

PRODUCT SPECIFICATION

Alkaline AAA Size Battery（EXCELLENT）

Model: AAA LR03

Version: 1022-02

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1. General Information

1.1 Scope

This specification defines the technical requirements for alkaline cell, Zn/MnO2, LR14/C Size(No Mercury and Cadmium added) to be supplied to the Customer by Gigatek Batteries Private Limited.

1.2 Production classification

Alkaline Battery

1.3 Model type

ANSI:24A IEC:LR03 Size: AAA

2. Reference standards

2.1 International standards

IEC60086-1:2021——Primary batteries-part 1: General

IEC60086-2:2021——Primary batteries-part 2: Physical and electrical specifications

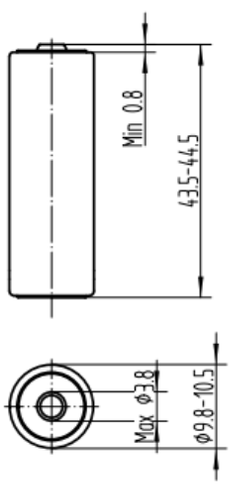
IEC60086-5:2021——Primary batteries-part 5: Safety of batteries with aqueous electrolyte

2.2 EU's battery directive

This product complies with EU's battery directive (2006/66/EC)

Packaging materials comply with EU's directive on packaging materials and waste (94/62/EC)

3. Specification

Nominal Voltage	1.5Volt	
Open Circuit Voltage	$1.5^{+0.18}_{-0}$ Volt	
Typical Weight	12±1g	
Capacity (10mA 24h/d 0.8V)	1230mAh（Reference）	
Terminals	Flat	
Storage Temperature Range	5~30℃	
Shelf Life	60Months（Each battery will carry a manufacturing date code followed by month and year of manufacturing for domestic and expiry for export. Storage Temperature 20±2℃ Storage Humidity 55±20%）	

4. Electrical Characteristic

★ Unless other stated, all the tests are performed at: 20±2 ℃, 55$^{+20}_{-40}$% RH

★ All samples should be left standing at above environment for 8 hours at least before testing

★ The digital voltmeter (DCM) is accurate to 1mV (impedance ≥ 1 m)

★ The load resistance of the total circuit is accurate within±0.5% of the specified value

★ The Storage conditions for batteries used to delayed discharge test are 20±2 ℃, 55±2 0% RH

★ Normal value means the average of multiple test results from long-term monitoring which is for reference only.

★ MAD means minimum average duration

★ The initial battery refers to batteries produced within 60 days

★ Marked with※is a quick test item for shipment release

Service output

Test condition					Initial		After 12months storage	After 60months storage
Application	Load	Daily period	End voltage（V)	Unit	Normal	MAD		
Portable lighting	5.1Ω	4m/h,8h/d	0.9	min	236	200	184	131
Remote control	24Ω	15s/m，8h/d	1.0	h	21.2	19.8	19.2	13.1
Toy	5.1Ω	1h/d	0.8	min	260	215	198	117
Digital audio	50mA	1h/12h,24h/d	0.9	h	22.8	21.5	20.4	10.8
※	100mA	24h/d	0.9	h	8.9	8.2	/	/

5. Leakage resistance of batteries

5.1 Over-discharge test

Over-discharge test		
Temperature and humidity	Method	Requirements
20±2 ℃ 55±20%	After measured discharge capacity, continue discharge until load voltage drop to less than 40% of original	No leakage and no deformation

5.2 High temperature storage

High temperature storage		
Temperature and humidity	Time	Requirements
60±2 ℃ 90±5%	20Days	No leakage

6. Safety Requirements

Test	Conditions	Sample	Requirements
Storage after partial use	Discharge a fresh battery under IEC 60086-2 until the service life falls by 50%of MAD value	5	No leakage No fire No explosion
Transportation-shock	Half sine wave shock with 75 g_n in first 3 Milliseconds, and 125-175 g_n peak acceleration shock pulse, shock one time in three perpendicular directions g_n=9,80665m/s²	5	No leakage No fire No explosion
Transportation-vibration	A simple harmonic motion shall be applied to the battery having an amplitude of 0.8mm, with a total maximum excursion of 1.6m. The frequency shall be varied at the rate of 1 Hz/min between the limits of 10Hz and 55Hz. The entire range of frequencies (10Hz to 55Hz) and return (55Hz to 10Hz) shall be traversed in (90±5) min for each mounting position (direction of vibration). Rest battery for 1h.	5	No leakage No fire No explosion
Thermal Cycling Shock	Repeat the following temperature cycle 10 times: Heat to +70℃ within 30 minutes, hold for 4 hours. Cool to +20°C within 30 minutes, hold for 2 hours. Cool to -20℃ within 30 minu tes, hold for 4 hours. Heat to +20℃ within 30 minutes After the 10th cycle store batteries for 7 days	5	No fire, No explosion
Incorrect installation	Four undischarged batteries of the same brand, type and origin shall be connected in series with one reversed. The circuit shall be completed for 24h or until the battery case temperature has returned to ambient.	20	No fire, No explosion
Short Circuit	Connect positive and negative terminals using circuitry with a resistance of less than 0.1 Ohm. Discharge for 24 hours.	5	No fire, No explosion
Over Discharge Test	Discharge one fresh battery under IEC 60086-2, with highest MAD value until on-load voltage falls to (n x 0.6v)"n" is the number of cells. Then, connect 3 fresh batteries of the same brand, type and origin in series. Continue discharge until voltage falls to four times (n x 0.6v). The value of the resistor shall be approximately four times the lowest value from the resistive load IEC60086-2. The final value of the resistor shall be the nearest value to that prescribed in 6.4 of IEC 60086-1	20	No fire, No explosion
Drop Test	Drop at 1 m height onto concrete 6 times, twice on each the battery's 3 axes.	5	No fire, No explosion

7. Information of safety

7.1 Safety precautions during handling of batteries

★ Insert batteries correctly with regard to the polarities(+ & -)of battery and the equipment

★ Do not short-circuit batteries

★ Do not charge batteries

- ★ Do not force discharge batteries
- ★ Do not mix old and new batteries or batteries of different types or brands
- ★ Exhausted batteries should be immediately removed from equipment and properly disposed
- ★ Do not heat batteries
- ★ Do not weld or solder directly to batteries
- ★ Do not dismantle batteries
- ★ Do not deform batteries
- ★ Do not dispose of batteries in fire
- ★ Keep batteries out of the reach of children
- ★ Do not allow children to replace batteries without adult supervision
- ★ Do not encapsulate or modify batteries
- ★ Store unused batteries in their original packaging away from metal object. If already unpacked, do not mix or jumble batteries.
- ★ Remove batteries from equipment if it is note to be used for an extended period of time unless it is for emergency purposes.

7.2 Packaging

- ★ The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking.
- ★ 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.

7.3 Display and storage

- ★ Batteries shall be stored in well-ventilated, dry and cool conditions
- ★ Battery cartons should not be piled up in several layers(or should not exceed a specified height)
- ★ 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
- ★ Do not mix unpacked batteries so as to avoid mechanical damage and/or short-circuit among each other
- ★ Do not keep batteries at relative humidity of 75% or above
- ★ Do not keep batteries at temperature of 45℃ or above

7.4 Transportation

- ★ When loaded for transportation, battery packages should be so arranged to minimize the risk of falling e.g. one from the top of another.
- ★ They should not be stacked so high that damage to the lower packages occurs, Protection from inclement weather should be provided.

7.5 Disposal

- ★ Do not dismantle batteries
- ★ Do not dispose of batteries in fire except under conditions of controlled incineration
- ★ Primary batteries may be disposed of via the communal refuse arrangements, provided that no local rules to the contrary exist
- ★ Where there is provision for the collection of used batteries, the following should be considered:
  - a) Store collected batteries in a non-conductive container.
  - b) Store collected batteries in a well-ventilated area. Since some used batteries may still contain a residual charge, they could be short circuited, charged or force discharged and thereby evolve hydrogen gas. If collection containers and storage areas are not properly ventilated, hydrogen gas can build up an explosion in the presence of an ignition source.
  - c) Do not mix collected batteries with other materials. Since some used batteries may still contain a residual charge, they could be short circuited, charged or force discharged. The subsequent possible heat generation can ignite flammable wastes such as oily rags, paper or wood and can cause a fire.
  - d) Consider protecting used battery terminals, particularly those batteries with high voltage, to preclude short circuits , charging and force discharging, for instance, by means of covering battery terminals with insulating tape.
  - e) Failure to observe these recommendations may result in leakage, fire, and/or explosion.

8.Instructions for use

- ★ Always select the correct size and grade of battery most suitable for the intended use. Information provided with the equipment to assist correct battery selection should be retained for reference.
- ★ Replace all batteries of a set at the same time.
- ★ Clean the battery contacts and also those of the equipment prior to battery installation.
- ★ Ensure that the batteries all installed correctly with regard to polarity.
- ★ Remove batteries from equipment which is not to be used for an extended period of time.
- ★ Remove exhausted batteries promptly.

9.Heavy metal content

- ★ Mercury(Hg) content should be less than 1PPM
- ★ Cadmium (Cd) content should be less than 2 PPM
- ★ Lead (Pb) content should be less than 15 PPM

10.Note

Any other items do not list in here please refer to IEC 60086 standard.