



***NICKEL METAL HYDRIDE
BATTERY
NH-4/5SC2200***

BRIEF SPECIFICATION

Model: NH-4/5SC2200
Nominal Voltage: 1.2V
Nominal Capacity: 2200mAh
Weight: Approx. 45.0 g
Manufacturer: EEMB Co., Ltd.
Website: www.eemb.com

1. Preface

This specification is suitable for the performance of the Ni-MH rechargeable battery produced by EEMB CO.,LTD

2. Model

NH-4/5SC2200

3. Specification of single cell

Description		Specification	
Model		NH-4/5SC2200	
Nominal voltage		1.2V	
Dimensions	Diameter (mm)	22.5 ^{-0.7}	
	Height (mm)	34.0 ^{-1.0}	
Weight (g)		45.0	
Internal Impedance (mΩ)		≤10 (After Charge)	
Capacity		0.2C discharge	
	Minimum	300min	
	Typical	315min	
Charge	standard	220mA(0.1C)×15hrs	
	rapid	2200mA(1.0C)×1.1hrs	
Ambient Temperature	Charge	standard	0°C to 40°C
		rapid	0°C to 40°C
	Discharge	-20°C to 50°C	
	Storage	-20°C to 30°C	

4. Nominal Specification

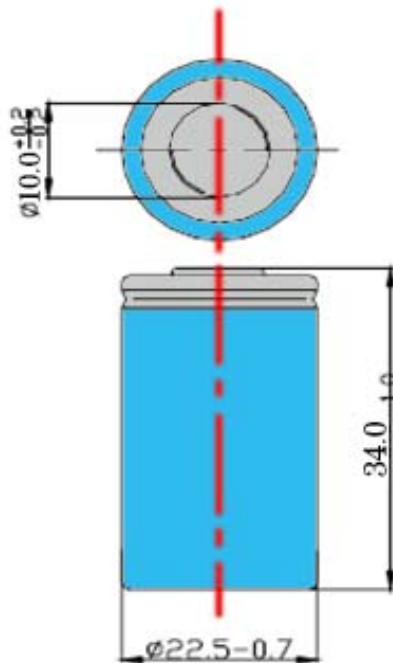
Description	Unit	Specification	Conditions
Nominal Voltage	V	1.2V	Unit cell
Typical Capacity	min	5.4	Discharge at 10C to 0.8V
Nominal Capacity	mAh	2200	Standard charging / discharging
Minimum Capacity	min	5.1	Discharge at 10C to 0.8V

Note: Any representations in this brochure concerning performance, are for informational purposes only and are not construed as warranties either expressed or implied, of future performance.

Standard Charge	mA	220(0.1C)	Ta =0~40°C
	hour	15	
Fast Charge	mA	440(0.2C) ~2200(1.0C) with charge termination control	-ΔV=5mv/ cell Timer cutoff=105% input capacity Temp. cutoff= 40~50°C, dT/dt=0.8°C/min(0.5 to 1.0C); 0.8~1°C/min(1C)
	hour	6.0(0.2C) 1.1(1.0C)	
Trickle Charge	mA	44(0.02C) ~110(0.05C)	Ta =0~40°C
Maximum Continuous Discharge Current	A	11(5.0C)	Ta= 0~50°C 0.8v cut off
Storage Temperature (Percent 40-60 charged state)	°C	-20~+50	Less than 1 week
		-20~+40	Less than 1 month
		-20~+30	Less than 3 months
		-20~+25	Less than 1 year
	%	65±20	Relative humidity
Typical Weight	g	45	Approx.

- Notes: 1. Ta: Ambient Temperature
 2. Approximate charge times from discharged state, for reference only.

5. Dimension of single cell (with tube) (unit: mm)



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6. Characteristics

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: $65 \pm 20\% \text{RH}$

Standard charge: $220\text{mA} (0.1\text{C}) \times 15\text{hours}$

Standard discharge: $440\text{mA} (0.2\text{C})$ to $1.0\text{V}/\text{cell}$

The batteries must be standard discharged before charging

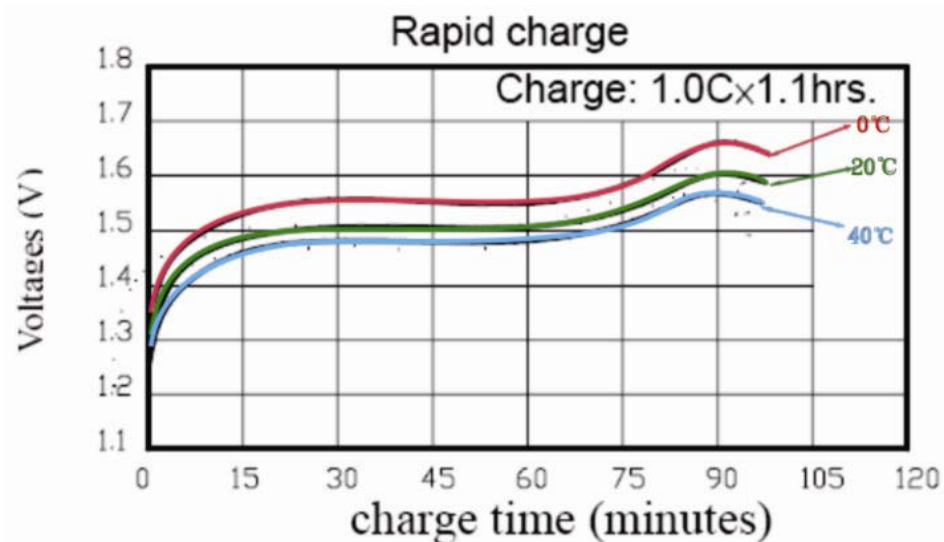
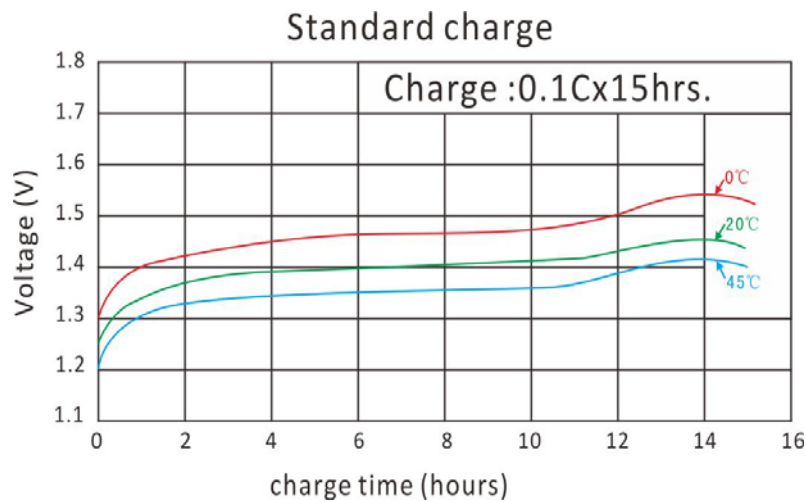
6.1 Battery test

Test	Unit	Specification	Conditions	Remarks
Capacity	min	≥ 5.1	Discharge at 10C to 0.8V	Up to 3 cycles Allowed
MPV	V	≥ 1.12	Discharge at 10C to 0.8V	Up to 3 cycles Allowed
Open Circuit Voltage (OCV)	V	≥ 1.25	Within 1 hour after standard charge	Unit cell
Internal Impedance (R_i)	$\text{m}\Omega$	≤ 10	Upon fully charge (1KHz)	
Low Temperature Discharge	min	≥ 240	Standard Charge, Storage: 24hrs at $0 \pm 2^{\circ}\text{C}$ 0.2C discharge at $0 \pm 2^{\circ}\text{C}$	$1.0\text{V}/\text{cell}$ Cut-off
Over charge	N/A	No conspicuous deformation and/or leakage	0.1C charge for 48 H	
Charge Reserve	min	≥ 180	Standard charge, storage for 28 days, standard discharge at 0.2C to $1.0\text{V}/\text{cell}$	
IEC Cycles Test	cycle	≥ 500	IEC 61951-2 ED3.0	
Humidity	N/A	No leakage	Standard charged, stand for 14 days at $33 \pm 3^{\circ}\text{C}$ and $80 \pm 5\%$ of relative humidity	
External Short Circuit	N/A	No fire and no explosion	After standard charge, short-circuit the cell at $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ until the cell temperature returns to ambient temperature. (cross section of the wire or connector should be more than 0.75mm^2)	

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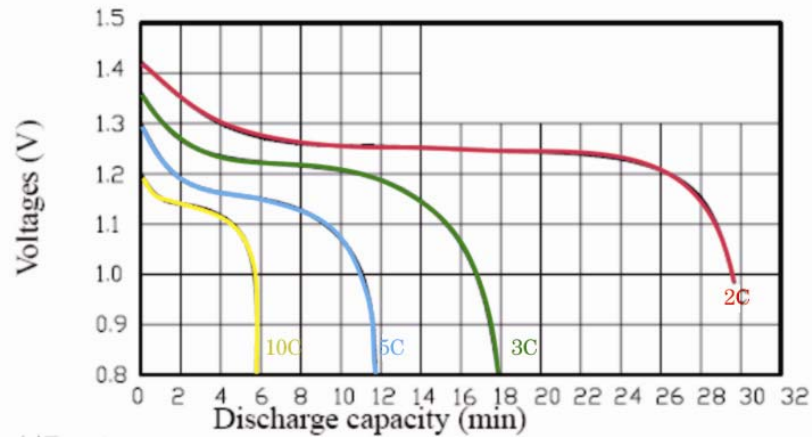
Safety Device Operation	N/A	No explosion	Forced discharge at 0.2C to a final voltage of 0V, then the current be increased to 1C and forced discharge continue for 60 min	Leakage of electrolyte and deformation are acceptable
Drop Test	N/A	$\Delta V < 0.02V/\text{cell}$ $\Delta Ri < 5\%/\text{cell}$	Charge at 0.1C for 16 hrs, then leave for 24 hrs. Check battery before / after drop on the wooden board of thickness: 30 mm Height: 50 cm Direction is not specified test for 3 times.	

6.2 Characteristics Curve

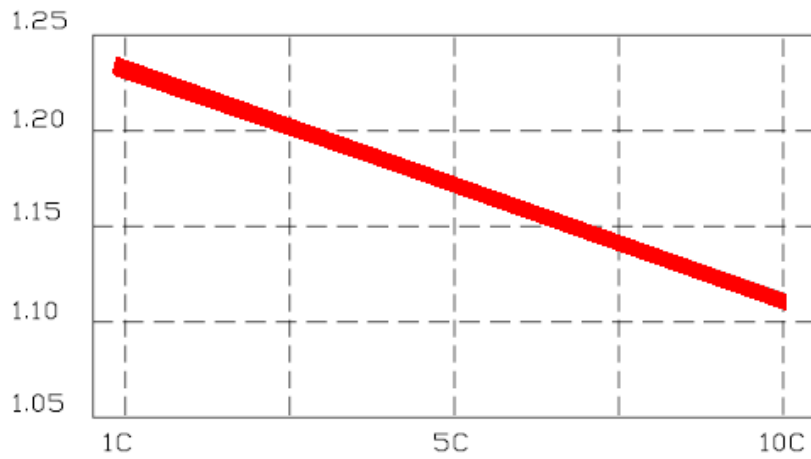


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Discharge characteristics



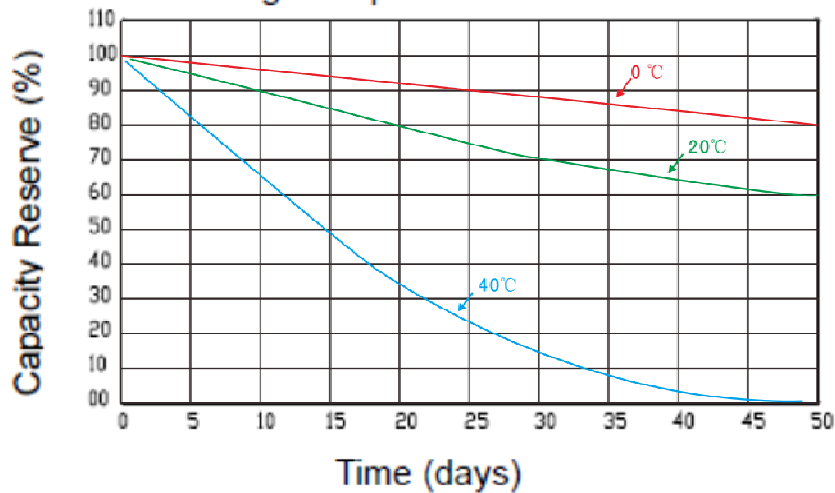
MPV(V)



Ni-MH

Charge retention curves of Ni-MH cylindrical cell At various storage temperature

Charge retention curves of Ni-MH cylindrical cell At various storage temperature



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6. Warranty

One year limited warranty against workmanship and material defect.

7. Cautions

- 1) Reverse charging is not acceptable.
- 2) Charge before use, use the correct charger for Ni-MH batteries
- 3) Do not charge / discharge with more than the specified current.
- 4) Do not short circuit the cell / battery.
- 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 to adverse conditions, like extreme temperature, deep cycling, excessive overcharge /over-discharge.
- 8) Store the cell / battery in a cool dry place.
- 9) For charging methods please reference to our technical handbook.
- 10) When find battery power down during use, please switch off the device to avoid over discharge.
- 11) When not using a battery, disconnect it from the device.
- 12) Well-ventilated place out of direct sunlight.
- 13) During long term storage, battery should be charged and discharged once every half a year.
- 14) When the battery is hot, please do not touch it and handle it, until it has cooled down.
- 15) Do not mix batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon batteries.
- 16) Do not mix new batteries in use with semi-used batteries, battery may be over-discharged.
- 17) Do not mix new batteries in use with semi-used batteries, battery may be over-discharged.
- 18) Keep away from children. If swallowed, contact a physician at once

8. Note: IEC61951-2 ED3.0 Endurance in cycles

Cycle No.	Charge	Rest	Discharge
1	0.1C×16hrs	None	0.25C×2hs20mins
2-48	0.25C×3hrs10mins	None	0.25C×2hs20mins
49	0.25C×3hrs10mins	None	0.25C to 1.0V/cell
50	0.1C×16hrs	1-4hr(s)	0.2C to 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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