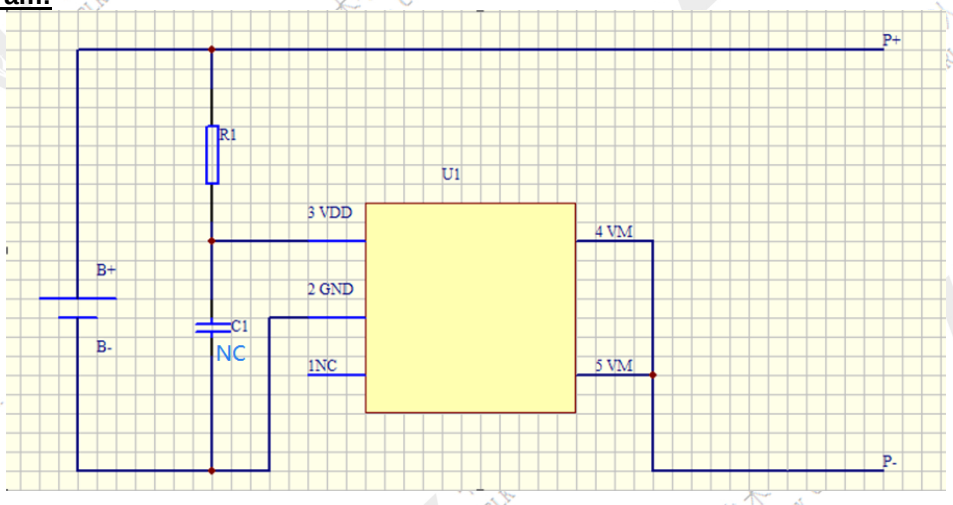
Remark: “YYMMDD” represents the date of manufacture, “YY” represents the year, “MM” represents the month, “DD” represents the date.

Construction:



W*H =16.0 (max)*50.5 (max)
Battery (Unit: mm)

Circuit diagram:



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 metal surfaces exist.	N/A
	Insulation resistance (MΩ) ..... :	N/A	—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate clearances 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 top of the 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	Overcharge, over discharge, over current and short-circuit proof circuit used in this battery, see tests of clause 7.	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	See above.	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 manufacturer's specification.	P
5.5	**Terminal contacts**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	DC connector complied with the requirements.	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	DC connector complied with the requirements.	P
	Terminal contacts are arranged to minimize the risk of short circuits		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	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 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	Safety analysis report provided by manufacturer.	P
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	Charging voltage of cell: 4.20V, not exceed 4.20V specified in Clause 7.1.2, Table 2.	P

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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	Final voltage of battery: 3.0V, 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		P
	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.	P
	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 should be provided by end product.	P
	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**	Complied.	P

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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	Quality plan provided.	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	Not coin cells	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 over discharge 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 ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery has 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		N/A
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	After stabilization for 1 h to 4 h, at an ambient 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		N/A
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)	CB approved cell used.	N/A
	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		N/A
	Results: no fire, no explosion, no leakage.....:	(See appended table 7.2.1)	N/A
7.2.2	Case stress at high ambient temperature (battery)	Tested as client requested.	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 resulting in exposure of internal protective components and cells.	P
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)	CB approved cell used.	N/A
	The cells were tested until one of the following occurred:		N/A
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		N/A
	Results: no fire, no explosion.....:	(See appended table 7.3.1)	N/A
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		P
	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	Shorting single fault conducted on two samples.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	A single fault applies to protective component parts such as MOSFET (metal oxide semiconductor field-effect transistor), fuse, thermostat or positive temperature coefficient (PTC) thermistor	Shorting single fault applies on IC U1 (Pin2-Pin4).	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	No fire. No explosion	P
7.3.4	Thermal abuse (cells)	CB approved cell used.	N/A
	Oven temperature (°C) ..... :	130°C	—
	Results: no fire, no explosion		N/A
7.3.5	Crush (cells)	CB approved cell used.	N/A
	The crushing force was released upon:		N/A
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		N/A
	- 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)	N/A
7.3.6	Over-charging of battery		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 applied.	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	1.0A applied.	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		P
	- Returned to ambient		N/A
	Results: no fire, no explosion ..... :	(See appended table 7.3.6)	P
7.3.7	Forced discharge (cells)	CB approved cell used.	N/A
	Discharge a single cell to the lower limit discharge voltage specified by the cell manufacturer		N/A
	The discharged cell is then subjected to a forced discharge at 1 It A to the negative value of the upper limit charging voltage		N/A

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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		N/A
	Results: no fire, no explosion ..... :	(See appended table 7.3.7)	N/A
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)	CB approved cell used and this test passed according to cell CB report.	N/A
	The cells complied with national requirement for ..... :	France, Japan, Republic of Korea and Switzerland	—
	The pressing was stopped upon:		N/A
	- 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		N/A
	Results: no fire ..... :	(See appended table 7.3.9)	N/A
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 provided to the end user		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Do not allow children to replace batteries without adult supervision		N/A
8.2	**Small cell and battery safety information**	Not small battery.	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 are 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 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 battery	N/A
	Batteries are marked with an appropriate caution statement	Batteries also marked with an appropriate caution statement.	P
	- Terminals have clear polarity marking on the external surface of the battery, or	DC connector used.	N/A
	- Not be marked with polarity markings if the design of the external connector prevents reverse polarity connections	External connectors can prevent reverse polarity connections.	P
9.3	**Caution for ingestion of small cells and batteries**	Not small batteries.	N/A
	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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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		N/A
9.4	**Other information**		P
	The following information are marked on or supplied with the battery:		P
	- Storage and disposal instructions	Information for storage and 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	Not coin cells.	N/A
ANNEX A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		N/A
A.1	**General**	CB approved cell used.	N/A
A.2	**Safety of lithium ion secondary battery**		N/A
A.3	**Consideration on charging voltage**		N/A
A.3.1	General		N/A
A.3.2	Upper limit charging voltage		N/A
A.3.2.1	General		N/A
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**		N/A
A.4.1	General		N/A
A.4.2	Recommended temperature range		N/A
A.4.2.1	General		N/A
A.4.2.2	Safety consideration when a different recommended temperature range is applied		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
A.4.6	Consideration of discharge		N/A
A.4.6.1	General		N/A
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		N/A
A.4.6.3	Discharge current and temperature range		N/A
A.4.6.4	Scope of application of the discharging current		N/A
A.5	**Sample preparation**		N/A
A.5.1	General		N/A
A.5.2	Insertion procedure for nickel particle to generate internal short		N/A
A.5.3	Disassembly of charged cell		N/A
A.5.4	Shape of nickel particle		N/A
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		N/A
A.6	**Experimental procedure of the forced internal short-circuit test**		N/A
A.6.1	Material and tools for preparation of nickel particle		N/A
A.6.2	Example of a nickel particle preparation procedure		N/A
A.6.3	Positioning (or placement) of a nickel particle		N/A
A.6.4	Damaged separator precaution		N/A
A.6.5	Caution for rewinding separator and electrode		N/A
A.6.6	Insulation film for preventing short-circuit		N/A
A.6.7	Caution when disassembling a cell		N/A
A.6.8	Protective equipment for safety		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
A.6.9	Caution in the case of fire during disassembling		N/A
A.6.10	Caution for the disassembling process and pressing the electrode core		N/A
A.6.11	Recommended specifications for the pressing device		N/A
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		N/A
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**	Not coin cells.	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
ANNEX F	**COMPONENT STANDARDS REFERENCES**		N/A

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

7.2.1	TABLE: Continuous charging at constant voltage (cells)			N/A
Sample No.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**
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Supplementary information:				

7.3.1	TABLE: External short circuit (cell)				N/A
Sample No.	**Ambient (°C)**	**OCV at start of test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature ~~rise ΔT~~ (°C)**	**Results**
Samples charged at charging temperature upper limit (°C)					
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Samples charged at charging temperature lower limit (°C)					
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Supplementary information:					

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**
Battery 4#	23.4	4.19	74	118.9	IC U1 (Pin2-Pin4) S-C	P
Battery 5#	23.4	4.19	80	117.6	IC U1 (Pin2-Pin4) S-C	P
Battery 6#	23.4	4.18	81	23.8	--	P
Battery 7#	23.4	4.18	78	23.6	--	P
Battery 8#	23.4	4.18	77	23.6	--	P
Supplementary information: - No fire or explosion Remark: S-C: short circuit						

7.3.5	TABLE: Crush (cells)			N/A
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 (°C)				
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Samples charged at charging temperature lower limit (°C)				
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Supplementary information:				

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

7.3.6	TABLE: Over-charging of battery		P
Constant charging current (A) .....:		1.0	—
Supply voltage (Vdc) .....:		5.88	—

Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
Battery 12#	3.28	110	26.5	P
Battery 13#	3.27	110	26.2	P
Battery 14#	3.33	110	26.9	P
Battery 15#	3.31	110	26.6	P
Battery 16#	3.30	110	26.9	P

Supplementary information:
- No fire or explosion

7.3.7	TABLE: Forced discharge (cells)			N/A

Sample No.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_t (A)	Lower limit discharge voltage (Vdc)	Results
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Supplementary information:

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
Battery 17#	4.19	4.18	18.176	18.174	P
Battery 18#	4.18	4.16	18.214	18.210	P
Battery 19#	4.19	4.17	18.106	18.104	P

Supplementary information:
- No fire or explosion
- No rupture
- No leakage
- No venting

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

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**
Battery 20#	4.18	4.17	18.129	18.128	P
Battery 21#	4.18	4.17	18.232	18.231	P
Battery 22#	4.19	4.18	18.162	18.162	P

Supplementary information:
- No fire or explosion
- No rupture
- No leakage
- No venting

7.3.9	TABLE: Forced internal short circuit (cells)				N/A
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 (°C)					
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Samples charged at charging temperature lower limit (°C)					
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Supplementary information:
[1)] Identify one of the following:
1: Nickel particle inserted between positive and negative (active material) coated area.
2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

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)]**
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Supplementary information:

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

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

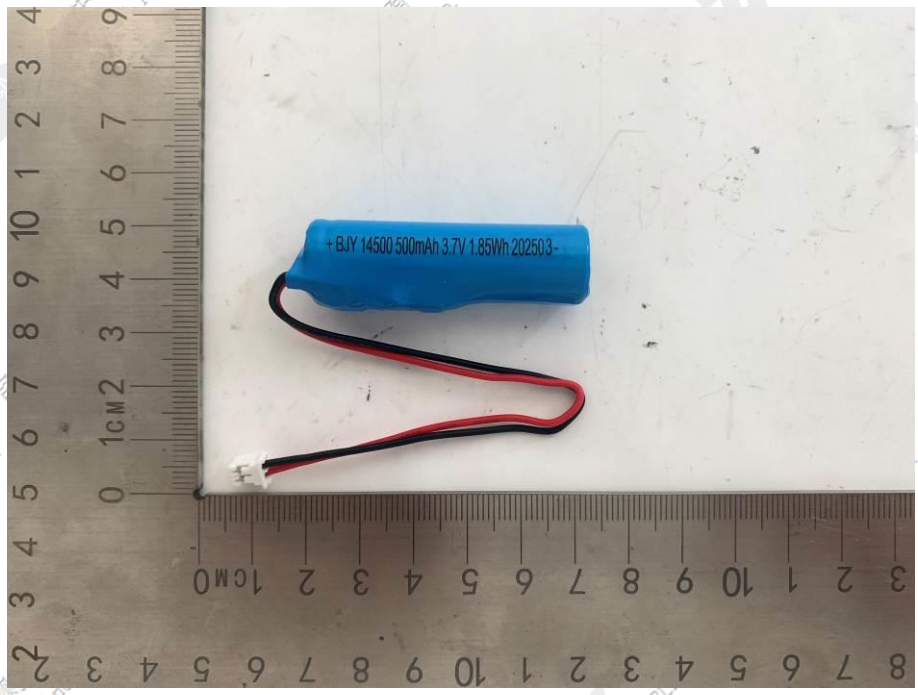
	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Wiring	Dongguan YingChang Electronic Technology Co Ltd	1007	24AWG, 80°C, 300Vac	UL 758	UL E518742
Wiring (Alternative)	Interchangeable	Interchangeable	24AWG minimum, Min. 80°C, Min. 300Vac	UL 758	UL approved
Connector	Shenzhen Yuankaitai Eiectronic Technology Co., Ltd	2.0-2P	2 Pins, Temperature range: -25°C ~ 85°C	--	--
PCB	SHENZHEN XING BAO SHUN ELECTRONICS SCIENTIFIC CO LTD	ZXD-1732-ZV4-YL	130°C, Min. Thk.: 0.6mm	--	--
PCB (Alternative)	Interchangeable	Interchangeable	130°C, Min. Thk.: 0.6mm	--	--
Protect IC (U1)	Suzhou XySemi Electronic Technology Co., Limited.	XB5401A	Overcharge detection voltage: 4.30±0.05V, Overdischarge detection voltage: 2.40±0.10V, Operating Ambient Temperature: -40°C to +85°C	--	Tested with appliance
Cell	Xinxiang Hongli Supply Source Technology Co., Ltd.	IMR14500-500mAh	3.7V, 500mAh	IEC 62133-2:2017/AMD1:2021	TÜV Rheinland CB Certificate No.: JPTUV-139100 & JPTUV-139100-M1 & JPTUV-139100-M2 & JPTUV-139100-A1/M2, Report No.: CN22NCNY 001 & CN22NCNY 002 & CN22NCNY 003 & CN22NCNY 004

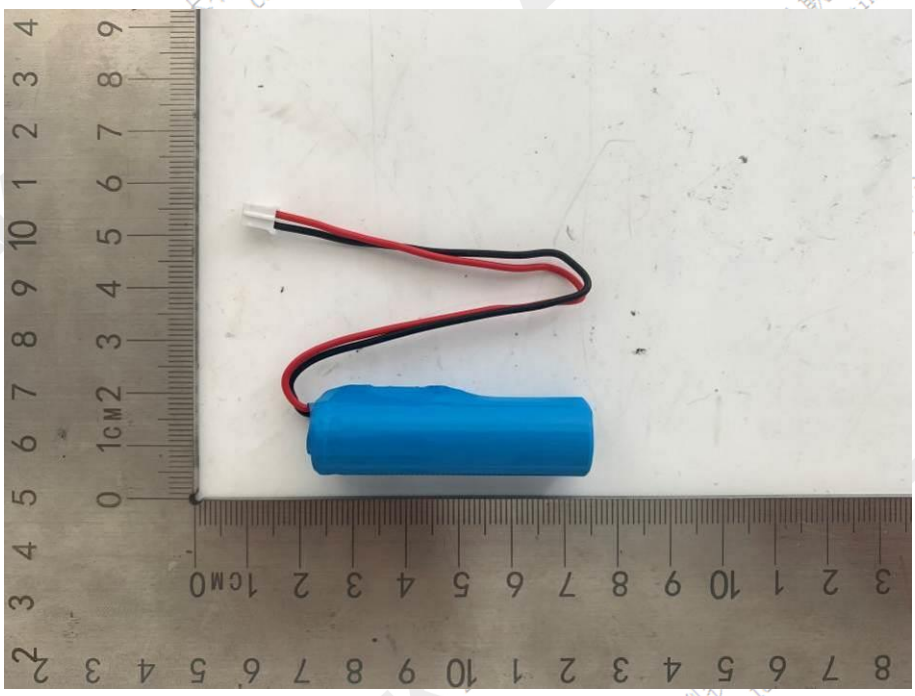
Supplementary information:

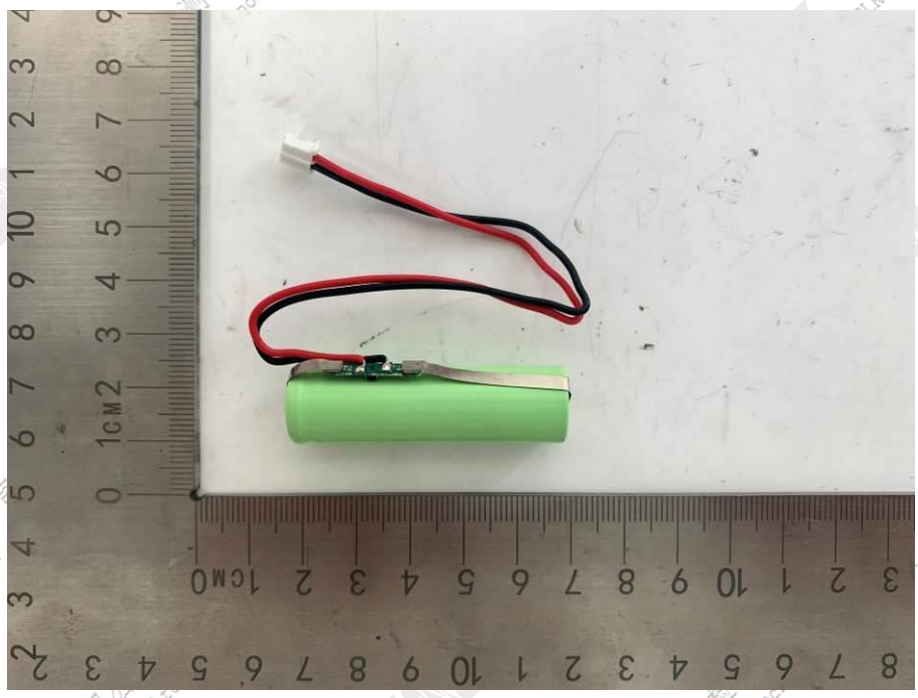
[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

Photos

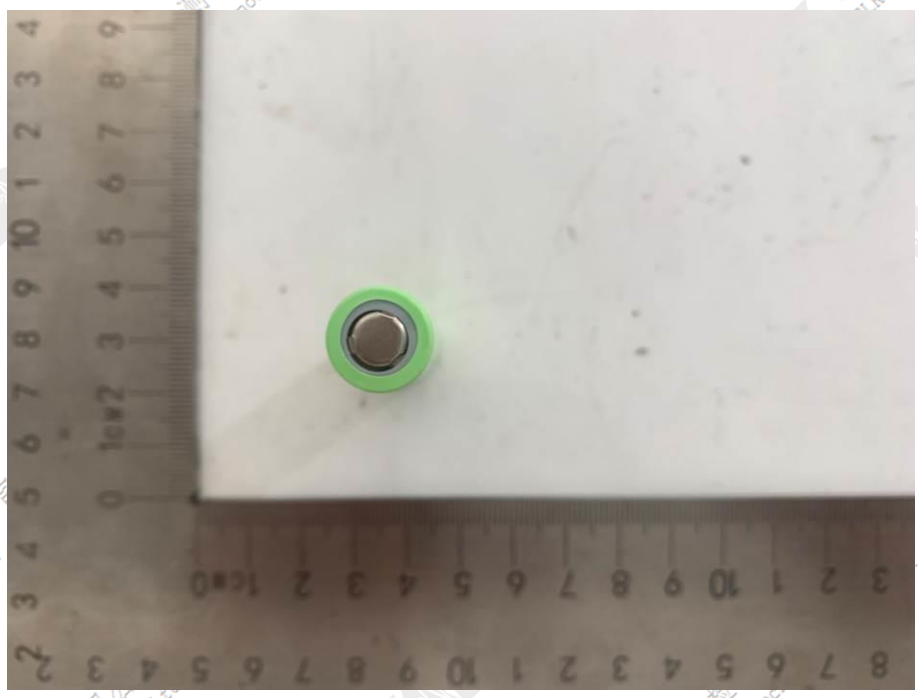
Model: 14500 500mAh

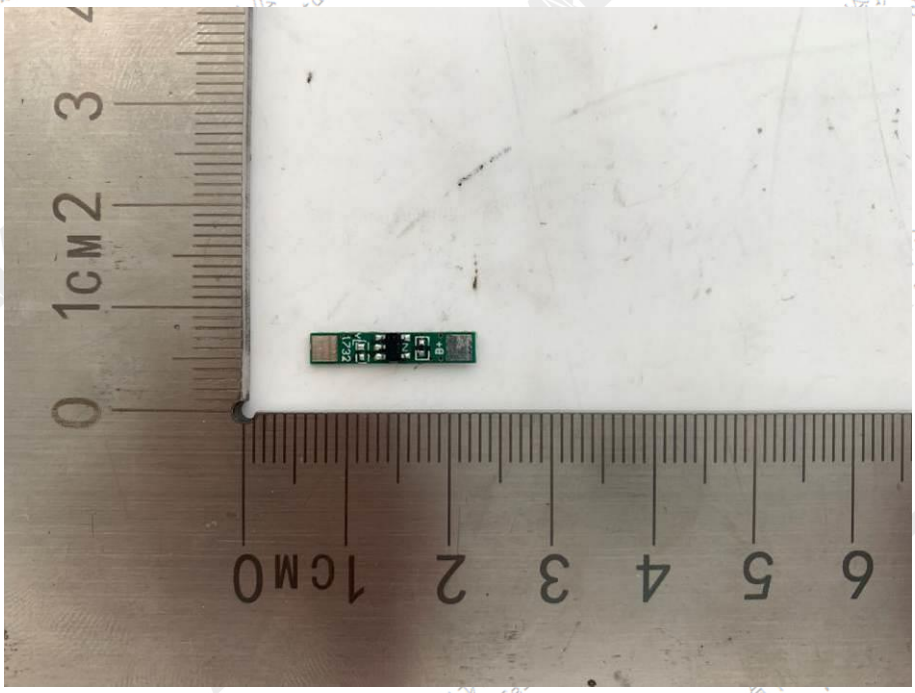


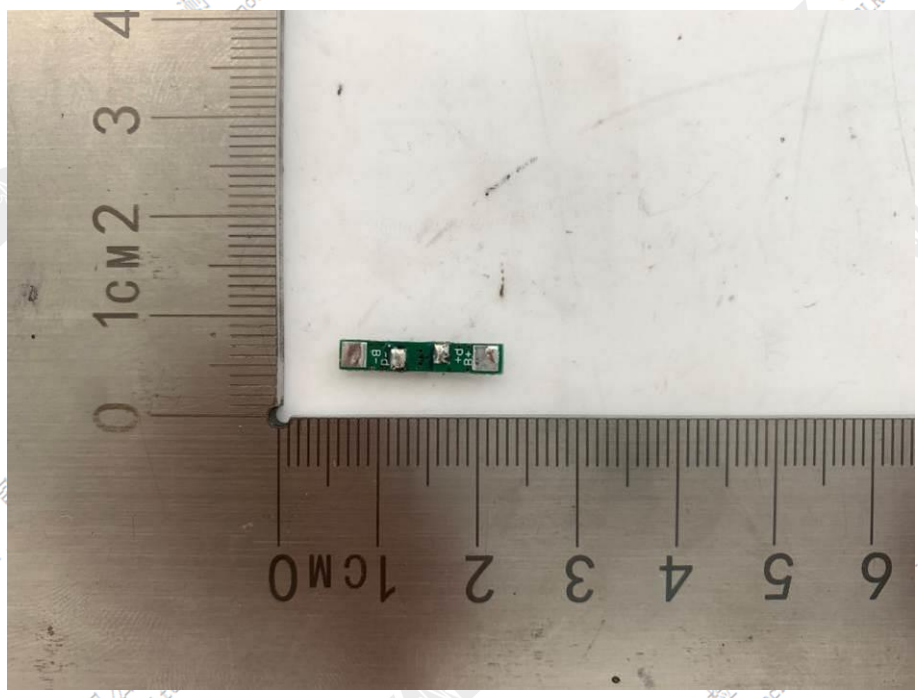





VX IMR14500-500mAh 3.7V
500mAh 1.85Wh 20250215







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