Test Report issued under the responsibility of:

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

Report Number. ..... :	2404B0730SHA-015
Date of issue ..... :	2024-11-15
Total number of pages	21
Name of Testing Laboratory preparing the Report ..... :	Intertek Testing Services (Shanghai FTZ) Co., Ltd. Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
Applicant's name ..... :	Zhejiang Mustang Battery Co., Ltd.
Address..... :	No.818 Rongji Road, Luotuo Town, Ningbo, China | 315202
Test specification:	
Standard ..... :	EN IEC 60086-5:2021+AC:2022-07
Test procedure..... :	Testing
Non-standard test method..... :	N/A
TRF template used..... :	IECEE OD-2020-F1:2021, Ed.1.4
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.
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Test item description ..... :	Extra Alkaline Battery		
Trade Mark ..... :	Raymax		
Manufacturer ..... :	Same as applicant		
Model/Type reference ..... :	LR03 (AAA)		
Ratings ..... :	1.5V		
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	**Intertek Testing Services (Shanghai FTZ) Co., Ltd.**	
Testing location/ address.....:		**Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China**	
Tested by (name, function, signature).....:		Michael Zheng (Engineer)	Michael Zheng
Approved by (name, function, signature)...:		Liping Chen (Mandated Reviewer)	liping chen
☐	**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):

Appendix 1: Photos of the product……Page 21

Summary of testing:

The test results presented in this report relate only to the item tested. The results indicates that the specimen complies with standard “EN IEC 60086-5:2021+AC:2022-07”.

Tests performed (name of test and test clause):	**Testing location:**
Clause 6.3.2.1, Test A: storage after partial use Clause 6.3.2.2, Test B-1: transportation-shock Clause 6.3.2.3, Test B-2: transportation-vibration Clause 6.3.2.4, Test C: climatic-temperature cycling Clause 6.4.2.1, Test D: incorrect installation Clause 6.4.2.2, Test E: external short circuit Clause 6.4.2.3, Test F: overdischarge Clause 6.4.2.4, Test G: free fall	Intertek Testing Services (Shanghai FTZ) Co., Ltd. Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China

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

None

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.

Test item particulars.....:	
Classification of installation and use.....:	Primary battery
Supply Connection.....:	1.5V
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2024-05-19
Date (s) of performance of tests.....:	2024-06-06 to 2024-07-25

General remarks:

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

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

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

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

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

Name and address of factory (ies) ……..: Same as applicant

General product information:

Products covered by this report are primary alkaline Zinc Manganese Dioxide batteries.

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
4	**REQUIREMENTS FOR SAFETY**		
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		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		P
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		P
5	**SAMPLING**		
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 EN IEC 60086-2.		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)		P

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	Reasonably foreseeable A misuse D Incorrect installation (n = 20) E External short circuit (n = 5) F Overdischarge (n = 20) G Free fall (n = 5)		P
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**		
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	23°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.	No explosion	P
6.2.2	Fire		P
	A fire is considered to have occurred if flames are emitted from a test cell or battery.	No fire	P

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.3	Leakage		P
	Leakage is considered to have occurred if there is an unplanned escape of electrolyte from a cell or battery.	No leakage	P
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.	No venting	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		P
	An undischarged battery is discharged under an application or service output test condition, with the load defined in EN 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		P
	Results: no leakage, no fire and no explosion..... :	(See appended table)	P
6.3.2.2	Test B-1 – Transportation-shock		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		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		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

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
6.4.2.1	Test D – Incorrect installation (four batteries in series)		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		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
6.4.2.3	Test F – Overdischarge		P
	Results: no fire and no explosion..... :	(See appended table)	P
6.4.2.4	Test G – Free fall test		P
	Results: no fire and no explosion..... :	(See appended table)	P
7	**INFORMATION FOR SAFETY**		
7.1	**Precautions during handling of batteries**		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	Warning statement marked on battery body.	P
	b) Do not short-circuit batteries		N/A
	c) Keep batteries out of the reach of children	Warning statement marked on battery body.	P
	d) Do not charge batteries	Warning statement marked on battery body.	P
	e) Do not force discharge batteries		N/A
	f) Do not mix old and new batteries or batteries of different types or brands	Warning statement marked on battery body.	P
	g) Exhausted batteries should be immediately removed from equipment and properly disposed of		N/A
	h) Do not expose batteries to heat.	Warning statement marked on battery body.	P

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	i) Do not weld or solder directly to batteries		N/A
	j) Do not dismantle batteries	Warning statement marked on battery body.	P
	k) Do not deform batteries		N/A
	l) Do not dispose of batteries in fire	Warning statement marked on battery body.	P
	m) Do not allow children to replace batteries without adult supervision		N/A
	n) Do not encapsulate and/or modify batteries		N/A
	o) Store unused batteries in their original packaging away from metal objects. If already unpacked, do not mix or jumble batteries		N/A
	p) Remove batteries from equipment if it is not to be used for an extended period of time unless it is for emergency purposes		N/A
7.2	**Packaging**		N/A
	The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking	The end package is not considered in this report.	N/A
	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		N/A
7.3	**Handling of battery cartons**		N/A
	Battery cartons should be handled with care. Rough handling might result in battery damage. This can cause leakage, explosion, or fire.	The end package is not considered in this report.	N/A
7.4	**Display and storage**		N/A
	a) Batteries shall be stored in well-ventilated, dry and cool conditions	The end package is not considered in this report.	N/A
	b) Battery cartons should not be piled up in several layers (or should not exceed a specified height)		N/A
	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		N/A
	d) Do not mix unpacked batteries so as to avoid mechanical damage and/or short-circuit among each other		N/A
	e) See Annex A for additional details		N/A
7.5	**Transportation**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	When loaded for transportation, battery packages should be so arranged to minimise the risk of falling		N/A
7.6	**Disposal**		N/A
	a) Do not dismantle batteries	Not checked	N/A
	b) Do not dispose of batteries in fire except under conditions of controlled incineration		N/A
	c) Primary batteries may be disposed of via the communal refuse arrangements, provided that no local rules to the contrary exist		N/A
	d) The provision for the collection of used batteries		N/A
	Following should be considered:		N/A
	• Store collected batteries in a non-conductive container.		N/A
	• Store collected batteries in a well-ventilated area.		N/A
	• Do not mix collected batteries with other materials.		N/A
	• Consider protecting used battery terminals, particularly those batteries with high voltage		N/A
	• Failure to observe these recommendations may result in leakage, fire, and/or explosion.		N/A
8	**INSTRUCTIONS FOR USE**		
	a) Always select the correct size and grade of battery most suitable for the intended use	The Instruction is not considered in this report.	N/A
	Information provided with the equipment to assist correct battery selection should be retained for reference		N/A
	b) Replace all batteries of a set at the same time		N/A
	c) Clean the battery contacts and also those of the equipment prior to battery installation		N/A
	d) Ensure that the batteries are installed correctly with regard to polarity (+ and –)		N/A
	e) Remove batteries from equipment which is not to be used for an extended period of time		N/A
	f) Remove exhausted batteries promptly		N/A
9	**MARKING AND PACKAGING**		
9.1	**General batteries**		P
	With the exception of small batteries (see 9.2), each battery shall be marked with the following information		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) designation, IEC or common ..... :	Batteries are marked IEC designation “LR03” and common designation “AAA”	P
	b) expiration of a recommended usage period or year and month or week of manufacture ..... :	Marked 04-2029 on battery bottom	P
	c) polarity of the positive (+) terminal ..... :	Batteries are marked polarity “+” and “-”	P
	d) nominal voltage ..... :	Batteries are marked nominal voltage “1.5V”	P
	e) name or trade mark of the manufacturer or supplier ..... :	Batteries are marked trademark “Raymax”	P
	f) cautionary advice ..... :	Warning statement marked on battery body.	P
9.2	**Swallowable button cells**		N/A
	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
	g) Caution for ingestion of swallowable batteries, see also 7.1 c) and Annex D		N/A
	h) Child resistant packaging		N/A
9.3	**Safety pictograms**		N/A
	Safety pictograms that could be considered for use as an alternative to written cautionary advice are provided in Annex C.		N/A
Annex A	**Additional information on display and storage**		
	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**		
B.1	**Background**		N/A
B.1.1	General		N/A
B.1.2	Battery failures resulting from poor battery compartment design		N/A

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	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
B.7	**Other design considerations**		N/A
Annex C	**Safety pictograms**		
C.1	**General**		N/A
	Cautionary advice to fulfil the marking requirements in this standard has, on a historical basis, been in the form of written text		N/A
C.2	**Pictograms**		N/A
	The pictogram recommendations and cautionary advices are given in Table C.1		N/A

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
	 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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		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**		
E.1	**General**		N/A
E.1.1	**General**		N/A
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

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

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict

6.3.2.1	TABLE: Test A – Storage after partial use				P
Model, Sample number	**OCV at start of test (Vdc)**	**Longest test duration load**	**MAD (h)**	**Storage temperature (45 ± 2 ºC)**	**Results**
LR03 / 001	1.4777 / 1.5218V	24 Ω	7.25 h	45 ºC	No leakage, no fire and no explosion
LR03 / 002	1.4788 / 1.5230V	24 Ω	7.25 h	45 ºC	
LR03 / 003	1.4788 / 1.5229V	24 Ω	7.25 h	45 ºC	
LR03 / 004	1.4786 / 1.5232V	24 Ω	7.25 h	45 ºC	
LR03 / 005	1.4788 / 1.5232V	24 Ω	7.25 h	45 ºC	

Supplementary information:

- No fire
- No explosion
- No leakage
- Fire
- Explosion
- Leakage
- Leakage
- Bulge
- 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**	
LR03 / 006	23ºC	1.6460 / 1.6461V	No leakage, no fire and no explosion	
LR03 / 007	23ºC	1.6491 / 1.6490V		
LR03 / 008	23ºC	1.6396 / 1.6395V		
LR03 / 009	23ºC	1.6462 / 1.6462V		
LR03 / 010	23ºC	1.6482 / 1.6482V		

Supplementary information:

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

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict

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**
LR03 / 011	23ºC	1.6487 / 1.6487V	No leakage, no fire and no explosion
LR03 / 012	23ºC	1.6442 / 1.6442V	
LR03 / 013	23ºC	1.6475 / 1.6474V	
LR03 / 014	23ºC	1.6492 / 1.6492V	
LR03 / 015	23ºC	1.6425 / 1.6426V	

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**
LR03 / 016	1.6498 / 1.6417V	No leakage, no fire and no explosion
LR03 / 017	1.6496 / 1.6375V	
LR03 / 018	1.6479 / 1.6413V	
LR03 / 019	1.6463 / 1.6400V	
LR03 / 020	1.6446 / 1.6376V	

Supplementary information:

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

EN IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict

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 (Ω)**	**Maximum case temperature (°C)**	**Results**
LR03 / 021~024	23ºC	1.6442V	0.076 Ω	91°C	No fire and no explosion
LR03 / 025~028	23ºC	1.6447V	0.078 Ω	99°C	
LR03 / 029~032	23ºC	1.6429V	0.077 Ω	102°C	
LR03 / 033~036	23ºC	1.6428V	0.082 Ω	103°C	
LR03 / 037~040	23ºC	1.6432V	0.079 Ω	90°C	

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 (Ω)**	**Maximum case temperature (°C)**	**Results**
LR03 / 041	23ºC	1.6445V	0.076 Ω	122ºC	No fire and no explosion
LR03 / 042	23ºC	1.6438V	0.078 Ω	117ºC	
LR03 / 043	23ºC	1.6440V	0.077 Ω	130ºC	
LR03 / 044	23ºC	1.6259V	0.082 Ω	119ºC	
LR03 / 045	23ºC	1.6433V	0.079 Ω	120ºC	

Supplementary information:

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

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Clause	Requirement + Test	Result - Remark	Verdict

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**
LR03 / 046~049	23ºC	1.6434V	14.5h	20.4 Ω	No fire and no explosion. Max. temperature: 32ºC
LR03 / 050~053	23ºC	1.6431V	14.5h	20.4 Ω	
LR03 / 054~057	23ºC	1.6440V	14.5h	20.4 Ω	
LR03 / 058~061	23ºC	1.6427V	14.5h	20.4 Ω	
LR03 / 062~065	23ºC	1.6436V	14.5h	20.4 Ω	

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**	
LR03 / 066	23ºC	1.6427 / 1.6428V	No fire and no explosion	
LR03 / 067	23ºC	1.6465 / 1.6465V		
LR03 / 068	23ºC	1.6487 / 1.6488V		
LR03 / 069	23ºC	1.6452 / 1.6453V		
LR03 / 070	23ºC	1.6429 / 1.6430V		

Supplementary information:

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

Product Photos:

LR03 (AAA)