



SPECIFICATIONS

Sealed Rechargeable Nickel Metal Hydride Ni-MH 3500mAh 1/2D

1、SCOPE

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

Model : **NH12D3500 (16/27)**

Cell Size: **12D cusp (32.1±0.1×36.5±0.5) mm**

12D crew cut (32.1±0.1×35.0±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	3500	Standard Charge/Discharge
Nominal Capacity	mAh	3500	Standard Charge/Discharge
Standard Charge	mA	350 (0.1C)	T ₁ =20±5°C (See Note 1)
	hour	14~16	
Fast Charge	mA	1750 (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	2.4 approx (See Note 2)	
Trickle Charge	mA	(0.03C)~(0.05C)	T ₁ =20±5°C
Standard discharge	mA	700 (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	82.0	Unit cell

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

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Notice: Unless duly signed and stamped, the information (subject to change without prior notice) contained herein this document is for reference only and should not be used as a criterion for product guarantee or warranty.



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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 : 350 mA (0.1C) x 14 hours

Discharge: 700mA (0.2C) to 1.0V/cell

Test	Unit	Specifications	Condition	Remarks
Capacity	mAh	≥ 3500	Standard Charge/ Discharge	Up to 3 cycles are allowed
Open Circuit Voltage (OCV)	V	≥ 1.25	Within 1 hour after standard charge	
Internal Impedance	m Ω	≤ 16	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	≥ 2100 (60%)	Standard Charge, Storage: 28 days Standard Discharge	$T_1=20\pm 5^{\circ}\text{C}$
IEC Cycle Life	Cycle	≥ 500	IEC61951-2(2003)7.4.1.1	See Note 3
Leakage		No leakage nor deformation	Fully charged at: 350 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.	



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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

One year 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 such as: extreme temperature, deep cycling, excessive overcharge/over-discharge.
- (8) Store the cells/batteries in a cool dry place. Always discharge batteries before packing.



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Notes :

- [1] T1: 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 × 16h	None	0.25C × 2h20min
2-48	0.25C × 3h10min	None	0.25C × 2h20min
49	0.25C × 3h10min	None	0.25C to 1.0V/cell
50	0.1C × 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.

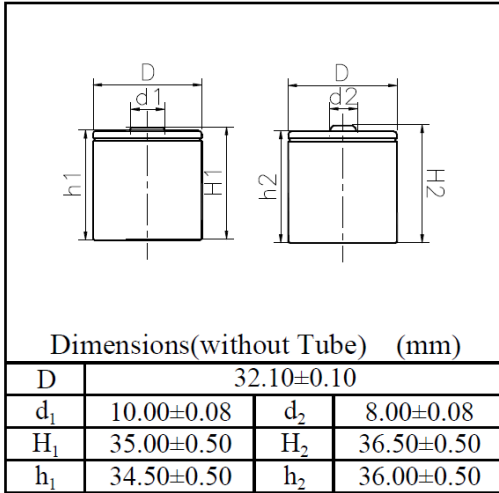
Note: Charge and discharge graphs will be shown on separate sheet.



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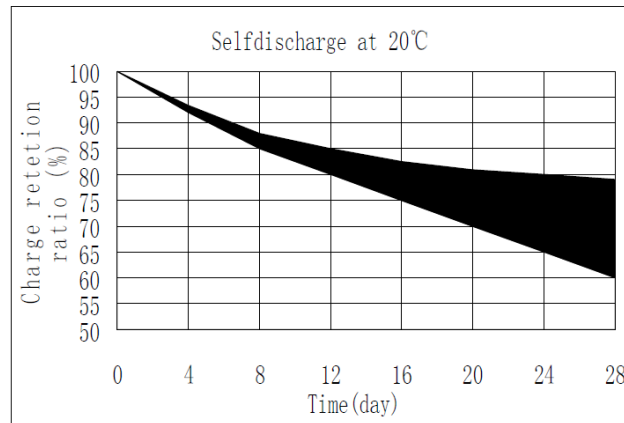
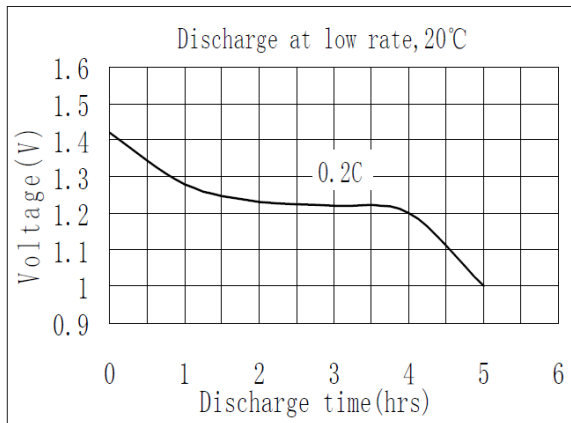
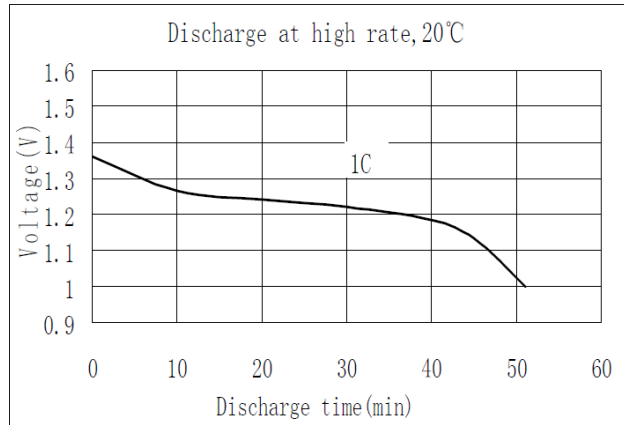
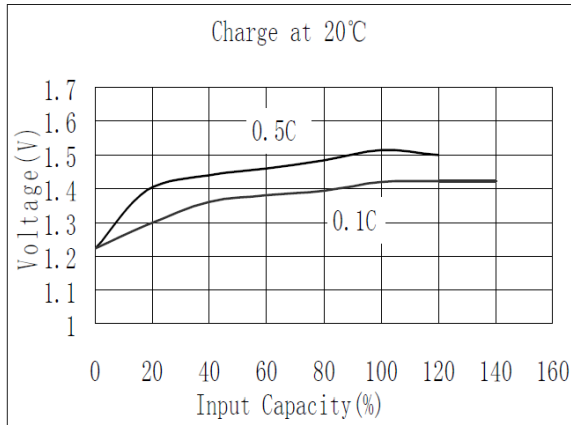
MODEL No: NH12D3500

Description: 3500 mAh SIZE NI-MH 1/2D



Specification

Nominal Capacity		3500 mAh	
Nominal Voltage		1.2 V	
Charge current	Standard	350 mA	
	Fast	1750 mA	
Charge time	Standard	14~16 Hrs	
	Fast	2.4 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)		≤ 16	
Weight		82.0 g	



Remark: The manufacturer reserves the right to alter or amend the design, model and specification without prior notice.