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. ..... :	EFSH24070036-IE-01-L01
Date of issue ..... :	2025-02-17
Total number of pages ..... :	101 Pages
Name of Testing Laboratory preparing the Report ..... :	Eurofins Electrical Testing Service (Shanghai) Co., Ltd.
Applicant's name ..... :	GlobTek, Inc.
Address ..... :	186 Veterans Dr. Northvale, NJ 07647 USA
Test specification:	
Standard ..... :	IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
TRF template used ..... :	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No. ..... :	IEC62133_2C
Test Report Form(s) Originator .... :	DEKRA Certification B.V.
Master TRF ..... :	Dated 2022-07-01

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General disclaimer:

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Test item description	Lithium-Ion Battery Pack
Trade Mark(s)	GlobTek, Inc.
Manufacturer	GlobTek, Inc. 186 Veterans Dr. Northvale, NJ 07647 USA
Model/Type reference.....	BL5000C2170*F*(the 1st*part denotes for battery packs configuration, which may be 1S1P,1S2P,1S3P,1S4P,2S1P,2S2P,2S3P,2S4P,3S1P,3S2P,3S3P,3S4P,4S1P,4S2P ,4S3P,4S4P , the 2nd*part denotes the IC type which can be T or S,T - Texas Instruments S - Sinowealth)
Ratings.....	P.8 Table 1

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**	Eurofins Electrical Testing Service (Shanghai) Co., Ltd.	
	Testing location/ address	Building 18, No. 2168 Chenhang Highway, Minhang District, Shanghai, China	
	Tested by (name, function, signature)	Pengcheng Wang / Project Engineer	Pengcheng WANG
	Approved by (name, function, signature)	Jackie Zhao / Project Engineer	

☐	**Testing procedure: CTF Stage 1:**		
	Testing location/ address		
	Tested by (name, function, signature)		
	Approved by (name, function, signature)		

☐	**Testing procedure: CTF Stage 2:**		
	Testing location/ address		
	Tested by (name + signature)....		
	Witnessed by (name, function, signature)		
	Approved by (name, function, signature)		

☐	**Testing procedure: CTF Stage 3:**	
☐	**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 I: (Republic of Korea) NATIONAL DIFFERENCES (3 pages)

Attachment II: 38 pages of photos.

Summary of testing:

From the result of our inspection and tests on the submitted samples, we conclude they comply with requirements of the standard.

Tests performed (name of test and test clause):

☐ Clause 5.2 Insulation and wiring

☐ Clause 7.2.1 Continuous charging at constant voltage (cells)

☒ Clause 7.2.2 Case stress at high ambient temperature (battery)

☐ Clause 7.3.1 External short-circuit (cell)

☒ Clause 7.3.2 External short-circuit (battery)

☒ Clause 7.3.3 Free fall

☐ Clause 7.3.4 Thermal abuse (cells)

☐ Clause 7.3.5 Crush (cells)

☒ Clause 7.3.6 Over-charging of battery

☐ Clause 7.3.7 Forced discharge (cells)

☒ Clause 7.3.8.1 Vibration (battery)

☒ Clause 7.3.8.2 Mechanical shock (battery)

☐ Clause 7.3.9 Design evaluation – Forced internal short circuit (cells)

Testing location:

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.

Building 18, No. 2168 Chenhang Highway, Minhang District, Shanghai, China

Summary of compliance with National Differences (List of countries addressed):

Republic of Korea (KR) differences

No National Differences have been addressed for EU Group, United Kingdom (GB),

☒ **The product fulfils the requirements of**

EN 62133-2:2017+A1:2021

KC 62133-2(2020-07)

BS EN 62133-2:2017+A1:2021

Use of uncertainty of measurement for decisions on conformity (decision rule):

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:… (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

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.



The above examplenameplate for BL5000C21701S2PFS represents the basic format used by all models in this report.

Nameplate differences for models covered in this report：

1. MODEL：BL5000C2170*F*(the 1st*part denotes for battery packs configuration, which may be 1S1P,1S2P,1S3P,1S4P,2S1P,2S2P,2S3P,2S4P,3S1P,3S2P,3S3P,3S4P,4S1P,4S2P,4S3P,4S4P , the 2nd*part denotes the IC type which can be T or S,T - Texas Instruments S - Sinowealth)

2. Ratings：Refer to P.8 Table 1

3. The number of connector pins, which can be 4, 6, 8 or others, and the corresponding pinout.

4. When cell= LR2170SD, battery designation=*INR22/72-*; When cell= LR2170SZ, battery designation=*INR22/71-*; The 1st*part denote the number of series connected cells in the battery;The 2nd*part denote the number of parallel connected cells if 2 or greater (-*not shown if value is 1).

Test item particulars.....:	Lithium-Ion Battery Pack
Classification of installation and use.....:	To be defined in final product
Supply Connection.....:	DC connector
Recommend charging method declared by the manufacturer.....:	CC/CV
Discharge current (0,2 It A).....:	P.8 Table 1
Specified final voltage.....:	3.0V
Upper limit charging voltage per cell.....:	LR2170SD, 03BCEA5：4.25V LR2170SZ：4.2V
Maximum charging current.....:	P.8 Table 1
Charging temperature upper limit.....:	45°C
Charging temperature lower limit.....:	0°C
Polymer cell electrolyte type.....:	☐ gel polymer ☐ solid polymer ☒ N/A
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item.....:	2024-07-04
Date (s) of performance of tests.....:	2024-07-04 to 2024-12-23

General remarks:

The test results presented in this report relate only to the object tested.

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"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

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

The related applicable CTL decisions have been considered and the requirements found fulfilled

Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.

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

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

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

Name and address of factory (ies) ..... : GlobTek (Suzhou) Co., Ltd.
Building 4, No. 76 JinLing East Road, Suzhou Industrial Park, Suzhou, JiangSu, 215021, China

General product information and other remarks:

This battery pack is constructed with rechargeable Li-ion cell(s) and a PCB containing over-charge, over-discharge, and short- circuit protection circuits.

Table 1：

Model	PCB	Ratings	Discharge current (0,2 It A)/mA	Specified final voltage/ V	Maximum charging current/A	Configuration	Plastic Housing Type
BL5000C21701S1PFT	PCB1	3.6V, 5000mA, 18Wh	1000	3	1	1S1P	A
BL5000C21701S2PFT	PCB1	3.6V, 10000mA, 36Wh	2000	3	2	1S2P	B
BL5000C21701S3PFT	PCB1	3.6V, 15000mA, 54Wh	3000	3	3	1S3P	C
BL5000C21701S1PFS	PCB2	3.6V, 5000mA, 18Wh	1000	3	1	1S1P	A
BL5000C21701S2PFS	PCB2	3.6V, 10000mA, 36Wh	2000	3	2	1S2P	B
BL5000C21701S3PFS	PCB2	3.6V, 15000mA, 54Wh	3000	3	3	1S3P	C
BL5000C21701S4PFS	PCB2	3.6V, 20000mA, 72Wh	4000	3	4	1S4P	D
BL5000C21701S4PFT	PCB3	3.6V, 20000mA, 72Wh	4000	3	4	1S4P	D
BL5000C21702S1PFT	PCB3	7.2V, 5000mA, 36Wh	1000	6	1	2S1P	B
BL5000C21702S2PFT	PCB3	7.2V, 10000mA, 72Wh	2000	6	2	2S2P	D
BL5000C21702S3PFT	PCB3	7.2V, 15000mA, 108Wh	3000	6	3	2S3P	E
BL5000C21702S4PFT	PCB3	7.2V, 20000mA, 144Wh	4000	6	4	2S4P	F
BL5000C21703S1PFT	PCB3	10.8V, 5000mA, 54Wh	1000	9	1	3S1P	C
BL5000C21703S2PFT	PCB3	10.8V, 10000mA, 108Wh	2000	9	2	3S2P	E
BL5000C21703S3PFT	PCB3	10.8V, 15000mA, 162Wh	3000	9	3	3S3P	G
BL5000C21703S4PFT	PCB3	10.8V, 20000mA, 216Wh	4000	9	4	3S4P	H
BL5000C21704S1PFT	PCB3	14.4V, 5000mA, 72Wh	1000	12	1	4S1P	D
BL5000C21704S2PFT	PCB3	14.4V, 10000mA, 144Wh	2000	12	2	4S2P	F
BL5000C21704S3PFT	PCB3	14.4V, 15000mA, 216Wh	3000	12	3	4S3P	H
BL5000C21704S4PFT	PCB3	14.4V, 20000mA, 288Wh	4000	12	4	4S4P	I
BL5000C21702S1PFS	PCB4	7.2V, 5000mA, 36Wh	1000	6	1	2S1P	B
BL5000C21702S2PFS	PCB4	7.2V, 10000mA, 72Wh	2000	6	2	2S2P	D
BL5000C21702S3PFS	PCB4	7.2V, 15000mA, 108Wh	3000	6	3	2S3P	E
BL5000C21702S4PFS	PCB4	7.2V, 20000mA, 144Wh	4000	6	4	2S4P	F
BL5000C21703S1PFS	PCB4	10.8V, 5000mA, 54Wh	1000	9	1	3S1P	C
BL5000C21703S2PFS	PCB4	10.8V, 10000mA, 108Wh	2000	9	2	3S2P	E
BL5000C21703S3PFS	PCB4	10.8V, 15000mA, 162Wh	3000	9	3	3S3P	G
BL5000C21703S4PFS	PCB4	10.8V, 20000mA, 216Wh	4000	9	4	3S4P	H
BL5000C21704S1PFS	PCB4	14.4V, 5000mA, 72Wh	1000	12	1	4S1P	D
BL5000C21704S2PFS	PCB4	14.4V, 10000mA, 144Wh	2000	12	2	4S2P	F
BL5000C21704S3PFS	PCB4	14.4V, 15000mA, 216Wh	3000	12	3	4S3P	H
BL5000C21704S4PFS	PCB4	14.4V, 20000mA, 288Wh	4000	12	4	4S4P	I

Plastic Housing Differences:

Plastic housings A through G have similar designs and use the same materials, but are different in size.

Parameters:

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21701S1PFT	BL5000C21701S2PFT	BL5000C21701S3PFT	BL5000C21701S1PFS
Nominal capacity/mAh	5000	10000	15000	5000
Nominal voltage/V	3.6	3.6	3.6	3.6
Nominal charge	0.375A（0℃~10℃）	0.75A（0℃~10℃）	1.125A（0℃~10℃）	0.375A（0℃~10℃）

current/A	1A（10℃~45℃）	2A（10℃~45℃）	3A（10℃~45℃）	1A（10℃~45℃）
Nominal discharge current/A	1	2	3	1
Maximum charge current/A	1	2	3	1
Maximum discharge current/A	5	5	5	5
Limited Charging Voltage/V	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4（0℃~5℃） 4.125（5℃~35℃） 4（35℃~45℃）
Upper limit charging voltage/V	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4（0℃~5℃） 4.125（5℃~35℃） 4（35℃~45℃）
Cut-off voltage/V	3	3	3	3
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21701S2PFS	BL5000C21701S3PFS	BL5000C21701S4PFS	BL5000C21701S4PFT
Nominal capacity/mAh	10000	15000	20000	20000
Nominal voltage/V	3.6	3.6	3.6	3.6
Nominal charge current/A	0.75A（0℃~10℃） 2A（10℃~45℃）	1.125A（0℃~10℃） 3A（10℃~45℃）	1.5A（0℃~10℃） 4A（10℃~45℃）	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃））
Nominal discharge current/A	2	3	4	4
Maximum charge current/A	2	3	4	4
Maximum discharge current/A	5	5	5	8
Limited Charging Voltage/V	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）
Upper limit charging voltage/V	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）	4V（0℃~5℃） 4.125V（5℃~35℃） 4V（35℃~45℃）
Cut-off voltage/V	3	3	3	3
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21702S1PFT	BL5000C21702S2PFT	BL5000C21702S3PFT	BL5000C21702S4PFT
Nominal capacity/mAh	5000	10000	15000	20000
Nominal voltage/V	7.2	7.2	7.2	7.2
Nominal charge current/A	0.375A（0℃~5℃） 0.75A（5℃~10℃） 1A(10℃~45℃)	0.75A（0℃~5℃） 1.5A（5℃~10℃） 2A(10℃~45℃)	1.125A（0℃~5℃） 2.25A（5℃~10℃） 3A(10℃~45℃)	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃)
Nominal discharge current/A	1	2	3	4
Maximum charge current/A	1	2	3	4
Maximum discharge current/A	5	8	8	8
Limited Charging Voltage/V	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）
Upper limit charging voltage/V	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）
Cut-off voltage/V	6	6	6	6
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21703S1PFT	BL5000C21703S2PFT	BL5000C21703S3PFT	BL5000C21703S4PFT
Nominal capacity/mAh	5000	10000	15000	20000
Nominal voltage/V	10.8	10.8	10.8	10.8
Nominal charge current/A	0.375A（0℃~5℃） 0.75A（5℃~10℃） 1A(10℃~45℃)	0.75A（0℃~5℃） 1.5A（5℃~10℃） 2A(10℃~45℃)	1.125A（0℃~5℃） 2.25A（5℃~10℃） 3A(10℃~45℃)	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃)
Nominal discharge current/A	1	2	3	4
Maximum charge current/A	1	2	3	4
Maximum discharge current/A	5	8	8	8
Limited Charging Voltage/V	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）
Upper limit charging voltage/V	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）
Cut-off voltage/V	9	9	9	9
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21704S1PFT	BL5000C21704S2PFT	BL5000C21704S3PFT	BL5000C21704S4PFT
Nominal capacity/mAh	5000	10000	15000	20000
Nominal voltage/V	14.4	14.4	14.4	14.4
Nominal charge current/A	0.375A（0℃~5℃） 0.75A（5℃~10℃） 1A(10℃~45℃)	0.75A（0℃~5℃） 1.5A（5℃~10℃） 2A(10℃~45℃)	1.125A（0℃~5℃） 2.25A（5℃~10℃） 3A(10℃~45℃)	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃)
Nominal discharge current/A	1	2	3	4
Maximum charge current/A	1	2	3	4
Maximum discharge current/A	5	8	8	8
Limited Charging Voltage/V	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）
Upper limit charging voltage/V	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）
Cut-off voltage/V	12	12	12	12
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21702S1PFS	BL5000C21702S2PFS	BL5000C21702S3PFS	BL5000C21702S4PFS
Nominal capacity/mAh	5000	10000	15000	20000
Nominal voltage/V	7.2	7.2	7.2	7.2
Nominal charge current/A	0.375A（0℃~5℃） 0.75A（5℃~10℃） 1A(10℃~45℃)	0.75A（0℃~5℃） 1.5A（5℃~10℃） 2A(10℃~45℃)	1.125A（0℃~5℃） 2.25A（5℃~10℃） 3A(10℃~45℃)	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃)
Nominal discharge current/A	1	2	3	4
Maximum charge current/A	1	2	3	4
Maximum discharge current/A	5	8	8	8
Limited Charging Voltage/V	8V（0℃~5℃）	8V（0℃~5℃）	8V（0℃~5℃）	8V（0℃~5℃）

	8.25V（5℃~35℃） 8V（35℃~45℃）	8.25V（5℃~35℃） 8V（35℃~45℃）	8.25V（5℃~35℃） 8V（35℃~45℃）	8.25V（5℃~35℃） 8V（35℃~45℃）
Upper limit charging voltage/V	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）	8V（0℃~5℃） 8.25V（5℃~35℃） 8V（35℃~45℃）
Cut-off voltage/V	6	6	6	6
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21703S1PFS	BL5000C21703S2PFS	BL5000C21703S3PFS	BL5000C21703S4PFS
Nominal capacity/mAh	5000	10000	15000	20000
Nominal voltage/V	10.8	10.8	10.8	10.8
Nominal charge current/A	0.375A（0℃~5℃） 0.75A（5℃~10℃） 1A(10℃~45℃)	0.75A（0℃~5℃） 1.5A（5℃~10℃） 2A(10℃~45℃)	1.125A（0℃~5℃） 2.25A（5℃~10℃） 3A(10℃~45℃)	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃)
Nominal discharge current/A	1	2	3	4
Maximum charge current/A	1	2	3	4
Maximum discharge current/A	5	8	8	8
Limited Charging Voltage/V	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）
Upper limit charging voltage/V	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）	12V（0℃~5℃） 12.375V（5℃~35℃） 12V（35℃~45℃）
Cut-off voltage/V	9	9	9	9
Charging temperature/℃	0~45	0~45	0~45	0~45

Product name	Lithium-Ion Battery Pack			
Type/model	BL5000C21704S1PFS	BL5000C21704S2PFS	BL5000C21704S3PFS	BL5000C21704S4PFS
Nominal capacity/mAh	5000	10000	15000	20000
Nominal voltage/V	14.4	14.4	14.4	14.4
Nominal charge current/A	0.375A（0℃~5℃） 0.75A（5℃~10℃） 1A(10℃~45℃)	0.75A（0℃~5℃） 1.5A（5℃~10℃） 2A(10℃~45℃)	1.125A（0℃~5℃） 2.25A（5℃~10℃） 3A(10℃~45℃)	1.5A（0℃~5℃） 3A（5℃~10℃） 4A(10℃~45℃)
Nominal discharge current/A	1	2	3	4
Maximum charge current/A	1	2	3	4
Maximum discharge current/A	5	8	8	8
Limited Charging Voltage/V	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）
Upper limit charging voltage/V	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）	16V（0℃~5℃） 16.5V（5℃~35℃） 16V（35℃~45℃）
Cut-off voltage/V	12	12	12	12
Charging temperature/℃	0~45	0~45	0~45	0~45

Test List（Cell: LR2170SD, 03BCEA5）：

There are 32 models covered by this report. All models are constructed in a similar manner and with similar materials. The models differ according to their series and parallel cell connections and corresponding protection PCB.Tested items are recorded below:

Model	With shrink wrap plastic film				
	Clause 7.3.6	Clause 7.3.2	Clause 7.3.8.1	Clause 7.3.8.2	Clause 7.3.3

BL5000C21701S1PFT	•	•			
BL5000C21701S2PFT					
BL5000C21701S3PFT	•	•			
BL5000C21701S1PFS	•	•	•	•	•
BL5000C21701S2PFS					
BL5000C21701S3PFS			•	•	•
BL5000C21701S4PFS	•	•			
BL5000C21701S4PFT	•	•			
BL5000C21702S1PFT	•	•	•	•	•
BL5000C21702S2PFT					
BL5000C21702S3PFT			•	•	•
BL5000C21702S4PFT	•	•			
BL5000C21703S1PFT	•	•			
BL5000C21703S2PFT					
BL5000C21703S3PFT					
BL5000C21703S4PFT	•	•			
BL5000C21704S1PFT	•	•			
BL5000C21704S2PFT			•	•	•
BL5000C21704S3PFT			•	•	•
BL5000C21704S4PFT	•	•			
BL5000C21702S1PFS	•	•			
BL5000C21702S2PFS			•	•	•
BL5000C21702S3PFS					
BL5000C21702S4PFS	•	•			
BL5000C21703S1PFS	•	•			
BL5000C21703S2PFS					
BL5000C21703S3PFS			•	•	•
BL5000C21703S4PFS	•	•			
BL5000C21704S1PFS	•	•			
BL5000C21704S2PFS					
BL5000C21704S3PFS					
BL5000C21704S4PFS	•	•	•	•	•

Products a total of 9 kinds of shells from A ~ I, shells in addition to inconsistent size other than the same, the same 1S1P products a product with buttons without shells, specific tests are as follows:

Model	With Plastic housing					Shrink wrap plastic with positive button top		
	Clause 7.2.2	Clause 7.3.8.1	Clause 7.3.8.2	Clause 7.3.3	Types of housings	Clause 7.3.8.1	Clause 7.3.8.2	Clause 7.3.3
BL5000C21701S1PFT					A	•	•	•
BL5000C21701S2PFT					B			
BL5000C21701S3PFT					C			
BL5000C21701S1PFS	•	•	•	•	A	•	•	•
BL5000C21701S2PFS	•	•	•	•	B			
BL5000C21701S3PFS	•	•	•	•	C			
BL5000C21701S4PFS					D			
BL5000C21701S4PFT	•	•	•	•	D			
BL5000C21702S1PFT					B			
BL5000C21702S2PFT					D			
BL5000C21702S3PFT	•	•	•	•	E			
BL5000C21702S4PFT					F			
BL5000C21703S1PFT					C			
BL5000C21703S2PFT					E			
BL5000C21703S3PFT					G			
BL5000C21703S4PFT					H			
BL5000C21704S1PFT					D			

BL5000C21704S2PFT	•	•	•	•	F			
BL5000C21704S3PFT	•	•	•	•	H			
BL5000C21704S4PFT					I			
BL5000C21702S1PFS					B			
BL5000C21702S2PFS					D			
BL5000C21702S3PFS					E			
BL5000C21702S4PFS					F			
BL5000C21703S1PFS					C			
BL5000C21703S2PFS					E			
BL5000C21703S3PFS	•	•	•	•	G			
BL5000C21703S4PFS					H			
BL5000C21704S1PFS					D			
BL5000C21704S2PFS					F			
BL5000C21704S3PFS					H			
BL5000C21704S4PFS	•	•	•	•	I			

Test List（Alternative Cell: LR2170SZ）：

For the cell model cell LR2170SZ products, the cell has a certificate and the core model LR2170SD, 03BCEA5 products Clause 7.3.2 and Clause 7.3.6 test current is 0A other are the same, the test content is as follows:

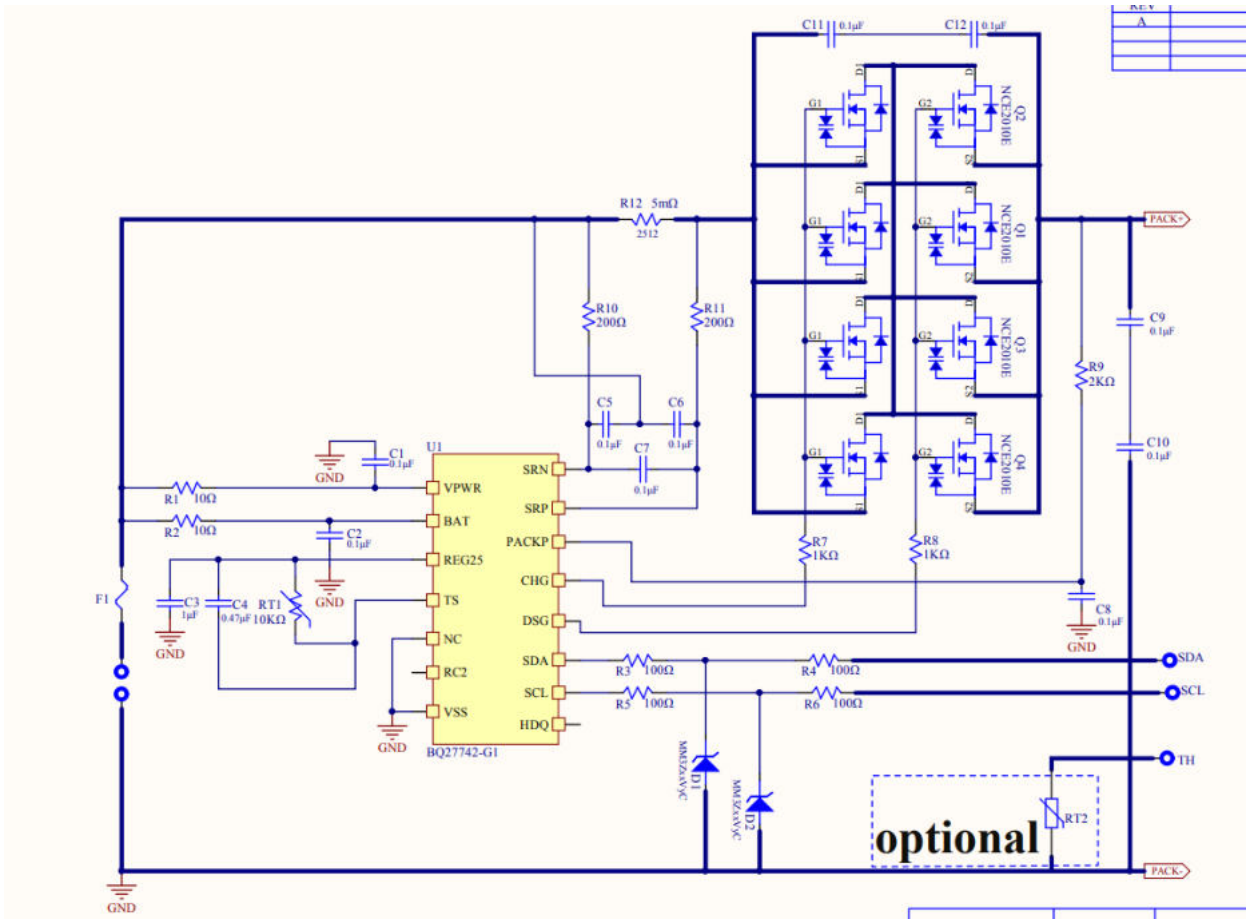
Model	With plastic shrink wrap film					
	Clause 7.2.2	Clause 7.3.6	Clause 7.3.2	Clause 7.3.8.1	Clause 7.3.8.2	Clause 7.3.3
BL5000C21701S3PFT		•	•			
BL5000C21701S4PFS		•	•			
BL5000C21704S4PFT		•	•			
BL5000C21704S4PFS		•	•			

One sample each of Clause 7.3.6 and Clause 7.3.2 was tested in this report model.

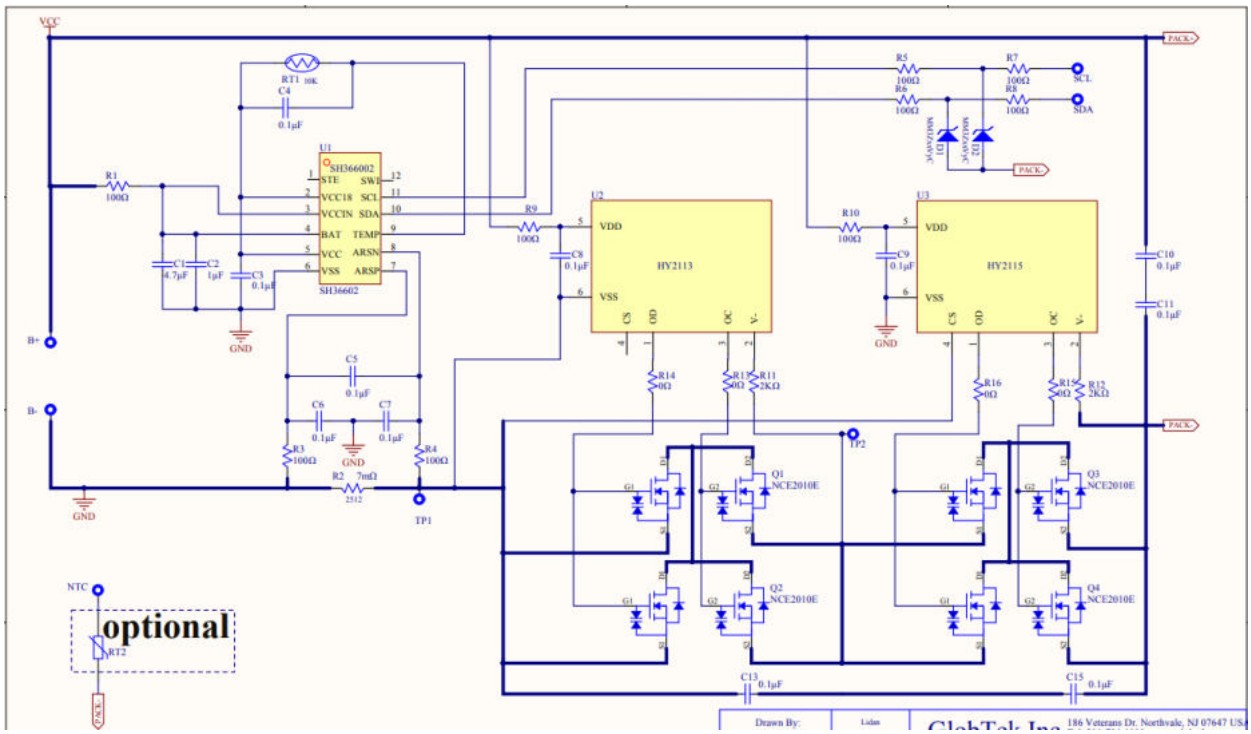
Circuit diagram:

In the below circuit diagrams, an optional NTC is shown with the intent of providing an analog temperature signal for external reading . The NTC does not contribute to the functionality of the battery pack. The samples tested in this report did not include the optional NTC. Since the NTC does not impact the testing performed, samples with the NTC included do not need additional testing.

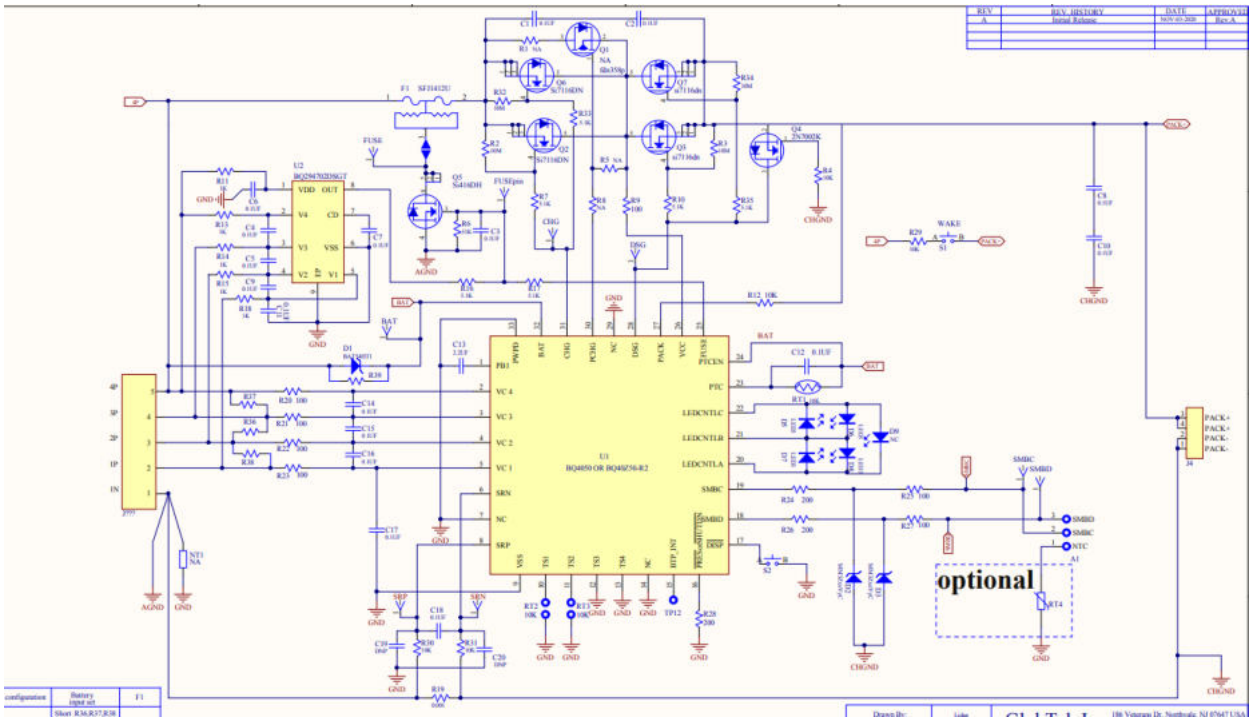
PCB1


C11 0.1μF
C12 0.1μF
R12 5mΩ
2512
R10 200Ω
R11 200Ω
C5 0.1μF
C6 0.1μF
C7 0.1μF
C1 0.1μF
U1
VPWR
BAT
REG25
TS
NC
RC2
VSS
SRN
SRP
PACKP
CHG
DSG
SDA
SCL
HDQ
BQ27742-G1
R1 10Ω
R2 10Ω
C2 0.1μF
C3 1μF
C4 0.47μF
RT1 10KΩ
F1
GND
R3 100Ω
R4 100Ω
R5 100Ω
R6 100Ω
R7 1KΩ
R8 1KΩ
R9 2KΩ
C8 0.1μF
C9 0.1μF
C10 0.1μF
Q1 NCE2010E
Q2 NCE2010E
Q3 NCE2010E
Q4 NCE2010E
PACK+
PACK-
SDA
SCL
TH
D1 MMSZ5245C
D2 MMSZ5245C
optional
RT2

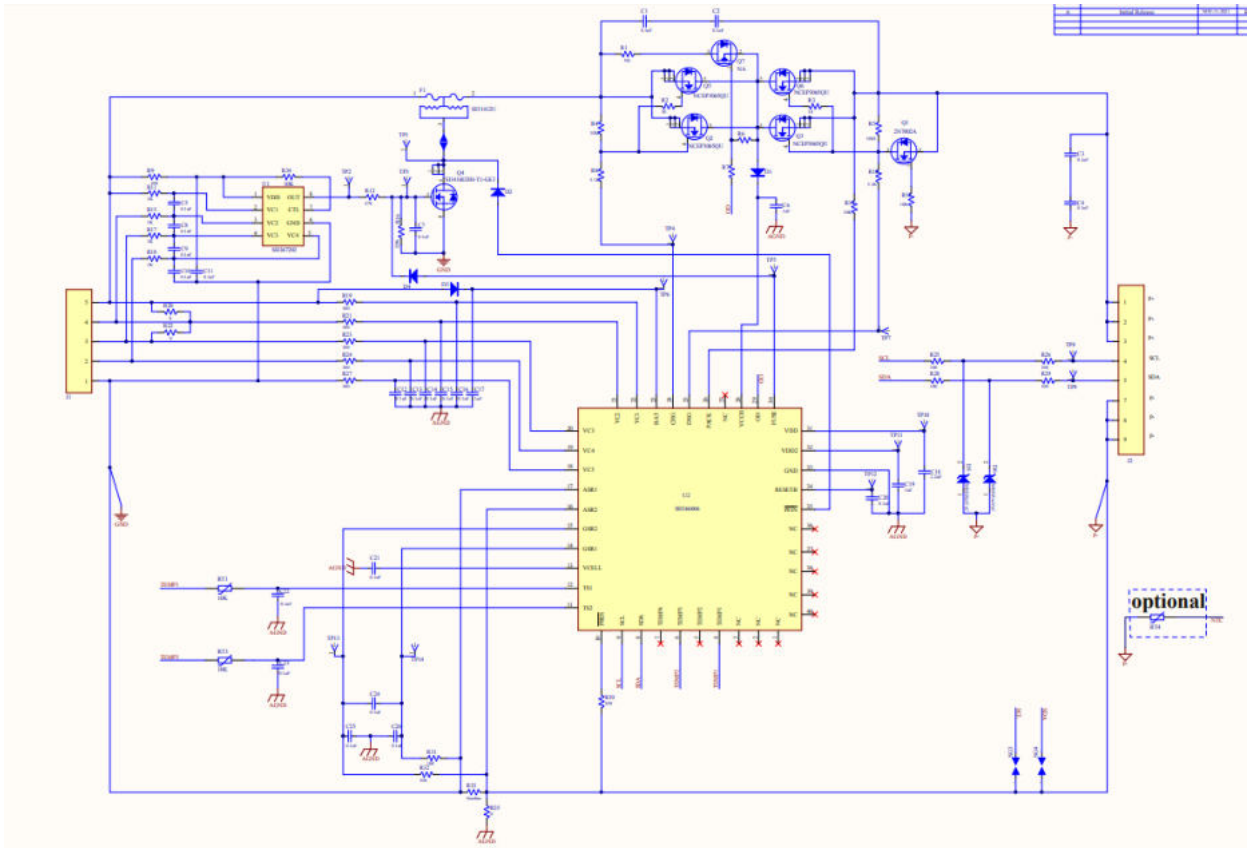
PCB2


VCC
RT1 10K
C4 0.1μF
U1
SH366002
STE
VCC18
VCCIN
BAT
VCC
VSS
SW
SCL
SDA
TEMP
ARSN
ARSP
SH36602
R1 100Ω
C1 4.7μF
C2 1μF
C3 0.1μF
B+
B-
GND
C5 0.1μF
C6 0.1μF
C7 0.1μF
R3 100Ω
R4 100Ω
R2 7mΩ
2512
TP1
U2
HY2113
VDD
VSS
CS
OD
OC
V-
R9 100Ω
C8 0.1μF
R14 0Ω
R13 0Ω
R11 2KΩ
U3
HY2115
R10 100Ω
C9 0.1μF
R16 0Ω
R15 0Ω
R12 2KΩ
TP2
Q1 NCE2010E
Q2 NCE2010E
Q3 NCE2010E
Q4 NCE2010E
R5 100Ω
R6 100Ω
R7 100Ω
R8 100Ω
D1 MMSZ5245C
D2 MMSZ5245C
PACK-
SCL
SDA
C10 0.1μF
C11 0.1μF
C13 0.1μF
C15 0.1μF
NTC
optional
RT2
Drawn By:
Lidan
GlobTek Inc
186 Veterans Dr. Northvale, NJ 07647 USA

PCB3



PCB4



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Clause	Requirement + Test	Result - Remark	Verdict
4	**PARAMETER MEASUREMENT TOLERANCES**		P
	Parameter measurement tolerances		P
5	**GENERAL SAFETY CONSIDERATIONS**		P
5.1	**General**		P
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		P
5.2	**Insulation and wiring**		P
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ	No metal surface exists.	N/A
	Insulation resistance (MΩ) ..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate clearances 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		P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	**Temperature, voltage and current management**		P
	Batteries are designed such that abnormal temperature rise conditions are prevented		N/A
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	Overcharge, over discharge, over current and short-circuit proof circuit used in this battery. See tests of clause 7.	P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that specified chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the manufacturer's specification.	P
5.5	**Terminal contacts**		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		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		P
5.6	**Assembly of cells into batteries**		P
5.6.1	General		P
	Each battery has 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		P
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery has protective circuitry that can maintain the cells within their operating regions		N/A
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly	Current, voltage and temperature limits specified by cell manufacturer.	P
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		N/A
	Protective circuit components are added as appropriate and consideration given to the end-device application		P
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance		P
5.6.2	Design recommendation		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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	Single cell. Upper limit charging voltage of cell: LR2170SD, 03BCEA5：4.25V LR2170SZ：4.2V.	P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage are not 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 are not discharged beyond the cell manufacturer's specified final voltage	Final voltage of cell: 3.0V, final voltage of battery: 3.0V, not below the final voltage specified by cell manufacturer.	P
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry are incorporated into the battery management system		N/A
5.6.3	Mechanical protection for cells and components of batteries		P
	Mechanical protection for cells, cell connections and control circuits within the battery are provided to prevent damage as a result of intended use and reasonably foreseeable misuse	Mechanical protection for cell connections and control circuits provided.	P
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product	Mechanical protection is provided by the final product housing	P
	The battery case and compartments housing cells are designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For batteries intended for building into a portable end product, testing with the battery installed within the end product is 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	Battery: ISO 9001.	P
5.8	**Battery safety components**		P
6	**TYPE TEST AND SAMPLE SIZE**		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old	Tests are performed according to specified in Table 1 of this standard. The samples are not more than six months old.	P
	The internal resistance of coin cells are measured in accordance with Annex D. Coin cells with internal resistance less than or equal to 3 Ω are tested in accordance with Table 1	Not coin cells	N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and over discharge protection		P
	When conducting the short-circuit test, consideration is given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test	See clause 7.3.2.	P
7	**SPECIFIC REQUIREMENTS AND TESTS**		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 °C ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery has been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage		P

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Clause	Requirement + Test	Result - Remark	Verdict
7.1.2	Second procedure	CB approved cell used.	N/A
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		N/A
	After stabilization for 1 h to 4 h, at an ambient temperature of the highest test temperature and the lowest test temperature, respectively, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant current to constant voltage charging method		N/A
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)	CB approved cell used.	N/A
	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		N/A
	Results: no fire, no explosion, no leakage.....:		N/A
7.2.2	Case stress at high ambient temperature (battery)	Tested complied.	P
	Oven temperature (°C).....:	70 °C	—
	Results: no physical distortion of the battery case resulting in exposure of internal protective components and cells		P
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)	CB approved cell used.	N/A
	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		N/A
	Results: no fire, no explosion.....:		N/A
7.3.2	External short-circuit (battery)	Tested complied.	P
	The batteries were tested until one of the following occurred:		P
	- 24 hours elapsed; or		N/A
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	A single fault in the discharge protection circuit is conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		P
	A single fault applies to protective component parts such as MOSFET (metal oxide semiconductor field-effect transistor), fuse, thermostat or positive temperature coefficient (PTC) thermistor		P
	Results: no fire, no explosion ..... :	(See appended table7.3.2)	P
7.3.3	Free fall	Tested complied.	P
	Results: no fire, no explosion		P
7.3.4	Thermal abuse (cells)	CB approved cell used.	N/A
	Oven temperature (°C) ..... :		—
	Results: no fire, no explosion		N/A
7.3.5	Crush (cells)	CB approved cell used.	N/A
	The crushing force was released upon:		N/A
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: no fire, no explosion ..... :		N/A
7.3.6	Over-charging of battery	Tested complied.	P
	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		P
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		P
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		P
	Test was continued until the temperature of the outer casing:		P
	- Reached steady state conditions (less than 10 °C change in 30-minute period); or		P
	- Returned to ambient		N/A
	Results: no fire, no explosion ..... :	(See appended table7.3.6)	P
7.3.7	Forced discharge (cells)	CB approved cell used.	N/A
	Discharge a single cell to the lower limit discharge voltage specified by the cell manufacturer		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The discharged cell is then subjected to a forced discharge at 1 It A to the negative value of the upper limit charging voltage		N/A
	- The discharge voltage reaches the negative value of upper limit charging voltage within the testing duration. The voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A
	- The discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration. The test is terminated at the end of the testing duration		N/A
	Results: no fire, no explosion ..... :		N/A
7.3.8	Mechanical tests (batteries)	(See appended table 7.3.8.1)	P
7.3.8.1	Vibration	Tested complied.	P
	Results: no fire, no explosion, no rupture, no leakage or venting. ..... :	(See appended table 7.3.8.2)	P
7.3.8.2	Mechanical shock	Tested complied.	P
	Results: no leakage, no venting, no rupture, no explosion and no fire ..... :	(See appended table 7.3.8.2)	P
7.3.9	Design evaluation – Forced internal short-circuit (cells)	CB approved cell used.	N/A
	The cells complied with national requirement for ..... :		N/A
	The pressing was stopped upon:		N/A
	- 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		N/A
	Results: no fire ..... :		N/A
8	**INFORMATION FOR SAFETY**		P
8.1	**General**		P
	Manufacturers of secondary cells provides information about current, voltage and temperature limits of their products	Information for safety mentioned in manufacturer's specifications	P
	Manufacturers of batteries provides information regarding how to minimize and mitigate hazards to equipment manufacturers or end-users	Information for safety mentioned in manufacturer's specifications	P
	Systems analyses are performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	As appropriate, any information relating to hazard avoidance resulting from a system analysis is provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		P
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 swallowable out of the reach of children		N/A
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		N/A
	- In case of ingestion of a cell or battery, seek medical assistance promptly		N/A
9	**MARKING**		P
9.1	**Cell marking**	The final product is battery.	N/A
	Cells are marked as specified in IEC 61960, except coin cells		N/A
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		N/A
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		N/A
9.2	**Battery marking**	See marking plate on page 4	P
	Batteries are marked as specified in IEC 61960, except for coin batteries		P
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity	Not coin batteries.	N/A
	Batteries are marked with an appropriate caution statement		P
	- Terminals have clear polarity marking on the external surface of the battery, or		P
	- Not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		N/A
9.3	**Caution for ingestion of small cells and batteries**		N/A

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	Coin cells and batteries identified as small batteries include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	Small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion is given on the immediate package		N/A
9.4	**Other information**		P
	The following information are marked on or supplied with the battery:		P
	- Storage and disposal instructions		P
	- Recommended charging instructions		P
10	**PACKAGING AND TRANSPORT**		N/A
	Packaging for coin cells are not be small enough to fit within the limits of the ingestion gauge of Figure 3		N/A
ANNEX A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		**P**
A.1	**General**	CB approved cell used.	P
A.2	**Safety of lithium ion secondary battery**		P
A.3	**Consideration on charging voltage**		P
A.3.1	General		P
A.3.2	Upper limit charging voltage		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		P
A.4	**Consideration of temperature and charging current**		P
A.4.1	General		P
A.4.2	Recommended temperature range		P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied		P
A.4.3	High temperature range		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 the high temperature range		P

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Clause	Requirement + Test	Result - Remark	Verdict
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		P
A.4.4	Low temperature range		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		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
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**		N/A
A.5.1	General		N/A
A.5.2	Insertion procedure for nickel particle to generate internal short		N/A
A.5.3	Disassembly of charged cell		N/A
A.5.4	Shape of nickel particle		N/A
A.5.5	Insertion of nickel particle in cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		N/A
A.6	**Experimental procedure of the forced internal short-circuit test**		N/A
A.6.1	Material and tools for preparation of nickel particle		N/A
A.6.2	Example of a nickel particle preparation procedure		N/A
A.6.3	Positioning (or placement) of a nickel particle		N/A
A.6.4	Damaged separator precaution		N/A
A.6.5	Caution for rewinding separator and electrode		N/A
A.6.6	Insulation film for preventing short-circuit		N/A
A.6.7	Caution when disassembling a cell		N/A
A.6.8	Protective equipment for safety		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
A.6.9	Caution in the case of fire during disassembling		N/A
A.6.10	Caution for the disassembling process and pressing the electrode core		N/A
A.6.11	Recommended specifications for the pressing device		N/A
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		P
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		P
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		N/A
D.1	**General**		N/A
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing .....:		N/A
	Coin cells with an internal resistance less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1	(See appended table D.2)	N/A
ANNEX E	**PACKAGING AND TRANSPORT**		**N/A**
ANNEX F	**COMPONENT STANDARDS REFERENCES**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: Continuous charging at constant voltage (cells)			N/A
Sample No.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**
Supplementary information:				

7.3.1	TABLE: External short circuit (cell)				N/A
Sample No.	**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 °C					
Samples charged at charging temperature lower limit °C					
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

7.3.2	TABLE: External short circuit (battery)					P
Sample No.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (°C)**	**Component single fault condition**	**Results**
BL5000C21701S1PFT #1	23.3	4.09	80	0.3	F2	No fire or explosion
BL5000C21701S1PFT #2	22.2	4.10	80	0.2	Q3	No fire or explosion
BL5000C21701S1PFT #3	22.6	4.10	80	0.1	--	No fire or explosion
BL5000C21701S1PFT #4	22.3	4.11	80	0.1	--	No fire or explosion
BL5000C21701S1PFT #5	22.5	4.10	81	0.1	--	No fire or explosion
BL5000C21701S3PFT #34	23.3	4.09	80	0.4	F2	No fire or explosion
BL5000C21701S3PFT #35	23.2	4.10	80	8.2	Q3	No fire or explosion
BL5000C21701S3PFT #36	22.6	4.10	80	0.3	--	No fire or explosion
BL5000C21701S3PFT #37	23.3	4.11	80	0.3	--	No fire or explosion
BL5000C21701S3PFT #38	24.2	4.10	80	0.3	--	No fire or explosion
BL5000C21701S4PFT #44	22.3	4.09	80	0.3	F1	No fire or explosion
BL5000C21701S4PFT #45	22.7	4.10	80	0.4	Q3	No fire or explosion
BL5000C21701S4PFT #46	22.6	4.09	80	0.3	--	No fire or explosion
BL5000C21701S4PFT #47	22.7	4.10	80	0.4	--	No fire or explosion
BL5000C21701S4PFT #48	22.8	4.10	80	0.1	--	No fire or explosion
BL5000C21702S1PFT #54	24.1	8.24	80	0.3	Fuse	No fire or explosion
BL5000C21702S1PFT #55	24.0	8.23	80	0.4	Q3	No fire or explosion
BL5000C21702S1PFT #56	24.0	8.24	80	0.2	--	No fire or explosion

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Clause	Requirement + Test	Result - Remark	Verdict

BL5000C21702S1PFT #57	24.4	8.24	80	0.2	--	No fire or explosion
BL5000C21702S1PFT #58	24.5	8.24	80	0.2	--	No fire or explosion
BL5000C21702S4PFT #91	22.9	8.22	80	0.2	Fuse	No fire or explosion
BL5000C21702S4PFT #92	23.3	8.23	80	0.2	Q3	No fire or explosion
BL5000C21702S4PFT #93	23.0	8.23	80	0.7	Q7	No fire or explosion
BL5000C21702S4PFT #94	23.8	8.22	80	0.2	--	No fire or explosion
BL5000C21702S4PFT #95	23.5	8.21	80	0.2	--	No fire or explosion
BL5000C21703S1PFT #101	24.3	12.33	80	0.1	Fuse	No fire or explosion
BL5000C21703S1PFT #102	23.8	12.34	80	0.6	Q3	No fire or explosion
BL5000C21703S1PFT #103	24.0	12.34	80	0.2	--	No fire or explosion
BL5000C21703S1PFT #104	24.2	12.35	80	0.2	--	No fire or explosion
BL5000C21703S1PFT #105	24.5	12.33	80	0.1	--	No fire or explosion
BL5000C21703S4PFT #120	24.0	12.32	80	0.2	Fuse	No fire or explosion
BL5000C21703S4PFT #121	23.8	12.33	80	0.2	Q3	No fire or explosion
BL5000C21703S4PFT #122	23.1	12.33	80	0.3	Q7	No fire or explosion
BL5000C21703S4PFT #123	23.8	12.33	80	0.2	--	No fire or explosion
BL5000C21703S4PFT #124	23.5	12.32	80	0.1	--	No fire or explosion
BL5000C21704S1PFT #130	23.3	16.47	80	0.3	Fuse	No fire or explosion
BL5000C21704S1PFT #131	23.8	16.46	80	0.2	Q3	No fire or explosion
BL5000C21704S1PFT #132	24.2	16.47	80	0.1	Q7	No fire or explosion
BL5000C21704S1PFT	24.0	16.47	80	0.2	--	No fire or

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Clause	Requirement + Test	Result - Remark	Verdict

#133						explosion
BL5000C21704S1PFT #134	24.2	16.44	80	0.1	--	No fire or explosion
BL5000C21704S4PFT #158	22.6	16.42	80	0.2	Fuse	No fire or explosion
BL5000C21704S4PFT #159	23.6	16.42	80	0.1	Q3	No fire or explosion
BL5000C21704S4PFT #160	22.9	16.42	80	0.3	Q7	No fire or explosion
BL5000C21704S4PFT #161	23.0	16.41	80	0.1	--	No fire or explosion
BL5000C21704S4PFT #162	23.1	16.42	80	0.1	--	No fire or explosion
BL5000C21701S1PFS #177	23.1	4.10	80	0.3	F2	No fire or explosion
BL5000C21701S1PFS #178	24.2	4.09	80	0.4	Q1	No fire or explosion
BL5000C21701S1PFS #179	23.6	4.11	80	0.3	Q3	No fire or explosion
BL5000C21701S1PFS #180	24.1	4.10	80	0.2	--	No fire or explosion
BL5000C21701S1PFS #181	24.3	4.11	80	0.2	--	No fire or explosion
BL5000C21701S4PFS #232	23.3	4.09	80	0.3	Q1	No fire or explosion
BL5000C21701S4PFS #233	22.2	4.10	80	0.2	Q2	No fire or explosion
BL5000C21701S4PFS #234	22.6	4.10	80	0.1	Q3	No fire or explosion
BL5000C21701S4PFS #235	23.0	4.08	80	0.3	Q4	No fire or explosion
BL5000C21701S4PFS #236	23.2	4.09	80	0.2	--	No fire or explosion
BL5000C21702S1PFS #242	19.5	7.74	80	0.1	F1	No fire or explosion
BL5000C21702S1PFS #243	22.3	7.73	80	0.2	Q3	No fire or explosion
BL5000C21702S1PFS #244	21.3	7.73	80	0.2	--	No fire or explosion
BL5000C21702S1PFS #245	23.3	7.74	80	0.1	--	No fire or explosion

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Clause	Requirement + Test	Result - Remark	Verdict

BL5000C21702S1PFS #246	24.3	7.75	80	0.3	--	No fire or explosion
BL5000C21702S4PFS #270	23.7	7.79	80	0.2	F1	No fire or explosion
BL5000C21702S4PFS #271	24.1	7.80	80	0.1	Q3	No fire or explosion
BL5000C21702S4PFS #272	23.8	7.79	80	0.1	Q6	No fire or explosion
BL5000C21702S4PFS #273	24.0	7.78	80	0.2	--	No fire or explosion
BL5000C21702S4PFS #274	23.0	7.75	80	0.1	--	No fire or explosion
BL5000C21703S1PFS #280	23.8	12.32	80	0.3	Fuse	No fire or explosion
BL5000C21703S1PFS #281	23.6	12.31	80	0.2	Q3	No fire or explosion
BL5000C21703S1PFS #282	24.0	12.32	80	0.2	--	No fire or explosion
BL5000C21703S1PFS #283	24.1	12.33	80	0.1	--	No fire or explosion
BL5000C21703S1PFS #284	23.1	12.31	80	0.1	--	No fire or explosion
BL5000C21703S4PFS #299	24.2	11.87	80	0.2	F1	No fire or explosion
BL5000C21703S4PFS #300	24.5	11.88	80	0.3	Q3	No fire or explosion
BL5000C21703S4PFS #301	24.0	11.87	80	0.4	Q6	No fire or explosion
BL5000C21703S4PFS #302	24.4	11.87	80	0.1	--	No fire or explosion
BL5000C21703S4PFS #303	23.4	11.88	80	0.2	--	No fire or explosion
BL5000C21704S1PFS #309	24.3	16.41	80	0.2	Fuse	No fire or explosion
BL5000C21704S1PFS #310	24.1	16.41	80	0.3	Q3	No fire or explosion
BL5000C21704S1PFS #311	24.0	16.40	80	0.2	Q6	No fire or explosion
BL5000C21704S1PFS #312	23.1	16.42	80	0.2	--	No fire or explosion
BL5000C21704S1PFS	22.1	16.42	80	0.2	--	No fire or

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Clause	Requirement + Test	Result - Remark	Verdict

#313						explosion
BL5000C21704S4PFS #337	24.1	16.20	80	0.3	Fuse	No fire or explosion
BL5000C21704S4PFS #338	24.0	16.19	80	0.6	Q3	No fire or explosion
BL5000C21704S4PFS #339	22.2	16.20	80	0.7	Q6	No fire or explosion
BL5000C21704S4PFS #340	23.0	16.18	80	0.3	--	No fire or explosion
BL5000C21704S4PFS #341	23.2	16.14	80	0.1	--	No fire or explosion
Supplementary information: The batteries remain on test until the surface temperature declines by 20 % of the maximum temperature rise. - No fire or explosion - Others (please explain)						

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Clause	Requirement + Test	Result - Remark	Verdict

7.3.5	TABLE: Crush (cells)			N/A
Sample No.	**OCV before test (Vdc)**	**OCV at removal of crushing force (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit °C				
Samples charged at charging temperature lower limit °C				
Supplementary information:				

7.3.6	TABLE: Over-charging of battery- BL5000C21701S1PFT			P
Constant charging current (A) ..... :		**10**		—
Supply voltage (Vdc) ..... :		**5.88**		—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21701S1PFT #6	3.14	60	28.4	No fire or explosion
BL5000C21701S1PFT #7	3.13	60	29.7	No fire or explosion
BL5000C21701S1PFT #8	3.13	60	29.4	No fire or explosion
BL5000C21701S1PFT 9#	3.13	60	29.9	No fire or explosion
BL5000C21701S1PFT #10	3.14	60	29.3	No fire or explosion
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)				

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Clause	Requirement + Test	Result - Remark	Verdict

7.3.6	TABLE: Over-charging of battery- BL5000C21701S3PFT				P
Constant charging current (A) ..... :		30			—
Supply voltage (Vdc) ..... :		5.88			—
Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results	
BL5000C21701S3PFT #29	3.14	60	24.4	No fire or explosion	
BL5000C21701S3PFT #30	3.13	60	24.5	No fire or explosion	
BL5000C21701S3PFT #31	3.13	60	24.3	No fire or explosion	
BL5000C21701S3PFT #32	3.13	60	23.8	No fire or explosion	
BL5000C21701S3PFT #33	3.14	60	24.3	No fire or explosion	
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)					

7.3.6	TABLE: Over-charging of battery- BL5000C21701S4PFT				P
Constant charging current (A) ..... :		40			—
Supply voltage (Vdc) ..... :		5.88			—
Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results	
BL5000C21701S4PFT #39	3.22	60	23.8	No fire or explosion	
BL5000C21701S4PFT #40	3.23	60	23.5	No fire or explosion	
BL5000C21701S4PFT #41	3.22	60	23.6	No fire or explosion	
BL5000C21701S4PFT #42	3.23	60	23.6	No fire or explosion	
BL5000C21701S4PFT #43	3.21	60	24.0	No fire or explosion	
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)					

7.3.6	TABLE: Over-charging of battery- BL5000C21702S1PFT	P

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Clause	Requirement + Test	Result - Remark	Verdict

Constant charging current (A) ..... :	**10**	—
Supply voltage (Vdc) ..... :	**10.08**	—

Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
BL5000C21702S1PFT #49	6.47	60	34.68	No fire or explosion
BL5000C21702S1PFT #50	6.46	60	39.67	No fire or explosion
BL5000C21702S1PFT #51	6.47	60	37.13	No fire or explosion
BL5000C21702S1PFT #52	6.46	60	38.09	No fire or explosion
BL5000C21702S1PFT #53	6.45	60	38.76	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	TABLE: Over-charging of battery- BL5000C21702S4PFT	P
Constant charging current (A) ..... :	**40**	—
Supply voltage (Vdc) ..... :	**10.08**	—

Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
BL5000C21702S4PFT #86	6.45	60	23.8	No fire or explosion
BL5000C21702S4PFT #87	6.46	60	23.5	No fire or explosion
BL5000C21702S4PFT #88	6.46	60	23.6	No fire or explosion
BL5000C21702S4PFT #89	6.47	60	23.6	No fire or explosion
BL5000C21702S4PFT #90	6.46	60	24.0	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	TABLE: Over-charging of battery- BL5000C21703S1PFT	P
Constant charging current (A) ..... :	**10**	—
Supply voltage (Vdc) ..... :	**15.12**	—

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Clause	Requirement + Test	Result - Remark	Verdict

Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
BL5000C21703S1PFT #96	9.69	60	38.5	No fire or explosion
BL5000C21703S1PFT #97	9.70	60	37.5	No fire or explosion
BL5000C21703S1PFT #98	9.66	60	40.1	No fire or explosion
BL5000C21703S1PFT #99	9.67	60	39.4	No fire or explosion
BL5000C21703S1PFT #100	9.69	60	35.9	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	TABLE: Over-charging of battery- BL5000C21703S4PFT		P
Constant charging current (A) ..... :		**40**	—
Supply voltage (Vdc) ..... :		**15.12**	—

Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results
BL5000C21703S4PFT #115	9.74	60	33.2	No fire or explosion
BL5000C21703S4PFT #116	9.69	60	34.2	No fire or explosion
BL5000C21703S4PFT #117	9.72	60	35.6	No fire or explosion
BL5000C21703S4PFT #118	9.70	60	34.9	No fire or explosion
BL5000C21703S4PFT #119	9.74	60	33.6	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	TABLE: Over-charging of battery- BL5000C21704S1PFT		P
Constant charging current (A) ..... :		**10**	—
Supply voltage (Vdc) ..... :		**20.16**	—

Sample No.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results

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Clause	Requirement + Test	Result - Remark	Verdict

BL5000C21704S1PFT #125	12.91	60	23	No fire or explosion
BL5000C21704S1PFT #126	12.85	60	23.8	No fire or explosion
BL5000C21704S1PFT #127	12.90	60	22.9	No fire or explosion
BL5000C21704S1PFT #128	12.89	60	23.1	No fire or explosion
BL5000C21704S1PFT #129	12.95	60	22.7	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	**TABLE: Over-charging of battery- BL5000C21704S4PFT**			P
Constant charging current (A) ..... :		**40**		—
Supply voltage (Vdc) ..... :		**20.16**		—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21704S4PFT #153	12.52	60	23.5	No fire or explosion
BL5000C21704S4PFT #154	12.47	60	23.7	No fire or explosion
BL5000C21704S4PFT #155	12.48	60	23.4	No fire or explosion
BL5000C21704S4PFT #156	22.8	60	23.8	No fire or explosion
BL5000C21704S4PFT #157	23.0	60	23.6	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	**TABLE: Over-charging of battery- BL5000C21701S1PFS**			P
Constant charging current (A) ..... :		**10**		—
Supply voltage (Vdc) ..... :		**5.88**		—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21701S1PFS	3.17	60	23.2	No fire or

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Clause	Requirement + Test	Result - Remark	Verdict

#172				explosion
BL5000C21701S1PFS #173	3.16	60	23.3	No fire or explosion
BL5000C21701S1PFS #174	3.17	60	23.4	No fire or explosion
BL5000C21701S1PFS #175	3.17	60	23.5	No fire or explosion
BL5000C21701S1PFS #176	3.16	60	23.4	No fire or explosion
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)				

7.3.6	**TABLE: Over-charging of battery- BL5000C21701S4PFS**			P
Constant charging current (A) ..... :		**40**		—
Supply voltage (Vdc) ..... :		**5.88**		—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21701S4PFS #227	3.22	60	23.4	No fire or explosion
BL5000C21701S4PFS #228	3.23	60	22.9	No fire or explosion
BL5000C21701S4PFS #229	3.22	60	23.3	No fire or explosion
BL5000C21701S4PFS #230	3.23	60	23.4	No fire or explosion
BL5000C21701S4PFS #231	3.21	60	22.8	No fire or explosion
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)				

7.3.6	**TABLE: Over-charging of battery- BL5000C21702S1PFS**			P
Constant charging current (A) ..... :		**10**		—
Supply voltage (Vdc) ..... :		**10.08**		—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21702S1PFS #237	6.32	60	23.5	No fire or explosion
BL5000C21702S1PFS #238	6.36	60	23.4	No fire or explosion

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BL5000C21702S1PFS #239	6.30	60	22.8	No fire or explosion
BL5000C21702S1PFS #240	6.40	60	22.9	No fire or explosion
BL5000C21702S1PFS #241	6.36	60	23.1	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	**TABLE: Over-charging of battery- BL5000C21702S4PFS**			P
Constant charging current (A) ..... :	**40**			—
Supply voltage (Vdc) ..... :	**10.08**			—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21702S4PFS #265	6.25	60	22.5	No fire or explosion
BL5000C21702S4PFS #266	6.26	60	22.9	No fire or explosion
BL5000C21702S4PFS #267	6.30	60	23.0	No fire or explosion
BL5000C21702S4PFS #268	6.25	60	23.8	No fire or explosion
BL5000C21702S4PFS #269	6.30	60	23.1	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	**TABLE: Over-charging of battery- BL5000C21703S1PFS**			P
Constant charging current (A) ..... :	**10**			—
Supply voltage (Vdc) ..... :	**15.12**			—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21703S1PFS #275	9.27	60	22.3	No fire or explosion
BL5000C21703S1PFS #276	9.28	60	22.5	No fire or explosion
BL5000C21703S1PFS	9.29	60	22.9	No fire or

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#277				explosion
BL5000C21703S1PFS #278	9.31	60	22.8	No fire or explosion
BL5000C21703S1PFS #279	9.28	60	23.1	No fire or explosion
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)				

7.3.6	**TABLE: Over-charging of battery- BL5000C21703S4PFS**			P
Constant charging current (A) ..... :	**40**			—
Supply voltage (Vdc) ..... :	**15.12**			—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21703S4PFS #294	9.636	60	21.36	No fire or explosion
BL5000C21703S4PFS #295	9.719	60	21.77	No fire or explosion
BL5000C21703S4PFS #296	9.683	60	22.88	No fire or explosion
BL5000C21703S4PFS #297	9.643	60	21.82	No fire or explosion
BL5000C21703S4PFS #298	9.716	60	22.18	No fire or explosion
Supplementary information: The temperature of the outer case reached steady state conditions - No fire or explosion - Others (please explain)				

7.3.6	**TABLE: Over-charging of battery- BL5000C21704S1PFS**			P
Constant charging current (A) ..... :	**10**			—
Supply voltage (Vdc) ..... :	**20.16**			—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21704S1PFS #304	12.795	60	22.4	No fire or explosion
BL5000C21704S1PFS #305	12.784	60	21.8	No fire or explosion
BL5000C21704S1PFS #306	12.385	60	22.2	No fire or explosion

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BL5000C21704S1PFS #307	12.346	60	21.5	No fire or explosion
BL5000C21704S1PFS #308	12.459	60	22.0	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.6	**TABLE: Over-charging of battery- BL5000C21704S4PFS**			P
Constant charging current (A) ..... :		**40**		—
Supply voltage (Vdc) ..... :		**20.16**		—
Sample No.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
BL5000C21704S4PFS #332	12.407	60	23.86	No fire or explosion
BL5000C21704S4PFS #333	12.672	60	23.43	No fire or explosion
BL5000C21704S4PFS #334	12.462	60	23.99	No fire or explosion
BL5000C21704S4PFS #335	12.467	60	22.98	No fire or explosion
BL5000C21704S4PFS #336	12.459	60	23.45	No fire or explosion

Supplementary information: The temperature of the outer case reached steady state conditions
- No fire or explosion
- Others (please explain)

7.3.7	**TABLE: Forced discharge (cells)**			N/A
Sample No.	**OCV before application of reverse charge (Vdc)**	**Measured reverse charge I_t (A)**	**Lower limit discharge voltage (Vdc)**	**Results**

Supplementary information:

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Clause	Requirement + Test	Result - Remark	Verdict

7.3.8.1	**TABLE: Vibration**	P

Sample No.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results
BL5000C21701S1PFT #11（With Plastic housing）	4.10	4.10	205.3	205.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #12（With Plastic housing）	4.11	4.11	205.5	205.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #13（With Plastic housing）	4.11	4.09	205.4	205.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S2PFS #363（With Plastic housing）	4.10	4.09	282.5	282.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S2PFS #364（With Plastic housing）	4.09	4.09	282.8	282.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S2PFS #365（With Plastic housing）	4.09	4.09	282.9	282.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #20（Shrink wrap plastic with positive button top）	4.11	4.10	85.3	85.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #21（Shrink wrap plastic with positive button top）	4.12	4.10	85.4	85.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #22（Shrink wrap plastic with positive button top）	4.11	4.11	85.3	85.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S1PFT #59	8.23	8.24	170.2	170.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S1PFT #60	8.22	8.21	170.9	170.9	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S1PFT #61	8.23	8.23	169.9	169.8	No fire or explosion. No rupture or leakage. No venting.

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BL5000C21702S3PFT #68	8.21	8.21	481.1	481.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #69	8.22	8.21	479.4	479.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #70	8.22	8.23	479.8	479.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #77（With Plastic housing）	8.15	8.15	904.1	904.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #78（With Plastic housing）	8.17	8.14	907.6	906.9	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #79（With Plastic housing）	8.14	8.14	899.3	899.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFT #106（With Plastic housing）	12.26	12.26	1027.9	1027.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFT #107（With Plastic housing）	12.27	12.26	1027.5	1027.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFT #108（With Plastic housing）	12.24	12.24	1023.7	1027.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFT #135	16.472	16.470	629.5	629.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFT #136	16.475	16.474	628.4	628.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFT #137	16.468	16.469	630.3	630.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFT #144	16.472	16.470	925.8	926.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFT #145	16.481	16.477	933.2	933.0	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test	Result - Remark	Verdict

BL5000C21704S3PFT #146	16.478	16.475	925.5	925.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFT #163（With Plastic housing）	16.34	16.34	1610.2	1610.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFT #164（With Plastic housing）	16.35	16.34	1606.9	1606.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFT #165（With Plastic housing）	16.34	16.34	1619.0	1619.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #182	4.09	4.09	89.6	89.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #183	4.10	4.09	89.7	89.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #184	4.09	4.08	89.7	89.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #191（Shrink wrap plastic with positive button top）	4.12	4.11	85.5	85.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #192（Shrink wrap plastic with positive button top）	4.11	4.10	85.3	85.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #193（Shrink wrap plastic with positive button top）	4.11	4.11	85.3	85.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #209	4.09	4.08	238,7	238,7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #210	4.10	4.10	238,9	238,8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #211	4.10	4.09	238.8	238.8	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test			Result - Remark	Verdict
BL5000C21701S3PFS #218（With Plastic housing）	4.04	4.03	517.6	517.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #219（With Plastic housing）	4.05	4.05	506.6	506.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #220（With Plastic housing）	4.03	4.03	508.3	508.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #247	7.801	7.800	332.5	332.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #248	7.802	7.801	330.1	330.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #249	7.796	7.795	330.1	330.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #256（With Plastic housing）	4.06	4.06	591.5	591.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #257（With Plastic housing）	4.09	4.09	580.7	580.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #258（With Plastic housing）	4.08	4.06	588.3	588.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFS #285	11.910	11.909	696.4	696.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFS #286	11.905	11.904	700.0	699.9	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFS #287	11.907	11.907	699.8	699.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFS #314（With Plastic housing）	16.39	16.39	1040.2	1040.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFS #315（With Plastic housing）	16.40	16.38	1031.7	1031.2	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test	Result - Remark	Verdict

BL5000C21704S2PFS #316（With Plastic housing）	16.39	16.38	1034.6	1034.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFS #323（With Plastic housing）	16.40	16.38	1514.5	1514.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFS #324（With Plastic housing）	16.41	16.37	1519.7	1519.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFS #325（With Plastic housing）	16.40	16.40	1521.4	1521.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFS #342	16.178	16.177	1226.8	1226.7.	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFS #343	16.192	16.191	1226.6	1226.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFS #344	16.195	16.193	1224.5	1224.4	No fire or explosion. No rupture or leakage. No venting.

Supplementary information:

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

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Clause	Requirement + Test	Result - Remark	Verdict

7.3.8.2	TABLE: Mechanical shock				P
Sample No.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
BL5000C21701S1PFT #14（With Plastic housing）	4.11	4.11	205.6	205.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #15（With Plastic housing）	4.10	4.10	205.5	205.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #16（With Plastic housing）	4.12	4.12	205.7	205.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S2PFS #366（With Plastic housing）	4.12	4.12	282.5	282.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S2PFS #367（With Plastic housing）	4.11	4.10	282.7	282.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S2PFS #368（With Plastic housing）	4.11	4.11	282.6	282.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #23（Shrink wrap plastic with positive button top）	4.12	4.10	85.2	85.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #24（Shrink wrap plastic with positive button top）	4.11	4.11	85.4	85.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFT #25（Shrink wrap plastic with positive button top）	4.12	4.11	85.3	85.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S1PFT #62	8.22	8.22	169.5	169.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S1PFT #63	8.23	8.22	169.6	169.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S1PFT #64	8.23	8.23	170.7	170.6	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test		Result - Remark		Verdict
BL5000C21702S3PFT #71	8.22	8.22	480.2	480.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #72	8.21	8.22	480.1	480.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #73	8.22	8.21	479.7	479.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #80（With Plastic housing）	8.16	8.14	906.6	905.9	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #81（With Plastic housing）	8.17	8.16	906.6	906.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S3PFT #82（With Plastic housing）	8.16	8.16	899.7	899.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFT #109（With Plastic housing）	12.32	12.25	1027.8	1027.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFT #110（With Plastic housing）	12.28	12.25	1027.9	1027.9	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFT #111（With Plastic housing）	12.29	12.25	1023.6	1023.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFT #138	16.475	16.475	628.6	628.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFT #139	16.471	16.470	629.7	629.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFT #140	16.469	16.471	630.2	630.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFT #147	16.475	16.471	926.2	926.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S3PFT #148	16.473	16.470	925.8	925.7	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test	Result - Remark	Verdict

BL5000C21704S3PFT #149	16.479	16.471	925.3	925.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFT #166（With Plastic housing）	16.41	16.40	1610.8	1610.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFT #167（With Plastic housing）	16.40	16.38	1606.9	1606.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S4PFT #168（With Plastic housing）	16.42	16.37	1619.5	1619.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #185	4.08	4.07	89.5	89.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #186	4.10	4.09	89.8	89.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #187	4.08	4.08	89.7	89.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #194（Shrink wrap plastic with positive button top）	4.13	4.10	85.2	85.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #195（Shrink wrap plastic with positive button top）	4.12	4.11	85.3	85.2	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S1PFS #196（Shrink wrap plastic with positive button top）	4.11	4.11	85.3	85.3	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #212	4.09	4.10	238.9	238.9	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #213	4.10	4.10	238.7	238.6	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #214	4.09	4.09	239.0	239.0	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test			Result - Remark	Verdict
BL5000C21701S3PFS #221（With Plastic housing）	4.08	4.08	517.9	517.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #222（With Plastic housing）	4.04	4.04	506.9	506.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21701S3PFS #223（With Plastic housing）	4.06	4.06	508.5	508.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #250	7.803	7.802	330.1	330.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #251	7.799	7.798	332.1	332.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #252	7.795	7.794	331.8	331.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #259（With Plastic housing）	4.07	4.06	582.3	582.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #260（With Plastic housing）	4.08	4.07	589.1	589.1	No fire or explosion. No rupture or leakage. No venting.
BL5000C21702S2PFS #261（With Plastic housing）	4.09	4.07	519.5	519.4	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFS #288	11.905	11.905	701.0	700.8	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFS #289	11.900	11.900	701.1	701.0	No fire or explosion. No rupture or leakage. No venting.
BL5000C21703S3PFS #290	11.901	11.900	700.7	700.5	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFS #317（With Plastic housing）	16.37	16.37	1040.8	1040.7	No fire or explosion. No rupture or leakage. No venting.
BL5000C21704S2PFS #318（With Plastic housing）	16.47	16.39	1037.1	1037.1	No fire or explosion. No rupture or leakage. No venting.

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Clause	Requirement + Test			Result - Remark		Verdict
BL5000C21704S2PFS #319（With Plastic housing）	16.39	16.36	1034.1	1033.1	No fire or explosion. No rupture or leakage. No venting.	
BL5000C21704S3PFS #326（With Plastic housing）	16.42	16.41	1514.5	1514.4	No fire or explosion. No rupture or leakage. No venting.	
BL5000C21704S3PFS #327（With Plastic housing）	16.45	16.37	1519.7	1519.6	No fire or explosion. No rupture or leakage. No venting.	
BL5000C21704S3PFS #328（With Plastic housing）	16.43	16.36	1522.4	1522.3	No fire or explosion. No rupture or leakage. No venting.	
BL5000C21704S4PFS #345	16.201	16.200	1225.3	1225.2	No fire or explosion. No rupture or leakage. No venting.	
BL5000C21704S4PFS #346	16.215	16.215	1221.5	1221.5	No fire or explosion. No rupture or leakage. No venting.	
BL5000C21704S4PFS #347	16.173	16.172	1226.8	1226.7	No fire or explosion. No rupture or leakage. No venting.	
Supplementary information: - No fire or explosion - No rupture - No leakage - No venting - Others (please explain)						

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.9	TABLE: Forced internal short circuit (cells)				N/A
Sample No.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location [1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit 45 °C					
Samples charged at charging temperature lower limit 0°C					
Supplementary information:					

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 an internal resistance less than or equal to 3 Ω, see test result on corresponding tables according to Clause 6 and Table 1.				

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard[2)]**	**Mark(s) of conformity[1)]**
Cell	LISHEN	LR2170SD, 03BCEA5	Ratings: 3,6 Vdc, Rated capacity: 4900 mAh, nominal capacity: 5000 mAh	IEC 62133-2:2017/AMD1:2021	BE-44800
Alternative Cell	LISHEN	LR2170SZ	Rated Voltage: 3,6 V Rated Capacity: 4900 mAh Nominal Capacity: 5000 mAh	IEC 62133-2:2017/AMD1:2021	NL-100631
Connector (Optional)	Molex L L C	39-01-2040	Min.V-2	IEC 62133-2:2017/AMD1:2021	Tested with battery
Alternative Connector (Optional)	Molex L L C	39-01-2060	Min.V-2	IEC 62133-2:2017/AMD1:2021	Tested with battery
Alternative Connector (Optional)	Interchangeable	Interchangeable	Min.V-2	IEC 62133-2:2017/AMD1:2021	Tested with battery
Alternative Connector (Optional)	Molex L L C	39-01-2080	Min.V-2	IEC 62133-2:2017/AMD1:2021	Tested with battery
Plastic housing (Optional)	SABIC INNOVATIVE PLASTICS B V	945（GG ）	Min. V-0, Min. 120°C, Min. 2.0mm thickness	UL 764	UL E45329
Alternative Plastic housing (Optional)	SABIC JAPAN L L C	945（GG）	Min. V-0, Min. 120°C, Min. 2.0mm thickness	UL 764	UL E207780
Alternative Plastic housing (Optional)	SABIC INNOVATIVE PLASTICS B V	C2950	Min. V-0, Min. 75°C Min. 2.0mm thickness	UL 764	UL E45329
Alternative Plastic housing (Optional)	SABIC JAPAN L L C	C2950	Min. V-0, Min. 75°C Min. 2.0mm thickness	UL 764	UL E207780
Internal Wire	Interchangeable	Interchangeable	Min. 24AWG, Min.300V, Min.80°C	UL 758	UL approved

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

positve tip cap	Suzhou Industrial Park ZTNY New Energy Technology Co.,Ltd.	Positive Button/tip	diameter 4.8mm，height 2.25mm，	IEC 62133-2：2017/AMD1:2021	Tested with battery
PCB1					
PCB	SHUANG MING INDUSTRY CO LTD	T005V0	V-0, 130 ºC	UL 796	UL E78017
Alternative PCB	Interchange able	Interchange able	V-0, 130 ºC	UL 796	UL approved
F1	WAYON	S20059F-LP600F	6A/20V	IEC 62133-2:2017/AMD1:2021	Tested with battery
IC (U1)	TEXAS INSTRUMENTS	BQ27742-G1	V_{VPWR}：-0.3~20V T_A：-40~85℃	IEC 62133-2:2017/AMD1:2021	Tested with battery
MOSFET Q1Q3	VBsemi	VBC6N2014	VDS：20V VGS：±12V TJ：-55~150℃ ID：0~6.2A（25℃）	IEC 62133-2:2017/AMD1:2021	Tested with battery
PCB2					
PCB	Shenzhen Jia Li Chuang Technology Developmen t Co LTD	JLC-2	V-0, 130 ºC	UL 796	UL E479892
Alternative PCB	Interchange able	Interchange able	V-0, 130 ºC	UL 796	UL approved
IC (U1)	Sino Wealth	SH366002	Vcc：1.7~2V VBAT：2.5~5.5V	IEC 62133-2:2017/AMD1:2021	Tested with battery
IC (U2)	HYCON	HY2113-FB2B	VDD-VSS：1.5~8V VDD-VCS：1.5~20V	IEC 62133-2:2017/AMD1:2021	Tested with battery
IC (U3)	HYCON	HY2115-OB9D	VDSOP1：1.5~8V VDSOP2：1.5~20V	IEC 62133-2:2017/AMD1:2021	Tested with battery

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

MOSFET Q1,Q2，Q3，Q4	VBsemi	VBC6N2014	VDS：20V VGS：±12V TJ：-55~150℃ ID：0~6.2A（25℃）	IEC 62133-2:2017/AMD1:2021	Tested with battery
PCB3					
PCB	GUANGDE BOYA XINXING ELECTRONICTECHNOLOGY CO LTD	BY-1	V-0, 130 ℃	UL 796	UL E475783
Alternative PCB	Interchange able	Interchange able	V-0, 130 ℃	UL 796	UL approved
IC (U1)	TEXAS INSTRUMENTS	BQ40Z50-R2	Vcc：2.2~26V Topr：-40~85℃	IEC 62133-2:2017/AMD1:2021	Tested with battery
IC (U2)	TEXAS INSTRUMENTS	BQ294702	Vcc：2.2~26V Topr：-40~85℃	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1（1S4P)	WAYON	WPF12A1J	12A/3.0V-4 .5V	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1 (2S(1-4)P)	Dexerials	SFJ-0812U	12A/4.0V-9 .0V	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1 (3S(1-4)P)	Dexerials	SFJ-1212U	12A/7.4V-1 3.8V	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1 (4S(1-4)P)	Dexerials	SFJ-1412U	12A/10.5V-19.6V	IEC 62133-2:2017/AMD1:2021	Tested with battery
MOSFET Q2,Q3，Q6，Q7 (1S4P&(2-4)S（2-4）P)	NCEPOWER	NCEP3065QU	65A 30V 2mΩ	IEC 62133-2：2017/AMD1:2021	Tested with battery
MOSFET Q2,Q3，((2-4)S1P)	NCEPOWER	NCEP3065QU	65A 30V 2mΩ	IEC 62133-2：2017/AMD1:2021	Tested with battery

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

MOSFET Q5	vishay	SI1416EDH-T1-GE3	3.9A 30V 58mΩ	IEC 62133-2：2017/AMD1:2021	Tested with battery
MOSFET Q4	KEC	2N7002A	115mA/60V	IEC 62133-2：2017/AMD1:2021	Tested with battery
PCB4					
PCB	Shenzhen Jia Li Chuang Technology Developmen t Co LTD	JLC-2	V-0, 130 °C	UL 796	UL E479892
Alternative PCB	Interchange able	Interchange able	V-0, 130 °C	UL 796	UL approved
IC (U1)	SinoWealth	SH367202I/008IY-ACA00	VDD：2.5~30V ICC:7μA	IEC 62133-2:2017/AMD1:2021	Tested with battery
IC (U2)	SinoWealth	SH366006	VDD:-0.3~7V VBAT：5~25V	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1 (2S(1-4)P)	Dexerials	SFJ-0812U	12A/4.0V-9 .0V	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1 (3S(1-4)P)	Dexerials	SFJ-1212U	12A/7.4V-1 3.8V	IEC 62133-2:2017/AMD1:2021	Tested with battery
F1 (4S(1-4)P)	Dexerials	SFJ-1412U	12A/10.5V-19.6V	IEC 62133-2:2017/AMD1:2021	Tested with battery
MOSFET Q2,Q3，Q5 ,Q6 ((2-4)S（2-4）P)	NCEPOWER	NCEP3065QU	65A 30V 2mΩ	IEC 62133-2：2017/AMD1:2021	Tested with battery
MOSFET Q2,Q3，((2-4)S1P)	NCEPOWER	NCEP3065QU	65A 30V 2mΩ	IEC 62133-2：2017/AMD1:2021	Tested with battery

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

MOSFET Q4	vishay	SI1416EDH-T1-GE3	3.9A 30V 58mΩ	IEC 62133-2：2017/AMD1:2021	Tested with battery
MOSFET Q1	KEC	2N7002A	115mA/60V	IEC 62133-2：2017/AMD1:2021	Tested with battery

Supplementary information:

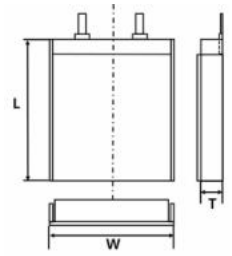
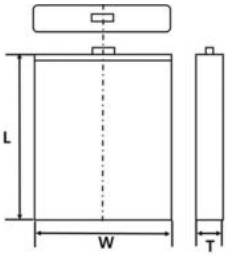
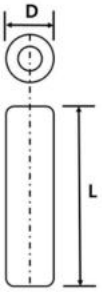
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.

2) License available upon request.

Attachment I: (Republic of Korea) NATIONAL DIFFERENCES

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT **IEC 62133-2** **(REPUBLIC OF KOREA) NATIONAL DIFFERENCES** (SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES - SAFETY REQUIREMENTS FOR PORTABLE SEALED SECONDARY LITHIUM CELLS, AND FOR BATTERIES MADE FROM THEM, FOR USE IN PORTABLE APPLICATIONS - PART 2: LITHIUM SYSTEMS)			
Differences according to.....: National standard KC62133-2(2020-07)			
TRF template used: .....: IECEE OD-2020-F3:2022, Ed. 1.2			
Attachment Form No.....: KR_ND_IEC62133_2C **Attachment Originator .....**: KTR **Master Attachment**.....: 2023-08-02			
Copyright © 2022 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			
	National Differences		P
7.3.6	**Over-charging of battery**		P
(Revision)	***[Add the bolded text]*** b) Test The test shall be carried out in an ambient temperature of 20 °C ± 5 °C. Each test battery shall be discharged at a constant current of 0,2 It A, to a final discharge voltage specified by the manufacturer. Sample batteries shall then be charged at a constant current of 2,0 It A, using a 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 • 1,2 times the upper limit charging voltage presented in Table A.1 per cell for series connected multi-cell batteries, and • sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached. **• In case the charging voltage specified by the manufacturer is higher than the overcharge test voltage, the maximum charging voltage specified by manufacturer should be applied with 2.0 ItA,** **(e.g., quick charging power bank, etc.)**		P

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
	[Replace to the following statement] c) Acceptance criteria Filling beyond the manufacturer's specified limits should not result in ignition or explosion		N/A
Annex G	**Definition for shape and materials of outer case for cell**		—
(Addition)	G.1 General Annex G provides definitions for shape and materials of outer case for cell G.2 Shape of outer case for cell G 2.1 Cylindrical cell Cell with a cylindrical shape in which the overall height is equal to or greater than diameter. G 2.2 Prismatic cell Cell having the shape of a parallelepiped whose faces are rectangular G.3 Materials of outer case for cell G.3.1 Soft case Non-metallic outer case or container for cell G.3.2 Hard case Metallic outer case or container for cell.	(Shape of outer cases) ☒ Cylindrical ☐ Prismatic (Materials of outer cases) ☒ Hard ☐ Soft	—
Annex H	**Calculation method of the volumetric energy density for cell**		—
(Addition)	Annex H provide a calculation method of the volumetric energy density for cell in use of smart phone, tablet, notebook. H.1 General Unless otherwise stated in the Annex E, the dimensions for calculation are based on these for cell before shipment and the volumetric energy density shall be calculated with a maximum values specified by manufacturer. If the specification for cell can't be provided a dimension for calculation, the manufacturer's other documentation shall be provided to demonstrate compliance for its calculation.	LR2170SD, 03BCEA5：658.6 Wh/L LR2170SZ：693.684Wh/L	—

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
	H.2 Calculation Method  L : Length (max.) of cell (including terrace) W : Width (max.) of cell T : Thickness (max.) when shipping charge (For reference, Please Exclude the dimension of any tape that Is attached to cell) $Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V) \times Rated\ capacity\ (Ah)}{Length\ (L) \times Width\ (W)\ \times Thickness\ (T)}$ [H.1 – Prismatic cell using soft case]  L : Length (max.) of cell W : Width (max.) of cell T : Thickness when shipping charge (For reference, Please Exclude the dimension of any tape that Is attached to cell) $Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V) \times Rated\ capacity\ (Ah)}{Length\ (L) \times Width\ (W)\ \times Thickness\ (T)}$ [H.2 – Prismatic cell using hard case]  D : Diameter (max.) of cell L : Length (max.) of cell (According to shape of cell at shipping, The dimension of tube for cell may be included In overall dimension of cell) $Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V) \times Rated\ capacity\ (Ah)}{3.14159 \times \frac{Diameter\ (D)^2}{4} \times Length(L)}$ [H.3 – Cylindrical cell using hard case]		

Attachment II: Photos

Photo 1
Overview of battery for 1S1P

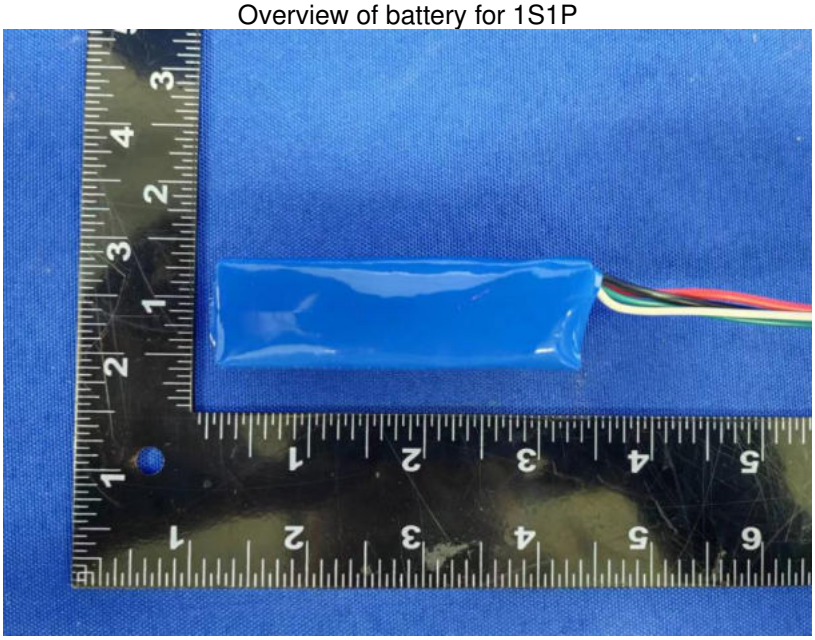


Photo 2
Overview of battery for 1S1P

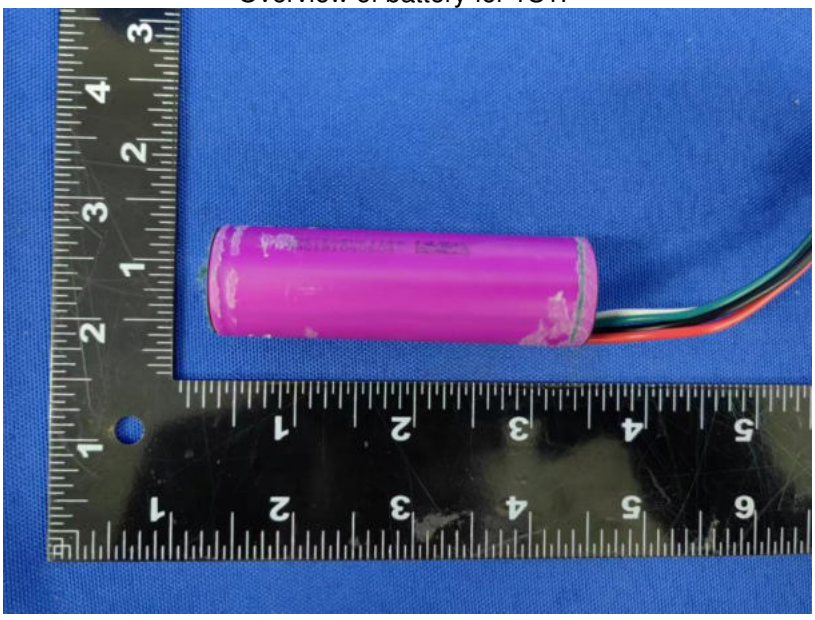


Photo 3
Overview of battery for 1S3P

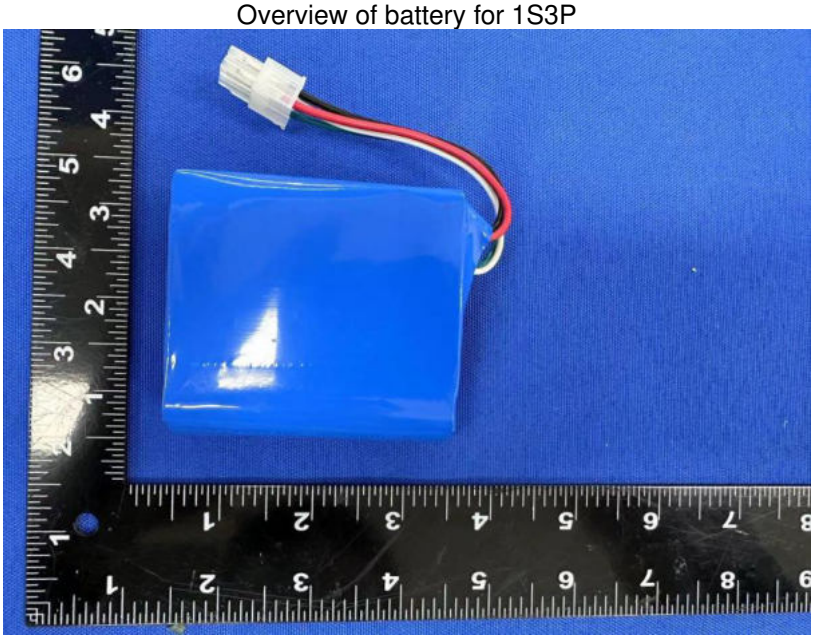


Photo 4
Overview of battery for 1S3P

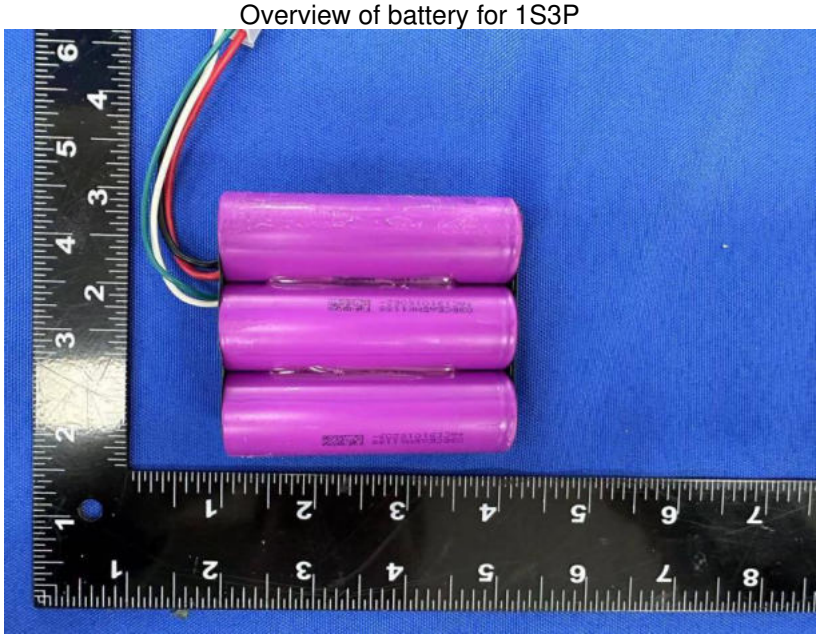


Photo 5
Overview of battery for 1S4P

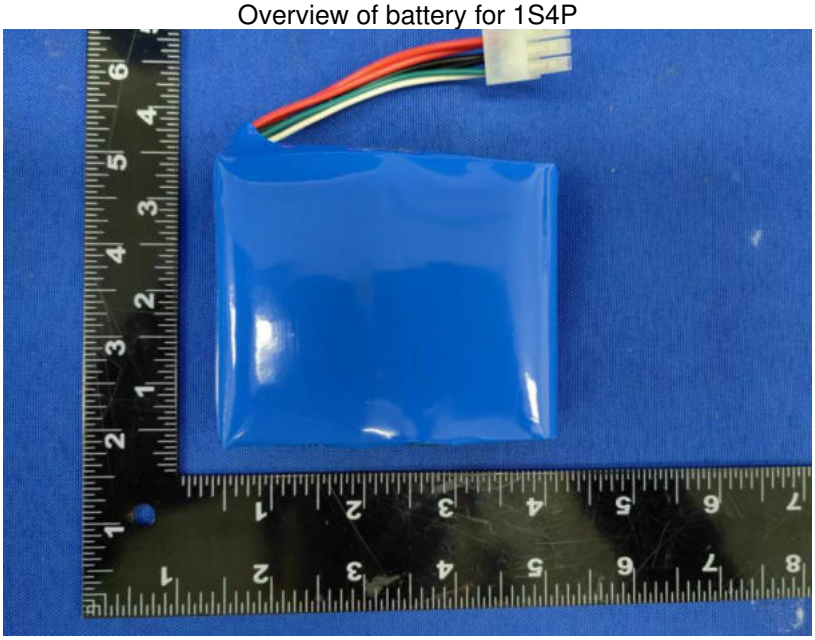


Photo 6
Overview of battery for 1S4P

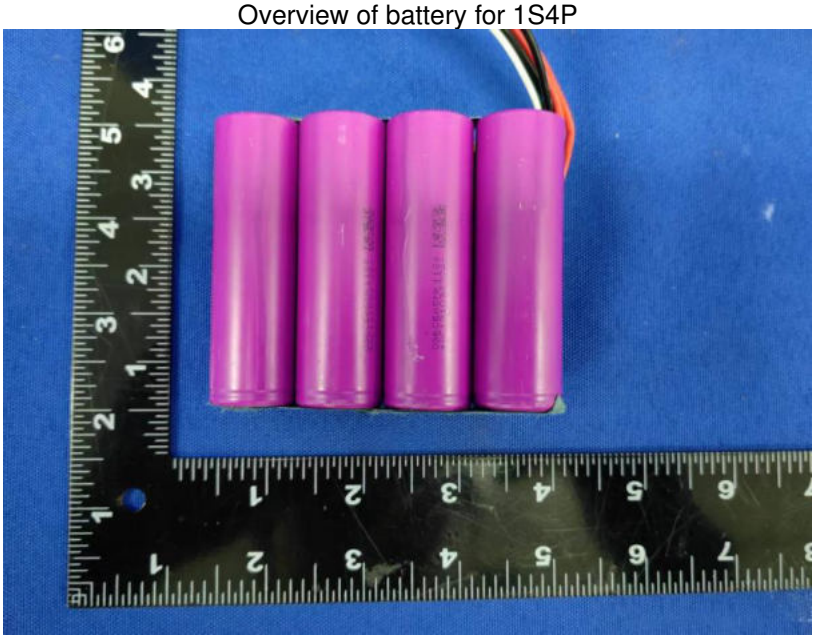


Photo 7

Overview of battery for 2S1P

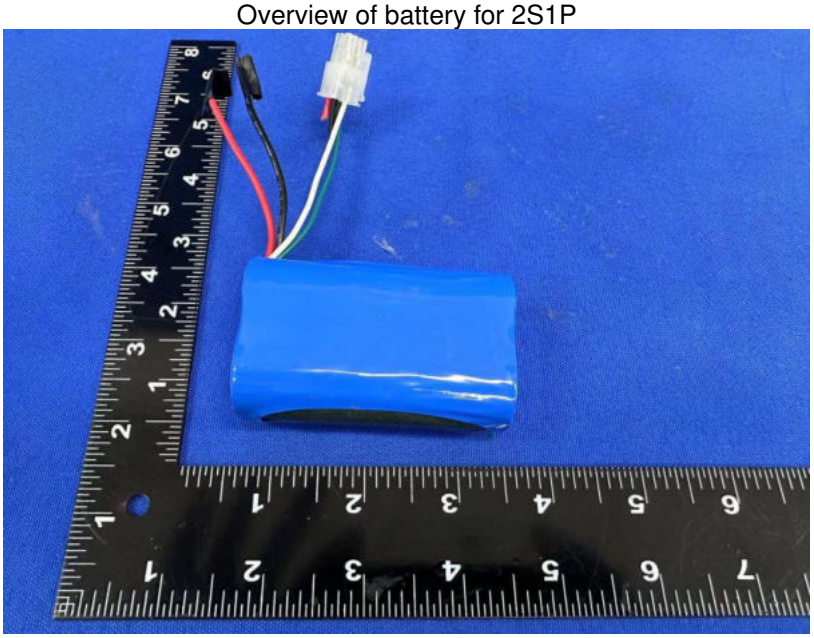


Photo 8

Overview of battery for 2S1P

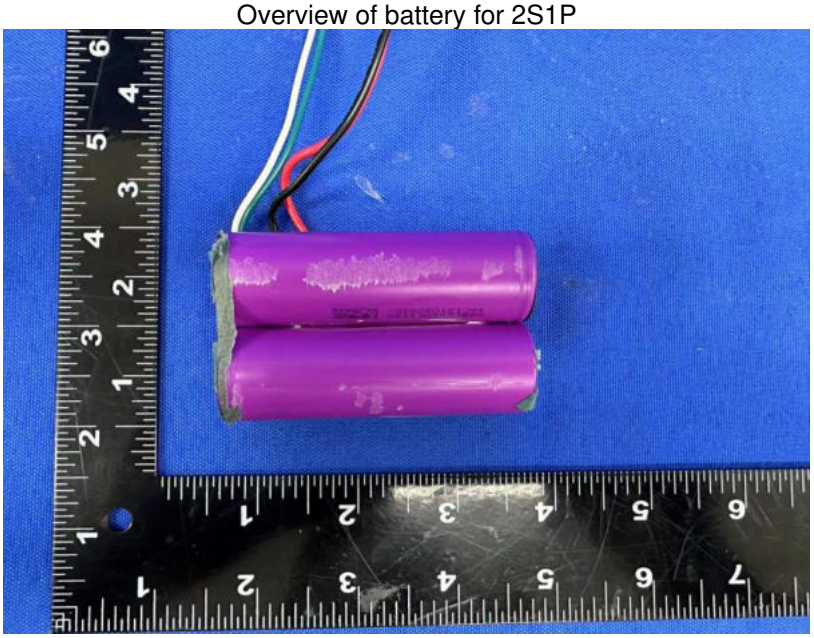


Photo 9

Overview of battery for 2S2P



Photo 10

Overview of battery for 2S2P

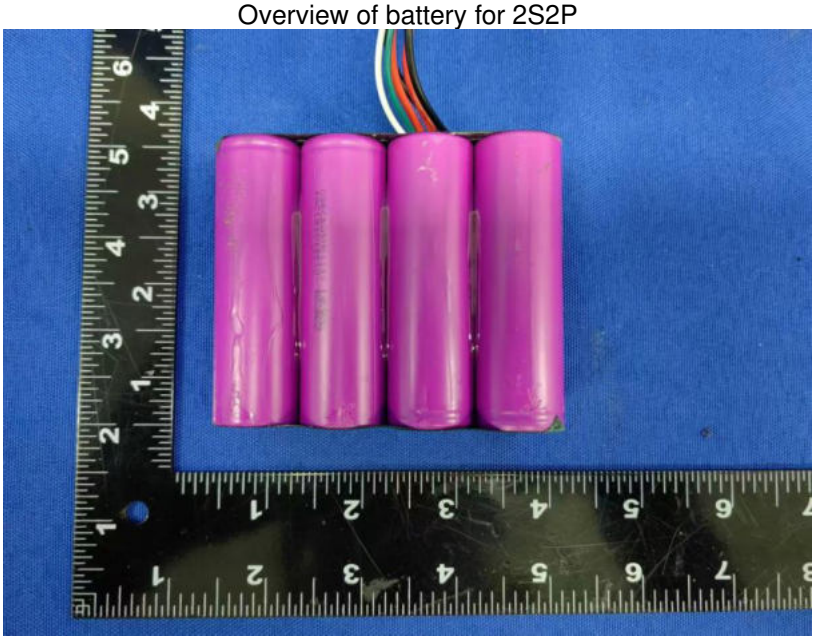


Photo 11
Overview of battery for 2S3P

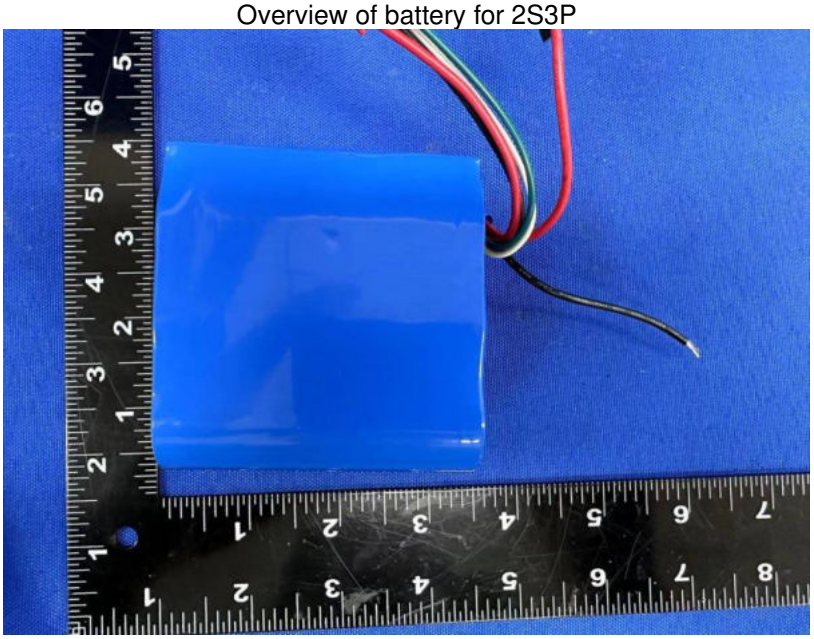


Photo 12
Overview of battery for 2S3P

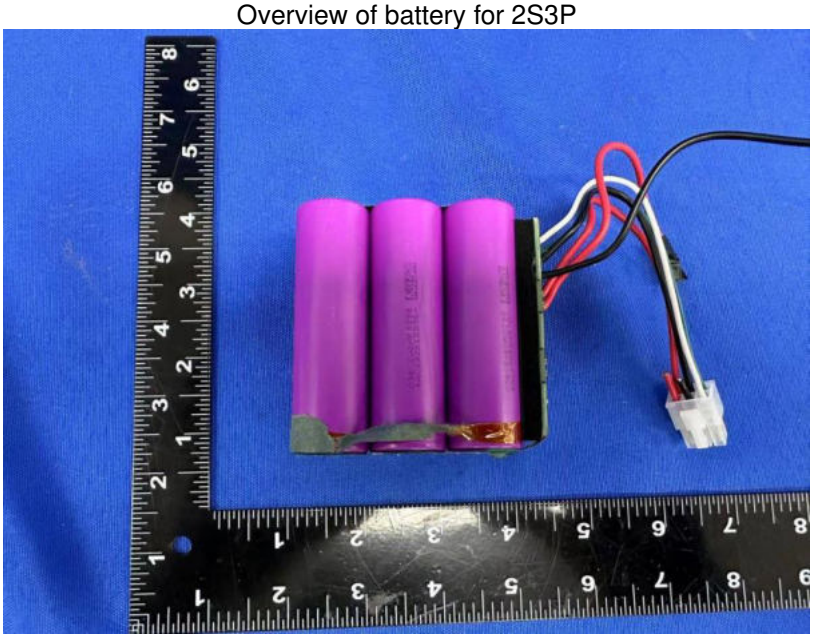


Photo 13
Overview of battery for 2S4P

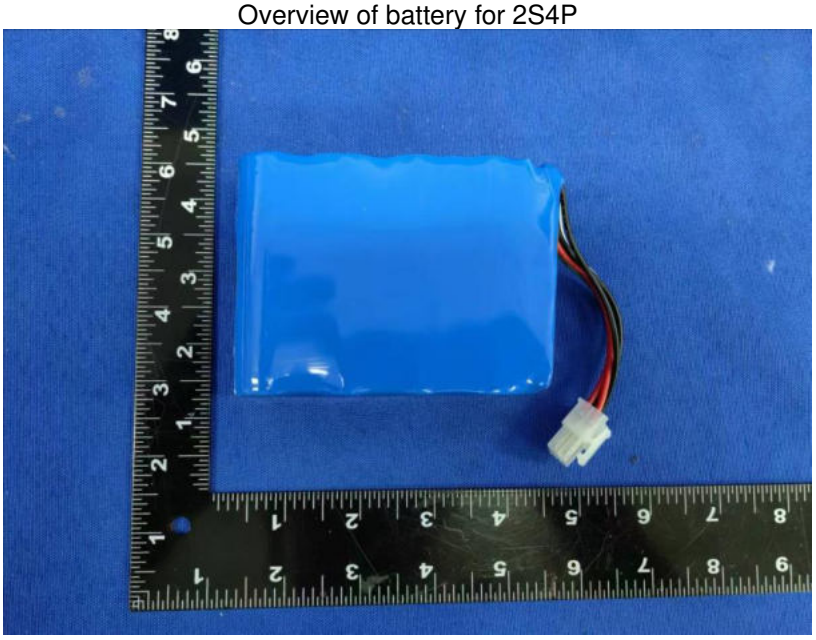


Photo 14
Overview of battery for 2S4P

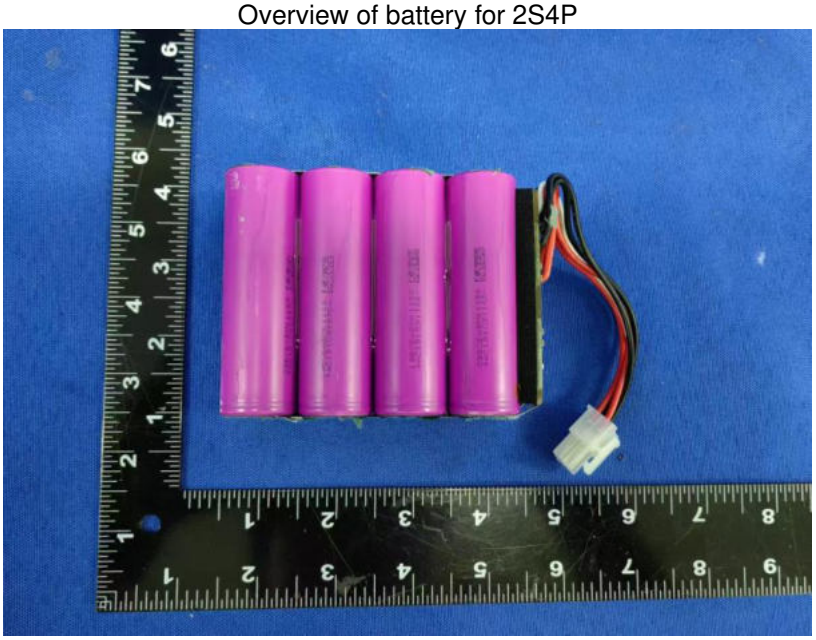


Photo 15
Overview of battery for 3S1P

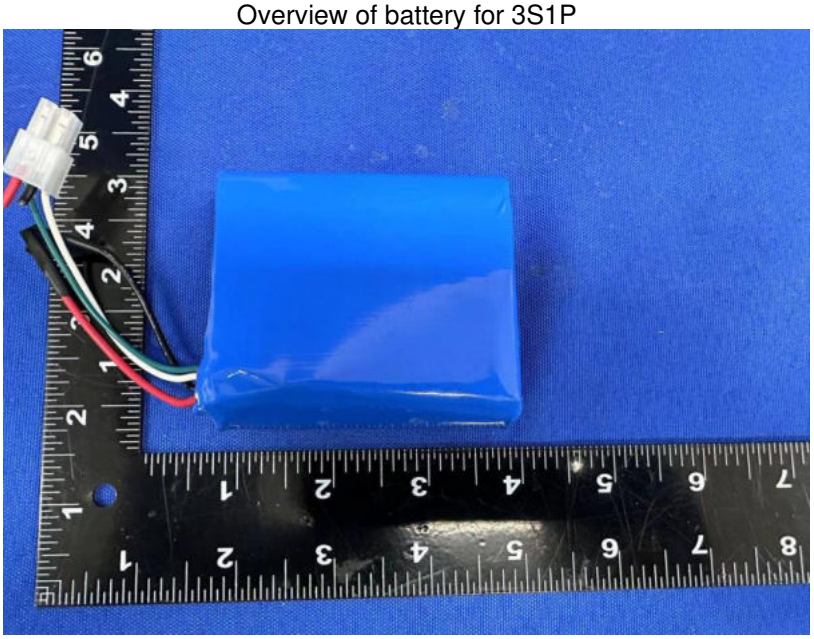


Photo 16
Overview of battery for 3S1P

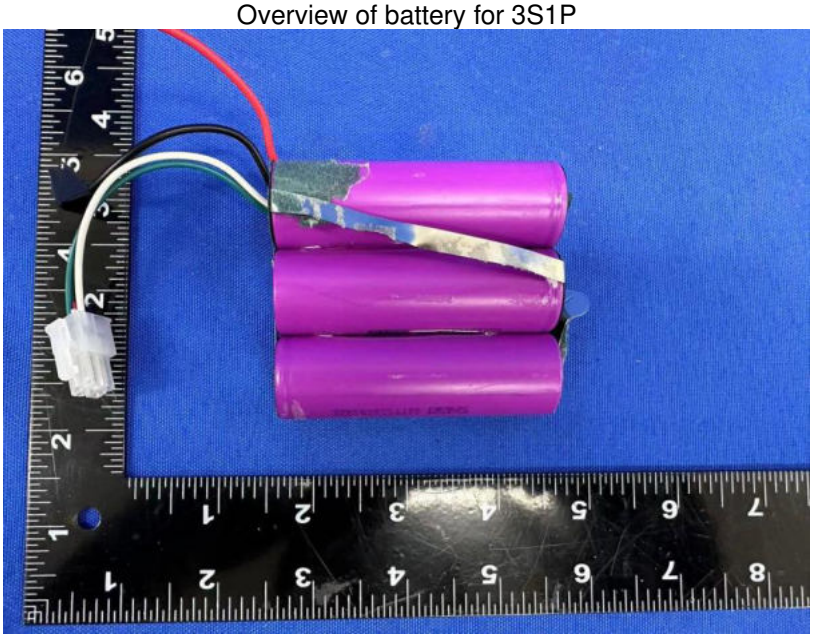


Photo 17
Overview of battery for 3S3P

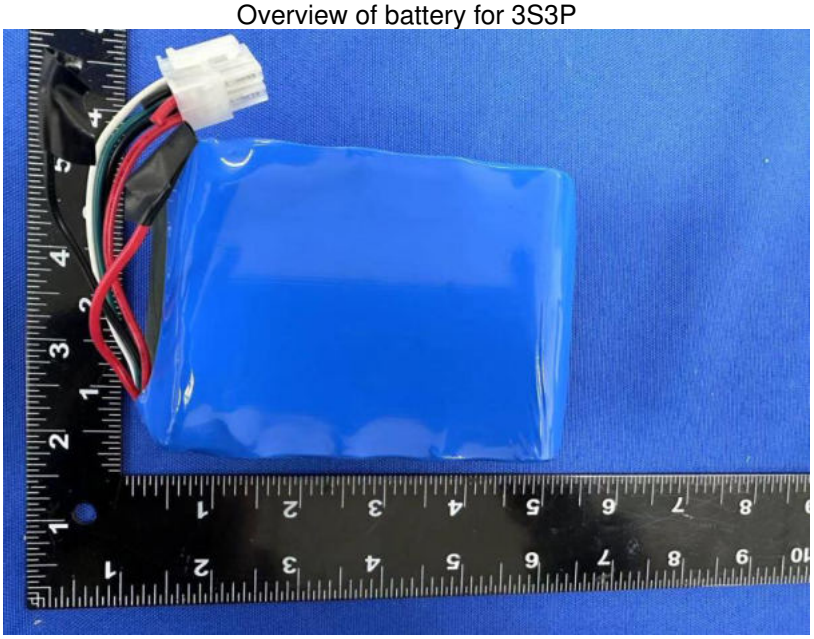


Photo 18
Overview of battery for 3S3P

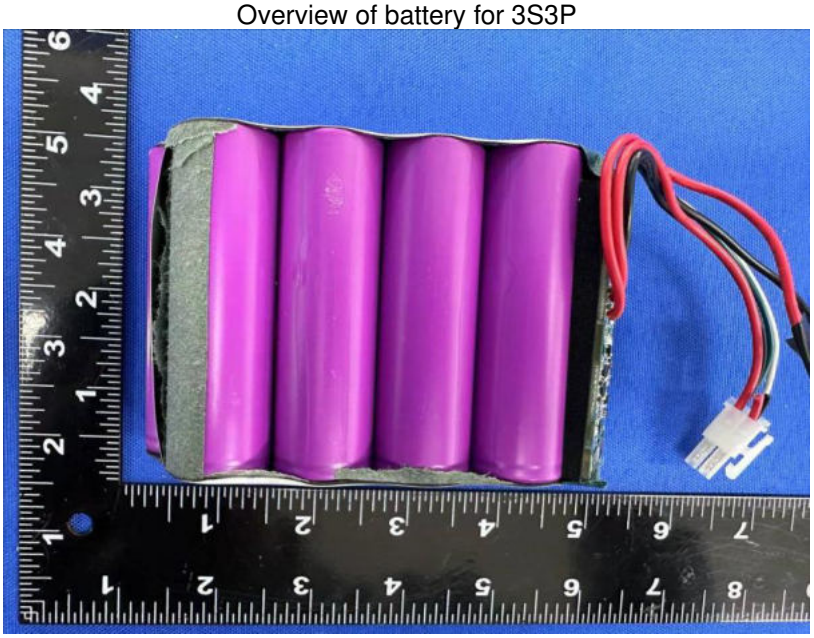


Photo 19
Overview of battery for 3S4P

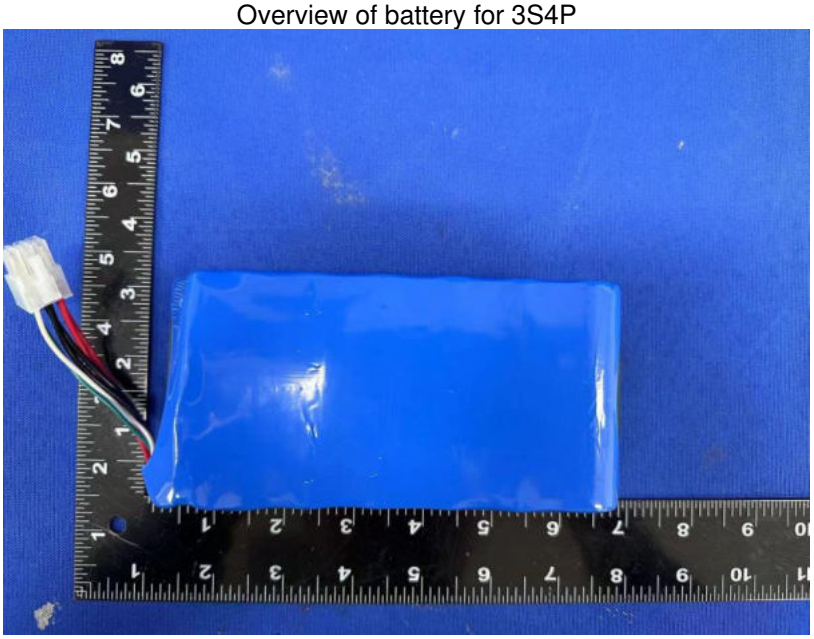


Photo 20
Overview of battery for 3S4P

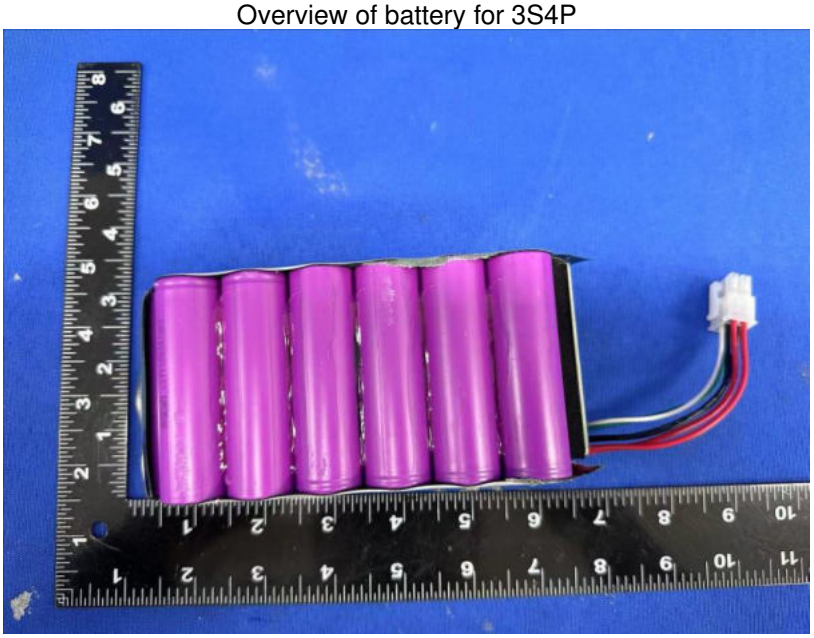


Photo 21

Overview of battery for 4S1P

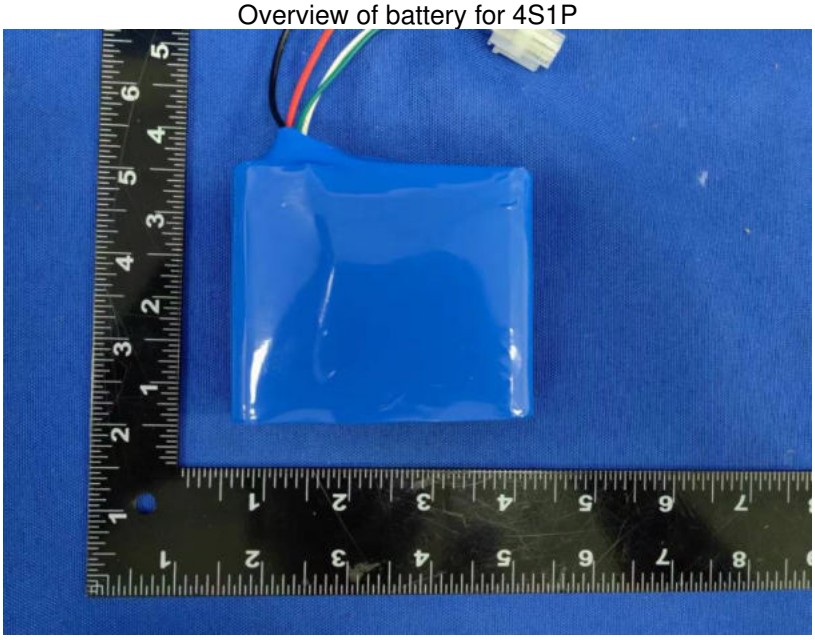


Photo 22

Overview of battery for 4S1P

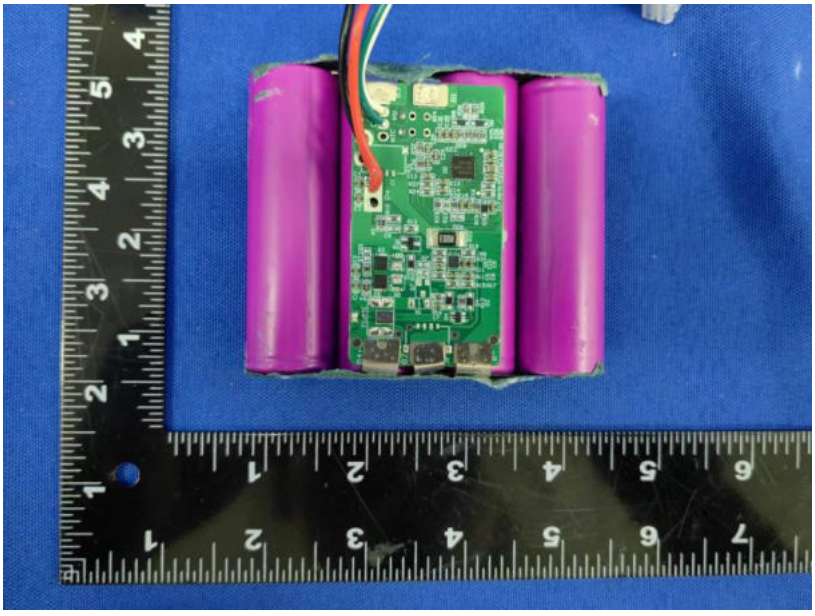


Photo 23

Overview of battery for 4S2P

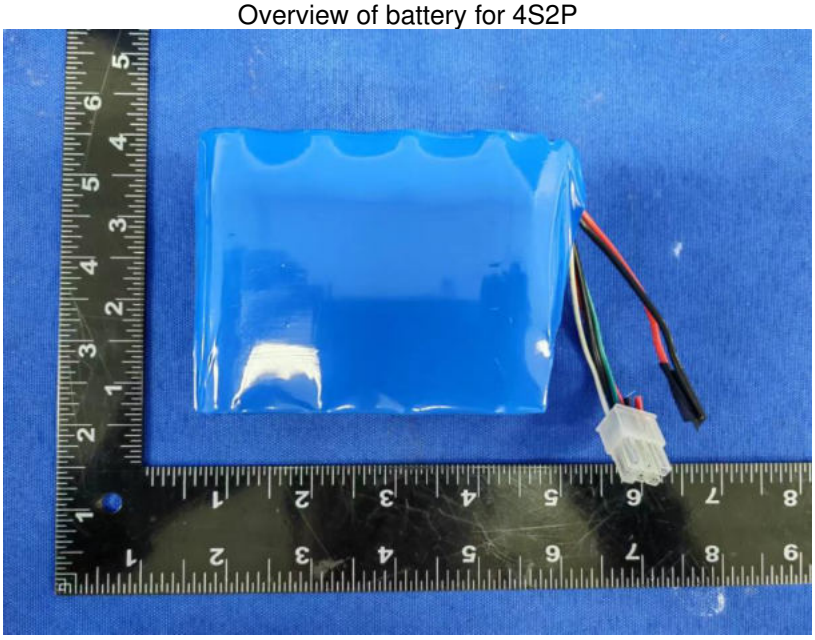


Photo 24

Overview of battery for 4S2P

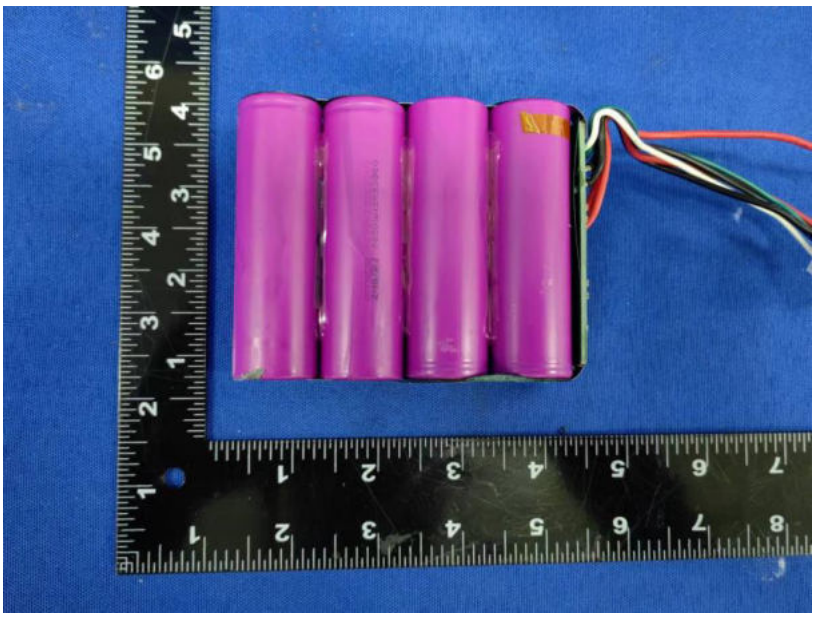


Photo 25

Overview of battery for 4S3P

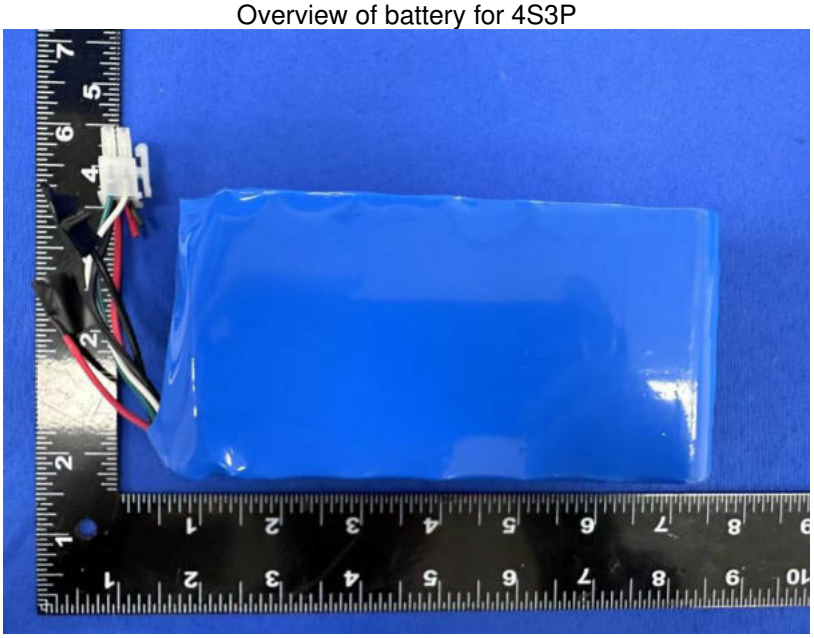


Photo 26

Overview of battery for 4S3P



Photo 27
Overview of battery for 4S4P

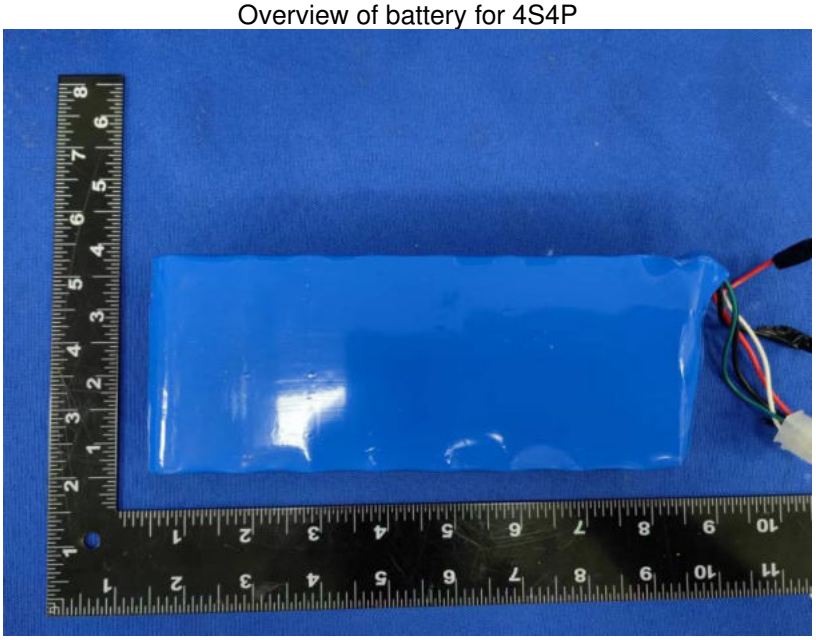


Photo 26
Overview of battery for 4S4P

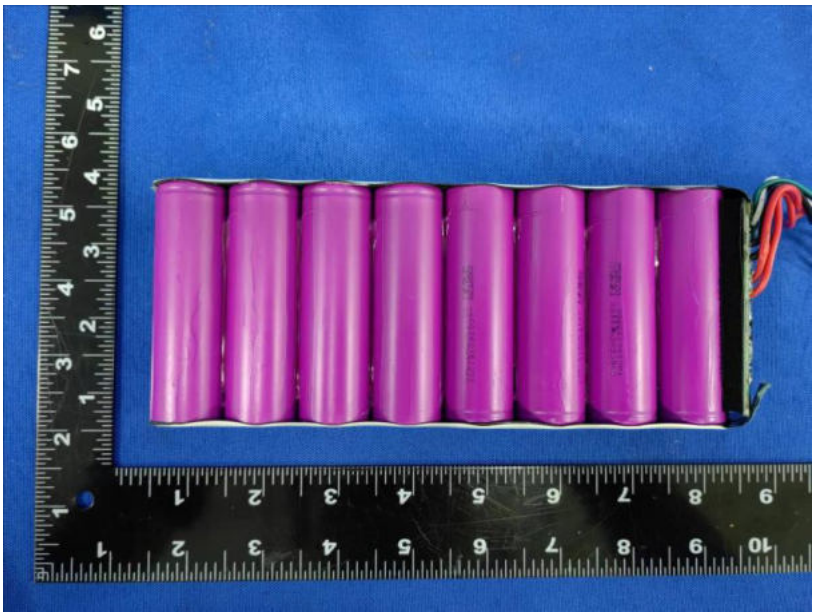


Photo 29
Overview of battery for 1S1P- Shrink wrap plastic with positive button top

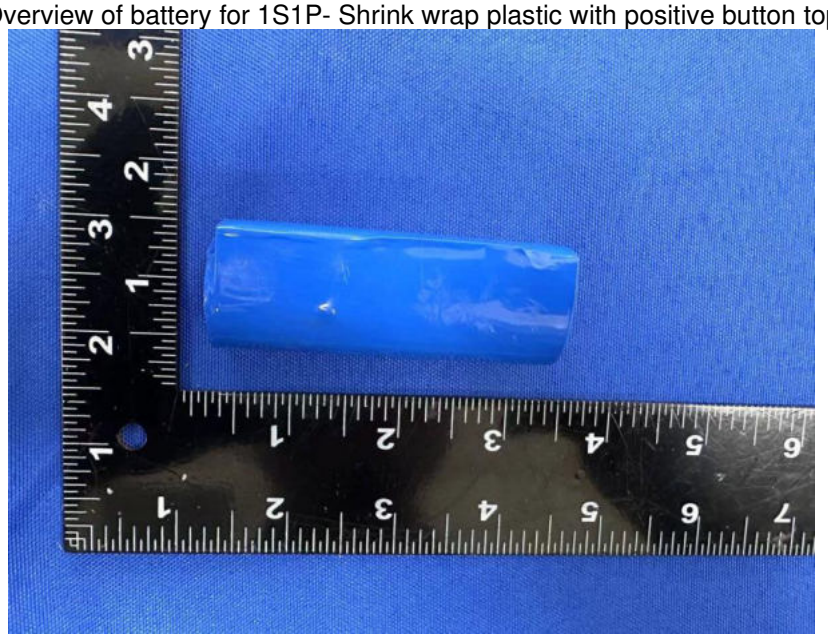


Photo 30
Overview of battery for 1S1P- Shrink wrap plastic with positive button top

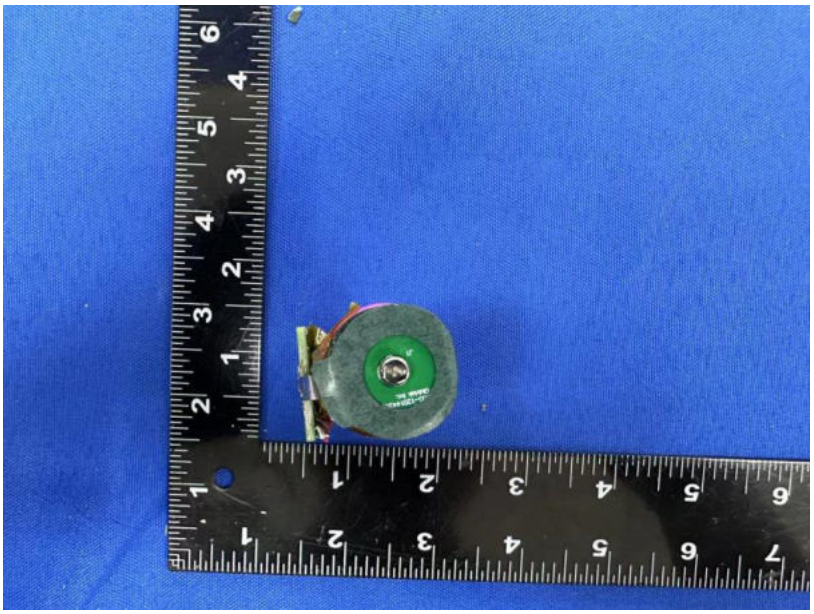


Photo 31
Overview of battery for 1S1P- Battery With Plastic housing



Photo 32
Overview of battery for 1S1P- Battery With Plastic housing

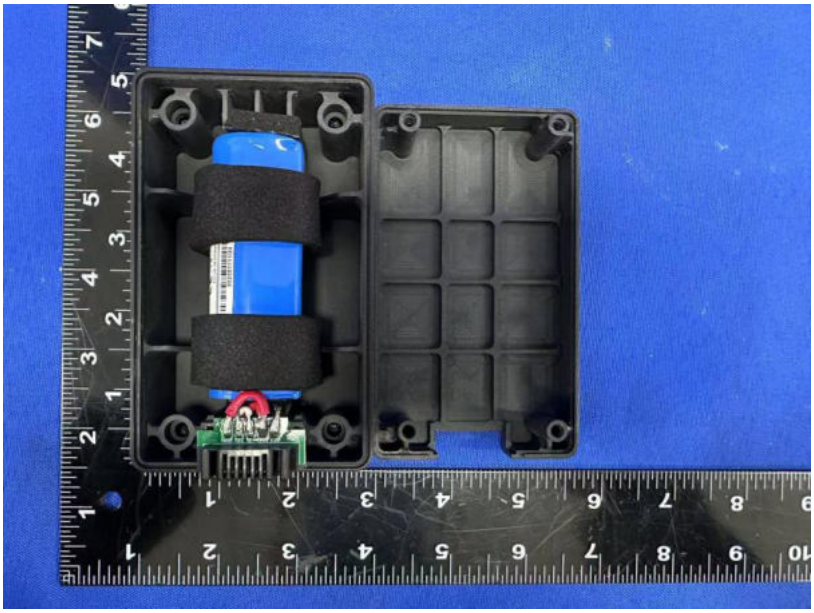


Photo 33
Overview of battery for 1S1P- Battery With Plastic housing

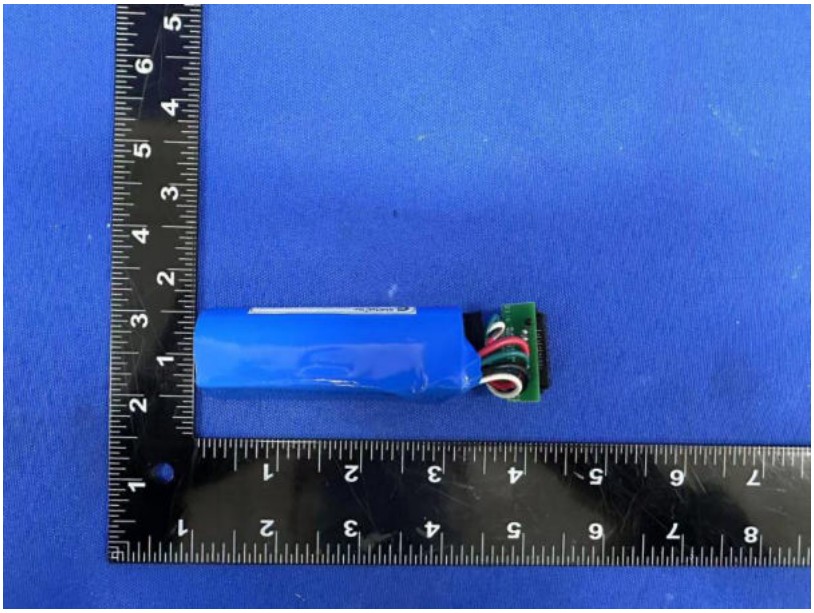


Photo 34
Overview of battery for 1S1P- Battery With Plastic housing

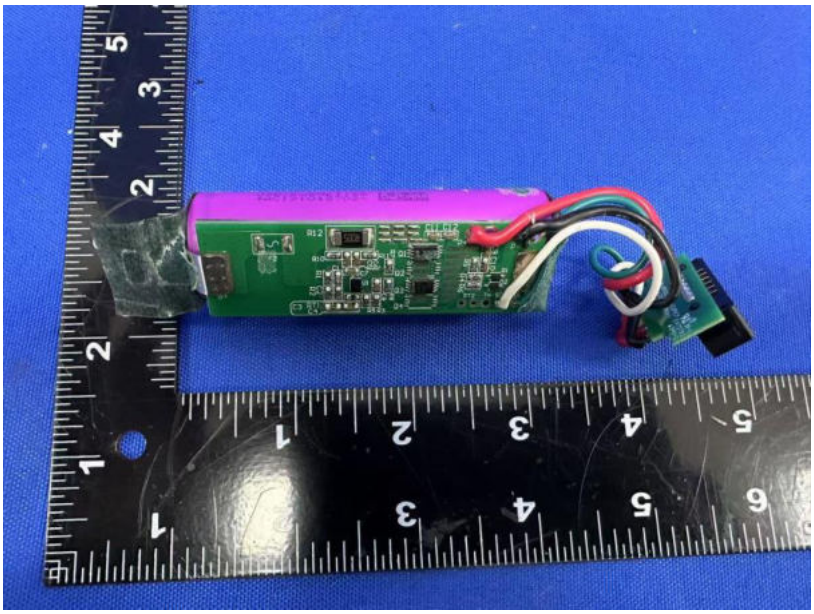


Photo 35
Overview of battery for 1S3P- Battery With Plastic housing



Photo 36
Overview of battery for 1S3P- Battery With Plastic housing

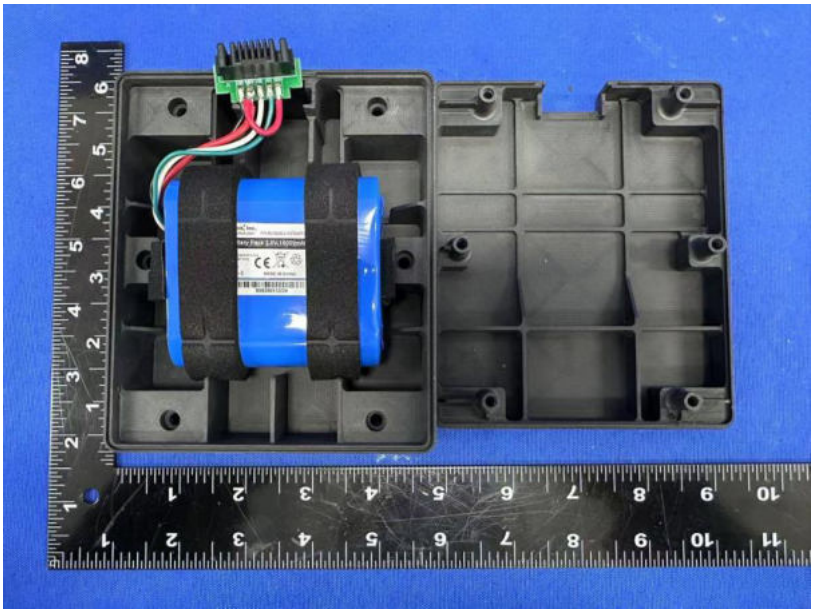


Photo 37
Overview of battery for 1S3P- Battery With Plastic housing

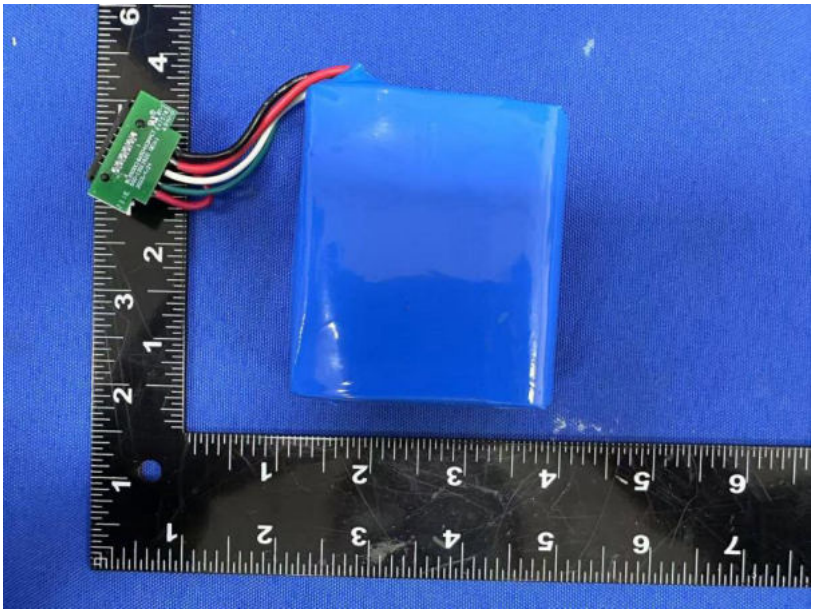


Photo 38
Overview of battery for 1S3P- Battery With Plastic housing

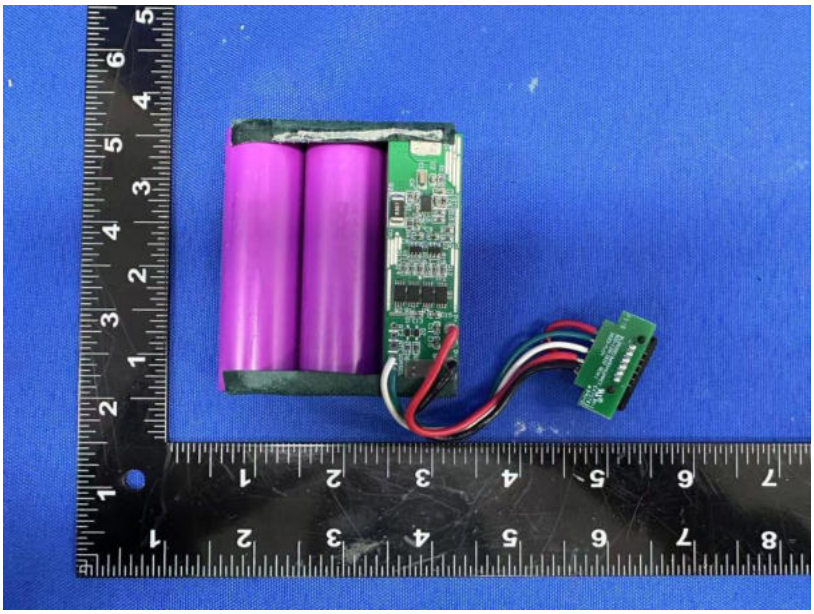


Photo 39
Overview of battery for 1S4P- Battery With Plastic housing



Photo 40
Overview of battery for 1S4P- Battery With Plastic housing

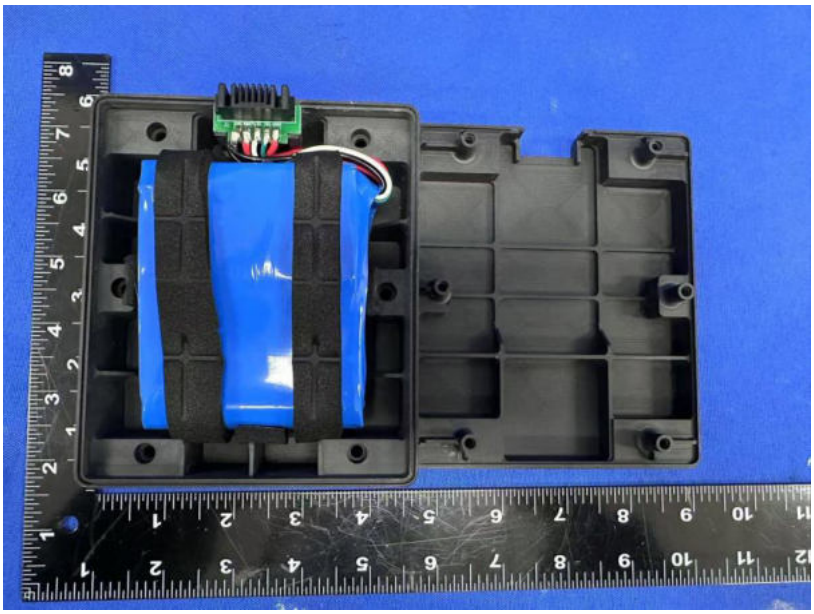


Photo 41
Overview of battery for 1S4P- Battery With Plastic housing

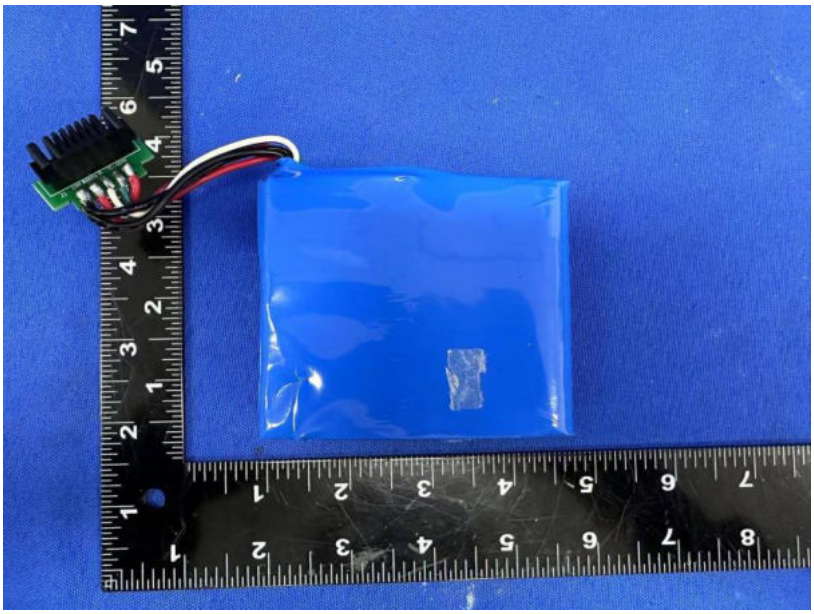


Photo 42
Overview of battery for 1S4P- Battery With Plastic housing

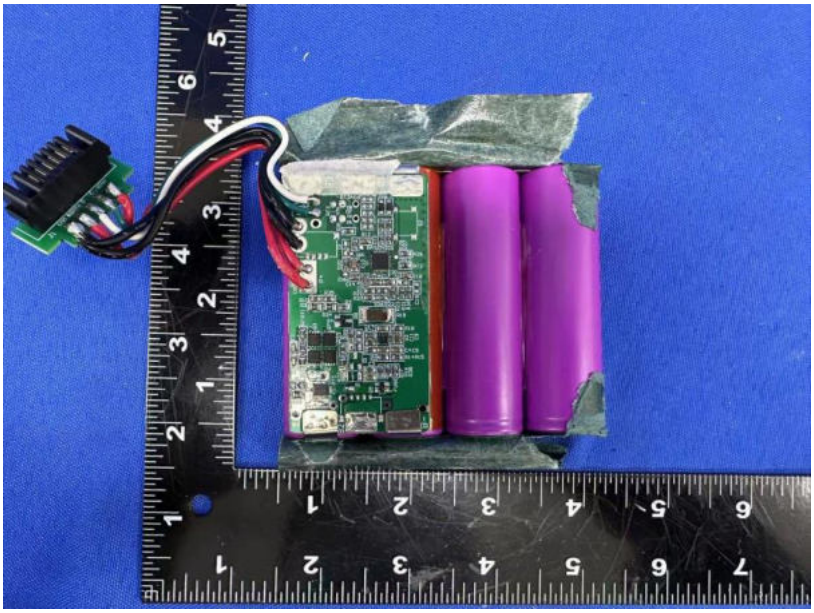


Photo 43

Overview of battery for 2S3P- Battery With Plastic housing



Photo 44

Overview of battery for 2S3P- Battery With Plastic housing

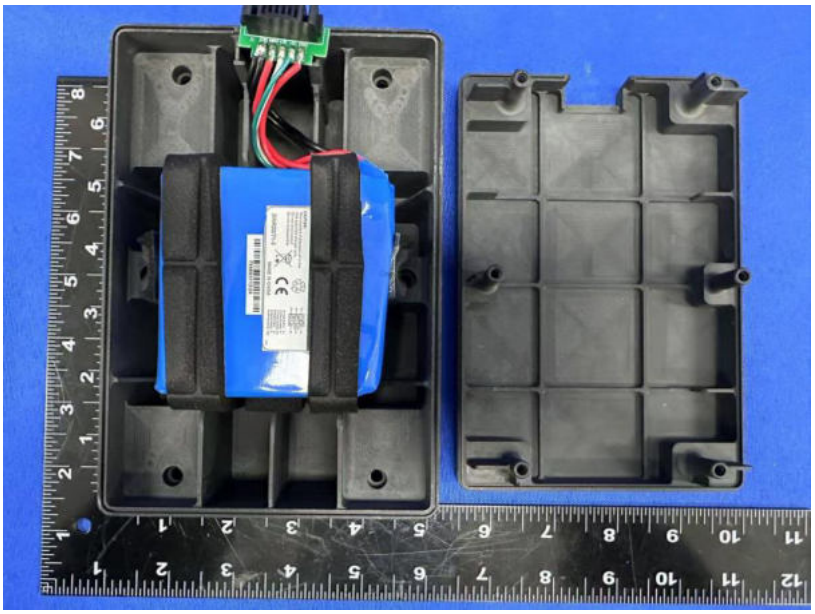


Photo 45
Overview of battery for 2S3P- Battery With Plastic housing

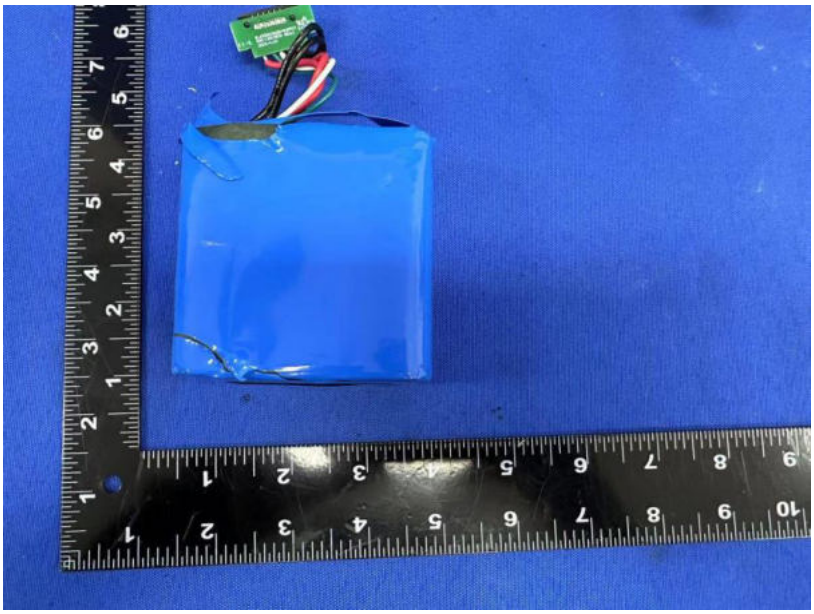


Photo 46
Overview of battery for 2S3P- Battery With Plastic housing

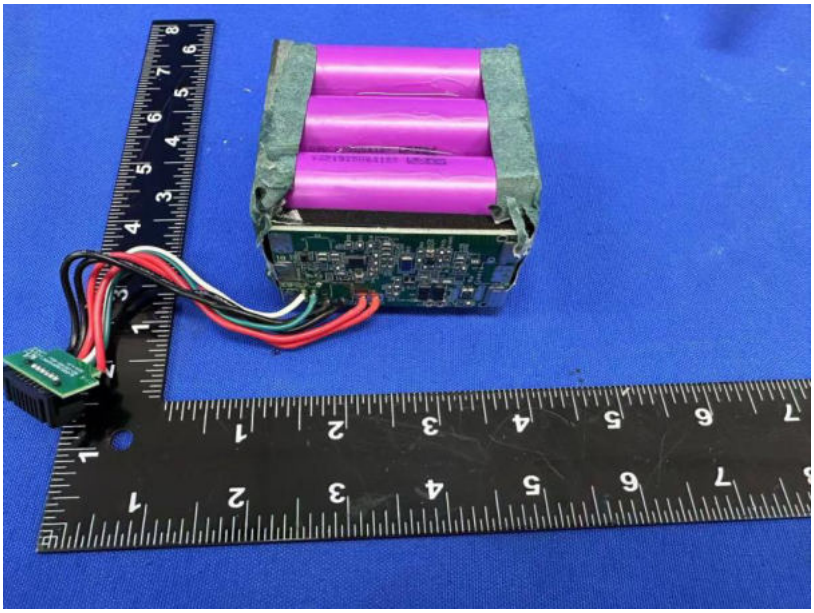


Photo 47
Overview of battery for 3S3P- Battery With Plastic housing



Photo 48
Overview of battery for 3S3P- Battery With Plastic housing

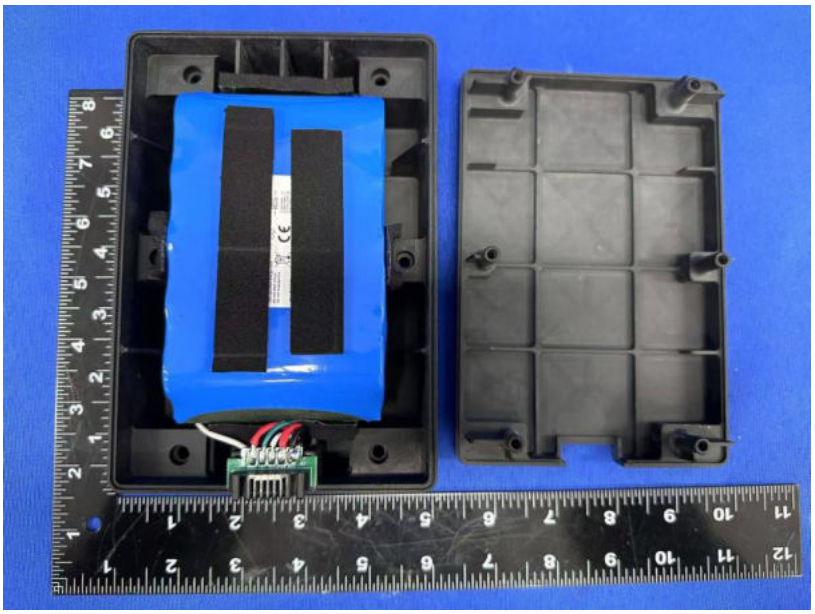


Photo 49
Overview of battery for 3S3P- Battery With Plastic housing

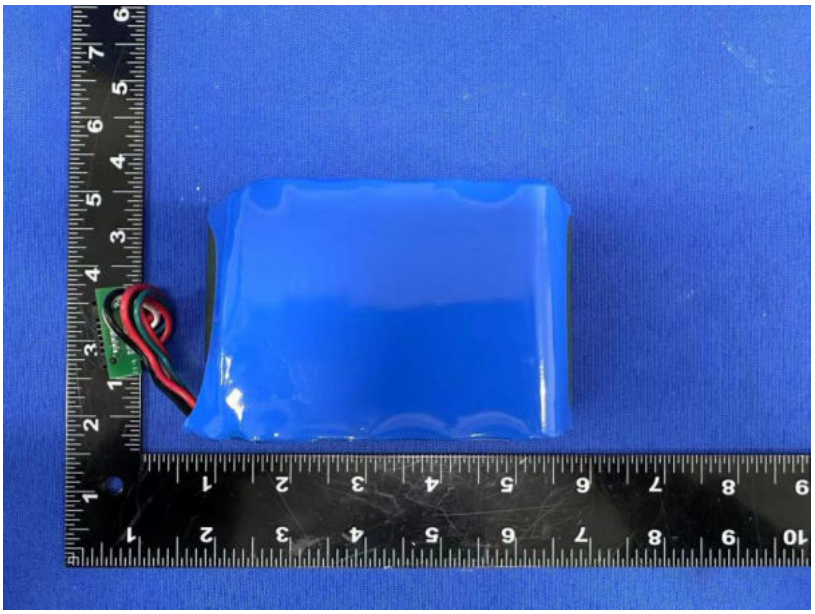


Photo 50
Overview of battery for 3S3P- Battery With Plastic housing

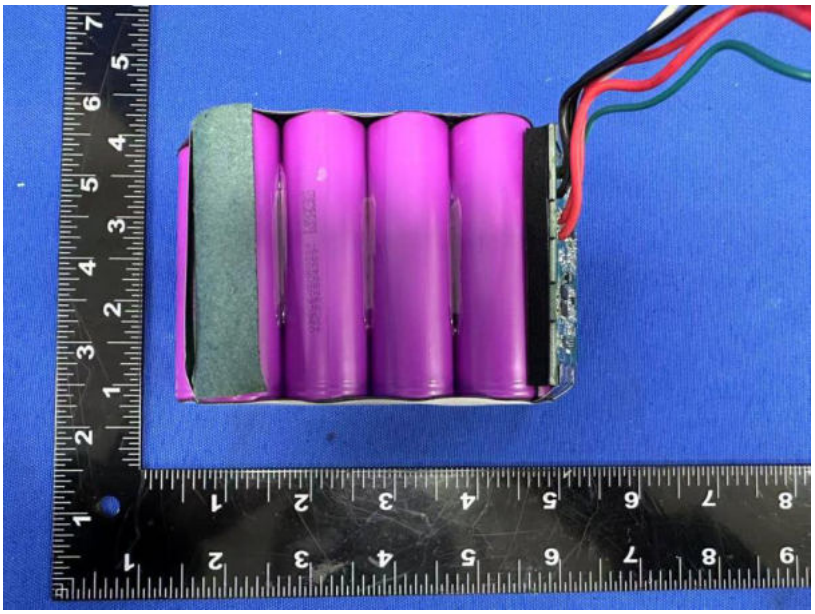


Photo 51
Overview of battery for 4S2P- Battery With Plastic housing



Photo 52
Overview of battery for 4S2P- Battery With Plastic housing

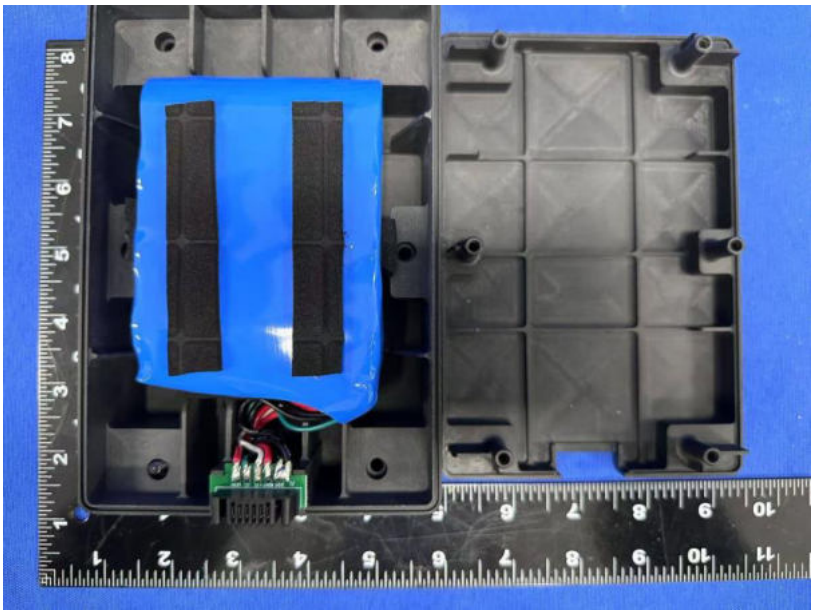


Photo 53
Overview of battery for 4S2P- Battery With Plastic housing

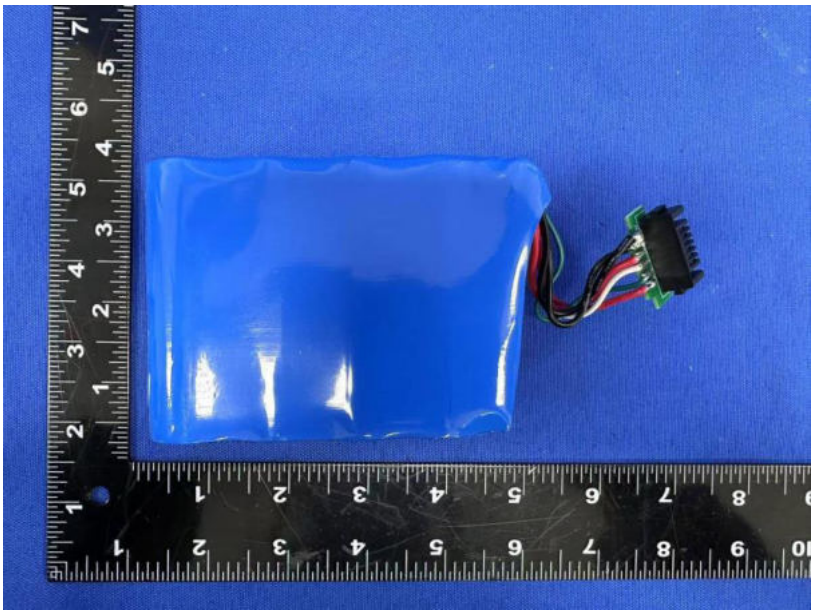


Photo 54
Overview of battery for 4S2P- Battery With Plastic housing

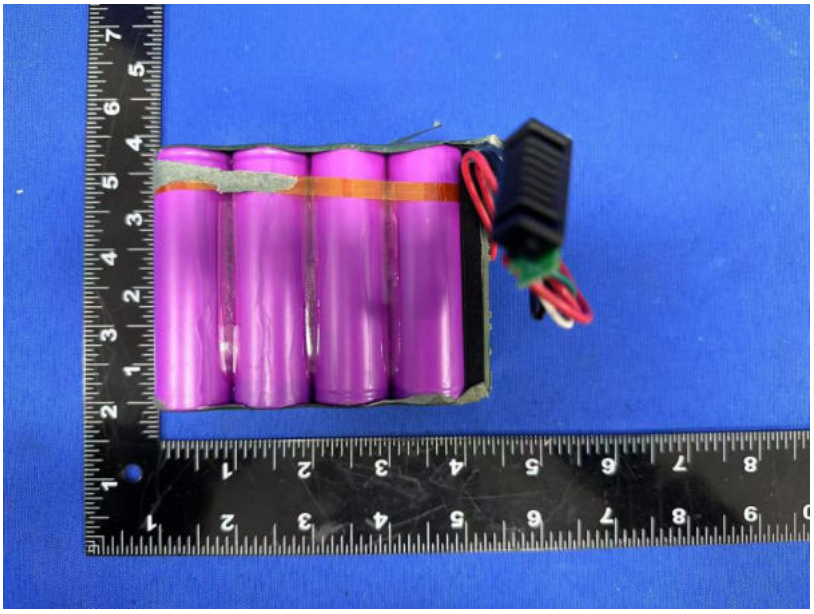


Photo 55
Overview of battery for 4S3P- Battery With Plastic housing

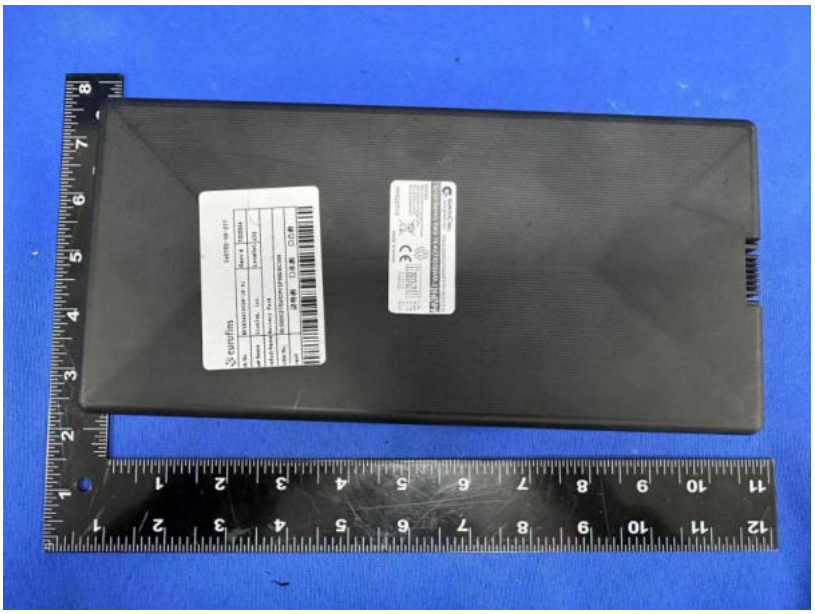


Photo 56
Overview of battery for 4S3P- Battery With Plastic housing

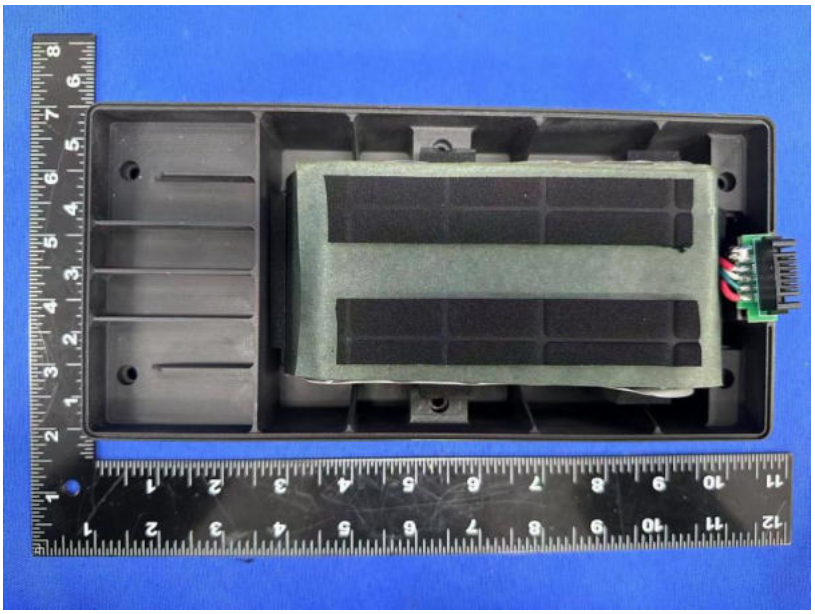


Photo 57
Overview of battery for 4S3P- Battery With Plastic housing

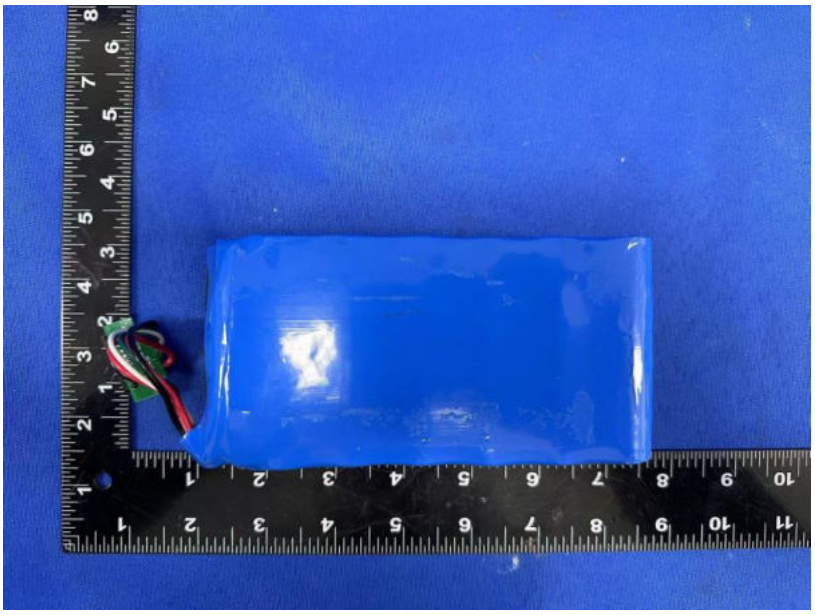


Photo 58
Overview of battery for 4S3P- Battery With Plastic housing

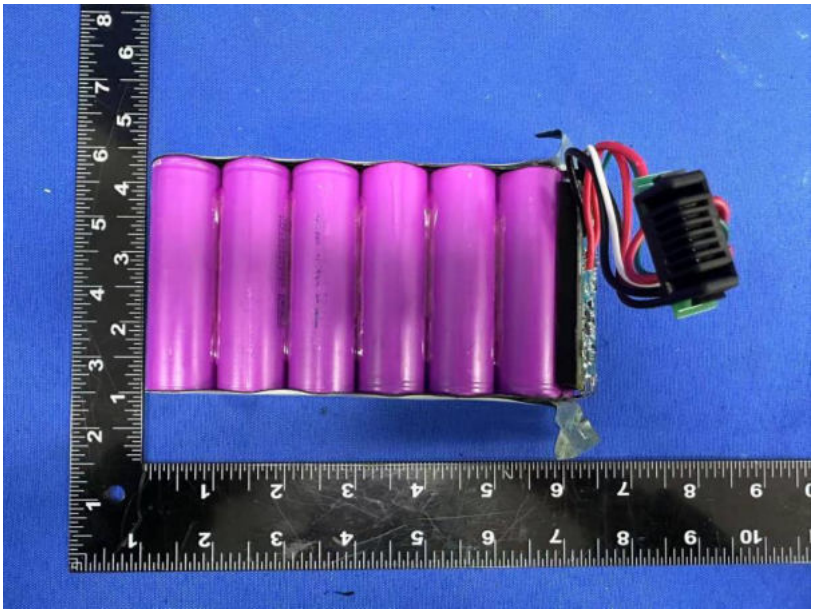


Photo 59
Overview of battery for 4S4P- Battery With Plastic housing

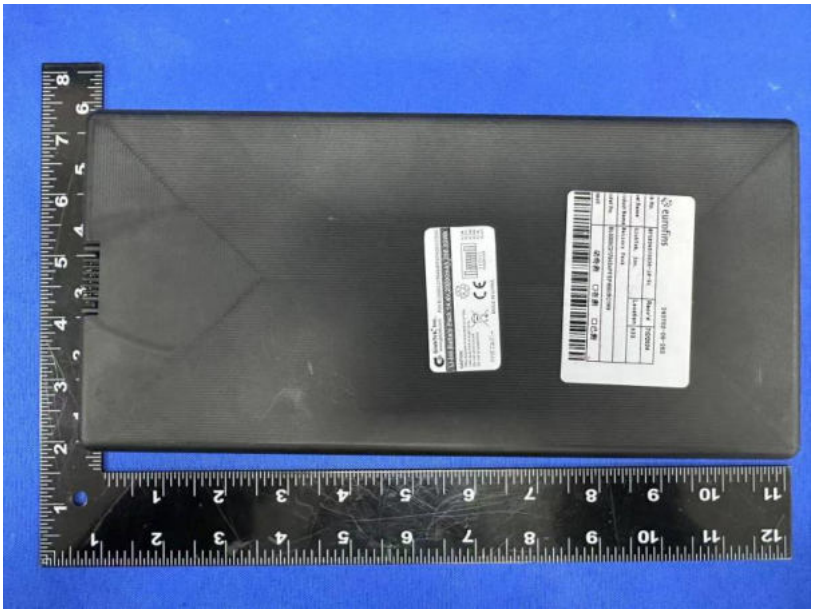


Photo 60
Overview of battery for 4S4P- Battery With Plastic housing

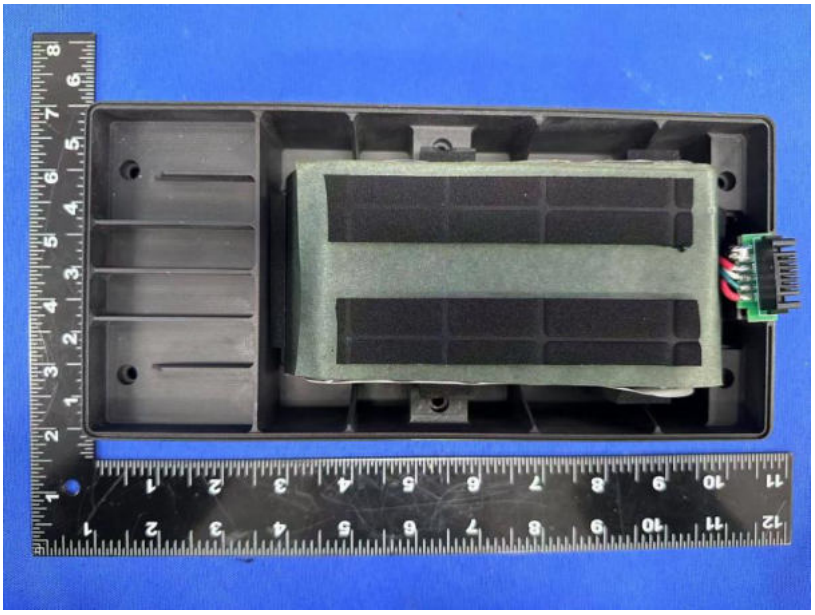


Photo 61
Overview of battery for 4S4P- Battery With Plastic housing

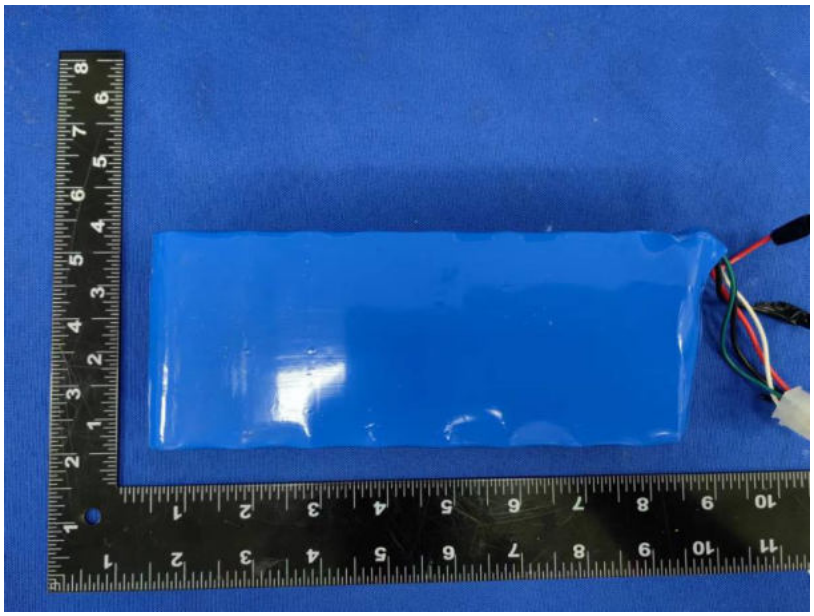


Photo 62
Overview of battery for 4S4P- Battery With Plastic housing

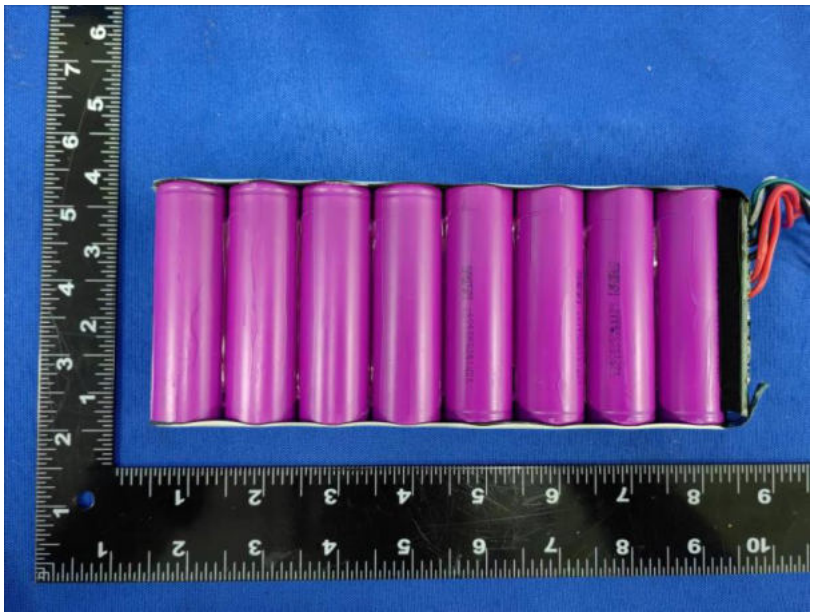


Photo 63
Overview of battery for 1S2P- Battery With Plastic housing



Photo 64
Overview of battery for 1S2P- Battery With Plastic housing

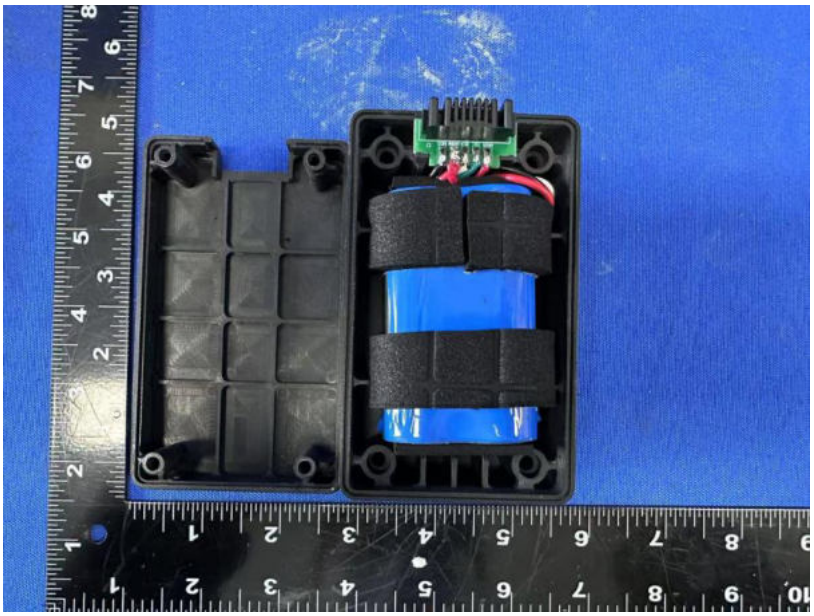


Photo 65
Overview of battery for 1S2P- Battery With Plastic housing

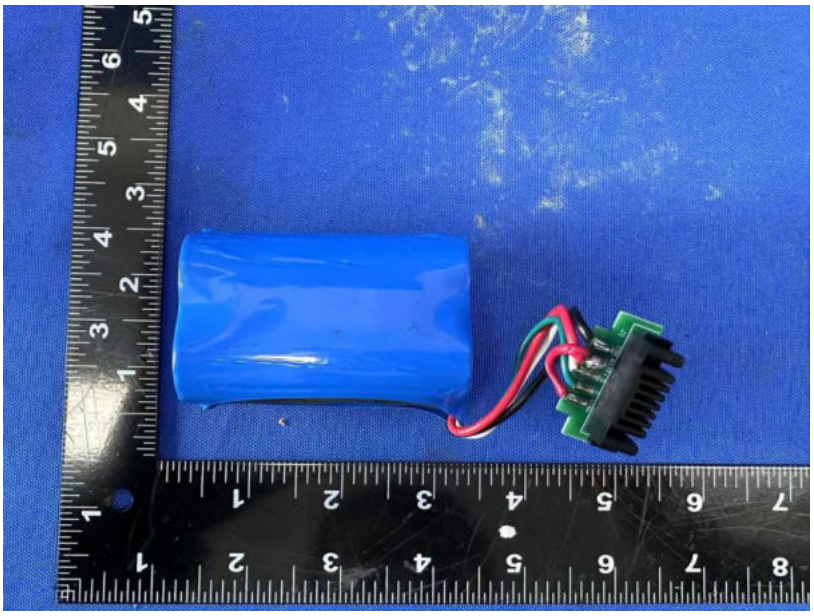


Photo 66
Overview of battery for 1S2P- Battery With Plastic housing

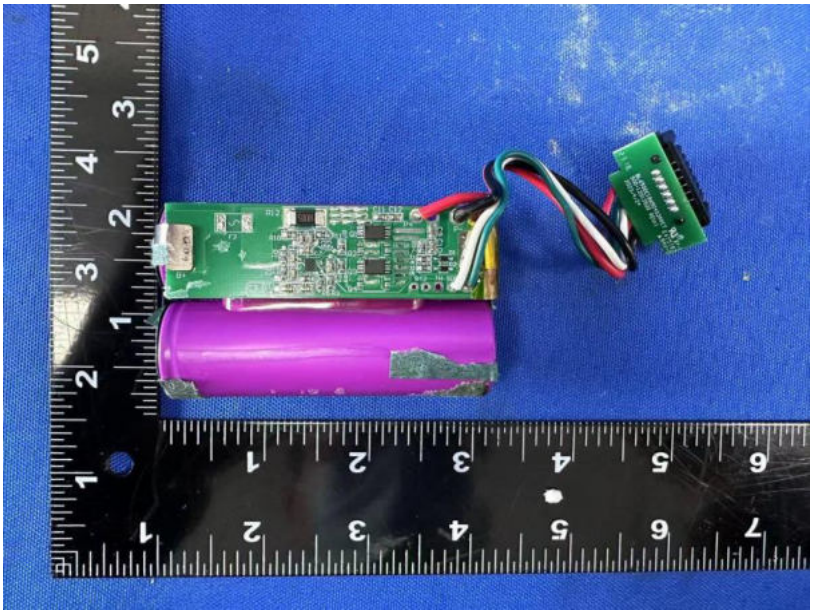


Photo 67

Main board view-PCB1（The PCB1 without the NTC soldered）

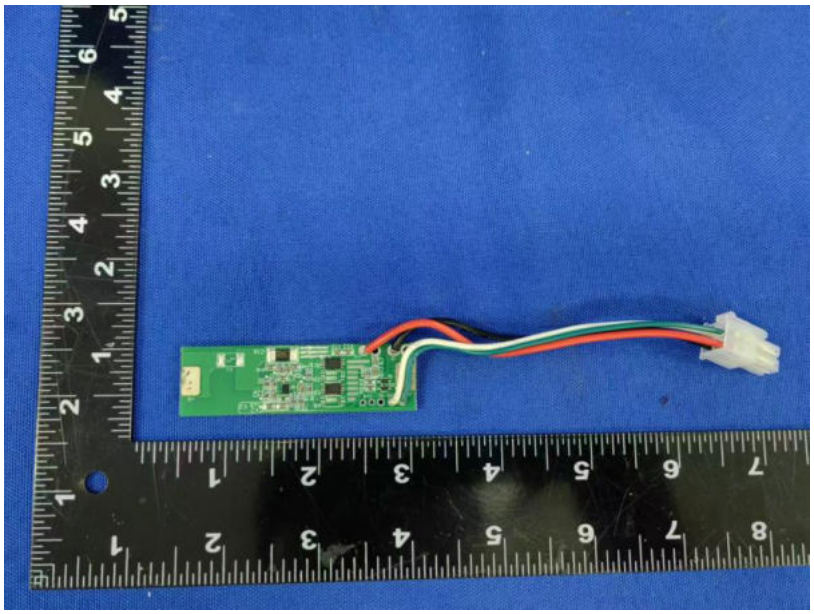


Photo 68

Main board view-（The PCB1 without the NTC soldered）

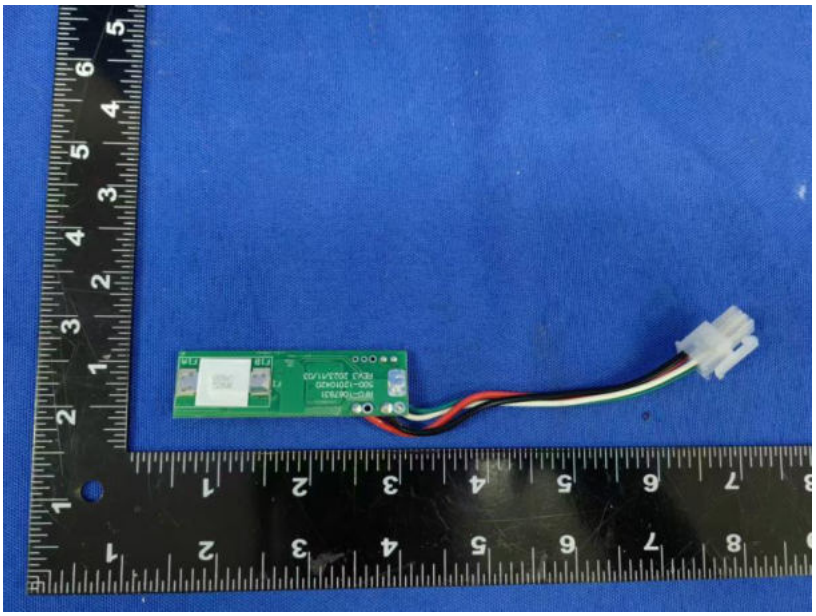


Photo 69

Main board view-（The PCB2 without the NTC soldered）

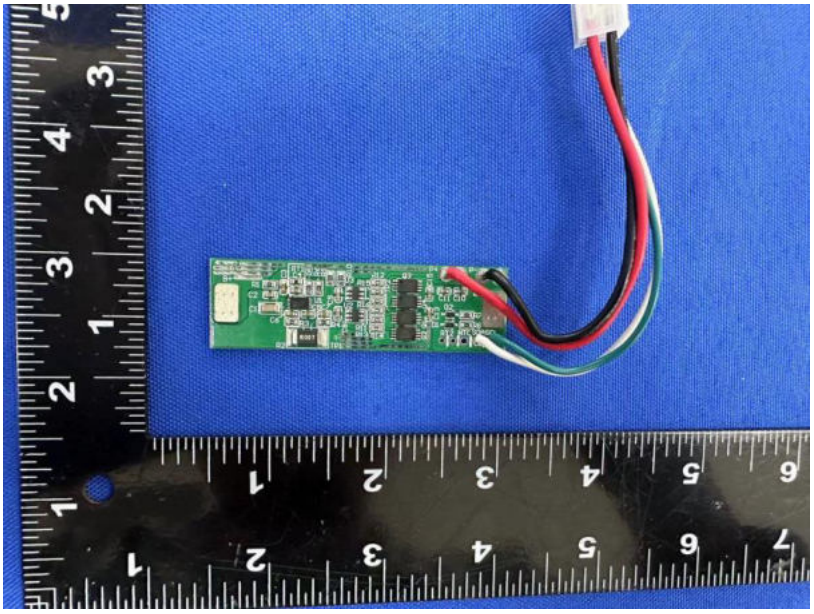


Photo 70

Main board view-（The PCB2 without the NTC soldered）

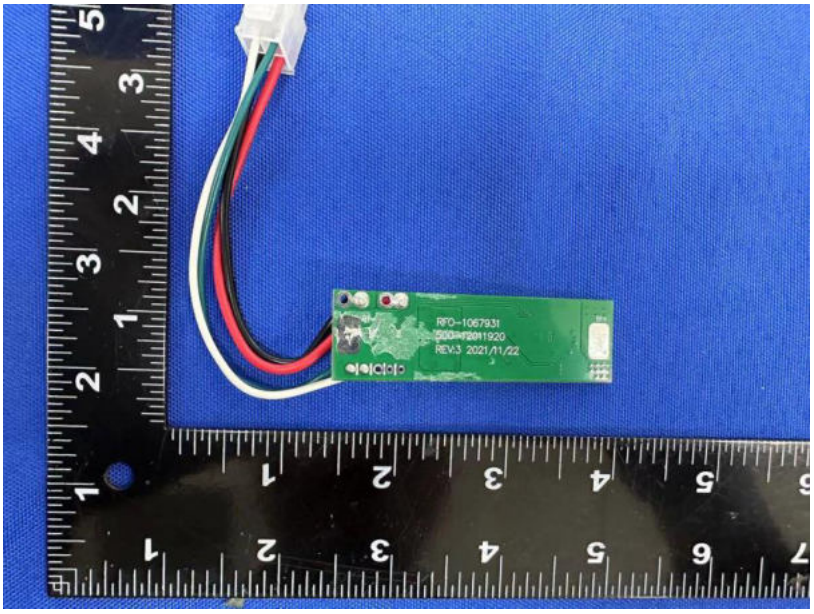


Photo 71

Main board view-（The PCB3 without the NTC soldered）

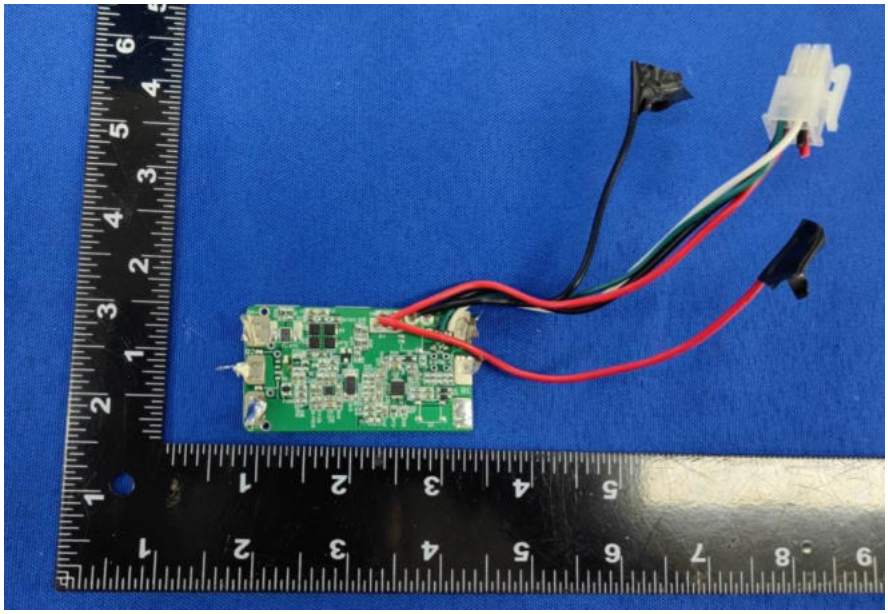


Photo 72

Main board view-（The PCB3 without the NTC soldered）

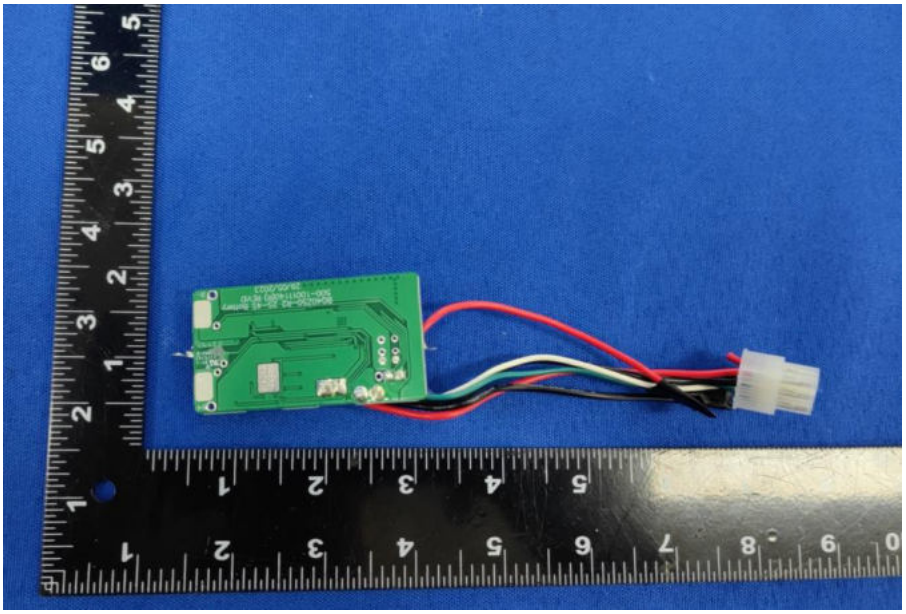


Photo 73

Main board view-（The PCB4 without the NTC soldered）

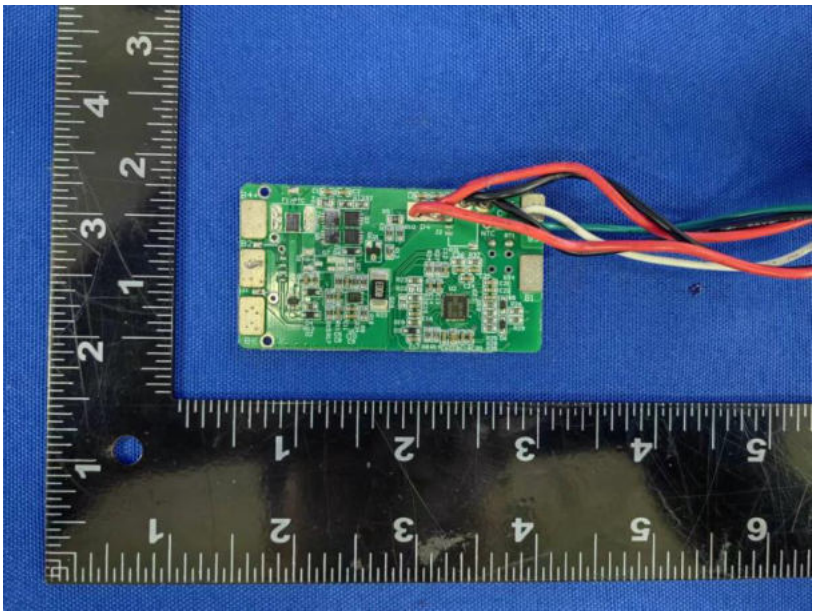


Photo 74

Main board view-（The PCB4 without the NTC soldered）

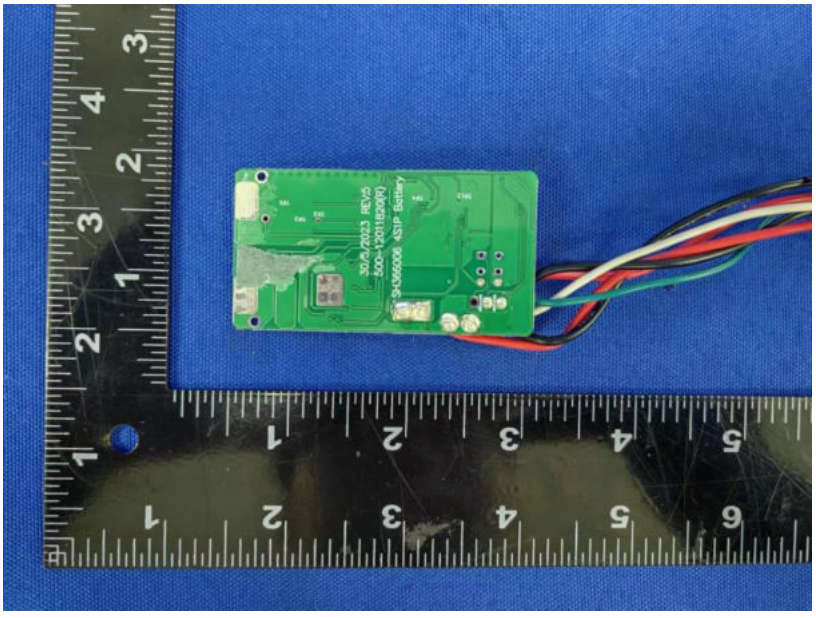


Photo 75

Main board view-（The PCB1 with the NTC soldered）

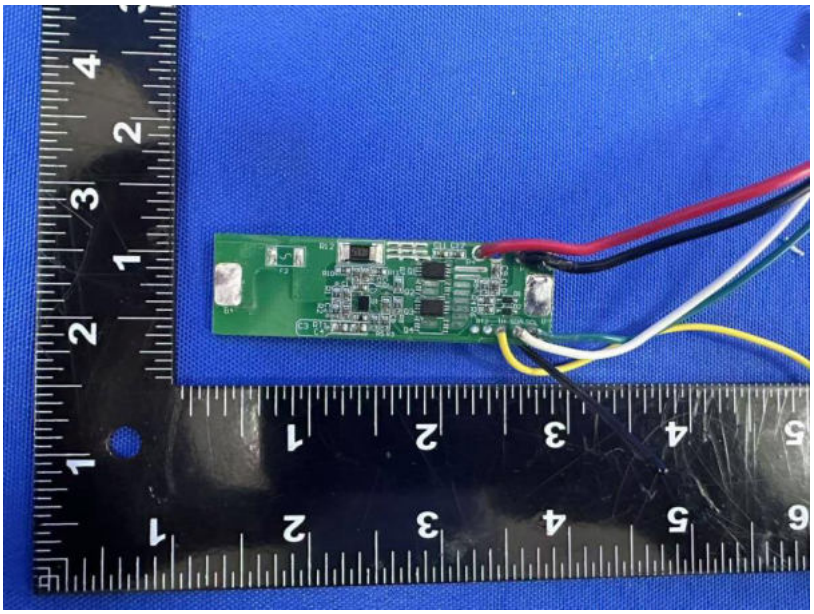


Photo 76

Main board view-（The PCB1 with the NTC soldered）

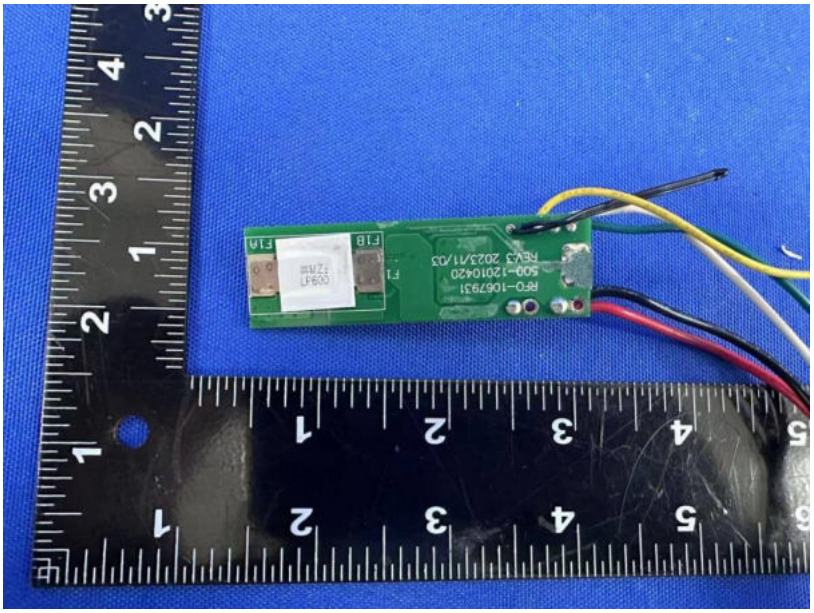


Photo 77

Main board view-（The PCB2 with the NTC soldered）

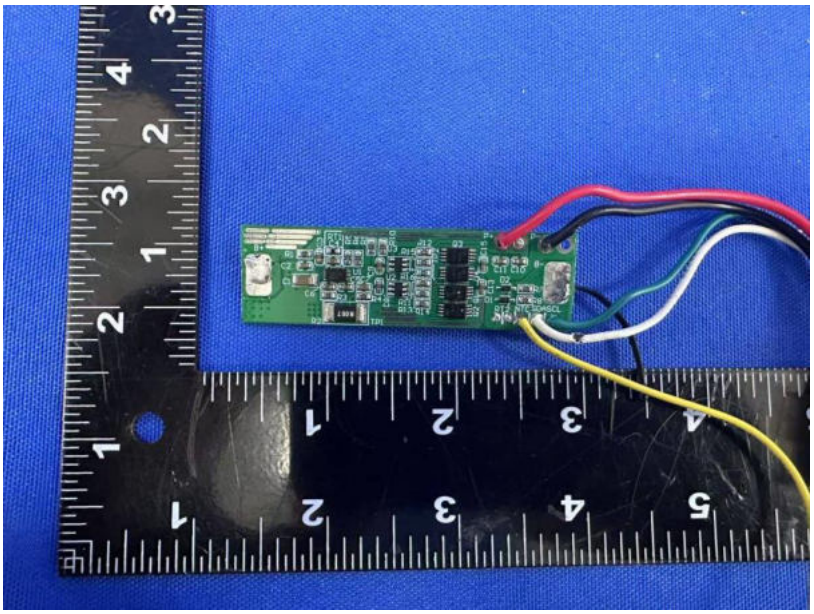


Photo 78

Main board view-（The PCB2 with the NTC soldered）

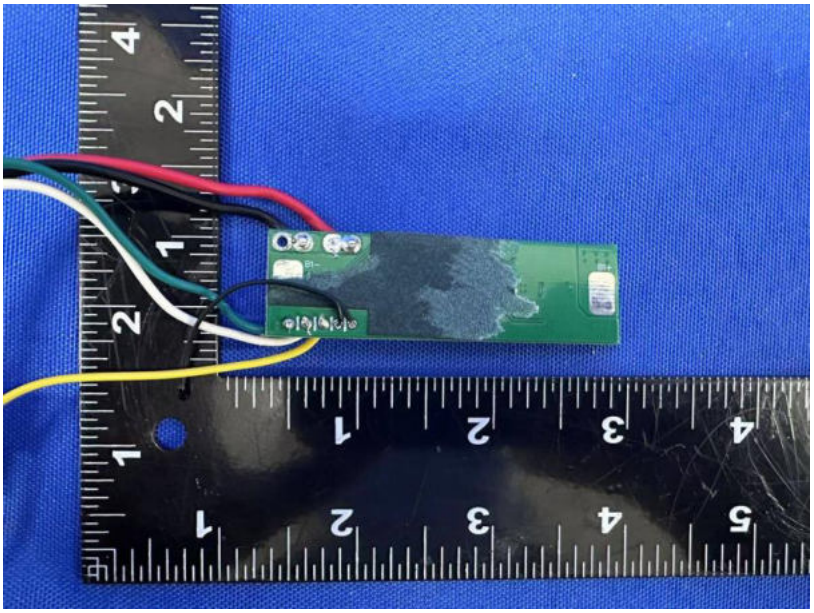


Photo 79

Main board view-（The PCB3 with the NTC soldered）

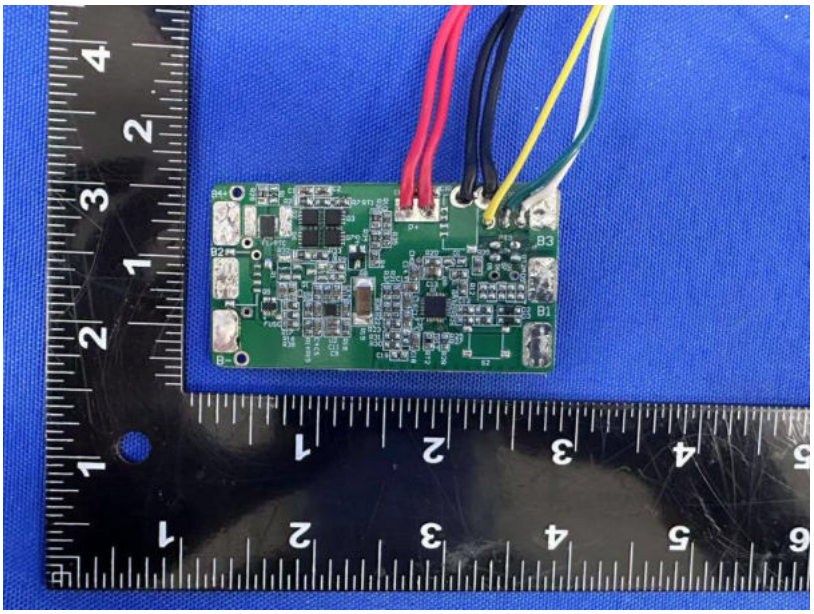


Photo 80

Main board view-（The PCB3 with the NTC soldered）

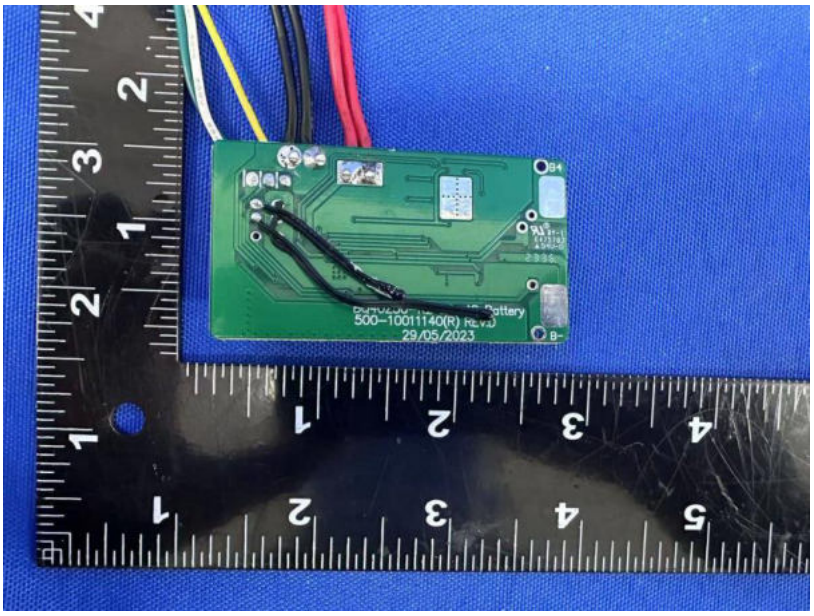


Photo 81

Main board view-（The PCB4 with the NTC soldered）

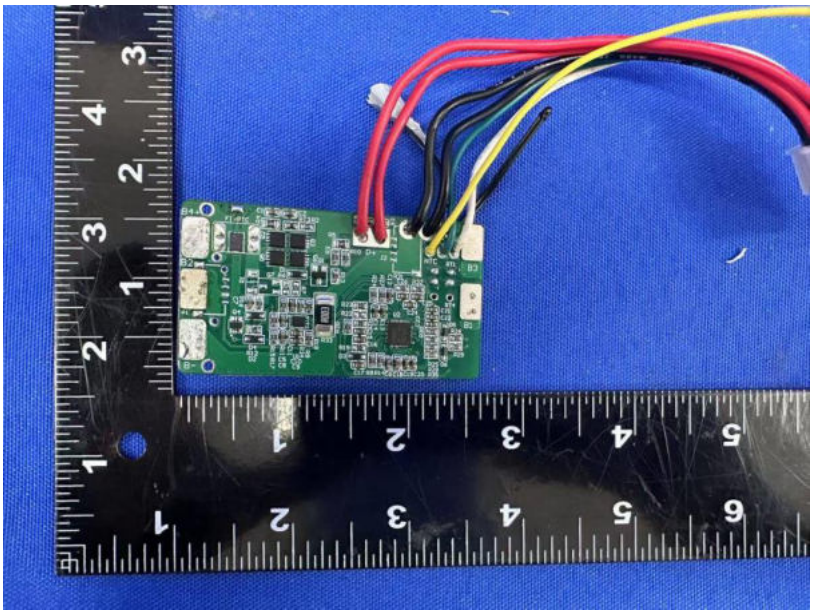


Photo 82

Main board view-（The PCB4 with the NTC soldered）

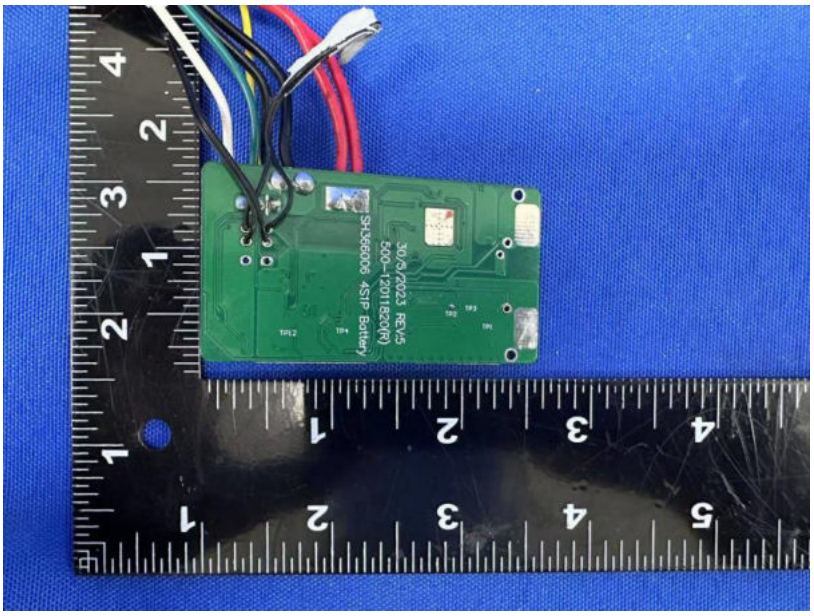


Photo 83
Cell view- LR2170SD, 03BCEA5

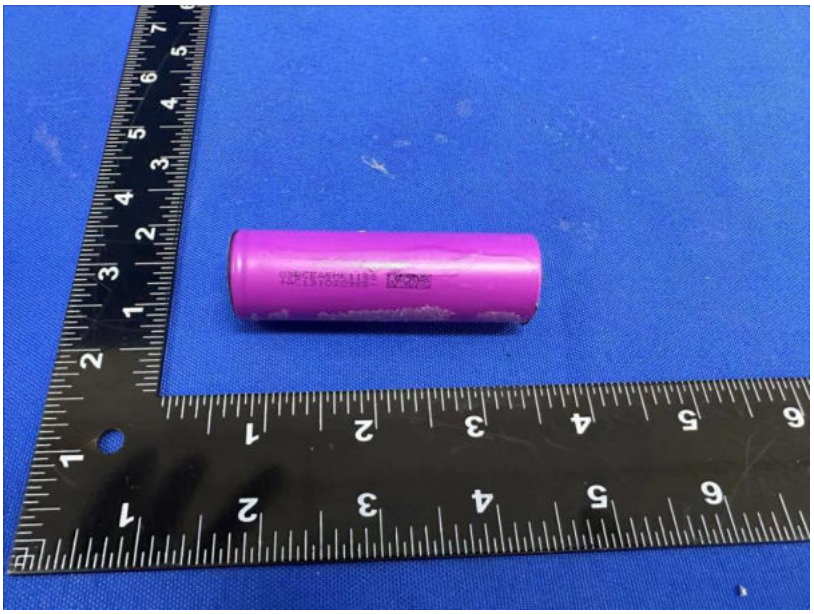


Photo 84
Cell view- LR2170SZ



----- End of Report -----