

Alkaline Zinc-Manganese Dry Battery Technology Specification

Customer _____

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

Model No **AA LR6 1.5V**

Serial No _____

Produce No _____

| | | | |
|--------------------|--|-------------------|--------------|
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1 Scope

This specification defines the technical requirements for 1.5V LR6Alkaline 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

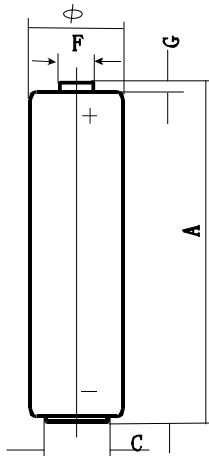
Zinc-Manganese dioxide

3.2 Nominal voltage:1.5V

3.3 Designation

IEC&GB(China): LR6; ANSI Number: AA;

4 LR6 Battery Dimensions



| The | LR6 | |
|------------|------|------|
| Measure No | Max | Min |
| A | 50.5 | 49.2 |
| C | 9.5 | 8.0 |
| F | 5.5 | 3.0 |
| G | 2.5 | 1.0 |
| Ø | 14.5 | 13.5 |

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5 Voltage and Short current

| Item | OCV (V) | CCV (V) | SCC (A) |
|-----------------|---------------------------|-------------|------------|
| Initial | $1.56 \leq OCV \leq 1.65$ | ≥ 1.45 | ≥ 6.0 |
| After 12 months | ≥ 1.56 | ≥ 1.4 | ≥ 5.0 |

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

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

SCC measurment: $\pm 0.5\%$

6 LR6 ervice output :

| Discharge conditions | | | | Average Minimum Discharge time |
|----------------------|--------------|----------|---------|---|
| Load(Ω) | Daily period | E.P. (V) | Initial | Delayed discharge performance after 12 months |
| 3.9 | 24h/d | 0.8 | 400min | 370min |
| 3.9 | 1/d | 0.8 | 7.8h | 7.0h |
| 10 | 24h/d | 0.9 | 21h | 18.9h |

Initial:60 days after prduction

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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 |
|---------------|---|-------------|---|------------|
| Overdischarge | 10Ω 24h/d for 48h at $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$, | n=9pcs | No leakage;Max of 0.35 mm height increase | Ac=0, Re=1 |

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| | | | | |
|---------------------------------------|---|---------|------------|------------|
| High Temperature and 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°C Dry Storage | Stored for 12 weeks at 45°C | n=20pcs | No leakage | Ac=0, Re=1 |

8 Safety Requirement

| Item | Test conditions | Sample size | Requirements of IEC60086-5:2005& GB8897.5-2006 | Acceptance ⁴⁻ |
|---|---|-------------|--|--------------------------|
| Partial Use | Stored at $45^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 30days after undischarged batteries were test discharged 3.9Ω 24h/d, EPV=1.0V. | 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(3 + 1 anti-charge test) | Place three undischarged and unconditioned batteries in a series with one | n=5pcs | No explosion | Ac=0, Re=1 |

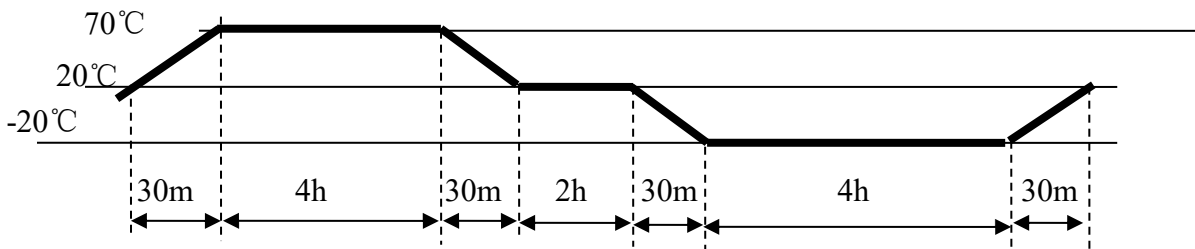
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| | | | | |
|-----------|--|-------------|--|------------|
| | test sample battery reversed, Complete the circuit until vent activation or until the temperature of the reversed battery returns to ambient. | | | |
| Item | Test conditions | Sample size | Requirements of IEC60086-5:2005& GB8897.5-2006 | 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 |

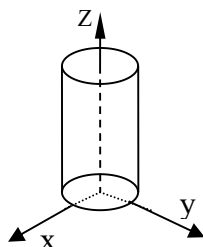
| | | | | |
|---------------|--|--------|--------------|------------|
| Overdischarge | Discharge one test sample battery(C1) with 43Ω resistance load until EPV is 0.6V, Connect three undischarged batteries and the sample battery in series with a 7.5Ω resistance load(R1) as shown in note 3, Maintain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

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

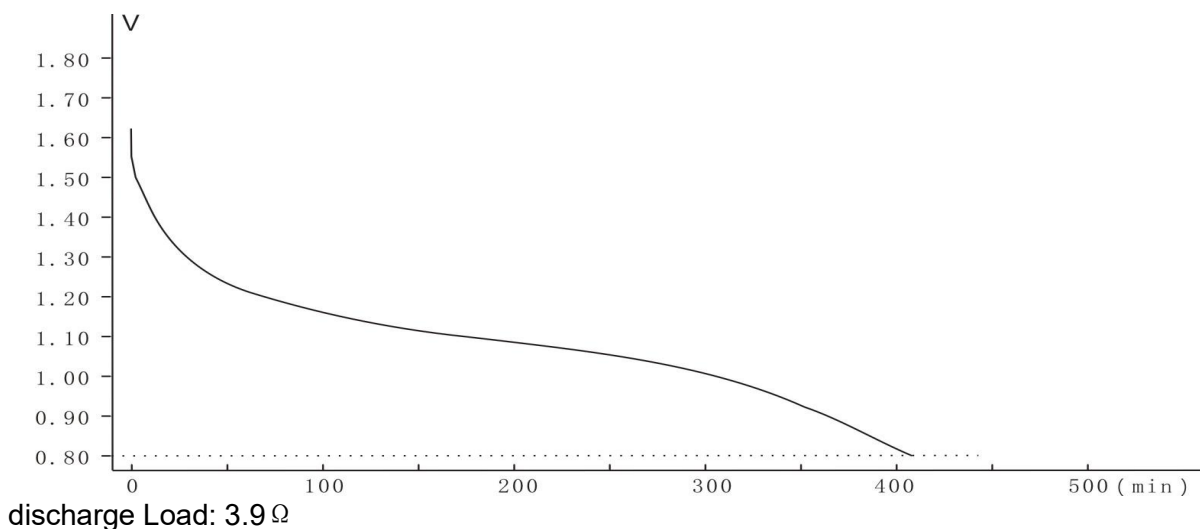
Storage life of batteries are ten years long at 20°C ± 2°C and RH 60±15%

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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