



Bonrex Technology Co.,Ltd

PRODUCT SPECIFICATION

LITHIUM MANGANESE DIOXIDE BATTERY

MODEL : CR123A

File No.: BR-CR123A-SM-001

Version: A/0

Status:



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1 Scope

This specification applicable to lithium manganese dioxide cylindrical battery, Model CR123A

- 1.1. Model Number: CR123A
- 1.2. Nominal Voltage: 3 V
- 1.3. Nominal Capacity: 1600 mAh
(Continuous discharge at temperature $20 \pm 5^{\circ}\text{C}$ under 20mA current load to 1.5V cut-off voltage)
- 1.4. Weight: Approx. 17g
- 1.5. Outer Dimensions: The dimensions shall be according to the Fig. 1. Battery dimensions.

2 Standard Parameters

- 2.1. Temperature Range: Operating -40 to $+60^{\circ}\text{C}$
Storage -20 to $+40^{\circ}\text{C}$
- 2.2. Standard Discharge Current: 20 mA
- 2.3. Max. Continuous Discharge Current: 1500 mA

3 Performance

- 3.1. Open Circuit Voltage: 3.0V to 3.35V
- 3.2. Pulse Discharge Conditions: Population Mean ≥ 1800 cycles
Pulse Current: 900 mA
One Cycle: 3 seconds on, 27 seconds off
Cut Off V.: 1.55 V
Temperature : $20 \pm 2^{\circ}\text{C}$
- 3.3. Pulse Discharge Conditions: Population Mean ≥ 1100 cycles
Pulse Current: 950 mA
One Cycle: 3 seconds on, 27 seconds off
Cut Off V.: 1.2 V
Temperature : $20 \pm 2^{\circ}\text{C}$
- 3.4. Discharge Capacity:
 - 3.4.1. Continuous discharge at temperature $20 \pm 5^{\circ}\text{C}$ under 20mA current load to 1.5V cut-off voltage, The discharge capacity should be not less than nominal capacity
 - 3.4.2. Self-discharging rate: $\leq 2\%$ per year.

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3.5. Leakage Resistance: The battery shall not show leakage or salting which harms performance.

4 PTC (Positive Temperature Coefficient) Device Performance

4.1. Appearance: There shall be no noticeable deformation and / or scratches.

4.2. Resistance: The resistance shall be between 10 to 70mΩ (no load).
When 5 A flows, the resistance shall be more than 10Ω before 80 seconds.

5 Measuring Instruments and Measuring Methods

5.1. Test Conditions: Unless otherwise specified elsewhere, tests should be conducted at ordinary temperature ($25 \pm 5^{\circ}\text{C}$) and ordinary humidity ($65 \pm 5\% \text{RH}$).

5.2. Measuring Instruments:

5.2.1. Volt Meter: Internal Impedance: More than 1MΩ.
Accuracy: Less than 0.25%

5.2.2. Caliper: Accuracy: Less than 0.25%

5.2.3. Balance: Sensitivity: More than 100 mg

5.3. Measuring Method:

5.3.1. Outer Dimensions: This shall be measured with the caliper described in Item 5.2.2.

5.3.2. Weight: This shall be measured with the balance described in Item 5.2.3

5.3.3. Open Circuit Voltage: This shall be measured with the volt meter described in Item 5.2.1.

5.3.4. Operating Time: Operating time shall be measured with cycles until terminal (Duration) voltage reaches the specified cut-off voltage.

5.3.5. Load resistance: Load resistance should include resistance throughout external circuits, and its tolerance should be $\pm 0.5\%$

5.3.6. Leakage Resistance: Heat cycle test
Leakage appearance and outer dimension shall be checked after 10 cycles according to MIL-STD-202E-106D.
The battery shall be kept in a dry place. It should not show any dew point when stored in this condition.

5.3.7. Heat cycle Test: The battery shall be carried out the Heat cycle Test according to IEC 60086-4: 2014.

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After 10 cycles of Heat cycle, the battery shall be kept in dry place.
The leakage and appearance shall be checked by naked eyes.
Dimensions shall be checked.

5.3.8. High Temp. Storage: The battery shall be stored at 60°C for 28 days. After the storage, the battery shall be kept in dry place at 25±5°C during 4 hours, then leakage and appearance shall be checked by visual means.

5.4 Appearance: Visual inspection: The surfaces of the batteries are clean. The mark is clear. There should not be deformation, rust, stain or leakage.

6 Precautions for Stored

6.1. A battery shall not be stored at temperatures in excess of 40°C. Storage at less than 30°C is recommended. Storage at less than -30°C can deform the plastic parts and may cause a leakage. To prevent self-discharge caused by corrosion, or decrease of insulation, humidity during storage shall be less than 70%.

6.2 Keep away from heat source of flame.

7 Precautions for use

The battery has an explosion resistant construction. But the following cautions should be taken, because combustible materials such as lithium metal and organic electrolyte are contained in the battery

- * Do not use except in applicable model or equipment.
- * Do not connect more than three cells in series.
- * Do not mix different types (chemistries) of batteries
- * Do not short circuit.
- * Do not dispose in fire.
- * Do not charge.
- * Do not disassemble.
- * Do not connect the wrong polarity (+,-)

7.1. The battery shall not be washed by ultrasonic wave washer.

8 Important Notes (Warranty)

8.1. Warning: Fire and burn hazard. Do not recharge, short circuit, over discharge, crush,

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disassemble, heat above 100°C (212°F) or incinerate. Keep battery far away from children put them in original package until ready to use. Dispose of used batteries promptly.

- 8.2. When customer does any work on the battery ignoring instructions in this specification, for example wire is soldered to the tab or battery surface directly; Bonrex Technology Co., Ltd. cannot warrant any battery performance including safety and the customer should undertake the responsibility of all damage caused by this battery.
- 8.3. Do not solder the battery directly. Excessive heating may cause deformation of the battery components such as the gasket, which may lead to the battery swelling, leakage, explosion or ignition.
High temperature and long time may cause heat gathered.
- 8.4. Observe the soldering condition for the tabbed battery to be specified by the manufacturer. Choose the tabbed battery if soldering is required.
Excessive heating may cause deformation of the gasket, leakage or performance deterioration of the battery.
- 8.5. Tabs can be soldered on the battery terminals directly by spot-welding. The parameters of the spot-welder must be adjusted carefully to avoid the battery being perforated, changing voltage and temperature rising above 65°C. Assure not to exceed the battery temperature higher than 60°C at soldering.
- 8.6. Do not over discharge the battery lower than 0V. It may lead to reversed polarity and cause ignition, heating, leakage or explosion.
- 8.7. Battery characteristics vary with type and grade, even when batteries are the same size and shape. When replacing batteries with new ones, be sure to carefully check the symbols and numbers on each battery.
- 8.8. Please design equipment so that infants cannot easily remove batteries and swallow them.
- 8.9. Consult the sales representative, when series or parallel connection of several batteries is required.

9 Date code system

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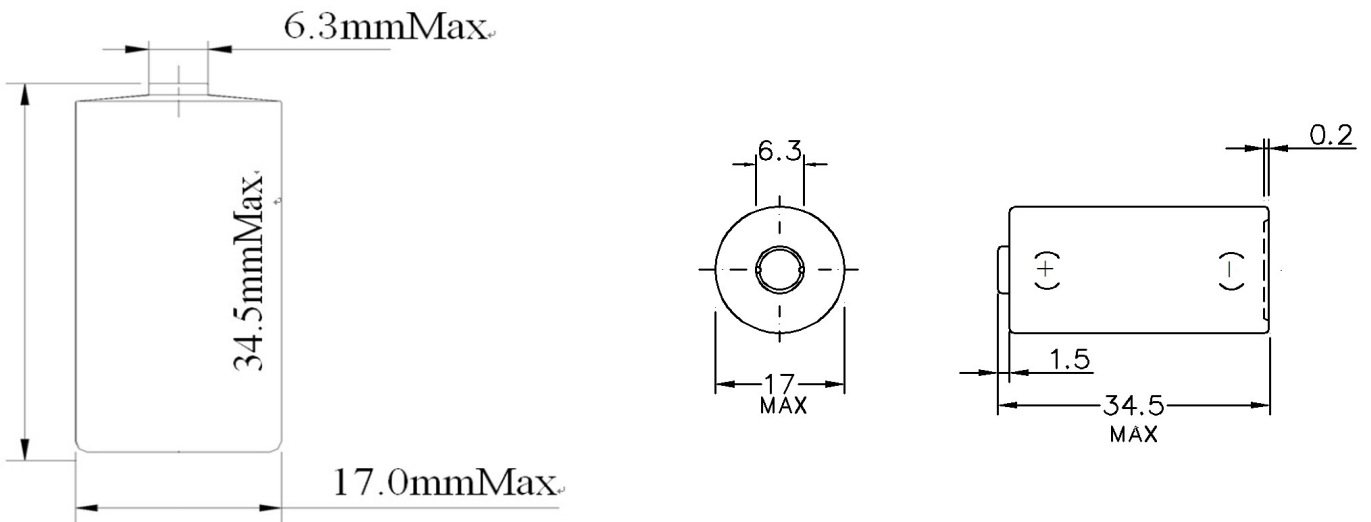
Ex. 16 05 26 01
 ↓ ↓ ↓ ↓
 Year Month Day Batch No.

10. The Battery Dimensions (Fig. 1.)

Voltage : 3V

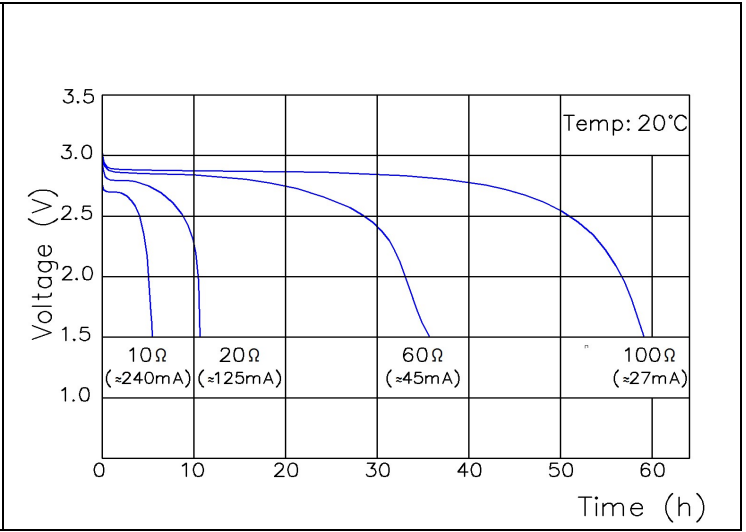
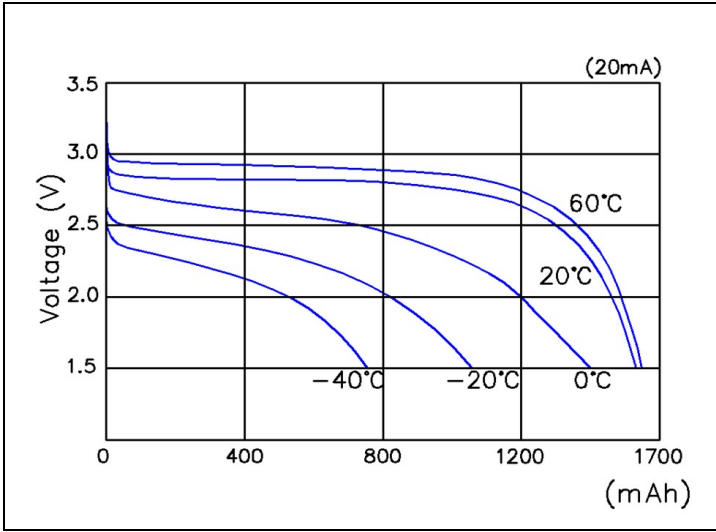
Terminals : Flat Contact

Remarks : *PTC device is installed inside



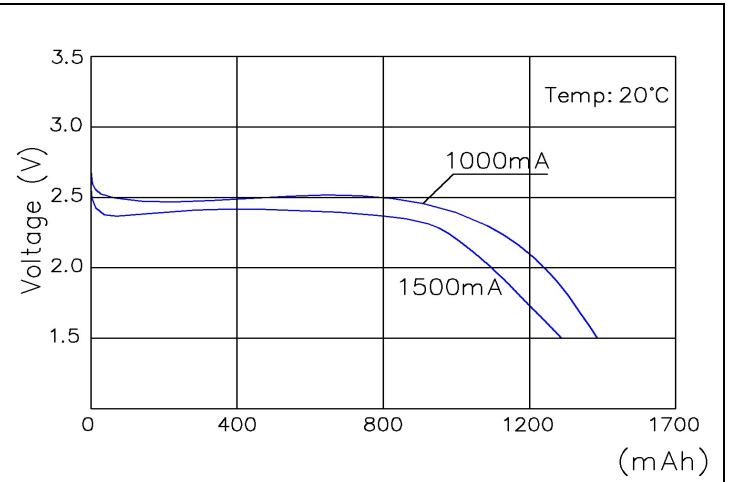
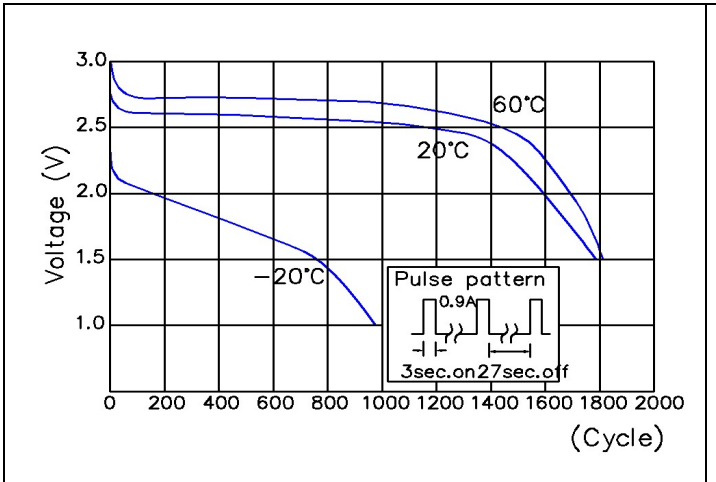
Unit: mm

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Pulse Discharge

High Drain Discharge



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