Test Report issued under the responsibility of:

TEST REPORT
IEC 62619
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications

Report Number ..... :	CBP2603WDG0039
Date of issue ..... :	2026-03-18
Total number of pages ..... :	20
Name of Testing Laboratory preparing the Report ..... :	Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province, 523942, China.
Applicant's name ..... :	Danyang Weisheng Electronics Co., Ltd
Address ..... :	No. 88, Qiliang North Road, Danyang Development Zone, Zhenjiang City, Jiangsu Province, China
Test specification:	
Standard ..... :	IEC 62619:2022
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
TRF template used ..... :	IECEE OD-2020-F1:2022, Ed.1.5
Test Report Form No. ..... :	IEC62619B
Test Report Form(s) Originator .... :	UL Solutions (Demko)
Master TRF ..... :	Dated 2023-02-24

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

General disclaimer:

The test results presented in this report relate only to the object tested.
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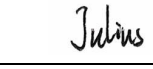
Test item description .....:	Grid-Connected Hybrid inverter
Trademark(s).....:	BIENESOL
Manufacturer.....:	Same as applicant
Model/Type reference.....:	Cube-5200, Cube-5200-800
Ratings .....:	51.2Vd.c., 100Ah

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

☒	**CB Testing Laboratory:**	Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch	
Testing location/ address ..... :		No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province, 523942, China.	
Tested by (name, function, signature) ..... :		Julus Wang (Project Engineer)	
Approved by (name, function, signature) .. :		Jetter Yang (Senior 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):

- 7 pages of Attachment 1 (Photos of product)

Summary of testing:

Tests performed (name of test, test clause and date test performed):	**Testing location: (CBTL~~, SPTL, CTF, Subcontractor~~)**
- 7.1 Charging procedures for test purposes 2026-02-27 to 2026-03-03 - 7.2.3.3 Edge and corner drop test (battery system) 2026-03-03 - 8.2.2 Overcharge control of voltage (battery system) 2026-02-28 - 8.2.3 Overcharge control of current (battery system) 2026-02-28 - 8.2.4 Overheating control (battery system) 2026-03-03	Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province, 523942, China.

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

N/A

☒ **The product fulfils the requirements of EN IEC 62619:2022.**

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.

Battery label:

Grid-Connected Hybrid inverter

Model	Cube-5200				
PV Input	MAX.input power:	2500W	AC Output	Rated voltage:	L/N/PE 220/230/240V
	Absolute max.voltage:	60V		Nominal frequency:	50Hz
	MPPT voltagerange:	16-60V		Max. continuous current:	11A
	Nominal operating voltage:	42V		Max. continuous apparent power:	2500VA
	Max.input current:	16A	EPS	Rated voltage:	L/N/PE 220/230/240V
	Max.short circuit current:	18A		Nominal frequency:	50Hz
Battery	Battery type:	Lithium		Max. continuous current:	11A
	BatteryDesignation:IFpP51/162/119[16S1P] M/-30+60/95			Max. continuous apparent power:	2500VA
	Rated capacity:	100Ah	Others	Protective class:	I
	Rated electricity:	5120Wh		Ingress protection:	IP65
	Rated voltage:	51.2V		Operation temperature range:	-25~60℃
	Max.charge/discharge:	62A		Overvoltage category:	DC II AC III
AC input	Rated voltage:	L/N/PE 220/230/240V		Inverter topology:	Non-isolated
	Nominal frequency:	50Hz		Power factor:	0.8leading...0.8lagging
	Max.input current:	11A			
	Max.input power:	2500W			

SN

RoHS 3min

Manufactured by:Danyang Weisheng Electronics Co., Ltd
TEL:+86-511-86962290 E-MAIL:sales@bienesol.com
Address:No. 88, Qiliang North Road, Danyang Development Zone, Zhenjiang City, Jiangsu Province
Website:http://www.bienesol.com

Grid-Connected Hybrid inverter

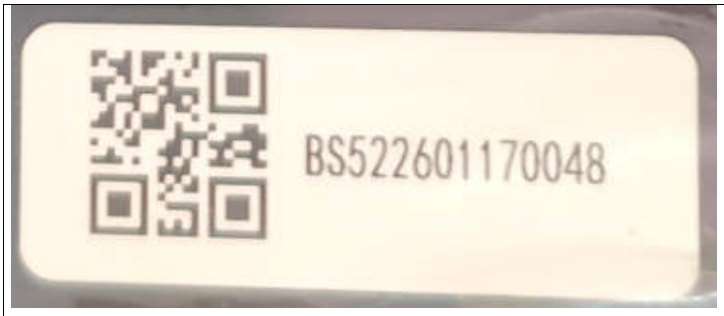
Model	Cube-5200-800				
PV Input	MAX.input power:	2500W	AC Output	Rated voltage:	L/N/PE 220/230/240V
	Absolute max.voltage:	60V		Nominal frequency:	50Hz
	MPPT voltagerange:	16-60V		Max. continuous current:	3.5A
	Nominal operating voltage:	42V		Max. continuous apparent power:	800VA
	Max.input current:	16A	EPS	Rated voltage:	L/N/PE 220/230/240V
	Max.short circuit current:	18A		Nominal frequency:	50Hz
Battery	Battery type:	Lithium		Max. continuous current:	11A
	BatteryDesignation:IFpP51/162/119[16S1P] M/-30+60/95			Max. continuous apparent power:	2500VA
	Rated capacity:	100Ah	Others	Protective class:	I
	Rated electricity:	5120Wh		Ingress protection:	IP65
	Rated voltage:	51.2V		Operation temperature range:	-25~60℃
	Max.charge/discharge:	62A		Overvoltage category:	DC II AC III
AC input	Rated voltage:	L/N/PE 220/230/240V		Inverter topology:	Non-isolated
	Nominal frequency:	50Hz		Power factor:	0.8leading...0.8lagging
	Max.input current:	11A			
	Max.input power:	2500W			

SN

RoHS 3min

Manufactured by:Danyang Weisheng Electronics Co., Ltd
TEL:+86-511-86962290 E-MAIL:sales@bienesol.com
Address:No. 88, Qiliang North Road, Danyang Development Zone, Zhenjiang City, Jiangsu Province
Website:http://www.bienesol.com

Label of SN CODE:



"2601" in "BS522601170048" represents the date of manufacture, "26" represents the year, "01" represents the month.

Remark(s):

1. The battery uses anti-reverse terminals.

2. Disposal instructions are supplied with product specification:

Storage and Disposal

• If the device is not to be used immediately or needs to be stored for an extended period, please check that the packaging is intact. The device should be stored in a well ventilated room, and the environment should be protected from damage to the device components.

• During long-term storage, the product should be charged and discharged every 3 months. Products that have not been charged and discharged for more than 3 months will be void of warranty service.

• If the battery level of the product is extremely low and it has been unused for an extended period, it must be charged before use.

• After an extended period of inactivity, a comprehensive inspection should be performed before restarting the device.

• Upon device decommissioning, it must be properly disposed of in accordance with local regulations, as its components may pose a risk to the environment.

• If conditions permit, fully discharge the battery and place it in a designated battery recycling bin. Batteries containing potentially hazardous chemicals must not be disposed of as regular trash. Please comply with local laws and regulations regarding battery recycling and disposal.

• If a product malfunction prevents the battery from fully discharging, do not place it in a battery recycling bin. Contact a professional battery recycling company for disposal.

• Over-discharged batteries that can not be charged must be properly disposed of.

Test item particulars .....:	
Classification of installation and use .....:	To be defined in final product
Supply Connection.....:	Customer-defined connector
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 .....:	2026-02-27
Date (s) of performance of tests.....:	2026-02-27 to 2026-03-03

General remarks:

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

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

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).....:	Danyang Weisheng Electronics Co., Ltd No. 88, Qiliang North Road, Danyang Development Zone, Zhenjiang City, Jiangsu Province, China

General product information and other remarks:

1. The battery system model Cube-5200, Cube-5200-800 are rechargeable Li-ion battery consists of 16 pcs (16S1P, model No.: PF160-100A) approved rechargeable Li-ion cells which had been tested by TÜV Rheinland (Shanghai) Co., Ltd. Kunshan Branch with CB test report No.: CN23BLOY 001, CN23BLOY 002 and approved by TÜV Rheinland Japan Ltd. with CB certificate No.: JPTUV-147063, JPTUV-147063-M1.

2. All tests were performed on model Cube-5200 are valid for model Cube-5200-800 since it is identical in hardware and just different in power derated by software. The parts that are not applicable have been supplemented with relevant tests and explanations.

3. The following table is the main features of cell and battery system:

Cell and battery	Rechargeable Li-ion Cell	Battery system	Battery system
Model Name	PF160-100A	Cube-5200	Cube-5200-800
Rated capacity (Ah)	100	100	100
Nominal voltage (V)	3.2	51.2	51.2
Standard Charge Current (A)	50	50	50
Standard Discharge Current (A)	100	50	50
Maximum continuous charge current (A)	100	62	62
Maximum continuous discharge current (A)	250	62	62
Charge temperature Range (°C)	0 to 60	-25* to 60	-25* to 60
Discharge temperature Range (°C)	-30 to 60	-25 to 60	-25 to 60
Standard Charge Voltage (V)	3.65	58.4	58.4
Upper limit Charging Voltage (V)	3.75	58.4	58.4
End-of-discharge Voltage (V)	2.5V(＞0°C) 2V(≤0°C)	40	40
Weight (kg)	2.0±0.1	61.699	61.699
Dimension(mm)	Thickness: 50.0±0.5mm; Height: 118.5±0.5mm; Width: 160.6±0.5mm	Thickness: Max.251mm; Height: Max. 630mm; Width: Max. 380mm	Thickness: Max.251mm; Height: Max. 630mm; Width: Max. 380mm
Connection mode	--	16S1P	16S1P
Recommend charging method declared by the manufacturer	At constant current 50A till cell voltage reaches 3.65V, then switch to constant voltage 3.65V till charging current drops to 5A.	Charge the battery at constant current 50A until voltage reaches 58.4V, then charge at constant voltage 58.4V till charge current is 5A	Charge the battery at constant current 50A until voltage reaches 58.4V, then charge at constant voltage 58.4V till charge current is 5A
Remark: * At -25°C to 0°C, the cell cannot operate. It is heated by a heating sheet until the temperature rises above 0 °C, at which point the cell can be charged.			

IEC 62619			
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 are safe under conditions of both intended use and reasonably foreseeable misuse ...:	Check by Clause 6, Clause 7, 8.1, and 8.2. See also critical components information	P
	Reduce the risk of injuries from moving parts		P
5.2	**Insulation and wiring**		P
	Voltage, current, altitude, and humidity requirements		P
	Adequate clearances and creepage distances between connectors and live parts at different voltages or between live parts and non-current-carrying accessible parts	The evaluation needs to be further performed according to relevant final product safety standard(s) as end applications.	N/A
	Protect from hazardous live parts, including during installation		N/A
	The mechanical integrity of internal connections		P
5.3	**Venting**		P
	Pressure relief function		P
	Encapsulation used to support cells within an outer casing		P
5.4	**Temperature/voltage/current management**		P
	The design prevents abnormal temperature-rise	Overcharge, over discharge,over current and short-circuitproof circuit used in this battery.	P
	Voltage, current, and temperature limits of the cells		P
	Specifications and charging instructions for equipment manufacturers		P
5.5	**Terminal contacts of the battery pack and/or battery system**		P
	Polarity marking(s)		P
	Polarity marking not provided for keyed external connector		P
	Capability to carry the maximum anticipated current		P
	External terminal contact surfaces		P
	Terminal contacts are arranged to minimize the risk of short circuits		P
5.6	**Assembly of cells, modules, or battery packs into battery systems**		P
5.6.1	General		P
	Independent control and protection method(s)		P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	Recommendations of cell operating limits, mounting advice, storage conditions and other design recommendations by the cell manufacturer		P
	Batteries designed for the selective discharge of a portion of their series connected cells		N/A
	Protective circuit component(s) and consideration to the end-device application		P
5.6.2	Battery system design		P
	The voltage control function		P
	Maximum charging/discharging current of the cell are not exceeded		P
5.7	**Operating region of lithium cells and battery systems for safe use**		P
	The cell operating region .....:		P
	Designation of battery system to comply with the cell operating region		P
5.8	**System lock (or system lock function)**		P
	Non-resettable function to stop battery operation		P
	Manual with procedure for resetting of battery operation		P
	Emergency battery final discharge		N/A
5.9	**Quality plan**		P
	Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented.....:	ISO9001 provided	P
	The process capabilities and the process controls		P
6	**TYPE TEST CONDITIONS**		P
6.1	**General**		P
6.2	**Test items**		P
	Cells or batteries that are not more than six months old (See Table 1 of IEC 62619)		P
	Capacity confirmation of the cells or batteries		P
	Default ambient temperature of test, 25 °C ± 5 °C	Tests were carried out in an ambient temperature of 25±5°C.	P
7	**SPECIFIC REQUIREMENTS AND TESTS**		P
7.1	**Charging procedure for test purposes**		P
	The battery discharged to a specified final voltage prior to charging		P
	The cells or batteries charged using the method specified by the manufacturer.....:	Charge the battery at constant current 50A until voltage reaches 58.4V, then charge at constant voltage 58.4V till charge current is 5A.	P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
7.2	**Reasonably foreseeable misuse**		P
7.2.1	External short-circuit test (cell or cell block)	CB approved cell used.	P
	Short circuit with total resistance of 30 mΩ ± 10 mΩ at 25 °C ± 5 °C		N/A
	Results: no fire, no explosion		N/A
7.2.2	Impact test (cell or cell block)	CB approved cell used.	P
	Cylindrical cell, longitudinal axis impact		N/A
	Prismatic cell, longitudinal axis and lateral axis impact		N/A
	Results: no fire, no explosion.		N/A
7.2.3	Drop test (cell or cell block, and battery system)		P
7.2.3.1	General		P
7.2.3.2	Whole drop test (cell or cell block, and battery system)	CB approved cell used.	P
	Description of the Test Unit.....:	--	—
	Mass of the test unit (kg).....:	--	—
	Height of drop (m) .....:	--	—
	Results: no fire, no explosion		N/A
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)		P
	Description of the Test Unit.....:	Battery system: Cube-5200	—
	Mass of the test unit (kg).....:	61.699	—
	Height of drop (m) .....:	0.05	—
	Results: no fire, no explosion		P
7.2.4	Thermal abuse test (cell or cell block)	CB approved cell used.	P
	Results: no fire, no explosion		N/A
7.2.5	Overcharge test (cell or cell block)	CB approved cell used.	P
	For those battery systems that are provided with only a single protection for the charging voltage control		—
	Results: no fire, no explosion.....:	--	N/A
7.2.6	Forced discharge test (cell or cell block)	CB approved cell used.	P
	Cells connected in series in the battery system.....:	--	N/A
	Redundant or single protection for discharge voltage control provided in battery system.....:	--	N/A
	Target Voltage.....:	--	N/A
	Maximum discharge current of the cell, Im .....:	--	N/A
	Discharge current for forced discharge, 1.0 It.....:	--	N/A
	Discharging time, t = (1 It / Im) x 90 (min) .....:	--	N/A
	Results: no fire, no explosion.....:	--	N/A
7.3	**Considerations for internal short-circuit – Design evaluation**		**P**

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
7.3.1	General		P
7.3.2	Internal short-circuit test (cell)	CB approved cell used.	P
	Samples preparation procedure: In accordance with Clause A.5 and A.6 of IEC 62133-2:2017		N/A
	Tested per 7.3.2 b) in an ambient temperature of 25 °C ± 5 °C.		N/A
	The appearance of the short-circuit location recorded by photograph or other means.....:	--	—
	The pressing was stopped - When a voltage drop of 50 mV was detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) was reached		N/A
	Results: no fire.....:	--	N/A
7.3.3	Propagation test (battery system)	Cell level according to 7.3.2 internal short-circuit test	N/A
	Method to create a thermal runaway in one cell ....:		N/A
	Results: No external fire from the battery system, no battery case rupture .....:		N/A
8	**BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY)**		P
8.1	**General requirements**		**P**
	Functional safety analysis for critical controls	Analysis for functional safety according to Annex H of IEC 60730-1:2020.	P
	Conduct of a process hazard analysis for both the cell manufacturing process and the battery system manufacturing process		P
	Conduct of risk assessment and mitigation of the battery system		P
8.2	**Battery management system (or battery management unit)**		**P**
8.2.1	Requirements for the BMS		P
	The safety integrity level (SIL) target of the BMS		P
	The charge control evaluated by tests in clauses 8.2.2 to 8.2.4		P
8.2.2	Overcharge control of voltage (battery system)		P
	The exceeded charging voltage applied to the whole battery system		P
	The exceeded charging voltage applied to only a part of the battery system, such as the cell(s).....:		N/A
	Results: no fire, no explosion.....:	See Table 8.2.2.	P
	The BMS terminated the charging before exceeding the upper limit charging voltage		P
8.2.3	Overcharge control of current (battery system)		P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: no fire, no explosion.....:	See Table 8.2.3	P
	The BMS detected the overcharging current and controlled the charging to a level below the maximum charging current		P
8.2.4	Overheating control (battery system)		P
	The cooling system, if provided, was disconnected		P
	Elevated temperature for charging, 5 °C above maximum operating temperature.....:	65°C	P
	Results: no fire, no explosion..... :	See Table 8.2.4	P
	The BMS detected the overheat temperature and terminated charging		P
	The battery system operated as designed during test		P
9	**EMC**		N/A
	Battery system fulfil EMC requirements of the end-device application.....:	[ ] See attachment [ ] for detail EMC report [X] Intended for to be tested in the end use application [*include specific application*]	N/A
10	**INFORMATION FOR SAFETY**		P
	The cell manufacturer provides information about current, voltage and temperature limits of their products		P
	The battery system manufacturer provides information regarding how to mitigate hazards to equipment manufacturers or end-users.		P
11	**MARKING AND DESIGNATION (REFER TO CLAUSE 5 OF IEC 62620)**		P
	The marking items shown in Table 1 in IEC 62620 indicated on the cell, battery system or instruction manual.		P
	Cell or battery system has clear and durable markings		P
	Cell designation	Approved cell used	P
	Battery designation	See making label for details	P
	Battery structure formulation		P
12	**PACKAGING AND TRANSPORT**		P
	Refer to Annex D		P
ANNEX A	**OPERATING REGION OF CELLS FOR SAFE USE**		P
A.1	General	Approved cell used	P
A.2	Charging conditions for safe use		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
A.3	Consideration on charging voltage		N/A
A.4	Consideration on temperature		N/A
A.5	High temperature range		N/A
A.6	Low temperature range		N/A
A.7	Discharging conditions for safe use		N/A
A.8	Example of operating region		N/A
ANNEX B	**PROCEDURE OF 7.3.3 PROPAGATION TEST BY LASER IRRADIATION**		N/A
B.1	**General**		N/A
B.2	**Test conditions**		N/A
B.2.1	Cell test (preliminary test)		N/A
	The cell fully charged according to the manufacturer recommended conditions.....:		—
	Laser irradiation point on the cell.....:		—
	Output power of laser irradiation.....:		—
	Tested in an ambient temperature of 25 °C ± 5 °C		N/A
	Repeat of cell test for 3 times		N/A
B.2.2	Battery system test (main test)		N/A
	The battery system fully charged according to the manufacturer recommended conditions.....:		—
	Target cell to be laser irradiated .....:		—
	The irradiation point on the target cell same or similar as that on the cell test		—
	Output power of laser irradiation.....:		—
	Tested in an ambient temperature of 25 °C ± 5 °C		N/A
ANNEX C	**PROCEDURE OF 7.3.3 PROPAGATION TEST BY METHODS OTHER THAN LASER**		N/A
C.1	General		N/A
C.2	Test conditions:		N/A
	– The battery fully charged according to the manufacturer recommended conditions.....:		—
	– Target cell forced into thermal runaway .....:		—
	– A specially prepared sample (e.g. a heater or a hole for nail penetration provided) used for ease of testing .....:		—
C.3	Method used for initiating the thermal runaway. 1) Heater (Heater, Burner, Laser, Inductive heating 2) Overcharge 3) Nail penetration of the cell 4) Combination of above methods 5) Other methods .....:		—

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX D	**PACKAGING AND TRANSPORT**		P
	The materials and pack design chosen in a way as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		P
	Regulations concerning international transport of secondary lithium batteries		P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Critical components information				**P**
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Cell	CORNEX NEW ENERGY CO., LTD.	PF160-100A	3.2V, 100Ah, 320Wh	IEC 62619: 2022	TÜV Rheinland (Shanghai) Co., Ltd. Kunshan Branch with CB test report No.: CN23BLOY 001, CN23BLOY 002 and approved by TÜV Rheinland Japan Ltd. with CB certificate No.: JPTUV-147063, JPTUV-147063-M1
Lead wire	JIANGSU XINGYUAN HIGH TEMPERATUR E WIRE & CABLE CO LTD	3530	6AWG, 200°C, 600Vac	UL758	UL E333113
or	Interchangeable	Interchangeable	Min. 6AWG, min. 200°C, min. 600Vac	UL758	UL approved
-Description:	Interchangeability based on specified rating.				
Metal Case	DangYang Weisheng Electronics Co., LtD	Cube	SPCC, Min. thickness: 1.2mm	IEC 62619: 2022	Tested in appliance
NTC (NTC1 to NTC4)	Guangdong Vicktee Sensor Co., Ltd	GMF52X-103Y3435ZB	R_{25}: 10KΩ±1%, $B_{25/85}$: 3435K±1%, Topr: -55°C to 150°C	UL 1434	UL E540357
Fuse (F1, F2)	Advanced Surgetech Materials Ltd.	A202001-200	200A, 150Vdc	IEC 60269-1:2006+A1+A2 IEC 60269-7:2021	TÜV Rheinland Certificate No. R50592564 0001
PCB1 & PCB 2	Guangdong Kingshine Electronic Technology Company Limited	DS1	V-0, 130°C	UL 94 UL 796	UL E358874
or	Interchangeable	Interchangeable	V-0, 130°C	UL 94 UL 796	UL approved
-Description:	Interchangeability based on specified rating.				

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

IC (U1)	Monolithic Power Systems, Inc.	MP2797DFP-0000	VTOP Voltage: 18V to 75.2V, Operation temperature: -40°C to 85°C	IEC 62619: 2022	Tested in appliance
IC (U41)	Nations Technologies Inc.	N32G452VEL7	Operation Voltage: 1.8V to 3.6V, Operation temperature: -40°C to 105°C	IEC 62619: 2022	Tested in appliance
MOSFET (QP1~QP6, QP9~QP16, QP21~QP24)	Microelectronics (Chongqing) Limited	CRSS028N10N	V_{DS}: 100V, V_{GS}: ±20V, I_D: 180A, T_J, T_{STG}: -55 to 150ºC	IEC 62619: 2022	Tested in appliance
MOSFET (QC1-QC4)	Microelectronics (Chongqing) Limited	CRSS057N10N	V_{DS}: 100V, V_{GS}: ±20V, I_D: 120A, T_J, T_{STG}: -55 to 150ºC	IEC 62619: 2022	Tested in appliance
Current Sensing Resistor (RS2, RS4, RS7, RS9, RS11, RS13, RS15, RS16, RS18, RS20)	Suzhou Prosemi Micro-electronic Technology Co., Ltd	LMP25MF3P0R002	2mΩ±1%, 3W, Topr: -55°C to 170°C	IEC 62619: 2022	Tested in appliance
Mylar sheet	CHENGDU KANGLONGXIN PLASTICS CO LTD	H KLX FRPC-1860	V-0, 80°C	UL 94 UL746	UL E315185

Supplementary information:

1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.
2) License available upon request.

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: External short-circuit test (cell or cell block)				N/A
Sample No.	**Ambient (at 25°C ± 5ºC)**	**OCV at start of test (V dc)**	**Resistance of Circuit (mΩ)**	**Maximum Case Temperature Rise ΔT (°C)**	**Results**
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Supplementary information:

Results:

A – No fire or Explosion

B – Fire

C – Explosion

D – The test was completed after 6 h

E – The test was completed after the cell casing cooled to 20% of the maximum temperature rise

F – Other (Please explain):___

7.2.5	TABLE: Overcharge test (cell or cell block)					N/A
Sample No.	**OCV at start of test (V dc)**	**OCV at end of test (V dc)**	**Measured Maximum Charging Current (A)**	**Measured Maximum Charging Voltage (V dc)**	**Max. Cell Case Temperature (°C)**	**Results**
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Supplementary information:

Results:

A – No fire or Explosion

B – Fire

C – Explosion

D – Test concluded when temperature reached a steady state condition

E – Test concluded when temperature returned to ambient

F – Other (Please explain): _____

7.2.6	TABLE: Forced discharge test (cell or cell block)				N/A
Sample No.	**OCV before applying reverse charge (V dc)**	**Target Voltage (V dc)**	**Measured Reverse Charge Current It (A)**	**Total Time for Reversed Charge Application (min)**	**Results**
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Supplementary information:

Results:

A – No fire or Explosion

B – Fire

C – Explosion

D – Other (Please explain): ___

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.2	TABLE: Internal short-circuit test (cell)			N/A
Sample No.	**OCV at start of test (V dc)**	**Particle location [1)]**	**Maximum applied pressure (N)**	**Results**
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Supplementary information:

[1)]Identify one of the following**:**

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

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

Results:

A – No fire or explosion

B – Fire

C – Explosion

D – Test concluded when 50 mV voltage drop occurred prior to reaching force limit

E – Test concluded when 800/400 N pressure was reached and 50 mV voltage drop was not achieved

F – Test was concluded when fire or explosion occurred

G – Other (Please explain): __

7.3.3	TABLE: Propagation test (battery system)					N/A
Sample No.	**OCV of Battery System Before Test (V dc)**	**OCV of Target Cell Before Test (V dc)**	**Maximum Cell Case Temperature (°C)**	**Maximum DUT Enclosure Temperature (°C)**	**Results**	
--	--	--	--	--	--	
Method of cell failure [1)]		**Location of target cell**		**Area for fire protection (m^2)**		
--		--		--		

Supplementary information:

1) Cell can be failed through laser exposure, applied heat, overcharge, nail penetration or combinations of these failures or other acceptable methods. See supporting documentation for details on cell failure method

2) If the battery system has no outer covering, the manufacturer is required to specify the area for fire protection.

Results:

A – No fire external to DUT enclosure or area for fire protection or no battery case rupture

B – Fire external to DUT enclosure or area for fire protection

C – Explosion

D – Battery case rupture

E – Other (Please explain): __

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

8.2.2	TABLE: Overcharge control of voltage (battery system)				P
Sample No.	**OCV at start of test for Cell/Cell Blocks (V dc)**	**Maximum Charging Current (A)**	**Max. Charging Voltage (V dc)**	**Max. Voltage of Cell/Cell Blocks (V dc)**	**Results**
DUT1	2.644 ~ 2.734	62.00	57.742	3.651	A, D, F

	Charge Voltage Applied Battery System: 1)	
	Whole	**Part**
	66.0V	--

Supplementary information:

1)The exceeded voltage can be applied to only a part of the system such as the cell(s) in the battery system per Figure 6 of IEC 62619, if it is difficult to do it in using the whole battery system.

Results:

A – No Fire or Explosion

B – Fire

C – Explosion

D – The voltage of the measured cells or cell blocks did not exceed the upper limit charging voltage

E – The voltage of the measured cells or cell blocks did exceed the upper limit charging voltage

F – All function of battery system did operate as intended during the test.

G – All function of battery system did not operate as intended during the test.

H – Other (Please explain): ___

8.2.3	TABLE: Overcharge control of current (battery system)			P
Sample No.	**OCV at start of test (V dc)**	**Max. Charging Current (A)**	**Max. Charging Voltage (V dc)**	**Results**
DUT1	44.597	74.4	46.819	A, D, F

Supplementary information:

Results:

A – No fire or Explosion

B – Fire

C – Explosion

D – Overcurrent sensing function of BMU did operate and then charging stopped

E – Overcurrent sensing function of BMU did not operate and then charging stopped

F – All function of battery system did operate as intended during the test.

G – All function of battery system did not operate as intended during the test.

H – Other (Please explain): ____

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

8.2.4	TABLE: Overheating control (battery system)		P
Sample No.	**OCV at start (SOC 50%) of test (V dc)**	**Maximum Charging Current (A)**	**Maximum Charging Voltage (V dc)**
DUT1	53.076	62	54.803
Maximum Specified Temperature of Battery System (°C)		**Maximum Measured Cell Case Temperature (°C)**	**Results**
60.0		60.0	A, D, F

Supplementary information:

Results:

A – No fire or Explosion

B – Fire

C – Explosion

D – Temperature sensing function of BMU did operate and then charging stopped

E – Temperature sensing function of BMU did not operate and then charging stopped

F – All function of battery system did operate as intended during the test.

G – All function of battery system did not operate as intended during the test.

H – Other (Please explain): ____

9	TABLE: EMC				N/A
Standard used for EMC test:					
Sample No.	**EMC Test Item**	**Battery Condition**	**EMC Test Level/ Parameters**	**Compliance Criteria**	**Results**
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Supplementary information:

Battery Condition During EMC test

1 – In Operation Mode, [ ] Supplied at ____, [ ] Load at____

2 – In non-operation Mode, Battery state of charge (SOC) before test at around____

Compliance Criteria and Test Results:

A – No fire or Explosion

B – Fire

C – Explosion

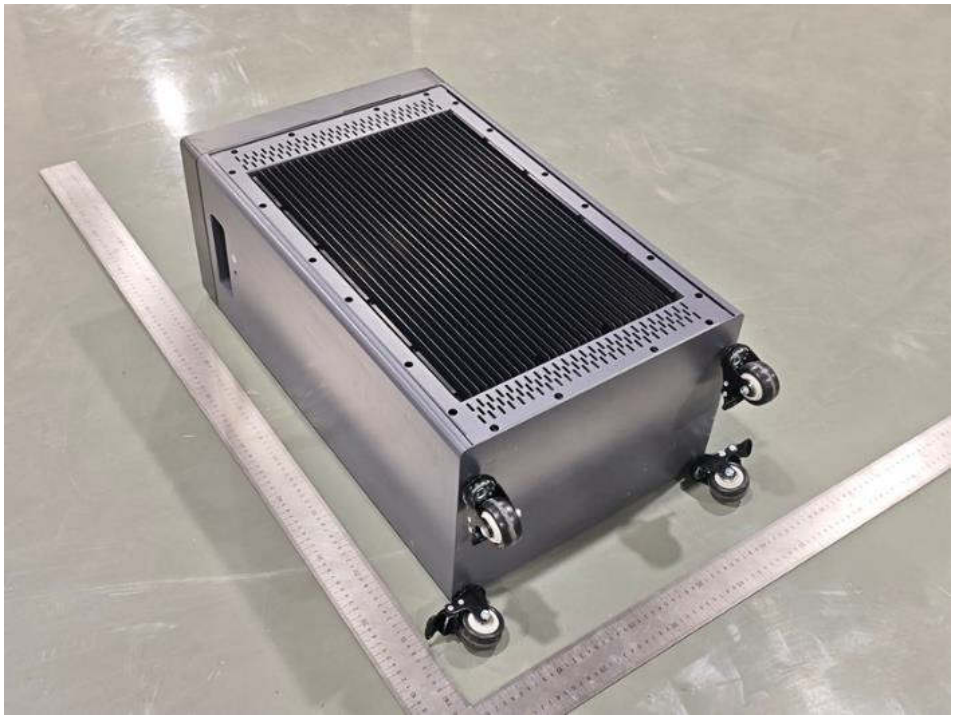
D – Battery system did operate as intended during the test.

E - All function of battery system did operate as intended after the test.

F - All function of battery system did not operate as intended during the test, (Please explain): ____

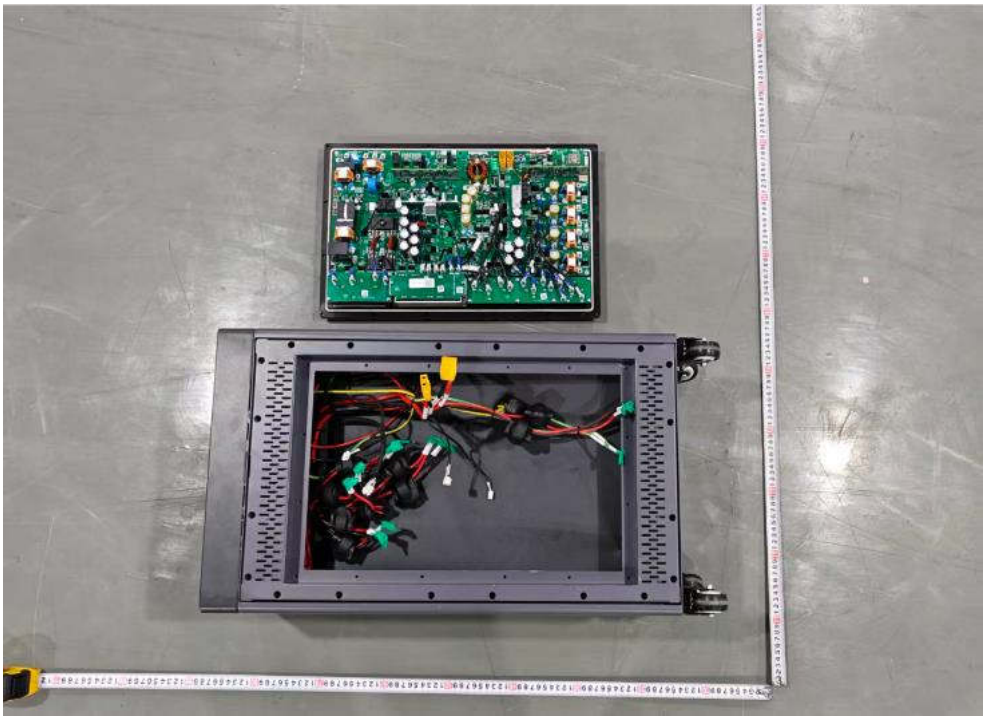
G - Other (Please explain): ____

Attachment 1 (Photos of product)

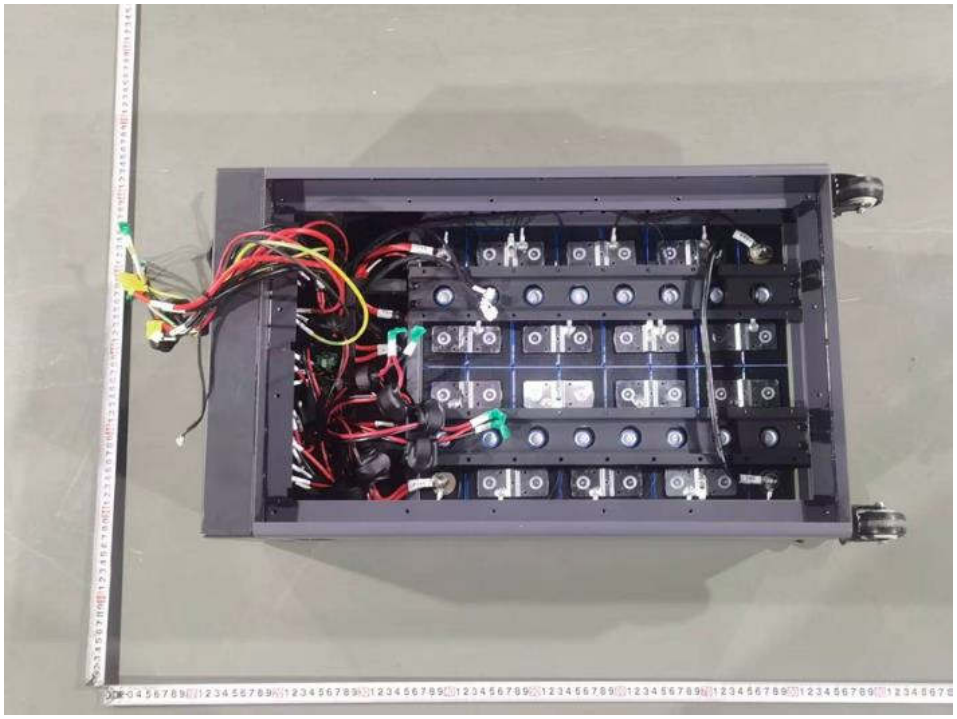


Overall view 1 of battery system

Overall view 2 of battery system



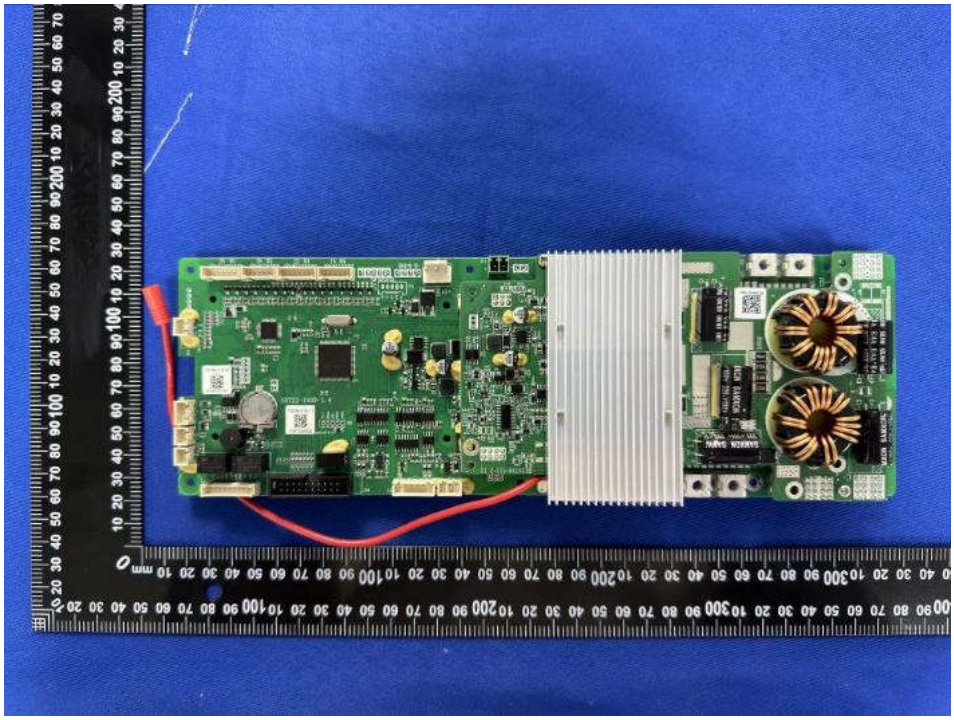
Internal view 1 of battery system



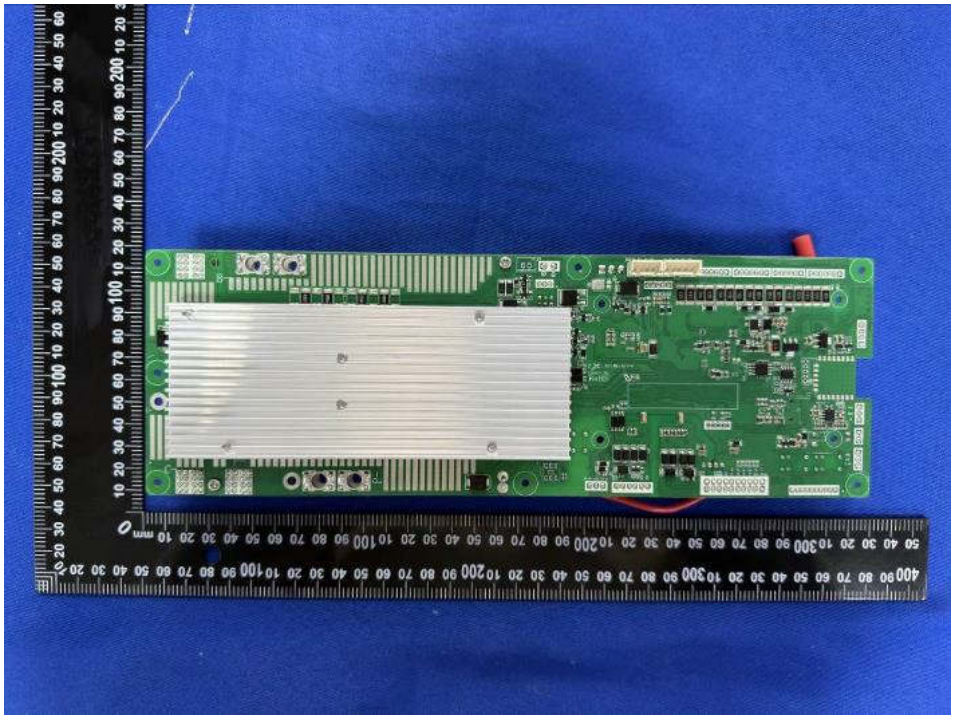
Internal view 2 of battery system

Internal view 3 of battery system

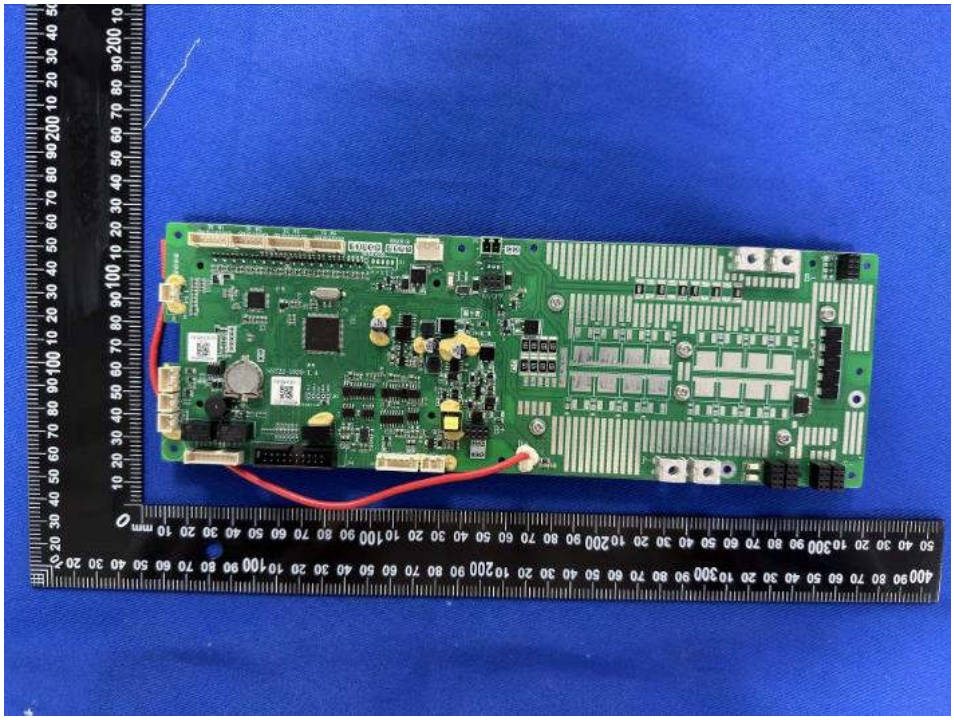
Mylar sheet



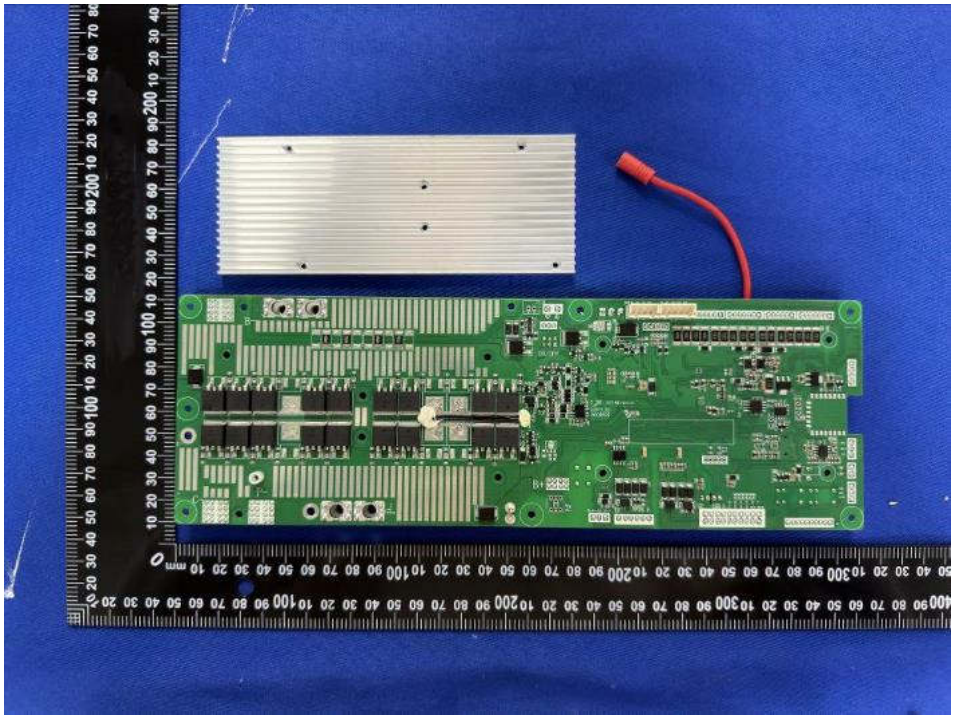
Top view of PCBA1 and PCB2



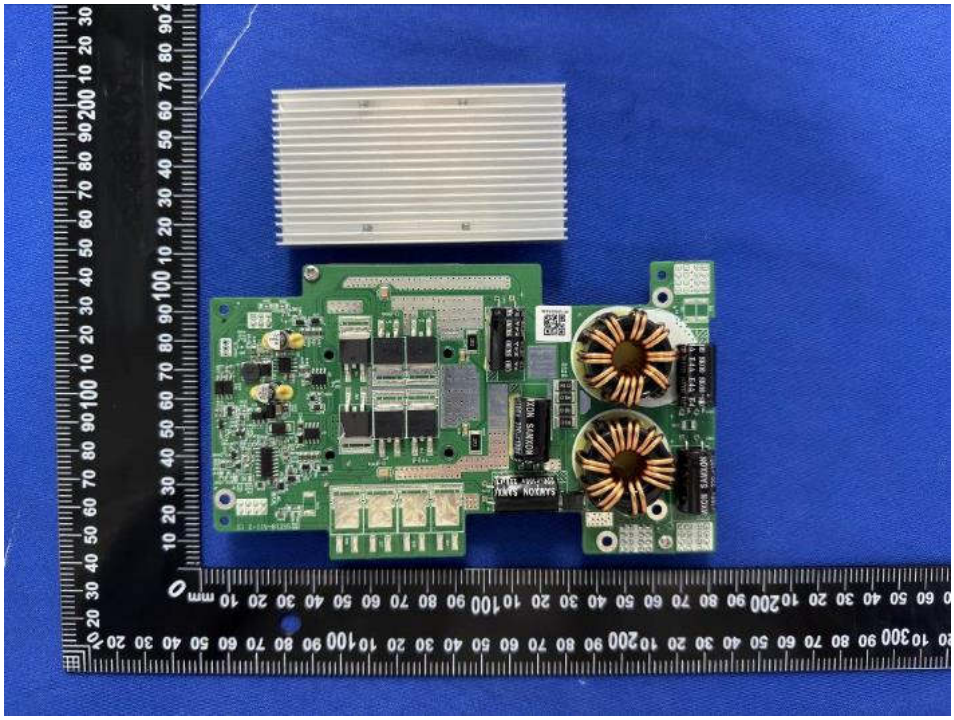
Bottom view of PCBA1 and PCB2



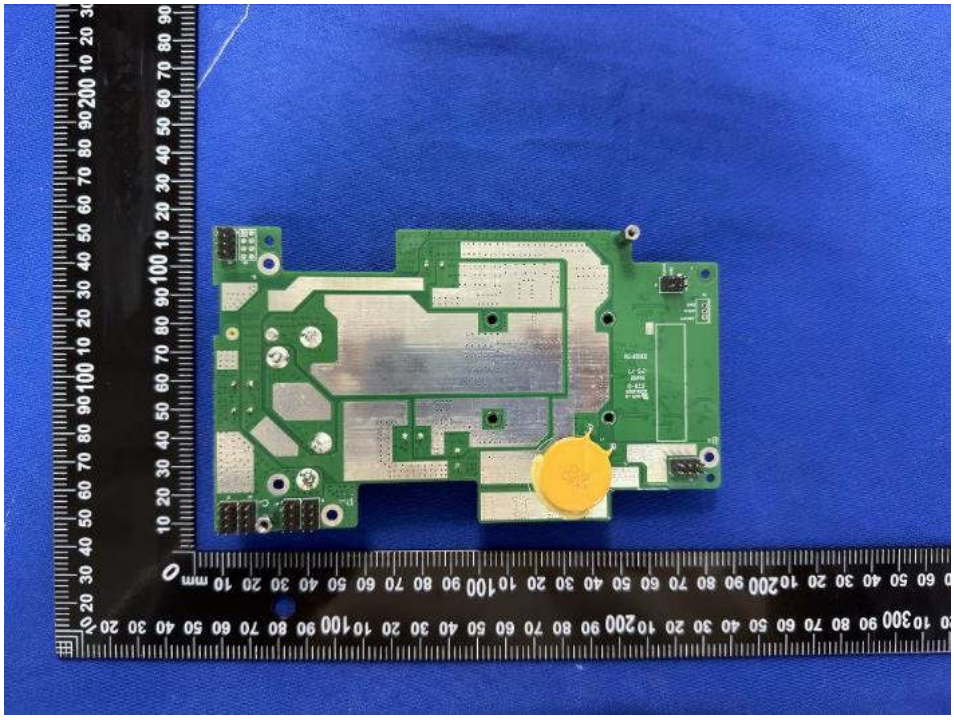
Top view of PCBA1



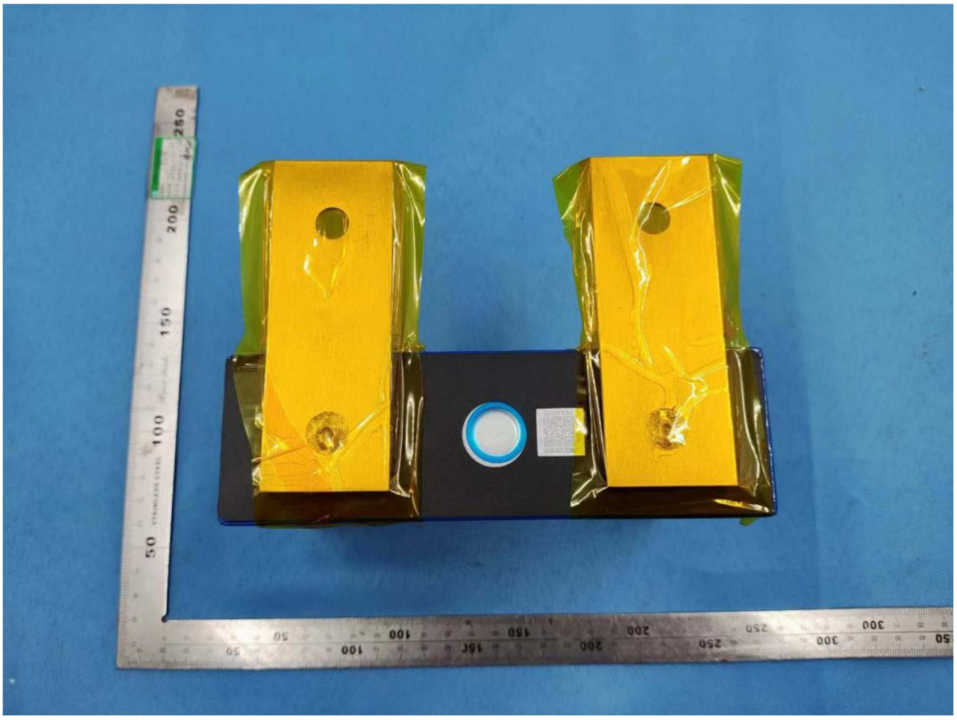
Bottom view 2 of PCBA1



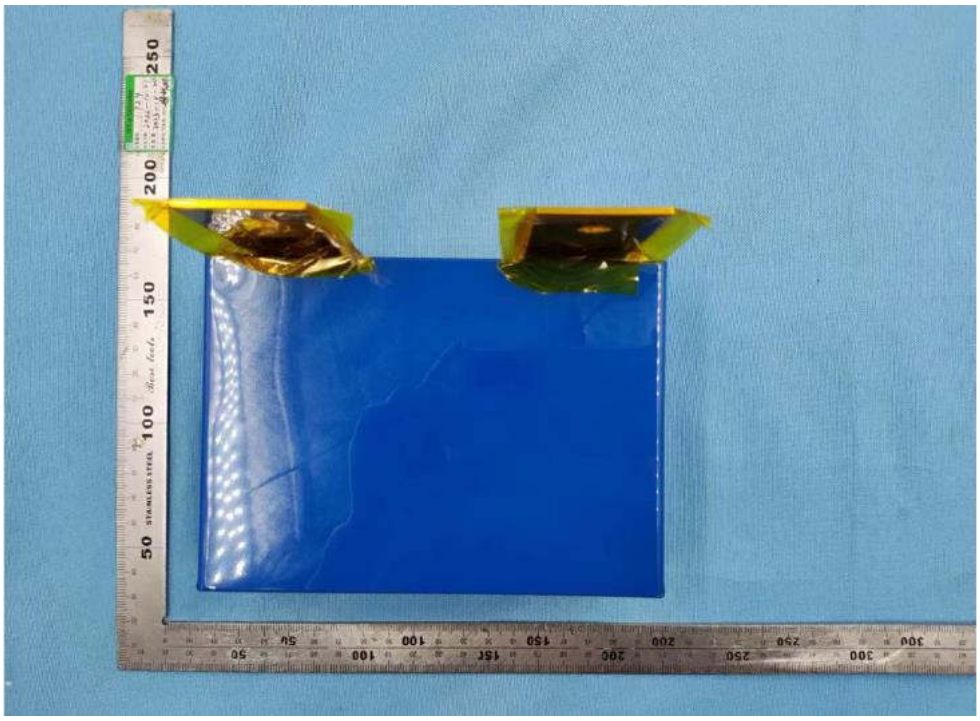
Top view of PCBA2



Bottom view 2 of PCBA2



Overall view 1 of cell



Overall view 2 of cell