



Ref. Certif. No.

JPTUV-095510

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product
Produit

Li-ion Cylindrical Cell

Name and address of the applicant
Nom et adresse du demandeur

SHENZHEN BOFUNENG BATTERY CO., LTD.
A Building Chun yang Industrial park
Zhugushi Road Wulian community, Long Cheng Street, Longgang district, Shenzhen, P. R. China

Name and address of the manufacturer
Nom et adresse du fabricant

SHENZHEN BOFUNENG BATTERY CO., LTD.
A Building Chun yang Industrial park
Zhugushi Road Wulian community, Long Cheng Street, Longgang district, Shenzhen, P. R. China

Name and address of the factory
Nom et adresse de l'usine

SHENZHEN BOFUNENG BATTERY CO., LTD.
A Building Chun yang Industrial park
Zhugushi Road Wulian community, Long Cheng Street, Longgang district, Shenzhen, P. R. China

Ratings and principal characteristics
Valeurs nominales et caractéristiques principales

Refer to test report

Trademark (if any)
Marque de fabrique (si elle existe)

Type of Manufacturer's Testing Laboratories used
Type de programme du laboratoire d'essais constructeur

N/A

Model / Type Ref.
Ref. de type

Refer to test report

Additional information (if necessary may also be reported on page 2)
Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2^{ème} page)

For model differences, refer to test report

A sample of the product was tested and found to be in conformity with
Un échantillon de ce produit a été essayé et a été considéré conforme à la

IEC 62133-2:2017
See Test Report for National Differences

As shown in the Test Report Ref. No. which forms part of this Certificate
Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat

50231844 001

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification



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Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
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Date: 03.04.2019

Signature:

Dipl.-Ing. Univ. S. O. Steinke

SHENZHEN BOFUNENG BATTERY CO., LTD.

Date : 03.04.2019

Our ref. : Qinj SZ

Your ref.: 168107432

A Building Chun yang Industrial
park
Zhugushi Road Wulian community
Long Cheng Street, Longgang
district
Shenzhen

Ref : CB Certificate Japan

Type of Equipment : Li-ion Cylindrical Cell

Model Designation : See Certificate

Certificate No. : JPTUV-095510

Report No. : 50231844 001

Dear Ladies and Gentlemen,

Thank you very much for your interest in our services.

Please find enclosed your certification documents.

We appreciate your support and would like to offer our assistance in the approval of your future products through our extensive range of technical services.

Please feel free to contact us whatever your requirements may be.

With kind regards,

Certification Body

Dipl.-Ing. Univ. S. O. Steinke

Enclosure

证书的详细资料请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询



Test Report issued under the responsibility of:



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: 50231844 001
Date of issue: 2019-04-02
Total number of pages.....: 31 pages

Name of Testing Laboratory preparing the Report.....: Shenzhen LCS Compliance Testing Laboratory Ltd.
Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

Applicant's name.....: SHENZHEN BOFUNENG BATTERY CO., LTD.
Address: A Building Chun yang Industrial park, Zhugushi Road, Wulian community, Long Cheng Street, Longgang district, Shenzhen, P. R. China

Test specification:
Standard: IEC 62133-2: 2017
Test procedure: CB Scheme
Non-standard test method.....: N/A

Test Report Form No......: IEC 62133_2A
Test Report Form(s) Originator: DEKRA
Master TRF.....: Dated 2017-08-10

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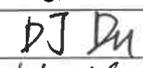
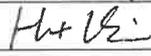
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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description	Li-ion Cylindrical Cell	
Trade Mark	N/A	
Manufacturer	Same as applicant	
Model/Type reference	1) INR18500E, 2) 18500 1000mAh, 3) INR18500A, 4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh, 7) INR18500G, 8) 18500 1300mAh, 9) INR18500, 10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh, 13) INR18500B, 14) 18500 1600mAh, 15) INR18500D, 16) 18500 1900mAh	
Ratings	1) 3.7V, 1000mAh, 3.70Wh, 2) 3.7V, 1000mAh, 3.70Wh, 3) 3.7V, 1100mAh, 4.07Wh, 4) 3.7V, 1100mAh, 4.07Wh, 5) 3.7V, 1200mAh, 4.44Wh, 6) 3.7V, 1200mAh, 4.44Wh, 7) 3.7V, 1300mAh, 4.81Wh, 8) 3.7V, 1300mAh, 4.81Wh, 9) 3.7V, 1400mAh, 5.18Wh, 10) 3.7V, 1400mAh, 5.18Wh, 11) 3.7V, 1500mAh, 5.55Wh, 12) 3.7V, 1500mAh, 5.55Wh, 13) 3.7V, 1600mAh, 5.92Wh, 14) 3.7V, 1600mAh, 5.92Wh, 15) 3.7V, 1900mAh, 7.03Wh, 16) 3.7V, 1900mAh, 7.03Wh	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	Shenzhen LCS Compliance Testing Laboratory Ltd.
	Testing location/ address	Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
	Tested by (name, function, signature)	DJ Du 
	Approved by (name, function, signature)....	Hart Qiu 
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
	Testing location/ address	
	Tested by (name, function, signature)	
	Approved by (name, function, signature)....	
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
	Testing location/ address	
	Tested by (name + signature)	
	Witnessed by (name, function, signature)...	
	Approved by (name, function, signature)....	
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
	Testing location/ address	
	Tested by (name, function, signature)	
	Witnessed by (name, function, signature)...	
	Approved by (name, function, signature)....	
	Supervised by (name, function, signature) :	

List of Attachments (including a total number of pages in each attachment):	
Attachment 1: Photo documentation (8 pages).	
Summary of testing:	
<p>Tests performed (name of test and test clause):</p> <p>cl.5.6.2 Design recommendation;</p> <p>cl.7.1 Charging procedure for test purposes (for Cells);</p> <p>cl.7.2.1 Continuous charging at constant voltage (Cells);</p> <p>cl.7.3.1 External short-circuit (Cells);</p> <p>cl.7.3.3 Free fall (Cells);</p> <p>cl.7.3.4 Thermal abuse (Cells);</p> <p>cl.7.3.5 Crush (Cells);</p> <p>cl.7.3.7 Forced discharge (Cells);</p> <p>cl.7.3.9 Design evaluation – Forced internal short-circuit (Cells).</p> <p>Tests are made with the number of cells specified in IEC 62133-2: 2017.</p>	<p>Testing location:</p> <p>Shenzhen LCS Compliance Testing Laboratory Ltd. Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China</p>
Summary of compliance with National Differences (List of countries addressed):	
N/A	
<input checked="" type="checkbox"/> The product fulfils the requirements of <u>EN 62133-2: 2017</u>	

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 Cylindrical Cell	
Model: INR18500E	
3.7V, 1000mAh, 3.70Wh	
INR19/51 Date: 2019/01	
SHENZHEN BOFUNENG BATTERY CO., LTD.	

+	-
Li-ion Cylindrical Cell	
Model: 18500 1000mAh	
3.7V, 1000mAh, 3.70Wh	
INR19/51 Date: 2019/01	
SHENZHEN BOFUNENG BATTERY CO., LTD.	

+	-
Li-ion Cylindrical Cell	
Model: INR18500A	
3.7V, 1100mAh, 4.07Wh	
INR19/51 Date: 2019/01	
SHENZHEN BOFUNENG BATTERY CO., LTD.	

+	-
Li-ion Cylindrical Cell	
Model: 18500 1100mAh	
3.7V, 1100mAh, 4.07Wh	
INR19/51 Date: 2019/01	
SHENZHEN BOFUNENG BATTERY CO., LTD.	

+ -

Li-ion Cylindrical Cell

Model: INR18500F

3.7V, 1200mAh, 4.44Wh

INR19/51 Date: 2019/01

SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -

Li-ion Cylindrical Cell

Model: 18500 1200mAh

3.7V, 1200mAh, 4.44Wh

INR19/51 Date: 2019/01

SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -

Li-ion Cylindrical Cell

Model: INR18500G

3.7V, 1300mAh, 4.81Wh

INR19/51 Date: 2019/01

SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -

Li-ion Cylindrical Cell

Model: 18500 1300mAh

3.7V, 1300mAh, 4.81Wh

INR19/51 Date: 2019/01

SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -

Li-ion Cylindrical Cell

Model: INR18500

3.7V, 1400mAh, 5.18Wh

INR19/51 Date: 2019/01

SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -
Li-ion Cylindrical Cell
Model: 18500 1400mAh
3.7V, 1400mAh, 5.18Wh
INR19/51 Date: 2019/01
SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -
Li-ion Cylindrical Cell
Model: INR18500C
3.7V, 1500mAh, 5.55Wh
INR19/51 Date: 2019/01
SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -
Li-ion Cylindrical Cell
Model: 18500 1500mAh
3.7V, 1500mAh, 5.55Wh
INR19/51 Date: 2019/01
SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -
Li-ion Cylindrical Cell
Model: INR18500B
3.7V, 1600mAh, 5.92Wh
INR19/51 Date: 2019/01
SHENZHEN BOFUNENG BATTERY CO., LTD.

+ -
Li-ion Cylindrical Cell
Model: 18500 1600mAh
3.7V, 1600mAh, 5.92Wh
INR19/51 Date: 2019/01
SHENZHEN BOFUNENG BATTERY CO., LTD.

Test item particulars.....:	
Classification of installation and use.....:	To be defined in final product
Supply Connection	Electrode tab
Recommend charging method declared by the manufacturer	Charging the cell with 0.2C constant current and 4.2V constant voltage until the current reduces to 0.02C at ambient 20°C±5°C.
Discharge current (0,2 It A)	0.2C
Specified final voltage.....:	3.0V
Upper limit charging voltage per cell.....:	4.2V
Maximum charging current	1.0C
Charging temperature upper limit	45°C
Charging temperature lower limit.....:	0°C
Polymer cell electrolyte type.....:	<input type="checkbox"/> gel polymer... <input type="checkbox"/> solid polymer... <input checked="" type="checkbox"/> 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	2019-02-15
Date (s) of performance of tests	2019-02-15 to 2019-03-20
General remarks:	
<p>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.</p>	
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60086-2:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	Same as applicant

General product information and other remarks:

The cell consists of the positive electrode plate, negative electrode plate, separator, electrolyte, case. The positive and negative electrode plates are housed in the case in the state being separated by the separator.

INR18500E, 18500 1000mAh, INR18500A, 18500 1100mAh, INR18500F, 18500 1200mAh, INR18500G, 18500 1300mAh, INR18500, 18500 1400mAh, INR18500C, 18500 1500mAh, INR18500B, 18500 1600mAh, INR18500D and 18500 1900mAh have same voltage, same construction design, same size, same chemical material, same electrochemistry except the model names and nominal capacity.

The models **18500 1000mAh**, **18500 1200mAh**, **18500 1500mAh** and **18500 1900mAh** were selected for all testing.

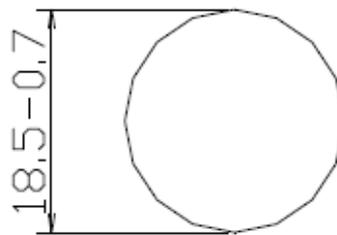
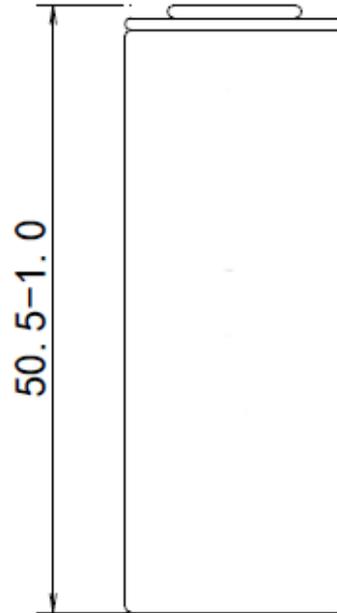
The main features of the cells are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
INR18500E, 18500 1000mAh	1000mAh	3.7V	200mA	200mA	1000mA	3000mA	4.2V	3.0V
INR18500A, 18500 1100mAh	1100mAh	3.7V	220mA	220mA	1100mA	3300mA	4.2V	3.0V
INR18500F, 18500 1200mAh	1200mAh	3.7V	240mA	240mA	1200mA	3600mA	4.2V	3.0V
INR18500G, 18500 1300mAh	1300mAh	3.7V	260mA	260mA	1300mA	3900mA	4.2V	3.0V
INR18500, 18500 1400mAh	1400mAh	3.7V	280mA	280mA	1400mA	4200mA	4.2V	3.0V
INR18500C, 18500 1500mAh	1500mAh	3.7V	300mA	300mA	1500mA	4500mA	4.2V	3.0V
INR18500B, 18500 1600mAh	1600mAh	3.7V	320mA	320mA	1600mA	4800mA	4.2V	3.0V
INR18500D, 18500 1900mAh	1900mAh	3.7V	380mA	380mA	1900mA	5700mA	4.2V	3.0V

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

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
INR18500E, 18500 1000mAh	4.2V	50mA	0°C	45°C
INR18500A, 18500 1100mAh	4.2V	55mA	0°C	45°C
INR18500F, 18500 1200mAh	4.2V	60mA	0°C	45°C
INR18500G, 18500 1300mAh	4.2V	65mA	0°C	45°C
INR18500, 18500 1400mAh	4.2V	70mA	0°C	45°C
INR18500C, 18500 1500mAh	4.2V	75mA	0°C	45°C

INR18500B, 18500 1600mAh	4.2V	80mA	0°C	45°C
INR18500D, 18500 1900mAh	4.2V	95mA	0°C	45°C

Construction:

Cell(Unit: mm)

Circuit diagram:

None, cell only.

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 case exists.	N/A
	Insulation resistance (MΩ) :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate clearance and creepage distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	Venting		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Venting mechanism exists on the top of the cylindrical cell.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	Temperature, voltage and current management	Cell only.	N/A
	Batteries are designed such that abnormal temperature rise conditions are prevented		N/A
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		N/A
	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		N/A
5.5	Terminal contacts		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Electrode tab complied with the requirements.	P

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P
	Terminal contacts are arranged to minimize the risk of short-circuit		P
5.6	Assembly of cells into batteries		P
5.6.1	General	Cell only.	N/A
	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		N/A
	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		N/A
	Protective circuit components added as appropriate and consideration given to the end-device application		N/A
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance		N/A
5.6.2	Design recommendation	Cell only.	N/A
	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		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks		N/A

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
	For 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		N/A
	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	Cell only.	N/A
	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		N/A
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product		N/A
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		N/A
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		N/A
5.7	Quality plan		P
	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. ISO9001: 2015 certificate provided.	P
5.8	Battery safety components		P
	According annex F	See TABLE: Critical components information.	N/A

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
6	TYPE TEST AND SAMPLE SIZE		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old		P
	Coin cells with resistance $\leq 3 \Omega$ (measured according annex D) are tested according table 1	Not coin cells.	N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of $20 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection	Cell only.	N/A
	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	Cell only.	N/A
7	SPECIFIC REQUIREMENTS AND TESTS		P
7.1	Charging procedure for test purposes		P
7.1.1	First procedure		P
	This charging procedure applies to subclauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of $20 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$, using the method declared by the manufacturer	See page 6.	P
	Prior to charging, the battery have been discharged at $20 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ at a constant current of 0,2 It A down to a specified final voltage	See page 6.	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 0-45°C declared.	P
7.2	Intended use		P
7.2.1	Continuous charging at constant voltage (cells)	Tested complied.	P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer	Charging for 7 days with 0.2C.	P
	Results: No fire. No explosion. No leakage.....:	(See appended table 7.2.1)	P

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.2	Case stress at high ambient temperature (battery)	Cell only.	N/A
	Oven temperature (°C)		—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		N/A
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:		N/A
	- 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)	Cell only.	N/A
	The batteries were tested until one of the following occurred:		N/A
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		N/A
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		N/A
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		N/A
	Results: No fire. No explosion..... :		N/A
7.3.3	Free fall	Tested complied.	P
	Results: No fire. No explosion	No fire. No explosion.	P
7.3.4	Thermal abuse (cells)	Tested complied.	P
	Oven temperature (°C)	130°C	—
	Results: No fire. No explosion	No fire. No explosion.	P
7.3.5	Crush (cells)	Tested complied.	P
	The crushing force was released upon:		P
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion..... :	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery	Cell only.	N/A
	The supply voltage which is:		--
	- 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		N/A
	- 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		N/A
	Test was continued until the temperature of the outer casing:		N/A
	- Reached steady state conditions (less than 10 °C change in 30-minute period); or		N/A
	- Returned to ambient		N/A
	Results: No fire. No explosion..... :		N/A
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)		N/A
7.3.8.1	Vibration	Cell only.	N/A
	Results: No fire, no explosion, no rupture, no leakage or venting. :		N/A
7.3.8.2	Mechanical shock	Cell only.	N/A
	Results: No leakage, no venting, no rupture, no explosion and no fire :		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	800N for cylindrical cells.	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	Cell only.	N/A
	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	Not small cell and battery.	N/A
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		N/A
	- Keep small cells and batteries which are considered swallow able 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 cell is marked in accordance with IEC 61960, also see page 4.	P
	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

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
9.2	Battery marking	Cell only.	N/A
	Batteries marked as specified in IEC 61960, except for coin batteries		N/A
	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
	Terminals have clear polarity marking on the external surface of the battery		N/A
	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	Not small cell and battery.	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 safety mentioned in manufacturer's specifications.	P
	Recommended charging instructions	Information for safety 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	Not coin cells.	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

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
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
A.3.2	Upper limit charging voltage	4.2V	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 declared by client is 0-45°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	Charging low temperature declared by client is: 0°C	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	No documents provided by manufacturer explaining the lower limit exceed 10°C, -5°C applied for testing in this report for safety considerations.	P
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging current		P
A.5	Sample preparation		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle in cylindrical cell		P
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		N/A
A.6	Experimental procedure of the forced internal short-circuit test		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

IEC 62133-2: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX B	RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS		N/A
ANNEX C	RECOMMENDATIONS TO THE END-USERS		N/A
ANNEX D	MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS		N/A
D.1	General	Not coin cells.	N/A
D.2	Method		N/A
	A sample size of three coin cells is required for this measurement..... :	(See appended table D.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		N/A
ANNEX F	COMPONENT STANDARDS REFERENCES		N/A

TABLE: Critical components information					P
Object/part no.	Manufacturer/trademark	Type/model	Technical data	Standard	Mark(s) of conformity ¹⁾
Cell	SHENZHEN BOFUNENG BATTERY CO., LTD.	1) INR18500E, 2) 18500 1000mAh, 3) INR18500A, 4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh, 7) INR18500G, 8) 18500 1300mAh, 9) INR18500, 10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh, 13) INR18500B, 14) 18500 1600mAh, 15) INR18500D, 16) 18500 1900mAh	1) 3.7V, 1000mAh, 2) 3.7V, 1000mAh, 3) 3.7V, 1100mAh, 4) 3.7V, 1100mAh, 5) 3.7V, 1200mAh, 6) 3.7V, 1200mAh, 7) 3.7V, 1300mAh, 8) 3.7V, 1300mAh, 9) 3.7V, 1400mAh, 10) 3.7V, 1400mAh, 11) 3.7V, 1500mAh, 12) 3.7V, 1500mAh, 13) 3.7V, 1600mAh, 14) 3.7V, 1600mAh, 15) 3.7V, 1900mAh, 16) 3.7V, 1900mAh	IEC 62133-2: 2017	Tested with appliance
-Positive Electrode	XINXIANG TIANLI ENERGY CO.,LTD	TLM510	Li(Ni _{0.5} Co _{0.2} Mn _{0.3})O ₂ , NMP, PVDF, Conductive Additive, Aluminum Foil	--	--
-Negative Electrode	Ganzhou RFT Technology Co.,Ltd	AGF-2	Graphite, CMC, SBR, Conductive Additive, Copper Foil	--	--
-Electrolyte	DONGGUAN SHANSHAN BATTERY MATERIALS CO.,LTD	LD-1039	LiPF ₆ +EC+EMC+DEC	--	--
-Separator	W-SCOPE KOREA CO.,LTD	20µm	PE, Shutdown Temperature: 135°C	--	--
Supplementary information:					
¹⁾ Provided evidence ensures the agreed level of compliance.					

7.2.1	TABLE: Continuous charging at constant voltage (cells)				P
Sample no.	Recommended charging voltage V _c (Vdc)	Recommended charging current I _{rec} (mA)	OCV before test (Vdc)	Results	
For model 18500 1000mAh					
C1	4.2	200	4.20	P	
C2	4.2	200	4.19	P	
C3	4.2	200	4.20	P	
C4	4.2	200	4.20	P	
C5	4.2	200	4.19	P	
For model 18500 1200mAh					
C1	4.2	240	4.19	P	
C2	4.2	240	4.19	P	
C3	4.2	240	4.20	P	
C4	4.2	240	4.19	P	
C5	4.2	240	4.20	P	
For model 18500 1500mAh					
C1	4.2	300	4.19	P	
C2	4.2	300	4.20	P	
C3	4.2	300	4.20	P	
C4	4.2	300	4.19	P	
C5	4.2	300	4.19	P	
For model 18500 1900mAh					
C1	4.2	380	4.19	P	
C2	4.2	380	4.19	P	
C3	4.2	380	4.20	P	
C4	4.2	380	4.19	P	
C5	4.2	380	4.20	P	
Supplementary information:					
- No fire or explosion					
- No leakage					

7.3.1	TABLE: External short-circuit (cells)					P
Sample no.	Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature (°C)	Results	
For model 18500 1000mAh						
Samples charged at charging temperature upper limit (45°C)						
C6	55.5	4.17	89	69.5	P	
C7	55.5	4.17	84	72.0	P	
C8	55.5	4.17	80	71.4	P	
C9	55.5	4.18	77	70.8	P	
C10	55.5	4.17	82	70.9	P	
Samples charged at charging temperature lower limit (-5°C)						
C11	55.6	4.13	83	71.6	P	
C12	55.6	4.13	86	89.5	P	
C13	55.6	4.12	84	70.3	P	
C14	55.6	4.13	79	69.7	P	
C15	55.6	4.12	80	70.2	P	
For model 18500 1200mAh						
Samples charged at charging temperature upper limit (45°C)						
C6	55.7	4.17	81	69.3	P	
C7	55.7	4.17	87	68.4	P	
C8	55.7	4.18	89	69.7	P	
C9	55.7	4.18	86	70.2	P	
C10	55.7	4.17	84	67.5	P	
Samples charged at charging temperature lower limit (-5°C)						
C11	55.6	4.12	83	70.8	P	
C12	55.6	4.12	82	70.1	P	
C13	55.6	4.12	79	69.6	P	
C14	55.6	4.13	85	68.7	P	
C15	55.6	4.13	88	69.4	P	
For model 18500 1500mAh						
Samples charged at charging temperature upper limit (45°C)						
C6	55.9	4.18	81	66.9	P	
C7	55.9	4.18	84	70.3	P	
C8	55.9	4.17	89	69.2	P	
C9	55.9	4.17	83	69.5	P	
C10	55.9	4.17	87	65.8	P	
Samples charged at charging temperature lower limit (-5°C)						
C11	55.6	4.12	80	68.2	P	

C12	55.6	4.12	82	67.5	P
C13	55.6	4.13	78	68.3	P
C14	55.6	4.12	86	69.4	P
C15	55.6	4.13	88	68.0	P
For model 18500 1900mAh					
Samples charged at charging temperature upper limit (45°C)					
C6	55.7	4.18	82	69.7	P
C7	55.7	4.17	80	68.1	P
C8	55.7	4.17	87	71.1	P
C9	55.7	4.18	84	70.5	P
C10	55.7	4.17	86	69.3	P
Samples charged at charging temperature lower limit (-5°C)					
C11	55.9	4.13	80	68.5	P
C12	55.9	4.12	79	70.7	P
C13	55.9	4.12	74	68.3	P
C14	55.9	4.12	81	71.3	P
C15	55.9	4.13	89	69.9	P
Supplementary information:					
- No fire or explosion					

7.3.2	TABLE: External short-circuit (batteries)					N/A
Sample no.	Ambient (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature (°C)	Component single fault condition	Results
Supplementary information:						
- No fire or explosion						

7.3.5	TABLE: Crush (cells)				P
Sample no.	OCV before test (Vdc)	OCV at removal of crushing force (Vdc)	Maximum force applied to the cell during crush (kN)	Results	
For model 18500 1000mAh					
Samples charged at charging temperature upper limit (45°C)					
C29	4.18	4.17	13	P	
C30	4.17	4.16	13	P	
C31	4.18	4.17	13	P	
C32	4.18	4.17	13	P	
C33	4.17	4.17	13	P	
Samples charged at charging temperature lower limit (-5°C)					
C34	4.13	4.12	13	P	
C35	4.12	4.11	13	P	
C36	4.13	4.12	13	P	
C37	4.12	4.11	13	P	
C38	4.12	4.11	13	P	
For model 18500 1200mAh					
Samples charged at charging temperature upper limit (45°C)					
C29	4.17	4.16	13	P	
C30	4.17	4.16	13	P	
C31	4.18	4.17	13	P	
C32	4.18	4.17	13	P	
C33	4.17	4.16	13	P	
Samples charged at charging temperature lower limit (-5°C)					
C34	4.13	4.12	13	P	
C35	4.12	4.12	13	P	
C36	4.12	4.11	13	P	
C37	4.13	4.12	13	P	
C38	4.13	4.12	13	P	
For model 18500 1500mAh					
Samples charged at charging temperature upper limit (45°C)					
C29	4.17	4.16	13	P	
C30	4.17	4.16	13	P	
C31	4.18	4.17	13	P	
C32	4.18	4.17	13	P	
C33	4.17	4.16	13	P	
Samples charged at charging temperature lower limit (-5°C)					
C34	4.12	4.11	13	P	

C35	4.12	4.11	13	P
C36	4.13	4.12	13	P
C37	4.13	4.12	13	P
C38	4.12	4.11	13	P
For model 18500 1900mAh				
Samples charged at charging temperature upper limit (45°C)				
C29	4.18	4.17	13	P
C30	4.17	4.16	13	P
C31	4.17	4.16	13	P
C32	4.17	4.17	13	P
C33	4.18	4.17	13	P
Samples charged at charging temperature lower limit (-5°C)				
C34	4.12	4.11	13	P
C35	4.13	4.12	13	P
C36	4.13	4.11	13	P
C37	4.12	4.11	13	P
C38	4.12	4.11	13	P
Supplementary information:				
- No fire or explosion				

7.3.6	TABLE: Over-charging of battery			N/A
Constant charging current (A)				—
Supply voltage (Vdc)				—
Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
Supplementary information:				
- No fire or explosion				

7.3.7	TABLE: Forced discharge (cells)				P
Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_t (mA)	Lower limit discharge voltage (Vdc)	Results	
For model 18500 1000mAh					
C39	3.27	1000	3.0	P	
C40	3.24	1000	3.0	P	
C41	3.29	1000	3.0	P	
C42	3.24	1000	3.0	P	
C43	3.25	1000	3.0	P	
For model 18500 1200mAh					
C39	3.31	1200	3.0	P	
C40	3.29	1200	3.0	P	
C41	3.27	1200	3.0	P	
C42	3.30	1200	3.0	P	
C43	3.32	1200	3.0	P	
For model 18500 1500mAh					
C39	3.29	1500	3.0	P	
C40	3.32	1500	3.0	P	
C41	3.30	1500	3.0	P	
C42	3.27	1500	3.0	P	
C43	3.29	1500	3.0	P	
For model 18500 1900mAh					
C39	3.21	1900	3.0	P	
C40	3.23	1900	3.0	P	
C41	3.24	1900	3.0	P	
C42	3.24	1900	3.0	P	
C43	3.25	1900	3.0	P	
Supplementary information:					
- No fire or explosion					

7.3.8.1	TABLE: Vibration(batteries)					N/A
Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results	
Supplementary information:						
<ul style="list-style-type: none"> - No fire or explosion - No rupture - No leakage - No venting 						

7.3.8.2	TABLE: Mechanical shock(batteries)					N/A
Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results	
Supplementary information:						
<ul style="list-style-type: none"> - No fire or explosion - No rupture - No leakage - No venting 						

7.3.9	TABLE: Forced internal short circuit (cells)					P
Sample no.	Chamber ambient T (°C)	OCV before test (Vdc)	Particle location ¹⁾	Maximum applied pressure (N)	Results	
For model 18500 1000mAh						
Samples charged at charging temperature upper limit (45°C)						
C44	45	4.18	1	800	P	
C45	45	4.18	1	800	P	
C46	45	4.17	1	800	P	
C47	45	4.17	1	800	P	
C48	45	4.17	1	800	P	
Samples charged at charging temperature lower limit (-5°C)						
C49	-5	4.13	1	800	P	
C50	-5	4.13	1	800	P	
C51	-5	4.12	1	800	P	
C52	-5	4.12	1	800	P	
C53	-5	4.12	1	800	P	
For model 18500 1200mAh						
Samples charged at charging temperature upper limit (45°C)						
C44	45	4.17	1	800	P	
C45	45	4.18	1	800	P	
C46	45	4.18	1	800	P	
C47	45	4.18	1	800	P	
C48	45	4.17	1	800	P	
Samples charged at charging temperature lower limit (-5°C)						
C49	-5	4.12	1	800	P	
C50	-5	4.12	1	800	P	
C51	-5	4.13	1	800	P	
C52	-5	4.13	1	800	P	
C53	-5	4.13	1	800	P	
For model 18500 1500mAh						
Samples charged at charging temperature upper limit (45°C)						
C44	45	4.17	1	800	P	
C45	45	4.18	1	800	P	
C46	45	4.17	1	800	P	
C47	45	4.17	1	800	P	
C48	45	4.18	1	800	P	
Samples charged at charging temperature lower limit (-5°C)						
C49	-5	4.13	1	800	P	

C50	-5	4.13	1	800	P
C51	-5	4.12	1	800	P
C52	-5	4.12	1	800	P
C53	-5	4.13	1	800	P
For model 18500 1900mAh					
Samples charged at charging temperature upper limit (45°C)					
C44	45	4.17	1	800	P
C45	45	4.17	1	800	P
C46	45	4.18	1	800	P
C47	45	4.18	1	800	P
C48	45	4.18	1	800	P
Samples charged at charging temperature lower limit (-5°C)					
C49	-5	4.12	1	800	P
C50	-5	4.13	1	800	P
C51	-5	4.12	1	800	P
C52	-5	4.13	1	800	P
C53	-5	4.13	1	800	P
Supplementary information:					
1) Identify one of the following:					
1: Nickel particle inserted between positive and negative (active material) coated area.					
2: Nickel particle inserted between positive aluminium foil and negative active material coated area.					
- No fire or explosion					

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					

-- End of Report --

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh

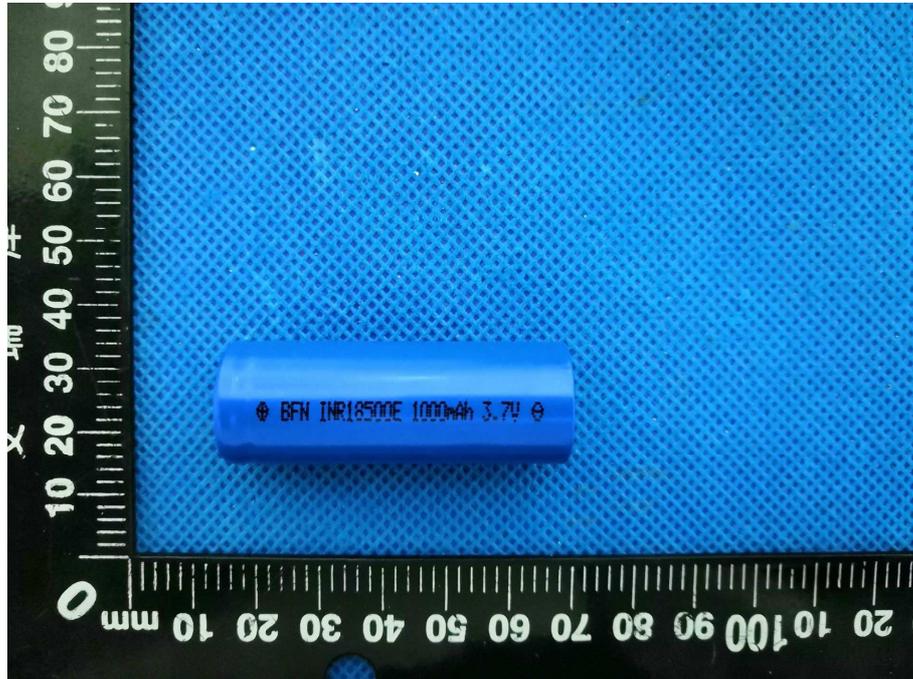


Figure 1 Front view of cell (18500 1000mAh)

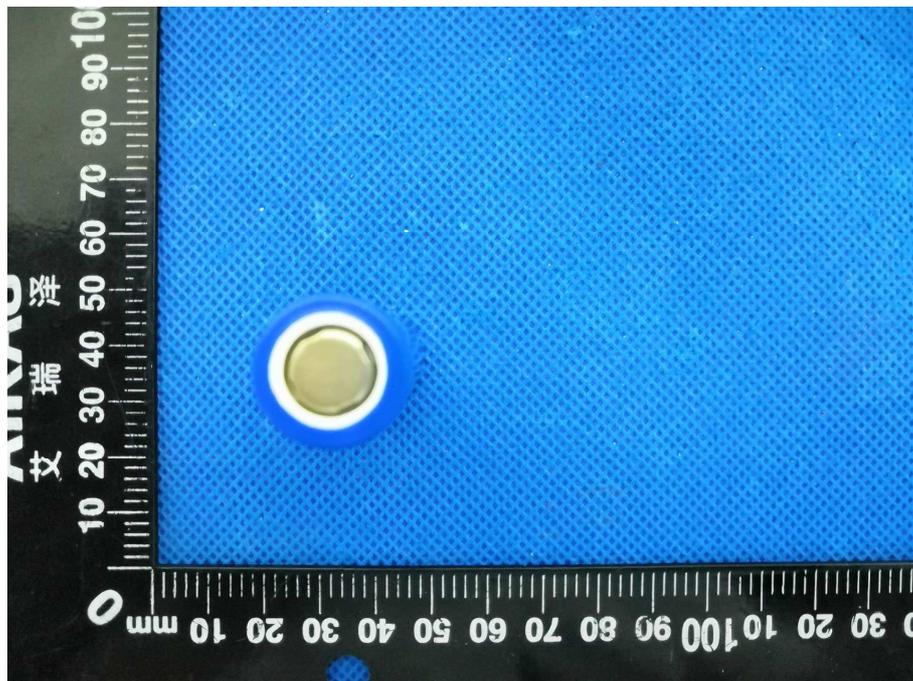


Figure 2 Top view of cell (18500 1000mAh)

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh

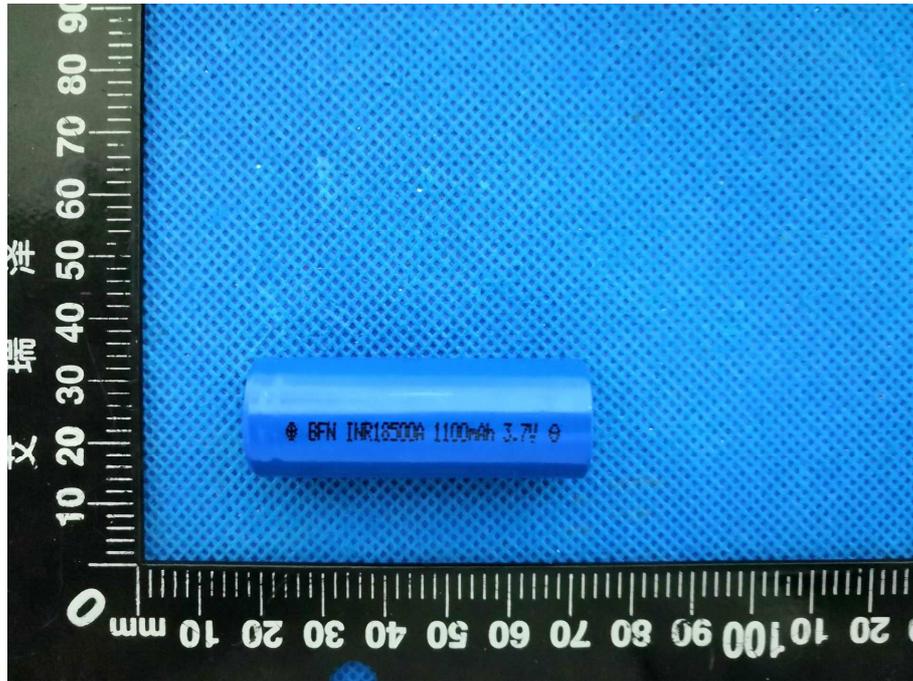


Figure 3 Front view of cell (18500 1100mAh)

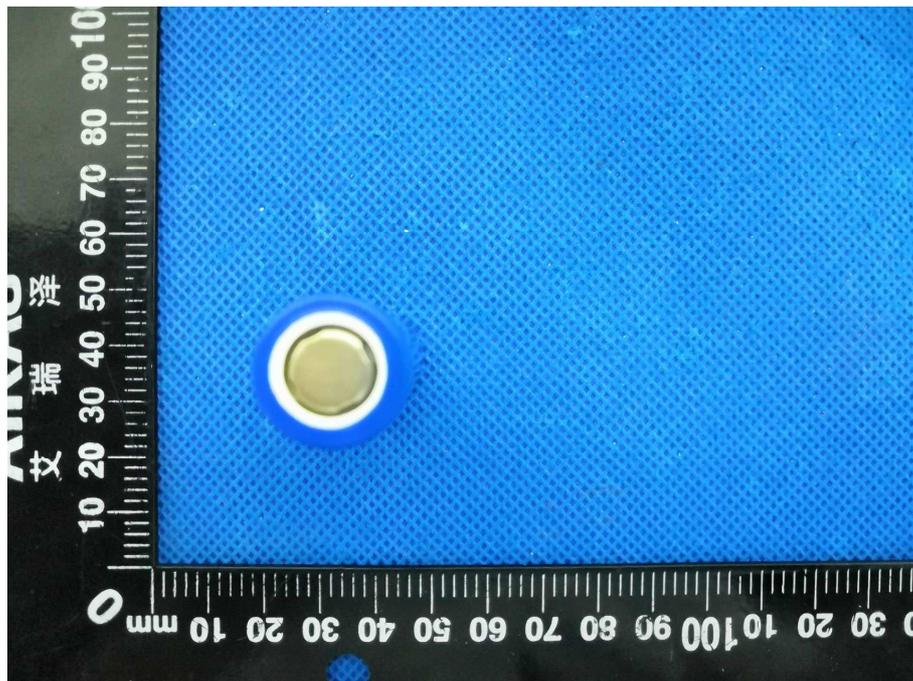


Figure 4 Top view of cell (18500 1100mAh)

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh

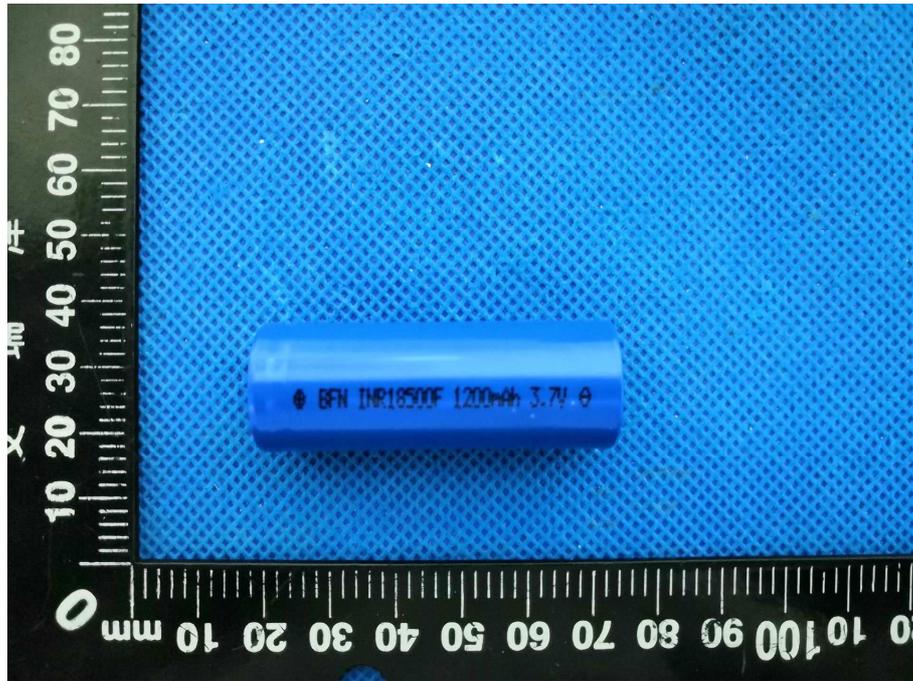


Figure 5 Front view of cell (18500 1200mAh)

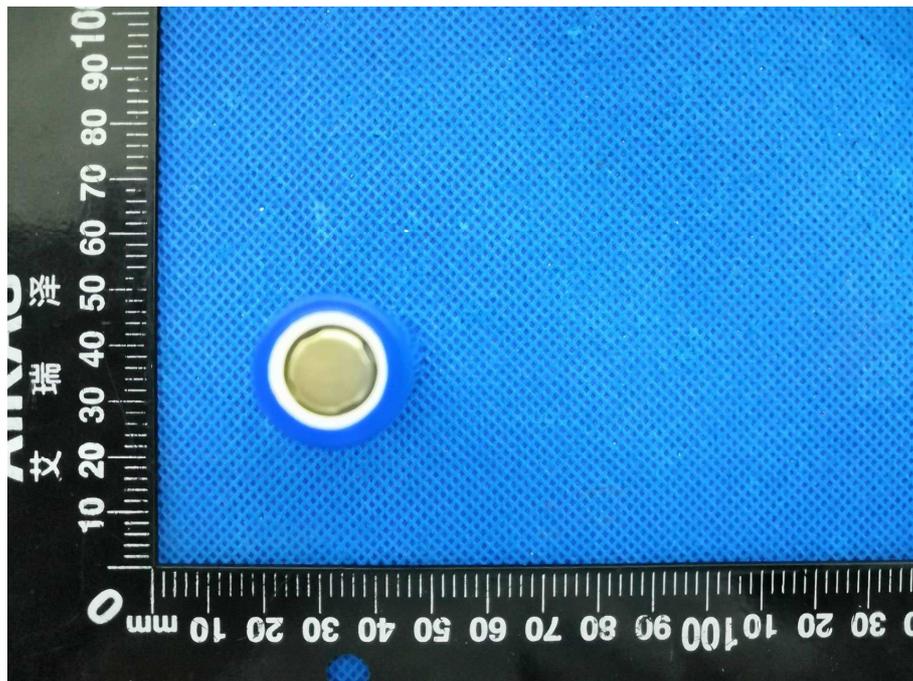


Figure 6 Top view of cell (18500 1200mAh)

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh



Figure 7 Front view of cell (18500 1300mAh)

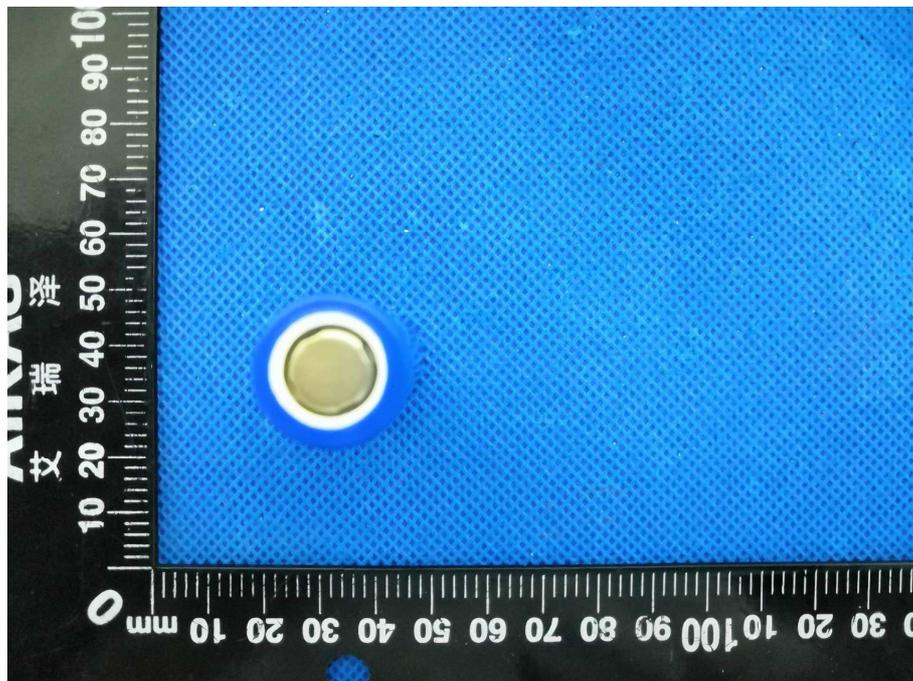


Figure 8 Top view of cell (18500 1300mAh)

Product: Li-ion Cylindrical Cell
Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A, 4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh, 7) INR18500G, 8) 18500 1300mAh, 9) INR18500, 10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh, 13) INR18500B, 14) 18500 1600mAh, 15) INR18500D, 16) 18500 1900mAh

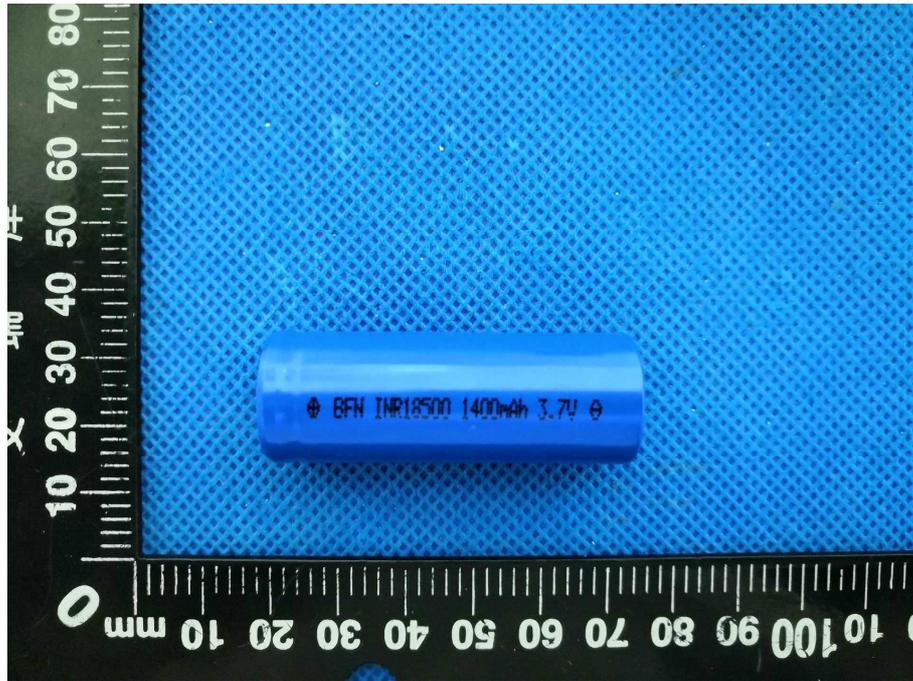


Figure 9 Front view of cell (18500 1400mAh)

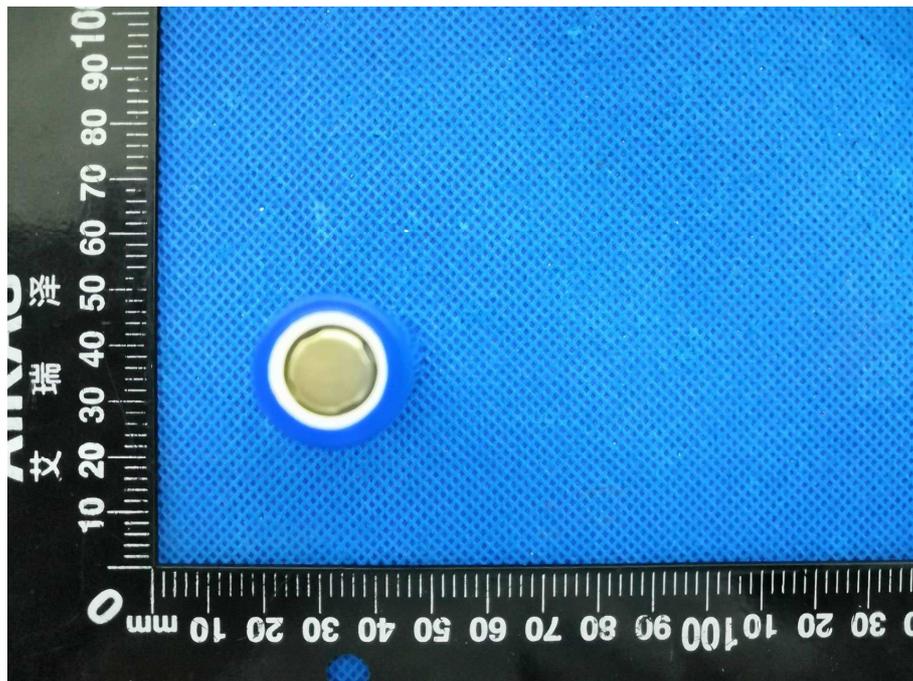


Figure 10 Top view of cell (18500 1400mAh)

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh



Figure 11 Front view of cell (18500 1500mAh)

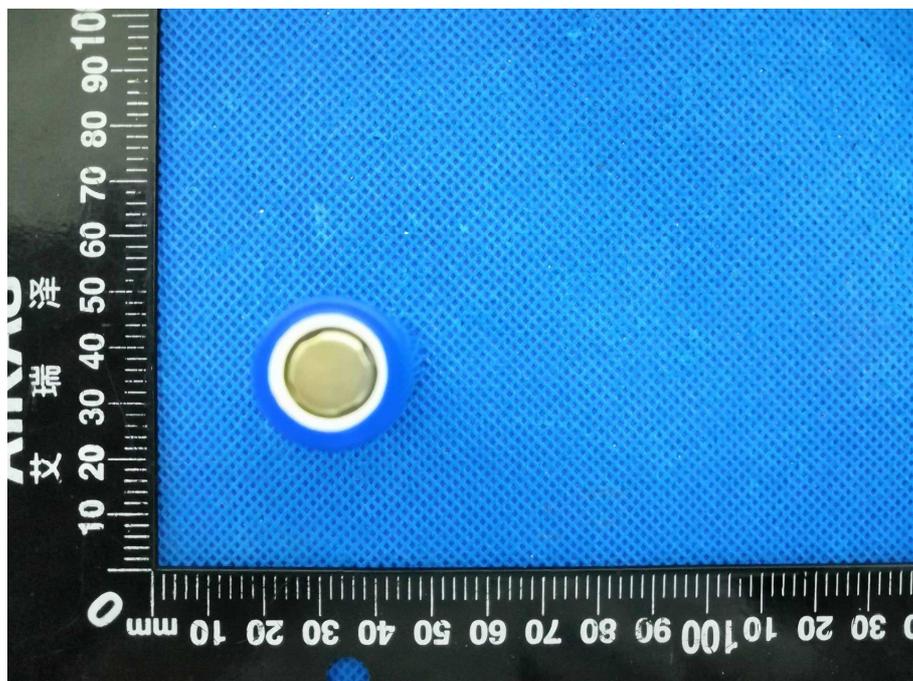


Figure 12 Top view of cell (18500 1500mAh)

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh

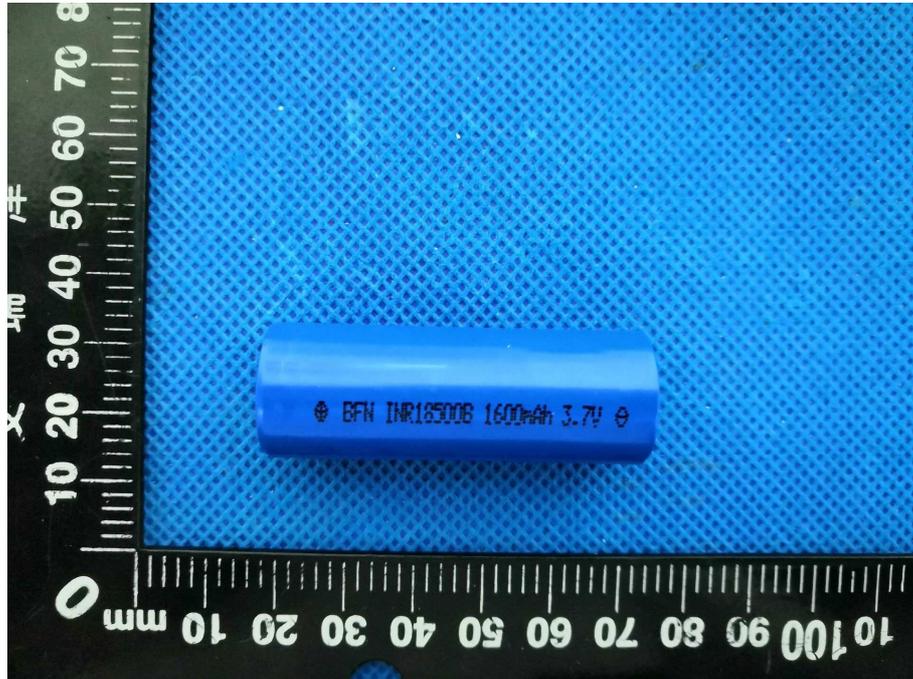


Figure 13 Front view of cell (18500 1600mAh)

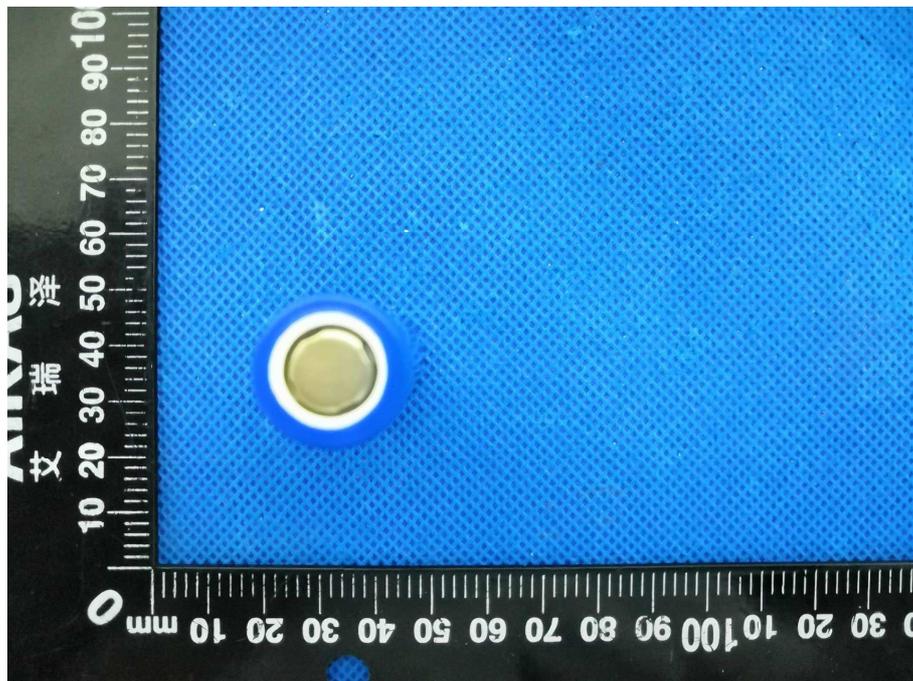


Figure 14 Top view of cell (18500 1600mAh)

Product: Li-ion Cylindrical Cell

Type Designation: 1) INR18500E, 2) 18500 1000mAh, 3) INR18500A,
4) 18500 1100mAh, 5) INR18500F, 6) 18500 1200mAh,
7) INR18500G, 8) 18500 1300mAh, 9) INR18500,
10) 18500 1400mAh, 11) INR18500C, 12) 18500 1500mAh,
13) INR18500B, 14) 18500 1600mAh, 15) INR18500D,
16) 18500 1900mAh



Figure 15 Front view of cell (18500 1900mAh)

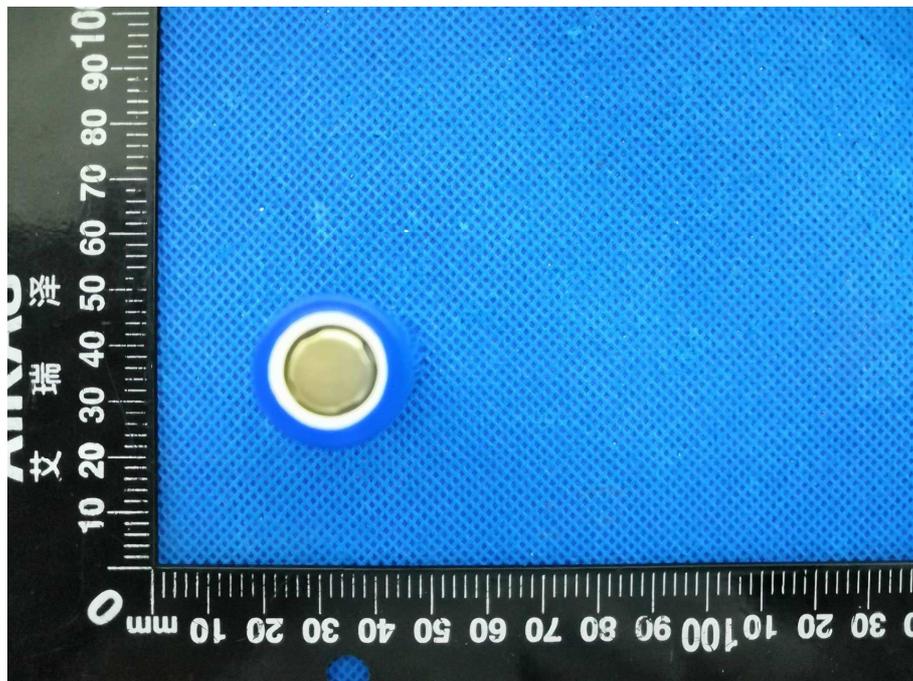


Figure 16 Top view of cell (18500 1900mAh)