



Ref. Certif. No.

JPTUV-091432

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

Rechargeable Li-ion Battery

Name and address of the applicant
Nom et adresse du demandeur

Shenzhen Max Technology Co., LTD
F/3-4, Bldg.22,
ChangXing High-Tech Park, Shajing, Bao'an Dist, Shenzhen,
Guangdong, P. R. China

Name and address of the manufacturer
Nom et adresse du fabricant

Shenzhen Max Technology Co., LTD
F/3-4, Bldg.22,
ChangXing High-Tech Park, Shajing, Bao'an Dist, Shenzhen,
Guangdong, P. R. China

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

Shenzhen Max Technology Co., LTD
F/3-4, Bldg.22,
ChangXing High-Tech Park, Shajing, Bao'an Dist, Shenzhen,
Guangdong, P. R. China

Ratings and principal characteristics
Valeurs nominales et caractéristiques principales

3.7V, 650mAh, 2.405Wh

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

642540

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

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 62133:2012
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

50186875 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
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Date: 15.10.2018

Signature:

Simon Yu



Test Report issued under the responsibility of:



TEST REPORT

IEC 62133

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

Report Number..... : 50186875 001

Date of issue..... : 2018-10-10

Total number of pages : 23 pages

Name of Testing Laboratory preparing the Report : TÜV Rheinland Taiwan Ltd., Taichung Branch

Applicant's name : Shenzhen Max Technology Co., LTD

Address : F/3-4, Bldg.22, ChangXing High-Tech Park, Shajing, Bao'an Dist, Shenzhen, Guangdong, P. R. China

Test specification:

Standard : IEC 62133:2012

Test procedure : CB Scheme

Non-standard test method : N/A

Test Report Form No. : IEC62133C

Test Report Form(s) Originator : UL (Demko)

Master TRF : 2018-07-27

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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..... :	Rechargeable Li-ion Battery	
Trade Mark..... :	N/A	
Manufacturer	Same as applicant	
Model/Type reference	642540	
Ratings	3.7V, 650mAh, 2.405Wh	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	TÜV Rheinland Taiwan Ltd., Taichung Branch
Testing location/ address..... :	No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya District, Taichung City, 428 Taiwan Chinese Taipei	
Tested by (name, function, signature)		X  Project Engineer Signed by: Jason C. H. Chang
Approved by (name, function, signature)...		X  Reviewer Signed by: Dennis H. P. Chiu
<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): - Photo Documentation - National Differences Total number of pages in each attachment is indicated in individual attachment.	
Summary of testing:	
Tests performed (name of test and test clause): Name of test and test clause of tests performed are given in appended Compliance Checklist, Measurement section and Attachments if any. <ul style="list-style-type: none"> • Clause 8.1 – Charging procedure for test purposes • Clause 8.2.1 – Continuous charging at constant voltage • Clause 8.2.2 – Moulded case stress at high ambient temperature • Clause 8.3.1 – External short circuit • Clause 8.3.2 – External short circuit • Clause 8.3.3 – Free fall • Clause 8.3.4 – Thermal abuse • Clause 8.3.5 – Crush • Clause 8.3.6 – Over-charging of battery • Clause 8.3.7 – Forced discharge • Clause 8.3.9 – Forced internal short circuit Tests are made with the number of cells and batteries specified in EN 62133: 2013 (Second Edition) Table 2.	Testing location: <ul style="list-style-type: none"> • Unless otherwise indicated, all tests except for Clause 8.3.9 – Forced internal short circuit were performed at the location stated in “Testing procedure and testing location” • For Clause 8.3.9 – Forced internal short circuit TÜV Rheinland (Shenzhen) Co., Ltd. East of F/1, F/2~F/4, Building 1, Cybio Technology Building, No. 6 Langshang No.2 Road, North Hi-tech Industry Park 518057 Shenzhen Nanshan District, China
Summary of compliance with National Differences (List of countries addressed): DK, HU, SE, SG <input checked="" type="checkbox"/> The product fulfils the requirements of <u>EN 62133: 2013</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.

+ (Red) Rechargeable Li-ion Battery

Model: 642540 1ICP7/26/41

3.7V 650mAh 2.405Wh

Shenzhen Max Technology Co., LTD

- (Black) Date: 2018.08.01 Made in China

Test item particulars.....:	
Recommend charging method declared by the manufacturer	Charging the battery with 130mA constant current until 4.2V, then constant voltage until the charge current reduces to 6.5mA at ambient 20°C±5°C.
Discharge current (0,2 I_t A)	See General product information for details
Specified final voltage	See General product information for details
Chemistry	<input type="checkbox"/> nickel systems <input checked="" type="checkbox"/> lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell.....:	See General product information for details
Maximum charging current	See General product information for details
Charging temperature upper limit	See General product information for details
Charging temperature lower limit.....:	See General product information for details
Polymer cell electrolyte type	<input type="checkbox"/> gel polymer <input type="checkbox"/> solid polymer
Possible test case verdicts:	
- test case does not apply to the test object.....: N/A	
- test object does meet the requirement.....: P (Pass)	
- test object does not meet the requirement.....: F (Fail)	
Testing.....:	
Date of receipt of test item	2018-08-23
Date (s) of performance of tests	2018-08-23 to 2018-09-17
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <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 62133C:	
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:

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

Model: 642540 (Battery)	
Item:	Specification
Cell's arrangement:	1S1P
Rated capacity (Ah):	0.65
Nominal voltage (Vdc):	3.7
Maximum charge current (A):	0.65
Maximum charge voltage (Vdc):	4.23
Discharge cutoff voltage (Vdc):	2.75
Maximum discharge current (A):	0.65
Discharge current (0,2 It A)	0.13
Upper limit charging voltage per cell (Vdc):	4.25 (Worse Case Condition)
Operation temperature upper limit for charging (°C):	45
Operation temperature lower limit for charging (°C):	10

Model: 642540 (Cell)	
Item:	Specification
Rated capacity (Ah):	0.65
Nominal voltage (Vdc):	3.7
Maximum charge current (A):	0.65
Maximum charge voltage (Vdc):	4.23
Discharge cutoff voltage (Vdc):	2.75
Maximum discharge current (A):	0.65
Discharge current (0,2 It A)	0.13
Upper limit charging voltage per cell (Vdc):	4.25 (Worse Case Condition)
Charging temperature upper limit (°C):	45
Charging temperature lower limit (°C):	10

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
4	Parameter measurement tolerances		P
	Parameter measurement tolerances	Compliance checked.	P
5	General safety considerations		P
5.1	General	Compliance checked.	P
5.2	Insulation and wiring	See below.	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 accessible metal case.	N/A
	Insulation resistance (MΩ) :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements	Wires/conductors possess adequate cross-sectional areas for their intended application	P
	Orientation of wiring maintains adequate creepage and clearance distances between conductors	Compliance checked.	P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse	Compliance checked.	P
5.3	Venting	See below.	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	Compliance checked.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief	Compliance checked.	P
5.4	Temperature/voltage/current management	See below.	P
	Batteries are designed such that abnormal temperature rise conditions are prevented	Compliance checked.	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	Compliance checked.	P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the specifications.	P
5.5	Terminal contacts	See below.	P
	Terminals have a clear polarity marking on the external surface of the battery	The “+ (Red)” and “- (Black)” polarity explicitly marked on surface of the battery.	P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Compliance checked.	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P
	Terminal contacts are arranged to minimize the risk of short circuits	Compliance checked.	P
5.6	Assembly of cells into batteries		P
5.6.1	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer	Single cell in the battery.	N/A
	Each battery has an independent control and protection		N/A
	Manufacturers of cells make recommendations about 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 separate circuitry to prevent the cell reversal caused by uneven discharges		N/A
	Protective circuit components are added as appropriate and consideration given to the end-device application		N/A
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N/A
5.6.2	Design recommendation for lithium systems only		P
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Clause 8.1.2, Table 4; or	Max. charging voltage: 4.23V, not exceed 4.25V specified in Clause 8.1.2, Table 4.	P
	- Charging voltage of the cell does not exceed the different upper limit of the charging voltage determined through Clause 8.1.2, NOTE 1.		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, by monitoring the voltage of every single cell or the single cellblocks; or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- The voltages of any one of the single cells or single cellblocks does not exceed the different upper limit of the charging voltage, determined through Clause 8.1.2, NOTE 1, by monitoring the voltage of every single cell or the single cellblocks		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or		N/A
	- Charging is stopped when the upper limit of the different charging voltage, determined through Clause 8.1.2, NOTE 1, 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
5.7	Quality plan	See below.	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. The manufacturer provides an ISO 9001: 2015 Certificate.	P
6	Type test conditions		P
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old	Complied. Lithium system.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	Tests are carried out at 20°C ± 5°C.	P
7	Specific requirements and tests (nickel systems)		N/A
7.1	Charging procedure for test purposes	Lithium system.	N/A
7.2	Intended use		N/A
7.2.1	Continuous low-rate charging (cells)		N/A
	Results: No fire. No explosion		N/A
7.2.2	Vibration		N/A
	Results: No fire. No explosion. No leakage		N/A
7.2.3	Moulded case stress at high ambient temperature		N/A
	Oven temperature (°C)..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N/A
7.2.4	Temperature cycling		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3	Reasonably foreseeable misuse		N/A
7.3.1	Incorrect installation cell		N/A
	The test was carried out using: - Four fully charged cells of the same brand, type, size and age connected in series, with one of them reversed; or		N/A
	- A stabilized dc power supply.		N/A
	Results: No fire. No explosion..... :		N/A
7.3.2	External short circuit		N/A
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	Results: No fire. No explosion..... :		N/A
7.3.3	Free fall		N/A
	Results: No fire. No explosion.		N/A
7.3.4	Mechanical shock (crash hazard)		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3.5	Thermal abuse		N/A
	Oven temperature (°C)..... :		—
	Results: No fire. No explosion.		N/A
7.3.6	Crushing of cells		N/A
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		N/A
	Results: No fire. No explosion..... :		N/A
7.3.7	Low pressure		N/A
	Chamber pressure (kPa)..... :		—

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion. No leakage.		N/A
7.3.8	Overcharge		N/A
	Results: No fire. No explosion..... :		N/A
7.3.9	Forced discharge		N/A
	Results: No fire. No explosion..... :		N/A

8	Specific requirements and tests (lithium systems)		P
8.1	Charging procedures for test purposes	Complied.	P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2	Considered.	P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9	Considered.	P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5 °C for the upper limit and minus 5 °C for the lower limit	Charge temperature range: 10-45°C declared. 10°C used for lower limit tests. 45°C used for upper limit tests.	N/A
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1)		N/A
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4,25 V), the applied upper limit charging voltage and upper limit charging temperatures were adjusted accordingly	4.25V applied.	N/A
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1)		N/A
8.2	Intended use	See below.	P
8.2.1	Continuous charging at constant voltage (cells)	See below.	P
	Results: No fire. No explosion..... :	(See Table 8.2.1)	P
8.2.2	Moulded case stress at high ambient temperature (battery)	Tested as request by client.	P
	Oven temperature (°C)	70°C	—
	Results: No physical distortion of the battery casing resulting in exposure if internal components	No physical distortion of the battery casing.	P
8.3	Reasonably foreseeable misuse		P
8.3.1	External short circuit (cell)	Tested complied.	P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion..... :	(See Table 8.3.1)	P
8.3.2	External short circuit (battery)	See below.	P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		P
	Results: No fire. No explosion..... :	(See Table 8.3.2)	P
8.3.3	Free fall	See below.	P
	Results: No fire. No explosion.	Compliance checked.	P
8.3.4	Thermal abuse (cells)	See below.	P
	The cells were held at 130°C ± 2°C for: - 10 minutes; or	Compliance checked.	P
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)		N/A
	Oven temperature (°C)..... :	130°C	—
	Gross mass of cell (g)	<500g, small cell.	—
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.5	Crush (cells)	See below.	P
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or	Compliance checked.	P
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N/A
	- 10% of deformation has occurred compared to the initial dimension		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.5)	P
8.3.6	Over-charging of battery	See below.	P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Test was continued until the temperature of the outer casing: - Reached steady state conditions (less than 10°C change in 30-minute period); or		N/A
	- Returned to ambient	Applied for.	P
	Results: No fire. No explosion..... :	(See Table 8.3.6)	P
8.3.7	Forced discharge (cells)	See below.	P
	Results: No fire. No explosion..... :	(See Table 8.3.7)	P
8.3.8	Transport tests		P
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods	Manufacturer provided UN38.3 test report.	P
8.3.9	Design evaluation – Forced internal short circuit (cells)	See below.	P
	The cells complied with national requirement for :	France, Japan, Republic of Korea and Switzerland.	—
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N for prismatic cells.	P
	Results: No fire :	(See Table 8.3.9)	P
9	Information for safety		P
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	Information for safety mentioned in manufacturer's specifications.	P
	The manufacturer of batteries ensures that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards.	Information for safety mentioned in manufacturer's specifications.	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user :		N/A
10	Marking		P
10.1	Cell marking	The final product is battery.	N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.		N/A
10.2	Battery marking	See below.	P
	Batteries marked in accordance with the requirements for the cells from which they are assembled.	The battery is marked in accordance with IEC 61960, also see Copy of marking plate	P
	Batteries marked with an appropriate caution statement.		N/A
10.3	Other information	See below.	P
	Storage and disposal instructions marked on or supplied with the battery.	Information for storage and disposal instructions mentioned in manufacturer's specifications.	P
	Recommended charging instructions marked on or supplied with the battery.	Information for recommended charging instructions mentioned in manufacturer's specifications.	P

11	Packaging		P
	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.	Battery packs are provided with adequate packaging.	P

Annex A	Charging range of secondary lithium ion cells for safe use		P
A.1	General		P
A.2	Safety of lithium-ion secondary battery	Compliance checked.	P
A.3	Consideration on charging voltage	Compliance checked.	P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4.25V applied.	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.25V applied.	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

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature range declared by client is: 10-45°C	N/A
A.4.3	High temperature range	Not higher than the temperature specific in this standard.	P
A.4.3.1	General		P
A.4.3.2	Explanation of safety viewpoint		P
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		P
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		N/A
A.4.4	Low temperature range	Not lower than the temperature specific in this standard.	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 low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		N/A
A.4.5	Scope of the application of charging current		P
A.5	Sample preparation		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N/A
A.5.6	Insertion of nickel particle to prismatic cell		P

TABLE: Critical components information					
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity ¹⁾
Cell	Shenzhen Max Technology Co., LTD	642540 (cell)	3.7V, 650mAh	IEC 62133: 2012	Tested with appliance
-Positive electrode	HUNAN SHANSHAN ADVANCED MATERIAL CO., LTD	LC420HS	LiCoO ₂ , PVDF, NMP, Conductive Additive, Copper Foil, μm (143) \times mm (43.5) \times mm(497)	--	--
-Negative electrode	Jiangxi Zhengtuo New Energy Technology Co., Ltd	LH5	Graphite, CMC, SBR, Distilled Water, Conductive Additive, μm (100) \times mm (44.5) \times mm (434)	--	--
-Separator	Foshan Jinhui Hi-Tech Optoelectronic Material Co., LTD	20 μm *47.5mm* 908mm	PP, Shutdown temperature: 130°C	--	--
-Electrolyte	Zhuhai Smoothway Electronic Materials CO., LTD	SWHM-A003	LiPF ₆ , EMC, EC, DMC	--	--
PCB	SHENZHEN XING BAO SHUN ELECTRONICS SCIENTIFIC CO LTD	XBS-8	V-0, 130°C	UL 796 UL 94	UL (E361977)
Protective IC (U1)	Shenzhen Developer Microelectronics Co., Ltd	DW01	V _{CU} : 4.28 \pm 0.05V V _{DL} : 2.4 \pm 0.1V	--	--
MOSFET (U2)	Shenzhen Developer Microelectronics Co., Ltd	DP8205	V _{DS} : 20V, V _{GS} : \pm 12V I _D : 5A	--	--
DC Connector	CHYAOYEE JVT CONNECTORS CO LTD	Cat. Nos JVT1225H02	2Pins, AC/DC 250V, 2.5A	UL 1977	UL (E364171)
Lead wire	DONGGUAN ZHONGZHEN ELECTRONIC WIRE CO LTD	3302	28AWG, 105°C, 30V	UL 758	UL (E355578)
Tape	SHENZHEN GUANGYE ELECTRONICS TECHNOLOGY CO LTD	511	200°C	UL 510	UL (E309332)
Supplementary information:					
¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

7.2.1	TABLE: Continuous low rate charge (cells)					N/A
Model	Recommended charging method, (CC, CV, or CC/CV)	Recommended charging voltage V_c, (Vdc)	Recommended charging current I_{rec}, (A)	OCV at start of test, (Vdc)	Results	
Supplementary information:						

7.2.2	TABLE: Vibration			N/A
Model		OCV at start of test, (Vdc)	Results	
Supplementary information:				

7.3.1	TABLE: Incorrect installation (cells)			N/A
Model		OCV of reversed cell, (Vdc)	Results	
Supplementary information:				

7.3.2	TABLE: External short circuit					N/A
Model	Ambient (at $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ or $55^{\circ}\text{C} \pm 5^{\circ}\text{C}$)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT, ($^{\circ}\text{C}$)	Results	
Supplementary information:						

7.3.6	TABLE: Crush			N/A
Model		OCV at start of test, (Vdc)	OCV at removal of crushing force, (Vdc)	Results
Supplementary information:				

7.3.8	TABLE: Overcharge			N/A
Model	OCV prior to charging, (Vdc)	Maximum charge current, (A)	Time for charging, (hours)	Results
Supplementary information:				

7.3.9	TABLE: Forced discharge (cells)			N/A
Model	OCV before application of reverse charge, (Vdc)	Measured reverse charge I_t , (A)	Time for reversed charge, (minutes)	Results
Supplementary information:				

8.2.1	TABLE: Continuous charging at constant voltage (cells)				P
Model	Recommended charging voltage V _c , (Vdc)	Recommended charging current I _{rec} , (mA)	OCV at start of test, (Vdc)	Results	
642540 (cell)	4.20	130	4.18	A	
642540 (cell)	4.20	130	4.18	A	
642540 (cell)	4.20	130	4.19	A	
642540 (cell)	4.20	130	4.18	A	
642540 (cell)	4.20	130	4.19	A	
Supplementary information:					
A: No fire or explosion or leakage					

8.3.1	TABLE: External short circuit (cell)				P
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (mΩ)	Maximum case temperature rise ΔT , (°C)	Results
Samples charged at charging temperature upper limit					
642540 (cell)	23.8	4.22	81	58.8	A, ¹⁾
642540 (cell)	23.8	4.21	82	65.0	A, ¹⁾
642540 (cell)	23.8	4.21	80	69.8	A, ¹⁾
642540 (cell)	23.8	4.22	81	66.7	A, ¹⁾
642540 (cell)	23.8	4.20	81	63.6	A, ¹⁾
Samples charged at charging temperature lower limit					
642540 (cell)	23.9	4.15	81	65.3	A, ²⁾
642540 (cell)	23.9	4.15	80	62.4	A, ²⁾
642540 (cell)	23.9	4.17	82	70.0	A, ²⁾
642540 (cell)	23.9	4.16	82	61.3	A, ²⁾
642540 (cell)	23.9	4.16	81	56.8	A, ²⁾
Supplementary information:					
A: No fire or explosion					
¹⁾ Test sample charge at 45 °C					
²⁾ Test sample charge at 10 °C					

8.3.2	TABLE: External short circuit (battery)				P
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (mΩ)	Maximum case temperature rise ΔT , (°C)	Results
Samples charged at charging temperature upper limit					
642540 (pack)	55.1	4.21	81	0.3	A, ¹⁾

642540 (pack)	55.1	4.22	82	0.3	A, ¹⁾
642540 (pack)	55.1	4.21	81	0.4	A, ¹⁾
642540 (pack)	55.1	4.22	81	0.5	A, ¹⁾
642540 (pack)	55.1	4.21	80	0.5	A, ¹⁾
Samples charged at charging temperature lower limit					
642540 (pack)	55.4	4.15	82	0.2	A, ²⁾
642540 (pack)	55.4	4.16	81	0.3	A, ²⁾
642540 (pack)	55.4	4.16	81	0.3	A, ²⁾
642540 (pack)	55.4	4.15	80	0.4	A, ²⁾
642540 (pack)	55.4	4.17	82	0.2	A, ²⁾
Supplementary information: A: No fire or explosion ¹⁾ Test sample charge at 45 °C ²⁾ Test sample charge at 10 °C					

8.3.5	TABLE: Crush					P
Model	OCV at start of test, (Vdc)	OCV at removal of crushing force, (Vdc)	Width/ diameter of cell before crush, (mm)	Required deformation for crush, (mm)	Results	
Samples charged at charging temperature upper limit						
642540 (cell)	4.20	4.20	--	--	A, ¹⁾	
642540 (cell)	4.21	4.21	--	--	A, ¹⁾	
642540 (cell)	4.21	4.21	--	--	A, ¹⁾	
642540 (cell)	4.22	4.22	--	--	A, ¹⁾	
642540 (cell)	4.21	4.21	--	--	A, ¹⁾	
Samples charged at charging temperature lower limit						
642540 (cell)	4.16	4.16	--	--	A, ²⁾	
642540 (cell)	4.16	4.16	--	--	A, ²⁾	
642540 (cell)	4.17	4.17	--	--	A, ²⁾	
642540 (cell)	4.17	4.17	--	--	A, ²⁾	
642540 (cell)	4.15	4.15	--	--	A, ²⁾	
Note: A 13kN force applied at the wide side of prismatic cells. No voltage abrupt occurred.						
Supplementary information:						
A: No fire or explosion						
¹⁾ Test sample charge at 45 °C						
²⁾ Test sample charge at 10 °C						

8.3.6	TABLE: Over-charging of battery				P
Constant charging current (A) :			1.3		—
Supply voltage (Vdc) :			5.0		—
Model	OCV before charging, (Vdc)	Resistance of circuit, (mΩ)	Maximum outer casing temperature, (°C)	Results	
642540 (pack)	3.34	--	33.5	A	
642540 (pack)	3.36	--	33.2	A	
642540 (pack)	3.35	--	35.0	A	
642540 (pack)	3.35	--	33.4	A	
642540 (pack)	3.36	--	33.8	A	
Supplementary information:					
A: No fire or explosion					
Ambient temperature during testing: 23.5°C					

8.3.7	TABLE: Forced discharge (cells)				P
Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I _r , (mA)	Time for reversed charge, (minutes)	Results	
642540 (cell)	3.36	650	90	A	
642540 (cell)	3.35	650	90	A	
642540 (cell)	3.34	650	90	A	
642540 (cell)	3.35	650	90	A	
642540 (cell)	3.35	650	90	A	
Supplementary information:					
A: No fire or explosion					

8.3.9	TABLE: Forced internal short circuit (cells)					P
Model	Chamber ambient, (°C)	OCV at start of test, (Vdc)	Particle location ¹⁾	Maximum applied pressure, (N)	Results	
642540 (cell)	45	4.21	1	400	A _i ²⁾	
642540 (cell)	45	4.21	1	400	A _i ²⁾	
642540 (cell)	45	4.20	1	400	A _i ²⁾	
642540 (cell)	45	4.22	1	400	A _i ²⁾	
642540 (cell)	45	4.21	1	400	A _i ²⁾	
642540 (cell)	10	4.17	1	400	A _i ³⁾	
642540 (cell)	10	4.15	1	400	A _i ³⁾	

642540 (cell)	10	4.16	1	400	A, ³⁾
642540 (cell)	10	4.17	1	400	A, ³⁾
642540 (cell)	10	4.16	1	400	A, ³⁾

Supplementary information:

A: No fire or explosion

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.

²⁾ Test sample charge at 45 °C

³⁾ Test sample charge at 10 °C

List of test equipment used:

A completed list of used test equipment shall be provided in the Test Reports when a Customer's Testing Facility according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 or CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement/ testing	Testing/measuring equipment/material used, (equipment ID)	Range used	Last calibration date	Calibration due date

Information:

"No listing of test equipment used necessary for chosen test procedure".

IEC 62133 ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

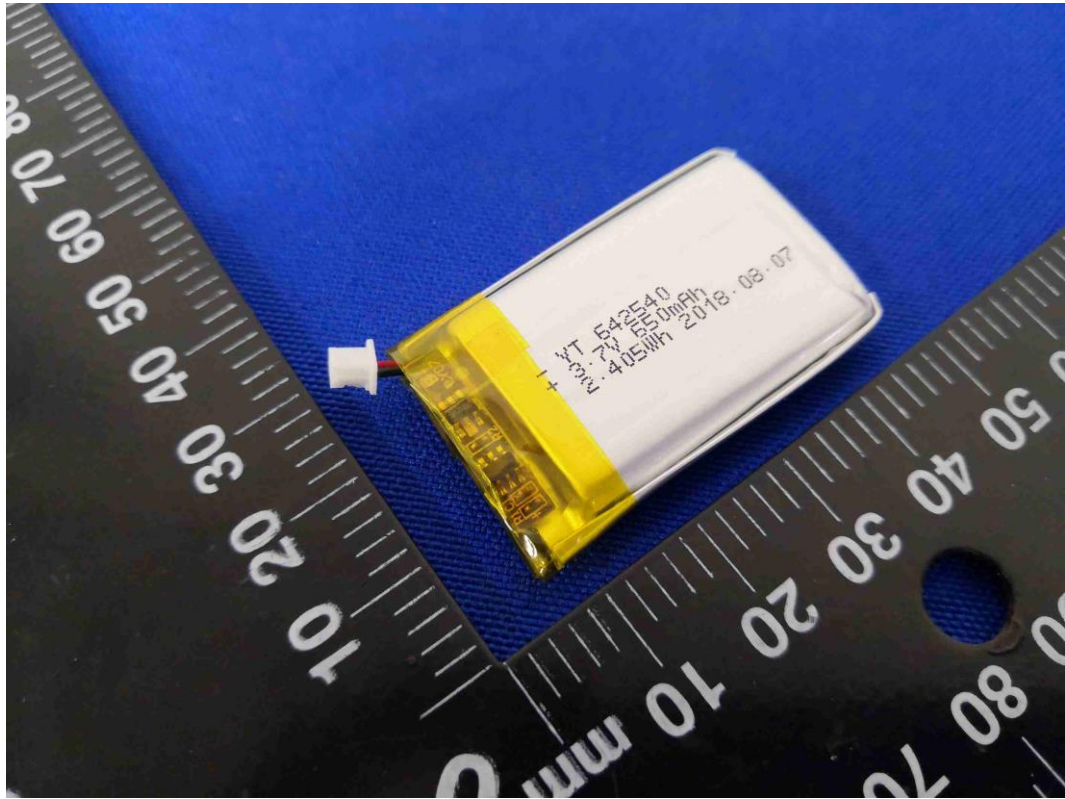
ATTACHMENT TO TEST REPORT IEC 62133 SINGAPORE NATIONAL DIFFERENCES Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications
Differences according.....: Consumer Goods Safety Requirements Notice No. 1 of 2015
Attachment Form No.:
Attachment Form Originator: TUV Rheinland Taiwan
Master Attachment Form: IECEE CB Bulletin on 2015-10-14

Clause	Requirement + Test	Result - Remark	Verdict
	Portable power banks In addition to complying with the safety requirements of applicable standards specific to the product, and under the provision of Regulation 4(a)(ii) of the Consumer Protection (Consumer Goods Safety Requirements) Regulations [CGSR], SPRING Singapore as the Safety Authority also requires portable power banks to comply with the following minimum safety requirements, as detailed in Appendix F Additional Safety Requirements Imposed by the Safety Authority:		N/A
	1 Portable power banks shall comply with the requirements of the following safety standards: 1.1 IEC 62133:2012 Secondary cells and batteries containing alkaline or non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications; and 1.2 IEC 60950-1:2005+A1:2009+A2:2013 Information technology equipment – Safety – Part 1: General requirements OR 1.3 Any other industry standard specific to power banks.		N/A
	2 Portable power banks shall be supplied with the following safety information: 2.1 'Instructions for use' as specified below 2.2 Instructions on how to charge the portable power bank 2.3 Information on the minimum and maximum operating temperatures of the portable power bank Minimum Instructions ² for Use for Portable Power Banks to be provided with portable power banks to the customer a) The power bank will generate heat when charging. Always charge in a well ventilated area. Do not charge under pillows, blankets or on flammable surfaces. b) Keep the power bank away from heat sources,		N/A

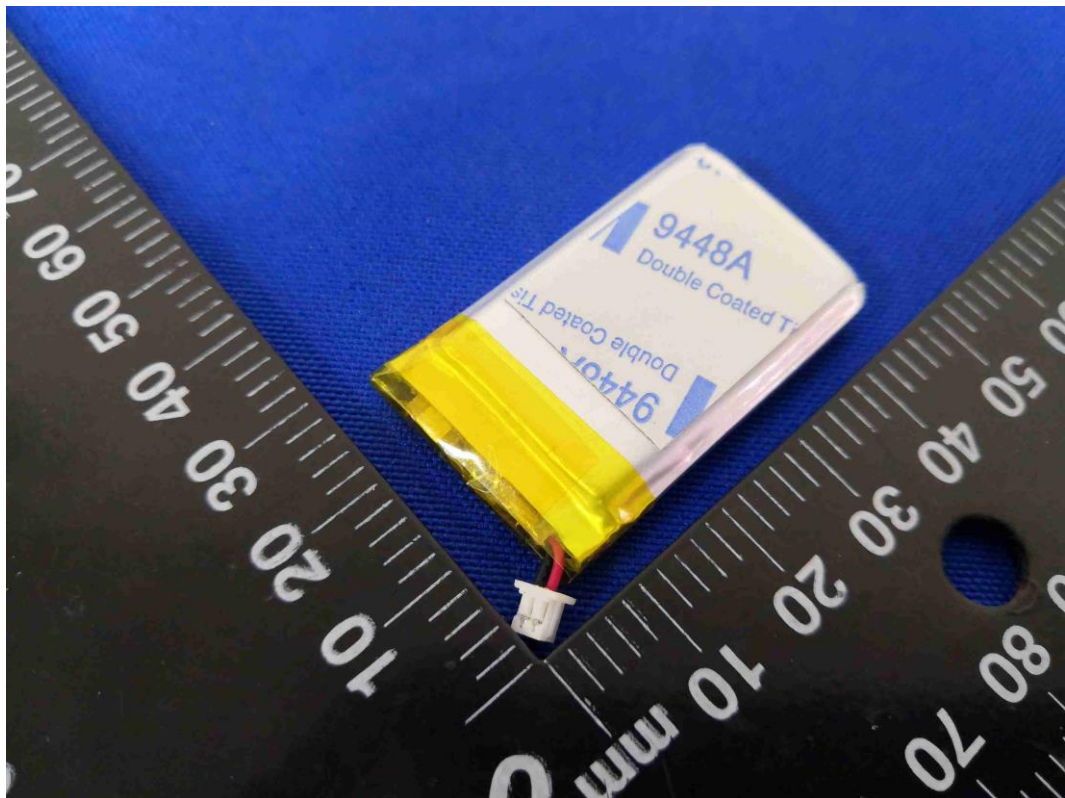
IEC 62133 ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>direct sunlight, combustible gas, humidity, water or other liquids.</p> <p>c) Do not disassemble, open, microwave, incinerate, paint or insert foreign objects into the power bank.</p> <p>d) Do not subject the power bank to mechanical shock such as crushing, bending, puncturing or shredding. Avoid dropping or placing heavy object on the power bank.</p> <p>e) Do not short-circuit the power bank or store it in a receptacle where it may be short-circuited by other metallic or conductive objects.</p> <p>f) Do not operate the power bank if it has been wet or otherwise damaged, to prevent against electric shock, explosion and/or injury. Contact the dealer or authorized agent.</p> <p>g) Power bank usage by children should be supervised.</p> <p>h) Please read the operating instructions (including charging instructions and information on the minimum and maximum operating temperatures), supplied with this power bank.</p>		
	<p>Notes:</p> <p>1. A "portable power bank" is defined as any portable energy-storage device containing secondary batteries with charging circuitry, which is used to charge portable consumer electronic devices via DC output of up to 5 volts.</p> <p>The following products do not fall within the above definition:</p> <ul style="list-style-type: none"> Products with AC input Products with jump starter function Rechargeable batteries and their chargers, sold as separate products Higher capacity power packs intended for charging high power industrial devices Uninterruptible Power Supply (UPS) systems <p>2. The requirements listed above are the minimum requirements. Please include other information relevant to the specific product as may be deemed necessary.</p>		--

Product: Rechargeable Li-ion Battery

Type Designation: 642540



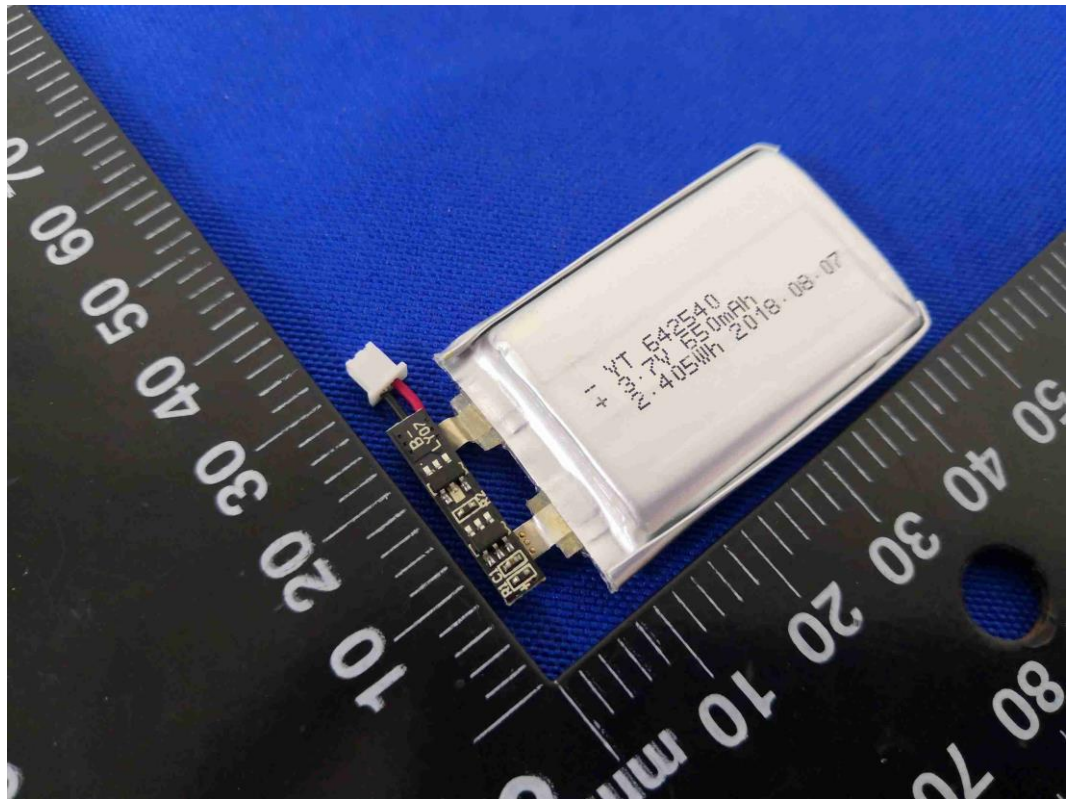
Picture 1. Front view of battery



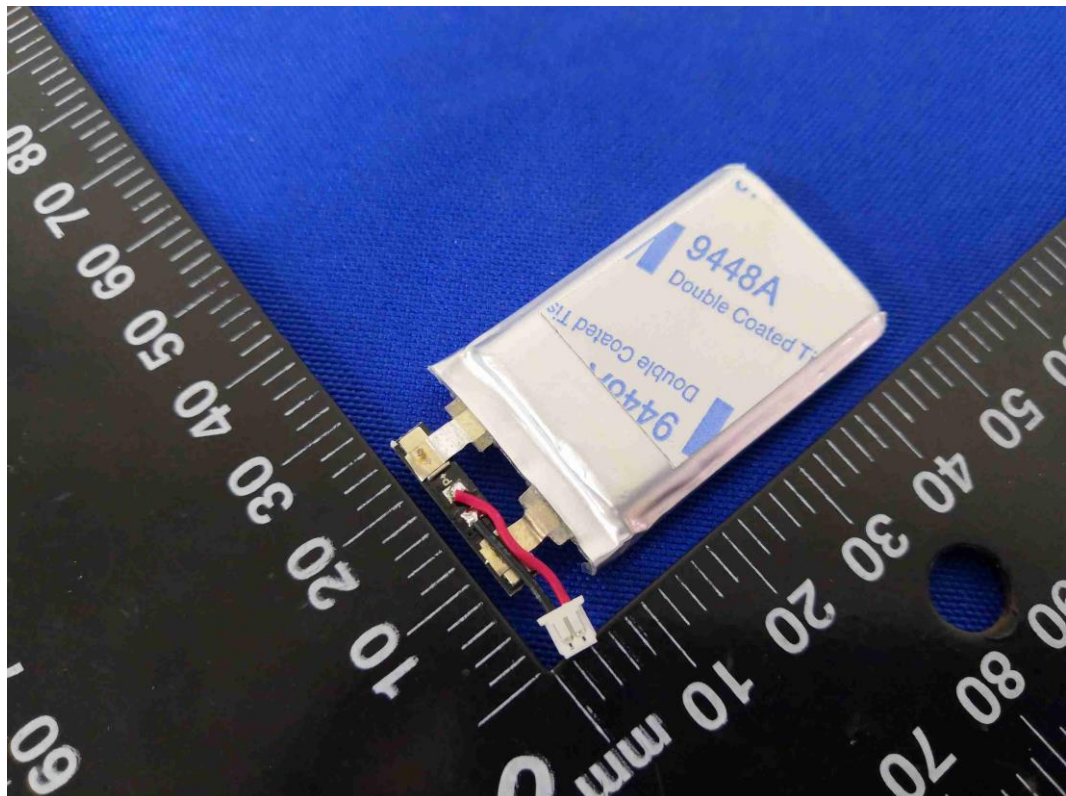
Picture 2. Back view of battery

Product: Rechargeable Li-ion Battery

Type Designation: 642540



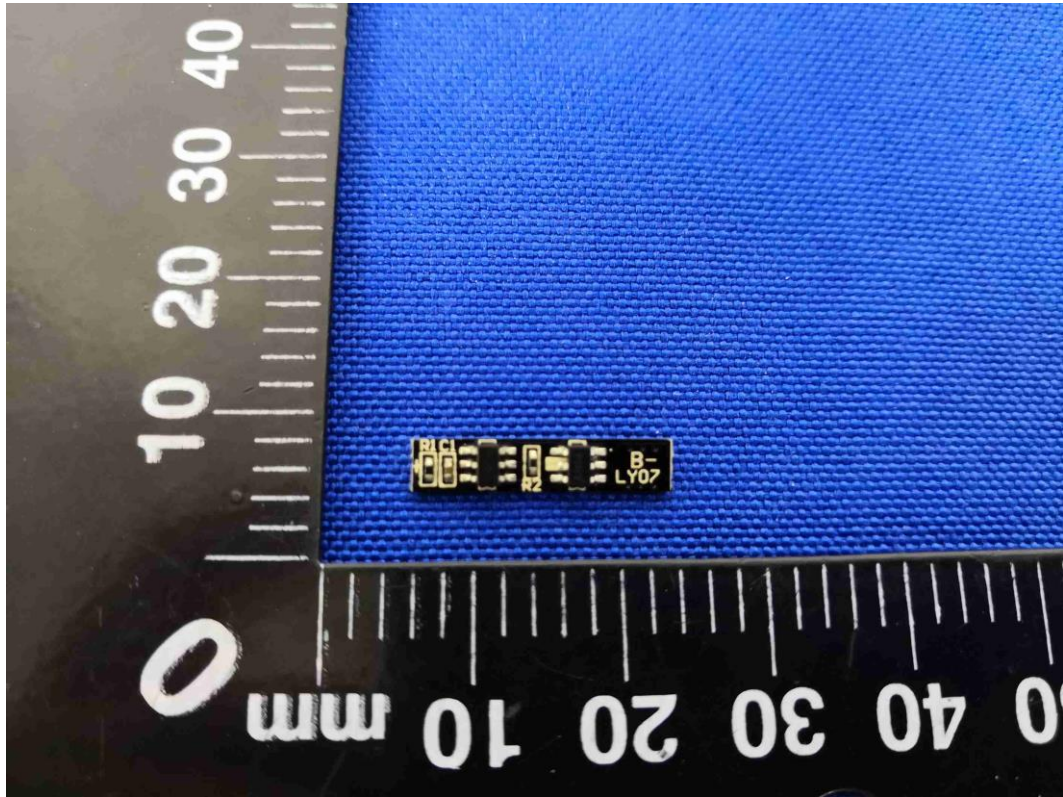
Picture 3. Inner view-1 of battery



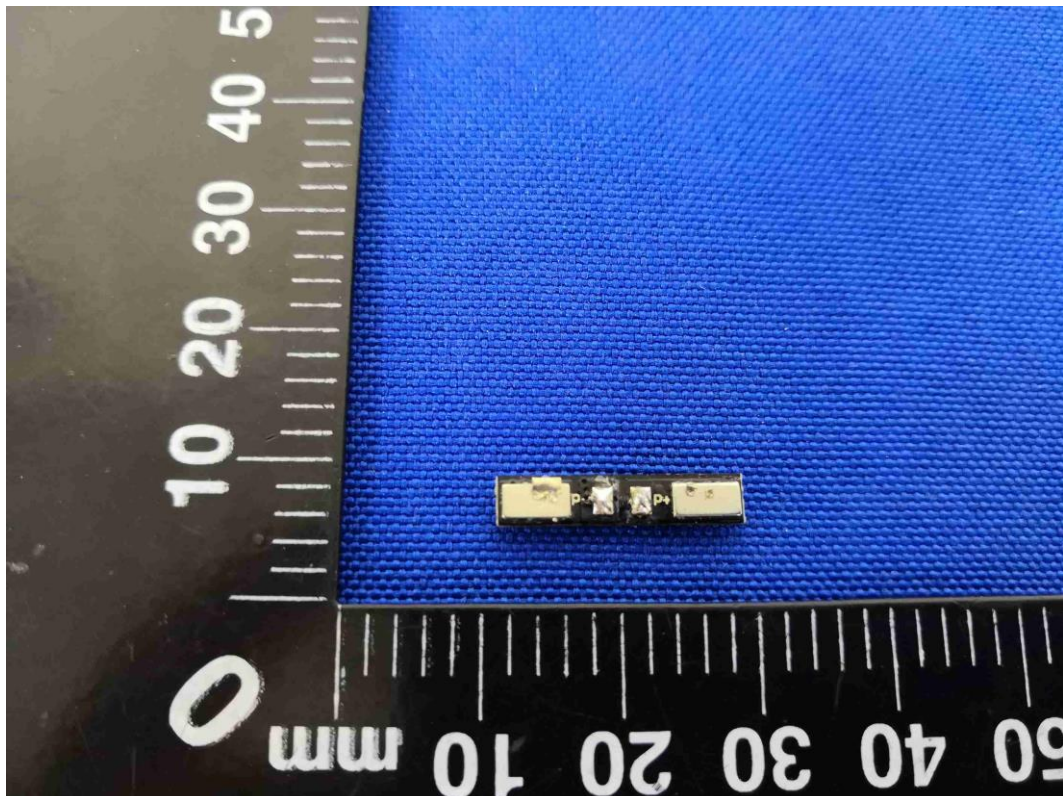
Picture 4. Inner view-2 of battery

Product: Rechargeable Li-ion Battery

Type Designation: 642540



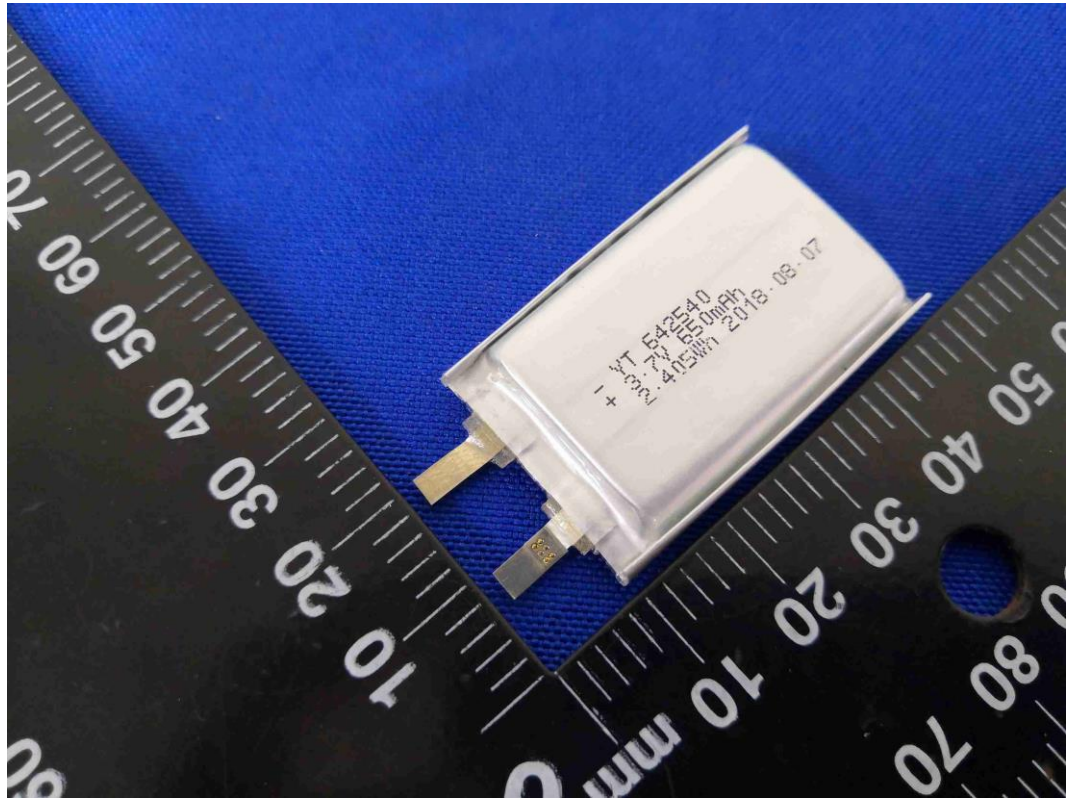
Picture 5. Component view of protection board



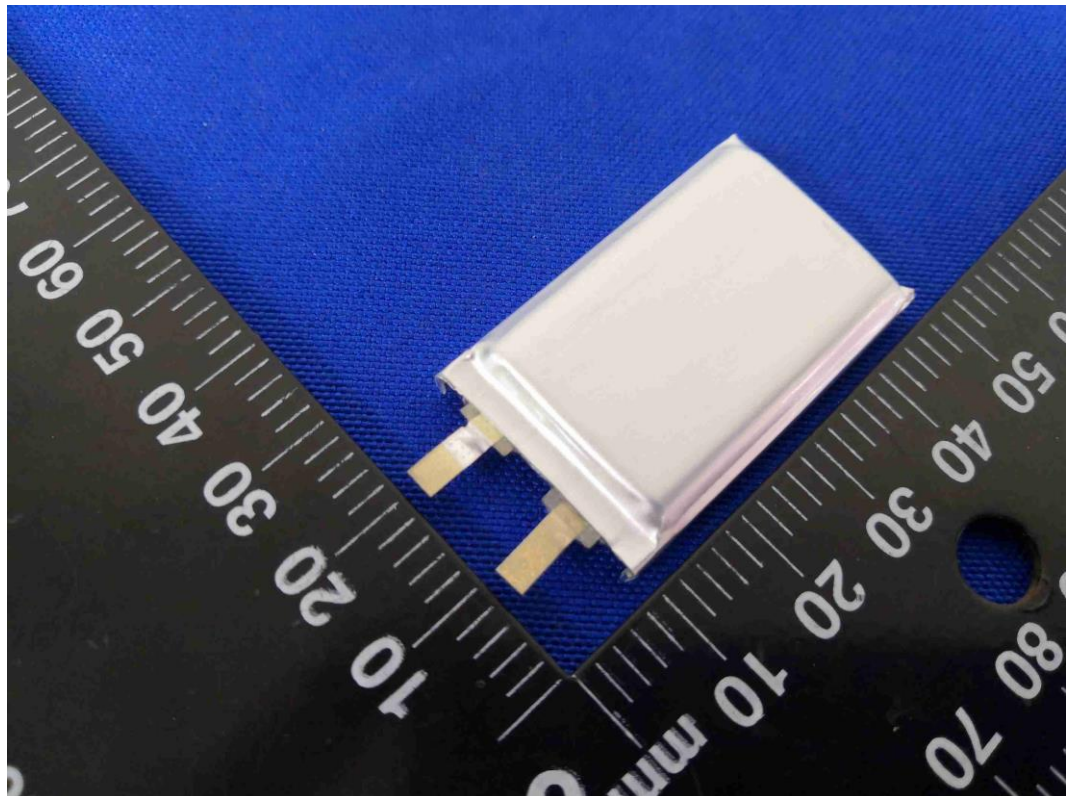
Picture 6. Trace view of protection board

Product: Rechargeable Li-ion Battery

Type Designation: 642540



Picture 7. Front view of cell



Picture 8. Back view of cell