DELIVERY SPECIFICATIONS

Chemistry: Alkaline Manganese Dioxide Battery

Model No.: HQ-ALK-AAA-03

	Total pages: 5 (including this cover page)

Customer comment:

Alkaline Battery LR03/AAA

1. Scope

This specification governs the performance of the following Alkaline battery.

model: HQ-ALK-AAA-03.

1.1 Designations:

IEC : LR03

JIS : AM-4

ANSI : AAA

Others : 24A, E92, 4003

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)	1000	Condition: load 20Ω, 24 h / day, at 20±2□, RH 60±15%, end point voltage 0.9V
Chemical System	Alkaline Manganese Dioxide	Mercury or cadmium is not added in the battery.
Applications Temperature (℃)	– 10 ~ 40	N/A
Typical Weight (g)	11.5	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.

Alkaline Battery LR03/AAA

Test Items	Off-Load Volt (V)	On-Load Volt (V)	Flush Current (A)	Test Criterion
New Battery	1.59	1.40	6.00	ISO2859-1:1999 (GB/T2828.1-2003), Class S-4, Once Sampling, AQL = 1.0
After 3 moths, at 45℃	1.56	1.35	5.00	
After 12 months, Room temperature	1.56	1.35	5.00	

4. Service Output

Test conditions: -- temperature at 20±2□,

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

Standard	Discharge Condition			Average Minimum Discharge Time	
	Discharge Load	Discharge Time	E.P.V. (V)	New Battery	After 12 mths, at room temp.
IEC	75Ω	4 h/d	0.9	70 h	63 h
IEC	10Ω	1 h/d	0.9	7 h	6.3 h
IEC	5.1Ω	4 m/h, 8 h/d	0.9	200min	180min
IEC	24Ω	15s/min,8h/d	1.0	20 h	18 h
IEC	Drain 600mA	10s/min,1h/d	0.9	250 cycles	225 cycles
Daily-max	20Ω	24h/d	0.9	16.5 h	14.8 h

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	20Ω continuous discharge at temperature 20±2℃; relative humidity: 60±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±2℃; relative humidity below 90% RH	20 days		N = 30; Ac = 1; Re = 2

6. Safety Characteristics

Item	Condition	Period	Requirement	Acceptance Standard
Short-circuit Characteristics	At temperature 20±2℃	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: LR03 / AAA

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±2℃; Relative humidity: 60±15% RH).

Validity date is impressed at the bottom of battery.

10. Cautions for Use

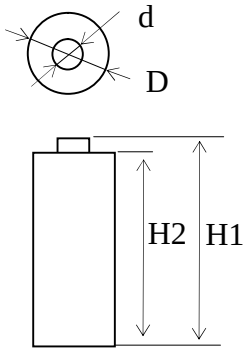
1. Since the battery is not manufactured for recharging, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
2. The battery shall be installed with its "+" and "-" polarity in a correct position, otherwise may cause short-circuit.
3. Short-circuiting, heating, 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.

Alkaline Battery LR03/AAA

Data Sheet

Nominal voltage	1.5V
Nominal capacity	1000mAh
Standard load	20Ω
Standard discharge	Load 20Ω /24h/d
End point voltage	0.9V
Operating temperature	– 10 ~ 40℃
Weight	11.5g

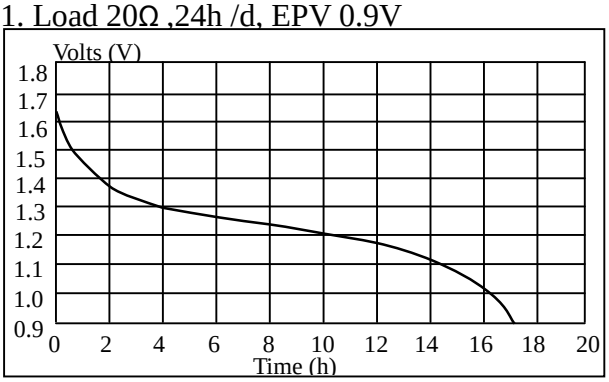
Dimensions (mm)



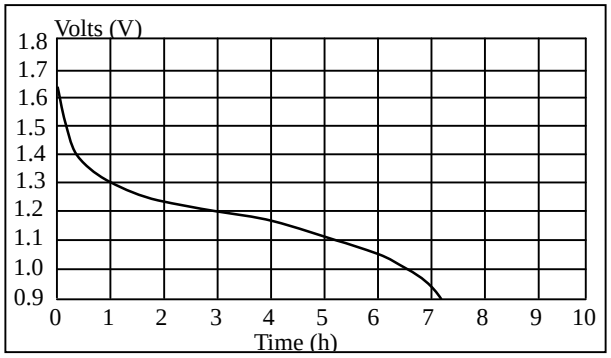
D	9.5~10.5
d	3.8±0.2
H1	43.3~44.5
H2	42.1±0.2

Discharge Characteristics (20±2℃, RH60±15%)

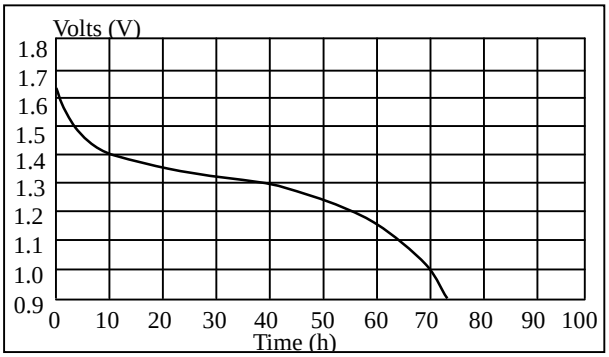
1. Load 20Ω ,24h /d, EPV 0.9V



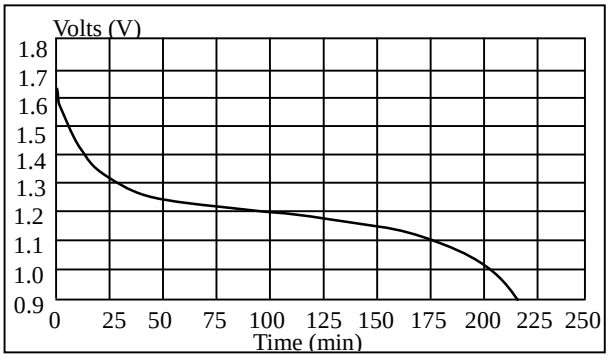
2. Load 10Ω ,1h/d, EPV 0.9V



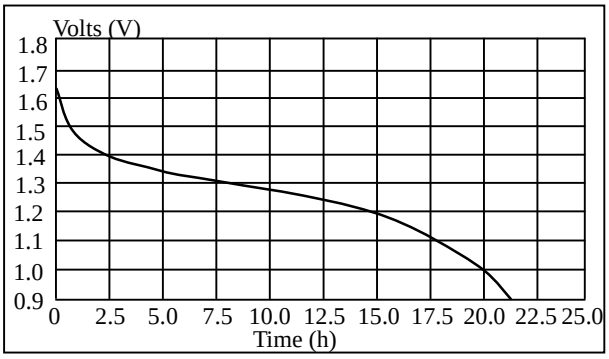
3. Load 75Ω ,4h /d, EPV 0.9V



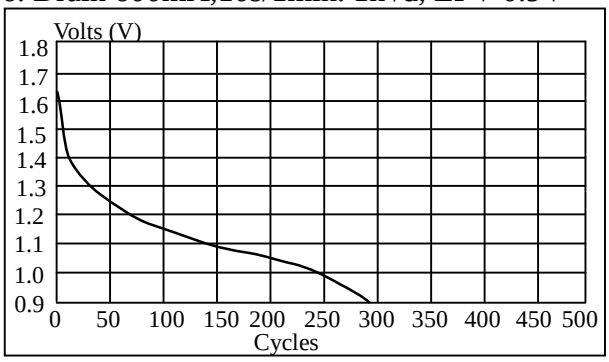
4. Load 5.1Ω ,4min./1h, 8h /d, EPV 0.9V



5. Load 24Ω ,15s/1min, 8h /d, EPV 0.9V



6. Drain 600mA,10s/1min. 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.