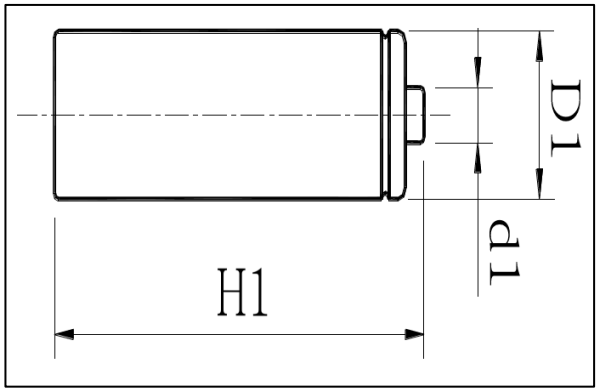
Datasheet / Product specification
Model: Solar AA

1. Product drawing

D1 = 14.5 mm
d1 = 4.8mm±0.2 mm
H1 = 50.5 mm



2. Scope:

This specification is applicable to rechargeable NiMH battery, HR6 distributed under brandname RAVER.

3. Law & Regulation Compliances:

This product complies with EU's battery directive (2006/66/EC).
Packaging materials comply with EU's directive on packaging materials and waste (94/62/EC)

4. General:

Nominal voltage			1.2V	
Nominal capacity			600mAh (at 0.2C discharge)	
Maximum discharge current			600mA (1.0C)	
Discharge cutt-off voltage			1.0V	
Capacity			**0.2C Discharge**	**1.0C Discharge**
		Minimum	290min	54min
		Typical	300min	60min
Dimensions		Diameter	14.5 mm	
		Height	50.5 mm	
Weight(Approximately)			16 g	
Internal Impedance at 1000 Hz			50m Ω (Max) After Charge	
Charge	Standard		60mA(0.1C)×15hrs	
	Rapid		600mA(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	

5. Appearance

The battery visually inspected by unaided eye 30cm away from battery. The battery shall be free from dents, scratch, rust and extruded internal compounds, such as sealing compounds and etc, and serious displacement of artwork. Appearance defects shall not be observed that may adversely affect actual use or performance of batteries.

6. Electrical Characteristics

Before proceed the following tests, the cells should be discharged at 0.2C to 1.0V cutoff. Unless otherwise stated, tests should be done within one month of delivery under the following conditions:
Ambient temperature: 20°C ±5°C
Relative Humidity: 65±20%

Test	Unit	Specification	Condition	Remarks
Capacity	min	≥290	Standard Charge / Discharge	Up to 3 cycles are allowed
Open circuit Voltage (OCV)	V	≥1.25	Within 1 hr after standard charge	Unit cell
Internal Impedance (Ri)	mΩ	≤50	Upon fully charge at 1kHz	*
High Rate Discharge (1.0C)	min	≥54	Standard Charge/rest 30min discharge at 1.0C to 1.0V	Up to 3 cycles are allowed
High Rate Discharge (2.0C)	min	≥N/A	Standard Charge/rest 30min discharge at 2.0C to 0.9V	Up to 3 cycles are allowed
Low Temperature Discharge	min	≥240	Standard Charge, Storage:24hrs at 0±2°C 0.2C discharge at 0±2°C	1.0V/cell Cut-off
Overcharge	N/A	No conspicuous deformation and/or leakage	0.1C charge for 48hrs	*
Charge reserve	mAh	≥70% First capacity	Standard charge storage at 20 degree: 28 days Standard discharge (0.2C)	1.0V/cell Cut-off
IEC Cycle Life Test	Cycle	≥500	IEC61951-2(2003)7.4.1.1	*
Humidity	N/A	No leakage	Standard charged, stand for 14 days at 33±3°C and 80±5% of relative humidity	*
External Short Circuit	N/A	No fire and no explosion	After standard charge, short-circuit the cell at 20°C ±5°C until the cell temperature returns to ambient temperature.(cross section of the wire or connector should be more than 0.75m^2)	*
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
Free falling(drop)	N/A	Δ V<0.02V/cell Δ Ri<5%/cell	Charge at 0.1C for 16hrs,and then leave for 24hrs,check battery before / after drop Height: 50 cm Thickness of wooden board: 30mm Direction is not specified Test for 3 times	*

Remark:
Please activate the battery once every 3 months according to the following method: Charge at 0.1C for 15 hrs, rest 10 min, then discharge with 0.2C to 1.0V/cell,rest 10 min, then charge at 0.2C to 150min.
Standard Charge/Discharge Conditions: Charge: 60mA (0.1C)×15hrs Discharge: 120mA(0.2C) to 1.0V/cell

7. Cycle-life test according to IEC61951

Before the endurance in cycles test, the cell shall be discharged at 0.2 1tA to a final voltage of 1.0V/sell. The following endurance test shall then be carried out, irrespective of cell designation, in an ambient temperature of 20°C ±5°C.Charge and discharge shall be carried out at constant current throughout, using the conditions specified in table 5.Precautions shall be taken to prevent the cell-case temperature from rising above 35°C during the test, by providing a forced air draught if necessary.

NOTE-Actual cell temperature, not the ambient temperature, determines cell performance.

Cycle number	Charge	Stand in Charged condition	Discharge
1	0.1C_tA for 16 h	None	0.25 C_tA for 2 h 20 min[2)]
2 to 48	0.25 C_tA for 3 h 10 min	None	0.25 C_tA for 2 h 20 min[2)]
49	0.25 C_tA for 3 h 10 min	None	0.25 C_tA to 1.0V/cell
50	0.1 C_tA for 16 h	1h to 4h	0.2C_5A to 1.0V/cell

Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3h at this stage, a further cycle as specified for cycle 50 shall be carried out.
The endurance test is considered complete when two such successive cycles give discharge duration less than 3h.The number of cycles obtained when the test is completed shall be not less than 500.

It is permissible to allow sufficient open-circuit rest time after the completion of discharge at cycle 50,so as to start cycle 51 at an exact two-week internal. A similar procedure may be adopted at cycles 100,150,200,250,300,350,400and 450.
If cell discharge voltage drops below 1.0V/cell,discharge may be discontinued.

8. Safety instructions

1. Batteries should be charged prior to use.
2. When using a new battery for the first time or after long term storage, please fully charge the battery before use.
3. For charging methods please reference to above tables
4. Use the correct charger for Ni-Cd or Ni-MH batteries.
5. Do not reverse charge batteries.
6. Do not short circuit batteries, permanent damage to batteries may result.
7. Do not incinerate or mutilate batteries, may burst or release toxic material.
8. Do not solder directly to cells or batteries.
9. Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive overcharge/overdischarge.
10. Store batteries in a cool dry place.
11. Do not mix new batteries in use with semi-used batteries or batteries of a different chemistry, over-discharge may occur.
12. Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment; otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source.
13. When connecting a battery pack to a charger, ensure correct polarity.
14. If find any noise, excessive temperature or leakage from a battery, please stop its use.
15. When the battery is hot, please do not touch it and handle it, until it has cooled down.

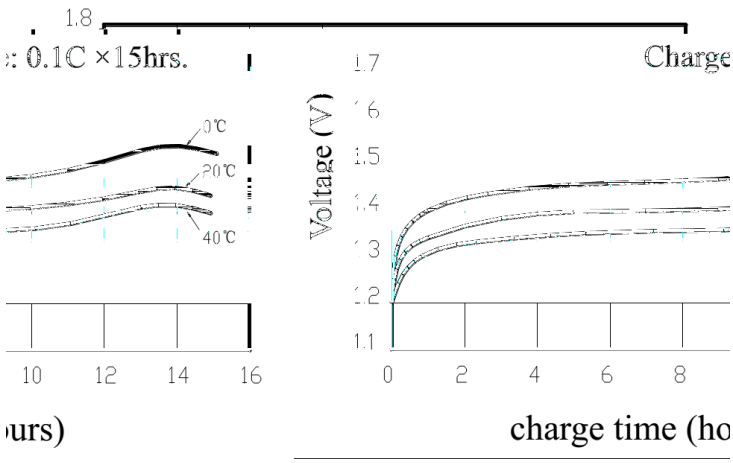
16. Do not remove the outer sleeve from a battery pack nor cut into its housing.
17. When find battery power down during use, please switch off the device to avoid overdischarge.
18. When not using a battery, disconnect it from the device.
19. Unplug a battery by holding the connector itself and not by pulling at its cord.
20. After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.
21. Never put a battery into water or seawater.
22. During long term storage, battery should be charged and discharged once every 3 months.
23. Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing uponcontact.
24. Keep away from children. If swallowed, contact a physician at once.

9. Packaging Requirements

9.1 The total of heavy metal lead, cadmium, mercury, and hexavalent chromium concentration shall not exceed 100 ppm in Packaging materials and printing inks. Ozone depleting substances (ODS) shall not be used in the manufacturing of any packaging.
The printing on each cell label is legible and permanent. Label defects, if any, shall conform to mutually agreed upon limit samples.
9.2 It is recommended that packaging for shipment and sales according to following packaging specification: 2pcs cells in a blister, 12 blisters in a display box, 12 display boxes in a final outer carton.
9.3 Otherwise packaging for shipment and sales shall conform to the mutually agreed to packaging specification of the designated customers.

10. Charge and discharge diagrams

Standard charge characteristics



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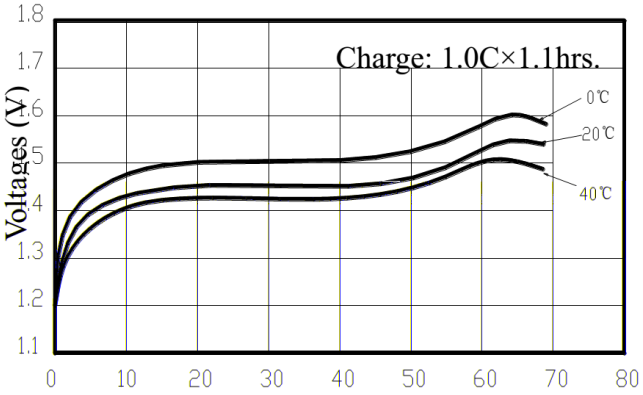
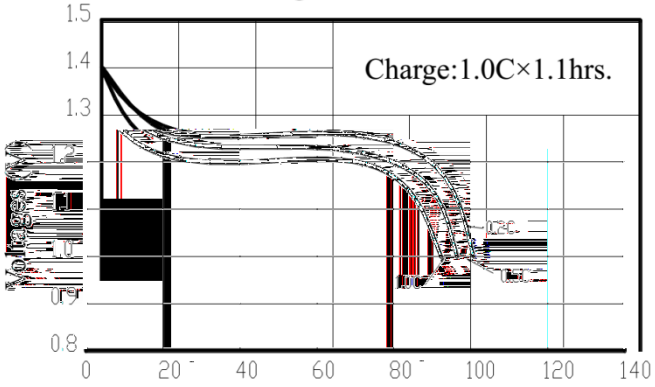
Rapid charge characteristics



Discharge characteristics



Cycle life characteristics