



# GR03M

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## TECHNICAL SPECIFICATION FOR ZINC MANGANESE DIOXIDE BATTERY

DATE: 9/15/2005

SPEC. NO.: ES-GR03M

REVISION: 2005C

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*The Manufacturer reserves the right to modify product specification and data stated herein without prior notice*

## 1. Scope

This Specification is applicable to Golden Power's Greenergy Heavy Duty Battery  
Model No.:GR03M

### 1.1 Designations

Golden Power: GR03M                      IEC: R03                      Others: AAA, 1212  
JIS: UM-4                      ANSI: 24D

### 1.2 Reference Document

IEC 60086-1 (2000-11) --- Primary Batteries - Part 1: General  
IEC 60086-2 (2001-10) --- Primary Batteries - Part 2: Physical and electrical specification  
IEC 60086-5 (2000-07) --- Primary Batteries - Part 5: Safety of batteries with aqueous electrolyte

## 2. Chemical System

Zinc-Manganese Dioxide (Zinc Chloride Electrolyte)

**\* MERCURY AND CADMIUM ARE NOT ADDED IN THE BATTERY**

**3. Nominal Voltage:**     1.5 V

**4. Average Weight :**     9.6 g

## 5. Nominal Capacity

370mAh (condition: 75Ω load resistance, discharge 4 hours per day at 20+/-2°C, end-point voltage 0.9V )

## 6. Electrical Characteristics

Test conditions:     3.9Ω+/-0.5% load resistance, measuring time 0.3 seconds,  
temperature at 20+/-2 °C, tested within 30 days after delivery.

	Off-Load Voltage (V)	On-Load Voltage (V)	* Flush current (A)	Test Specification
New Battery	1.62	1.43	3.50	MIL-STD 105E, Class II, Double Sampling, AQL=0.4
After 3 mths. at 45°C	1.60	1.38	2.50	
After 12 mths. room temp	1.60	1.38	2.50	

## 7. Service Output

Condition: Test temperature 20 +/- 2°C, tested within 30 days after delivery

Standard	Discharge Condition			Average Minimum Discharge Time		
	Discharge Load	Discharge Time	E.P.V. (V)	New Battery	After 3 mths. at 45°C	After 12 mths. at room temperature
IEC	75Ω	4 h/d	0.9V	21 h	19 h	19 h
IEC	10Ω	1 h/d	0.9V	2.3 h	2 h	2 h
IEC	5.1Ω	4 m/h, 8 h/d	0.9V	75 min	67 min	67 min
IEC	3.6Ω	15 sec/min	0.9V	160 cycles	144 cycles	144 cycles

Satisfaction Standard:

- 1) 9 pieces of battery will be tested for each discharging standard.
- 2) The result of the average discharging time from each discharging standard shall be equal to or more than the average minimum time requirement; and no more than one battery has a service output less than 80% of the specified requirement.
- 3) One re-test is allowed to confirm the previous result

**8. Electrolyte Leakage Proof Characteristics**

Item	Condition	Period	Requirement	Acceptance Standard
Over-discharge Characteristics	15Ω continuous discharge at temperature 20+/-2°C; relative humidity: 65+/-20%RH	EPV = 0.6 V	There shall be no deformation exceeding the specified dimensions, nor leakage recognized by human eye	N=40; Ac=1; Re=2
Storage Characteristics	Storage at temperature 45 +/- 2°C; relative humidity below 70%RH	60 days		N=40, Ac=1, Re=2

**9. Safety Characteristics**

Item	Condition	Period	Requirement	Acceptance Standard
Short Circuit Characteristics	At temperature 20+/-2°C	24 hours	There shall be no explosion of battery	N=8; Ac=0; Re=1
Abusive Characteristics	Short circuit 4 pieces of battery in series, one of the 4 batteries has to be connected with its polarity reversed	24 hours		

**10. Marking**

The following markings will be printed, stamped or impressed on the body of the battery:

- (1) Designation : GR03M
- (2) Manufacturer's name or abbreviation **"Golden Power Logo"**
- (3) Polarity: "+" or "-"
- (3) Warning: Battery may explode or leak if recharged or disposed of in fire

**11. Caution for use**

- (1) Since the battery is not manufactured for recharging, 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 short-circuit.
- (3) Short-circuiting, heating, disposing of into fire and disassembling the battery are prohibited.
- (4) Battery cannot be forced discharged, which lead to excess gassing and, may result in bulging, leakage and de-crimping of cap.
- (5) New and used batteries cannot be used at the same time, when replaced batteries 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 damage to the device.
- (7) Direct soldering is not allowed, which will damage the battery.
- (8) Battery should be kept out of the reach of children to prevent swallow, in case of accident should contact physician at once.

**12. Shelf Life** 2 years after delivery under proper storage conditions.  
(Temperature: 20+/-2°C; Relative humidity: 65+/-20%RH)

**13. Discharge Curves** (Condition: Test temperature 20+/-2°C)

- Discharge Method: 75Ω 4 h/d (Ref to the Figure 1)
- Discharge Method: 10Ω 1 h/d (Ref to the Figure 2)

**14. Battery Structure and Dimension:** Ref to Drawing DWG-S001

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Figure 1: GR03M DISCHARGE CURVE

Discharge Method: 75 ohm; Period: 4 h/d

Temperature: 20+/-2°C

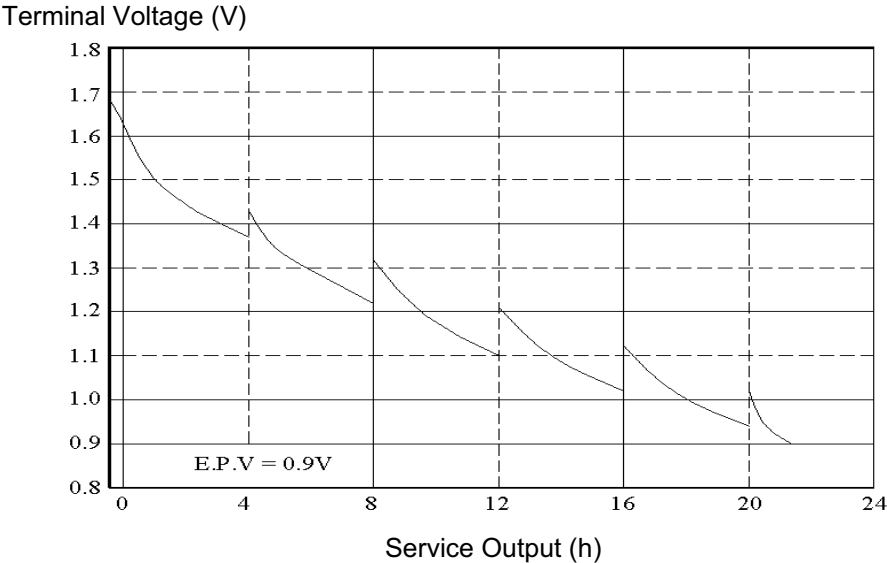
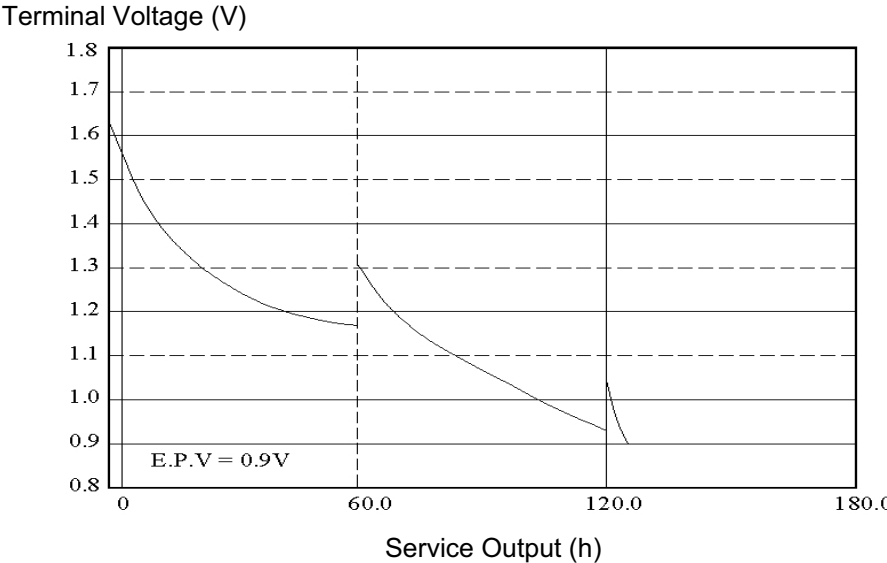


Figure 2: GR03M DISCHARGE CURVE

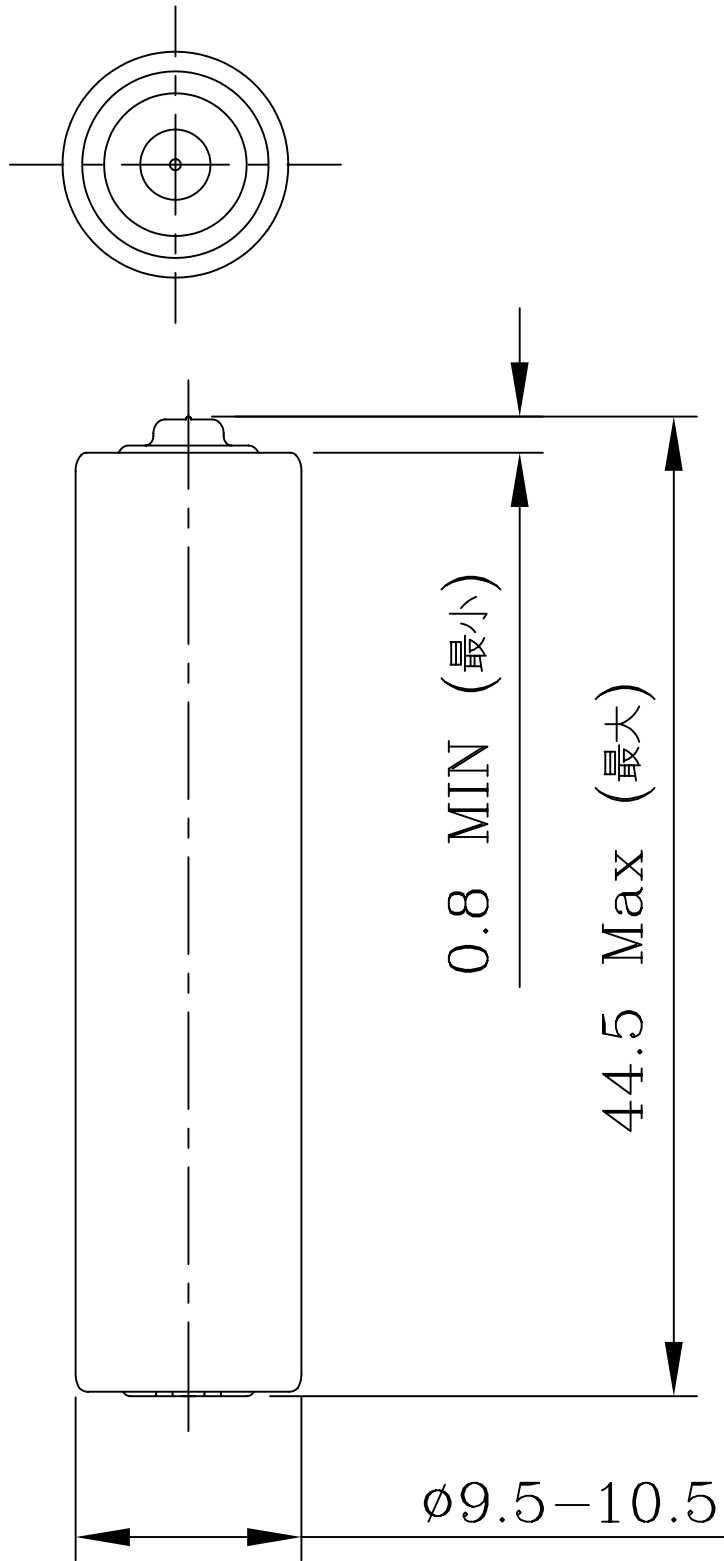
Discharge Method: 10 ohm; Period: 1 h/d

Temperature: 20+/-2°C



# GR03M BATTERY DIMENSION AND STRUCTURE

## GR03M 電池外形及尺寸



**GOLDEN POWER CORPORATION (HK) LTD.**

金力企業(香港)有限公司

MODEL(型號): GR03M

DWG No.(圖號): DWG-S-001

SCALE(比例): NTS DIM(單位): mm

Approved by (審核):

DATE(日期): 15/9/05 DRAWN BY(繪制): Kelvin

Cecilia Chu

TOLERANCES (公差) LINEAR  $\pm 1$  3rd ANGLE PROJECTION  
ANGULAR  $\pm 1/4$  (第三角度視圖)