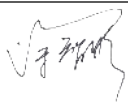



**TECHNICAL SPECIFICATION**  
**FOR**  
**ALKALINE MANGANESE DIOXIDE BATTERY**  
**TYPE: 23A**

|                     |   |                       |   |
|---------------------|---|-----------------------|---|
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## 1. Scope

This specification is applicable to the Alkaline Manganese Dioxide Battery 23A supplied by GUANGDONG TIANQIU ELECTRONICS TECHNOLOGY CO.,LTD.

## 2. Designations

### 2.1 Defining

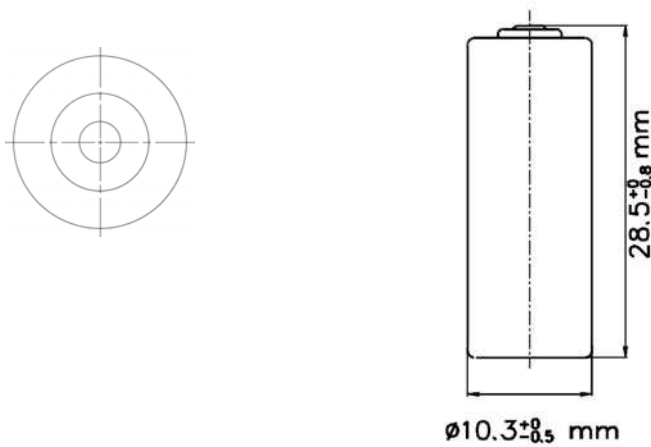
At the temperature of  $20 \pm 2^\circ\text{C}$ , loading at  $20\text{k}\Omega$  continuous discharge, till the voltage down to  $7.2\text{V}$

## 3. Designations and Dimensions

### 3.1 Designations:

Alkaline Manganese Dioxide Battery 23A

### 3.2 Dimensions



## 4. Product characteristic

| Item              | Characteristic   |
|-------------------|--|
| Nominal capacity  | 50mAh  |
| Nominal voltage   | 12V  |
| End point Voltage | 7.2 V  |
| Storage humidity  | $60 \pm 15 \% \text{ RH}$ (no condensate)                        |
| Dimensions        | maximum height:28.50mm<br>Maximum diameter: $\Phi 10.5\text{mm}$ |
| Approx. weight    | 7.9g   |

## 5. Technical requirements

### 5.1 Test conditions

Unless otherwise specified, the test conditions shall be, as a general rule, at the temperature of  $20 \pm 2^\circ\text{C}$  and the relative humidity of  $60 \pm 15\%$ .

### 5.2 Electrical characteristics

| NO.   | Item                    | Test condition  | Requirement   |
|-------|-------------------------|---|---|
| 5.2.1 | storage characteristics | Sampling plan : MIL-STD-105E, General Inspection Lever II , Single Sampling, AQL=0.4<br>Remark: Load voltage test method: 20K $\Omega$ /0.3S, The initial samples shall be tested within 30 days after delivery | Open Circuit Voltage(V) load voltage(V)<br>Initial: 12.0 11.9 |
| 5.2.2 | Service output          | Load resistance:20k $\Omega$ ;<br>Discharge method:24h/d continuously discharge; End point voltage 7.2V<br>Remark: The initial samples shall be tested within 30 days after delivery.                           | Initial $\geq$ 95hrs<br>12 months @ RT $\geq$ 81hrs           |
| 5.2.3 | Short circuit test      | Short circuit for 24 hrs at the temperature of $20 \pm 2^\circ\text{C}$   | No explosion<br>N=5, Ac=0, Re=1.                              |

#### 5.2.2&5.2.3 acceptance standard:

- 1) 9 pieces of battery will be tested for each discharging method.
- 2) The average discharging time from each discharging method shall be equal to or greater than the specified figure, and no more than one battery has a service output less than 80% of the specified figure.
- 3) One retest is allowed to confirm the results if the first test didn't meet the requirements.

### 5.3 Shelf life

One year after delivery under normal storage conditions.90% of the initial capacity will be maintained after one year storage.

## 6. Marking

Tian's Qiu logo



anode mark

Battery type

nominal voltage

## 7. Caution for Use

- 1) Since the battery is not designed to be charged, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
- 2) The battery shall be installed with its “+” and “-” polarity in correct position, otherwise may cause the battery to be charged or over-discharged.
- 3) Short-circuiting, heating, disposing of in fire and disassembling the battery are prohibited.
- 4) Battery cannot be forced discharge, which lead to excess internal gas generation and, may result in bulging, leakage and explosion.
- 5) New and used batteries cannot be mix used at the same time, when replaced batteries, it is recommend to replace all and with the same brand type.
- 6) Exhausted batteries should be removed from compartment to prevent over-discharge, which cause leakage and damage to the device.
- 7) Direct soldering is not allowed, which will damage the battery.
- 8) Keep the battery out of the reach of children to prevent swallow, in case of accident should contact physician at once.
- 9) The battery should not be dismantled and deformed.

## 8. Referenced Standards

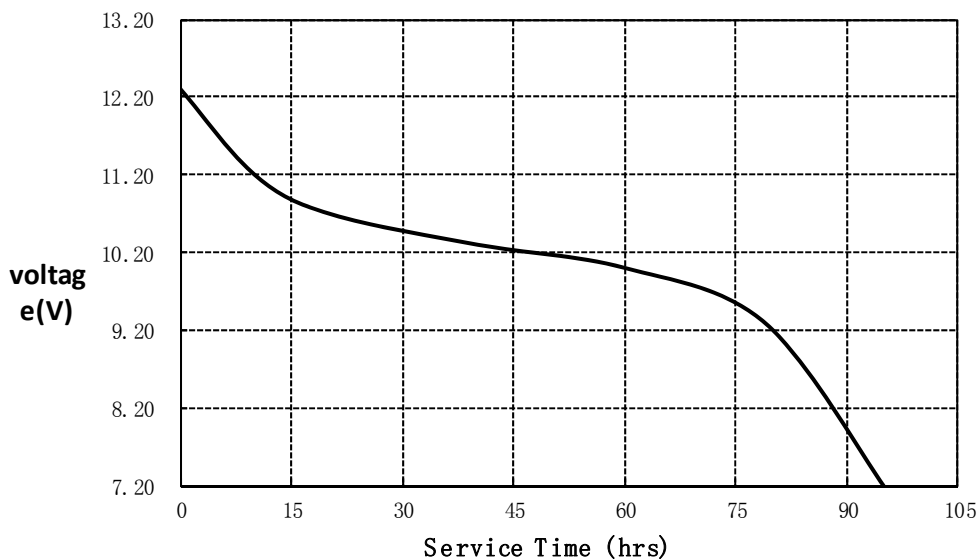
IEC 60086-1:2015–Primary Batteries –Part 1: General

IEC 60086-2:2015 –Primary Batteries –Part 2: Physical and electrical specifications

IEC 60086-3:2011 –Primary Batteries –Part 3: Watch batteries

IEC 60086-5:2011 –Primary Batteries –Part 5: Safety of batteries with aqueous electrolyte

## 9. Discharge Curves



**Discharge method: 20kΩ, 24hours/day, E.V. 7.2V**

**Temperature: 20±2℃**