

Approval Sheet

Of Sealed Nickel Metal Hydride Cylindrical Cell

Model No. : SN-2/3AAA40H

CUST NO. : _____

SANIK NO. : SN09-AS001-2329 _____

DATE : October 13, 2009 _____

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	Customer Dept.	Li Guo zhu
Approve	Zhang Hong bing	

SANIK BATTERY CO., LTD.
SPECIFICATION
 SEALED NICKEL-METAL HYDRIDE CYLINDRICAL CELL

1. APPLICATION

This specification applies to the Nickel-Metal Hydride Cylindrical Cell.

Model : SN-2/3AAA40H

Cell type : 2/3AAA

2. RATINGS

Description	Specification	Conditions
Nominal Voltage	<u>1.2</u> V	
Nominal Capacity	<u>400</u> mAh	Standard Charge/Discharge
Minimum Capacity	<u>385</u> mAh	Standard Charge/Discharge
Standard Charge	<u>40</u> mA(0.1C) × 16 hrs	Ta=0 ~ 45°C (see Note 1)
Rapid Charge	<u>200</u> mA(0.5C) × 2.1 hrs approx. (see Note 2)	(With -Δ V or dT/dt or TCO control) Timer CutOff = 105% -Δ V = <u>5-10</u> mV/cell dT/dt = 1 ~ 2°C/3min Temp. CutOff = 50°C (122°F) Ta=10 ~ 45°C
Trickle Charge	<u>20-40</u> mA(0.05C-0.1C)	Ta=0 ~ 45°C
Discharge Cut-off Voltage	<u>1.0</u> V	
Maximum Discharging Current	<u>400</u> mA(1C)	Ta= -20°C ~ 50°C

Storage Temperature	-20°C ~ 35°C	Discharged state
Typical Weight(approximate)	<u>7.5</u> g	

3. PERFORMANCE

3-1. TEST CONDITIONS

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

Ambient Temperature ,Ta : 20±5°C and
 Relative Humidity : 65±20%

Notes : Standard Charge/Discharge Conditions :

Charge : 40mA (0.1C) × 16 hrs
 Discharge : 80mA (0.2C) to 1.0V/cell

3-2. TEST MOTHOD & PERFORMANCE

Test	Specification	Conditions	Remarks
Capacity	≥ <u>385</u> mAh	Standard Charge/Discharge	Up to 3 cycles are allowed
Open Circuit Voltage(OCV)	≥ <u>1.25</u> V	Within 1hr after standard charge	
Internal Impedance (Ri)	≤ <u>55</u> mΩ	Upon fully charge(1000Hz)	
High Rate Discharge (0.5C)	≥104min	Standard Charge, 1hr rest before discharge	
High Rate Discharge (1 C)	≥49min	Standard Charge, 1hr rest before discharge	
Overcharge	No leakage nor explosion	<u>40</u> mA(0.1C) charge 28 days	
Charge Retention	≥ <u>240</u> mAh	Standard Charge, Storage : 28 days, Standard Discharge	
IEC Cycle Test	≥500 Cycle	IEC 61951-2 : 2003	(see Note 3)

Test	Specification	Conditions	Remarks
Leakage	No leakage nor deformation.	Fully charged at <u>200mA</u> (0.5C), Stand for 14 days	Unit cell
External Short Circuit	No fire and no explosion.	After standard charge, short circuit the cell(s) at 20+/-5°C until the cell(s) temperature returns to ambient temperature (The resistance of the inter-connecting circuitry shall not exceed 0.1ohm).	Unit cell
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 16hrs, then leave for 24hrs, check battery before/after vibration, Amplitude : 1.5mm Vibration : 3000CPM Any direction for 60mins.	Unit cell
Impact Resistance	Change of voltage should be under 0.02V/cell, Change of impedance should be under 5 milli-ohm/cell.	Charge the battery 0.1C16hrs, then leave for 24hrs, check battery before/after dropped, Height : 50cm Wooden board (thickness 30mm) Direction not specified 3times.	Unit cell

4. ASSEMBLY & DIMENSIONS

As per attached drawing.

5. EXTERNAL APPEARANCE

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

6. WARRANTY

One (1) year limited warranty against workmanship and material defects.

7. CAUTION

- 7-1. Reverse charging is not acceptable.
- 7-2. Charge before use. The cells / batteries are delivered in an uncharged state.
- 7-3. Do not charge / discharge with more than the specified current.
- 7-4. Do not short circuit the cell / battery. Permanent damage to the cell / battery may result.
- 7-5. Do not incinerate or mutilate the cell /battery.
- 7-6. Do not solder directly to the cell /battery.
- 7-7. The life expectancy may be reduced if the cell / battery is subjected to adverse conditions like: extreme temperature , deep cycling , excessive overcharge / overdischarge.
- 7-8. Store the cell / battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment.
- 7-9. For storage of cells/ batteries over one year, in order to prevent the degrading of the function of cells, cells / batteries should be at least charged and discharged once trimester.
- 7-10. Keep away from children. If swallowed, contact a physician at once.
- 7-11. Air ventilation should be provided in the plastic case of batteries, otherwise it may have a risk of accumulating gas (oxygen gas, hydrogen gas) generated inside the cell resulting in explosion triggered by fire sources (motors or switches). Airtight battery compartments are strongly discouraged.
- 7-12. The batteries comply with Restrictions on Hazardous Substances (RoHS) Direction.

8. Notes :

- 1 : Ta : Ambient Temperature
- 2 : Approximate charge time from discharged state, for reference only.
- 3 : IEC 61951 : 2003 Cycle Life Test :

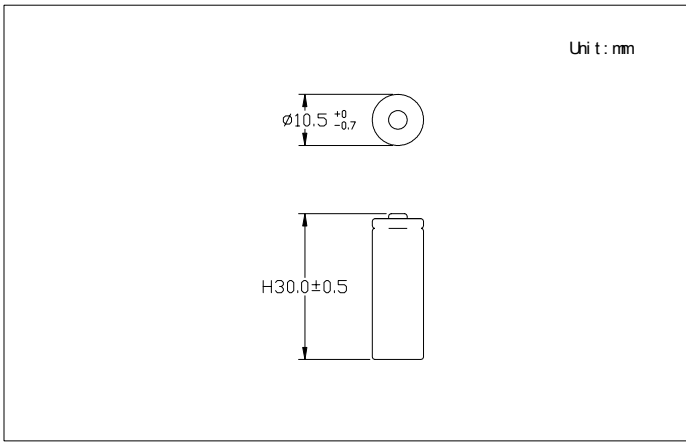
Cycle number	Charge	Rest	Discharge
1	0.1C×16hrs	None	0.25C× 2hrs20mins
2-48	0.25C× 3hrs10mins	None	0.25C×2hrs20mins
49	0.25C× 3hrs10mins	None	0.25C× 1.0V/cell
50	0.1C×16hrs	1-4hr(s)	0.2C×1.0V/cell
Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs			

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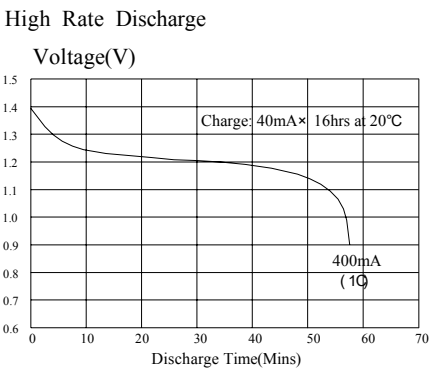
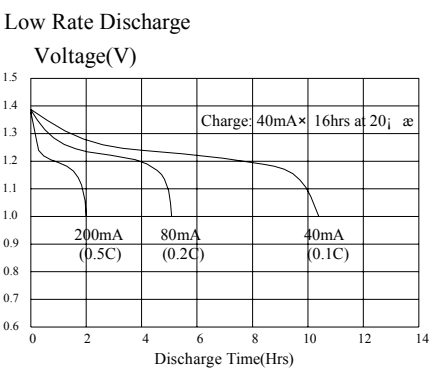
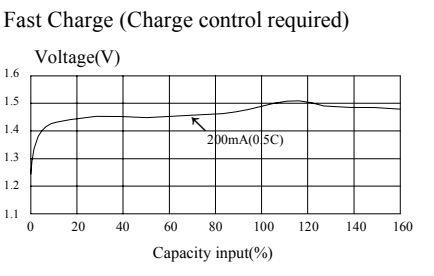
SN-2/3AAA40H

Data Sheet for SN-2/3AAA40H

Specifications		
Type	Rechargeable Nickel Metal Hydride Cylindrical Cell	
Model	SN-2/3AAA40H	
Nominal Voltage	1.2V	
Applications	40-400mA(Recommended Discharge Current)	
Capacity	when discharge at 80mA to 1.0V at 20°C	
	Nominal	400mAh
	Minimum	385mAh
Dimensions	Diameter	10.5 ^{+0.7} mm
	Height	30.0 _j ± 0.5mm
Charge Condition	40mA for 16hrs at 20°C	
Rapid Charge	200mA(0.5C) Charge termination control recommended control parameters: Timer CutOff = 105% -Δ V= 5-10mV/cell dT/dt= 1 ~ 2°C/3min Temp. CutOff = 50°C (122° F) Ta=10 ~ 45°C	
Internal Resistance	Average 40mΩ upon fully charged (Range 35-55mΩ) at 1000Hz	
Service Life(IEC standard)	≥ 500 cycles	
Weight	About 7.5g	
Ambient Temperature	Standard Charging	0°C to 45°C
	Fast Charging	10°C to 45°C
	Discharging	-20°C to 65°C
	Storage	-20°C to 35°C



Characteristics



Note:

- Nominal capacity rated at 0.2C, 20j ±.
- The above information is generally descriptive only and is not intended as guarantee or warranty cell and battery specifications are subject to change without notice. All descriptions or warranties are contained solely in specification sheets accompanying formal offers. Please consult SANIK for conditions of application outside those described in this document.

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