

# EEMB CO., LTD

## Lithium Manganese Dioxide Battery Specification

### *High Power Type*

<b>Model:</b>	<b>CR1/3N</b>
<b>Capacity:</b>	<b>170mAh</b>

Prepared	Checked	Approved

Customer :

Customer Approval (Customer confirmation) :		
Signature	Checked	Approved

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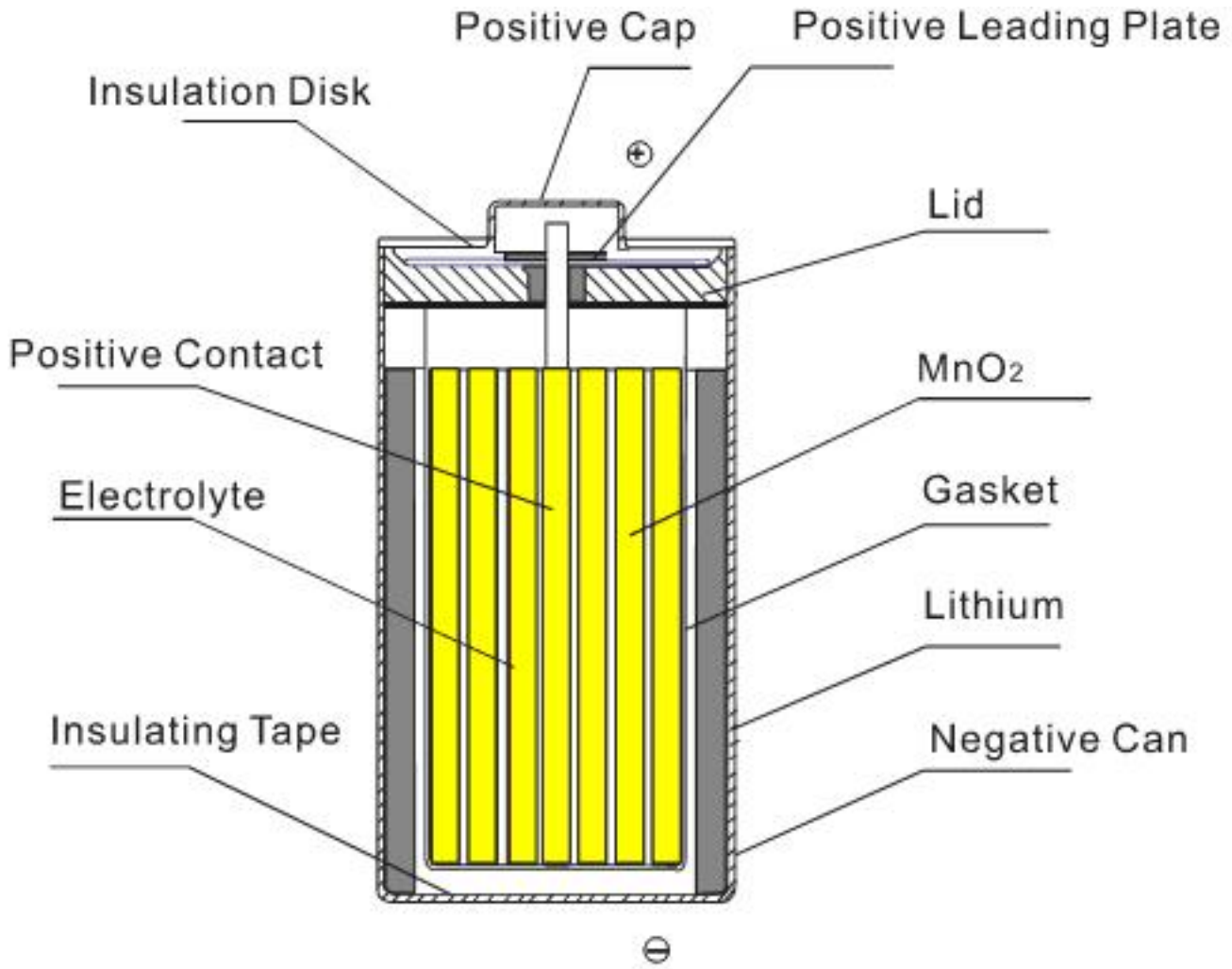
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### Battery Structure



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**Catalog**

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## 1. Scope

This product specification defines the requirements of the Lithium Manganese Dioxide battery supplied to the customer by EEMB Co., Ltd.

## 2. Features and Applications

### Features:

- High energy density
- Outstanding operational temperature range: -40°C to +60°C
- Stable discharge characteristics
- Low self-discharge: less than 1% per year at room temperature
- Superior shelf life and operational life: up to 10 years
- Safe and environmentally friendly.

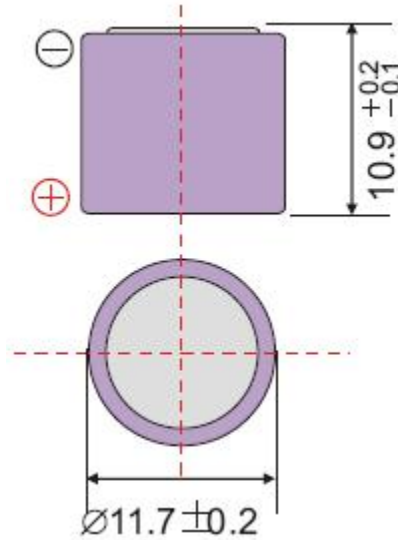
### Applications:

- Water, gas and electricity meters
- Alarm system, GPS system, GSM system, Medical devices

## 3. Battery Basic Characteristics

No.	Item	Characteristics
3.1	Model	CR1/3N
3.2	Nominal Capacity	170mAh
3.3	Nominal Voltage	3.0V
3.4	Standard Discharge Current	3mA
3.5	Max. Continuous Discharge Current	60mA
3.6	Max. Pulse Discharge Current	140mA
3.7	Discharge Cut-off Voltage	2.0V
3.8	Weight	Approx. 3g
3.9	Operating Temperature	-40~60°C
3.10	Storage Condition	Temperature ≤ 30°C; Humidity ≤ 75%RH

#### 4. Dimension (Unit: mm)



#### 5. Appearance

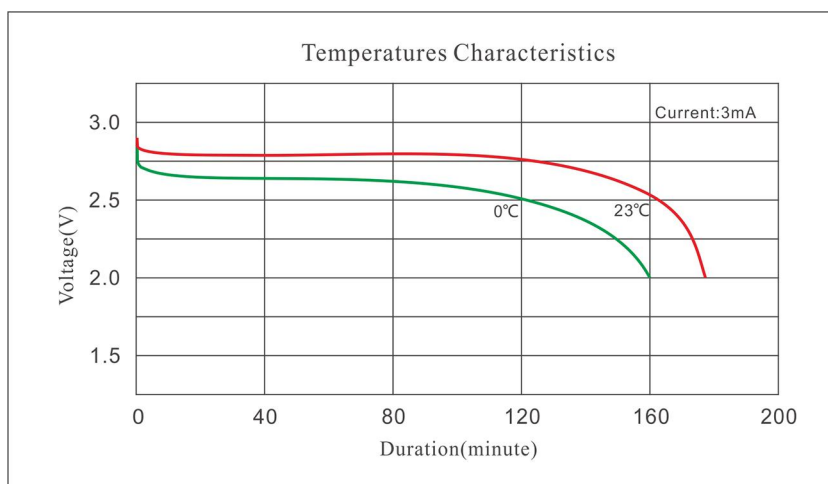
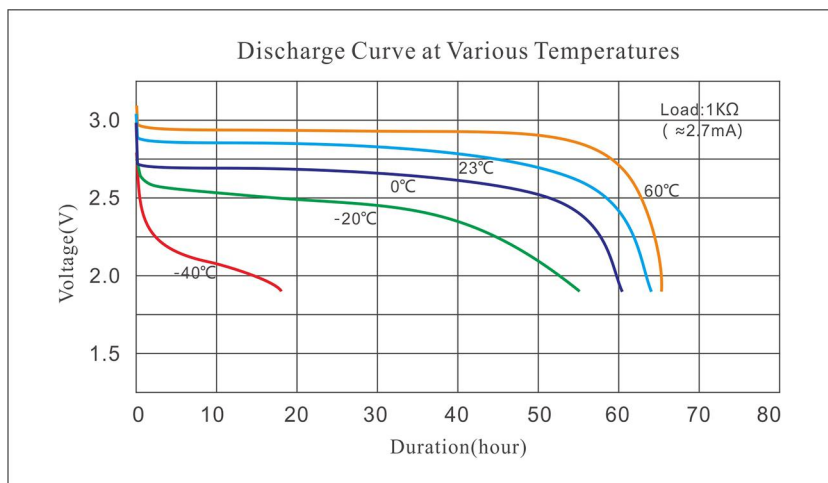
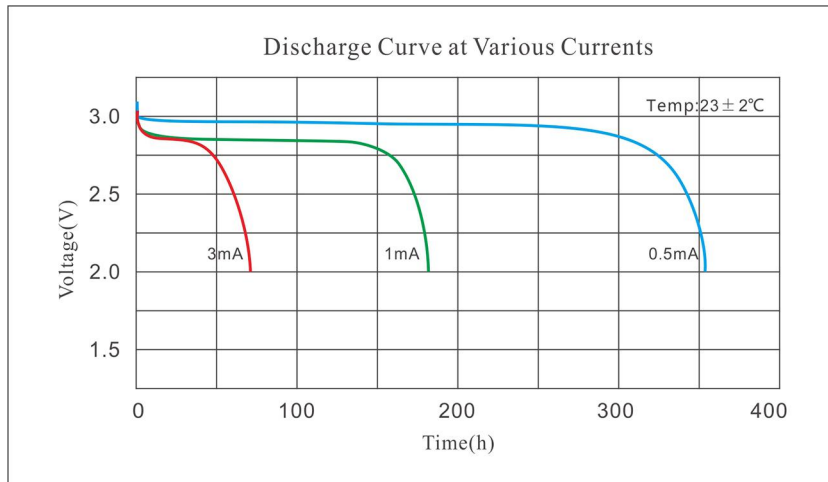
It shall be free from any defects such as remarkable scratches, breaks, cracks, discoloration, leakage, or middle deformation.

#### 6. Performance and Test Methods

Test condition: Temperature 20°C~25°C; Humidity 65±20%.

No	Item	Standard	Test Methods
6.1	Compression test	No electrolyte loss No rupturing	Press the cell with 1120kg
6.2	Short circuit	No electrolyte loss No rupturing	Short circuit for 24 hrs with 0.1Ω
6.3	High temperature	No fire No explosion	Store at 150°C for 2 hours
6.4	Puncture test	No electrolyte loss No rupturing	Total penetration of the cell by a nail φ3mm
6.5	Vibration test	No damage, leakage No fire or explosion	Amplitude at frequency range: 5 to 55Hz: ±0.75mm Frequency Range: 5Hz, 55Hz, 500Hz, 55Hz, 5Hz Acceleration at frequency range: 55Hz to 500Hz: 100m/s Cycle duration: 15min Oscillation time of each main axis: 3 h.

## 7. Characteristics Curve

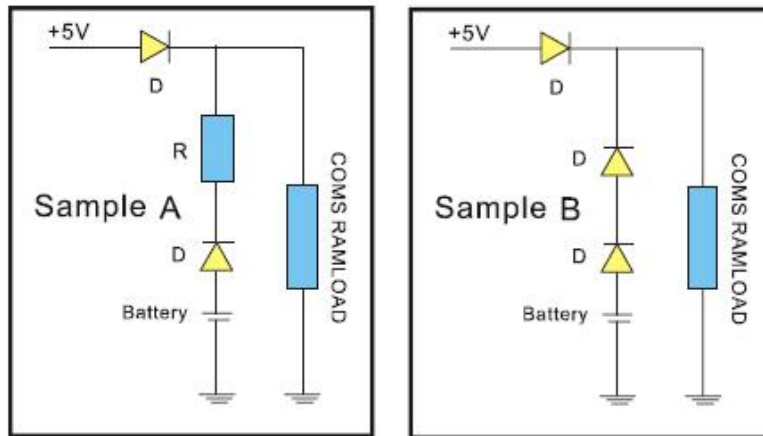


## 8. Memory Backup Circuit Design Suggestion

A primary lithium battery is not rechargeable, when used for memory backup in combination with another power source; current may flow into the battery from the other source. A protection diode and resistor into the circuit is needed to avoid battery charging or over discharging. Select a silicon diode or a diode with minimum leakage current,

and design the circuit so that the amount of charging due to leakage current will not exceed 2% of the nominal battery capacity over the total period of use.

While used for memory backup, the following circuit shall be applied:



## 9. Matters Needing Attention

Strictly observes the following needing attention. EEMB will not be responsible for any accident occurred by handling outside of the precautions in this specification.

### **! Caution**

- Use Nickel-plated iron or Nickel-plated stainless steel for the terminals that contact the battery.
- Make sure that terminal contact pressure is 50g minimum, for a stable contact.
- Keep the battery and contact terminal surfaces clean and free from moisture and foreign matter.
- Before inserting the battery, check the battery contact terminals to make sure they are normal, not bent or damaged. (Bent terminals may not make good contact with the battery or may cause short circuit.)
- When the batteries are piled up in a disorderly way, their positive and negative terminals may short-circuit, consuming some batteries while charging others, causing explosion.
- Lithium batteries that are almost exhausted can output a voltage that is almost the same as that of a new battery: Please does not judge a battery only with a Voltmeter. Do not mix batteries of different types and brands, or new and used batteries. We are well informed that battery pack should be assembled with single batteries of similar voltage, capacity and inner resistance.
- Lithium batteries need a period of time to recover their normal voltage after even a slight short circuit. Therefore, if the battery is short-circuited, wait an adequate long time for batteries to recover before measuring their electrical characteristics.
- Use a high impedance (1M or higher) voltmeter to measure battery voltage.
- Add fuse between negative and connector. Once short circuit, it will cut immediately and permanently.
- Do not contact terminals with conductive i.e. metal, goods. Keep batteries in non-conductive, i.e. plastic, trays.
- Reduce impact to insulation layer from vibration, but the dimension will enlarge.
- 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 them.

### **! Danger**

- DO NOT recharge, short-circuit, disassemble, deform, heat or place the battery near a direct flame. This battery contains flammable materials such as lithium and organic solvent and performing any of the above actions could cause it to ignite explode or become damaged.
- DO NOT over-discharge the battery. In case the battery is over-discharged when connected with exterior power source or connected with other batteries in series, explosion may occur.
- Keep this battery out of the reach of children. If it is swallowed, contact a physician immediately.
- When storing a battery or throwing it away, be sure to cover it with tape. If the battery is contacted with other metal objects, it could cause fire or become damaged.

### **! Warning**

- Thoroughly read the user's manual before use, inaccurate handling may cause leakage, heat, smoke, explosion, or fire, causing device trouble or injury.
- Insert the battery with the "+" and "-" ends correctly oriented.
- If the battery is used together with new batteries, do not use it with a different type battery.
- Do not solder the battery directly. Protect the welding point and connector.
- The battery should be preferably stored in dry and cool conditions. Avoid storing the battery in direct sunlight, or in excessively hot and humid place. Storage at high temperature must be avoided to preserve the battery life time.

EEMB reserves the final explanation. Please use battery strictly according to specification. EEMB will not be responsible for any inappropriate operation. EEMB keeps the right to change product specifications without previous notice. If any question, please consult with the manufacturer