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|  | <p>Test Report issued under the responsibility of:</p> <p>NCB TÜV SÜD PSB Pte Ltd. 15 International Business Park, TÜV SÜD@IBP Singapore 609937 Singapore</p> |  |
| <p>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</p> | | |
| <p>Report Number..... : 085-282360318-000 Date of issue : 2024-06-03 Total number of pages : 33 pages</p> | | |
| <p>Name of Testing Laboratory preparing the Report : TÜV SÜD New Energy Testing (Guangdong) Co., Ltd.</p> | | |
| <p>Applicant's name : Jiangmen Jeeseng Energy Co., Ltd. Address : 3rd and 4th floors of Building 2, No. 93, Jiangwan Road, Huicheng, Xinhui District, 529100 Jiangmen City, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA</p> | | |
| <p>Test specification: Standard : IEC 62619:2022 Test procedure : CB Scheme Non-standard test method : N/A</p> | | |
| <p>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</p> | | |
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| <p>General disclaimer:</p> <p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.</p> | | |

| | | |
|---|--|---|
| Test item description : | Rechargeable Li ion Battery System | |
| Trademark(s) | JEESENG | |
| Manufacturer | Same as the applicant | |
| Model/Type reference | JEEDD-102100, JEEDD-153100, JEEDD-204100, JEEDD-256100, JEEDD-307100, JEEDD-358100 | |
| Ratings | JEEDD102100: 102.4 Vd.c.,100Ah JEEDD153100: 153.6 Vd.c., 100Ah JEEDD-204100: 204.8 Vd.c.,100Ah JEEDD-256100: 256 Vd.c., 100Ah JEEDD-307100: 307.2Vd.c., 100Ah JEEDD-358100: 358.4 Vd.c.,100Ah | |
| Responsible Testing Laboratory (as applicable), testing procedure and testing location(s): | | |
| <input checked="" type="checkbox"/> | CB Testing Laboratory: | TÜV SÜD New Energy Testing (Guangdong) Co., Ltd. |
| | Testing location/ address : | North-1/F, 2/F & Unit 301-3/F, TÜV SÜD Testing Center, D1, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China |
| | Tested by (name, function, signature) : | Lena Li (Project Handler)  |
| | Approved by (name, function, signature) ...: | Vitta Wang (Designated Reviewer)  |
|  | | |
| <input type="checkbox"/> | Testing procedure: CTF Stage 1: | |
| | Testing location/ address : | |
| | Tested by (name, function, signature) : | |
| | Approved by (name, function, signature) ...: | |
| <input type="checkbox"/> | Testing procedure: CTF Stage 2: | |
| | Testing location/ address : | |
| | Tested by (name + signature) | |
| | Witnessed by (name, function, signature) .: | |
| | Approved by (name, function, signature) ...: | |
| <input type="checkbox"/> | Testing procedure: CTF Stage 3: | |
| <input type="checkbox"/> | Testing procedure: CTF Stage 4: | |
| | Testing location/ address : | |
| | Tested by (name, function, signature) : | |
| | Witnessed by (name, function, signature) .: | |

| | | |
|---|--|--|
| Approved by (name, function, signature)... : | | |
| Supervised by (name, function, signature) : | | |

List of Attachments (including a total number of pages in each attachment):

Attachment No. 1: Photo Documentation (24 pages)

Summary of testing:

Tests performed (name of test, test clause and date test performed):

In section 7, test of clause 7.2.3.3 was performed on one Rechargeable Li ion Battery Module model no.

JEEDDMK512100-1 and one Rechargeable Li ion Battery Module model no. JEEDDMK512100-2.

In section 8, tests of clause 8.2.2, clause 8.2.3 and clause 8.2.4 were performed on a Rechargeable Li ion Battery System model no. JEEDD-102100.

| Name of test, test clause | Date of test performed |
|---|------------------------|
| - Cl. 7.2.3.3 Edge or corner drop test (cell or cell block, and battery system) | 2023-10-13 |
| - Cl. 8.2.2 Overcharge control of voltage (battery system) | 2023-10-11 |
| - Cl. 8.2.3 Overcharge control of current (battery system) | 2023-10-10 |
| - Cl. 8.2.4 Overheating control (battery system) | 2023-10-12 |

The samples comply with the above requirements of IEC 62619:2022 (Edition 2.0).

Testing location: (CBTL, SPTL, CTF, Subcontractor)

TÜV SÜD New Energy Testing (Guangdong) Co., Ltd.

Address: North-1/F, 2/F & Unit 301-3/F, TÜV SÜD Testing Center, D1, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China

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

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.

| JEESENG | | JEESENG | | JEESENG | |
|---|------------------------------------|--|------------------------------------|---|------------------------------------|
| Product Name | JEEDD-102100 | Product Name | JEEDD-153100 | Product Name | JEEDD-204100 |
| Product Model | Rechargeable Li ion Battery System | Product Model | Rechargeable Li ion Battery System | Product Model | Rechargeable Li ion Battery System |
| Rated Capacity And Nominal Voltage | 100Ah 102.4Vd.c. | Rated Capacity And Nominal Voltage | 100Ah 153.6Vd.c. | Rated Capacity And Nominal Voltage | 100Ah 204.8Vd.c. |
| Name of instruction | IFpP51/161/120[(16S)7S]M/+10+40/90 | Name of instruction | IFpP51/161/120[(16S)7S]M/+10+40/90 | Name of instruction | IFpP51/161/120[(16S)7S]M/+10+40/90 |
| Rated energy | 10.24kW·h | Rated energy | 15.36kW·h | Rated energy | 20.48kW·h |
| Maximum continuous charging/discharging current: | 75A | Maximum continuous charging/discharging current: | 75A | Maximum continuous charging/discharging current: | 75A |
| Level of protection | IP54 | Level of protection | IP54 | Level of protection | IP54 |
| Maximum continuous charging/discharging power: | 7.6KW | Maximum continuous charging/discharging power: | 11KW | Maximum continuous charging/discharging power: | 15KW |
| Protection Class: | Class I | Protection Class: | Class I | Protection Class: | Class I |
| Date of production | 20230810 | Date of production | 20230810 | Date of production | 20230810 |
| Serial number | 2023081010010-A | Serial number | 2023081010010-B | Serial number | 2023081010010-C |
| Size of equipment | : L X W X H:600.1mmx491.5mmx526mm | Size of equipment | : L X W X H:600.1mmx491.5mmx703mm | Size of equipment | : L X W X H:600.1mmx491.5mmx880mm |
| Smanufacturer | : Jiangmen Jeeseng Energy Co.,Ltd. | Smanufacturer | : Jiangmen Jeeseng Energy Co.,Ltd. | Smanufacturer | : Jiangmen Jeeseng Energy Co.,Ltd. |
| Made in China | | Made in China | | Made in China | |
|     | |     | |     | |

| JEESENG | | JEESENG | | JEESENG | |
|---|------------------------------------|--|------------------------------------|---|------------------------------------|
| Product Name | JEEDD-256100 | Product Name | JEEDD-307100 | Product Name | JEEDD-358100 |
| Product Model | Rechargeable Li ion Battery System | Product Model | Rechargeable Li ion Battery System | Product Model | Rechargeable Li ion Battery System |
| Rated Capacity And Nominal Voltage | 100Ah 256Vd.c. | Rated Capacity And Nominal Voltage | 100Ah 307.2Vd.c. | Rated Capacity And Nominal Voltage | 100Ah 358.4Vd.c. |
| Name of instruction | IFpP51/161/120[(16S)7S]M/+10+40/90 | Name of instruction | IFpP51/161/120[(16S)7S]M/+10+40/90 | Name of instruction | IFpP51/161/120[(16S)7S]M/+10+40/90 |
| Rated energy | 25.6kW·h | Rated energy | 30.72kW·h | Rated energy | 35.84kW·h |
| Maximum continuous charging/discharging current: | 75A | Maximum continuous charging/discharging current: | 75A | Maximum continuous charging/discharging current: | 75A |
| Level of protection | IP54 | Level of protection | IP54 | Level of protection | IP54 |
| Maximum continuous charging/discharging power: | 19KW | Maximum continuous charging/discharging power: | 23KW | Maximum continuous charging/discharging power: | 26KW |
| Protection Class: | Class I | Protection Class: | Class I | Protection Class: | Class I |
| Date of production | 20230810 | Date of production | 20230810 | Date of production | 20230810 |
| Serial number | 2023081010010-D | Serial number | 2023081010010-E | Serial number | 2023081010010-F |
| Size of equipment | : L X W X H:600.1mmx491.5mmx1057mm | Size of equipment | : L X W X H:600.1mmx491.5mmx1234mm | Size of equipment | : L X W X H:600.1mmx491.5mmx1411mm |
| Smanufacturer | : Jiangmen Jeeseng Energy Co.,Ltd. | Smanufacturer | : Jiangmen Jeeseng Energy Co.,Ltd. | Smanufacturer | : Jiangmen Jeeseng Energy Co.,Ltd. |
| Made in China | | Made in China | | Made in China | |
|     | |     | |     | |

Remark:

1. There are serial number with 15 characters tracing the detail information of the battery system, such as "20230810010010-A". And "20230810" represents the date of manufacture on August 10th, 2023.
2. "+" "-" are marked near the connectors.
3. Disposal caution is listed in the user manual.
4. The below warning label will be marked near the connectors of battery system:



| | |
|---|--|
| Test item particulars: Rechargeable Li ion Battery System | |
| Classification of installation and use: Use in industrial applications | |
| Supply Connection: Supply by terminal: | |
| 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 : 2023-09-11 | |
| Date (s) of performance of tests : 2023-09-11 to 2024-06-02 | |
| General remarks: | |
| "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. | |
| Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator. | |
| Manufacturer's Declaration per sub-clause 4.2.5 of IEC62619B: | |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable |
| When differences exist; they shall be identified in the General product information section. | |
| Name and address of factory (ies) : Same as the applicant | |

General product information and other remarks:

1. Rechargeable Li ion Battery System model no. JEEDD-102100, JEEDD-153100, JEEDD-204100, JEEDD-256100, JEEDD-307100, JEEDD-358100 are used in industrial applications.
2. Rechargeable Li ion Battery System model no. JEEDD-102100, JEEDD-153100, JEEDD-204100, JEEDD-256100, JEEDD-307100, JEEDD-358100 respectively consist of a Rechargeable Li-ion Module model no. JEEDDMK512100-1, a high voltage control unit model no. JSDD-100A and 1, 2, 3, 4, 5, 6 pcs Rechargeable Li-ion Module model no. JEEDDMK512100-2 connected in series connection. In addition, Rechargeable Li-ion Module model no. JEEDDMK512100-1 is still located at the bottom.
3. Rechargeable Li-ion Module model no. JEEDDMK512100-1 and JEEDDMK512100-2 are same except for case height, which consists of Rechargeable Li-ion Cell with model no. LF100LA connected in 16S.

Additionally, details information of the battery system is shown in following table:

| Item | Specification | | |
|---|--------------------------|-------------------------------------|--|
| | Rechargeable Li-ion Cell | Rechargeable Li ion Battery Module | Rechargeable Li ion Battery System |
| Type /model | LF100LA | JEEDDMK512100-1, JEEDDMK512100-2 | JEEDD-102100, JEEDD-153100, JEEDD-204100, JEEDD-256100, JEEDD-307100, JEEDD-358100 |
| Nominal voltage | 3.2Vd.c. | 51.2Vd.c. | JEEDD-102100:102.4vd.c. JEEDD-153100:153.6Vd.c. JEEDD-204100: 204.8 Vd.c. JEEDD-256100: 256 Vd.c. JEEDD-307100:307.2Vd.c. JEEDD-358100: 358.4 Vd.c. |
| Rated capacity | 102Ah | 100Ah | 100Ah |
| Charging voltage declared by manufacturer | 3.65V | 56V(3.50V/cell) | JEEDD-102100:112V or any cell reaches 3.50V, JEEDD-153100:168V or any cell reaches 3.50V, JEEDD-204100: 224V or any cell reaches 3.50V, JEEDD-256100: 280V or any cell reaches 3.50V, JEEDD-307100: 336V or any cell reaches 3.50V, JEEDD-358100: 392V or any cell reaches 3.50V |
| Upper limit charging voltage | 3.9V | 56.32V (3.52V/cell) | JEEDD-102100:112.64V or any cell reaches 3.52V, JEEDD-153100:168.96V or any cell reaches 3.52V, JEEDD-204100: 225.28V or any cell reaches 3.52V, JEEDD-256100: 281.6V or any cell reaches 3.52V, JEEDD-307100: 337.92V or any cell reaches 3.52V, JEEDD-358100: 394.24V or any cell reaches 3.52V |
| Charging current | 50A | 70A | 70A |

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|--|---|--|---|
| declared by manufacturer | | | |
| Maximum continuous charging current | 100A | 75A | 75A |
| Discharging current declared by manufacturer | 50A | 70A | 70A |
| Maximum continuous discharging current | 250A | 75A | 75A |
| Discharging cut off voltage | 2.0V | 45.6V or any cell reaches 2.85V | JEEDD-102100:91.2V or any cell reaches 2.85V, JEEDD-153100:136.8V or any cell reaches 2.85V, JEEDD-204100: 182.4V or any cell reaches 2.85V, JEEDD-256100: 228V or any cell reaches 2.85V, JEEDD-307100: 273.6V or any cell reaches 2.85V, JEEDD-358100: 319.2V or any cell reaches 2.85V, |
| Lower limit discharging voltage | 1.9V | - | - |
| Standard temperature range for charging | 0°C to 65°C | 5°C to 45°C | 5°C to 45°C |
| Standard temperature range for discharging | -30°C to 65°C | 5°C to 45°C | 5°C to 45°C |
| Standard charging method by manufacturer | Charge at constant current 50A until the voltage reaches 3.65V, then charge at 3.65V till charge current is 0.05I _A (5.1A) | Charge at constant current 20A until the voltage reaches 46.4V or any cell reaches 2.9V, afterwards charge at constant current 50A until the voltage reaches 48V or any cell reaches 3.0V, after that charge at constant current 70A until the voltage reaches 55.2V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 55.68V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 56V or any cell reaches 3.5V | JEEDD-102100: Charge at constant current 20A until the voltage reaches 92.8V or any cell reaches 2.9V, afterwards charge at constant current 50A until the voltage reaches 96V or any cell reaches 3.0V, after that charge at constant current 70A until the voltage reaches 110.4V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 111.36V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 112V or any cell reaches 3.5V. JEEDD-153100: Charge at constant current 20A until the voltage reaches 139.2V or any cell reaches 2.9V, afterwards charge at constant |

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| | | | <p>current 50A until the voltage reaches 144V or any cell reaches 3.0V, after that charge at constant current 70A until the voltage reaches 165.6V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 167.04V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 168V or any cell reaches 3.5V.</p> <p>JEEDD-204100: Charge at constant current 20A until the voltage reaches 185.6V or any cell reaches 2.9V, afterwards charge at constant current 50A until the voltage reaches 192V or any cell reaches 3.0V, after that charge at constant current 70A until the voltage reaches 220.8V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 222.72V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 224V or any cell reaches 3.5V.</p> <p>JEEDD-256100: Charge at constant current 20A until the voltage reaches 232V or any cell reaches 2.9V, afterwards charge at constant current 50A until the voltage reaches 240V or any cell reaches 3.0V, after that charge at constant current 70A until the voltage reaches 276V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 278.4V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 280V or any cell reaches 3.5V.</p> <p>JEEDD-307100: Charge at constant current 20A until the voltage reaches 278.4V or any cell reaches 2.9V, afterwards charge at constant current 50A until the voltage reaches 288V or any cell</p> |
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| | | | reaches 3.0V, after that charge at constant current 70A until the voltage reaches 331.2V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 334.08V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 336V or any cell reaches 3.5V. JEEDD-358100: Charge at constant current 20A until the voltage reaches 324.8V or any cell reaches 2.9V, afterwards charge at constant current 50A until the voltage reaches 336V or any cell reaches 3.0V, after that charge at constant current 70A until the voltage reaches 386.4V or any cell reaches 3.45V, then charge at constant current 50A until the voltage reaches 389.76V or any cell reaches 3.48V, and then charge at constant current 10A until the voltage reaches 392V or any cell reaches 3.5V. |
| Charging method for internal short-circuit test | Charge at constant current 100A until the voltage reaches 3.9V, then charge at 3.9V till the charge current is 0.05 tA (5.1A) | - | - |
| Dimension | T*W*H: (49.9±1.0)mm*(160.0±1.0)mm*(118.5±1.0)mm | JEEDDMK512100-1: LxWxH: (600.1±5)mmx (491.5±5)mmx (208.9±5)mm JEEDDMK512100-2: LxWxH: (600.1±5)mmx (491.5±5)mmx (194.5±5)mm | LxWxH: 600.1mmx491.5mmx526mm for JEEDD-102100, LxWxH: 600.1mmx491.5mmx703mm for JEEDD-153100, LxWxH: 600.1mmx491.5mmx880mm for JEEDD-204100, LxWxH: 600.1mmx491.5mmx1057mm for JEEDD-256100, LxWxH: 600.1mmx491.5mmx1234mm for JEEDD-307100, LxWxH: 600.1mmx491.5mmx1411mm for JEEDD-358100 |
| Weight | (1.98±0.1)kg | JEEDDMK512100-2: Approx.51.5kg | JEEDD-102100:132.35kg, JEEDD-153100:186.65kg, |

| | | | |
|---------------|---|---------------------------------|---|
| | | JEEDDMK512100-1: Approx.54kg | JEEDD-204100: 240.95kg, JEEDD-256100: 295.25kg, JEEDD-307100: 349.55kg, JEEDD-358100: 403.85kg |
| Configuration | - | 16S | JEEDD-102100: (16S)2S, JEEDD-153100: (16S)3S, JEEDD-204100: (16S)4S, JEEDD-256100: (16S)5S, JEEDD-307100: (16S)6S, JEEDD-358100: (16S)7S |

Remark:

The final evaluation of the battery must be conducted in the end device application for which the battery will be used.

| IEC 62619 | | | |
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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 are safe under conditions of both intended use and reasonably foreseeable misuse... : | Clause 6, Clause 7, 8.1, and 8.2. See also table 5.1 for 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 | | P |
| | Protect from hazardous live parts, including during installation | | P |
| | 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 | | 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 |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Independent control and protection method(s) | | P |
| | 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..... : | See page 7 to 11 | 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 | The battery system has a non-resettable protection when cell operating region (voltage, current, or temperature) is exceeded. It is not user resettable and not automatic reset. | P |
| | Manual with procedure for resetting of battery operation | The function of the battery system can be reset by the manufacturer after checking the status of cells/batteries. | P |
| | Emergency battery final discharge | | N/A |
| 5.9 | Quality plan | | P |
| | Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented..... : | ISO9001 certificate was provided | P |
| | The process capabilities and the process controls | | P |

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|------------|---|--|---|
| 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 |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Default ambient temperature of test, 25 °C ± 5 °C | | P |

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| 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 | See page 7 to 11 | P |
| 7.2 | Reasonably foreseeable misuse | | P |
| 7.2.1 | External short-circuit test (cell or cell block) | | N/A |
| | 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) | | N/A |
| | 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 | | N/A |
| 7.2.3.2 | Whole drop test (cell or cell block, and battery system) | | N/A |
| | 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 module: JEEDDMK512100-1 and JEEDDMK512100-2 |
| | Mass of the test unit (kg) | | Measured: Max. 54.00kg of JEEDDMK512100-1, Max. 51.60kg of JEEDDMK512100-2 |
| | Height of drop (m)..... : | | 0.05m |
| | Results: no fire, no explosion | | P |
| 7.2.4 | Thermal abuse test (cell or cell block) | | N/A |
| | Results: no fire, no explosion | | N/A |

| IEC 62619 | | | |
|------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.2.5 | Overcharge test (cell or cell block) | | N/A |
| | For those battery systems that are provided with only a single protection for the charging voltage control | | — |
| | Results: no fire, no explosion..... : | See Table 7.2.5. | N/A |
| 7.2.6 | Forced discharge test (cell or cell block) | | N/A |
| | 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, $t = (1 It / Im) \times 90$ (min.) : | | N/A |
| | Results: no fire, no explosion..... : | See Table 7.2.6. | N/A |
| 7.3 | Considerations for internal short-circuit – Design evaluation | | N/A |
| 7.3.1 | General | | N/A |
| 7.3.2 | Internal short-circuit test (cell) | | N/A |
| | 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 $25 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$. | | N/A |
| | The appearance of the short-circuit location recorded by photograph or other means : | See Attachment # __ | — |
| | 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..... : | See Table 7.3.2. | N/A |
| 7.3.3 | Propagation test (battery system) | Clause 7.3.2 was tested in the cell report | N/A |
| | Method to create a thermal runaway in one cell ... : | See Annex B and C | N/A |
| | Results: No external fire from the battery system, no battery case rupture : | See results in Table 7.3.3 | N/A |
| 8 | BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY) | | P |
| 8.1 | General requirements | | P |

| IEC 62619 | | | |
|------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Functional safety analysis for critical controls | Functional safety analysis has been done according to Annex H of IEC 60730-1:2013+AMD1:2015+AMD2:2020 (Class B control) | 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 |
| | 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 | | N/A |
| | Elevated temperature for charging, 5 °C above maximum operating temperature..... : | 70°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 |

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|-----------|---|---------------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 9 | EMC | | P |
| | Battery system fulfil EMC requirements of the end-device application..... : | See EMC report no. 64.771.23.60320.01 | P |

| | | | |
|-----------|---|--|-----|
| 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. | | N/A |

| | | | |
|-----------|--|--|-----|
| 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 | | N/A |
| | Battery designation | | 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 | | P |
| A.2 | Charging conditions for safe use | | P |
| A.3 | Consideration on charging voltage | | P |
| A.4 | Consideration on temperature | | P |
| A.5 | High temperature range | | N/A |
| A.6 | Low temperature range | | N/A |
| A.7 | Discharging conditions for safe use | | P |
| A.8 | Example of operating region | | P |

| IEC 62619 | | | |
|----------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 |

| 5.1 | TABLE: Critical components information | | | | P |
|---|--|---|---|------------------|-------------------------------------|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity ¹⁾ |
| The high voltage control unit of Rechargeable Li ion Battery System, model no.JSDD-100A | | | | | |
| 1. BMS | SHENZHEN PACE ELECTRONICS CO., LTD | BCU-1501C (Software version: BCU-1501-JS30245-1.0, Hardware version: SST22-0189-2.2); | Overcharge detection voltage for each cell: 3.52V, Overcharge detection voltage for battery: 112.64V for JEEDD-102100, 168.96V for JEEDD-153100, 225.28V for JEEDD-204100, 281.6V for JEEDD-256100, 337.92V for JEEDD-307100, 394.24V for JEEDD-358100, Overdischarge detection voltage for each cell: 2.85V, Overdischarge detection voltage for battery: 91.2V for JEEDD-102100, 136.8V for JEEDD-153100, 182.4V for JEEDD-204100, 228V for JEEDD-256100, 273.6V for JEEDD-307100, 319.2V for JEEDD-358100, Charge overcurrent detection current: 80A, Discharge overcurrent detection current: 80A, High temperature charging protection: 52°C, High temperature discharging protection: 52°C, Low temperature charging protection: 4°C, Low temperature discharging protection: -15°C | - | - |
| - PCB material | KINGBOARD LAMINATES HOLDINGS LTD | KB-6160C | V-0, 130°C | UL 796 and UL 94 | UL E123995 |
| -Alternative | SHENGYI TECHNOLOGY CO LTD | S1600 | 130°C, V-0 | UL 796 and UL 94 | UL E109769 |
| - IC for MCU (U3) | ST | STM32H723ZG T6 | Supply voltage: 1.62~3.6V, T _{opr.} : -40°C to 125°C | - | - |
| -IC for MCU power (UA1) | HOLTEK | HT7533-2 | V _{in} :0~30V, OUT PUT: 3.3V, 10mA, T _{opr.} : -40°C to 85°C | - | - |

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|---|--|------------------------|---|---|--------------------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| - IC for AFE (UA4) (For high voltage and current sampling) | ST | STM32G0B1C CT6 | Supply voltage: 1.7~3.6V, T _{opr} : -40°C to 125°C | - | - |
| - IC for DCDC (UL2) | MPS | MP9457GF | Supply voltage:4.5-55V T _{opr} : -40°C to 125°C | | |
| -DC-DC (UA2) | Mornsun | H0505CS-1WR3 | Supply voltage:4.5~5.5V, OUT PUT: 5V, 20~200mA, T _{opr} : -40°C to 105°C | IEC 60950-1 | DK-56034-UL |
| -IC for WDT (U8) | Shengbang Microelectronics (Beijing) Co., LTD | SGM706B | Supply voltage: 0.3-6V, T _{opr} : -40°C to 125°C | - | - |
| - Relay (LS2,LS1) | HONGFA | HFD4/5-SR | Supply voltage: 5V, 30V, 1A | - | - |
| -IC for isolation (UA5) | Shanghai Chipanalog Microelectronics Co., Ltd. | CA-IS3822HWW | Supply voltage: 2.5V-5.5V, Isolation voltage: 7500Vac T _{opr} : -40°C to 125°C | - | UL E511334 |
| -Optocoupler (ISO4,ISO1,ISO3,ISO5,ISO8,ISO2) | NQUNXIN | QXY258-CuH-S | Supply voltage: 1.25V, I _F : 50mA, V _{iso} : 5000Vrms, T _{opr} : -40°C to 125°C | - | - |
| -Fuse for precharge (FPG1, FPG2, FPG3, FPL5) | SHENZHEN LANSON ELECTRONICS CO LTD | 12H (12H1400C) | 4A, 63V T _{opr} : -40°C to 125°C | UL248-1 | UL E221465 |
| -Fuse for power (FPL6) | SHENZHEN LANSON ELECTRONICS CO LTD | 12H (12H1100C) | 63V, 1A, T _{opr} : -40°C to 125°C | UL248-1 | UL E221465 |
| -IC FOR CAN (UC2,UC3,UC5) | SIT | SIT1044T | Supply voltage: 4.75~5.25V, T _{opr} : -40°C to 150°C | - | - |
| -Terminal for current (J5) | Dongguan Kaifeng Electronics Co., LTD | KF12EKN-R-3.81-2*2P-1G | 3.81W, 12V, 2X2P PA66, T _{opr} : -40-125°C | - | - |
| -Terminal for voltage (J6) | Kefa Electronics Co. LTD | KF2EDGRM-5.08-08P | 5.08W, 12V, 6P, PA66, T _{opr} : -40-125°C | - | - |
| 2. Hall (1PCS) | Shenzhen Socan Technologies Co.,Ltd | SCK1 (SCK1D-100A) | 4.5~5.5VDC, ±100A -40°C~125°C | EN61000-6-3:2017+A1:2011; EN IEC61000-6-1:2019 | Beide B-E200730595 |

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|---|--|-------------------------|---|---|--------------------------------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| 3. Resistance for precharge | Anhui Kebi Electronic Technology Co.,Ltd | RX24 (RX24-200W 50 J) | 200W, 50Ω±5%, -50°C~250°C | EN 60204-1:2018 | UDEM M.2021.206. C64993 |
| -Alternative | Bengbu Vanke Electronic Science and Technology Co., LTD. | RX24 (RX24-200W 50 J) | 200W, 50Ω±5%, -55°C~155°C | EN60115-1:2023 | UDEM M.2023.206. C88079 |
| 4. Contactor for charge and discharge protection (3PCS) | Zhejiang Dongya Electronic Co., Ltd. | DH(V)200 (DHV200HAAN A) | Contact ratings: 450VDC, Rated current: 200A, Coil ratings: 24V, 2A -40°C ~85°C | EN/IEC 60947-4-1:2019 | TUV Rheinland R 50541544 |
| 5. Contactor for precharge | ZHEJIANG DONGYA ELECTRONIC CO., LTD | DH20 (DH20P24PNA) | Contact ratings: 450VDC, 20A -40°C ~85°C | EN60947-4-1:2010+A1:2012 | CQC CE18030400 5743 |
| 6. Insulating column for fuse | Zhejiang Chloe Electric Power Co. , Ltd. | KLY (KLY-20308) | 600V, 500MΩ, ≤1mA, -40°C ~140°C | - | - |
| 7. Fuse | SHENZHEN VICTORS INDUSTRIAL Co., Ltd. | VRH-100A | Voltage Rating: 500VDC, Current Rating: 100A, Operating temperature: -40°C to 125°C | - | - |
| 8. Circuit breaker | Projoy Electric Co., Ltd. | PEBS-H-125 | 2P, U _{max} : 500 VDC, I _{max} : 100A, T _{opr} : -30°C ~70°C | EN60947-2:2017+A1 | TUV Rheinland R5060087400 01 |
| -Alternative | Shanghai Liangxin Electrical Co.,Ltd. | NDB6Z-125C | 2P, U _{max} : 600 VDC, I _{max} : 100A, T _{opr} : -40°C ~70°C | EN60947-2:2006+A1 +A2 | TUV Rheinland R 50291270 003 |
| 9. Shunt | VICTORY CHINA FAR EAST ELECTRONICS CO., LTD. OF BENGBU | FL-2 | -20°C ~50°C 200A 75mV | - | - |
| 10. DC-DC Converter | Mornsun Guangzhou Science & Technology Co., Ltd. | PV75-2YB24R3 | U _{in} : 80 - 1000VDC, U _{out} : 24V, 3.125A, -40°C to 85°C | Annex I of Council Directive 2014/35/EU | TUV Rheinland AN 50579752000 1 |
| -Alternative | Suzhou Mean Well Technology Co.,Ltd. | RSDH-150-24 | U _{in} : 250 - 1500VDC, U _{out} : 24V, 6.2A, -40°C to 80°C | EN 62109-1:2010 | DEKRA NL-85965 |

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|---|---|-------------------------------------|---|-------------------------|------------------------------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| 11. Battery Switch | Huanli Electronics Co., Ltd. | PSY-22BF-11EP/S 24V G | -25°C ~+55°C, U _i : 250V, U _e /I _e : 24V/3A | - | - |
| -Alternative | Onpow Push Button Manufacture Co., Ltd. | ONPOW6122 (ONPOW6122F-11ET/G/24V/S) | -25°C ~+55°C, U _i : 250V, U _e /I _e : 24V/3A | EN61058-1:2018 | UDEM M.2022.206. C74012 |
| 12.Connector for P+ P- | Shenzhen Connection Electronic Co., Ltd. | ES08-P25S-02-BK | 1000VDC, I _{MAX} : 150A, 40°C~125°C | PPP 51090A:2018 | TÜV SÜD Z2 1083380006 Rev.00 |
| - Plastic part of connector for P+ P- | Celanese (Suzhou) Engineering Plastics Co Ltd | A 63 V0GV(ee)(f1) | PA66, V-0, 0.75mm 130°C | UL 746 | UL E331274 |
| -Alternative | Huizhou Futronics Electronic Technology Co.,Ltd | FSP240160CN-UA62A | Rated Voltage: 1000VDC; Rated Current: 125A, Operating Temperature: -40°C~125°C | PPP 51090A:2018 | TÜV SÜD Z211677600 06 Rev.00 |
| - Plastic part of alternative connector for P+ P- | Celanese (Suzhou) Engineering Plastics Co Ltd | A 63 V0GV(ee)(f1) | PA66, V-0, 0.75mm 130°C | UL 746 | UL E331274 |
| 13. Copper busbar | Jiangmeng JEESENG ENERGY GROUP CO.,LTD. | JS-T-23091510001 | Copper, Width: 23mm | - | - |
| 14. Wiring for Connector (B+, B-) | GUANGDONG MINZAN INDUSTRIAL CO LTD | 1007 | 4AWG, 600V, 200°C | UL 758 | UL E531469 |
| -Alternative | Dongguan Guangtong New Energy Technology Co Ltd | 1330 | 4AWG, 600V, 200°C | UL 758 | UL E528852 |
| 15. Wiring for connecting | GUANGDONG MINZAN INDUSTRIAL CO LTD | 1000mm-16Px2-2.2S-tin/5NTC-16S-1.0 | 6AWG, 600V, 200°C | - | - |
| 16.Rectifier bridge | ZHEJIANG JINGLI RECTIFIER CO.,LTD. | MD (MDK200A1600V) | I _F : 200A, V _{RRM} : 500V-2500V, I _{FSM} :6KA | EN 61558-1:2005+A1:2009 | GTS CLZJ191118 20766 |
| 17.Case | Jiangmeng JEESENG ENERGY GROUP CO.,LTD. | PACK_A | SGCC, Thickness:1.4mm | - | - |

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|---|--|---|---|-----------------|---|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| Rechargeable Li-ion Battery Module, model no. JEEDDMK512100-1 | | | | | |
| 1.Cell | EVE Power Co., Ltd. | LF100LA | 3.2Vd.c., 102Ah | IEC 62619: 2022 | Cert. no.: SG PSB-BT-03455, Report no.: 085-282260325-000 |
| 2.BMU | SHENZHEN PACE ELECTRONICS CO., LTD | BMU-18081C (Software version: BMU-20553-1.5, Hardware version: SCH-SST22-0553-1.5); | - | - | - |
| - PCB material | KINGBOARD LAMINATES HOLDINGS LTD | KB-6160C | 130°C, V-0 | UL 796 | UL E123995 |
| -Alternative | SHENGYI TECHNOLOGY CO LTD | S1600 | 130°C, V-0 | UL 796 | UL E109769 |
| - IC for MCU (UM1) | ST | STM32F072CB T6 | Supply voltage: 2V-3.6V, T _{opr} : -40°C to 85°C | - | - |
| -IC for WDT (U4) | Shengbang Microelectronics (Beijing) Co., LTD | SGM706B | Supply voltage: 0.3-6V T _{opr} : -40°C to 125°C | - | - |
| - IC for AFE (U1) | Aerosemi | MT9813 | Supply voltage: 10V~90V, T _{opr} : -40°C to 85°C | - | - |
| -IC for MCU power (UL3) | Belling | BL8072 | V _{in} :0~20V, OUT PUT: 3.3V, 2A, T _{opr} : -40°C to 85°C | - | - |
| -IC for isolation (UA1) | Shanghai Chipanalog Microelectronics Co., Ltd. | CA-IS3841HWW | Supply voltage: 2.5V-5.5V, T _{opr} : -40°C to 125°C | - | - |
| -Optocoupler (ISO2) | ENERLIGHT | CNY65 | Supply voltage: 1.25V, I _F : 60mA, Viso: 5000Vrms, T _{opr} : -55°C to 110°C | - | - |
| -IC for DCDC (UL2) | XLSEMI | XL4301E1 | Supply voltage: 8~40V OUT PUT :1.25~38V, 3A T _{opr} : -40°C to 150°C | - | - |
| -IC for Flash (UE1) | GigaDevice | GD25Q32ESIG | Supply voltage: 2.7-3.6V, T _{opr} : -65°C to 150°C | - | - |
| -Terminal (J2) | Yueqing Longsun Electric Co.,Ltd | 22011-20AW-1 | 2.2W, 2X10P PBT G40, T _{opr} : -40°C to 1125°C | - | - |

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|---|---|------------------------------------|---|------------------|------------------------------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| 3. Plastic rack for cell | KINGBOARD LAMINATES HOLDINGS LTD | KB-6150C | FR-4.0, V-0, T _{MIN} :0.63mm, 130°C | - | - |
| 4.Connector for P+ P- | Shenzhen Connection Electronic Co., Ltd. | ES08-P25S-02-BK | 1000VDC, I _{MAX} : 150A, 40°C~125°C | PPP 51090A:20 18 | TÜV SÜD Z210833800 06 Rev.00 |
| - Plastic part of connector for P+ P- | Celanese (Suzhou) Engineering Plastics Co Ltd | A 63 V0GV(ee)(f1) | PA66, V-0, 0.75mm 130°C | UL 746 | UL E331274 |
| -Alternative | Huizhou Futronics Electronic Technology Co.,Ltd | FSP240160CN-UA62A | Rated Voltage: 600V DC; Rated Current: 125A, Withstand Voltage: 2210V AC; Operating Temperature: -40°C~85°C | PPP 51090A:20 18 | TÜV SÜD Z211677600 06 Rev.00 |
| - Plastic part of alternative connector for P+ P- | Celanese (Suzhou) Engineering Plastics Co Ltd | A 63 V0GV(ee)(f1) | PA66, V-0, 0.75mm 130°C | UL 746 | UL E331274 |
| 5. Wiring for Connector (B+, B-) | GUANGDONG MINZAN INDUSTRIAL CO LTD | 1007 | 4AWG, 600V, 200°C | UL 758 | UL E531469 |
| -Alternative | Dongguan Guangtong New Energy Technology Co Ltd | 1330 | 4AWG, 600V, 200°C | UL 758 | UL E528852 |
| 6. Wiring for connecting | GUANGDONG MINZAN INDUSTRIAL CO LTD | 1000mm-16Px2-2.2S-tin/5NTC-16S-1.0 | 6AWG, 600V, 200°C | - | - |
| 7.Wiring for voltage sampling | NICTRON MANUFACTORY CHINA Co.,LTD | 1000mm-16Px2-2.2S-tin/5NTC-16S-1.0 | 24AWG, 300V 105°C | - | - |
| -Alternative | DONGGUAN ZHIHE ELECTRICAL CABLE TECH CO LTD | 1330 | 20AWG, 600V, 200°C | UL 758 | UL E258239 |
| 8.Wiring for temperature sampling | DONGGUAN BOLI ELECTRONIC CO LTD | 4413 (MF53-103F-3435-1600L) | 24AWG, 300V 150°C | UL 758 | UL E305164 |

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|---|---|--------------------------|---|-----------------|---------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| 9.NTC (5PCS) | Sunlord SHENZHEN SUNLORD ELECTRONICS CO LTD | SDNT1608X10 3F3450FTF | R ₂₅ =10kΩ±1%, B25/85: 3450K ±1%, T _{opr} :-55 to 125°C | - | - |
| 10.Case | Jiangmeng JEESENG ENERGY GROUP CO.,LTD. | SGCC | SGCC, Thickness: 1.4mm | - | - |
| Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | |

| 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 ± 5°C) | OCV at start of test (V dc) | Resistance of Circuit (mΩ) | Maximum Case Temperature Rise ΔT (°C) | Results | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |

Supplementary information:
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 |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |

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): _____

| IEC 62619 | | | |
|-----------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 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 | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |

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 | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |
| - | - | - | - | - | |

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): __

| IEC 62619 | | | |
|-----------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 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: | | | | | | |
| <p>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</p> <p>2) If the battery system has no outer covering, the manufacturer is required to specify the area for fire protection.</p> | | | | | | |
| <p>Results:</p> <p>A – No fire external to DUT enclosure or area for fire protection or no battery case rupture</p> <p>B – Fire external to DUT enclosure or area for fire protection</p> <p>C – Explosion</p> <p>D – Battery case rupture</p> <p>E – Other (Please explain): ___</p> | | | | | | |

| 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 |
| Battery 1 | 2.972 | 75 | 112.697 | 3.515 | A, D, F |
| | | | Charge Voltage Applied Battery System: 1) | | |
| | | | Whole | Part | |
| | | | 137.28 | - | |
| 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): ____ | | | | | |

| IEC 62619 | | | |
|-----------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 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 |
| Battery 1 | 94.962 | 120 | 101.423 | 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): _____ | | | | |

| 8.2.4 | TABLE: Overheating control (battery system) | | | P |
|---|---|--|---|---|
| Model No. | OCV at start(SOC 50%) of test, V dc | Maximum Charging Current, A | Measured Maximum Charging Voltage, V dc | |
| Battery 1 | 105.594 | 70 | 108.791 | |
| Maximum Specified Temperature of Battery System, °C | | Maximum Measured Cell Case Temperature, °C | Results | |
| 45 | | 51.8 | 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): _____ | | | | |

| IEC 62619 | | | |
|-----------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 9 | TABLE: EMC | | | | | N/A |
|---|---------------|-------------------|----------------------------|---------------------|---------|-----|
| Standard used for EMC test: | | | | | | |
| Sample No. | EMC Test Item | Battery Condition | EMC Test Level/ Parameters | Compliance Criteria | Results | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| - | - | - | - | - | - | |
| <p>Supplementary information:</p> <p>Battery Condition During EMC test</p> <p>1 – In Operation Mode, [] Supplied at _____, [] Load at _____</p> <p>2 – In non-operation Mode, Battery state of charge (SOC) before test at around _____</p> <p>Compliance Criteria and Test Results:</p> <p>A – No fire or Explosion</p> <p>B – Fire</p> <p>C – Explosion</p> <p>D – Battery system did operate as intended during the test.</p> <p>E - All function of battery system did operate as intended after the test.</p> <p>F - All function of battery system did not operate as intended during the test, (Please explain): _____</p> <p>G - Other (Please explain): _____</p> | | | | | | |

--- End ---