

## Alkaline Zinc-Manganese Dry Battery Technology Specification

Customer \_\_\_\_\_

Part name **Alkaline Zinc-Manganese Dry Battery**

Model No **AAA LR03 1.5V**

Serial No \_\_\_\_\_

Produce No \_\_\_\_\_

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**1 Scope**

This specification defines the technical requirements for 1.5V LR03 Alkaline cells distributed by Pkcell. If not otherwise specified, the technical requirements and dimensions for cells should meet or exceed the requirements of GB/T 8897.1-2008, GB 8897.2-2008

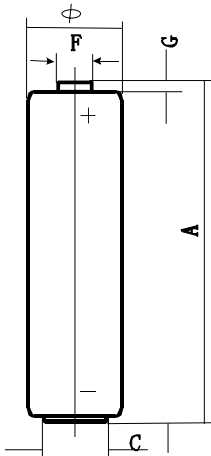
**2 Reference documents**

GB8897.1-2008 (IEC60086-1:2000, IDT) Primary batteries-Part 1:General  
 GB8897.2-2008 (IEC60086-2:2001, MOD) Primary batteries-Part 2:Physical and technological specifications  
 GB8897.5-2006 (IEC 60086-5:2005, MOD) Primary batteries-Part 5:Safety of batteries with aqueous electrolyte

**3 Chemical systems , voltages and designation**

3.1 Chemical systems: Alkaline manganese battery  
 Zinc-Manganese dioxide  
 3.2 Nominal voltage: 1.5V  
 3.3 Designation  
 IEC&GB(China): LR03; ANSI Number: AAA;

**4 LR03 Battery Dimensions**



The	LR03	
Measure No	Max	Min
A	44.5	43.5
C	6.6	4.3
F	3.8	3.0
G	2.2	0.8
Ø	10.5	9.8

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**5 Voltage and Short current**

Item	OCV (V)	CCV (V)	SCC (A)
Initial	1.56 ≤ OCV ≤ 1.65	≥ 1.45	≥ 5.0
After 12 months	≥ 1.56	≥ 1.4	≥ 4.0

OCV measurment: The inner resistance of Voltage Metre is above 1MΩ

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C. C. V. measurment: After  $0.2 \pm 0.01$ sec by  $R=5.0 \Omega$

SCC measurment:  $\pm 0.5\%$

**6 LR03 discharge performance :**

Discharge conditions				Average Minimum Discharge time
Load	Daily period	E. P. (V)	Initial	Delayed discharge performance after 12 months
5.1 $\Omega$	4m/h, 8h/d	0.9V	220min	210min
5.1 $\Omega$	1h/d	0.8V	4.0 h	3.8 h
24 $\Omega$	15s/m, 8h/d	1.0V	18.0h	17.0h
75 $\Omega$	4h/d	0.9V	72.0h	70.0h
100mA	1h/d	0.9V	9.0h	8.7h
3.9 $\Omega$	24h/d	0.9V	140min	130min

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Initial: 60 days after production

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

**7 Leakage Resistance**

Item	Test conditions	Sample size	Requirements	Acceptance

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Overdischarge	10 Ω 24h/d for 48h at 20°C ± 2°C,	n=9pcs	No leakage; Max of 0.35 mm height increase	Ac=0, Re=1
High Temperature and humidity storage	exposed to a temperature of 60°C ± 2°C and RH90 ± 5% for a period of 3 weeks.	n=20pcs	No leakage	Ac=0, Re=1
45°C Dry Storage	Stored for 12 weeks at 45°C	n=20pcs	No leakage	- 4 - Ac=0, Re=1

## 8 Safety Requirement

Item	Test conditions	Sample size	Requirements of IEC60086-5:2005 & GB8897.5-2006	Acceptance
Partial Use	Stored at 45°C ± 2°C for 30 days after undischarged batteries were test discharged 3.9 Ω 24h/d, EPV=1.0V.	n=5pcs	No leakage; No explosion	Ac=0, Re=1

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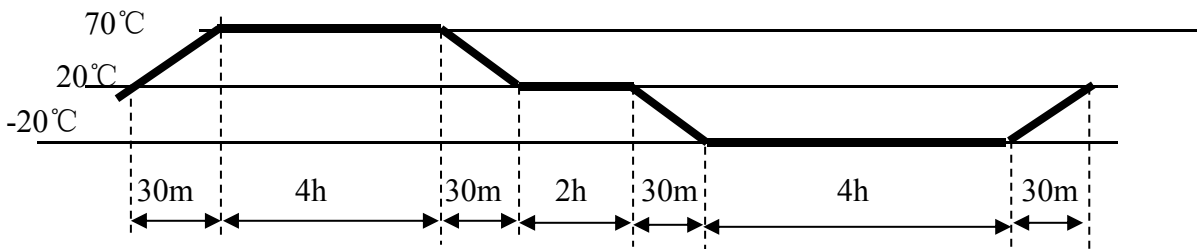
Thermal shock	See the following note 1, Total 10 Cycles	n=5pcs	No explosion	Ac=0, Re=1
Incorrect installation (3 + 1 anti-charge test)	Place three undischarged and unconditioned batteries in a series with one test sample battery reversed, Complete the circuit until vent activation or until the temperature of the reversed battery returns to ambient.	n=5pcs	No explosion	Ac=0, Re=1
Item	Test conditions	Sample size	Requirements of IEC60086-5:2005 & GB8897.5-2006	- 5 - Acceptance
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 following note 2	n=5pcs	No explosion	Ac=0, Re=1

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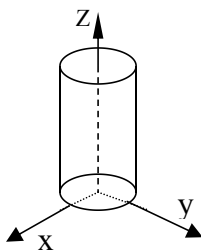
Overdischarge	Discharge one test sample battery (C1) with 43Ω resistance load until EPV is 0.6V, Connect three undischarged batteries and the sample battery in series with a 7.5Ω resistance load (R1) as shown in note 3, Maintain the circuit until the CCV of the series string reaches 1.2V	n=5pcs	No explosion	Ac=0, Re=1
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Note 1: Thermal shock

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Note 2 : Free fall



## 9 Inspection rules

10.1 Deliver inspection: Depending on GB2828

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Number	Test	Item	IL	AQL
1	Dimensions	5	S-2	0.4
2	Appearance	--	II	1.0
3	Discharge capacity	7	--	--
4	Open-circuit voltage	4.5	II	1.0

Routine inspection: Depending on GB2829 and QB/T2389

## 10 Inspection for service output:

10.1 9 samples shall be tested for service output

10.2 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.

10.3 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.

10.4 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.

## 11 Instructions for use

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

11.2 Replace all batteries of a set at the same time

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

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- 11.4 Ensure that batteries are installed correctly with regard polarity(+ and -);
- 11.5 Remove batteries from equipment which is not be used for an extend period of time;
- 11.6 Remove exhausted batteries promptly..

**12. Disply and storage**

- 12.1 Batteries shall be stored in well-ventilateddry and cool conditions
- 12.2 Battery cartons should not be piledup in severa layers, or should not exceed a specified height;
- 12.3 Batteries should not be exposed to direct sun ray for a long time or placed in areas where they get wet by rain. ;
- 12.4 Do not mix unpacked batteries so as to avoid mechanical damage and/or short circuit among each other

**13 Storage life**

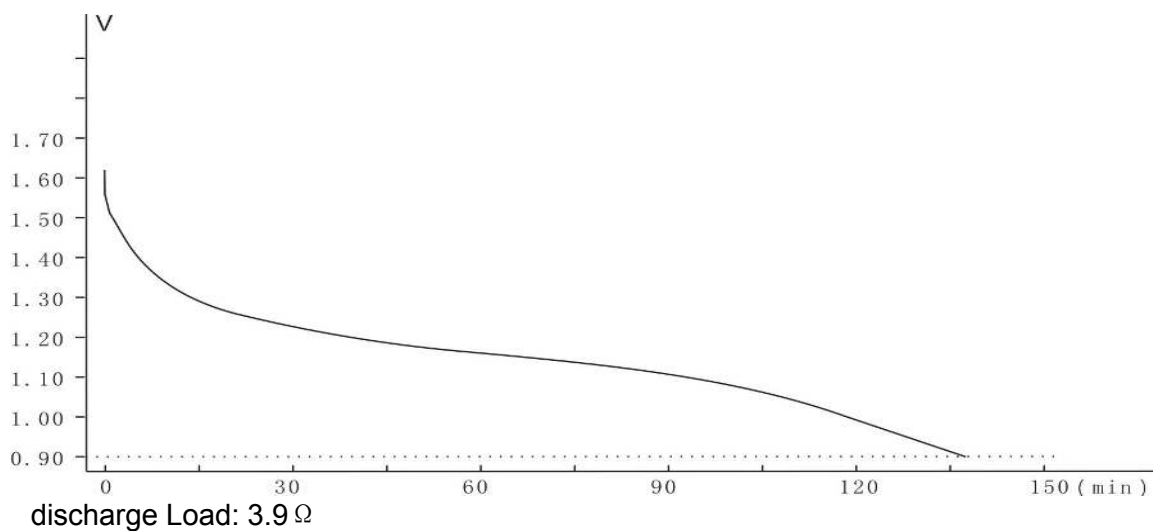
Storage life of batteries are ten years long at 20°C ± 2°C and RH 60±15%

**14 Marks**

- 15.1 Designation;
- 15.2 Polarity of terminals;
- 15.3 Nominal voltage;
- 15.4 Mercury content;
- 15.5 Name or trade mark , manufacturer or supplier ;
- 15.6 Cautionary advice

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Schematic diagram of discharge:



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