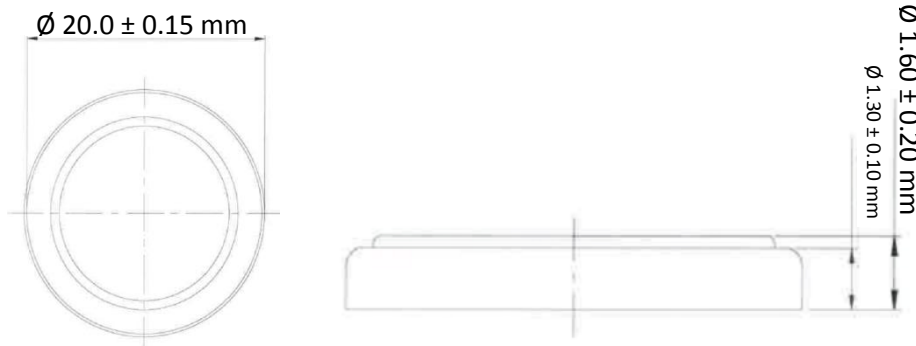


## **1. Product drawing**



## **2. Scope:**

This specification is applicable to lithium-manganese dioxide coin type battery, CR2016 distributed under brandname RAVER.

## **3. Law & Regulation Compliances:**

This product complies with EU's battery directive (2006/66/EC).

Packaging materials comply with EU's directive on packaging materials and waste (94/62/EC)

## **4. General:**

4.1 Type designation: CR2016

4.2 Chemical system: Anode  $\text{MnO}_2$ , Cathode Lithium, Electrolyte Lithium-salt organic electrolyte

4.3 Nominal voltage: 3.0 V

4.4 Weight: Approximate 1.7 g

4.5 Dimension: The dimensions shall be in accordance with the above figures both prior to and after service output test. Measuring equipment shall be with an accuracy  $\pm 0.05 \text{ mm}$  at least.

4.6 Capacity: Approximate 75mAh (30k $\Omega$ , 20 $\pm 2^\circ\text{C}$ , e.v.= 2.0V)

4.7 Operation temperature :  $-10^\circ\text{C} \sim 60^\circ\text{C}$

4.8. Recommend storage temperature : Not exceed  $30^\circ\text{C}$

4.9 The expiry date: is 10 years from the date of manufacture and is stated on the battery packing..

## **5. Appearance**

The battery visually inspected by unaided eye 30cm away from battery. The battery shall be free from dents, scratch, rust and extruded internal compounds, such as sealing compounds and etc, and serious displacement of artwork. Appearance defects shall not be observed that may adversely affect actual use or performance of batteries.

## **6. Electrical Characteristics**

Unless otherwise stated, all measurements are to be performed at a Standard Environment of  $20 \pm 2^\circ\text{C}$ ;  $55 \pm 20\%$  RH.

All samples are normalized for 8 hours at least at the above environment prior to measurement.



The digital voltmeter (DCM) is with the precision of 0.25% (internal resistance not less than 1 M $\Omega$ ). The load resistance of the total circuit is accurate within  $\pm 0.5\%$  of the specified value.

#### 6.1 Open circuit voltage and closed circuit voltage (Load resistance 15k $\Omega$ , 0.8S)

		<b>OCV(V)</b>	<b>CCV(V)</b>
Initial	Min	3.0V – 3.6V	3.0V – 3.6V
	Normal	3.0V – 3.6V	3.0V – 3.6V
Stored 1 year	Min	3.0V – 3.6V	3.0V – 3.6V
	Normal	3.0V – 3.6V	3.0V – 3.6V

#### 6.2 Service life (Load resistance 30k $\Omega$ , e.v.= 2.0V)

		<b>Service life</b>
Initial	Min	630 hrs
	Normal	750 hrs
Stored 1 year	Min	600 hrs
	Normal	700 hrs

Remark:

Min =  $0 \pm 2^\circ\text{C}$ , Normal =  $20 \pm 2^\circ\text{C}$

1) The initial discharge test shall commence within 30 days of manufacture. During stored period, the cells shall be stored under room temperature conditions.

2) Lot release service output test is conducted by 20  $\Omega$  continuous discharging to 0.9volts

- The batteries shall not leak during the service life test before the end voltage reached.

#### 6.3 Service life after storage at high temperature (Load resistance 30k $\Omega$ , e.v.= 2.0V)

Tested specimen batteries, after having been stored at the temperature  $60 \pm 2^\circ\text{C}$  through the period of 20 days, shall be kept for 4 hours or longer at the ambient temperature ( $20 \pm 2^\circ\text{C}$ ), and then shall be continuously discharged under the 30 k $\Omega$  load at same temperature ( $20 \pm 2^\circ\text{C}$ ), The discharge shall be continued until the voltage falls below the end-point voltage of 2.0V.

RESULT: 665 hrs of service life or longer is required

## **7. Leakage Resistance**

High temperature leakage test

Test conditions: store 30 days under  $45 \pm 2^\circ\text{C}$ , RH 75% then store 4~24h under standard environment.

Requirement: No visible leakage; No explosion.

## **8. Safety notices.**

8.1 Do not try to disassemble the batteries.

8.2 Do not short-circuit the batteries. Do not handle or store with metallic materials which can cause short-circuit

8.3 Do not throw the batteries into water or moisture them.

8.4 Do not punch or hammer the batteries.



- 8.5 Do not connect the (+) and (-) terminals in reverse polarity to devices.
- 8.6 Do not mix use of different types of different series of batteries, nor used batteries with new ones.
- 8.7 Do not put a lead or spot weld directly on the battery, if requirement please contact with our sales dept
- 8.8 Do not expose the batteries to direct sunlight, hot and humid places.
- 8.9 Do not damage or mishandle the package of batteries. If package is damaged, the batteries must be quarantined, inspected, and repacked.
- 8.10 Optimum storage condition: Temperature range:  $23\pm 5^{\circ}\text{C}$  • Humidity range: 45-75%
- 8.11 Please read this instruction carefully before use.
- 8.12 Never recharge/short-circuit/disassemble. Avoid dispose in fire or expose close to a heat generating area.
- 8.13 To prevent to be swallowed by children accidentally, please keep them out of children in case that they are swallowed, contact with a physician immediately.
- 8.14 Never expose batteries to strong impact because there is the danger of combustion or burst. Be sure the battery disconnected from circuit when storing or disposing

### **9. Packaging Requirements**

9.1 The total of heavy metal lead, cadmium, mercury, and hexavalent chromium concentration shall not exceed 100 ppm in Packaging materials and printing inks. Ozone depleting substances (ODS) shall not be used in the manufacturing of any packaging.

The printing on each cell label is legible and permanent. Label defects, if any, shall conform to mutually agreed upon limit samples.

9.2 It is recommended that packaging for shipment and sales according to following packaging specification: 5pcs cells in a blister, 30 blisters in a display box, 12 display boxes in a final outer carton.

9.3 Otherwise packaging for shipment and sales shall conform to the mutually agreed to packaging specification of the designated customers.

**Chart 1. Discharge diagram**

