Lithium Manganese Dioxide

2CR5

BRIEF SPECIFICATION

Model: 2CR5
Nominal Voltage: 6.0V
Nominal Capacity: 1300mAh
Standard Discharge Current: 10mA
Weight: 40g
Stainless steel container
ISO9002 Certified
Non dangerous for transportation

CONTENTS

1. General Information

The EEMB Lithium Manganese Dioxide cell chemistry was one of the first solid cathode cells commercially developed and is still the most widely used system today. These cells offer an excellent shelf life, good high-rate and low-rate capability, a wide operation temperature range and availability in cell designs. Potential design-in applications for these products are electronic, telecommunication, metering, instrumentation, office and other portable equipment use. Based on the outstanding cell performance and reliability of these produces, they have been able to meet and exceed the requirements of our customer base worldwide.

1.1 Advantages for EEMB Lithium Manganese Dioxide cells:

- High open circuit and load voltage: 2.8-3.2 volts per cell.
- High energy density: 270Wh/kg and 510Wh/l.
- Outstanding operational temperature range: -40 °C to +70 °C
- Flat discharge profile under low to medium rate applications.
- Low self-discharge: less than 1% per year at RT.
- Superior shelf life and operational life: up to 10 years.
- Ability to provide a variety of laser welded termination tabs for all cells.
- Safe and environmentally friendly.

1.2 Constructions of Lithium Cells

EEMB offers a complete range of primary lithium manganese dioxide cylindrical cells for memory backup and portable applications worldwide.
The cylindrical cell configurations, offer the high-capacity bobbin construction and high-power spirally wound product. The bobbin construction is targeted at low to moderate power requirements, dedicated for applications requiring up to a 10 year operational life at 20 °C. Our spirally wound constructional product offers high-rate discharge capability, with an operational life in excess of 5 years.

Lithium Cylindrical Batteries

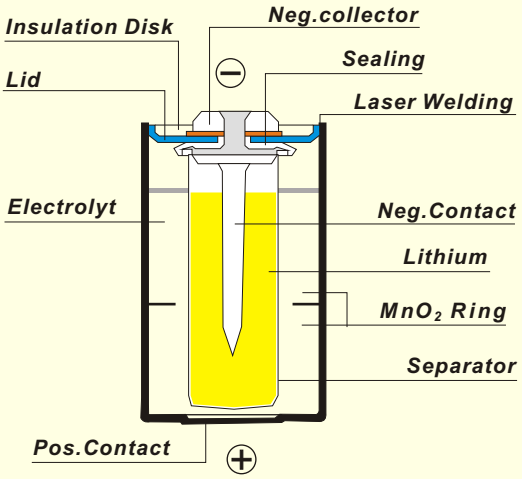


Fig.2
Bobbin construction
Schematic construction of a Li/MnO_2cylindrical cell (CR 1/2AA)

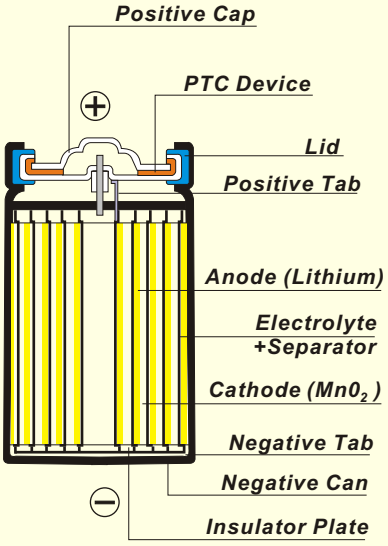


Fig.3
Spiral construction
Schematic construction of a Li/MnO_2cylindrical cell (CR 123A)

1.3 Characteristics and Applications

Main Applications
Both mechanical and electrical properties, together with reliability, ensure that EEMB lithium batteries meet the requirements of modern electronics. They are therefore ideally suited as power sources for the long term supply of microelectronic circuitry.

Main Characteristics

- Long life expectancy and long operational life.
- Low self discharge rate
- High energy density
- High cell voltage: 3 V
- Wide temperature range
- High operating Safety
- High reliability
- Resistance to corrosion
- No leakage problems

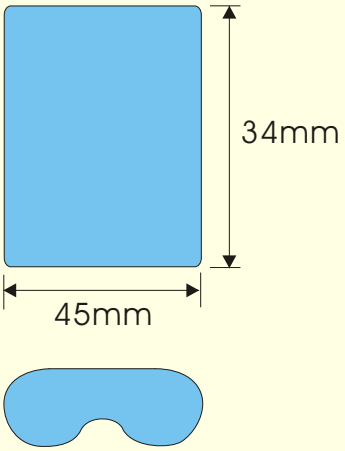
2. CR Primary Lithium Cells

2.1 Technical Data

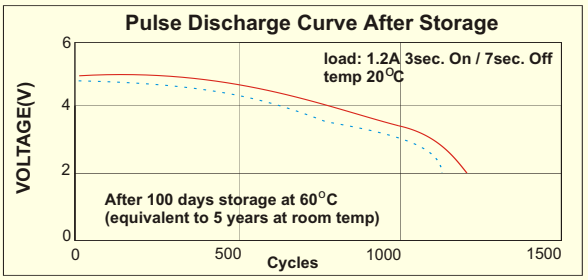
Model	Nominal Voltage(v)	Nominal capacity (mAh)	Standard discharge current (mA)	Continuous discharge current (mA)	Pulse discharge current (mA)
2CR5	6.0	1300	10	1000	3500

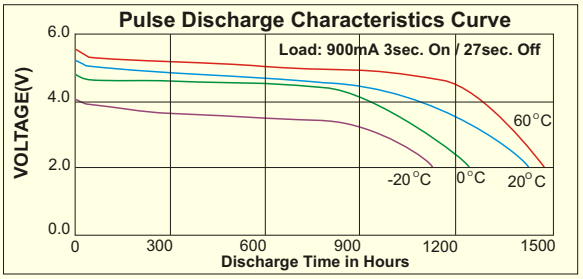
2.2 CR Primary Lithium Cylindrical Cell Performance Data

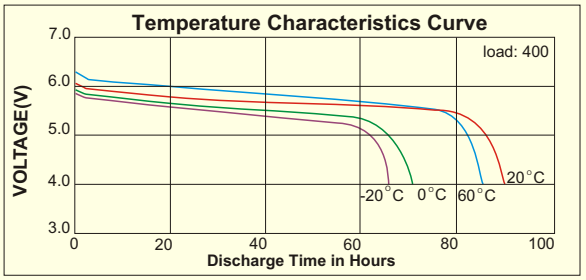
2CR5

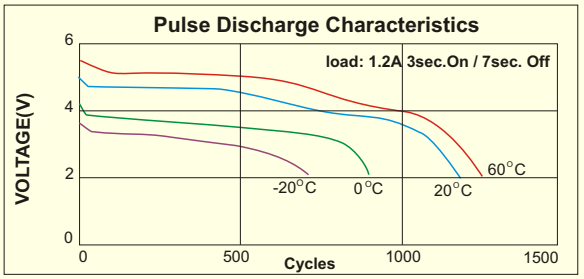


NOMINAL VOLTAGE (V)	6.0
NOMINAL CAPACITY (mAh)	1300
STANDARD DISCHARGE CURRENT(mA)	10
MAX. DISCHARGE CURRENT(mA)	
CONTINUOUS	1000
PULSE	3500
WIDTH (mm)	34
HEIGHT (mm)	45
WEIGHT (g)	40









3. General Design Characteristics

In order to ensure optimum battery performance for the primary CR cylindrical cells, we suggest consideration of the following design-in requirements. They are the nominal and operating voltage, load current and profile, the duty cycle, temperature requirements and shelf life for the application. These characteristics for each battery type must be evaluated against the design requirements to select the most appropriate product that fulfills these requirements.

3. 1 Safety Tests

3.1.1 Compression Test 1120 kg

No significant electrolyte loss
No rupturing

3.1.2 In short circuit condition 24 H, 0.1

After 24 hours the bottom of the cell is curved by only 0.1mm; diameter unchanged.
No electrolyte creepage or loss.
No rupturing.

3.1.3 Test at 150 C for 2 hours.

No electrolyte creepage or loss
No rupture
No fire
No explosion
Open circuit voltage almost unchanged at 3.2 V
The cell base bowed, causing cell height to increase by 1 mm, diameter unchanged.

3.1.4 Puncture Test total penetration of the cell by a nail 3mm

No splashing or pressurized electrolyte loss.
No rupturing.

3.1.5 Vibration Test

Amplitude at frequency range: 5 to 55 Hz: 0.75mm
Frequency Range: 5Hz 55Hz 500Hz 55Hz 5Hz
Acceleration at frequency range: 55 Hz to 500 Hz: 100m/s
Cycle duration:15min
Oscillation time of each main axis:3 h.
Without changing of the electrical values of CR 1/2 AA, CR2/3 AA, CRAA.

3.2 Safety Guidelines

Safety and Handling Issues

We recommend that attention begins to the design and implementation of our lithium-Manganese Dioxide cells to ensure superior operating performance. With our Lithium-Manganese Dioxide Batteries, the appropriate precautions must be taken to avoid physical and electrical abuse otherwise, the batteries can be hazardous if not used properly. To avoid such incidents, we would suggest you review the following safety and handling precautions for your potential applications:

1.Do not heat. Nor dispose of in fire.

If heated the plastic materials in the cell such as the gasket and separator may be damaged, causing leakage. The heat generated by a short circuit inside the batteries may lead to bursting or combustion. If disposed of in fire, batteries my violently rupture.

2.Do not charge (Lithium Primary Battery CR Series).

When a Lithium Primary Battery is charged, gas is generated inside the battery and can result in swelling, heat generation, leakage, violent rupture or potential fire.

3.Avoid forced discharge.

When batteries are force-over discharged with an external power source, the voltage drops to under 0.0 V (reverse electrode), and inner gas is generated. This can lead to swelling, heating, leakage violent rupture and / or potential fire.

4.Do not short circuit.

If the positive and negative terminals come into contact with each other or with a metal object, this can cause a short circuit, generating heat. If the batteries are stacked on top of each other or mixed, the resulting short-circuit can lead to heat generation, leakage, violent rupture or fire.

5.Do not disassemble, apply excessive pressure or deform.

If a battery is forcefully disassembled, gas may be generated which may cause throat irritation, or the lithium metal may generate heat, causing fire. If deformed under pressure or under impact, distortion of the seal may lead to leakage, or a short circuit inside the battery may lead to potential safety hazards.

6.Do not use with other battery types or old batteries with fresh cells.

If different types of batteries are used together, or fresh are used with old ones, the difference in characteristics of voltage, capacity, etc., may cause over discharge of the battery which is exhausted first, leading to swelling, bursting or fire.

7.Observer the (+) and (-) polarity.

If the batteries cell polarity is reversed by inserting the battery backwards, depending on the equipment, a short circuit or over discharging may result a potential safety hazard.

8.Do not swallow

store batteries in a safe location, out of the reach of babies and small children. Also, make sure that batteries can not be easily removed from equipment in which they are used. If swallowed by mistake, consult a doctor immediately.

9.Do not throw into the water.

This can result in corrosion and the generation of combustible gas.

10.Do not store in direct sunlight or rain.

Store batteries in a place not subject to direct sunlight. Make sure the area is dry and is approximately 20 C. Storage in areas with higher temperature, humidity or exposure to rain may cause deterioration in battery quality and durability.

11.Soldering.

Do not solder or weld directly to the cells surface. Use preassembled cells with tabs or leads.

3.3 Transportation of EEMB Lithium Cells

Lithium cells are considered non-dangerous if each battery with a solid cathode contains 1 gram or less of lithium and are therefore not subject to national or international dangerous goods regulations for transport by road, rail, sea, or air, provided that

1.Batteries are separated so as to prevent short circuits.

2.Batteries are packed in strong packaging, except when installed in electronic devices.

3.Details of specific transport regulations are available on special request.

All EEMB Lithium Cells listed above contain less than 1.0 gram of Lithium and, as long as they are packed as above, are therefore not subject to the dangerous goods regulations.

4.Tabs

EEMB Company Limited can provide following tabs and leads with the battery, Custom design welcomed.

Figure 1

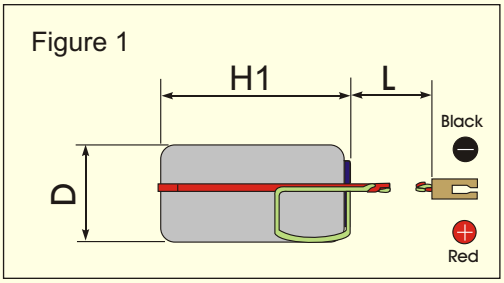


Figure 2

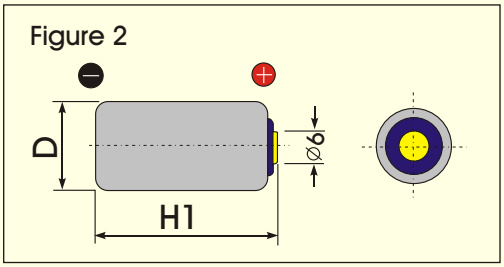


Figure 3

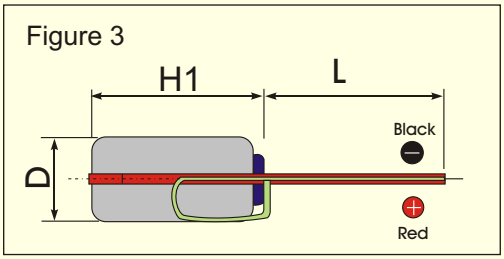


Figure 4

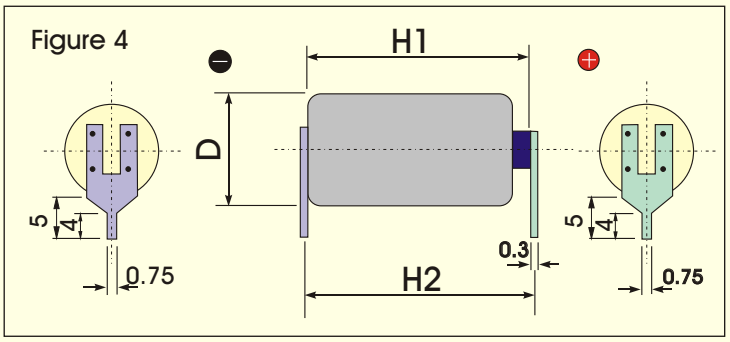


Figure 5