

Test report no.: <i>Prüfbericht-Nr.:</i>	CN23VOM3 001	Order No.: <i>Auftragsnr.:</i>	168439613	Page 1 of 34 <i>Seite 1 von 34</i>
Client reference no.: <i>Kunden-Referenz-Nr.:</i>	N/A	Order date: <i>Auftragsdatum:</i>	2023.07.06	
Client: <i>Auftraggeber:</i>	Shenzhen Xinja Energy Co., Ltd. Room 622, Tiancheng Building, No.1221, Guihua Community Sightseeing Road, Guanlan Street, Longhua New District Shenzhen, Guangdong, P.R. China			
Test item: <i>Prüfgegenstand:</i>	Rechargeable Li-ion Cell			
Identification / Type no.: <i>Bezeichnung / Typ-Nr.:</i>	See table 4 on page 6			
Order content: <i>Auftrags-Inhalt:</i>	TÜVus mark approval			
Test specification: <i>Prüfgrundlage:</i>	UL 1642:2020 R10.22			
Date of sample receipt: <i>Wareneingangsdatum:</i>	2023.07.06	See Attachment 2: Photo documents		
Test sample no.: <i>Prüfmuster-Nr.:</i>	NCT23027040-XJ 502030-C1~C115 NCT23027040-XJ104058-C1~C115 NCT23027040-XJ105080-C1~C115			
Testing period: <i>Prüfzeitraum:</i>	2023.07.06 to 2023.07.24			
Place of testing: <i>Ort der Prüfung:</i>	Shenzhen NCT Testing Technology Co.,Ltd			
Testing laboratory: <i>Prüflaboratorium:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Test result*: <i>Prüfergebnis*:</i>	Pass			
created by: <i>erstellt von:</i>	<i>Marco Huang</i>	authorized by: <i>genehmigt von:</i>	<i>Jeffrey Qin</i>	
Date: 2023.08.23 <i>Datum:</i>	Marco Huang	Issue date: 2023.08.23 <i>Ausstellungsdatum:</i>	Jeffrey Qin	
Position /Stellung:	Project Engineer	Position /Stellung:	Reviewer	
Other: <i>Sonstiges:</i>	1. The complete test report includes the following attachments: - Attachment 1: Equipment list (5 pages); - Attachment 2: Photo documents (3 pages).			
Condition of the test item at delivery: <i>Zustand des Prüfgegenstandes bei Anlieferung:</i>	Test item complete and undamaged Prüfmuster vollständig und unbeschädigt			
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark. <i>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</i>				

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Remarks Anmerkungen		
1	<p>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</p> <p><i>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfbedingungen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</i></p>	
2	<p>As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</p> <p><i>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</i></p>	
3	<p>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</p> <p><i>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</i></p>	
4	<p>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</p> <p><i>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</i></p>	

Test item particulars:

Information about the product needed to establish a (Test item particulars are selected by the TRF correct test program, such as product mobility, type of Originator base on the requirements in the standard) power connections and similar.

Designation.....	: See table 4 on page 6
Trademark.....	: N/A
Nominal voltage.....	: 3.7V
Rated capacity.....	: See table 4on page 6
Maximum charge voltage.....	: 4.2V
Maximum charge current.....	: 0.5C
Final voltage.....	: 2.75V
Ambient temperature range.....	: 0~45°C (charge), -20~60°C (discharge)
Recommend charging method declared by the manufacturer.....	: Charge the cell at 0.2C CC to 4.2V, then 4.2V CV until charging current reaches 0.02C at ambient20±5°C.

Utilization Type.....: Technician replaceable cell

Testing:
Test clauses and results:

cl.10 Short-Circuit Test.....	: P
cl.11 Abnormal Charging Test.....	: P
cl.12 Forced-Discharge Test.....	: N/A
cl.13 Crush Test.....	: P
cl.14 Impact Test.....	: P
cl.14A Round Bar Crush Test.....	: N/A
cl.15 Shock Test.....	: P
cl.16 Vibration Test.....	: P
cl.17 Heating Test.....	: P
cl.18 Temperature Cycling Test.....	: P
cl.19 Low Pressure (Altitude Simulation) Test.....	: P
cl.20 Projectile Test.....	: P

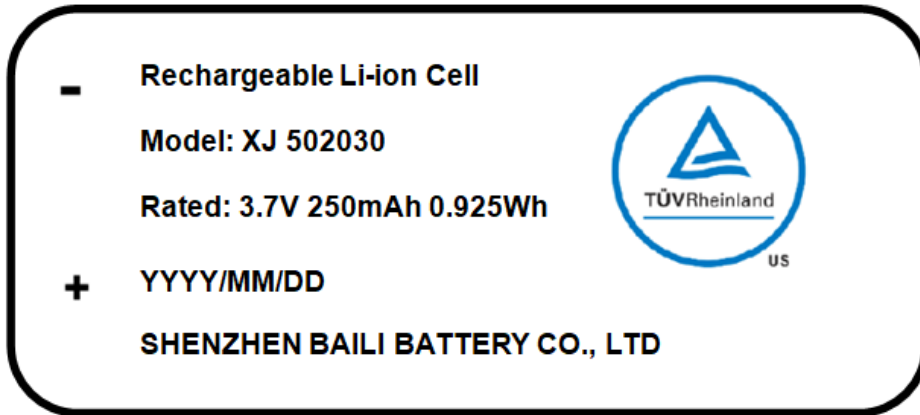
Testing location:

Shenzhen NCT Testing Technology Co.,Ltd
A101 & 2F, B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, China

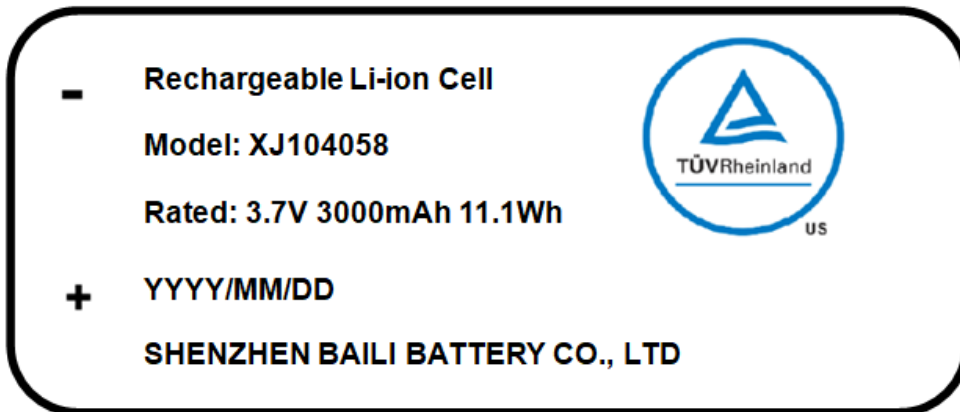
General remarks:

This report shall not be reproduced, except in full, without the written approval of the testing laboratory. The test results presented in this report relate only to the object tested.
"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

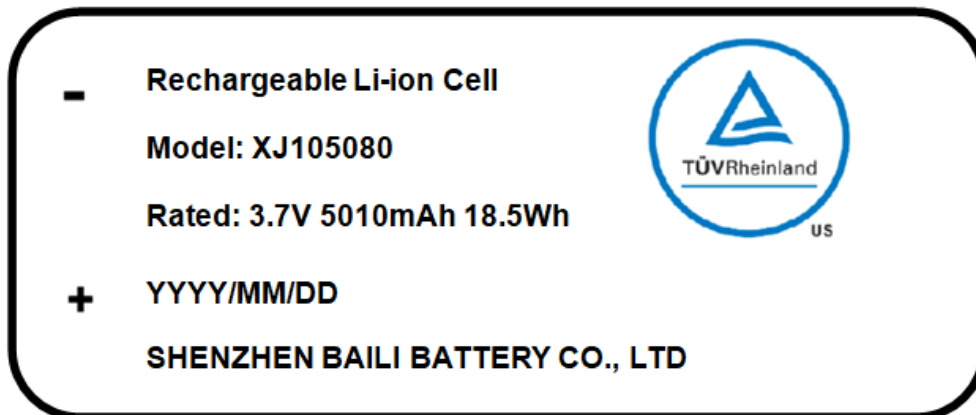
Copy of marking plate:



Label 1 for model: XJ 502030



Label 2 for model: XJ104058



Label 3 for model: XJ105080

Remark:

1. YYYY/MM/DD represents the date of manufacture.

“YYYY” represents the year,

“MM” represents the month.

“DD” represents the day.

2. Due to similarity of the marking plate, only labels of three representative models listed.

General product information:

This cell consists of the positive electrode plate, negative electrode plate, separator and electrolyte. The positive and negative electrode plates are housed in the case in the state being separated by the separator. The cell is evaluated according to UL 1642:2020 R10.22 in this test report, and passed all the tests.

1) These tested cell shave not been evaluated in combination with charger(s) or host product(s). Additional evaluation to determine compliance may be required on the combination(s) in the end product evaluation.
 2) The tested cells were evaluated for a maximum charge current and maximum voltage limit outlined in the Table below. The end product evaluation shall ensure that current and voltage limits noted are maintained.
 3)The fifteen models (Model name: XJ 502030, XJ602030, XJ701435, XJ602035, XJ602535, XJ602248, XJ803030, XJ902535, XJ102050, XJ102540, XJ903048, XJ803060, XJ103450, XJ104058, XJ105080) are identical (same shape, same chemical system, using same material), except the model name, size and the capacity. The tested models XJ 502030, XJ104058 and XJ105080 are representatives of all models.

- Table 1: Electrical parameter of model XJ 502030:

Model	Rated capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. charge current	Max. discharge current	Max. charge voltage	End discharge voltage
XJ 502030	250mAh	3.7V	50mA	50mA	125mA	125mA	4.2V	2.75V

- Table 2: Electrical parameter of model XJ104058:

Model	Rated capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. charge current	Max. discharge current	Max. charge voltage	End discharge voltage
XJ104058	3000mAh	3.7V	600mA	600mA	1500mA	1500mA	4.2V	2.75V

- Table 3: Electrical parameter of model XJ105080:

Model	Rated capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. charge current	Max. discharge current	Max. charge voltage	End discharge voltage
XJ105080	5010mAh	3.7V	1002mA	1002mA	2505mA	2505mA	4.2V	2.75V

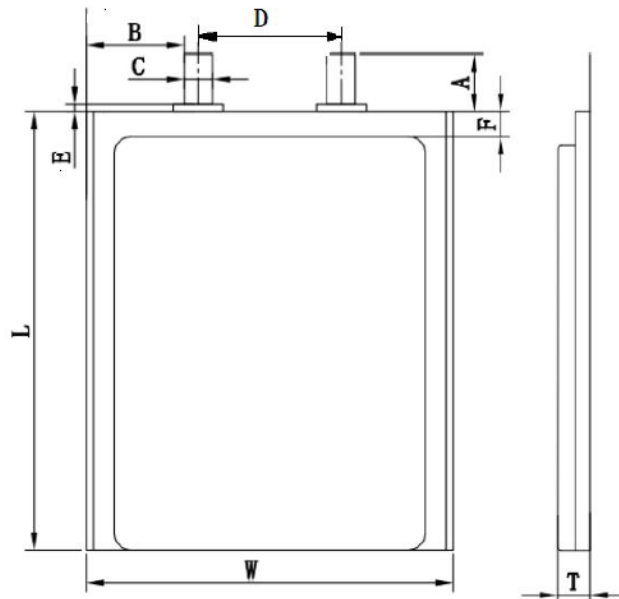
Remark: For the feature of other models, see Table 4 below.

- Table 4: All of the models:

Model	Energy density (Wh/L)	Rated Capacity(mAh)	Max. Thickness (mm)	Max. Width (mm)	Max. Height (mm)	Nominal charge current(mA)	Nominal discharge current (mA)	Max. charge current(mA)	Max. discharge current (mA)
XJ 502030	308.3	250	5.0	20.0	30.0	50	50	125	125
XJ602030	308.3	300	6.0	20.0	30.0	60	60	150	150
XJ701435	345.2	320	7.0	14.0	35.0	64	64	160	160
XJ602035	352.4	400	6.0	20.0	35.0	80	80	200	200
XJ602535	352.4	500	6.0	25.0	35.0	100	100	250	250
XJ602248	379.6	650	6.0	22.0	48.0	130	130	325	325
XJ803030	385.4	750	8.0	30.0	30.0	150	150	375	375
XJ902535	375.9	800	9.0	25.0	35.0	160	160	400	400
XJ102050	370.0	1000	10.0	20.0	50.0	200	200	500	500
XJ102540	407.0	1100	10.0	25.0	40.0	220	220	550	550
XJ903048	428.2	1500	9.0	30.0	48.0	300	300	750	750
XJ803060	462.5	1800	8.0	30.0	60.0	360	360	900	900
XJ103450	435.3	2000	10.0	34.0	50.0	400	400	1000	1000
XJ104058	478.4	3000	10.0	40.0	58.0	600	600	1500	1500
XJ105080	463.4	5010	10.0	50.0	80.0	1002	1002	2505	2505

Remark: All the models have the same nominal voltage 3.7V and the same end discharge voltage 2.75V, and have the same Max. charge voltage 4.2V.

Construction:



L: Height, W: Width, T: Thickness (Dimensions value refer to Table 4)
Cell

Factory:

SHENZHEN BAILI BATTERY CO., LTD

6th Floor, Building C, Huali Industrial Zone, Xinan 28 District, Baoan District, Shenzhen, Guangdong, P.R. China

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
INTRODUCTION			
1	Scope		P
2	General		P
3	Glossary		P
CONSTRUCTION			
4	General		N/A
4.1	Casing		N/A
4.1.1	The casing of a lithium battery shall have the strength and rigidity necessary to resist the abuses to which it may be subjected, without resulting in a risk of fire. The casing of a user-replaceable lithium battery shall have the strength and rigidity necessary to resist the abuses to which it may be subjected without resulting in a risk of injury to persons.	Technician replaceable cell without enclosure.	N/A
4.1.2	A cell of a user-replaceable battery shall be in a rigid casing of sufficient strength to prevent flexing. A tool providing the mechanical advantage of a pliers, screwdriver, or hacksaw shall be the minimum capable of opening the user-replaceable cell casing, if opening of the casing will expose metallic lithium.	See above	N/A
4.2	Electrolyte		N/A
4.2.1	A user-replaceable battery shall not contain pressurized vapor or liquid that could spray materials into the eyes or leak more than 5 mL of liquid when the battery casing is punctured under normal laboratory conditions, 23 ±2°C (73 ±3.6°F).	Technician-replaceable Battery.	N/A
4.3	Use		N/A
4.3.1	A lithium battery shall be protected from abnormal charging currents during use. A battery tested and found acceptable for the charging current, IC (see Section 11), under fault conditions specified by the manufacturer, shall be protected from larger charging currents in the end product application by: a) Two blocking components, such as diodes, or b) One blocking component and one current limiting component, such as a resistor or a fuse. The current limiting component shall limit the charging current to one-third the value used in the Abnormal Charging Test, Section 11.	Single cell only	N/A
PERFORMANCE			
5	General		P
5.1	Technician-replaceable Batteries		P
5.1.1	Technician-replaceable lithium cells or batteries are to be tested as described in Sections 10 – 20. Section 12, Forced-Discharge Test, is applicable only to cells intended to be used in series-connected multicell applications such as battery packs. For multicell installations, also see 5.3.1.		P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.2	When a fire or explosion occurs as a result of the Crush Test, Section 13, or the Impact Test, Section 14, or the Round Bar Crush Test, Section 14A, or the cell or battery ruptures to the extent that the aluminum test cage is penetrated during the Projectile Test, Section 20; the use of the technician replaceable cell or battery shall be restricted to applications in which it is not exposed to, or is protected from, any conditions shown to cause a fire or explosion.	No fire or explosion occurs	P
5.1.3	Cells and batteries subjected to the Shock Test, Section 15, Vibration Test, Section 16, Temperature Cycling Test, Section 18, and Low Pressure (Altitude Simulation) Test, Section 19, shall also not leak or vent. For these tests, unacceptable leakage is determined to have occurred when the resulting mass loss exceeds the values shown in Table 5.1, Venting and leakage mass loss criteria.	No leak or vent	P
5.2	User-replaceable Batteries		N/A
5.2.1	User-replaceable lithium cells or batteries are to be tested as described in Sections 10 – 20. Section 12, Forced Discharge Test, is applicable only to cells intended to be used in multicell applications such as battery packs. In addition to complying with the requirements for a technician replaceable cell or battery as specified in 5.1.1, a user-replaceable cell or battery shall not explode or ignite when subjected to the Crush Test, Section 13, or the Impact Test, Section 14. A user-replaceable battery shall comply with the requirements for Sections 10 – 20 and with the applicable construction requirements outlined in Section 4. Secondary lithium cells shall not be considered user-replaceable.	Technician-replaceable cell	N/A
5.2.2	Sets of five specimens each are to be used for the Projectile Test, Section 20.3; see Table 6.1. When only one specimen from a set of five does not comply with the requirements, another set of five specimens is to be tested. All specimens from this second set shall comply with the requirements.	Technician-replaceable cell	N/A
5.3	Multicell Installations		N/A
5.3.1	A technician-replaceable or user-replaceable cell intended for use in multicell installations or battery packs shall also be tested as described in 10.3 and Section 12. No fire or explosion shall occur as a result of these tests. In addition, batteries subjected to the test described in 10.3 shall meet the requirements as described in 5.1.1 and 5.2.1 for a cell or battery subjected to the Short-Circuit Test, Section 10.	Single cell.	N/A
6	Samples		P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
6.1	Fully charged primary cells or batteries and primary cells or batteries that have been conditioned by partial or complete discharge, or both, are to be used for the tests described in Sections 10 – 20. The number of samples to be used in each test for a primary cell or battery is shown in Table 6.1. When a group of cells or batteries of different sizes, but similar chemistries is involved, selected sizes representative of the range are to be tested.	The samples are secondary cells.	N/A
6.2	Fully charged secondary cells or batteries and secondary cells or batteries that have been conditioned by charge-discharge cycling are to be used for the tests described in Sections 10 – 20. The number of samples to be used in each test for a secondary cell or battery is shown in Table 6.2. When a group of cells or batteries of different sizes, and similar chemistries is involved, selected sizes representative of the range are to be tested.	The samples are secondary technician-replaceable cells. Prepared as required.	P
6.3	Prior to conducting the testing in Section 17, the lithium ion cell samples shall be pre-conditioned as outlined in 6.4 and 6.5.	Prepared as required.	P
6.4	For the heating test of Section 17, two sets of five lithium ion cell samples are to be fully discharged (i.e. to the manufacturer's specified end point voltage). The samples are then placed in a test chamber and conditioned for 1 to 4 h (5 samples at the upper temperature limit and 5 samples at the lower temperature limit of the operating region) as outlined in Table 6.3.	Prepared as required.	P
6.5	While still in the test chamber set at the temperature limits, the samples are charged (5 samples at the upper temperature limit and 5 samples at lower temperature limit) at the specified maximum charging current and upper limit charging voltage per Table 6.3, using a constant voltage charging method. Charging is continued until the charge current is reduced to the specified end of charge conditions (i.e. 0.05 times the charge current).	Prepared as required.	P
7	Conditioning of Samples		P
7.1	Discharge		N/A
7.1.1	Primary batteries are to be completely discharged by connecting their terminals through resistors that provide the desired level of discharge within 60 days. Batteries are to be discharged at room temperature. Cells with a liquid cathode such as thionyl chloride or sulfur dioxide, shall also be conditioned by one-half discharge	The samples are secondary cells.	N/A

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.2	For solid electrolyte and other types of primary lithium batteries that cannot be discharged within 60 days because of the small currents they inherently produce, longer discharge times plus discharge at higher temperatures may be used to obtain the desired level of discharge. The manufacturer's recommended discharge procedures are to be followed so as to obtain the required discharge level in the minimum time.	The samples are secondary cells.	N/A
7.2	Charge-discharge cycling		P
7.2.1	Secondary cells are to be conditioned at 25°C (77°F). Cells are continuously cycled as per the manufacturer's specifications. The specification shall be such that the full rated capacity of the cell is utilized and the number of cycles accumulated shall be at least equal to 25% of the advertised cycle life of the cell or cycled continuously for 90 days, whichever is shorter. Cycling is to be done either individually or in groups. Cells are to be recharged prior to testing as indicated in Table 6.2.	The samples are cycled at manufacturer's factory before they were sent for test.	P
8	Important test considerations		P
8.1	Some lithium batteries are capable of exploding when the tests described in Sections 10 – 20 are conducted. It is important that personnel be protected from the flying fragments, explosive force, sudden release of heat, and noise that results from such explosions. The test area is to be well ventilated to protect personnel from possible harmful fumes or gases.	Prepared the tests as required.	P
8.2	As an additional precaution, the temperatures on the surface of the battery casings shall be monitored during the tests described in Sections 10, 11, 12, 13, and 14. All personnel involved in the testing of lithium batteries are to be instructed never to approach a lithium battery while the surface temperature exceeds 90°C (194°F) and not to touch the lithium battery while the surface temperature exceeds 45°C (113°F).	Prepared the tests as required.	P
8.3	For protection, the Projectile Test, Section 20 is to be conducted in a room separate from the observer.	Prepared the tests as required.	P
9	Temperature Measurements		P
9.1	Temperatures are to be measured by thermocouples consisting of wires not larger than 24 AWG (0.21 mm ²) and not smaller than 30 AWG (0.05 mm ²) and a potentiometer-type instrument.	Prepared the tests as required.	P
9.2	The temperature measurements on the batteries are to be made with the measuring junction of the thermocouple held tightly against the metal casing of the battery.	Prepared the tests as required. Casing temperature was recorded on the center of the cell surface;	P
TESTS FOR TECHNICIAN-REPLACEABLE AND USER-REPLACEABLE BATTERIES			
ELECTRICAL TESTS			
10	Short-Circuit Test		P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
10.1	Each test sample battery, in turn, is to be short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a resistance load of $80 \pm 20 \text{ m}\Omega$. The temperature of the battery case is to be recorded during the test. The battery is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2V and the battery case temperature has returned to $\pm 10^\circ\text{C}$ ($\pm 18^\circ\text{F}$) of ambient temperature. The voltage at the end of the test may not reach 0.2 V due to operation of protective devices in the circuit. The return to near ambient of the battery (cell) casing in an indication of ultimate results.	Tested as required. See table 10	P
10.2	Tests are to be conducted at $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$) and at $55 \pm 5^\circ\text{C}$ ($131 \pm 9^\circ\text{F}$). The batteries are to reach equilibrium at $20 \pm 5^\circ\text{C}$ or $55 \pm 5^\circ\text{C}$, as applicable, before the terminals are connected.	Tested as required.	P
10.3	A battery is to be tested individually unless the manufacturer indicates that it is intended for use in series or parallel. For series or parallel use, additional tests on five sets of batteries are to be conducted using the maximum number of batteries to be covered for each configuration.	Tested as required.	P
10.4	When an overcurrent protective device activates during the test, the test shall be repeated with the battery supply connected to the maximum load that does not cause the protective device to open. Protective devices that are relied upon to meet the compliance criteria for the short circuit test shall comply with 2.3.1.	Only one single lithium-ion cell, no over-current or thermal protective device was integrated into the cell.	N/A
10.5	The samples shall not explode or catch fire.	The test results meet the requirements.	P
11	Abnormal Charging Test		P
11.1	Primary cells or batteries shall comply with 11.2 – 11.7.	Secondary cell	N/A
11.2	Cells or batteries conditioned in accordance with Tables 6.1, as applicable, are to be used for this test. The batteries are to be tested in an ambient temperature of $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$).		N/A

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
11.3	<p>Each test sample battery is to be subjected to a charging current of three times the current I_c, specified by the manufacturer by connecting it in opposition to a dc-power supply. The specified charging current is to be obtained by connecting a resistor of the specified size and rating in series with the battery. The test charging time is to be calculated using the formula:</p> $t_c = \frac{2.5C}{3(I_c)}, \text{ in which}$ <p>t_c is the charging time in hour</p> <p>C is the capacity of the cell/battery in ampere-hours, and</p> <p>I_c is the maximum charging current, in amperes, specified by the manufacturer.</p> <p>The minimum charging time is to be 7 hours.</p>		N/A
11.4	<p>When a non-resettable overcurrent or protective device operates during the test, the test is to be repeated at a charge current below the level that the protective device operates. When a resettable protective device operates during the test, the protector is allowed to reset to a total of 10 cycles; or until the appropriate charging time has been completed, but not less than 7 hours. Protective devices that are relied upon to meet the compliance criteria for the abnormal charging test shall comply with 2.3.1.</p>		N/A
11.5	The samples shall not explode or catch fire.		N/A
11.6	Secondary cells or batteries shall comply with 11.7 – 11.10.	See table 11, tested as required	P
11.7	Cells or batteries conditioned in accordance with Tables 6.2, as applicable, are to be used for this test. The batteries are to be tested in an ambient temperature of $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$).	Tested as required.	P
11.8	Each test sample battery is to be discharged at a constant current of $0.2 C/1 \text{ h}$, to a manufacturer specified discharge endpoint voltage. The cell or battery is then to be charged with a constant maximum specified output voltage and a current limit of three times the maximum charging current I_c , specified by the manufacturer. Charging duration is to be 7 hours or the time required to reach the manufacturer's specified end-of-charge condition, whichever is greater.	Tested as required.	P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
11.9	When a non-resettable overcurrent or protective device operates during the test, the test shall be repeated at an overcharging current below the level that the protection device operates. When a resettable protective device operates during the test, the protector is to be allowed to reset to a total of 10 cycles; or until the appropriate charging time has been completed, but not less than 7 hours. Protective devices that are relied upon to meet the compliance criteria for the abnormal charging test shall comply with 2.3.1.	The samples are to be tested without any assistance of over-current or thermal protective devices.	N/A
11.10	The samples shall not explode or catch fire.	No explosion or catch fire during and after the test	P
12	Forced-Discharged Test		N/A
12.1	This test is intended for cells that are to be used in series-connected, multicell applications, such as battery packs.	One single cell	N/A
12.2	A fully discharged cell is to be force-discharged by connecting it in series with fully charged cells of the same kind. The number of fully charged cells to be connected in series with the discharged cell is to equal the maximum number less one of the cells to be covered for series use. Five cells are to be completely discharged, at room temperature.		N/A
12.3	Once the fully discharged cell is connected in series with the specified number of fully charged cells the resultant battery pack is to be short circuited.		N/A
12.4	The positive and negative terminals of the sample are to be connected with a copper wire with a resistance load of $80 \pm 20 \text{m}\Omega$. The sample is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2V and the battery case temperature has returned to $\pm 10^\circ\text{C}$ (18°F) of ambient temperature. The voltage at the end of the test may not reach 0.2V due to operation of protective devices in the circuit. The return to near ambient of the cell casing is an indication of ultimate results.		N/A
12.5	When an overcurrent or protective operates during the test, the test shall be repeated with the battery supply connected to the maximum load that does not cause the protective device to open. Protective devices that are relied upon to meet the compliance criteria for the forced discharge test shall comply with 2.3.1.		N/A
12.6	The samples shall not explode or catch fire.		N/A
MECHANICAL TESTS			
13	Crush Test		P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
13.1	A battery is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar force mechanism. The flat surfaces are to be brought in contact with the cells and the crushing is to be continued until an applied force of 13 ±1 kN (3000 ±224 lbs) is reached. Once the maximum force has been obtained it is to be released.	Tested as required. See table 13	P
13.2	A cylindrical, pouch or prismatic cell is to be crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus. A prismatic cell is also to be rotated 90° around its longitudinal axis so that both the wide and narrow sides will be subjected to the crushing force. Each sample is to be subjected to a crushing force in only one direction. Separate samples are to be used for each test.	Tested as required. The samples are pouch lithium-ion cells.	P
	Exception: For Lithium ion systems, a cylindrical, pouch or prismatic cell is to be crushed with its longitudinal axis parallel to the flat surface of the crushing apparatus. Each sample is to be subjected to a crushing force in only one direction. Test only the wide side of pouch and prismatic cells.	Li-ion cell.	P
13.3	A coin or button battery is to be crushed with the flat surface of the battery parallel with the flat surfaces of the crushing apparatus.	Not a coin or button battery	N/A
13.4	The samples shall not explode or catch fire.	No explosion or catch fire during and after the test	P
14	Impact Test		P
14.1	A test sample battery is to be placed on a flat surface. A 15.8 ±0.1-mm (5/8 ±0.004-in) diameter bar is to be placed across the center of the sample. A 9.1 ±0.46-kg (20 ±1-lb) weight is to be dropped from a height of 610 ±25 mm (24 ±1 in) onto the sample. See Figure 14.1.	Tested as required. See table 14	P
14.2	A cylindrical, pouch or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8-mm (5/8-in) diameter curved surface lying across the center of the test sample. A prismatic cell is also to be rotated 90° around its longitudinal axis so that both the wide and narrow sides are subjected to the impact. Each sample is to be subjected to only a single impact. Separate samples are to be used for each test.	Tested as required. The samples are pouch lithium-ion cells.	P
	Exception1: For Lithium ion systems, a cylindrical, pouch or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8-mm (5/8-in) diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact. Test only the wide side of pouch and prismatic cells.	The samples are lithium-ion cells.	P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Exception 2: Pouch cells not evaluated to this test, and with a capacity greater than 300 mAh, shall comply with the Round Bar Crush Test in Section 14A.		N/A
14.3	A coin or button battery is to be impacted with the flat surface of the test sample parallel to the flat surface and the 15.8-mm (5/8-in) diameter curved surface lying across its center.	Not a coin or button battery	N/A
14.4	The samples shall not explode or catch fire.	No explosion or catch fire.	P
14A	Round Bar Crush Test		N/A
14A.1	With reference to Exception No. 2 in 14.2, pouch cells not evaluated with the Impact Test in Section 14 and with a capacity greater than 300 mAh shall be evaluated with this test.		N/A
14A.2	The sample shall be fully charged with the method recommended by the manufacturer.		N/A
14A.3	The sample shall be positioned on a flat surface with a 25 ±1 mm (1 ±0.039 in) diameter steel round bar placed on top of the sample. The edge of the bar is to be aligned with the top edge of the cell body, with the longitudinal axis of the bar perpendicular to the tab of the cell. The bar shall extend beyond the width of the test sample on each side by at least 5 mm (0.197 in) as shown in Figure 14A.1. A preload pressure of 0.4 – 0.6 N/cm ² (0.58 – 0.87 psi) shall be applied before the sample thickness is measured in 14A.5 and the crush force in 14A.6 is applied. See 14A.4. NOTE: A sample may be taped, glued or clamped to the flat surface, avoiding obstructing the round bar placement and crush plate motion, to eliminate any unevenness between the sample and the flat test surface.		N/A
14A.4	For cells with the positive tab and negative tab on opposite sides, the bar placement in 14A.3 and the crush force application in 14A.6 are applied on each side of the cell near the tabs, using a different set of samples for each side.		N/A
14A.5	After the bar placement per 14A.3 or 14A.4 and the preload pressure is applied per 14A.3, the thickness of the sample shall be measured allowing a tolerance of ±0.1 mm (±0.039 in), using the Measuring Method of Cell Thickness in the Annex for Dimensions of the Cell with a Laminate Film Case in the Standard for Secondary Cells and Batteries Containing Alkaline or Other Non-Acid Electrolytes – Secondary Lithium Cells and Batteries for Portable Applications – Part 3: Prismatic and Cylindrical Lithium Secondary Cells, and Batteries Made from Them, IEC 61960-3.		N/A

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
14A.6	A crush force shall be applied onto the round bar, with a crushing direction of $90 \pm 1^\circ$ between the crushing direction and round bar and the crushing direction and test platform. The displacement in the vertical direction shall be measured. The moving speed of the crush plate is to be no greater than 0.1 mm/s (0.004 in/s). The displacement of the crush plate shall be stopped and held for 30 s once the cell deformation reaches $13 \pm 1\%$ of the cell thickness (starting from the preload thickness measured in 14A.5) or the crush force reaches the force value in Table 14A.1, whichever comes first. See Figure 14A.1 and Figure 14A.2.		N/A
14A.7	The samples shall not explode or catch fire.		N/A
15	Shock Test		P
15.1	The cell is to be secured to the testing machine by means of a rigid mount which supports all mounting surfaces of the cell. Each cell shall be subjected to a total of three shocks of equal magnitude. The shocks are to be applied in each of three mutually perpendicular directions unless it has only two axes of symmetry in which case only two directions shall be tested. Each shock is to be applied in a direction normal to the face of the cell. For each shock the cell is to be accelerated in such a manner that during the initial 3 ms the minimum average acceleration is 75 g (where g is the local acceleration due to gravity). The peak acceleration shall be between 125 and 175 g. Cells shall be tested at a temperature of $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$).	Prepared the test as required. See table 15	P
15.2	The samples shall not explode or catch fire. In addition, the sample shall not vent or leak as described in 5.1.1.	No explosion or catch fire, the sample not vent or leak	P
16	Vibration Test		P
16.1	A battery is to be subjected to simple harmonic motion with an amplitude of 0.8 mm (0.03 inch) [1.6 mm (0.06 inch) total maximum excursion].	Prepared the test as required. See table 16.	P
16.2	The frequency is to be varied at the rate of 1 Hz/min between 10 and 55 Hz, and return in not less than 90 nor more than 100 min. The battery is to be tested in three mutually perpendicular directions. For a battery that has only two axes of symmetry, the battery is to be tested perpendicular to each axis.	Tested as required.	P
16.3	The samples shall not explode or catch fire. In addition the sample shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
ENVIRONMENTAL TESTS			
17	Heating Test		P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
17.1	A battery is to be heated in a gravity convection or circulating air oven with an initial temperature of 20 ±5°C (68±9°F). The temperature of the oven is to be raised at a rate of 5 ±2°C (9±3.6°F) per minute to a temperature of 130 ±2°C (266±3.6°F) and remain for 10 min. The sample shall return to room temperature (20±5°C) and then be examined. For batteries specified for temperatures above 100°C (212°F), the conditioning temperature shall be increased from 130 ±2°C (266±3.6°F), to 30±2°C (86±3.6°F) above the manufacturers maximum specified temperature. For a battery of lithium metal chemistry, the conditioning temperature shall be increased to a maximum of 170 ±2°C (338±3.6°F).	Tested as required. Oven temperature: 130°C.	P
17.2	The samples shall not explode or catch fire.	The test results meet the requirements.	P
18	Temperature Cycling Test		P
18.1	The batteries are to be placed in a test chamber and subjected to the following cycles: a) Raising the chamber-temperature to 70 ±3°C (158 ±5°F) within 30 minutes and maintaining this temperature for 4 hours. b) Reducing the chamber temperature to 20 ±3°C (68 ±5°F) within 30 minutes and maintaining this temperature for 2 hours. c) Reducing the chamber temperature to minus 40 ±3°C (minus 40 ±5°F) within 30 minutes and maintaining this temperature for 4 hours. d) Raising the chamber temperature to 20 ±3°C (68 ±5°F) within 30 minutes. e) Repeating the sequence for a further 9 cycles. f) After the 10th cycle, storing the batteries for a minimum of 24 hours, at a temperature of 20 ±5°C (68 ±9°F) prior to examination.	Tested as required. See table 18	P
18.2	The samples shall not explode or catch fire. In addition, the samples shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
19	Low Pressure (Altitude Simulation) Test		P
19.1	Sample batteries are to be stored for 6 hours at an absolute pressure of 11.6 kPa (1.68 psi) and a temperature of 20 ± 3°C (68 ± 5°F).	Tested as required. See table 19	P
19.2	The samples shall not explode or catch fire as a result of the Low Pressure (Altitude Simulation) Test. In addition, the samples shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
FIRE EXPOSURE TEST			
20	Projectile Test		P
20.1	When subjected to the test described in 20.2 - 20.5 no part of an exploding cell or battery shall penetrate the wire screen such that some or all of the cell or battery protrudes through the screen.	The test results meet the requirements.	P

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
20.2	Each test sample cell or battery is to be placed on a screen that covers a 102-mm (4-inch) diameter hole in the center of a platform table. The screen is to be constructed of steel wire mesh having 20 openings per 25.4 mm (1 in) and a wire diameter of 0.43 mm (0.017 in).	Prepared the test as required.	P
20.3	The screen is to be mounted 38 mm (1-1/2 in) above a Meker type burner. The fuel and air flow rates are to be set to provide a bright blue flame that causes the supporting screen to glow a bright red.	Prepared the test as required.	P
20.4	An eight-sided covered wire cage, 610-mm (2-ft) across and 305-mm (1-ft) high, made from metal screening is to be placed over the test sample. See Figure 20.1. The metal screening is to be constructed from 0.25-mm (0.010-in) diameter aluminum wire with 16-18 wires per 25.4 mm (1 inch) in each direction.	Tested as required.	P
20.5	The sample is to be heated and shall remain on the screen until it explodes or the cell or battery has ignited and burned out. It is not required to secure the sample in place unless it is at risk of falling off the screen before the test is completed. When required, the sample shall be secured to the screen with a single wire tied around the sample.	Tested as required.	P
MARKING			
21	General		P
21.1	A battery shall be legibly and permanently marked with: The manufacturer's name, trade name, or trademark or other descriptive marking by which the organization responsible for the product may be identified; A distinctive ("catalog" or "model") number or the equivalent; The date or other dating period of manufacture not exceeding any three consecutive months.	See marking plate on page 4	P
21.2	If a manufacturer produces a battery at more than one factory, each battery package shall have a distinctive marking to identify it as the product of a particular factory.	One factory only.	N/A
22	Primary Batteries		N/A
22.1	A primary battery shall be marked with the word "WARNING" and the following or an equivalent statement: "Risk of fire and burns. Do not recharge, open, crush, heat above (the manufacturer's specified temperature rating), or incinerate." If space does not permit marking on the battery, the marking may be on the smallest unit package.	Secondary cell	N/A

UL1642:2020			
Clause	Requirement + Test	Result - Remark	Verdict
22.2	<p>The packaging for a user-replaceable battery shall be marked with the word "CAUTION" and the following or equivalent statements:</p> <p>"Risk of fire and burns. Do not recharge, disassemble, heat above (the manufacturer's specified temperature rating), or incinerate. Keep battery out of reach of children and in original package until ready to use. Dispose of used batteries promptly."</p>		N/A
22.3	<p>For user replaceable lithium primary coin cells (3.0 V) the packaging shall also include the following or equivalent: "WARNING – Never put batteries in mouth. Swallowing may lead to serious injury or death. If ingested, immediately seek medical attention and have the doctor phone the National Capital Poison Control Center." This marking may be combined with the marking of 22.2, if the signal word "WARNING" is used instead of "CAUTION."</p>		N/A

10	TABLE: Short-Circuit Test(model: XJ 502030)					P
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C1	NCT23027040-XJ 502030-C2	NCT23027040-XJ 502030-C3	NCT23027040-XJ 502030-C4	NCT23027040-XJ 502030-C5	
Ambient temperature: (°C)	23.4	23.4	23.4	23.4	23.4	
Max. casing temp Tmax(°C)	121.7	122.7	122.6	116.5	119.0	
Sample No.	NCT23027040-XJ 502030-C6	NCT23027040-XJ 502030-C7	NCT23027040-XJ 502030-C8	NCT23027040-XJ 502030-C9	NCT23027040-XJ 502030-C10	
Ambient temperature: (°C)	55.3	55.3	55.3	55.3	55.3	
Max. casing temp Tmax(°C)	122.1	120.6	120.3	122.3	122.0	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C61	NCT23027040-XJ 502030-C62	NCT23027040-XJ 502030-C63	NCT23027040-XJ 502030-C64	NCT23027040-XJ 502030-C65	
Ambient temperature: (°C)	23.4	23.4	23.4	23.4	23.4	
Max. casing temp Tmax(°C)	120.8	118.4	123.3	119.7	123.5	
Sample No.	NCT23027040-XJ 502030-C66	NCT23027040-XJ 502030-C67	NCT23027040-XJ 502030-C68	NCT23027040-XJ 502030-C69	NCT23027040-XJ 502030-C70	
Ambient temperature: (°C)	55.3	55.3	55.3	55.3	55.3	
Max. casing temp Tmax(°C)	118.7	112.9	119.3	119.7	120.8	
Supplementary information: Tmax was recorded on the centre of the cell surface. No explode or catch fire.						

10	TABLE: Short-Circuit Test (model:XJ104058)					P
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C1	NCT23027040-XJ104058-C2	NCT23027040-XJ104058-C3	NCT23027040-XJ104058-C4	NCT23027040-XJ104058-C5	
Ambient temperature: (°C)	23.2	23.2	23.2	23.2	23.2	
Max. casing temp Tmax (°C)	132.7	125.6	113.8	127.2	112.7	
Sample No.	NCT23027040-XJ104058-C6	NCT23027040-XJ104058-C7	NCT23027040-XJ104058-C8	NCT23027040-XJ104058-C9	NCT23027040-XJ104058-C10	
Ambient temperature: (°C)	56.5	56.5	56.5	56.5	56.5	
Max. casing temp Tmax (°C)	124.0	126.8	120.9	129.5	125.3	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C61	NCT23027040-XJ104058-C62	NCT23027040-XJ104058-C63	NCT23027040-XJ104058-C64	NCT23027040-XJ104058-C65	
Ambient temperature: (°C)	23.2	23.2	23.2	23.2	23.2	
Max. casing temp Tmax (°C)	129.6	129	114.5	116.5	123.1	
Sample No.	NCT23027040-XJ104058-C66	NCT23027040-XJ104058-C67	NCT23027040-XJ104058-C68	NCT23027040-XJ104058-C69	NCT23027040-XJ104058-C70	
Ambient temperature: (°C)	56.5	56.5	56.5	56.5	56.5	
Max. casing temp Tmax (°C)	125.4	118.7	126.1	128.7	124.5	
Supplementary information: Tmax was recorded on the centre of the cell surface. No explode or catch fire.						

10	TABLE: Short-Circuit Test (model: XJ105080)					P
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C1	NCT23027040-XJ105080-C2	NCT23027040-XJ105080-C3	NCT23027040-XJ105080-C4	NCT23027040-XJ105080-C5	
Ambient temperature: (°C)	23.4	23.4	23.4	23.4	23.4	
Max. casing temp Tmax (°C)	119.1	125.9	127.3	123.0	127.1	
Sample No.	NCT23027040-XJ105080-C6	NCT23027040-XJ105080-C7	NCT23027040-XJ105080-C8	NCT23027040-XJ105080-C9	NCT23027040-XJ105080-C10	
Ambient temperature: (°C)	55.1	55.1	55.1	55.1	55.1	
Max. casing temp Tmax (°C)	124.3	128.2	132.3	125.6	123.9	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C61	NCT23027040-XJ105080-C62	NCT23027040-XJ105080-C63	NCT23027040-XJ105080-C64	NCT23027040-XJ105080-C65	
Ambient temperature: (°C)	23.4	23.4	23.4	23.4	23.4	
Max. casing temp Tmax (°C)	128.0	123.2	127.0	123.6	121.1	
Sample No.	NCT23027040-XJ105080-C66	NCT23027040-XJ105080-C67	NCT23027040-XJ105080-C68	NCT23027040-XJ105080-C69	NCT23027040-XJ105080-C70	
Ambient temperature: (°C)	55.1	55.1	55.1	55.1	55.1	
Max. casing temp Tmax (°C)	121.5	126.3	120.4	125.7	120.8	
Supplementary information: Tmax was recorded on the centre of the cell surface. No explode or catch fire.						

11	TABLE: Abnormal Charging Test(model: XJ 502030)					P
Id	0.05A		Ue		2.75V	
Ic	0.125A		Uc		4.2V	
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C11	NCT23027040-XJ 502030-C12	NCT23027040-XJ 502030-C13	NCT23027040-XJ 502030-C14	NCT23027040-XJ 502030-C15	
Ambient temperature: (°C)	23.3	23.3	23.3	23.3	23.3	
Max. casing temp Tmax (°C)	29.8	30.3	29.8	29.4	29.1	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C71	NCT23027040-XJ 502030-C72	NCT23027040-XJ 502030-C73	NCT23027040-XJ 502030-C74	NCT23027040-XJ 502030-C75	
Ambient temperature: (°C)	23.3	23.3	23.3	23.3	23.3	
Max. casing temp Tmax (°C)	29.6	29.5	30.1	29.7	29.3	
Supplementary information: Test current is 0.375A. No explode or catch fire.						

11	TABLE: Abnormal Charging Test (model: XJ104058)					P
Id	0.6A		Ue		2.75V	
Ic	1.5A		Uc		4.2V	
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C11	NCT23027040-XJ104058-C12	NCT23027040-XJ104058-C13	NCT23027040-XJ104058-C14	NCT23027040-XJ104058-C15	
Ambient temperature: (°C)	23.3	23.3	23.3	23.3	23.3	
Max. casing temp Tmax (°C)	29.7	29.6	30.7	29.8	29.9	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C71	NCT23027040-XJ104058-C72	NCT23027040-XJ104058-C73	NCT23027040-XJ104058-C74	NCT23027040-XJ104058-C75	
Ambient temperature: (°C)	23.3	23.3	23.3	23.3	23.3	
Max. casing temp Tmax (°C)	30.7	29.4	30.2	30.1	30.0	
Supplementary information: Test current is 4.5A. No explode or catch fire.						

11	TABLE: Abnormal Charging Test (model: XJ105080)					P
Id	1.002A		Ue		2.75V	
Ic	2.505A		Uc		4.2V	
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C11	NCT23027040-XJ105080-C12	NCT23027040-XJ105080-C13	NCT23027040-XJ105080-C14	NCT23027040-XJ105080-C15	
Ambient temperature: (°C)	23.5	23.5	23.5	23.5	23.5	
Max. casing temp Tmax (°C)	33.2	31.5	30.9	32.5	30.2	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C71	NCT23027040-XJ105080-C72	NCT23027040-XJ105080-C73	NCT23027040-XJ105080-C74	NCT23027040-XJ105080-C75	
Ambient temperature: (°C)	23.5	23.5	23.5	23.5	23.5	
Max. casing temp Tmax (°C)	31.6	30.5	31.4	29.3	31.2	
Supplementary information: Test current is 7.515A. No explode or catch fire.						

13	TABLE: Crush Test (model: XJ 502030)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C16	NCT23027040-XJ 502030-C17	NCT23027040-XJ 502030-C18	NCT23027040-XJ 502030-C19	NCT23027040-XJ 502030-C20	
Fire or explosion?	No	No	No	No	No	
Crush direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C76	NCT23027040-XJ 502030-C77	NCT23027040-XJ 502030-C78	NCT23027040-XJ 502030-C79	NCT23027040-XJ 502030-C80	
Fire or explosion?	No	No	No	No	No	
Crush direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Supplementary information: no explosion or catch fire.						

13	TABLE: Crush Test (model: XJ104058)					P
Ambient temperature: 23.3°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C16	NCT23027040-XJ104058-C17	NCT23027040-XJ104058-C18	NCT23027040-XJ104058-C19	NCT23027040-XJ104058-C20	
Fire or explosion?	No	No	No	No	No	
Crush direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C76	NCT23027040-XJ104058-C77	NCT23027040-XJ104058-C78	NCT23027040-XJ104058-C79	NCT23027040-XJ104058-C80	
Fire or explosion?	No	No	No	No	No	
Crush direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Supplementary information: no explosion or catch fire.						

13	TABLE: Crush Test (model: XJ105080)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C16	NCT23027040-XJ105080-C17	NCT23027040-XJ105080-C18	NCT23027040-XJ105080-C19	NCT23027040-XJ105080-C20	
Fire or explosion?	No	No	No	No	No	
Crush direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C76	NCT23027040-XJ105080-C77	NCT23027040-XJ105080-C78	NCT23027040-XJ105080-C79	NCT23027040-XJ105080-C80	
Fire or explosion?	No	No	No	No	No	
Crush direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Supplementary information: no explosion or catch fire.						

14	TABLE: Impact Test (model: XJ 502030)					P
Ambient temperature: 23.3°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C21	NCT23027040-XJ 502030-C22	NCT23027040-XJ 502030-C23	NCT23027040-XJ 502030-C24	NCT23027040-XJ 502030-C25	
Fire or explosion?	No	No	No	No	No	
Impact direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C81	NCT23027040-XJ 502030-C82	NCT23027040-XJ 502030-C83	NCT23027040-XJ 502030-C84	NCT23027040-XJ 502030-C85	
Fire or explosion?	No	No	No	No	No	
Impact direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Supplementary information: no explosion or catch fire.						

14	TABLE: Impact Test (model: XJ104058)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C21	NCT23027040-XJ104058-C22	NCT23027040-XJ104058-C23	NCT23027040-XJ104058-C24	NCT23027040-XJ104058-C25	
Fire or explosion?	No	No	No	No	No	
Impact direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C81	NCT23027040-XJ104058-C82	NCT23027040-XJ104058-C83	NCT23027040-XJ104058-C84	NCT23027040-XJ104058-C85	
Fire or explosion?	No	No	No	No	No	
Impact direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Supplementary information: no explosion or catch fire.						

14	TABLE: Impact Test (model: XJ105080)					P
Ambient temperature: 23.6°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C21	NCT23027040-XJ105080-C22	NCT23027040-XJ105080-C23	NCT23027040-XJ105080-C24	NCT23027040-XJ105080-C25	
Fire or explosion?	No	No	No	No	No	
Impact direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C81	NCT23027040-XJ105080-C82	NCT23027040-XJ105080-C83	NCT23027040-XJ105080-C84	NCT23027040-XJ105080-C85	
Fire or explosion?	No	No	No	No	No	
Impact direction	Wide side	Wide side	Wide side	Wide side	Wide side	
Supplementary information: no explosion or catch fire.						

14A	TABLE: Round Bar Crush Test					N/A
Ambient temperature: °C						
Fully Charged Samples						
Sample No.						
Fire or explosion? (near positive tab)						
Cell thickness (mm)						
Sample No.						
Fire or explosion? (near negative tab)						
Cell thickness (mm)						
Cycled Samples						
Sample No.						
Fire or explosion?						
Cell thickness (mm)						

15	TABLE: Shock Test(model: XJ 502030)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C26	NCT23027040-XJ 502030-C27	NCT23027040-XJ 502030-C28	NCT23027040-XJ 502030-C29	NCT23027040-XJ 502030-C30	
Mass before test (g)	5.485	5.501	5.428	5.513	5.443	
Mass after test (g)	5.484	5.499	5.427	5.511	5.442	
Mass loss ratio (%)	0.018	0.036	0.018	0.036	0.018	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C86	NCT23027040-XJ 502030-C87	NCT23027040-XJ 502030-C88	NCT23027040-XJ 502030-C89	NCT23027040-XJ 502030-C90	
Mass before test (g)	5.480	5.431	5.576	5.402	5.514	
Mass after test (g)	5.478	5.430	5.575	5.401	5.512	
Mass loss ratio (%)	0.036	0.018	0.018	0.019	0.036	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

15	TABLE: Shock Test (model: XJ104058)					P
Ambient temperature: 23.1°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C26	NCT23027040-XJ104058-C27	NCT23027040-XJ104058-C28	NCT23027040-XJ104058-C29	NCT23027040-XJ104058-C30	
Mass before test (g)	45.502	45.290	45.327	45.769	45.729	
Mass after test (g)	45.501	45.288	45.326	45.767	45.728	
Mass loss ratio (%)	0.002	0.004	0.002	0.004	0.002	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C86	NCT23027040-XJ104058-C87	NCT23027040-XJ104058-C88	NCT23027040-XJ104058-C89	NCT23027040-XJ104058-C90	
Mass before test (g)	45.299	45.621	45.857	45.385	45.447	
Mass after test (g)	45.298	45.619	45.855	45.384	45.446	
Mass loss ratio (%)	0.002	0.004	0.004	0.002	0.002	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

15	TABLE: Shock Test (model: XJ105080)					P
Ambient temperature: 23.3°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C26	NCT23027040-XJ105080-C27	NCT23027040-XJ105080-C28	NCT23027040-XJ105080-C29	NCT23027040-XJ105080-C30	
Mass before test (g)	83.375	83.188	84.452	84.502	84.373	
Mass after test (g)	83.373	83.185	84.450	84.499	84.371	
Mass loss ratio (%)	0.002	0.004	0.002	0.004	0.002	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C86	NCT23027040-XJ105080-C87	NCT23027040-XJ105080-C88	NCT23027040-XJ105080-C89	NCT23027040-XJ105080-C90	
Mass before test (g)	84.444	82.867	82.867	83.228	82.332	
Mass after test (g)	84.441	82.865	82.864	83.226	82.329	
Mass loss ratio (%)	0.004	0.002	0.004	0.002	0.004	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

16	TABLE: Vibration Test (model: XJ 502030)					P
Ambient temperature: 23.3°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C31	NCT23027040-XJ 502030-C32	NCT23027040-XJ 502030-C33	NCT23027040-XJ 502030-C34	NCT23027040-XJ 502030-C35	
Mass before test (g)	5.529	5.373	5.512	5.490	5.471	
Mass after test (g)	5.528	5.371	5.510	5.489	5.470	
Mass loss ratio (%)	0.018	0.037	0.036	0.018	0.018	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C91	NCT23027040-XJ 502030-C92	NCT23027040-XJ 502030-C93	NCT23027040-XJ 502030-C94	NCT23027040-XJ 502030-C95	
Mass before test (g)	5.499	5.402	5.530	5.488	5.445	
Mass after test (g)	5.497	5.401	5.529	5.486	5.444	
Mass loss ratio (%)	0.036	0.019	0.018	0.036	0.018	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

16	TABLE: Vibration Test (model: XJ104058)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C31	NCT23027040-XJ104058-C32	NCT23027040-XJ104058-C33	NCT23027040-XJ104058-C34	NCT23027040-XJ104058-C35	
Mass before test (g)	45.368	45.284	45.417	45.663	45.701	
Mass after test (g)	45.366	45.283	45.416	45.661	45.700	
Mass loss ratio (%)	0.004	0.002	0.002	0.004	0.002	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C91	NCT23027040-XJ104058-C92	NCT23027040-XJ104058-C93	NCT23027040-XJ104058-C94	NCT23027040-XJ104058-C95	
Mass before test (g)	45.814	45.293	45.554	45.740	45.358	
Mass after test (g)	45.813	45.292	45.552	45.739	45.356	
Mass loss ratio (%)	0.002	0.002	0.004	0.002	0.004	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

16	TABLE: Vibration Test (model: XJ105080)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C31	NCT23027040-XJ105080-C32	NCT23027040-XJ105080-C33	NCT23027040-XJ105080-C34	NCT23027040-XJ105080-C35	
Mass before test (g)	83.516	84.770	82.618	82.135	83.248	
Mass after test (g)	83.513	84.768	82.615	82.133	83.245	
Mass loss ratio (%)	0.004	0.002	0.004	0.002	0.004	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C91	NCT23027040-XJ105080-C92	NCT23027040-XJ105080-C93	NCT23027040-XJ105080-C94	NCT23027040-XJ105080-C95	
Mass before test (g)	81.787	82.834	84.880	82.580	82.288	
Mass after test (g)	81.785	82.831	84.878	82.577	82.286	
Mass loss ratio (%)	0.002	0.004	0.002	0.004	0.002	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

18	TABLE: Temperature Cycling Test(model: XJ 502030)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C46	NCT23027040-XJ 502030-C47	NCT23027040-XJ 502030-C48	NCT23027040-XJ 502030-C49	NCT23027040-XJ 502030-C50	
Mass before test (g)	5.452	5.557	5.429	5.522	5.433	
Mass after test (g)	5.449	5.553	5.426	5.518	5.430	
Mass loss ratio (%)	0.055	0.072	0.055	0.072	0.055	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C106	NCT23027040-XJ 502030-C107	NCT23027040-XJ 502030-C108	NCT23027040-XJ 502030-C109	NCT23027040-XJ 502030-C110	
Mass before test (g)	5.496	5.511	5.489	5.528	5.418	
Mass after test (g)	5.493	5.508	5.485	5.525	5.414	
Mass loss ratio (%)	0.055	0.054	0.073	0.054	0.074	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

18	TABLE: Temperature Cycling Test (model: XJ104058)					P
Ambient temperature: 23.5°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C46	NCT23027040-XJ104058-C47	NCT23027040-XJ104058-C48	NCT23027040-XJ104058-C49	NCT23027040-XJ104058-C50	
Mass before test (g)	45.669	45.747	45.324	45.288	45.347	
Mass after test (g)	45.666	45.743	45.320	45.285	45.344	
Mass loss ratio (%)	0.007	0.009	0.009	0.007	0.007	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C106	NCT23027040-XJ104058-C107	NCT23027040-XJ104058-C108	NCT23027040-XJ104058-C109	NCT23027040-XJ104058-C110	
Mass before test (g)	45.521	45.652	45.550	45.711	45.338	
Mass after test (g)	45.517	45.648	45.547	45.707	45.335	
Mass loss ratio (%)	0.009	0.009	0.007	0.009	0.007	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

18	TABLE: Temperature Cycling Test (model: XJ105080)					P
Ambient temperature: 23.3°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C46	NCT23027040-XJ105080-C47	NCT23027040-XJ105080-C48	NCT23027040-XJ105080-C49	NCT23027040-XJ105080-C50	
Mass before test (g)	82.557	83.618	83.640	83.072	83.453	
Mass after test (g)	82.553	83.615	83.637	83.068	83.449	
Mass loss ratio (%)	0.005	0.004	0.004	0.005	0.005	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C106	NCT23027040-XJ105080-C107	NCT23027040-XJ105080-C108	NCT23027040-XJ105080-C109	NCT23027040-XJ105080-C110	
Mass before test (g)	84.212	83.709	82.058	82.808	81.022	
Mass after test (g)	84.209	83.705	82.055	82.804	81.019	
Mass loss ratio (%)	0.004	0.005	0.004	0.005	0.004	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

19	TABLE: Low Pressure (Altitude Simulation) Test(model: XJ 502030)					P
Ambient temperature: 23.3°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ 502030-C51	NCT23027040-XJ 502030-C52	NCT23027040-XJ 502030-C53	NCT23027040-XJ 502030-C54	NCT23027040-XJ 502030-C55	
Mass before test (g)	5.500	5.574	5.440	5.555	5.522	
Mass after test (g)	5.499	5.572	5.439	5.553	5.521	
Mass loss ratio (%)	0.018	0.036	0.018	0.036	0.018	
Cycled Samples						
Sample No.	NCT23027040-XJ 502030-C111	NCT23027040-XJ 502030-C112	NCT23027040-XJ 502030-C113	NCT23027040-XJ 502030-C114	NCT23027040-XJ 502030-C115	
Mass before test (g)	5.475	5.563	5.462	5.520	5.397	
Mass after test (g)	5.473	5.562	5.460	5.519	5.396	
Mass loss ratio (%)	0.037	0.018	0.037	0.018	0.019	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

19	TABLE: Low Pressure (Altitude Simulation) Test (model: XJ104058)					P
Ambient temperature: 23.4°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ104058-C51	NCT23027040-XJ104058-C52	NCT23027040-XJ104058-C53	NCT23027040-XJ104058-C54	NCT23027040-XJ104058-C55	
Mass before test (g)	45.661	45.358	45.479	45.369	45.289	
Mass after test (g)	45.659	45.357	45.478	45.368	45.287	
Mass loss ratio (%)	0.004	0.002	0.002	0.002	0.004	
Cycled Samples						
Sample No.	NCT23027040-XJ104058-C111	NCT23027040-XJ104058-C112	NCT23027040-XJ104058-C113	NCT23027040-XJ104058-C114	NCT23027040-XJ104058-C115	
Mass before test (g)	45.774	45.639	45.528	45.449	45.619	
Mass after test (g)	45.773	45.637	45.526	45.448	45.617	
Mass loss ratio (%)	0.002	0.004	0.004	0.002	0.004	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

19	TABLE: Low Pressure (Altitude Simulation) Test (model: XJ105080)					P
Ambient temperature: 23.5°C						
Fully Charged Samples						
Sample No.	NCT23027040-XJ105080-C51	NCT23027040-XJ105080-C52	NCT23027040-XJ105080-C53	NCT23027040-XJ105080-C54	NCT23027040-XJ105080-C55	
Mass before test (g)	82.856	84.347	82.636	82.452	82.103	
Mass after test (g)	82.853	84.345	82.633	82.450	82.100	
Mass loss ratio (%)	0.004	0.002	0.004	0.002	0.004	
Cycled Samples						
Sample No.	NCT23027040-XJ105080-C111	NCT23027040-XJ105080-C112	NCT23027040-XJ105080-C113	NCT23027040-XJ105080-C114	NCT23027040-XJ105080-C115	
Mass before test (g)	82.876	83.481	82.488	82.425	82.245	
Mass after test (g)	82.874	83.478	82.486	82.422	82.243	
Mass loss ratio (%)	0.002	0.004	0.002	0.004	0.002	
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%						

Critical Components					
Material: e.g. external enclosure, PCB, closed-end connector, sleeves, cord anchorage etc					
Components with winding: e.g. motor, transformer, magnetic coil etc.					
Other components: e.g. switch, thermostat, heater, plug, internal wire, capacitor, relay, varistor etc.					
Object/Part No.	Manufacturer/ trademark	Type/Model	Technical data	Standard	Mark(s) of conformity
-Positive electrode	Hefei Rongjie Energy Materials Co., Ltd	TE500	LiCoO ₂ , PVDF, NMP, Conductive Additive, D ₅₀ : 14±2µm	--	--
-Negative electrode	Dongguan Shanshan Battery Material Co., Ltd	TS021TA01	Graphite, D ₅₀ : 14±2µm	--	--
-Separator	TianJin DG Membrane Tech Co.,Ltd	LYM1	PE, Shutdown temperature: 130°C, Thickness: 16µm	--	--
-Electrolyte	Jiangsu Kunlun Power Battery Material Co., Ltd	LBC3068G5 3	LiPF ₆ +EC+DMC+EMC	--	--

--End of main report--

List of test equipment used

Testing location:

Shenzhen NCT Testing Technology Co.,Ltd

A101 & 2F, B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, China

Clause	Measurement/ testing	Testing/measuring equipment/material used, (equipment ID)	Range used	Last calibration date	Calibration due date
10	Short-Circuit Test	NCT-018/Short circuit test instrument/BE-1000W	Temperature range: 20~60°C, DC Resistance: 80.06mΩ	2023/03/17	2024/03/16
		NCT-089/ Temperature recorder/ ANB-WD40	Temperature range: -50°C~300°C	2023/03/17	2024/03/16
		NCT-108/DC Resistance Tester/ UT620C	Range: 30-300mΩ, 3-300Ω, 3-300KΩ	2023/03/17	2024/03/16
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-005/Stop Watch/PC396	1~86400s	2022/10/28	2023/10/27
	NCT-025/Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27	
11	Abnormal Charging Test	NCT-011/Charge and discharge test system/ R2D6-20V-10A	20V, 10A	2022/10/28	2023/10/27
		NCT-101/Charge and discharge test system/ CT-4008-40V20A-NA	40V, 20A	2023/03/17	2024/03/16
		NCT-090/ Temperature recorder/ ANB-WD24	Temperature range: -30°C~300°C	2022/10/28	2023/10/27
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-005/Stop Watch/PC396	1~86400s	2022/10/28	2023/10/27

		NCT-060/Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
13	Crush Test	NCT-020/Temperature controlled crush test instrument/BE-6045T	Temperature range: -20~80°C Force: 0.4~20.0KN Speed range: 6-900mm/min Displacement range: 0.5~150mm	2022/10/28	2023/10/27
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-059/ Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
14	Impact Test	NCT-019/Impact test instrument/BE-5066	Weight mass: 9.1kg Drop height: 610mm Cross bar diameter: 15.8mm	2022/12/23	2023/12/22
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-006/Temperature and Humidity Recorder/HTC-1	-10°C~50°C, 20%~90%RH	2023/03/25	2024/03/24
15	Shock Test	NCT-022/Shock test instrument/SY10-2	Peak acceleration: 50G, 150G Pulse duration: 11ms, 6ms	2023/03/17	2024/03/16
		NCT-103/Electronic scale/YH-M2003	MAX:200g Precision: 0.001g	2022/10/28	2023/10/27
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27

		NCT-058/Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
16	Vibration Test	NCT-123/Vibration test instrument/JQA-202-335	Frequency range: 7-2000Hz Acceleration: 10-80m/s ² Amplitudes: 0.76-15.0mm	2023/03/17	2024/03/16
		NCT-103/Electronic scale/YH-M2003	MAX:200g Precision: 0.001g	2022/10/28	2023/10/27
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-005/Stop Watch/PC396	1~86400s	2022/10/28	2023/10/27
		NCT-058/Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
17	Heating Test	NCT-014/Thermal abuse test instrument/ BE-101-2A	Temperature: 85°C, 130°C Heating rate: 5.12°C/min Size: 50*50*60cm	2023/03/17	2024/03/16
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-005/Stop Watch/PC396	1~86400s	2022/10/28	2023/10/27
		NCT-062/ Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
18	Temperature Cycling Test	NCT-118/Constant temperature and humidity chamber/ SDJ205	Temperature range: -40°C ~ 130°C Humidity range: 20~98%RH Temperature change rate (-40~150): 5.03°C/min (150--40): 4.06°C/min	2023/03/17	2024/03/16

		NCT-103/Electronic scale/YH-M2003	MAX:200g Precision: 0.001g	2022/10/28	2023/10/27
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-005/Stop Watch/PC396	1~86400s	2022/10/28	2023/10/27
		NCT-025/Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
19	Low Pressure (Altitude Simulation) Test	NCT-012/Low-pressure high-altitude simulation test case/ GX-3020-Z	Pressure value: 11.6kPa Timer: 0-99.99h	2023/03/17	2024/03/16
		NCT-103/Electronic scale/YH-M2003	MAX:200g Precision: 0.001g	2022/10/28	2023/10/27
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27
		NCT-005/Stop Watch/PC396	1~86400s	2022/10/28	2023/10/27
		NCT-025/Temperature and Humidity Recorder/HTC-1	10°C~30°C, 40%~80%RH	2022/10/28	2023/10/27
20	Projectile Test	NCT-015/Projectile test instrument/GX-6053	Test hole diameter: 102.3mm, Test screen diameter: 0.252mm, Wire mesh density: 17.6, Test octagonal mesh cover height: 305.3mm, Test octagonal mesh cover width: 613.2mm	2023/03/17	2024/03/16
		NCT-001/Digital multimeter/17B+	DC/AC Voltage: Range: 400mV, 4-1000V DC/AC Current Range: 400μA, 4-400mA, 4-10A Resistance: 400Ω, 4-400KΩ, 4-40MΩ	2022/10/28	2023/10/27

		NCT-006/ Temperature and Humidity Recorder/HTC-1	-10°C~50°C, 20%~90%RH	2023/03/25	2024/03/24
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Product: Rechargeable Li-ion Cell

Type Designation: XJ 502030, XJ602030, XJ701435, XJ602035, XJ602535, XJ602248, XJ803030, XJ902535, XJ102050, XJ102540, XJ903048, XJ803060, XJ103450, **XJ104058**, **XJ105080**

Remark: The tested models XJ 502030, XJ104058, XJ105080 are representatives of all models.

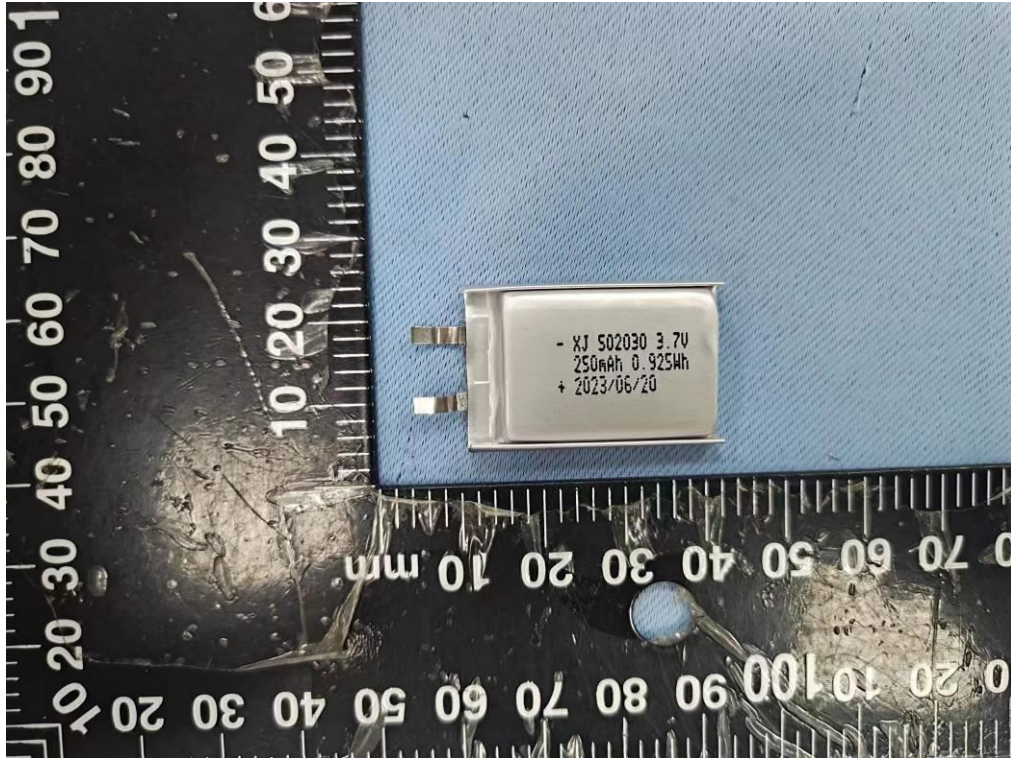


Figure 1. Front view of cell (model: XJ 502030)

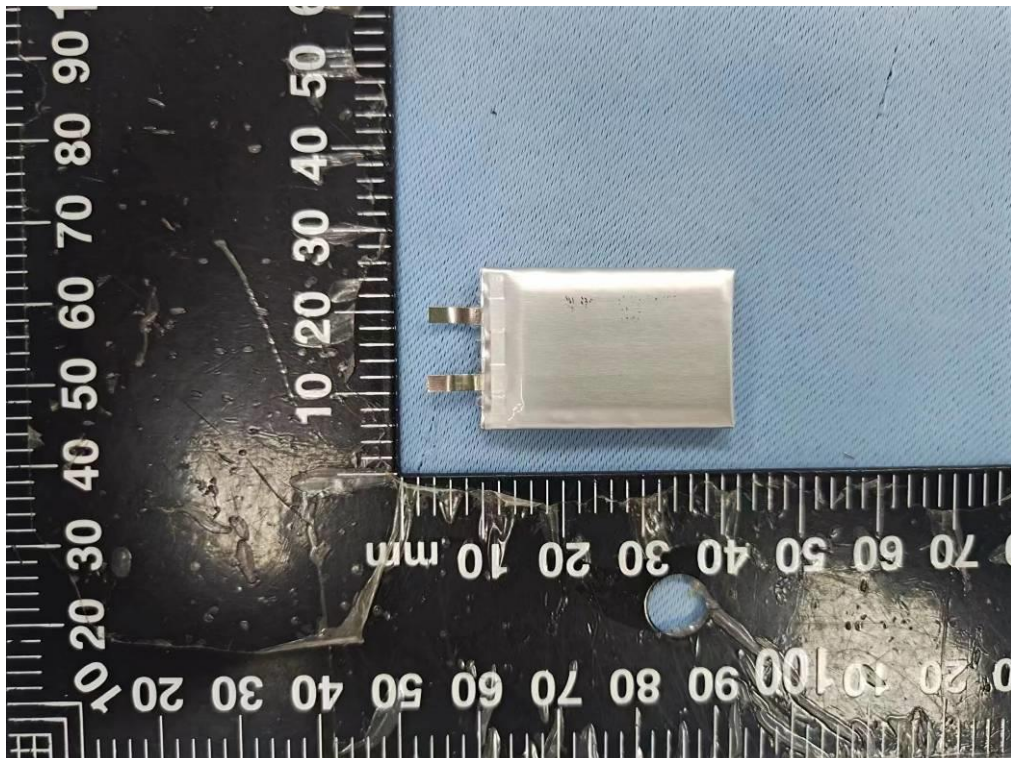


Figure 2. Back view of cell (model: XJ 502030)

Product: Rechargeable Li-ion Cell

Type Designation: XJ 502030, XJ602030, XJ701435, XJ602035, XJ602535, XJ602248, XJ803030, XJ902535, XJ102050, XJ102540, XJ903048, XJ803060, XJ103450, **XJ104058**, **XJ105080**



Figure 3. Front view of cell (model: XJ104058)

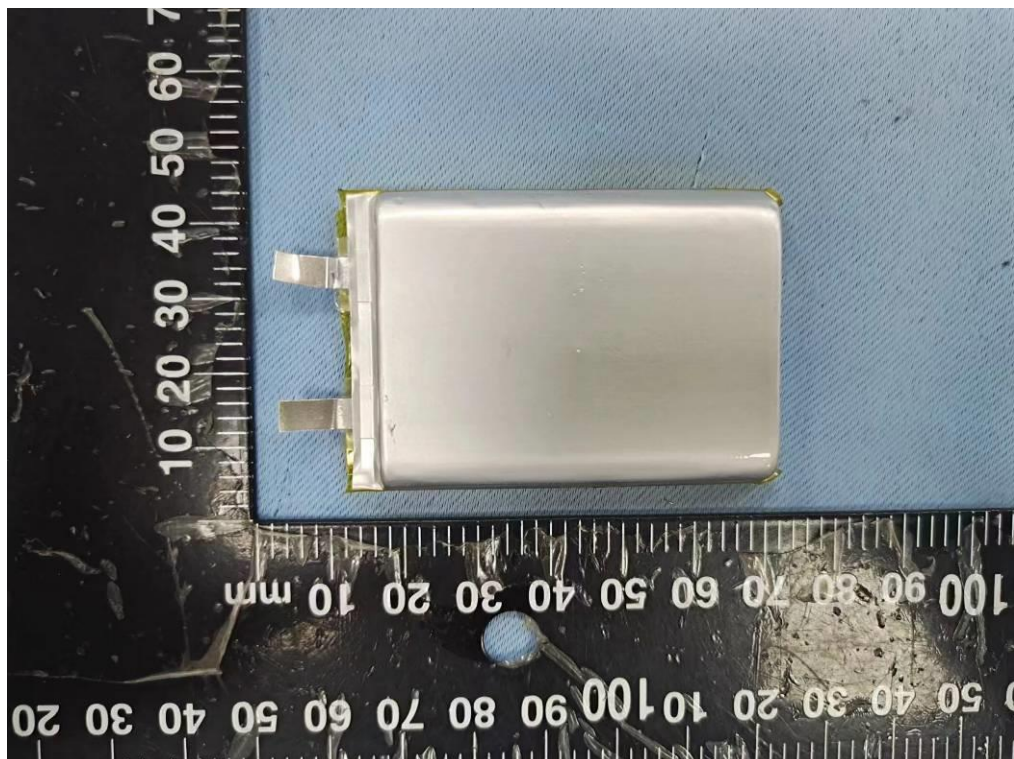


Figure 4. Back view of cell (model: XJ104058)

Product: Rechargeable Li-ion Cell

Type Designation: XJ 502030, XJ602030, XJ701435, XJ602035, XJ602535, XJ602248, XJ803030, XJ902535, XJ102050, XJ102540, XJ903048, XJ803060, XJ103450, **XJ104058**, **XJ105080**

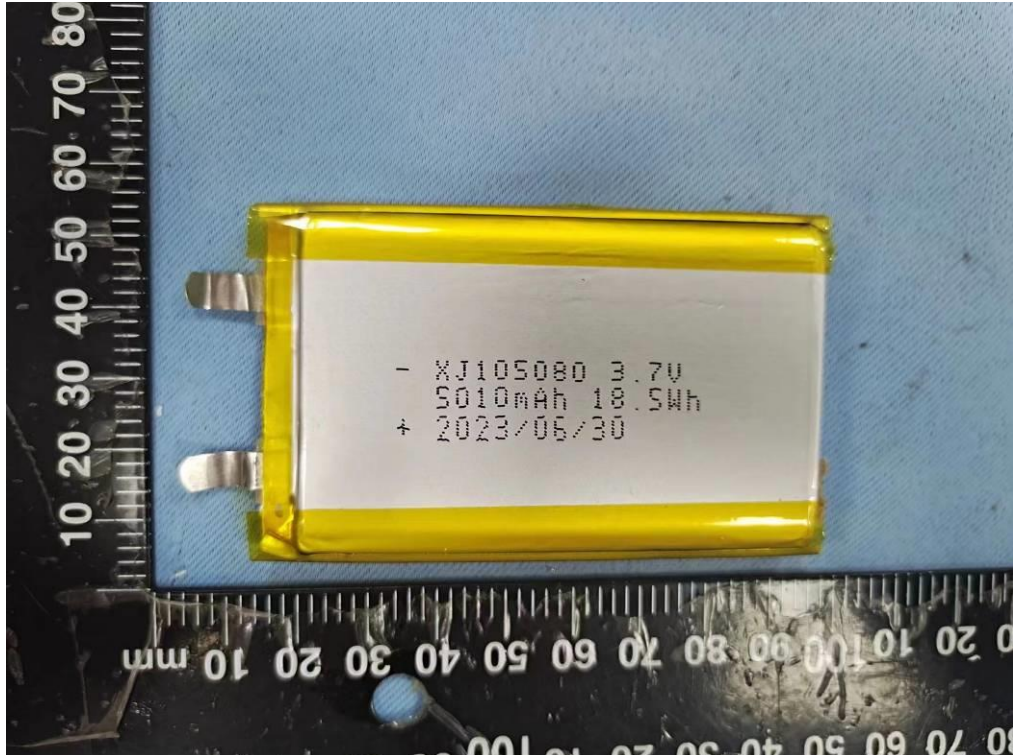


Figure 5. Front view of cell (model: XJ105080)

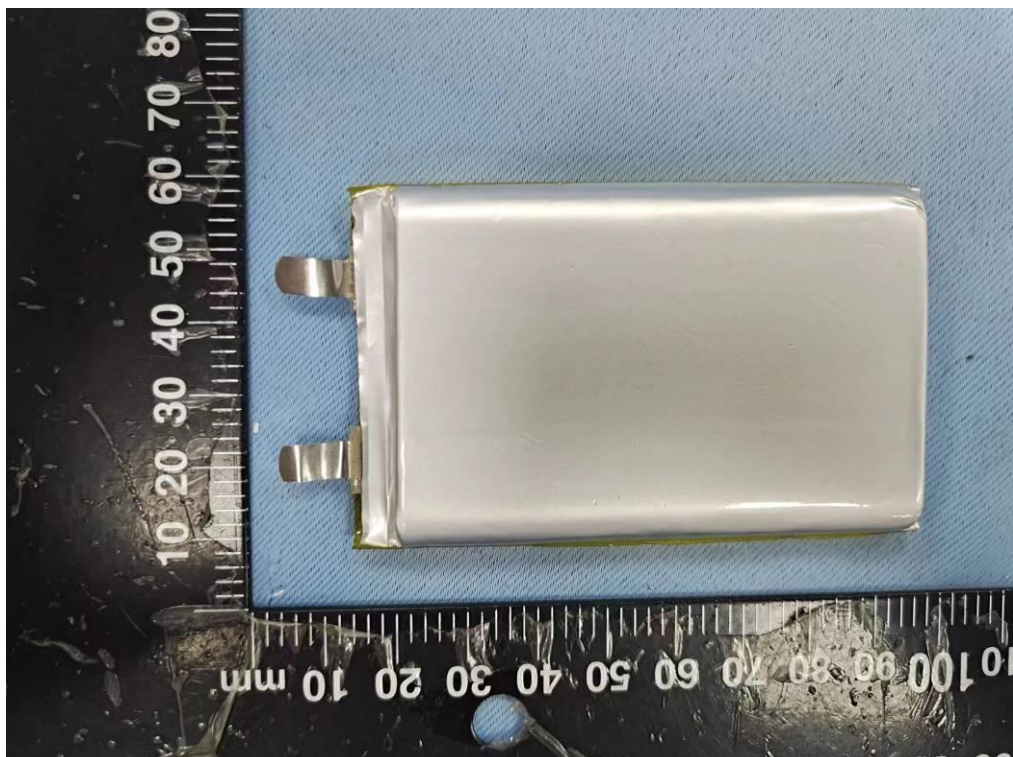


Figure 6. Back view of cell (model: XJ105080)