

Revision: 4.0

Product Specification

Product Model: Nickel-Metal Hydride Battery

Product Type: MH-4/3AF4500

Draw up: Technical Department

Add: 825 South 19th Street, Richmond, CA 94804 USA

Tel: 1-510-525-4710

Fax: 1-510-323-8008

Web address: <http://www.aaportablepower.com> E-Mail: sales@aaportablepower.com

1、SCOPE

This specification governs the performance of the following Nickel-Metal Hydride cylindrical cell and its stack-up battery.

Model: MH-4/3AF4500

Cell Size: (18.0±0.1×67.0±0.5)mm

2、DATA OF STACK UP BATTERIES

All data involve voltage and weight of stack-up batteries are equal to the value of unit cell multiplied by 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	Condition
Nominal Voltage	V/cell	1.2	Unit cell or stack-up batteries
Minimum Capacity	mAh	4350	Standard Charge/Discharge
Nominal Capacity	mAh	4500	Standard Charge/Discharge
Standard Charge	mA	450 (0.1C)	T ₁ =20±5°C (See Note 1)
	hour	14~16	
Fast Charge	mA	2250 (0.5C)	- ΔV=0~5mV/cell , Timer Cutoff=120%nominal capacity , Temp.Cutoff=55°C, dT/dt=0.8°C/min, T ₁ =20±5°C
	hour	4 approx (See Note 2)	
Trickle Charge	mA	(0.03C)~(0.05C)	T ₁ =20±5°C
Standard discharge	mA	900 (0.2C)	T ₁ = 20±5°C Humidity: Max.85%
Discharge Cut-off Voltage	V/cell	1.0	
Storage Temperature	°C	-20~25	Within 1 year*
		-20~35	Within 6 months
		-20~45	Within 1 month
		-20~55	Within 1 week
Typical Weight	Gram	66.0	unit cell

*To keep the best performance for those not used for a long time, we recommend to charge the cells/batteries at least 30% after discharge entirely in every 6 months.

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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±5°C

Relative Humidity : 65±20%

Notes: Standard Charge/Discharge conditions:

Charge: 450 mA(0.1C)× 14 hours

Discharge: 900 mA(0.2C) to 1.0V/cell

Test	Unit	Specification	Condition	Remarks
Capacity	mAh	≥ 4350	Standard Charge/ Discharge	up to 3 cycles are allowed
Open Circuit Voltage(OCV)	V	≥ 1.25	Within 1 hour after standard charge	
Internal Impedance	mΩ	≤ 20	Upon fully charged(1KHz)	
High Rate Discharge(1C)	min	≥ 51	Standard Charge, 1 hour rest before discharge by 1C to 1.0V/cell	up to 3 cycles are allowed
Charge Retention	mAh	≥ 2700 (60%)	Standard Charge,Storage: 28 days Standard Discharge	T ₁ =20±5°C
IEC Cycle Life	Cycle	≥ 500	IEC61951-2(2003)7.4.1.1	see Note 3
Leakage		No leakage nor deformation	Fully charged at : 450 mA for 48 hrs	
Vibration Resistance		Change of voltage should be less than 0.02V/cell,Change of impedance should be less than 5 milli-ohm/cell	Charge the battery at 0.1C for 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 should be less than 0.02V/cell,change of impedance should be less than 5 milli-ohm/cell	Charge the battery at 0.1C for 14hrs,then leave for 24hrs,check battery before/after dropped,height 50 cm 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 or 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 cells/batteries may result.

[5]Do not incinerate or mutilate the cells/batteries.

[6]Do not solder directly to the cells/batteries.

[7]The expected life may be reduced if the cells/batteries are subjected to adverse conditions as:
extreme temperature, deep cycling, excessive overcharge/ over-discharge.

[8]Store the cells/batteries in a cool dry place. Always discharge batteries before packing.

Notes:

[1] T_1 : Ambient Temperature.

[2] Approximate charge time from discharged state, for reference only.

[3] IEC61951-2(2003)7.4.1.1 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
Cycle 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3 h.			

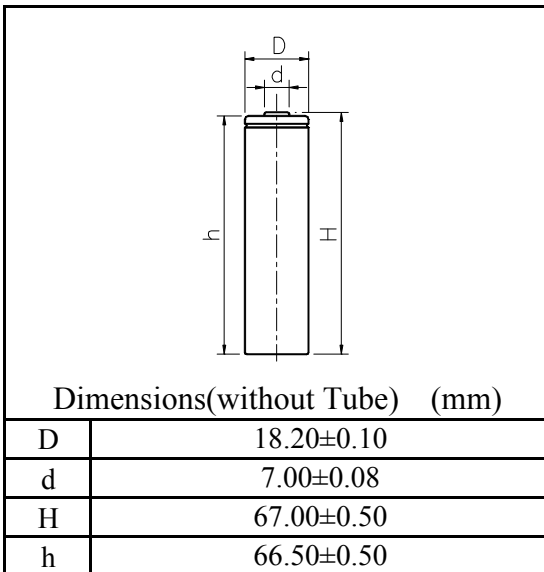
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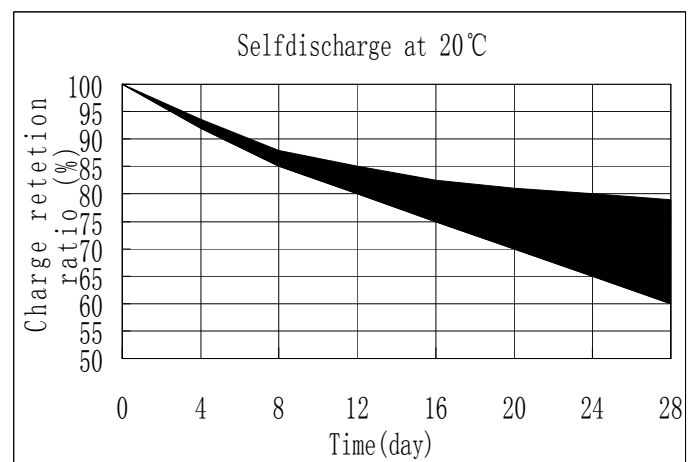
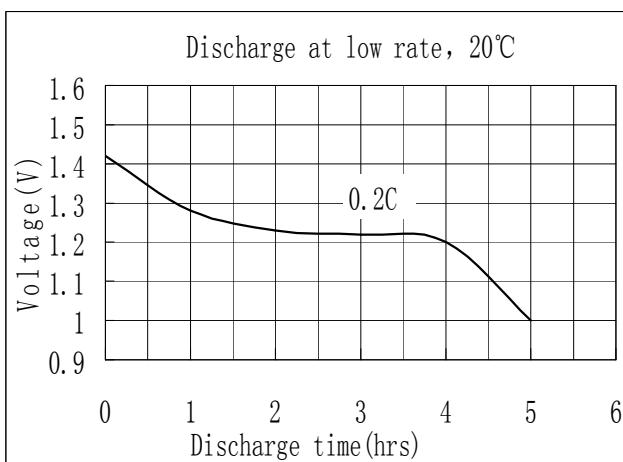
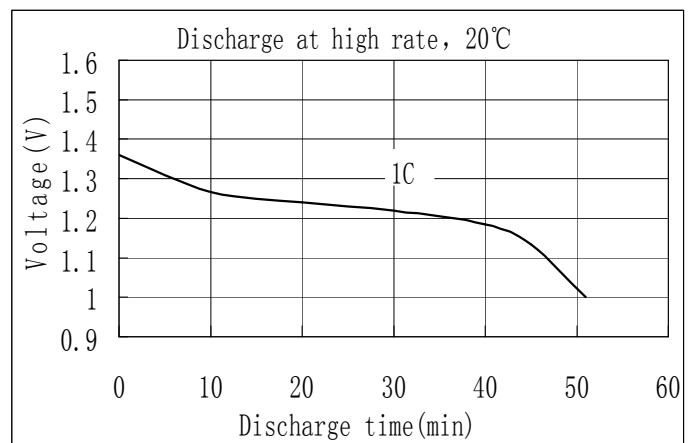
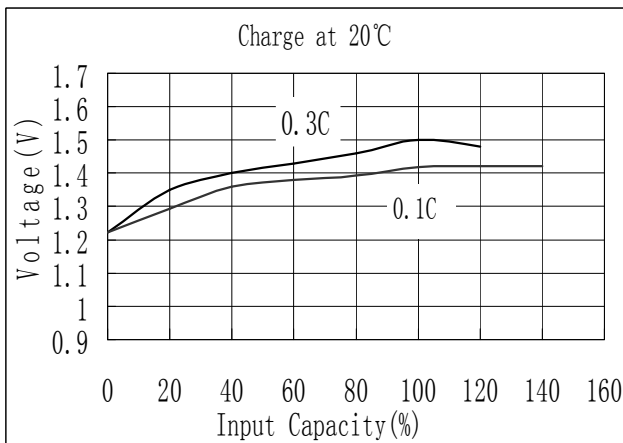
MODEL No: MH-4/3AF4500

Description: 4500 mAh SIZE NI-MH 4/3AF



Specification

Nominal Capacity		4500 mAh	
Nominal Voltage		1.2 V	
Charge current	Standard	450 mA	
	Fast	1350 mA	
Charge time	Standard	14~16 Hrs	
	Fast	4 Hrs	
Ambient Temperature	Charge	Standard	0°C~45°C
		Fast	10°C~45°C
	Discharge		-20°C~60°C
Storage		-20°C~55°C	
Internal Impedance(mΩ) (After Charge)		≤ 20	
Weight		66.0 g	



AAPPC reserves the right to alter or amend the design, model and specification without prior notice.

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