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TEST REPORT

Sample name &Model	Li-ion Polymer Battery 402228
Consignor	SHENZHEN LINWEAR INNOVATION TECHNOLOGY CO.,LTD.
Manufacturer	Dongguan Oude Battery Co. LTD

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

TEST REPORT
IEC 62133-2
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications – Part 2: Lithium systems

Report Number.....:	CCJC2020A371801
Date of issue.....:	2020-11-19
Total number of pages.....:	27 pages
Applicant's name .....:	SHENZHEN LINWEAR INNOVATION TECHNOLOGY CO.,LTD.
Address.....:	3F,Building G,Dongsheng Science Park, No. 69 Guanlan Avenue,Longhua,Shenzhen
Manufacturer's name .....:	Dongguan Oude Battery Co. LTD
Address.....:	18 Juxiang 1st Road, Dalang Town, Dongguan city, Guangdong Province, China
Factory's name .....:	Dongguan Oude Battery Co. LTD
Address .....:	18 Juxiang 1st Road, Dalang Town, Dongguan city, Guangdong Province, China
Test specification:	
Standard .....:	IEC 62133-2:2017
Test procedure .....:	Test Report
Non-standard test method.....:	N/A
Test item description.....:	The lithium battery
Trade Mark.....:	N/A
Model/Type reference.....:	402228
Ratings.....:	3.7Vd.c., 210mAh, 0.777Wh.

Testing procedure and testing location:

Testing Laboratory:

Testing location/ address.....: Shenzhen CCJC Technology Co.,Ltd.

1st Floor, Xinbaoyi Industry and Trade Building B, Houting Community, Shajing Town, Bao'an District, Shenzhen City.Guangdong China

Tested by (name + signature).....: Li Yuanyong .....

Reviewed by (name + signature) .....: Alison Song .....

Approved by (name + signature).....: Roc Cheng .....

List of Attachments:

Appendix 1: 3 pages of Photo Documentation

Summary of testing:

Tests performed (name of test and test clause):

cl. 7.2.1 Continuous charging at constant voltage (cells)
cl. 7.2.2 Case stress at high ambient temperature (battery)
cl. 7.3.1 External short-circuit (cell)
cl. 7.3.2 External short-circuit (battery)
cl. 7.3.3 Free fall
cl. 7.3.4 Thermal abuse (cells)
cl. 7.3.5 Crush (cells)
cl. 7.3.6 Over-charging of battery
cl. 7.3.7 Forced discharge (cells)
cl. 7.3.8.1 Vibration
cl. 7.3.8.2 Mechanical shock
cl. 7.3.9 Design evaluation – Forced internal short-circuit (cells)

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

The samples comply with the requirement of IEC 62133-2:2017.

Testing location:

Shenzhen CCJC Technology Co.,Ltd.

1st Floor, Xinbaoyi Industry and Trade Building B, Houting Community, Shajing Town, Bao'an District, Shenzhen City.Guangdong China

Summary of compliance with National Differences

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

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 Polymer Battery

402228 1ICP4/22/27

3.7V 210mAh 0.777Wh

Dongguan Oude Battery Co. LTD

Red wire(+) Black wire(-)

YYYY-MM-DD Made in China

Test item particulars.....:	
Classification of installation and use .....:	Build-in and use in portable applications
Supply connection .....:	DC connector
Recommend charging method declared by the manufacturer.....:	Charging the battery with 42mA constant current until 4.2V, then constant voltage untill the charge current reduces to 4.2mA at ambient 20°C±5°C.
Discharge current (0,2 It A) .....:	42mA
Specified final voltage.....:	3.0V
Upper limit charging voltage per cell .....:	4.2V
Maximum charging current.....:	210mA
Charging temperature upper limit.....:	50°C
Charging temperature lower limit .....:	0°C
Polymer cell electrolyte type.....:	☐ gel polymer ☐ solid polymer ☒ N/A
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2020-11-09
Date (s) of performance of tests.....:	2020-11-09 to 2020-11-19

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 point is used as the decimal separator.

General product information:

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

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

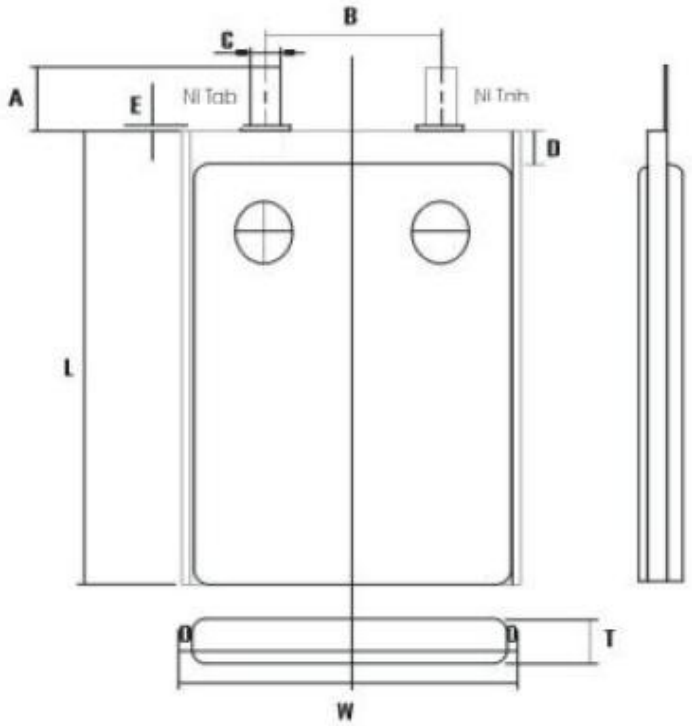
Type	Cell	Battery
Model	402228	402228
Nominal capacity	210mAh	210mAh
Nominal voltage	3.7V	3.7V
Nominal charge current	42mA	42mA
Nominal discharge current	42mA	42mA
Maximum charge current	210mA	210mA
Maximum discharge current	210mA	210mA
Maximum charge voltage	4.2V	4.2V
Cut-off voltage	3.0V	3.0V

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

Type	Cell
Model	402228
Upper limit charge voltage	4.2V
Taper-off current	10.5mA
Lower charge temperature	0°C
Upper charge temperature	50°C

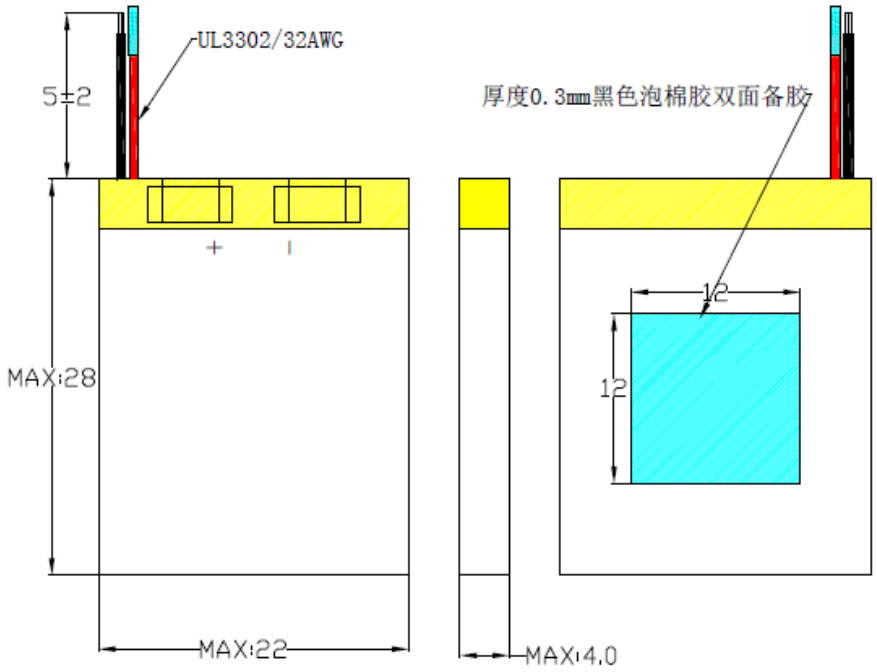
Construction:

Cell dimension: (unit: mm)

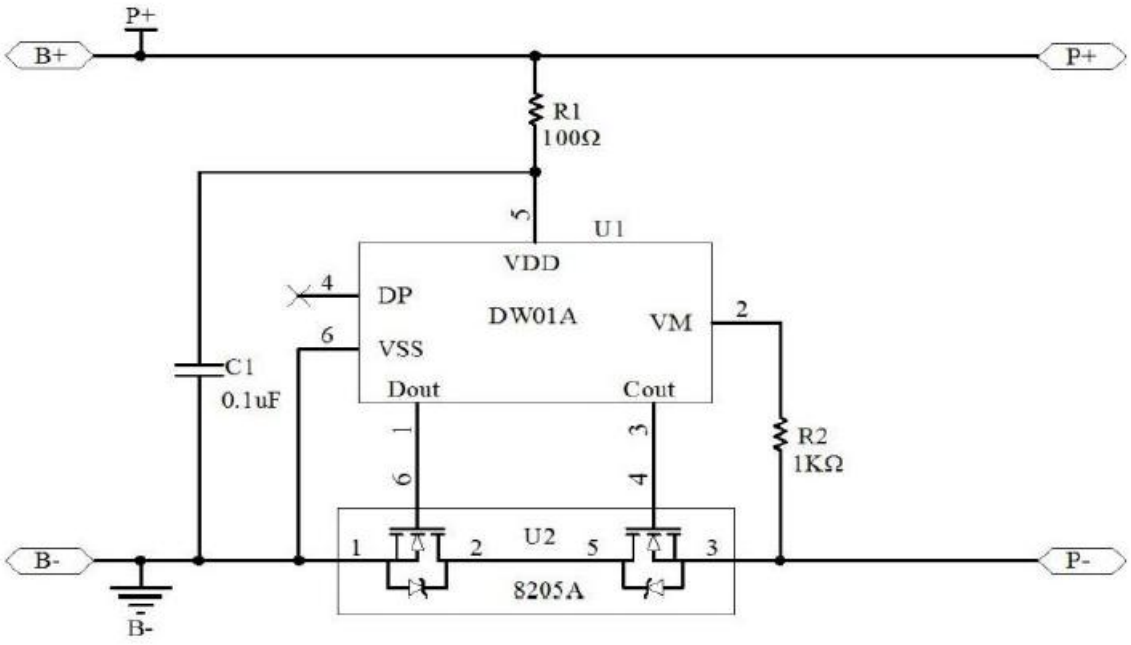


T:max.4.0mm, W:max.22.0mm, L:max.26.5mm

Battery dimension: (unit: mm)



Circuit diagram:



The final evaluation of the cell must be conducted in the end product for which the cell will be used.

IEC 62133-2:2017			
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 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 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 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 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

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	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 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	Electrode plate contacts complied with the requirements.	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	Complied.	P
	Terminal contacts are arranged to minimize the risk of short-circuit	Complied.	P
5.6	**Assembly of cells into batteries**		P
5.6.1	General	Protective circuit equipped on battery.	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		N/A
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions	Current, voltage and temperature limits specified by cell manufacturer.	P
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		N/A
	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		P
	Protective circuit components added as appropriate and consideration given to the end-device application	Protective circuit equipped on battery.	P

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	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	Max. charging voltage:4.2V, not exceed 4.2V specified in Table 2	P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		N/A
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N/A
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer’s specified final voltage	Final voltage of cell: 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 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

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	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 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 considered when conducting mechanical tests		N/A
5.7	**Quality plan**		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	Complied. ISO 9001: 2015 certificate provided.	P
5.8	**Battery safety components**		P
	According annex F		P
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	Complied.	P
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1		N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C	The tests are conducted in an ambient 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 given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test		P
7	**SPECIFIC REQUIREMENTS AND TESTS**		**P**
7.1	**Charging procedure for test purposes**		P
7.1.1	First procedure		P
	This charging procedure applies to sub clauses other than those specified in 7.1.2		P

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0.2 It A down to a specified final voltage		P
7.1.2	Second procedure		P
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0.05 It A, using a constant voltage charging method	Charge temperature 0-50°C declared.	P
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)		P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer	Tested complied.	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)		P
	Oven temperature (°C)..... :	70°C	—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells	No physical distortion of the battery case.	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

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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 conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		P
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor	S-C MOSFET(U2)	P
	Results: No fire. No explosion ..... :	(See appended table 7.3.2)	P
7.3.3	Free fall	Tested complied.	P
	Results: No fire. No explosion		P
7.3.4	Thermal abuse (cells)	Tested complied.	P
	Oven temperature (°C)..... :	130°C	—
	Results: No fire. No explosion		P
7.3.5	Crush (cells)		P
	The crushing force was released upon:		P
	- The maximum force of 13kN ±0.78kN has been applied; or	Tested complied.	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	Upper limit charging voltage:5.88V	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

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A
	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration		P
	Results: No fire. No explosion ..... :	(See appended table 7.3.7)	P
7.3.8	Mechanical tests (batteries)		P
7.3.8.1	Vibration	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	400N	P
	Results: No fire ..... :	(See appended table 7.3.9)	P
8	**INFORMATION FOR SAFETY**		**P**
8.1	**General**		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	Information for safety mentioned in manufacturer's specifications.	P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards	Information for safety mentioned in manufacturer's specifications.	P

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		N/A
8.2	**Small cell and battery safety information**		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**		P
	Cells marked as specified in IEC 61960, except coin cells	The final product is battery pack	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		P
9.2	**Battery marking**		P
	Batteries 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. Batteries also marked with an appropriate caution statement		N/A

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals have clear polarity marking on the external surface of the battery		P
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		N/A
9.3	**Caution for ingestion of small cells and batteries**		N/A
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	**Other information**		P
	Storage and disposal instructions	Information for storage 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**		**P**
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3		N/A
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		P
ANNEX A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		**P**
A.1	**General**		P
A.2	**Safety of lithium ion secondary battery**	Complied.	P
A.3	**Consideration on charging voltage**	Complied.	P
A.3.1	General		P

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
A.3.2	Upper limit charging voltage	4.2V applied.	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	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	See A.4.2.2.	P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature range declared by client is: 0-50°C	P
A.4.3	High temperature range	Not higher than the temperature specific in this standard.	N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range		N/A
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		N/A
A.4.4	Low temperature range	Not lower than the temperature specific in this standard.	N/A
A.4.4.1	General		N/A
A.4.4.2	Explanation of safety viewpoint		N/A
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range		N/A
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		N/A
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P
A.4.6.2	Final discharge voltage and explanation of safety viewpoint	3.0V applied.	P
A.4.6.3	Discharge current and temperature range	Discharge temperature range declared by client is: -20°C-60°C	P

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.6.4	Scope of application of the discharging current	Nominal discharge current: 42mA , Max discharge current:210mA	P
A.5	**Sample preparation**		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle in cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		P
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		P
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**
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		**N/A**
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		**N/A**
D.1	**General**		N/A

IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement..... :	(See appended tableD.2)	N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A
ANNEX E	**PACKAGING AND TRANSPORT**		P
ANNEX F	**COMPONENT STANDARDS REFERENCES**		P

5.8	TABLE: Critical components information				P
Object/part No.	Manufacturer/ trademark	Type/ model	Technical data	Standard	Mark(s)of conformity
Cell	Shenzhen Tianjin New Energy Technology Co.,Ltd	402228	3.7V, 210 mAh	IEC62133 -2:2017	Tested with appliance
-Positive electrode	Jiangmen Kanhoo Industry Co.,Ltd	LCO-103	$LiCoO_2$ Dimensions: 231mm* 22.0 mm* 0.114mm Specific capacity:145 mAh/g	--	--
-Negative electrode	Shenzhen Jin Run Energy Materials Co., Ltd	5A	Graphite, CMC, SBR, Distilled Water Dimensions: 256mm* 22.5mm* 0.125mm Specific capacity: 355mAh/g	--	--
-Separator	Shenzhen cognate material industry co., ltd	T=0.012mm	PE, Dimensions:605 mm* 24.5mm* 0.012mm Shut down temperature: 130-140°C	--	--
-Electrolyte	Dongguan Tianfeng Power Supply Material Co., Ltd	TF-3301	$LiPF_6$+EC+EMC+DC Conductivity: 7.6 mS/cm	--	--
PCB	Shenzhen Xinrui Power Electronics Co., Ltd	FR-4	V-0,130°C Min. thickness: 0.5mm	--	--
Lead wire	Dongguan Jinghai Electronic Technology Co. Ltd	3302	32AWG Tmax:105°C Vmax:30V	--	--
IC(U1)	Shenzhen Depp Microelectronics Co., Ltd	DW01	Overcharge Detection Voltage: 4.28±0.05V Over-discharge Detection Voltage: 2.4±0.1 V Operating temperature range:-40~85°C	--	Testes with appliance
MOSFET (U2)	Shenzhen Depp Microelectronics Co., Ltd	8205	Id:5 A Vds:20 V Operating temperature range:-55~150°C	--	Testes with appliance
Supplementary information: N/A					

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**
C1	4.2	0.042	4.19	P
C2	4.2	0.042	4.18	P
C3	4.2	0.042	4.19	P
C4	4.2	0.042	4.19	P
C5	4.2	0.042	4.19	P
Supplementary information: - No fire or explosion - No leakage - Others (please explain)				

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature ~~rise ΔT (K)~~ (°C)**	**Results**
Samples charged at charging temperature upper limit 50°C					
C6	54.8	4.19	86	116.4	P
C7	54.8	4.19	91	115.4	P
C8	54.8	4.19	88	117.2	P
C9	54.8	4.18	92	111.9	P
C10	54.8	4.19	89	113.5	P
Samples charged at charging temperature lower limit 0°C					
C11	54.8	4.08	86	104.9	P
C12	54.8	4.09	89	105.1	P
C13	54.8	4.08	90	106.2	P
C14	54.8	4.09	88	103.6	P
C15	54.8	4.09	87	108.0	P
Supplementary information: - No fire or explosion - Others (please explain)					

7.3.2	TABLE: External short-circuit (battery)					P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature ~~rise ΔT (K)~~(°C)**	**Component single fault condition**	**Results**
B4	22.8	4.19	88	100.5	S-C U2	P
B5	22.8	4.19	86	104.3	S-C U2	P
B6	22.8	4.19	91	104.9	S-C U2	P
B7	22.8	4.19	89	109.2	S-C U2	P
B8	22.8	4.19	88	23.2	Normal	P
Supplementary information: - No fire or explosion - 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 50°C				
C29	4.19	4.19	13.01	P
C30	4.19	4.19	13.01	P
C31	4.19	4.18	13.02	P
C32	4.19	4.19	13.02	P
C33	4.19	4.19	13.01	P
Samples charged at charging temperature lower limit 0°C				
C34	4.09	4.09	13.02	P
C35	4.08	4.08	13.01	P
C36	4.09	4.09	13.01	P
C37	4.09	4.09	13.01	P
C38	4.09	4.09	13.01	P
Supplementary information: - No fire or explosion - Others (please explain)				

7.3.6	TABLE: Over-charging of battery			P
Constant charging current (A) ..... :		0.42		—
Supply voltage (Vdc) ..... :		5.88		—
Sample no.	**OCV before charging (Vdc)**	**Maximum outer case temperature (°C)**	**Results**	
B12	3.21	31.7	P	
B13	3.23	32.2	P	
B14	3.23	31.6	P	
B15	3.22	32.0	P	
B16	3.23	32.1	P	

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.7	TABLE: Forced discharge (cells)			P
Sample no.	**OCV before application of reverse charge (Vdc)**	**Measured reverse charge I_t (A)**	**Lower limit discharge voltage (Vdc)**	**Results**
C39	3.23	0.21	3.0	P
C40	3.24	0.21	3.0	P
C41	3.23	0.21	3.0	P
C42	3.24	0.21	3.0	P
C43	3.23	0.21	3.0	P

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.8.1	TABLE: Vibration				P
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test(g)**	**Results**
B17	4.19	4.19	4.724	4.724	P
B18	4.19	4.18	4.716	4.716	P
B19	4.19	4.19	4.737	4.737	P

Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting
- Others (please explain)

7.3.8.2	TABLE: Mechanical shock				P
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test(g)**	**Results**
B20	4.19	4.19	4.748	4.748	P
B21	4.19	4.19	4.684	4.684	P
B22	4.19	4.18	4.717	4.717	P

Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting
- Others (please explain)

7.3.9	TABLE: Forced internal short circuit (cells)				P
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location[1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit 50°C					
C44	50	4.19	1	400	P
C45	50	4.19	1	400	P
C46	50	4.19	1	400	P
C47	50	4.19	1	400	P
C48	50	4.19	1	400	P
Samples charged at charging temperature lower limit 0°C					
C49	0	4.09	1	400	P
C50	0	4.08	1	400	P
C51	0	4.09	1	400	P
C52	0	4.09	1	400	P
C53	0	4.09	1	400	P

Supplementary information:

[1)]Identify one of the following:

1: Nickel particle inserted between positive and negative (active material) coated area.

2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

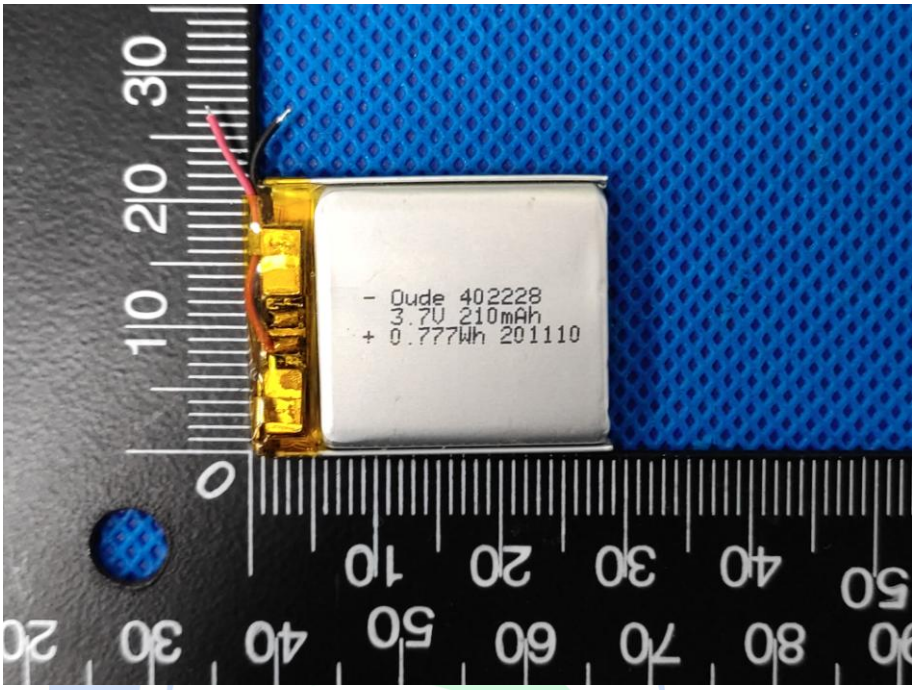
- No fire or explosion
- Others (please explain)

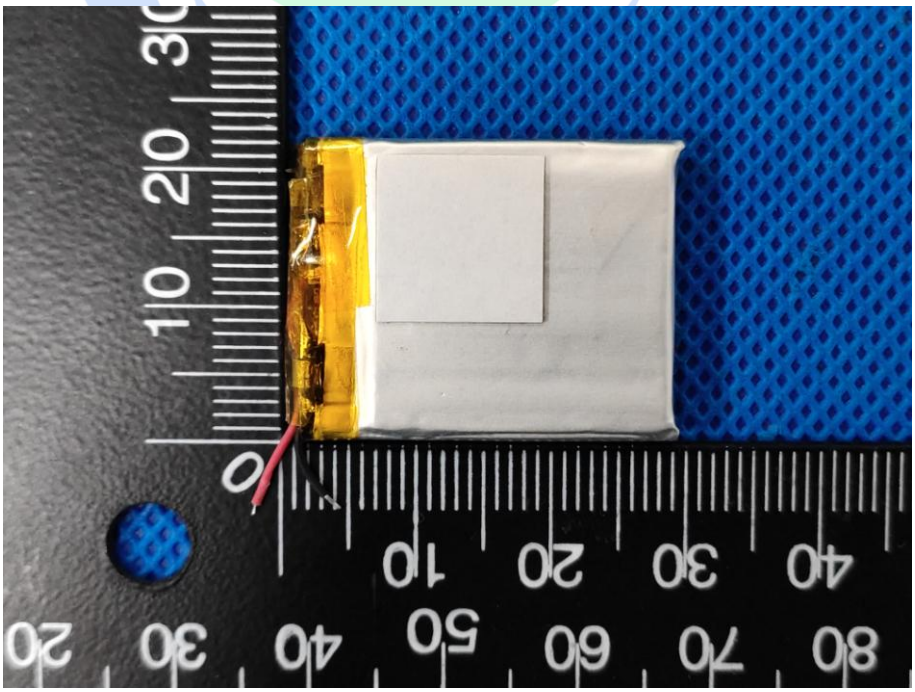
D.2	TABLE: Internal AC resistance for coin cells			N/A
Sample no.	**Ambient T (°C)**	**Store time (h)**	**Resistance Rac (Ω)**	**Results [1)]**

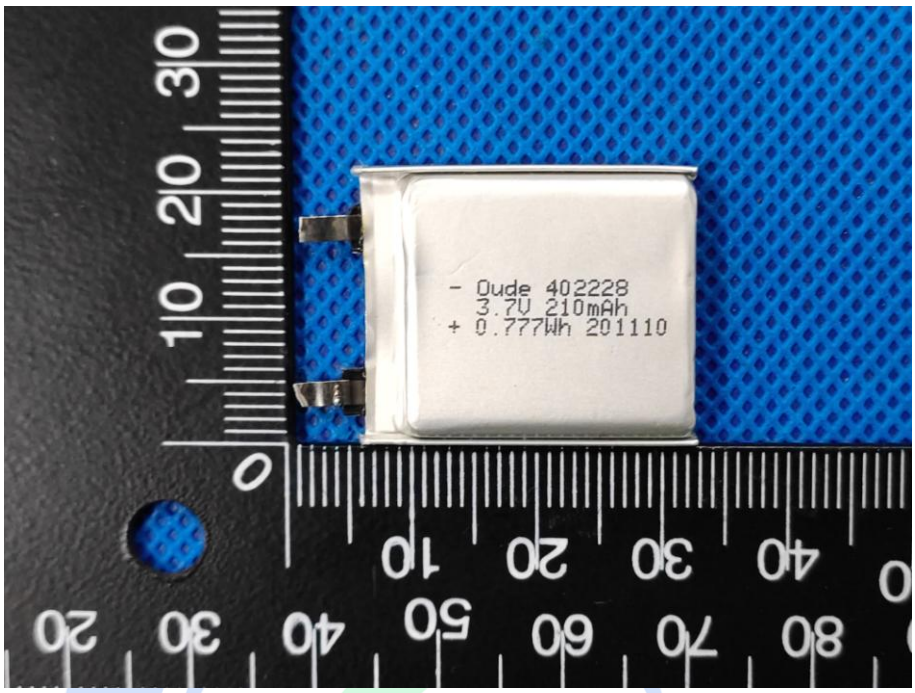
Supplementary information:

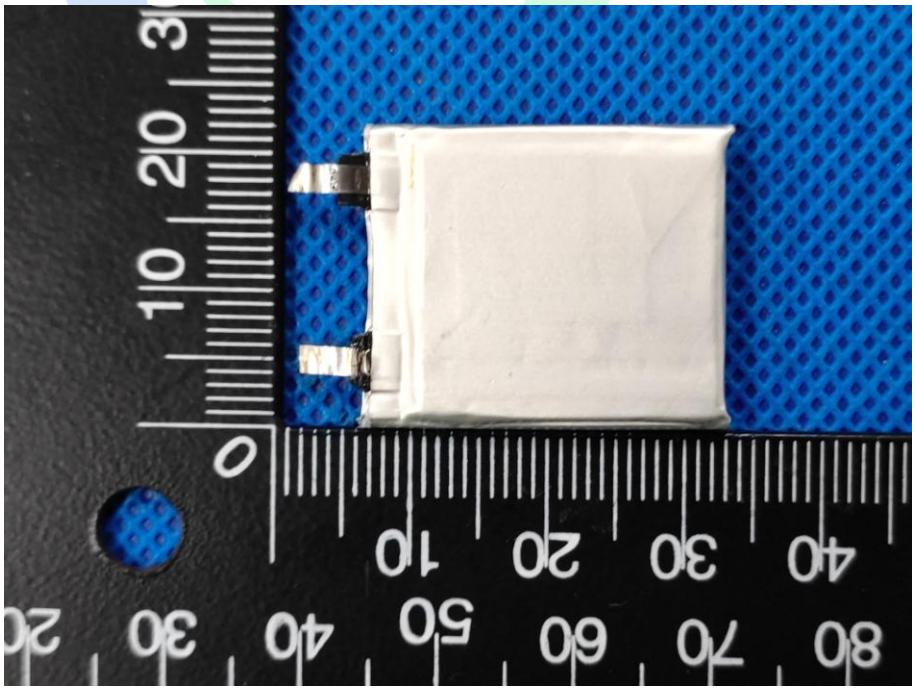
[1)] Coin cells with internal resistance less than or equal to 3 Ω, see test result on corresponding tables

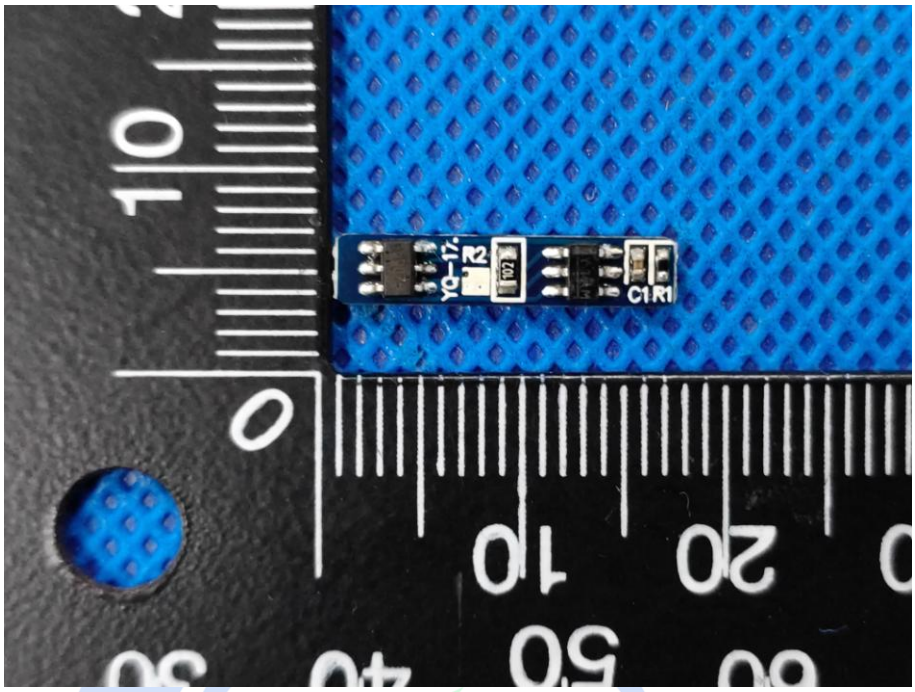
Appendix 1
Photo Documentation

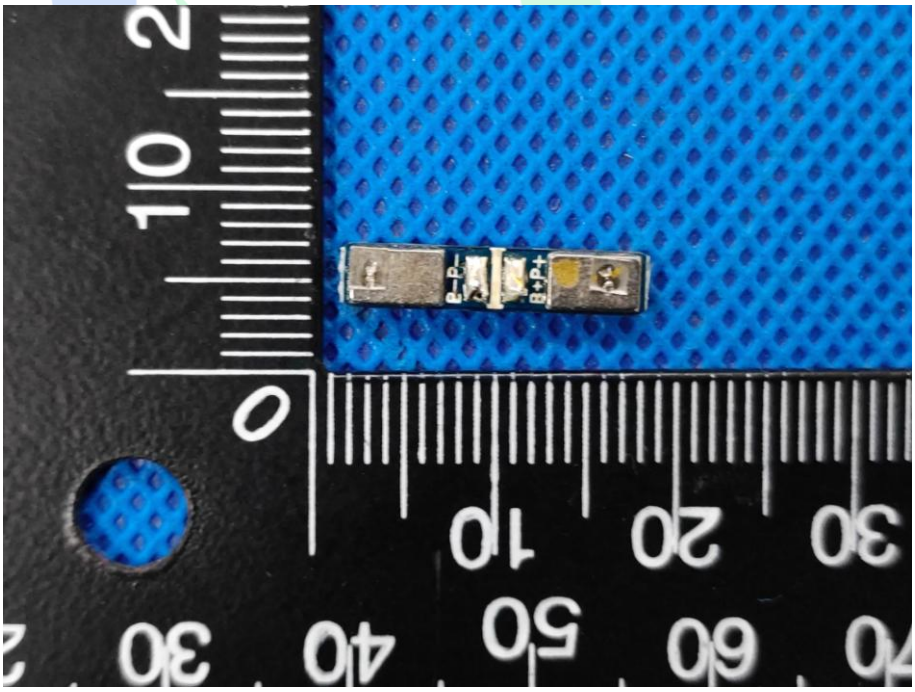
Details of:	Fig.1– Front view of battery
	

Details of:	Fig. 2 Back view of battery
	

Details of:	Fig. 3 Front view of cell
	

Details of:	Fig. 4 Back view of cell
	

Details of:	Fig. 5 Front view of PCM
	

Details of:	Fig. 6 Back view of PCM
	

---End of Test Report---