



# Alkaline Zinc-Manganese Dry Battery

## Specification

Model: LR03, 1.5V

Drafted	Checked	Approved
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Customer Confirmation	Corporate Name	
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If manufacturer want to modify the product technology specification, we won't inform you additionally



## 1 Scope

This specification defines the technical requirements for LR03 Alkaline cells distributed by HJBP power. If not other wise specified,the technical requirement sand dimensions for cells should meet or exceed the requirements of IEC/EN60086-1(2)(5):2011.

## 2 Reference documents

IEC/EN60086-1:2011,MOD, Primary batteries-Part 1:General

IEC/EN60086-2:2011,MOD, Primary batteries-Part 2:Physical and technological specifications

IEC/EN60086-5:2011,IDT, Primary batteries-Part 5:Safety of batteries with aqueous electrolyte

The battery meets the standard of EU battery directive 2006/66/EC.

## 3 Chemical systems, voltages and designation

3.1 Chemical systems:

Alkaline manganese battery

Zinc-Manganese dioxide (Alkali metal hydroxide)

Chemical System: Zn/KOH-H<sub>2</sub>O/MnO<sub>2</sub>

3.2 Nominal voltage:1.5V

3.3 Designation

IEC/EN: LR03, AAA; ANSI Number: 24A; JIS Number: AM4 Other:286

Heavy Metal Contents

Metal name	Hg	Cd	Pb
Limited contents	0.0005%(5ppm)	0.0020%(20ppm)	-
Contents	No	No	No

## 4 Battery Weight and Service output

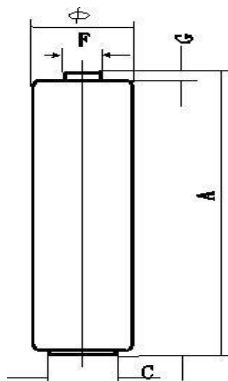
4.1 Battery Weight: 11.3g±0.5g(Average)

4.2 Nominal Capacity: 1000mAh

(Test conditions 20±2°C, RH60±15%, 3.9Ω, 4h/d, EPV=0.9V)

## 5 Battery Dimensions

The batteries meet dimensions of the attached drawing



Model	LR03	
Measure No. A	Max (Unit:mm)	Min (Unit:mm)
A	44.5	43.5
C	-	4.3
F	3.8	-
G	-	0.8
Ø	10.5	9.5



## 6 Voltage and Short current

Item	OCV(V)	CCV(V)	SCC (A)	Sample voltage
Initial (3 months)	$1.58 \leq \text{OCV} \leq 1.65$	$\geq 1.45$	$\geq 8.0$	MIL-STD-105E, Class II, Double Sampling, AQL=0.4
12 months Storage	$\geq 1.56$	$\geq 1.40$	$\geq 6.0$	

OCV measurement: The inner resistance of Voltage Metre is above  $1M\Omega$ .

CCV measurement: After  $0.2 \pm 0.01$ sec by  $R:3.9\Omega$

SCC measurement:

## 7 Service output

Standard	Discharge conditions			Requirement of IEC/EN60086-2:2011	Delayed discharge performance	
	Load	Discharge method	EPV		Initial	After 12months
IEC EN	75	4h/d	0.9	50h	54h	50h
	5.1	4min/h,8h/d	1.0	2.41h(145min)	2.8h	2.6h
	10	1h/d	0.9	-	7.5h	7.0h
REF	3.9	24h/d	0.9	-	155min	145min
	10	24h/d	0.9	-	7h	6.8h

Initial: 60 days after production

Test condition:  $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $60 \pm 15\% \text{RH}$

## 8 Leakage Resistance

Item	Test conditions	Sample size	Requirements	Acceptance
Over discharge	$10\Omega$ 4h/d for 48h at $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$	N=9pcs	No leakage, Max of 0.35mm height increase	Ac=0,Re=1
High temperature, high humidity storage	Exposed to a temperature of $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and $\text{RH}90 \pm 5\%$ for a period of 3 weeks.	N=20pcs	No leakage	Ac=0,Re=1
$45^{\circ}\text{C}$ dry storage	Stored for 12 weeks at $45^{\circ}\text{C}$	N=20pcs	No leakage	Ac=0,Re=1

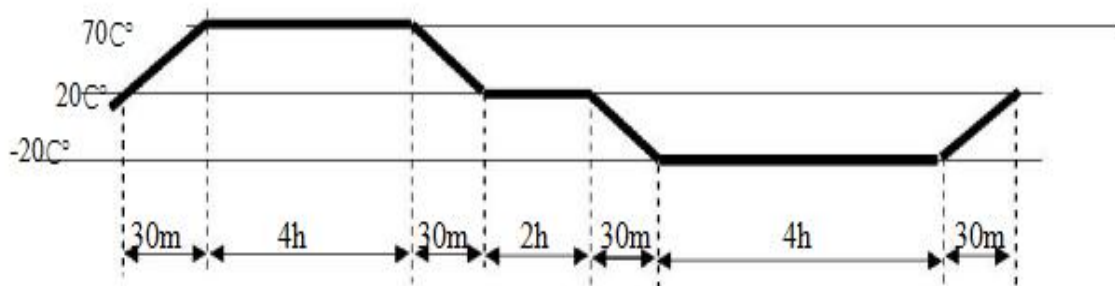
## 9 Safety Requirement

Item	Test conditions	Sample quantity	Requirements IEC60086-5:2011	Acceptance
Partial use	Stored at $45^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 30days after undischarged batteries were test discharged	N=5pcs	No leakage,no explosion	Ac=0,Re=1
Thermal shock	See the following note 1. Total 10 cycles	N=5pcs	No explosion	Ac=0,Re=1



Incorrect installation	Place three undischarged and unconditioned batteries in a series with one test sample battery reversed, Complete the circuit until vent activation or until the temperature of the reversed battery returns to ambient.	N=5pcs	No explosion	Ac=0,Re=1
Free fall	Drop each undischarged battery two times, oriented in each of three mutually perpendicular face(six total) from a height 1 meter, onto a concrete surface, see the note 2.	N=5pcs	No explosion	Ac=0,Re=1
Over discharge	Discharge one test sample battery(C1) with 43Ω resistance load until EPV is 0.6V, Connect three undischarged batteries and the sample battery in series with a 7.5Ω resistance load(R1) as shown in note 3, Maintain the circuit until the CCV of the series string reaches 2.4V.	N=5pcs	No explosion	Ac=0,Re=1

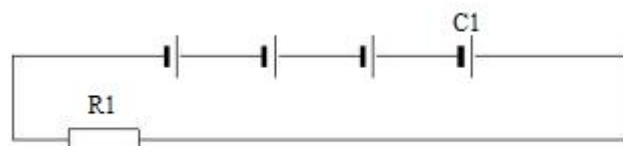
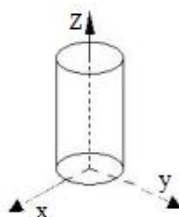
Note 1: Thermal shock



No

te 2: Free fall

Note 3: Over discharge





## 10 Inspection rules

Deliver inspection: Depending on ISO2859-1:1999

Item	Test	Item	IL	AQL
1	Dimension	5	S-2	0.4
2	Appearance	--	II	1.0
3	Discharge capacity	7	--	--
4	Open-circuit voltage 压	6	II	1.0

Routine inspection:

## 11 Inspection for service output

11.1 9 samples shall be tested for service output.

11.2 If the average value is equal to or more than the value of table 1, and if the number of batteries showing a value less than 80% of the value of table 1 is 1 or less. The batteries are considered to conform to the requirement.

11.3 If the average value is less than the value of table 1, or if the number of batteries showing a value less than 80% is 2 or more, the test shall be repeated with other 9 pieces. At the second test, if the average value is equal to or more than the value of table 1, and if the number of batteries showing a value less than 80% of the value of table 1 is 1 or less, these batteries are considered to conform to the requirement.

11.4 At above second test, if the average value is less than the value of table 1, or if the number of batteries showing a value less than 80% of the value of table 1 is 2 or more, the batteries are considered not to conform to the requirement. third test shall not be performed.

## 12 Instructions for use

12.1 Always select correct size and grade of battery most suitable for intended use.

12.2 Replace all batteries of a set at the same time.

12.3 Clean the battery contacts and also those of the equipment prior to battery installation.

12.4 Ensure that batteries are installed correctly with regard polarity(+ and -).

12.5 Remove batteries from equipment which is not be used for an extend period of time

12.6 Remove exhausted batteries promptly.

## 13. Display and storage

13.1 Batteries shall be stored in well-ventilated dry and cool conditions.

13.2 Battery cartons should not be piled up in several layers, or should not exceed a specified height.

13.3 Batteries should not be exposed to direct sun ray for a long time or placed in areas where they get wet by rain.

13.4 Do not mix unpacked batteries so as to avoid mechanical damage and/or short circuit among each other.

## 14 Storage life

Storage life of batteries are five years long at 20°C±2°C and RH 60±15%



## 15 Marks

15.1 Designation Model: LR03 AAA ALKALINE

15.2 Year and month of manufacture, which maybe in code, or the expiration of a guarantee period in clear.

15.3 Polarity of terminals: “+” “-”

15.4 Nominal voltage: 1.5V

15.5 Mercury content: No Mercury & Cadmium Added or 0% Mercury&Cadmium

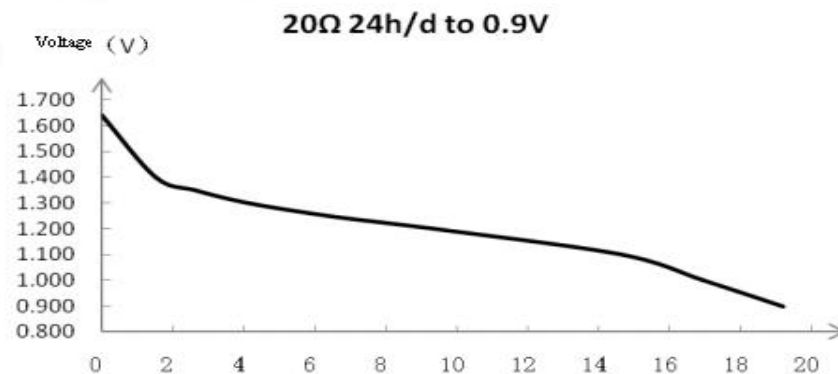
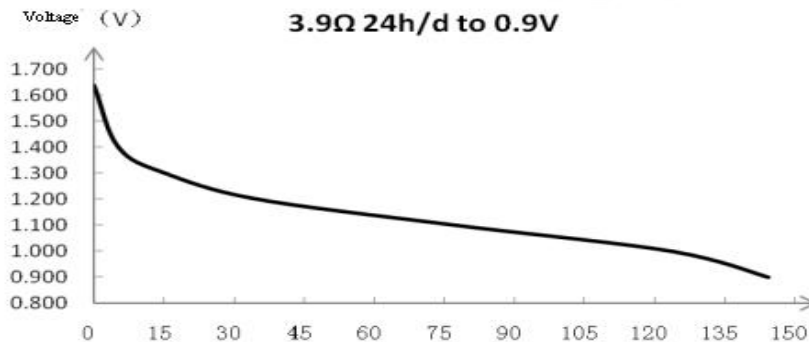
15.6 Name or trade mark, manufacturer or supplier: HJBP/NX/YOUR BRAND/YOUR PRIVATE LABEL

15.7 Cautionary advice

Do not dispose of in fire, recharge, put in backwards, mix with used or other battery types-may explode or leak and cause personal injury.



## 16 Typical Discharge Characteristics Marks



Note:

Thank you in advance for your reading.

1. With the progress of product technology, technical parameters, the specification will be updated too, Please contact HJBP power for latest specification.
2. If you need make battery pack or other battery or OEM your brand, your private label, Please contact us.