中国认可
国际互认
检测
TESTING
CNAS L4595

TEST REPORT
IEC 60086-5
Primary Batteries
Part 5: Safety of batteries with aqueous electrolyte

Report reference No ..... :	LCSA11203251S
Date of issue ..... :	2023-12-21
Total number of pages ..... :	22 pages
Testing laboratory Name ..... :	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address ..... :	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing location ..... :	Same as above
Applicant's Name ..... :	SHENZHEN GMCELL TECHNOLOGY CO,.LTD.
Address ..... :	Hualian Panorama International Building, 27 District, Bao'an, Shenzhen, China

Test specification:

Standard..... :	IEC 60086-5:2021
Test procedure..... :	Type Test
Non-standard test method..... :	N/A
Test Report Form No..... :	IEC60086_5C
Test Report Form(s) Originator..... :	Intertek Semko AB
Master TRF..... :	Dated 2021-11-01

General disclaimer:
The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. The authenticity of this Test Report and its contents can be verified by contacting the Shenzhen LCS Compliance Testing Laboratory Ltd., responsible for this Test Report.

Test item description ..... :	Super Heavy Duty Battery
Trade mark ..... :	GMCELL
Manufacturer..... :	Same as Applicant
Model and/or type reference ..... :	R03P
Rating(s) ..... :	1.5V

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	**Testing Laboratory:**	Shenzhen LCS Compliance Testing Laboratory Ltd.
Testing location/ address..... :		Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Tested by (name, signature)..... :	**Mark Bo**	Mark Bo
Checked by(name, signature)..... :	**Dean Du**	Dean Du
Approved by (name, signature)..... :	**Hart Qiu**	Hart Qiu
☐	**Testing procedure: CTF Stage 1:**	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature)... :		
☐	**Testing procedure: CTF Stage 2:**	
Testing location/ address..... :		
Tested by (name + signature)..... :		
Witnessed by (name, function, signature).. :		
Approved by (name, function, signature)... :		
☐	**Testing procedure: CTF Stage 3:**	
☐	**Testing procedure: CTF Stage 4:**	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Witnessed by (name, function, signature).. :		
Approved by (name, function, signature)... :		
Supervised by (name, function, signature) :		

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

Attachment 1: Photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
6.1.1 Applicable safety tests; 6.3.2.2 Test B-1 – Transportation-shock; 6.3.2.3 Test B-2 – Transportation-vibration; 6.3.2.4 Test C – Climatic-temperature cycling; 6.4.2.1 Test D – Incorrect installation; 6.4.2.2 Test E– External short circuit; 6.4.2.3 Test F – Over discharge; 6.4.2.4 Test G – Free fall test; 7 Information for safety.	Shenzhen LCS Compliance Testing Laboratory Ltd. Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Summary of compliance with National Differences:

☒ **The product fulfils the requirements of EN IEC60086-5:2021**

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

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

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

Information on uncertainty of measurement:

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

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

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

Copy of marking plate:

The artwork below may be only a draft.

Alkaline Battery
Model: R03P
+ 1.5V YYYY/MM/DD -
Expiration of a recommended usage period: 5 year.
SHENZHEN GMCELL TECHNOLOGY CO,.LTD
WARNING:
Do not disassemble, puncture, crush, heat, or burn.

Remark:

1.For the date code YYYY/MM/DD:

“YYYY” means year for manufacture;

“MM” means month for manufacture;

“DD” means day for manufacture.

2.The applicant and manufacturer information, product name, model, trademark and other information in this report are all provided by the applicant, and this laboratory is not responsible for verifying its authenticity.

Test item particulars.....	:
Classification of installation and use.....	: To be defined in final product
Supply connection.....	: Electrode Tab
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.....	: 2023-12-05
Date (s) of performance of tests.....	: 2022-12-05 to 2023-12-19
General remarks:	
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 testing laboratory. "(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.**	
Name and address of factory (ies).....	: Same as Applicant

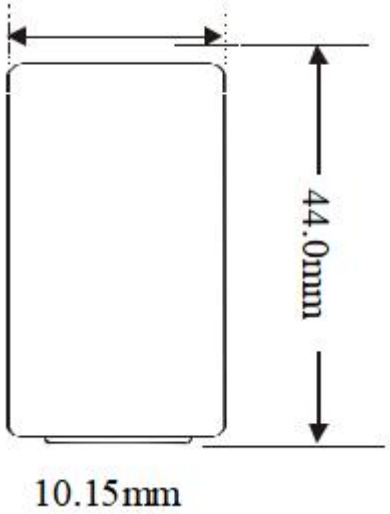
General product information:

This product is a single primary cell, and has no over-discharge, overcurrent and short-circuits proof circuit.

The main features of the cell are shown as below:

Model	Nominal voltage	Discharge Resistance	Cut-off Voltage
R03P	1.5V	10Ω	0.9V

Construction Unit (mm):



Cell (Unit: mm)

Circuit diagram:

N/A

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
4	**REQUIREMENTS FOR SAFETY**		P
4.1	**Design**		P
4.1.1	General		P
	Batteries shall be so designed that they do not present a safety hazard under conditions of normal (intended) use		P
4.1.2	Venting		P
	All batteries shall incorporate a pressure relief feature or shall be so constructed that they will relieve excessive internal pressure at a value and rate which will preclude explosion	Explosion-proof safety valve for venting exists.	P
	The battery case material and/or its final assembly shall be so designed that, in the event of one or more cells venting, the battery case does not present a hazard in its own right		N/A
4.2	**Quality plan**		P
	The manufacturer shall prepare 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	Complied. Quality plan provided.	P
5	**SAMPLING**		P
5.1	**General**		P
	Samples should be drawn from production lots in accordance with accepted statistical methods and shall meet the requirements specified for dimensions and open circuit voltage set forth in IEC 60086-2.	Provide by manufacturer.	P
5.2	**Sampling for type approval**		P
	The number of samples drawn for type approval is given in below,		P
	Open circuit voltage (n = 70) Dimensions (n = 70)		P
	Intended use A Partial use (n = 5) B-1 Transportation-shock (n = 5) B-2 Transportation-vibration (n = 5) C Climatic (n = 5) Reasonably foreseeable A misuse D Incorrect installation (n = 20)		P

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	E External short circuit (n = 5) F Overdischarge (n = 20) G Free fall (n = 5)		
5.3	**Validity of testing**		N/A
	Cells or batteries with aqueous electrolyte shall be subjected to the tests, as required in this document. Testing remains valid until a design change or requirement revision has been made. Retesting is required when:		N/A
	a) a battery specification changes by more than 0,1 g or 20 % mass, whichever is greater, for the cathode, anode or electrolyte;		N/A
	b) a battery specification change would lead to a failure of any of the tests;		N/A
	c) there is an addition of new tests or requirements;		N/A
	d) there is a requirement change that would lead to a failure of any of the tests.		N/A
6	**TESTING AND REQUIREMENTS**		P
6.1	**General**		P
6.1.1	Applicable safety tests		P
	Applicable safety tests are shown in Table 1		P
	The tests described in Tables 2 and 6 are intended to simulate conditions which the battery is likely to encounter during intended use and reasonably foreseeable misuse		P
6.1.2	Cautionary notice		P
6.1.3	Ambient temperature		P
	Unless otherwise specified, these tests shall be carried out at (20 ± 5) °C	Tests are carried out at 20°C ± 5°C.	P
6.2	**Evaluation of test criteria**		P
6.2.1	Explosion		P
	An explosion is considered to have occurred when there is an instantaneous release wherein solid matter from any part of the battery is propelled to a distance greater than 25 cm away from the battery.		P
6.2.2	Fire		P
	A fire is considered to have occurred if flames are emitted from a test cell or battery.		P
6.2.3	Leakage		P
	Leakage is considered to have occurred if there is an unplanned escape of electrolyte from a cell or battery.		P

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.4	Venting		P
	Venting is considered to have occurred if there is a release of excessive internal pressure from a cell or battery in a manner intended by design to preclude explosion.		P
6.3	**Intended use**		P
6.3.1	Intended use tests and requirements		P
6.3.2	Intended use test procedures		P
6.3.2.1	Test A – Storage after partial use		N/A
	An undischarged battery is discharged under an application or service output test condition, with the load defined in IEC 60086-2 resulting in the longest test duration until the service life falls by 50 % of the highest minimum average duration (MAD) value, followed by storage at (45 ± 2) °C for 30 days		N/A
	Results: no leakage, no fire and no explosion :		N/A
6.3.2.2	Test B-1 – Transportation-shock	Tested complied.	P
	The shock test shall be carried out under the conditions defined in Table 3 and the sequence in Table 4		P
	Results: no leakage, no fire and no explosion :	(See appended table)	P
6.3.2.3	Test B-2 – Transportation-vibration	Tested complied.	P
	The vibration test shall be carried out under the following test conditions and the sequence in Table 5		P
	Results: no leakage, no fire and no explosion :	(See appended table)	P
6.3.2.4	Test C – Climatic-temperature cycling	Tested complied.	P
	Temperature cycling procedure (see 1) to 7) and/or Figure 2)		P
	Result: no fire and no explosion :	(See appended table)	P
6.4	**Reasonably foreseeable misuse**		P
6.4.1	Reasonably foreseeable misuse tests and requirements		P
6.4.2	Reasonably foreseeable misuse test procedures		P
6.4.2.1	Test D – Incorrect installation (four batteries in series)	Tested complied.	P
	The circuit were complete for - 24 hours elapsed, or		N/A
	- until the battery case temperature has returned to ambient		P
	Results: no fire and no explosion :	(See appended table)	P
6.4.2.2	Test E – External short circuit	Tested complied.	P

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	The circuit were complete for - 24 hours elapsed, or		N/A
	- until the battery case temperature has returned to ambient		P
	Results: no fire and no explosion :	(See appended table)	P
6.4.2.3	Test F – Overdischarge	Tested complied.	P
	Results: no fire and no explosion :	(See appended table)	P
6.4.2.4	Test G – Free fall test	Tested complied.	P
	Results: no fire and no explosion :	(See appended table)	P
7	**INFORMATION FOR SAFETY**		P
7.1	**Precautions during handling of batteries**	Safety precautions are shown in battery specification and user manual.	P
	When used correctly, primary batteries with aqueous electrolyte provide a safe and dependable source of power. However, battery misuse or abuse may result in leakage, or in extreme cases, fire and/or explosion		P
	a) Always insert batteries correctly with regard to the polarities (+ and –) marked on the battery and the equipment		P
	b) Do not short-circuit batteries		P
	c) Keep batteries out of the reach of children		P
	d) Do not charge batteries		P
	e) Do not force discharge batteries		P
	f) Do not mix old and new batteries or batteries of different types or brands		P
	g) Exhausted batteries should be immediately removed from equipment and properly disposed of		P
	h) Do not expose batteries to heat.		P
	i) Do not weld or solder directly to batteries		P
	j) Do not dismantle batteries		P
	k) Do not deform batteries		P
	l) Do not dispose of batteries in fire		P
	m) Do not allow children to replace batteries without adult supervision		P
	n) Do not encapsulate and/or modify batteries		P
	o) Store unused batteries in their original packaging away from metal objects. If already unpacked, do not mix or jumble batteries		P
	p) Remove batteries from equipment if it is not to be used for an extended period of time unless it is for emergency purposes		P

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
7.2	**Packaging**		P
	The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking		P
	The materials and packaging design shall be chosen so as to prevent the development of unintentional electrical contact, corrosion of the terminals and some protection from the environment		P
7.3	**Handling of battery cartons**		P
	Battery cartons should be handled with care. Rough handling might result in battery damage. This can cause leakage, explosion, or fire.		P
7.4	**Display and storage**		P
	a) Batteries shall be stored in well-ventilated, dry and cool conditions		P
	b) Battery cartons should not be piled up in several layers (or should not exceed a specified height)		P
	c) When batteries are stored in warehouses or displayed in retail stores, they should not be exposed to direct sun rays for a long time or placed in areas where they get wet by rain		P
	d) Do not mix unpacked batteries so as to avoid mechanical damage and/or short-circuit among each other		P
	e) See Annex A for additional details		P
7.5	**Transportation**		P
	When loaded for transportation, battery packages should be so arranged to minimise the risk of falling		P
7.6	**Disposal**		P
	a) Do not dismantle batteries		P
	b) Do not dispose of batteries in fire except under conditions of controlled incineration		P
	c) Primary batteries may be disposed of via the communal refuse arrangements, provided that no local rules to the contrary exist		P
	d) The provision for the collection of used batteries		P
	Following should be considered:		P
	• Store collected batteries in a non-conductive container.		P
	• Store collected batteries in a well-ventilated area.		P
	• Do not mix collected batteries with other materials.		P
	• Consider protecting used battery terminals,		P

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	particularly those batteries with high voltage		
	• Failure to observe these recommendations may result in leakage, fire, and/or explosion.		P
8	**INSTRUCTIONS FOR USE**		P
	a) Always select the correct size and grade of battery most suitable for the intended use		P
	Information provided with the equipment to assist correct battery selection should be retained for reference		P
	b) Replace all batteries of a set at the same time		P
	c) Clean the battery contacts and also those of the equipment prior to battery installation		P
	d) Ensure that the batteries are installed correctly with regard to polarity (+ and –)		P
	e) Remove batteries from equipment which is not to be used for an extended period of time		P
	f) Remove exhausted batteries promptly		P
9	**MARKING AND PACKAGING**		P
9.1	**General batteries**		N/A
	With the exception of small batteries (see 9.2), each battery shall be marked with the following information		
	a) designation, IEC or common.....:		N/A
	b) expiration of a recommended usage period or year and month or week of manufacture.....:		N/A
	c) polarity of the positive (+) terminal.....:		N/A
	d) nominal voltage.....:		N/A
	e) name or trade mark of the manufacturer or supplier.....:		N/A
	f) cautionary advice.....:		N/A
9.2	**Marking of small batteries**		P
	a) designation, IEC or common.....:	R03P	P
	b) expiration of a recommended usage period or year and month or week of manufacture.....:	Expiration of a recommended usage period: 18 months.	P
	c) polarity of the positive (+) terminal.....:	“ + ”, “ – ”	P
	d) nominal voltage.....:	1.5V	P
	e) name or trade mark of the manufacturer or supplier.....:	SHENZHEN GMCELL TECHNOLOGY CO,.LTD	P
	f) cautionary advice.....:	See the 7.1	P
	g) Caution for ingestion of swallowable batteries, see also 7.1 c) and Annex D	Not intended to direct sale.	N/A
	h) Child resistant packaging	Not intended to direct sale.	N/A

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
9.3	**Safety pictograms**		P
	Safety pictograms that could be considered for use as an alternative to written cautionary advice are provided in Annex C.		P
Annex A	**Additional information on display and storage**		N/A
	It takes the form of advice to battery manufacturers, distributors, users, and equipment designers		N/A
	Storage and stock rotation		N/A
Annex B	**Battery compartment design guidelines**		N/A
B.1	**Background**		N/A
B.1.1	General		N/A
B.1.2	Battery failures resulting from poor battery compartment design		N/A
	Poor battery compartment design may lead to reversed battery installation or to short circuiting of the batteries		N/A
B.1.3	Potential hazards resulting from battery reversal		N/A
B.1.4	Potential hazards resulting from a short circuit		N/A
B.2	**General guidance for appliance design**		N/A
B.2.1	Key battery factors to be first considered		N/A
B.2.2	Other important factors to consider		N/A
B.3	**Specific measures against reversed installation**		N/A
B.3.1	General		N/A
	To overcome the problems associated with the reversed placement of a battery, consideration should be given at the design stage to ensure that batteries cannot be installed incorrectly or, if so installed, will not make electrical contact		N/A
B.3.2	Design of the positive contact		N/A
B.3.3	Design of the negative contact		N/A
B.3.4	Design with respect to battery orientation		N/A
B.3.5	Dimensional considerations		N/A
B.4	**Specific measures to prevent short-circuiting of batteries**		N/A
B.4.1	Measures to prevent short-circuiting due to battery jacket damage		N/A
B.4.2	Measures to prevent external short-circuit of a battery caused when coiled spring contacts are employed for battery connection		N/A
B.5	**Special considerations regarding recessed negative contacts**		N/A
B.6	**Waterproof and non-vented devices**		N/A

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
B.7	**Other design considerations**		N/A
Annex C	**Safety pictograms**	Not considered swallowable	P
C.1	**General**		P
	Cautionary advice to fulfil the marking requirements in this standard has, on a historical basis, been in the form of written text		P
C.2	**Pictograms**		P
	The pictogram recommendations and cautionary advices are given in Table C.1		P
	 DO NOT CHARGE		N/A
	 DO NOT DEFORM / DAMAGE		N/A
	 DO NOT DISPOSE OF IN FIRE		N/A
	 DO NOT INSERT INCORRECTLY		N/A
	 KEEP OUT OF REACH OF CHILDREN		N/A
	 DO NOT MIX DIFFERENT TYPES OR BRANDS		N/A
	 DO NOT MIX NEW AND USED		N/A
	 DO NOT OPEN / DISMANTLE		N/A
	 DO NOT SHORT CIRCUIT		N/A
	 INSERT CORRECTLY		N/A
C.3	**Recommendations for use**		N/A

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	The following instructions are provided for use of the pictograms		N/A
	a) Pictograms shall be clearly legible		N/A
	b) Whilst colours can be used, they should not detract from the information displayed. If colours are used, the background of pictograms E and J should be blue and the circle and diagonal bar of the other pictograms should be red.		N/A
	c) Not all of the pictograms need to be used together for a particular type or brand of battery. In particular, pictogram D and J are meant as alternatives for a similar purpose		N/A
Annex D	**Use of the KEEP OUT OF REACH OF CHILDREN safety sign**	Not intended to direct sale. Not button cells	N/A
D.1	**General**		N/A
D.2	**Safety sign**		N/A
	When a safety sign is used to convey the message that these swallowable button cells (i.e. can fit in the ingestion gauge, see Figure 7) should be kept out of the reach of children, the following best practices apply. The safety sign recommendation and cautionary advice for use on battery packaging are given in Table C.1, safety pictogram E.		N/A
D.3	**Best practices for marking the packaging**		N/A
	Packaging of swallowable button cells (i.e. can fit in the ingestion gauge, see Figure 7) should be marked with the safety pictogram E of Table C.1 to alert the purchaser of the increased risk of such cells.		N/A
	a) Refer to Table 7 for marking requirements on packaging.		N/A
	b) The safety sign should be on contrasting background. The background should cover at least 50 % of the area of the pictogram.		N/A
	c) The size of the safety sign should be 6 mm in diameter or larger.		N/A
	d) If the text "KEEP OUT OF REACH OF CHILDREN" is used, it should contrast with the background colour on which it is printed.		N/A
Annex E	**Child resistant packaging**	Not intended to direct sale. Not button cells	N/A
E.1	**General**		N/A
E.1.1	**General**		N/A

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
E.1.2	**Applicability**		N/A
E.1.3	**Packaging design**		N/A
E.1.3.1	**Single cell packaging**		N/A
	The packaging for button cells should meet one of the following:		N/A
	a) packaging strength as described in E.1.3.3		N/A
	b) packaging requirements based on local legislation or standardization [8], [9], [10], if applicable.		N/A
E.1.3.2	**Multi-cell packaging**		N/A
	Each cell containment in a multi-cell packaging should meet the above requirements even when another cell containment is removed from the packaging.		N/A
E.1.3.3	**Packaging strength**		N/A
	The packaging strength should be such that the packaging passes the tests described in Clause E.2.		N/A
E.2	**Packaging tests**		N/A
E.2.1	**General**		N/A
	The following test methods were developed based on the analysis of the behaviour of children in a test where they were required to try and open button cell packaging within a limited time. The tests should be conducted by an instructed person or, alternatively, if necessary, using suitable equipment.		N/A
E.2.2	**Test items**		N/A
	a) Bending test		N/A
	b) Torsion test		N/A
	c) Tearing test		N/A
	d) Pushing test		N/A
E.2.3	**Test procedure**		N/A
	The test procedure is conducted with ten sample packagings. Each sample is subjected to a series of tests in the order and frequency outlined in Table E.1.		N/A
E.2.4	**Criteria**		N/A
	Each test sample should meet the following criteria.		N/A
	a) each cell should be kept in its packaging until the end of the test series		N/A
	b) in order to prevent a child from pulling the cell out from its compartment, the packaging should not open too wide. The maximum allowable size of an opening in the packaging is 6 mm diameter for a		N/A

IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	round hole and 10 mm length for a slit. See Figure E.5 for maximum packaging openings.		

6.3.2.1	TABLE: Test A – Storage after partial use				N/A
Model, Sample number	**OCV at start of test (Vdc)**	**Lowest resistive load (Ω)**	**MAD (h)**	**Storage temperature (45 ± 5 ºC)**	**Results**
Supplementary information: - Others (please explain)					

6.3.2.2	TABLE: Test B-1 – Transportation-shock		P
Model, Sample number	**Ambient (20 ± 5 ºC)**	**OCV at start of test (Vdc)**	**Results**
1	23.1	1.66	P
2	23.1	1.65	P
3	23.1	1.65	P
4	23.1	1.66	P
5	23.1	1.66	P
Supplementary information: - No fire - No explosion - No leakage - Fire - Explosion - Leakage - Leakage - Bulge - Others (please explain)			

6.3.2.3	TABLE: Test B-2 – Transportation-Vibration		P
Model, Sample number	**Ambient (20 ± 5 ºC)**	**OCV at start of test (Vdc)**	**Results**
6	23.2	1.66	P
7	23.2	1.65	P
8	23.2	1.66	P
9	23.2	1.66	P
10	23.2	1.65	P

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Bulge
- Others (please explain)

6.3.2.4	TABLE: Test C – Climatic-temperature cycling	P
Model, Sample number	**OCV at start of test (Vdc)**	**Results**
11	1.65	P
12	1.66	P
13	1.66	P
14	1.66	P
15	1.65	P

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Bulge
- Others (please explain)

6.4.2.1	TABLE: Test D – Incorrect installation				P
Model, Sample number	**Ambient (20 ± 5 ºC)**	**OCV of reversed battery (Vdc)**	**Resistance of circuitry (mΩ)**	**Maximum case temperature (°C)**	**Results**
16-19	23.4	1.65	81	76.2	P
20-23	23.4	1.66	85	77.8	P
24-27	23.4	1.66	87	77.1	P
28-31	23.4	1.65	82	79.2	P
32-35	23.4	1.65	84	75.5	P

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Bulge
- Others (please explain)

6.4.2.2	TABLE: Test E – External short circuit				P
Model, Sample number	**Ambient (20 ± 5 ºC)**	**OCV of reversed cell (Vdc)**	**Resistance of circuitry (mΩ)**	**Maximum case temperature (°C)**	**Results**
36	23.2	1.65	89	82.9	P
37	23.2	1.66	88	87.2	P
38	23.2	1.66	87	85.6	P
39	23.2	1.65	82	84.2	P
40	23.2	1.66	84	86.9	P

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Bulge
- Others (please explain)

6.4.2.3	TABLE: Test F – Overdischarge				P
Model, Sample number	**Ambient (20 ± 5 ºC)**	**OCV at start of test (Vdc)**	**Highest MAD (h)**	**R1 (Ω)**	**Results**
41-44	23.2	1.65	80	20.3	P
45-48	23.2	1.66	80	20.4	P
49-52	23.2	1.66	80	20.1	P
53-56	23.2	1.65	80	20.5	P
57-60	23.2	1.66	80	20.2	P

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Bulge
- Others (please explain)

6.4.2.4	TABLE: Test G – Free fall test		P
Model, Sample number	**Ambient (20 ± 5 ºC)**	**OCV at start of test (Vdc)**	**Results**
61	23.1	1.65	P
62	23.1	1.66	P
63	23.1	1.65	P
64	23.1	1.65	P
65	23.1	1.66	P

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Bulge
- Others (please explain)

Attachment 1 Photo Documentation

Product: Super Heavy Duty Battery

Type Designation: R03P

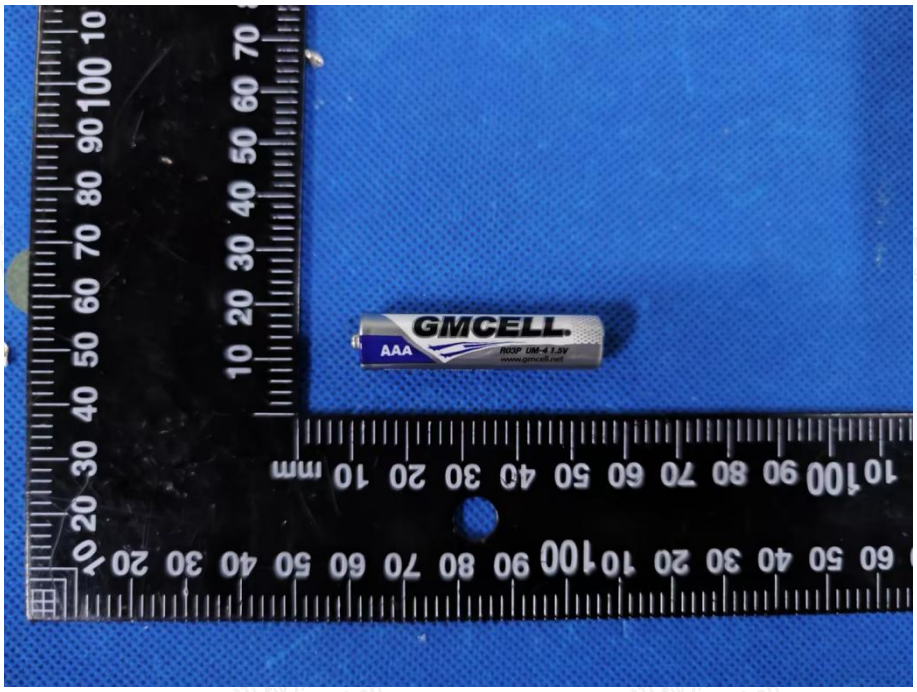


Figure 1 Front view of cell

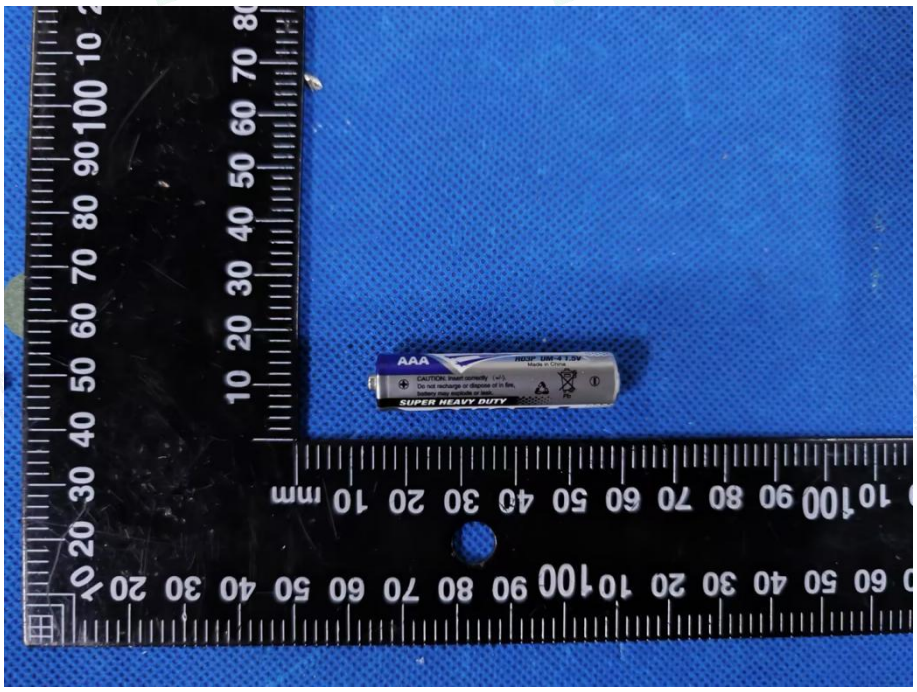


Figure 2 Side view of cell

*** End of report ***