

AA Portable Power Corp.

Document Number:

Revision: 3

Document Title: Product Specification of Ni-MH – AAA700 Cells

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1、SCOPE

This specification governs the performance of the following Nickel-Metal hydride Cylindrical cell and its stack-up battery。

Model: MH- AAA700

Cell Size: AAA Flat Top ($\phi 10.1^{+0.2} \times 43.6^{+0.5}$)

2、DATA OF STACK UP BATTERIES

All data involves voltage and weight to stack-up battery are equal to the value of unit cell time the number of unit cell which consisted in the stack-up batteries

Example : Stack-up batteries consisting three unit cells

Nominal voltage of unit cell=1.2V

Nominal voltage of stack-up batteries =1.2V×3=3.6V

3、RATINGS

| Description | Unit | Specification | Conditions |
|----------------------------|--------|---------------------------|---|
| Nominal Voltage | V/Cell | 1.2 | Unit cell |
| Nominal Capacity | mAh | 700 | Standard Charge/Discharge |
| Standard Charge | mA | 70 (0.1C) | T ₁ =0~45℃(see Note1) |
| | Hour | 14~16 | |
| Fast Charge | mA | 350(0.5C) | - Δ V=0~5mV/cell or Timer Cutoff=120% nominal capacity or Temp.Cutoff=55℃, T ₁ =10~45℃ |
| | hour | 2.4approx (see Note 2) | |
| Trickle Charge | mA | (0.05C)~(0.1C) | T ₁ =0~45℃ |
| Standard discharge | mA | 140 (0.2C) | T ₁ = -30~60℃ Humidity: Max.85% |
| Discharge Cut-off Voltage | V/cell | 1.0 | |
| Storage Temperature | ℃ | -30~65 | Discharged state、 Humidity、 Max.85% |
| Typical Weight (unit cell) | Gram | 14 | |

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4、 PERFORMANCE

Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

Ambient Temperature : $20 \pm 5^\circ\text{C}$

Relative Humidity : $65 \pm 20\%$

Notes: Standard Charge/Discharge Conditions:

Charge: 70 mA (0.1C) \times 14 hours

Discharge: 140 mA (0.2C) to 1.0V/cell

| Test | Unit | Specification | Conditions | Remarks |
|---------------------------|------------------|---|--|---|
| Capacity | mAh | ≥ 700 | Standard Charge Discharge | up to 3 cycles are allowed |
| Open Circuit Voltage(OCV) | V/cell | ≥ 1.25 | Within 1 hour after standard Charge | |
| Internal Impedance | m Ω /cell | 32 | Upon fully charge(1KHz) | |
| High Rate Discharge(1C) | minute | ≥ 54 | Standard Charge, 1 hour rest Before discharge by 700mA (1C)to 1.0V/cell | up to 3 cycles are allowed |
| Overcharge | / | No leakage nor explosion | 70mA(0.1C)Charge 28 days | |
| Charge Retention | mAh | $\geq 490(70\%)$ | Standard Charge, Storage: 28 days, Standard Discharge | |
| IEC Cycle Life | Cycle | ≥ 500 | IEC285(1993)4.4.1 | (see Note 3) |
| Accelerated Cycle Life | Cycle | ≥ 400 | Charge:350mA(0.5C) Discharge: 700mA(1C) To 1.0V/cell, end-of:80% nominal capacity | Cycling charging cut-off condition: - $\Delta V=0\sim 5\text{mV/cell}$ and Timer cut-off=110% Nominal capacity Input and Temp.cutoff=55 $^\circ\text{C}$ |
| Leakage | | No leakage nor deformation | Fully charged at :350mA(0.5C) for 2.4hrs Stand for 14 days | |
| Vibration Resistance | | Change of voltage should be under 0.02V/cell,Change of impedance should be under 5 milli-ohm/cell | Charge the battery 0.1C 14hrs,then leave for 24hrs,check Battery before/after vibration, Amplitude 1.5mm Vibration 3000 CPM Any direction for 60mins. | |
| Impact Resistance | | Change of voltage sho-uld be under 0.02V/cell Change of impedance should be under 5 milli-ohm/cell | Charge the battery 0.1C 14hrs Then leave for 24hrs,check bat-before/after dropped, Height 50cm Wooden board(thickness 30mm) Direction not specified,3 times. | |

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5、 CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached drawing.

6、 EXTERNAL APPEARANCE

The cell/battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation.

7、 WARRANTY

3 months limited warranty against workmanship and material defects.

8、 CAUTION

- (1)Reverse charging is not acceptable.
 - (2)Charge before use. The cells/batteries are delivered in an uncharged state.
 - (3)Do not charge/discharge with more than our specified current.
 - (4)Do not short circuit the cell/battery Permanent damage to the cell/battery may result.
 - (5)Do not incinerate or mutilate the cell/battery.
 - (6)Do not solder directly to the cell/battery.
 - (7)the life expectancy may be reduced if the cell/battery is subjected adverse conditions like: extreme temperature, deep cycling, excessive overcharge/ over-discharge.
 - (8)store the cell/battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment.
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Notes:

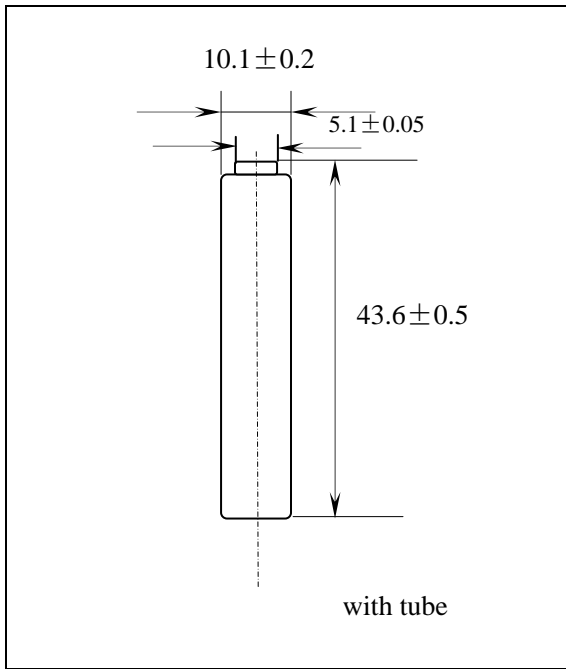
- (1) T_1 : Ambient Temperature.
- (2) Approximate charge time from discharged state, for reference only.
- (3) IEC285(1993)4.4.1 Cycle Life:

| Cycle No. | Charge | Rest | Discharge |
|--|------------------------|------|------------------------|
| 1 | $0.1C \times 16h$ | None | $0.25C \times 2h20min$ |
| 2-48 | $0.25C \times 3h10min$ | None | $0.25C \times 2h20min$ |
| 49 | $0.25C \times 3h10min$ | None | $0.25C$ to $1.0V/cell$ |
| 50 | $0.1C \times 16h$ | 1-4h | $0.2C$ to $1.0V/cell$ |
| Cycles 1 to so shall be repeated until the discharge duration on any 50 th Cycle becomes less than 3 h. | | | |

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MODEL No: MH-AAA700 Flat top

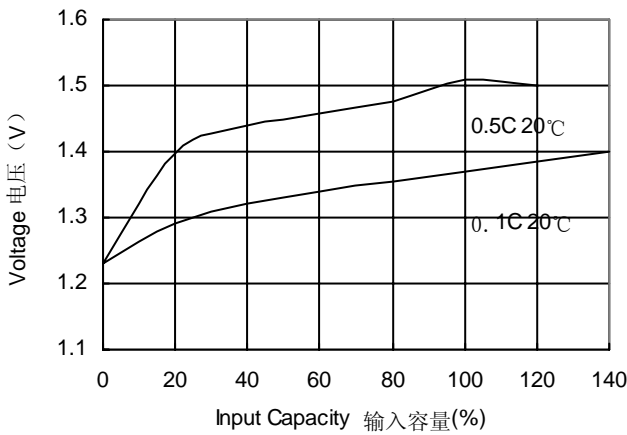
Description: 700mAh AAA SIZE Ni-MH



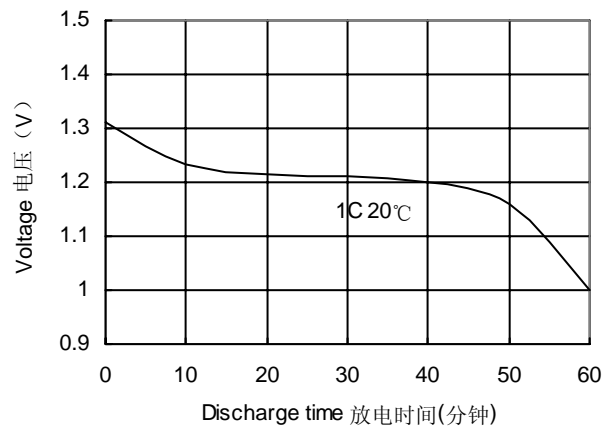
Specification

| | | | |
|--|-----------|-----------|------------|
| Nominal Capacity | | 700 mAh | |
| Nominal Voltage | | 1.2 V | |
| Charge current | Standard | 70mA | |
| | Quick | 210mA | |
| | Fast | 350mAh | |
| Charge time | Standard | 14~16 Hrs | |
| | Quick | 4.0 Hrs | |
| | Fast | 2.4Hrs | |
| Ambient Temperature | Charge | Standard | 0°C~45°C |
| | | Quick | 10°C~45°C |
| | | Fast | 10°C~45°C |
| | Discharge | | -30°C~60°C |
| | Storage | | -30°C~65°C |
| Internal Impedance(mΩ) (After Charge) | | 32 | |
| Weight | | 14g | |

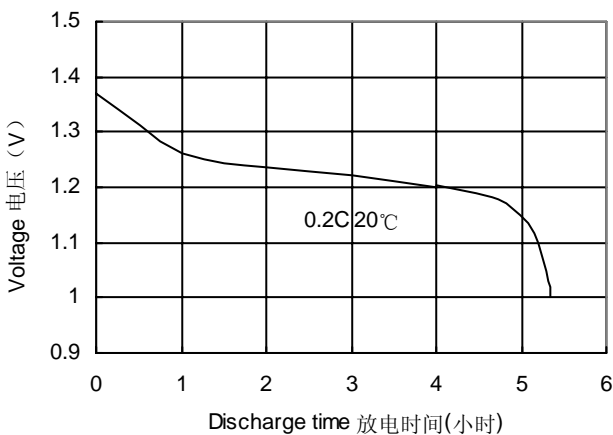
Charge(充电)



Discharge at high rate(高倍率放电)



Discharge at low rate(低倍率放电)



Charge Retention(荷电保持能力)

