

TECHNICAL SPECIFICATION
FOR
ALKALINE MANGANESE DIOXIDE BATTERY
TYPE: 27A

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1. Scope

This specification is applicable to the Alkaline Manganese Dioxide Battery 27A supplied by GUANGDONG TIANQIU ELECTRONICS TECHNOLOGY CO.,LTD.

2. Designations

2.1 Defining

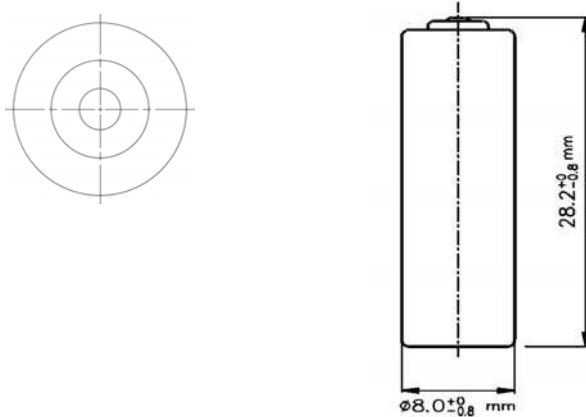
At the temperature of $20 \pm 2^\circ\text{C}$, loading at $20\text{k}\Omega$ continuous discharge, till the voltage down to 7.2V

3. Designations and Dimensions

3.1 Designations:

Alkaline Manganese Dioxide Battery 27A

3.2 Dimensions



4. Technical Specifications

Item	Characteristic
Nominal capacity	20mAh
Nominal voltage	12V
End point Voltage	7.2 V
Storage humidity	$60 \pm 15\%$ RH (no condensate)
Dimensions	maximum height: 28.20mm Maximum diameter: $\Phi 8.00\text{mm}$
Approx. weight	4.6g

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 Remark: Load voltage test method: $20\text{k}\Omega/0.3\text{S}$, The initial samples shall be tested within 30 days after delivery	Open Circuit Voltage(V) load voltage(V) Initial: 12.0 11.9
5.2.2	Service output	Load resistance: $20\text{k}\Omega$; Discharge method: 24h/d continuously discharge; End point voltage 7.2V Remark: The initial samples shall be tested within 30 days after delivery.	Initial $\geq 40\text{hrs}$ 12 months @ $\text{RT} \geq 44\text{hrs}$
5.2.3	Short circuit test	Short circuit for 24 hrs at the temperature of $20 \pm 2^{\circ}\text{C}$	No explosion $N=5, A_c=0, R_e=1$.

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



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

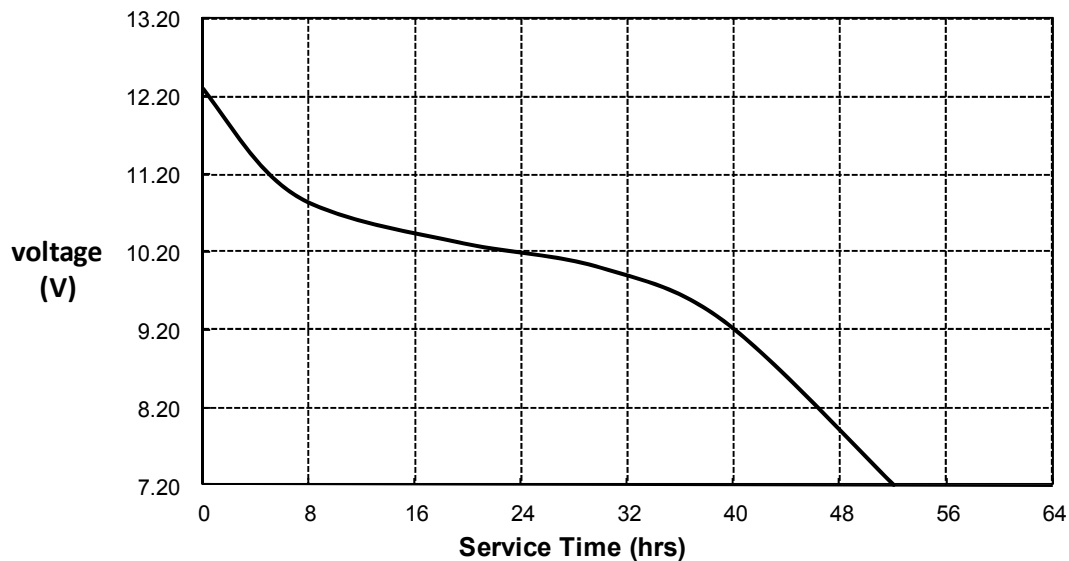
IEC 60086-1:2011 –Primary Batteries –Part 1: General

IEC 60086-2:2011 –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: 20k Ω , 24hours/day, E.V. 7.2V

Temperature: 20 \pm 2 $^{\circ}$ C