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CNAS L10443

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. .....:	DGCTL202509160022A
Date of issue .....:	2025-09-29
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Address .....:	Room 502, Building 4, No.1 Yanhu East Road, Shilongkeng, Liaobu Town, Dongguan City, Guangdong Province, P.R. China.
Applicant's name.....:	Shenzhen Yisheng Energy Co., Ltd.
Address .....:	Room 101, No. 4, Minghui Factory Building, Lixin North Road, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen
Manufacturer's name .....:	Shenzhen Yisheng Energy Co., Ltd.
Address .....:	Room 101, No. 4, Minghui Factory Building, Lixin North Road, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen
Test specification:	
Standard.....:	IEC62133-2:2017, IEC62133-2:2017/AMD1:2021
Test procedure .....:	Test Report
Non-standard test method.....:	N/A
Test item description .....:	Rechargeable lithium-ion battery
Trade Mark .....:	N/A
Model/Type reference .....:	603075
Ratings .....:	3.7V, 1750mAh, 6.475Wh

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 CTL. The authenticity of this Test Report and its contents can be verified by contacting the CTL, responsible for this Test Report.

Testing procedure and testing location:	
Testing Laboratory .....:	Dongguan CTL Electromagnetic Technology Co., Ltd.
Testing location/ address .....:	Room 502, Building 4, No.1 Yanhu East Road, Shilongkeng, Liaobu Town, Dongguan City, Guangdong Province, P.R. China.
Mail: linqunshuang@lgt-cert.com	Website: www.lgt-cert.com
List of Attachments (including a total number of pages in each attachment): Attachment NO.1: 3 pages of Photo Documentation	
Summary of testing:	
Tests performed (name of test and test clause): Tests are made with the number of samples specified in Table 2 of IEC 62133-2: 2017+AMD1: 2021. cl. 7.2.1 Continuous charging at constant voltage (cells) cl. 7.2.2 Moulded case stress at high ambient temperature (battery) cl. 7.3.1 External short-circuit (cell) cl. 7.3.2 External short-circuit (battery) cl. 7.3.3 Free fall (cell and battery) cl. 7.3.4 Thermal abuse (cells) cl. 7.3.5 Crush (cells) cl. 7.3.6 Over-charging of battery cl. 7.3.7 Forced discharge (cells) cl. 7.3.8.1 Vibration cl. 7.3.8.2 Mechanical shock cl. 7.3.9 Forced internal short circuit (cells)	**Testing location:** Dongguan CTL Electromagnetic Technology Co., Ltd. Room 502, Building 4, No.1 Yanhu East Road, Shilongkeng, Liaobu Town, Dongguan City, Guangdong Province, P.R. China.
Summary of compliance with National Differences List of countries addressed: List of countries addressed: N/A	

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
Model: 603075 (1ICP6/30/73)
3.7V 1750mAh 6.475Wh
Shenzhen Yisheng Energy Co., Ltd.
-Do not short circuit
-Do not dispose in fire or expose to high temperature the fire
YYYYMMDD

MADE IN CHINA

Test item particulars ..... :	
Classification of installation and use ..... :	Build-in and use in portable applications
Supply connection ..... :	Connector
Recommend charging method declared by the manufacturer ..... :	Charging the battery with 875mA constant current and 4.2V constant voltage until the current reduces to 87.5mA at ambient 20°C±5°C.
Discharge current (0,2 I_t A) ..... :	350mA
Chemistry ..... :	☐ nickel systems ..... ☒ lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell ..... :	4.25V
Maximum charging current ..... :	1750mA
Charging temperature upper limit ..... :	45°C
Charging temperature lower limit ..... :	5°C
Polymer cell electrolyte type ..... :	☐ gel polymer ..... ☐ solid polymer
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 ..... :	2025-09-16
Date (s) of performance of tests ..... :	2025-09-16 to 2025-09-29

General remarks:

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 testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	Same as Manufacturer

General product information and other remarks:

This battery is constructed with single Li-ion cell(1S1P), and has overcharge, over-discharge, over current and short-circuits proof circuit.

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

Model (battery)	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Final Voltage
603075	1750mAh	3.7V	875mA	875mA	1750mA	1750mA	4.25V	2.75V

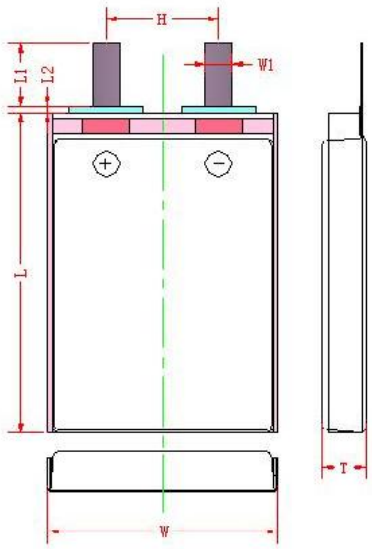
The main features of the cell in the battery are shown as below (clause 7.1.1):

Model (cell)	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Final Voltage
603075	1750mAh	3.7V	875mA	875mA	1750mA	1750mA	4.25V	2.75V

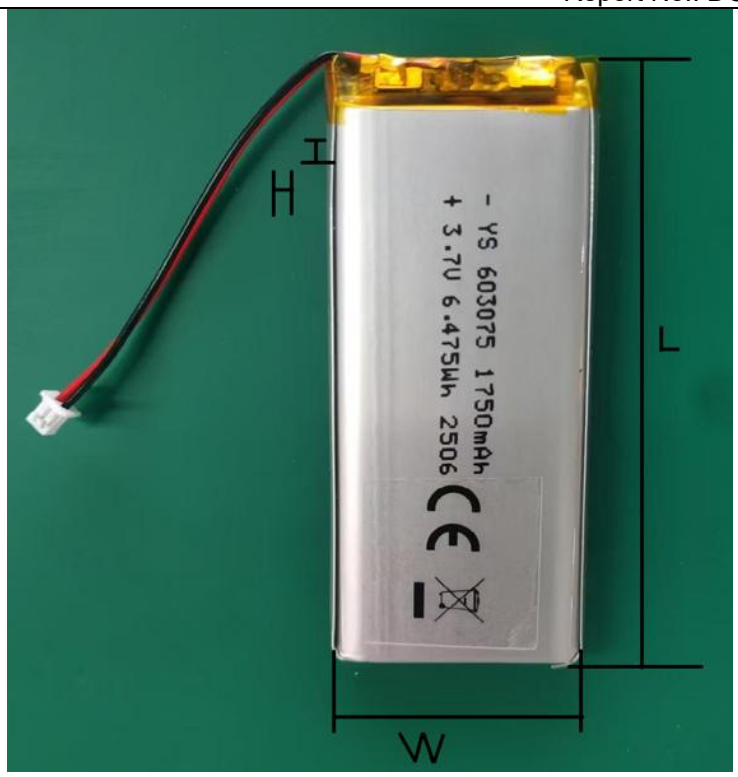
The main features of the cell in the battery are shown as below (clause 7.1.2):

Model (cell)	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
603075	4.25V	87.5mA	5°C	45°C

Construction:

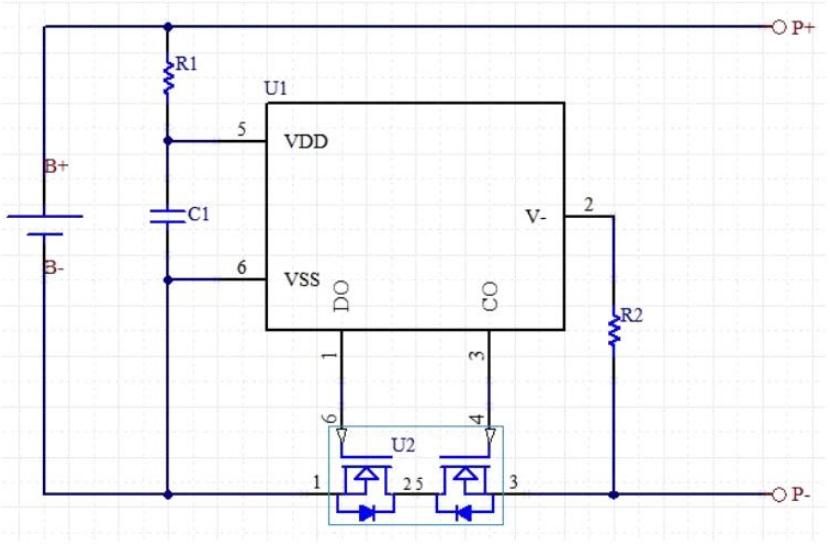


T: Max. 6.0mm, W: Max. 30.0mm, L: Max. 73.0mm
Cell



T: Max. 6.5mm, W: Max. 30.5mm, L: Max. 76mm
Battery

Circuit diagram:



IEC 62133-2: 2017+AMD1: 2021			
Clause	Requirement + Test	Result - Remark	Verdict
4	**Parameter measurement tolerances**		**P**
	Parameter measurement tolerances		P
5	**General safety considerations**		**P**
5.1	General		P
5.2	Insulation and wiring		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 surface 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 creepage and clearance 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 narrow side of the pouch 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/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 associated chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the battery specifications.	P
5.5	Terminal contacts		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P

IEC 62133-2: 2017+AMD1: 2021			
Clause	Requirement + Test	Result - Remark	Verdict
	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 circuits		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		P
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions		N/A
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly	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 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.	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	Max. Charging voltage of each cell block: 4.2V, not exceed 4.25V specified in Clause 7.1.2, Table 2.	P

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 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 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 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	Final voltage of cell: 2.75V, not exceed the final voltage specified by cell manufacturer.	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		P
	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	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	The mechanical protection provided by the battery case.	N/A
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		N/A
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		N/A
5.7	Quality plan		P

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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	The manufacturer has such quality plan	P
5.8	**Battery safety components**	See TABLE: Critical components information	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
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1	Not coin cell	N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection		P
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test	See clause 7.3.2.	P
7	**Specific requirements and tests (lithium systems)**		**P**
7.1	Charging procedures 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	See page 4.	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	See page 4.	P
7.1.2	Second procedure: This charging procedure applied to the tests of 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P

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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	Charge temperature range: 5-45°C declared. 5°C used for lower limit tests. 45°C used for upper limit tests.	P
7.2	Intended use		P
7.2.1	Continuous charging at constant voltage (cells)		P
	Results: No fire. No explosion..... :	(See Table 7.2.1)	P
7.2.2	Moulded case stress at high ambient temperature (battery)		P
	Oven temperature (°C)..... :	70	—
	Results: No physical distortion of the battery casing resulting in exposure of internal components	No physical distortion of the battery casing.	P
7.3	Reasonably foreseeable misuse		P
7.3.1	External short-circuit (cell)		P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion..... :	(See Table 7.3.1)	P
7.3.2	External short-circuit (battery)		P
	The batteries were tested until one of the following occurred: - 24 hours elapsed; or		P
	- The case temperature declined by 20% of the maximum temperature rise		P
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		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	Single fault conducted on four samples.	P
	A single fault in the discharge protection circuit should be conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test.	Single fault applies on MOSFET (U2)	P

IEC 62133-2: 2017+AMD1: 2021			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion..... :	(See Table 7.3.2)	P
7.3.3	Free fall		P
	Results: No fire. No explosion.	No fire. No explosion.	P
7.3.4	Thermal abuse (cells)		P
	The cells were held at 130°C ± 2°C for: - 30 minutes		P
	Oven temperature (°C)..... :	130°C	—
	Results: No fire. No explosion.	No fire, No explosion.	P
7.3.5	Crush (cells)		P
	The crushing force was released upon:		P
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: no fire, no explosion..... :	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery		P
	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	5.95V 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		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)		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

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
	Discharge a single cell to the lower limit discharge voltage specified by the cell manufacturer		P
7.3.8	Mechanical tests (batteries)		P
7.3.8.1	Vibration		P
	Results: No fire, no explosion, no rupture, no leakage or venting	(See Table 7.3.8.1)	P
7.3.8.2	Mechanical shock		P
	Results: no leakage, no venting, no rupture, no explosion and no fire	(See Table 7.3.8.2)	P
7.3.9	Design evaluation – Forced internal short circuit (cells)		P
	The cells complied with national requirement for .....:	France, Japan, Republic of Korea and Switzerland.	—
	The pressing was stopped upon: - 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	P
	Results: No fire ..... :	(See 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: 2017+AMD1: 2021			
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 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		N/A
	Cells 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	The battery is marked in accordance with IEC 61960, also see copy of marking plate.	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		P
	- Terminals have clear polarity marking on the external surface of the battery, or	The “+” and “-” polarity explicitly marked on surface of the battery.	P
	- Not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		N/A

IEC 62133-2: 2017+AMD1: 2021			
Clause	Requirement + Test	Result - Remark	Verdict
9.3	Caution for ingestion of small cells and batteries	Not small battery.	N/A
	Coin cells and batteries identified as small batteries according to 8.2 shall 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
	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 not small enough to fit within the limits of the ingestion gauge of Figure 3	Not coin cell.	N/A
Annex A	**Charging range of secondary lithium ion cells for safe use**		**P**
A.1	General		P
A.2	Safety of lithium-ion secondary battery		P
A.3	Consideration on charging voltage		P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4.25V applied.	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.25V applied.	P
A.4	Consideration of temperature and charging current		P
A.4.1	General		P
A.4.2	Recommended temperature range		P
A.4.2.1	General		P

IEC 62133-2: 2017+AMD1: 2021			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature range declared by client is 5-45°C.	P
A.4.3	High temperature range		N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		N/A
A.4.3.4	Safety consideration when specifying new upper limit in 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 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	Cell specified final voltage 2.75V, not exceed 2.75V specified by cell manufacturer.	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
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N/A
A.5.6	Insertion of nickel particle to prismatic cell		P

IEC 62133-2: 2017+AMD1: 2021			
Clause	Requirement + Test	Result - Remark	Verdict
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		P
A.6.4	Damaged separator precaution		P
A.6.5	Caution for rewinding separator and electrode		P
A.6.6	Insulation film for preventing short-circuit		P
A.6.7	Caution when disassembling a cell		P
A.6.8	Protective equipment for safety		P
A.6.9	Caution in the case of fire during disassembling		P
A.6.10	Caution for the disassembling process and pressing the electrode core		P
A.6.11	Recommended specifications for the pressing device		P
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		P
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		P
Annex D	**Measurement of the internal AC resistance for coin cells**		**N/A**
D.1	General	Not coin cell.	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 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**		P
ANNEX F	**COMPONENT STANDARDS REFERENCES**		N/A

	TABLE: Critical components information				P
Object/part no.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard**	**Mark(s) of conformity**
Cell	Shenzhen Feipeng New Energy Technology Co., Ltd.	603075	3.7V, 1750mAh	IEC 62133-2: 2017+ AMD1: 2021	Test with appliance
- Electrolyte	Jiangxi Jinhui Lithium Battery Materials Co., Ltd.	SZFP023	LiPF6, (Ms/cm2): 8.13 H2O≤ 20ppm, LiPF6:14.5%	--	--
- Separator	henzhen Haike Power Supply Co., Ltd.	9+3+1μm 68*0.013mm	PE+ PVDF 68*0.013mm	--	--
-Negative electrode	Huizhou Xinshiyuan Technology Co., Ltd	M10 (C: 99.8%)	Graphite	--	--
-Positive electrode	Hunan Soundwin New Material Co. Ltd.	SR-AL(65%)	D50(μm):11.3±1.50μm, (m_2/g):0.34±0.20, (g/cm_3):≥2.50	--	--
	Guangxi Lijin New Material Co., Ltd.	LJM-01(25%)			
Protection IC(U1)	Dongguan Baiqiang power Technology Co., Ltd.	G3J	Overcharge Protection Voltage: 4.25±0.05V, Over-discharge Protection Voltage: 3.0±0.08V, Topr: -40°C~+85°C	--	--
MOSFET (U2)	Dongguan Baiqiang power Technology Co., Ltd.	8205A	V_{DS}: 20V, V_{GS}: ±12V, I_D: 5A, T_J,T_{STG}: TSTG: -55°C~+150°C	--	--
PCB	SHEN ZHEN SHI JI RUI DA CIRCUIT TECHNOLOGY Co., Ltd	JRD-S	V-0, 130ºC	UL 94 UL 796	UL E340032
PCB (Alternative)	Interchangeable	Interchangeable	V-0, 130ºC	UL 94 UL 796	UL approved
Lead wire	Maoming Shi Lingzhong Electronics Co., Ltd.	1007	26AWG, 80ºC, 30V	UL 758	UL approved
Supplementary information: N/A					

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Model	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**
#C1	4.2	0.875	4.17	A,B
#C2	4.2	0.875	4.17	A,B
#C3	4.2	0.875	4.18	A,B
#C4	4.2	0.875	4.18	A,B
#C5	4.2	0.875	4.17	A,B
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)				

7.3.1	TABLE: External short circuit (cell)				P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature ~~rise ΔT~~, (°C)**	**Results**
Samples charged at charging temperature upper limit(45ºC)					
#C6	55.6	4.22	0.082	101.3	A,B
#C7	55.6	4.21	0.086	103.8	A,B
#C8	55.6	4.22	0.088	109.4	A,B
#C9	55.6	4.22	0.085	112.3	A,B
#C10	55.6	4.21	0.083	103.5	A,B
Samples charged at charging temperature lower limit(5ºC)					
#C11	55.1	4.18	0.081	112.1	A,B
#C12	55.1	4.18	0.085	118.5	A,B
#C13	55.1	4.19	0.083	116.6	A,B
#C14	55.1	4.18	0.085	114.3	A,B
#C15	55.1	4.17	0.084	118.2	A,B
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)					

7.3.2	TABLE: External short circuit (battery)				P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature ~~rise ΔT~~, (°C)**	**Results**
Fault condition: U2					
#B1	23.2	4.18	0.083	101.2	A,B
#B2	23.2	4.17	0.084	104.6	A,B
#B3	23.2	4.18	0.085	102.5	A,B
#B4	23.3	4.17	0.081	109.7	A,B
Normal condition					
#B5	23.2	4.17	0.086	24.3	A,B
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)					

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)				
#C26	4.22	4.22	13	A,B
#C27	4.21	4.21	13	A,B
#C28	4.22	4.22	13	A,B
#C29	4.22	4.22	13	A,B
#C30	4.21	4.21	13	A,B
Samples charged at charging temperature lower limit (5°C)				
#C31	4.17	4.17	13	A,B
#C32	4.17	4.17	13	A,B
#C33	4.18	4.18	13	A,B
#C34	4.18	4.18	13	A,B
#C35	4.17	4.17	13	A,B
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)				

7.3.6	TABLE: Over-charging of battery	P
Constant charging current (A) .....:	3.5	—
Supply voltage (Vdc) .....:	5.95	—

Model	OCV before charging, (Vdc)	Total charging time (minute)	Maximum outer casing temperature, (°C)	Results
#B9	3.112	90	32.3	A,B
#B10	3.135	90	33.5	A,B
#B11	3.125	90	35.8	A,B
#B12	3.126	90	34.6	A,B
#B13	3.118	90	33.3	A,B

Supplementary information:

A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge
G- Others (please explain)

7.3.7	TABLE: Forced discharge (cells)	P

Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I_t, (A)	Time for reversed charge, (minutes)	Results
#C36	3.122	1.75	90	A,B
#C37	3.148	1.75	90	A,B
#C38	3.133	1.75	90	A,B
#C39	3.135	1.75	90	A,B
#C40	3.121	1.75	90	A,B

Supplementary information:

A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge
G- Others (please explain)

7.3.8.1	TABLE: Vibration				P
Model	**Pre-test Mass (g)**	**Pre-test Voltage (V)**	**After test Mass (g)**	**After test Voltage (V)**	**Results**
#B14	26.612	4.18	26.612	4.18	A,B
#B15	26.616	4.18	26.616	4.18	A,B
#B16	26.611	4.17	26.611	4.17	A,B
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)					

7.3.8.2	TABLE: Mechanical shock				P
Model	**Pre-test Mass (g)**	**Pre-test Voltage (V)**	**After test Mass (g)**	**After test Voltage (V)**	**Results**
#B17	26.619	4.18	26.619	4.18	A,B
#B18	26.611	4.17	26.611	4.17	A,B
#B19	26.618	4.17	26.618	4.17	A,B
Supplementary information: A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge G- Others (please explain)					

7.3.9	TABLE: Forced internal short circuit (cells)				P
Model	**Chamber ambient, (°C)**	**OCV at start of test, (Vdc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Results**
#C41	45	4.22	1	400	A
#C42	45	4.22	1	400	A
#C43	45	4.21	1	400	A
#C44	45	4.21	1	400	A
#C45	45	4.22	1	400	A
#C46	5	4.17	1	400	A
#C47	5	4.17	1	400	A
#C48	5	4.18	1	400	A
#C49	5	4.17	1	400	A
#C50	5	4.18	1	400	A

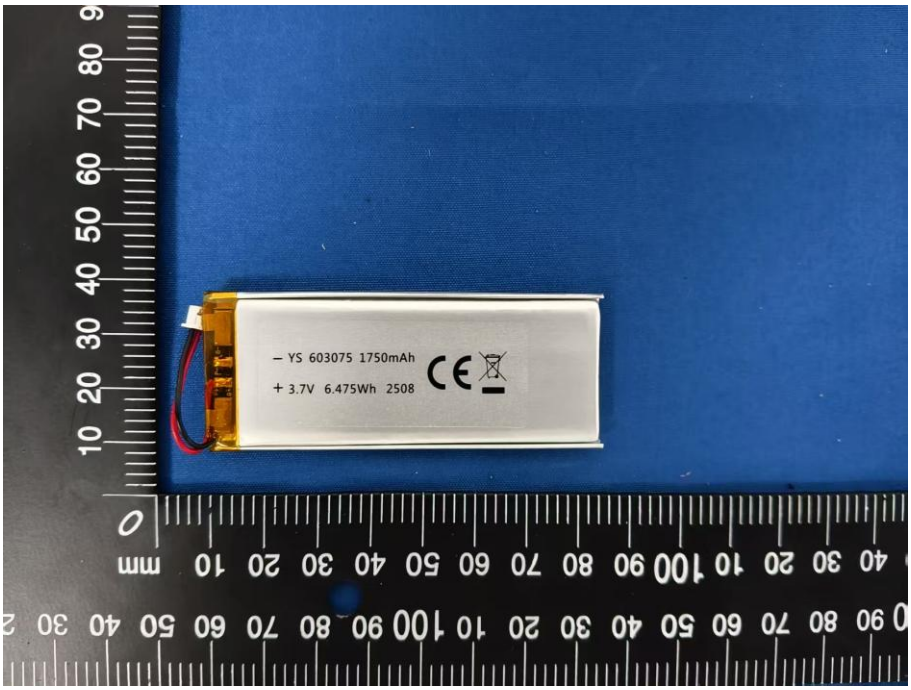
Supplementary information:
[1)] Identify one of the following:
1: Nickel particle inserted between positive and negative (active material) coated area.
2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

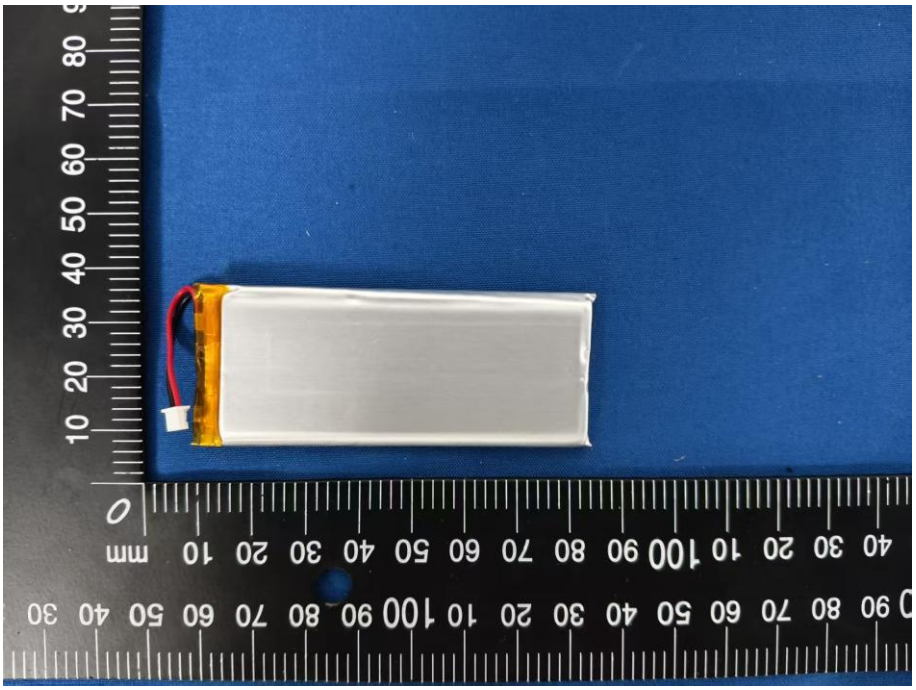
A- No fire or explosion B- No leakage C- Leakage D- Fire E- Explosion F- Bulge
G- Others (please explain)

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

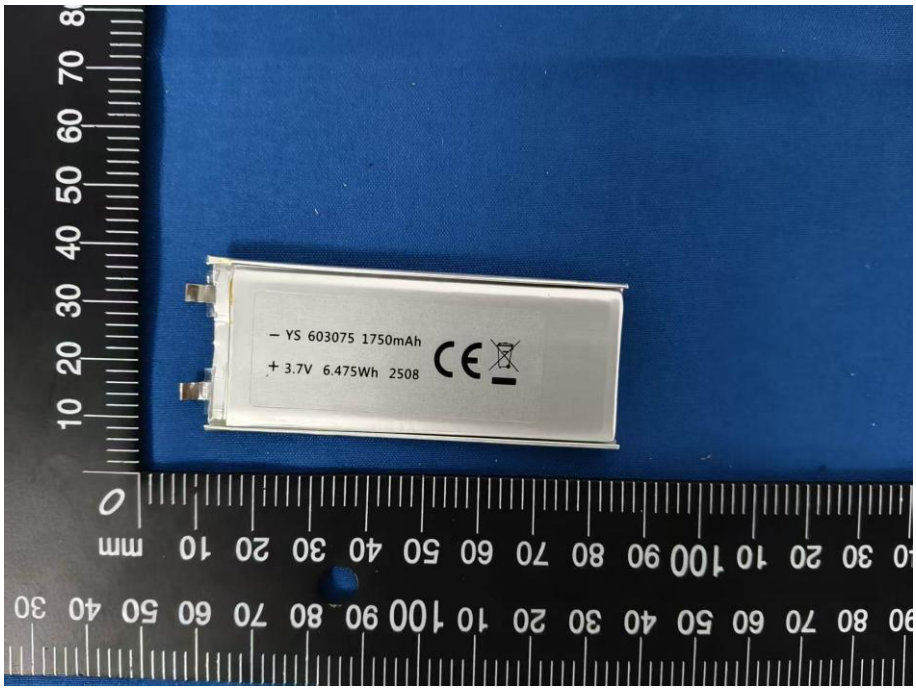
Supplementary information:

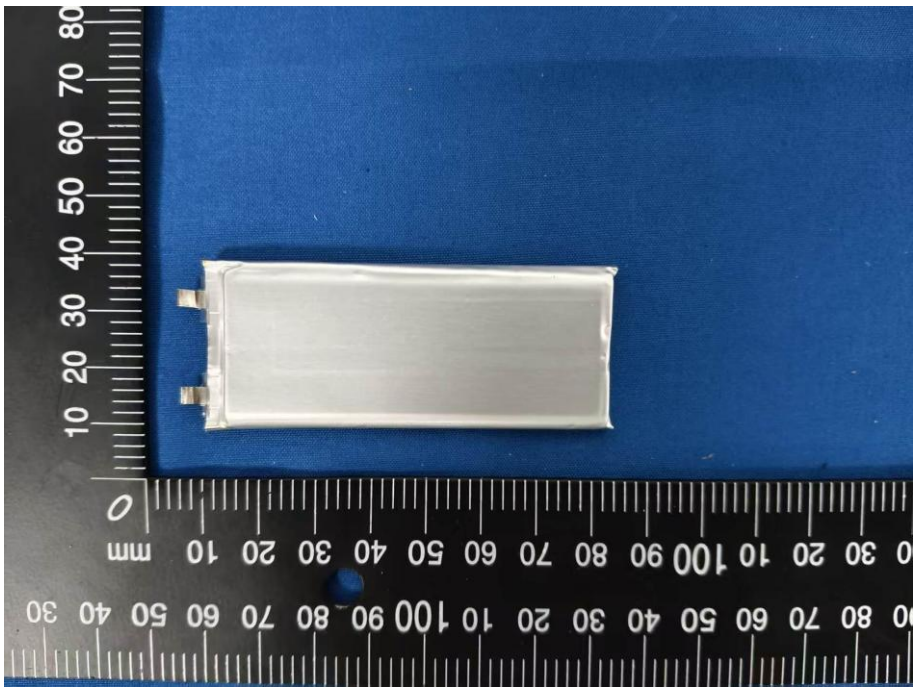
Attachment 1: Photo documentation



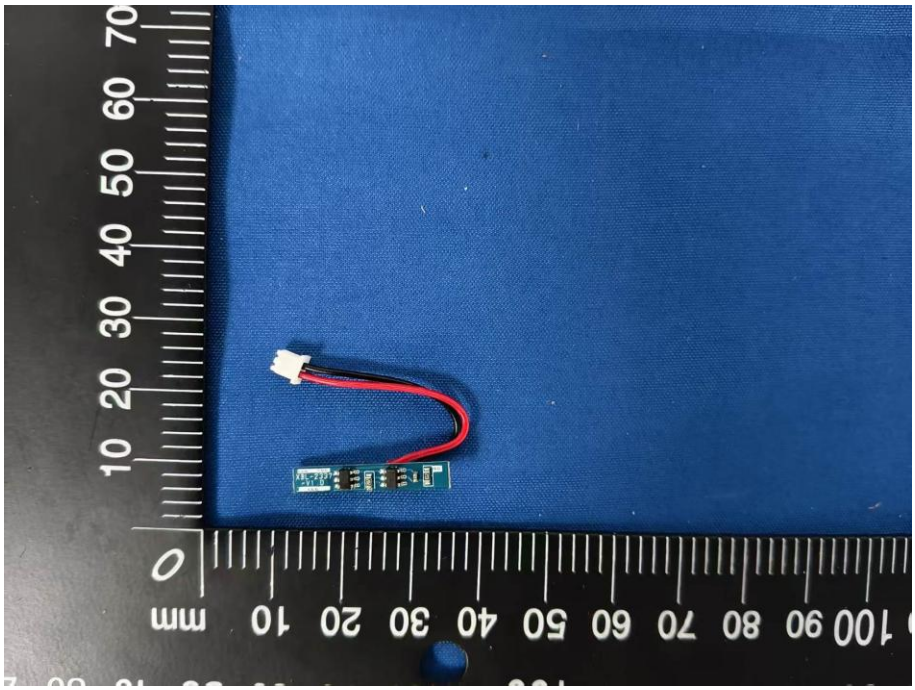


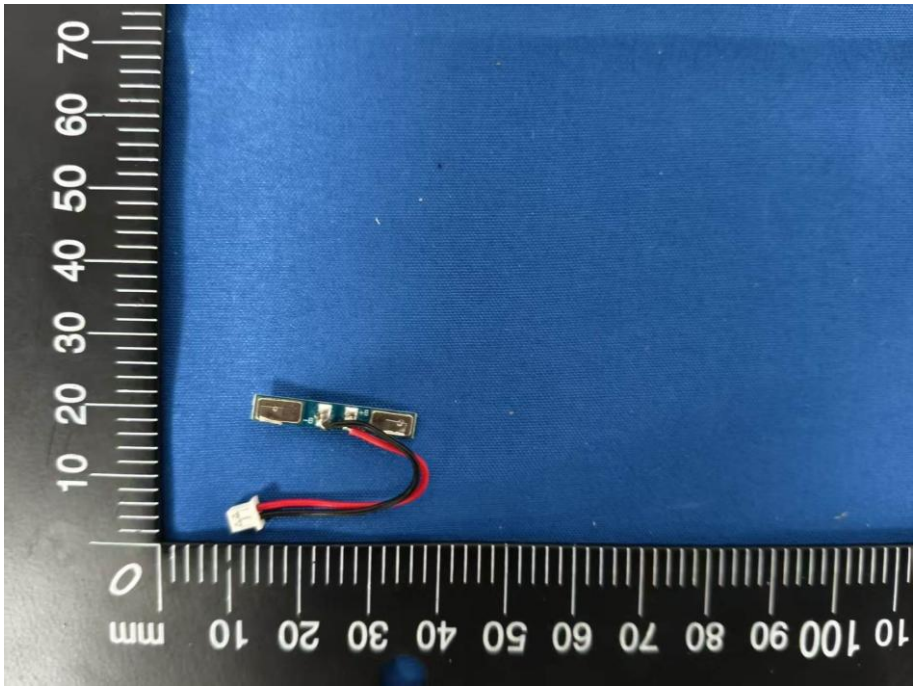
Attachment 1: Photo documentation





Attachment 1: Photo documentation





--End of Test Report--