
TECHNICAL DATASHEET

Chemistry: Alkaline Manganese Dioxide Battery

Model No.: HQ-ALK-AA-03

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| | |
| | Total pages: 5 (including this cover page) |

Customer comment:

Alkaline Battery

LR6/AA

1. Scope

This specification governs the performance of the following Alkaline battery.

model: HQ-ALK-AA-03.

1.1 Designations:

IEC : LR6

JIS : AM-3

ANSI : AA

Others : 24A, E91

2.2 Reference Document:

-- IEC 60086-1 (2000-11): Primary Batteries – Part 1: General

-- IEC 60086-2 (2001-10): Primary Batteries – Part 2: Physical and Electrical specification

-- IEC 60086-5 (2000-07): Primary Batteries – Part 5: Safety of batteries with aqueous electrolyte.

2. Ratings

| Items | Specifications | Remarks |
|-------------------------------|-------------------------------|--|
| Nominal Voltage (V) | 1.5 | N/A |
| Nominal Capacity (mAh) | 2500 | Condition: load 10Ω, 1 h/day, at 20±2°C, RH 60±15%, end point voltage 0.9V |
| Chemical System | Alkaline Manganese Dioxide | Mercury or cadmium is not added in the battery. |
| Applications Temperature (°C) | -10 ~ 40 | N/A |
| Typical Weight (g) | 24 | Approximate weight |
| Mechanical Dimensions | See attached Data Sheet | N/A |

3. Electrical Characteristics

- Test conditions: -- load resistance 3.9Ω±0.5%,
 -- measuring time 0.3 seconds,
 -- temperature at 20±2□,
 -- test carried out within 60 days after production data.

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| Test Items | Off-Load Volt (V) | On-Load Volt (V) | Flush Current (A) | Test Criterion |
|-------------------------------------|-------------------|------------------|-------------------|---|
| New Battery | 1.60 | 1.45 | 8.00 | ISO2859-1: 1999 Class S-4, Once Sampling, AQL =1.0 |
| After 3 moths, at 45°C | 1.56 | 1.40 | 6.00 | |
| After 12 months at room temperature | 1.56 | 1.40 | 6.00 | |

4. Service Output

Test conditions: -- temperature at $20\pm 2^{\circ}\text{C}$,

-- test to be carried out within 60 days after production data.

| Standard | Discharge Conditions | | | Average Minimum Discharge Time | |
|----------|-----------------------------|----------------|------------|--------------------------------|------------------------------|
| | Discharge load (Ω) | Discharge Time | E.P.V. (V) | New Battery | After 12 months at room temp |
| IEC | 43 | 4h/d | 0.9 | 90 h | 81 h |
| IEC | 10 | 1h/d | 0.9 | 18 h | 16 h |
| IEC | 3.9 | 1h/d | 0.8 | 6.5 h | 5.8 h |
| IEC | 24 | 15s/min, 8h/d | 0.9 | 45 h | 41 h |
| IEC | Drain 1000mA | 10s/min, 1h/d | 0.9 | 300 cycles | 270 cycles |

Satisfaction Standard:

- 1) 9 pieces of battery will be tested for each discharging standard;
- 2) The result of the average discharging time from each discharging standard shall be equal to or more than the average minimum time requirement; no more than one battery has a service output less than 80% of the specified requirement.
- 3) One re-test is allowed to confirm the previous result.

5. Electrolyte Leakage Proof Characteristics

| Item | Condition | Period | Requirement | Acceptance Standard |
|--------------------------------|--|----------|--|------------------------------|
| Over-discharge Characteristics | 10 Ω continuous discharge at temperature $20\pm 2^{\circ}\text{C}$; relative humidity: $60\pm 15\%$ RH | 48 hours | There shall be no deformation exceeding the specified dimensions, nor leakage recognized by human eye. | N = 9; Ac = 0; Re = 1 |
| Storage Characteristics | Storage at temperature $60\pm 2^{\circ}\text{C}$; relative humidity below 90% RH | 20 days | | N = 30; Ac = 1; Re = 2 |

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6. Safety Characteristics

| Item | Condition | Period | Requirement | Acceptance Standard |
|-------------------------------|--|--|-----------------------|------------------------------|
| Short-circuit Characteristics | At temperature $20\pm 2^{\circ}\text{C}$ | 24 hours | No explosion allowed | N = 5; Ac = 0; Re = 1 |
| Incorrect Installation | 4 pcs in series with 1 pc reverse polarized (IEC60086-5) | 24 hrs or till battery casing temp reaches room temp | No explosion allowed. | N = 4 x 5; Ac = 0; Re = 1 |

7. Marking

The following markings will be printed, stamped or impressed on the body of battery:

- a) Designation: LR6 / AA
- b) Manufacture's name or abbreviation "" logo.
- c) Polarity: "+" and "-".

8. External Appearance

The battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation.

9. Shelf Life and Validity Date

3 years after manufactural under proper storage conditions (Temperature: $20\pm 2^{\circ}\text{C}$; Relative humidity: $60\pm 15\%$ RH).

Validity date is impressed at the bottom of battery.

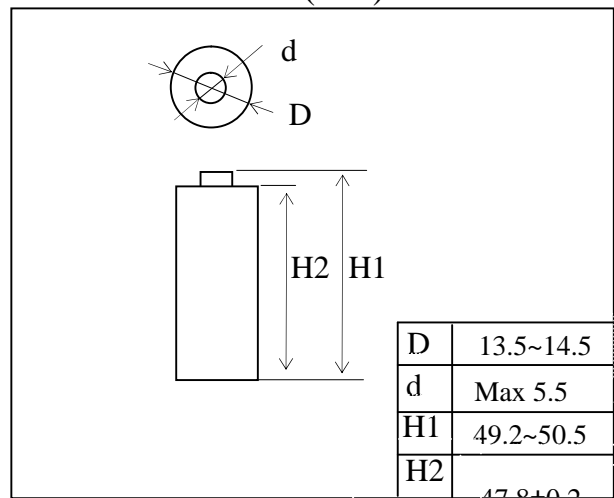
10. Cautions for Use

1. Since the battery is not manufactured for recharging, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
2. The battery shall be installed with its "+" and "-" polarity in a correct position, otherwise may cause short-circuit.
3. Short-circuiting, heating, disposing of into fire or disassembling of battery is prohibited.
4. Battery can not be forced discharged, which leads to excess gassing and may result in bulging, leakage and de-crimping of cap.
5. New batteries and used ones can not be used at the same time. It is recommended to use the same brand when replacing batteries.
6. Exhausted batteries shall be removed from the compartment in order to prevent over-discharge, which may cause leakage and damage to the device.
7. Direct soldering is not allowed, or else it will damage the battery.
8. Battery are to be kept away from children. If swallowed, contact a physician at once.

Data Sheet

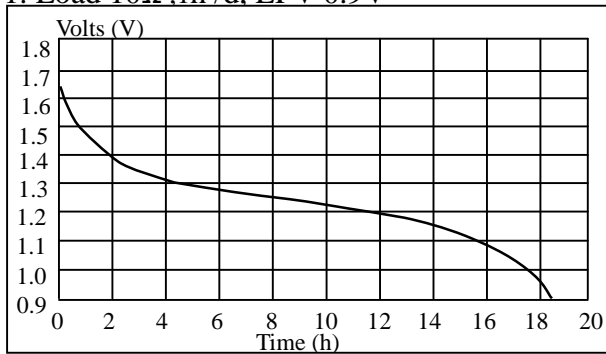
| | |
|-----------------------|----------------|
| Nominal voltage | 1.5V |
| Nominal capacity | 2500mAh |
| Standard load | 10Ω |
| Standard discharge | Load 10Ω, 1h/d |
| End point voltage | 0.9V |
| Operating temperature | - 10 ~ 40°C |
| Weight | 24g |

Dimensions (mm)

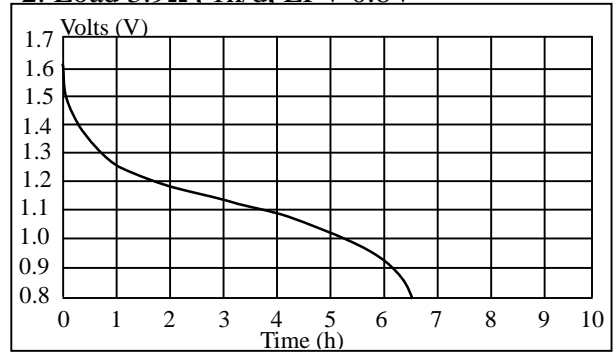


Discharge Characteristics (20±2°C, RH60±15%)

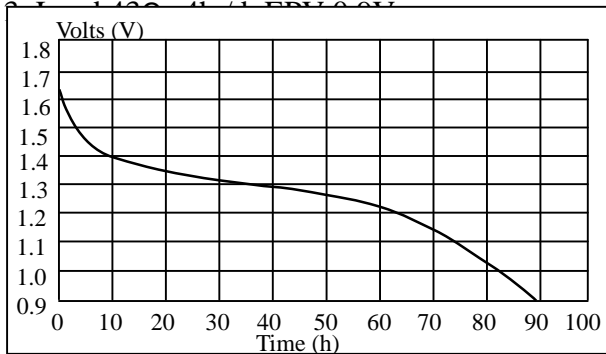
1. Load 10Ω, 1h/d, EPV 0.9V



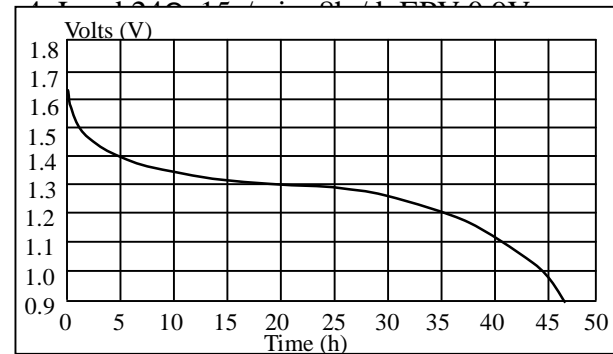
2. Load 3.9Ω, 1h/d, EPV 0.8V



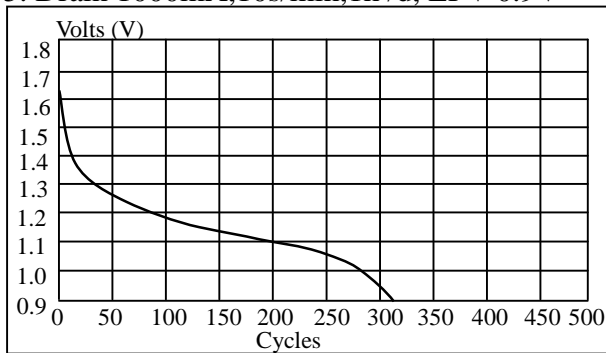
3. Load 10Ω, 1h/d, EPV 0.9V



4. Load 10Ω, 1h/d, EPV 0.9V



5. Drain 1000mA, 10s/min, 1h/d, EPV 0.9V



All data contained herein is for single cell and may vary for cell with specific configuration, subject to change without prior notice.