



中国认可
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检测
TESTING
CNAS L4065



TEST REPORT

Product: Lithium Manganese Dioxide Battery

Model and/or Type: CR123A

Ratings: 3.0V, 1500mAh

Report No. WHFAT20220516CE01

Test Classification : Commission test

Issue Date: 2022-06-24

Tested by
XiaoFangXing
Test Engineer

Reviewed by
Albert Yip
Audit Engineer

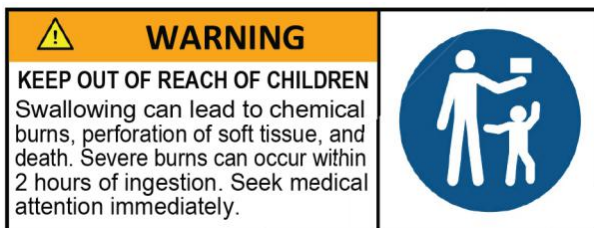
Approved by
Ku Hongbin
Approval Engineer

Guangzhou MCM Certification & Testing Co., Ltd.
广州邦禾检测技术有限公司

| General Information | |
|------------------------------------|---|
| Application Information: | |
| Applicant | Wuhan Fanso Technology Co., Ltd. |
| Address | YONGFENG AVENUE, HANYANG DISTRICT, WUHAN CITY, Hubei, P.R.China |
| Telephone | 18627884463 |
| E-mail | 4458879476@qq.com |
| General Information: | |
| Test Item Description | Lithium Manganese Dioxide Battery |
| Trade Mark | N/A |
| Model and/or Type | CR123A |
| Nominal Capacity | 1500mAh |
| Nominal Voltage | 3.0V |
| Manufacturer | Wuhan Fanso Technology Co., Ltd. |
| Address | YONGFENG AVENUE, HANYANG DISTRICT, WUHAN CITY, Hubei, P.R.China |
| Factory | Wuhan Fanso Technology Co., Ltd. |
| Address | YONGFENG AVENUE, HANYANG DISTRICT, WUHAN CITY, Hubei, P.R.China |
| Testing Laboratory: | |
| Laboratory | Guangzhou MCM Certification & Testing Co., Ltd. |
| Address | Building 2 No. 45 Zhong Er Section of Shiguang Road, Zhongcun Street, Panyu District, Guangzhou City, Guangdong Province, China. |
| Testing Location | 1 F No.13, Zhong San Section, ShiGuang Road, Panyu District, Guangzhou City, Guangdong Province, China |
| Test Specification: | |
| Standard | IEC 60086-4: 2019 Primary batteries -Part 4: Safety of lithium batteries |
| Procedure Deviation | N/A |
| Test Procedure | N/A |

Label:

The artwork below may be only a draft.



Remark: The warning label will be marked on the immediate package.

Technology Information:

| | Cell | Battery |
|---------------------------|---------|---------|
| Model | CR123A | -- |
| Rated Capacity | 1500mAh | -- |
| Nominal Voltage | 3.0V | -- |
| Nominal Discharge Current | 5.0mA | -- |
| Maximum Discharge Current | 1000mA | -- |
| Cut-Off Voltage | 2.0V | -- |
| Abnormal Charge Current | 5.0mA | -- |

Construction (unit: mm):



Remark :

The product fulfils the requirements of EN 60086-4: 2019.

Test Conclusion

| Clause | Test Item | Cell | Battery | Test Result |
|--------|--------------------------------|-----------|---------|-------------|
| 6.4.1 | Test A: Altitude | C1#~ C20# | / | P |
| 6.4.2 | Test B: Thermal cycling | C1#~ C20# | / | P |
| 6.4.3 | Test C: Vibration | C1#~ C20# | / | P |
| 6.4.4 | Test D: Shock | C1#~ C20# | / | P |
| 6.5.1 | Test E: External short-circuit | C1#~ C20# | / | P |
| 6.5.2 | Test F: Impact | / | / | N/A |
| 6.5.3 | Test G: Crush | C21#~C30# | / | P |
| 6.5.4 | Test H: Forced discharge | C31#~C40# | / | P |
| 6.5.5 | Test I: Abnormal charging | C41#~C45# | / | P |
| 6.5.6 | Test J: Free fall | C46#~C50# | / | P |
| 6.5.7 | Test K: Thermal abuse | C51#~C55# | / | P |
| 6.5.8 | Test L: Incorrect installation | C56#~C60# | / | P |
| 6.5.9 | Test M: Overdischarge | C61#~C70# | / | P |

Ambient Temperature: 20± 5°C
 Receiving Date: 2022-05-16
 Test Start Date: 2022-05-16
 Test End Date: 2022-06-14

Test conclusion:

The Lithium Manganese Dioxide Batteries submitted by Wuhan Fanso Technology Co., Ltd. have passed the test items of IEC 60086-4:2019 Primary batteries -Part 4: Safety of lithium batteries.

Seal:

| IEC 60086-4 | | | |
|-------------|--|--|----------|
| Clause | Requirements | Result + Remark | Verdict |
| 4 | PARAMETER MEASUREMENT TOLERANCES | | P |
| 4.1 | Design | | P |
| | a) Abnormal temperature rise above the critical value prevented | | N/A |
| | b) Temperature increases in the battery controlled | | N/A |
| | c) Lithium cells and batteries designed to relieve excessive internal pressure or to preclude a violent rupture under conditions of transport, intended use and reasonably foreseeable misuse | Pressure relieving device exists. | P |
| 4.2 | Quality plan | | P |
| | Manufacturer prepared and implemented a quality plan defining the procedures for the inspection of materials, components, cells and batteries during the course of manufacture, to be applied to the total process of producing a specific type of battery | ISO 9001: 2015 certificate provide. | P |
| | Manufactures understood their process capabilities and instituted the necessary process controls as they relate to product safety | | P |
| 5 | TYPE TESTING AND SAMPLING | | P |
| 5.1 | Validity of testing | | P |
| 5.2 | Test samples | (See table 1 in the standard) | P |
| 6 | TESTING AND REQUIREMENTS | | P |
| 6.1 | General | | P |
| 6.1.1 | Test application matrix | (See table 2 in the standard) | P |
| | s: cell or single cell battery | Cell only | P |
| | m: multi cell battery | | N/A |
| 6.1.3 | Ambient temperature (°C)..... | 20°C±5°C | P |
| 6.1.4 | Parameter measurement tolerances | | P |
| 6.1.5 | Predischarge | Predischarged cells provided by manufacturer | P |
| 6.1.6 | Additional cells | | P |
| 6.2 | Evaluation of test criteria | | P |
| 6.2.1 | Short-circuit | | P |
| 6.2.2 | Excessive temperature rise | | P |
| 6.2.3 | Leakage | | P |
| 6.2.4 | Venting | | P |
| 6.2.5 | Fire | | P |
| 6.2.6 | Rupture | | P |
| 6.2.7 | Explosion | | P |
| 6.3 | Tests and requirements – Overview | (See table 4 in the standard) | P |

| IEC 60086-4 | | | |
|-------------|--|--|----------|
| Clause | Requirements | Result + Remark | Verdict |
| 6.4 | Tests for intended use | | P |
| 6.4.1 | Test A: Altitude | (See appended table 6.4.1) | P |
| 6.4.2 | Test B: Thermal cycling | (See appended table 6.4.2) | P |
| 6.4.3 | Test C: Vibration | (See appended table 6.4.3) | P |
| 6.4.4 | Test D: Shock | (See appended table 6.4.4) | P |
| 6.5 | Tests for reasonably foreseeable misuse | | P |
| 6.5.1 | Test E: External short-circuit..... | (See appended table 6.5.1) | P |
| 6.5.2 | Test F: Impact | (See appended table 6.5.2) | N/A |
| 6.5.3 | Test G: Crush | (See appended table 6.5.3) | P |
| 6.5.4 | Test H: Forced discharge..... | (See appended table 6.5.4) | P |
| 6.5.5 | Test I: Abnormal charging | (See appended table 6.5.5) | P |
| 6.5.6 | Test J: Free fall..... | (See appended table 6.5.6) | P |
| 6.5.7 | Test K: Thermal abuse | (See appended table 6.5.7) | P |
| 6.5.8 | Test L: Incorrect installation..... | (See appended table 6.5.8) | P |
| 6.5.9 | Test M: Overdischarge | (See appended table 6.5.9) | P |
| 6.6 | Information given in the relevant specification | | P |
| | a) Predischarge current or resistive load and end-point voltage specified by the manufacturer..... | 5.0mA current discharge to 2.0V. | P |
| | b) Method to measure the energy of an explosion, if any..... | | P |
| | c) Shape: prismatic, flexible, coin or cylindrical Diameter: less than 18 mm or not less than 18 mm | Cylindrical cell, and diameter is less than 18mm | P |
| | d) Maximum continuous discharge current specified by the manufacturer for test H..... | 1000mA as specified by manufacturer applied. | P |
| | e) Rated capacity specified by the manufacturer for test H..... | 1500mAh | P |
| | f) Abnormal charging current declared by the manufacturer for test I | 5.0mA as specified by manufacturer applied. | P |
| | g) Normal reverse current declared by the manufacturer which applied to the battery during its operating life..... | Not applicable declared by manufacturer, reverse current is not allowed for the battery. | N/A |
| 7 | INFORMATION FOR SAFETY | | P |
| 7.1 | Safety precautions during design of equipment | | P |
| 7.1.1 | General | | P |
| 7.1.2 | Charge protection | Information for safety mentioned in manufacturer's specifications. | P |
| 7.1.3 | Parallel connection | Information for safety mentioned in manufacturer's specifications. | P |

| IEC 60086-4 | | | |
|-------------|---|---|---------|
| Clause | Requirements | Result + Remark | Verdict |
| 7.2 | Precautions during handling of batteries | | P |
| 7.3 | Packaging | | P |
| 7.4 | Handling of battery cartons | | P |
| 7.5 | Transport | UN 38.3 test report provided. | P |
| 7.5.1 | General | | P |
| 7.5.2 | Air transport | | P |
| 7.5.3 | Sea transport | | P |
| 7.5.4 | Land transport | | P |
| 7.6 | Display and storage | Information for display and storage mentioned in manufacturer's specifications. | P |
| 7.7 | Disposal | Information for disposal mentioned in manufacturer's specifications. | P |
| 8 | INSTRUCTIONS FOR USE | Information in manufacturer's specifications. | P |
| 9 | MARKING AND PACKAGING | | P |
| 9.1 | General | | P |
| 9.2 | Swallowable batteries | | P |
| 9.3 | Safety pictograms | Marked on the immediate package | P |
| ANNEX A | (INFORMATIVE) GUIDELINES FOR THE ACHIEVEMENT OF SAFETY OF LITHIUM BATTERIES | | N/A |
| ANNEX B | (INFORMATIVE) GUIDELINES FOR DESIGNERS OF EQUIPMENT USING LITHIUM BATTERIES | | N/A |
| ANNEX C | (INFORMATIVE) ADDITIONAL INFORMATION ON DISPLAY AND STORAGE | Reference to 7.6 | P |
| ANNEX D | (INFORMATIVE) SAFETY PICTOGRAMS | Information in terminal consumer specification or the immediate package. | P |
| D.1 | General | | P |
| D.2 | Pictograms | | P |
| D.3 | Instruction for use | | P |
| ANNEX E | (NORMATIVE) CHILD RESISTANT PACKAGING OF COIN CELLS | | N/A |
| E.1 | General | | N/A |
| E.2 | Applicability | | N/A |
| E.3 | Packaging tests | | N/A |
| E.3.1 | General | | N/A |
| E.3.2 | Test items | | N/A |

| IEC 60086-4 | | | |
|----------------|---|--|---------|
| Clause | Requirements | Result + Remark | Verdict |
| E.3.3 | Test procedure | | N/A |
| E.3.4 | Criteria | | N/A |
| ANNEX F | (INFORMATIVE) USE OF THE KEEP OUT OF REACH OF CHILDREN SAFETY SIGN | Information in terminal consumer specification or the immediate package. | P |
| F.1 | General | | P |
| F.2 | Safety sign | | P |
| F.3 | Best practices for marking the packaging | | P |
| F.4 | Best practices for marking the cell | | N/A |



Appendix Table

| TABLE: Critical components information | | | | | P |
|--|----------------------------------|--------------|---|-------------------|-------------------------------------|
| Object / part No. | Manufacturer / trademark | Type / model | Technical data | Standard | Mark(s) of conformity ¹⁾ |
| Cell | Wuhan Fanso Technology Co., Ltd. | CR123A | 3.0V, 1500mAh | IEC 60086-4: 2019 | Test with appliance |
| - Electrolyte | GT | ZR17 | PC+DME content $\geq 90\%$ | -- | -- |
| - Separator | CG | 0.025*30 | PP+PE+PP, Shutdown temperature: 135~160°C | -- | -- |
| - Negative electrode | GF | 0.165*24 | Metal lithium. content $\geq 99.9\%$ | -- | -- |
| - Positive electrode | XTDH | HEMD | Manganese Dioxide $\geq 91\%$ | -- | -- |
| Supplementary information: | | | | | |
| ¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | |



Appendix Table

| 6.4.1 | TABLE: Test A: Altitude | | | | | Pass | |
|---|-------------------------|-------------|------------|-------------|---------------|------------------|---------|
| Sample No. | Before test | | After test | | Mass loss (%) | Voltage drop (%) | Results |
| | Mass (g) | Voltage (V) | Mass (g) | Voltage (V) | | | |
| Undischarged | | | | | | | |
| C1# | 17.661 | 3.277 | 17.661 | 3.277 | 0.000 | 100.00 | P |
| C2# | 17.334 | 3.243 | 17.333 | 3.243 | 0.006 | 100.00 | P |
| C3# | 17.447 | 3.298 | 17.447 | 3.298 | 0.000 | 100.00 | P |
| C4# | 17.654 | 3.261 | 17.654 | 3.261 | 0.000 | 100.00 | P |
| C5# | 17.509 | 3.244 | 17.509 | 3.244 | 0.000 | 100.00 | P |
| C6# | 17.374 | 3.221 | 17.374 | 3.221 | 0.000 | 100.00 | P |
| C7# | 17.926 | 3.212 | 17.925 | 3.212 | 0.006 | 100.00 | P |
| C8# | 17.402 | 3.296 | 17.402 | 3.296 | 0.000 | 100.00 | P |
| C9# | 17.357 | 3.236 | 17.357 | 3.236 | 0.000 | 100.00 | P |
| C10# | 17.015 | 3.250 | 17.015 | 3.250 | 0.000 | 100.00 | P |
| Fully discharged | | | | | | | |
| C11# | 17.589 | 2.787 | 17.589 | 2.794 | 0.000 | 100.25 | P |
| C12# | 17.496 | 2.745 | 17.495 | 2.753 | 0.006 | 100.29 | P |
| C13# | 17.373 | 2.768 | 17.373 | 2.776 | 0.000 | 100.29 | P |
| C14# | 17.735 | 2.717 | 17.735 | 2.725 | 0.000 | 100.29 | P |
| C15# | 17.501 | 2.756 | 17.501 | 2.763 | 0.000 | 100.25 | P |
| C16# | 17.063 | 2.732 | 17.062 | 2.736 | 0.006 | 100.15 | P |
| C17# | 17.724 | 2.748 | 17.724 | 2.752 | 0.000 | 100.15 | P |
| C18# | 17.290 | 2.765 | 17.290 | 2.771 | 0.000 | 100.22 | P |
| C19# | 17.794 | 2.781 | 17.794 | 2.789 | 0.000 | 100.29 | P |
| C20# | 17.042 | 2.714 | 17.042 | 2.722 | 0.000 | 100.29 | P |
| Supplementary information: | | | | | | | |
| - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire. | | | | | | | |

Appendix Table

| 6.4.2 | TABLE: Test B: Thermal cycling | | | | | Pass | |
|---|--------------------------------|-------------|------------|-------------|---------------|------------------|---------|
| Sample No. | Before test | | After test | | Mass loss (%) | Voltage drop (%) | Results |
| | Mass (g) | Voltage (V) | Mass (g) | Voltage (V) | | | |
| Undischarged | | | | | | | |
| C1# | 17.661 | 3.277 | 17.658 | 3.268 | 0.017 | 99.73 | P |
| C2# | 17.333 | 3.243 | 17.331 | 3.232 | 0.012 | 99.66 | P |
| C3# | 17.447 | 3.298 | 17.445 | 3.288 | 0.011 | 99.70 | P |
| C4# | 17.654 | 3.261 | 17.651 | 3.253 | 0.017 | 99.75 | P |
| C5# | 17.509 | 3.244 | 17.507 | 3.234 | 0.011 | 99.69 | P |
| C6# | 17.374 | 3.221 | 17.371 | 3.216 | 0.017 | 99.84 | P |
| C7# | 17.925 | 3.212 | 17.921 | 3.203 | 0.022 | 99.72 | P |
| C8# | 17.402 | 3.296 | 17.398 | 3.283 | 0.023 | 99.61 | P |
| C9# | 17.357 | 3.236 | 17.352 | 3.221 | 0.029 | 99.54 | P |
| C10# | 17.015 | 3.250 | 17.011 | 3.244 | 0.024 | 99.82 | P |
| Fully discharged | | | | | | | |
| C11# | 17.589 | 2.794 | 17.587 | 2.903 | 0.011 | 103.90 | P |
| C12# | 17.495 | 2.753 | 17.492 | 2.954 | 0.017 | 107.30 | P |
| C13# | 17.373 | 2.776 | 17.370 | 2.962 | 0.017 | 106.70 | P |
| C14# | 17.735 | 2.725 | 17.731 | 2.978 | 0.023 | 109.28 | P |
| C15# | 17.501 | 2.763 | 17.498 | 2.939 | 0.017 | 106.37 | P |
| C16# | 17.062 | 2.736 | 17.058 | 2.962 | 0.023 | 108.26 | P |
| C17# | 17.724 | 2.752 | 17.722 | 2.995 | 0.011 | 108.83 | P |
| C18# | 17.290 | 2.771 | 17.288 | 2.988 | 0.012 | 107.83 | P |
| C19# | 17.794 | 2.789 | 17.791 | 2.938 | 0.017 | 105.34 | P |
| C20# | 17.042 | 2.722 | 17.038 | 2.976 | 0.023 | 109.33 | P |
| Supplementary information: | | | | | | | |
| - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire. | | | | | | | |

Appendix Table

| 6.4.3 | TABLE: Test C: Vibration | | | | | Pass | |
|---|--------------------------|-------------|------------|-------------|---------------|------------------|---------|
| Sample No. | Before test | | After test | | Mass loss (%) | Voltage drop (%) | Results |
| | Mass (g) | Voltage (V) | Mass (g) | Voltage (V) | | | |
| Undischarged | | | | | | | |
| C1# | 17.658 | 3.268 | 17.657 | 3.268 | 0.006 | 100.00 | P |
| C2# | 17.331 | 3.232 | 17.331 | 3.231 | 0.000 | 99.97 | P |
| C3# | 17.445 | 3.288 | 17.445 | 3.288 | 0.000 | 100.00 | P |
| C4# | 17.651 | 3.253 | 17.650 | 3.253 | 0.006 | 100.00 | P |
| C5# | 17.507 | 3.234 | 17.507 | 3.234 | 0.000 | 100.00 | P |
| C6# | 17.371 | 3.216 | 17.371 | 3.216 | 0.000 | 100.00 | P |
| C7# | 17.921 | 3.203 | 17.921 | 3.202 | 0.000 | 99.97 | P |
| C8# | 17.398 | 3.283 | 17.397 | 3.283 | 0.006 | 100.00 | P |
| C9# | 17.352 | 3.221 | 17.352 | 3.221 | 0.000 | 100.00 | P |
| C10# | 17.011 | 3.244 | 17.011 | 3.244 | 0.000 | 100.00 | P |
| Fully discharged | | | | | | | |
| C11# | 17.587 | 2.903 | 17.587 | 2.906 | 0.000 | 100.10 | P |
| C12# | 17.492 | 2.954 | 17.491 | 2.956 | 0.006 | 100.07 | P |
| C13# | 17.370 | 2.962 | 17.370 | 2.966 | 0.000 | 100.14 | P |
| C14# | 17.731 | 2.978 | 17.731 | 2.981 | 0.000 | 100.10 | P |
| C15# | 17.498 | 2.939 | 17.497 | 2.942 | 0.006 | 100.10 | P |
| C16# | 17.058 | 2.962 | 17.058 | 2.964 | 0.000 | 100.07 | P |
| C17# | 17.722 | 2.995 | 17.722 | 2.998 | 0.000 | 100.10 | P |
| C18# | 17.288 | 2.988 | 17.288 | 2.992 | 0.000 | 100.13 | P |
| C19# | 17.791 | 2.938 | 17.791 | 2.943 | 0.000 | 100.17 | P |
| C20# | 17.038 | 2.976 | 17.038 | 2.983 | 0.000 | 100.24 | P |
| Supplementary information: | | | | | | | |
| - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire. | | | | | | | |

Appendix Table

| 6.4.4 | TABLE: Test D: Shock | | | | | Pass | |
|---|----------------------|-------------|------------|-------------|---------------|------------------|---------|
| Sample No. | Before test | | After test | | Mass loss (%) | Voltage drop (%) | Results |
| | Mass (g) | Voltage (V) | Mass (g) | Voltage (V) | | | |
| Undischarged | | | | | | | |
| C1# | 17.657 | 3.268 | 17.656 | 3.268 | 0.006 | 100.00 | P |
| C2# | 17.331 | 3.231 | 17.331 | 3.231 | 0.000 | 100.00 | P |
| C3# | 17.445 | 3.288 | 17.445 | 3.288 | 0.000 | 100.00 | P |
| C4# | 17.650 | 3.253 | 17.649 | 3.253 | 0.006 | 100.00 | P |
| C5# | 17.507 | 3.234 | 17.507 | 3.234 | 0.000 | 100.00 | P |
| C6# | 17.371 | 3.216 | 17.371 | 3.216 | 0.000 | 100.00 | P |
| C7# | 17.921 | 3.202 | 17.921 | 3.202 | 0.000 | 100.00 | P |
| C8# | 17.397 | 3.283 | 17.397 | 3.283 | 0.000 | 100.00 | P |
| C9# | 17.352 | 3.221 | 17.351 | 3.221 | 0.006 | 100.00 | P |
| C10# | 17.011 | 3.244 | 17.011 | 3.244 | 0.000 | 100.00 | P |
| Fully discharged | | | | | | | |
| C11# | 17.587 | 2.906 | 17.587 | 2.906 | 0.000 | 100.00 | P |
| C12# | 17.491 | 2.956 | 17.491 | 2.957 | 0.000 | 100.03 | P |
| C13# | 17.370 | 2.966 | 17.370 | 2.966 | 0.000 | 100.00 | P |
| C14# | 17.731 | 2.981 | 17.731 | 2.981 | 0.000 | 100.00 | P |
| C15# | 17.497 | 2.942 | 17.497 | 2.943 | 0.000 | 100.03 | P |
| C16# | 17.058 | 2.964 | 17.058 | 2.964 | 0.000 | 100.00 | P |
| C17# | 17.722 | 2.998 | 17.722 | 2.998 | 0.000 | 100.00 | P |
| C18# | 17.288 | 2.992 | 17.288 | 2.993 | 0.000 | 100.03 | P |
| C19# | 17.791 | 2.943 | 17.791 | 2.943 | 0.000 | 100.00 | P |
| C20# | 17.038 | 2.983 | 17.038 | 2.983 | 0.000 | 100.00 | P |
| Supplementary information: | | | | | | | |
| - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire. | | | | | | | |

Appendix Table

| 6.5.1 | TABLE: Test E: External short-circuit | | | | Pass | |
|---|---------------------------------------|-----------------------------|-----------------------------|---|---------|--|
| Sample No. | Ambient, (°C) | OCV at start of test, (Vdc) | Resistance of circuit, (mΩ) | Maximum case temperature rise ΔT , (°C) | Results | |
| Undischarged | | | | | | |
| C1# | 55.9 | 3.217 | 82.6 | 96.4 | P | |
| C2# | 55.9 | 3.258 | 83.1 | 95.2 | P | |
| C3# | 55.9 | 3.268 | 84.0 | 92.3 | P | |
| C4# | 55.9 | 3.278 | 84.4 | 95.5 | P | |
| C5# | 55.8 | 3.292 | 84.3 | 92.2 | P | |
| C6# | 55.8 | 3.253 | 83.2 | 91.3 | P | |
| C7# | 55.8 | 3.270 | 83.6 | 97.4 | P | |
| C8# | 55.8 | 3.274 | 88.0 | 98.1 | P | |
| C9# | 55.8 | 3.279 | 87.6 | 95.7 | P | |
| C10# | 55.8 | 3.287 | 83.8 | 92.5 | P | |
| Fully discharged | | | | | | |
| C11# | 56.1 | 2.707 | 85.4 | 64.4 | P | |
| C12# | 56.1 | 2.790 | 87.8 | 60.9 | P | |
| C13# | 56.1 | 2.781 | 87.7 | 61.8 | P | |
| C14# | 56.1 | 2.739 | 87.4 | 63.6 | P | |
| C15# | 56.1 | 2.724 | 85.7 | 61.3 | P | |
| C16# | 55.7 | 2.723 | 85.5 | 60.3 | P | |
| C17# | 55.7 | 2.720 | 83.6 | 61.2 | P | |
| C18# | 55.7 | 2.706 | 86.5 | 63.0 | P | |
| C19# | 55.7 | 2.736 | 84.4 | 62.8 | P | |
| C20# | 55.7 | 2.756 | 84.8 | 63.1 | P | |
| Supplementary information: | | | | | | |
| - No excessive temperature rise (>170°C), no rupture, no explosion and no fire. | | | | | | |

Appendix Table

| 6.5.2 | TABLE: Test F: Impact | | | N/A |
|-----------------------------------|-----------------------|-----------------------------|---|---------|
| Sample No. | Ambient, (°C) | OCV at start of test, (Vdc) | Maximum case temperature rise ΔT , (°C) | Results |
| Undischarged | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Fully discharged | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Supplementary information: | | | | |

| 6.5.3 | TABLE: Test G: Crush | | | Pass |
|---|----------------------|-----------------------------|---|---------|
| Sample No. | Ambient, (°C) | OCV at start of test, (Vdc) | Maximum case temperature rise ΔT , (°C) | Results |
| Undischarged | | | | |
| C21# | 22.7 | 3.298 | 24.9 | P |
| C22# | 22.7 | 3.220 | 24.4 | P |
| C23# | 22.7 | 3.231 | 25.0 | P |
| C24# | 22.7 | 3.214 | 24.2 | P |
| C25# | 22.7 | 3.297 | 24.1 | P |
| Fully discharged | | | | |
| C26# | 22.9 | 2.768 | 24.2 | P |
| C27# | 22.9 | 2.715 | 24.7 | P |
| C28# | 22.9 | 2.783 | 24.4 | P |
| C29# | 22.9 | 2.772 | 24.3 | P |
| C30# | 22.9 | 2.728 | 24.0 | P |
| Supplementary information: | | | | |
| - No excessive temperature rise (>170°C), no explosion and no fire. | | | | |

Appendix Table

| 6.5.4 | TABLE: Test H: Forced discharge | | | Pass |
|-----------------------------------|---------------------------------|------------------------------|------------------------|---------|
| Sample No. | OCV at start of test, (Vdc) | Max. discharge current, (mA) | Test duration, (Hours) | Results |
| Fully discharged | | | | |
| C31# | 2.743 | 1000 | 1.5 | P |
| C32# | 2.729 | 1000 | 1.5 | P |
| C33# | 2.761 | 1000 | 1.5 | P |
| C34# | 2.765 | 1000 | 1.5 | P |
| C35# | 2.726 | 1000 | 1.5 | P |
| C36# | 2.780 | 1000 | 1.5 | P |
| C37# | 2.774 | 1000 | 1.5 | P |
| C38# | 2.721 | 1000 | 1.5 | P |
| C39# | 2.795 | 1000 | 1.5 | P |
| C40# | 2.762 | 1000 | 1.5 | P |
| Supplementary information: | | | | |
| - No explosion and no fire. | | | | |

| 6.5.5 | TABLE: Test I: Abnormal charging | | | Pass |
|-----------------------------------|----------------------------------|--------------------------------|------------------------|---------|
| Sample No. | OCV at start of test, (Vdc) | Abnormal charging current (mA) | Test duration, (Hours) | Results |
| Undischarged | | | | |
| C41# | 3.205 | 5.0 | 250 | P |
| C42# | 3.203 | 5.0 | 250 | P |
| C43# | 3.210 | 5.0 | 250 | P |
| C44# | 3.207 | 5.0 | 250 | P |
| C45# | 3.219 | 5.0 | 250 | P |
| Supplementary information: | | | | |
| - No explosion and no fire. | | | | |

Appendix Table

| 6.5.6 | TABLE: Test J: Free fall | | Pass |
|--|--------------------------|--------------------|---------|
| Sample No. | OCV before test (V) | OCV after test (V) | Results |
| Undischarged | | | |
| C46# | 3.207 | 3.206 | P |
| C47# | 3.201 | 3.200 | P |
| C48# | 3.215 | 3.215 | P |
| C49# | 3.207 | 3.207 | P |
| C50# | 3.203 | 3.203 | P |
| Supplementary information: - No venting, no explosion and no fire. | | | |

| 6.5.7 | TABLE: Test K: Thermal abuse | | Pass |
|--|------------------------------|--------------------|---------|
| Sample No. | OCV before test (V) | OCV after test (V) | Results |
| Undischarged | | | |
| C51# | 3.208 | 3.222 | P |
| C52# | 3.215 | 3.234 | P |
| C53# | 3.209 | 3.229 | P |
| C54# | 3.213 | 3.235 | P |
| C55# | 3.214 | 3.233 | P |
| Supplementary information: - No explosion and no fire. | | | |

| 6.5.8 | Test L: Incorrect installation | | | Pass |
|--|--------------------------------|-----------------------------|---|---------|
| Sample No. | OCV at start of test, (Vdc) | Resistance of circuit, (mΩ) | Maximum case temperature rise ΔT , (°C) | Results |
| Undischarged | | | | |
| C56# | 3.262 | 82.3 | 26.3 | P |
| C57# | 3.245 | 84.4 | 26.4 | P |
| C58# | 3.209 | 83.3 | 26.3 | P |
| C59# | 3.284 | 85.2 | 26.1 | P |
| C60# | 3.206 | 86.7 | 26.1 | P |
| Supplementary information: - No explosion and no fire. | | | | |

Appendix Table

| 6.5.9 | Test M: Overdischarge | | | Pass |
|--|-----------------------------|-------------------------------------|---|---------|
| Sample No. | OCV at start of test, (Vdc) | Resistance of circuit, (Ω) | Maximum case temperature rise ΔT , ($^{\circ}\text{C}$) | Results |
| 50% predischarged | | | | |
| C61# | 3.103 | 8.20 | 25.7 | P |
| C62# | 3.112 | 8.20 | 25.8 | P |
| C63# | 3.095 | 8.20 | 25.2 | P |
| C64# | 3.178 | 8.20 | 25.3 | P |
| C65# | 3.143 | 8.20 | 25.0 | P |
| 75% predischarged | | | | |
| C66# | 2.989 | 8.20 | 25.3 | P |
| C67# | 2.968 | 8.20 | 25.1 | P |
| C68# | 2.958 | 8.20 | 25.9 | P |
| C69# | 2.966 | 8.20 | 25.7 | P |
| C70# | 2.974 | 8.20 | 25.2 | P |
| Supplementary information: - No explosion and no fire. | | | | |



Appendix Table

Cell



Front view



Side view

-- End of the Report --

Important Note

1. The test report is invalid without the special seal for testing and Paging seal of Guangzhou MCM Certification & Testing Co., Ltd.
2. Nobody is allowed to partly photocopy this inspection report without written permission of Guangzhou MCM Certification & Testing Co., Ltd.
3. The test report is invalid without the signatures of Approver, Checker and Tester.
4. The test report is invalid if altered.
5. Objections to the test report must be submitted to Guangzhou MCM Certification & Testing Co., Ltd. within 15 days.
6. The test report is valid for the tested samples only.
7. As for the test result, "N/A" means "not applicable", "P" means "pass" and "F" means "fail".

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