

# BELRTUAA2200

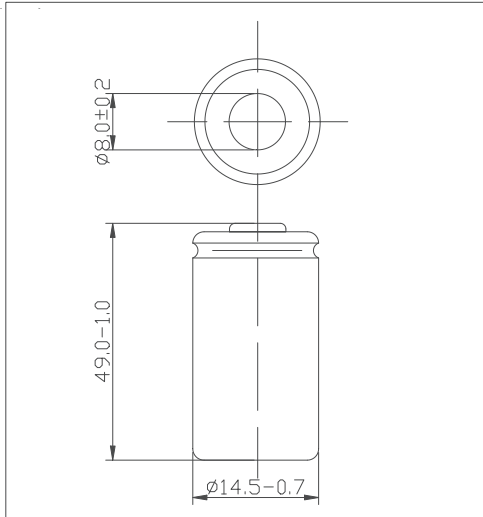
## 1.2V 2200 mAh

(Type): **LS49AA2200P**

### Specifications of single cell

Nominal voltage		1.2V
Capacity		0.5C Discharge
	Minimum	116min
	Typical	121min
Dimensions		mm
	Diameter	14.5 <sup>-0.7</sup>
	Height	49.0 <sup>-1.0</sup>
Weight(Approximately)		gram
		28.0
Internal Impedance At 1000 Hz		30mΩ(Max) After Charge
Charge	Standard	220mA(0.1C)×16hrs
	Rapid	1100mA(0.5C)×2.1hrs
Ambient temperature	Charge	°C
		standard
	Rapid	0°C to 40°C
	Discharge	-20°C to 50°C
	Storage	-20°C to 30°C

### PVC (Dimensions with tube)

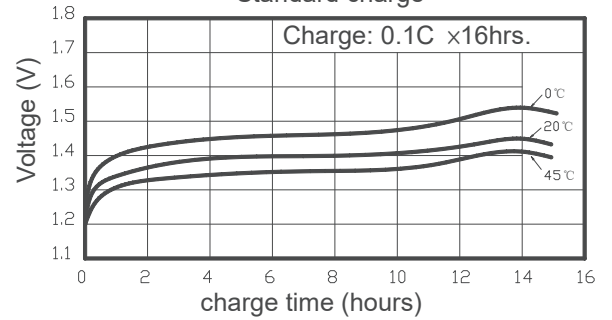


Note:

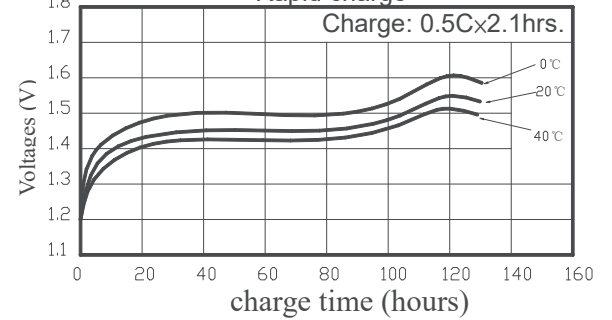
- Nominal capacity, rated at 0.2C 20°C.
- Average capacity, for reference only.
- Weight and internal impedance are For reference.

### Typical characteristics

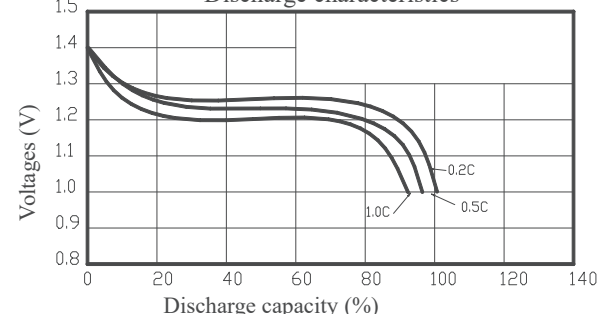
#### Standard charge



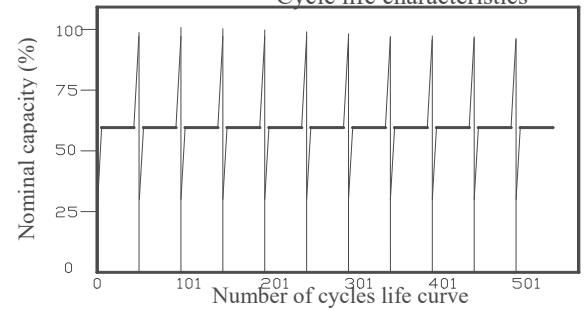
#### Rapid charge



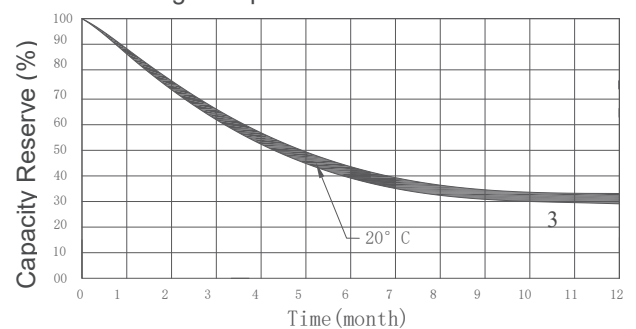
#### Discharge characteristics



#### Cycle life characteristics



#### Charge retention curves of Ni-MH cylindrical cell At 20°C storage temperature



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4.

Standard according as IEC of test cycle life.

### 1. PREFACE

Time (month)

The specification is suitable for the performance of NI-MH rechargeable battery produced by the SHENZHEN FBTECH CO., LTD.

### 2. MODEL

AA2200mAh 1.2V

### 3. APPEARANCE

There shall be no such details as discoloration or electrolyte leakage or 0 voltage.

### 4. RATINGS

Description	Unit	Specification	Condition
Nominal Voltage	V	1.2	Unit cell
Typical Capacity	min	121	Standard Charge/Discharge
Nominal Capacity	mAh	2200	Standard Charge/Discharge
Minimum Capacity	min	116	Standard Charge/ Discharge
Standard Charge	mA	220(0.1C)	Ta=0~40°C (see note )
	hour	16	
Fast Charge	mA	1100(0.5C) With charge termination control	-ΔV=5mV/cell Timer cutoff=110%input capacity Temp. cutoff=40~45°C dT/dt=0.8°C/min(0.5 to 1.0C); 0.8~1°C/min(1C)
	hour	2.1 approx.(0.5C)	
Trickle Charge	mA	44(0.02C)~110(0.05C)	Ta=0~40°C (see note 1)
Discharge Cut-off Voltage	V	1.0	Unit cell
Maximum Discharging Current	mA	4400(2.0C)	Ta =0~50°C 0.8v cut off
Storage Temperature	°C	-20~+25(within 1 year) -20~+30(within 3 month) -20~+40(within 1 month) -20~+50(within 1 week)	*
Typical Weight	g	29 approx	*

### 5. PERFORMANCE

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:  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$

Relative Humidity:  $65 \pm 20\%$

Note Standard Charge/Discharge Conditions:

Charge:  $220\text{ mA}(0.1\text{C}) \times 16\text{hrs}$

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

Test	Unit	Specification	Condition	Remarks
Capacity	min	$\geq 300$	Standard Charge / Discharge	Up to 3 cycles are allowed
Open circuit Voltage (OCV)	V	$\geq 1.25$	Within 1 hr after standard charge	Unit cell
Internal Impedance (Ri)	m $\Omega$	$\leq 30$	Upon fully charge at 1kHz	*
High Rate Discharge (2.0C)	min	$\geq \text{N/A}$	Standard Charge/rest 30min discharge at 2.0C to 0.8V	*
Low Temperature Discharge	min	$\geq 240$	Standard Charge, Storage:24hrs at $0 \pm 2^{\circ}\text{C}$ 0.2C discharge at $0 \pm 2^{\circ}\text{C}$	1.0V/cell Cut-off
Overcharge	N/A	No conspicuous deformation and/or leakage	0.1C charge for 48hrs	*
Charge Retention	mAh	$\geq 30\%$ First capacity)	Standard charge Storage at 20 degree: 1 year Standard discharge (0.2C)	1.0V/cell Cut-off
IEC Cycle Life Test	Cycle	$\geq 500$	IEC61951-2 ED3.0	*

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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 0.75mm <sup>2</sup> )	*
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	$\Delta V < 0.02V/cell$ $\Delta Ri < 5\%/cell$	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	*

Notes:

1.

Ta: Ambient Temperature

2.

Approximate charge time from discharged state, for reference only.

3.

Please activate the battery once every 3 months according to the following method. Otherwise, may cause the battery capacity attenuation, reducing the battery service life and so on.

Charge at 0.1C for 16 hrs, rest 10 min, then discharge with 0.2C to 1.0V/cell,rest 10 min, then charge at 0.2C to 150min.

**6. PRECAUTIONS TO ENSURE THE SAFETY ON BANDING BATTERY**

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 our technical handbook.

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 FBTECH batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.

12.

Do not mix new batteries in use with semi-used batteries, overdischarge may occur.

13.

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.

14.

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When connecting a battery pack to a charger, ensure correct polarity.

15.

If find any noise, excessive temperature or leakage from a battery, please stop its use.

16.

When the battery is hot, please do not touch it and handle it, until it has cooled down.

17.

Do not remove the outer sleeve from a battery pack nor cut into its housing.

18.

When find battery power down during use, please switch off the device to avoid overdischarge.

19.

When not using a battery, disconnect it from the device.

20.

Unplug a battery by holding the connector itself and not by pulling at its cord.

21.

After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

22.

Never put a battery into water or seawater.

23.

During long term storage, battery should be charged and discharged once every 3 months.

24.

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 upon contact.

25.

Keep away from children. If swallowed, contact a physician at once.

26.

Battery failure, may not be thrown away, please recycling

27.

Stored or transport, please let the battery apart and fixed, to prevent external short circuit

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7. : IEC61951-2 ED3.0

1	0.1C <sub>I</sub> A for 16 h	None	0.25 C <sub>I</sub> A for 2 h 20 min <sup>2)</sup>
2 to 48	0.25 C <sub>I</sub> A for 3 h 10 min	None	0.25 C <sub>I</sub> A for 2 h 20 min <sup>2)</sup>
49	0.25 C <sub>I</sub> A for 3 h 10 min	None	0.25 C <sub>I</sub> A to 1.0V
50	0.1 C <sub>I</sub> A for 16 h	1h to 4h	0.2C <sub>5</sub> A to 1.0V <sup>1)</sup>
<ul style="list-style-type: none"> <li>● 100,150,200,250,300,350,400and 450</li> <li>●</li> </ul>			

### Append: IEC61951-2 ED3.0 Endurance in cycles

Before the endurance in cycles test, the cell shall be discharged at 0.2 1A to a final voltage of 1.0V/cell. 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.

**Table 5-Endurance in cycles**

Cycle number	Charge	Stand in Charged condition	Discharge
1	0.1C <sub>I</sub> A for 16 h	None	0.25 C <sub>I</sub> A for 2 h 20 min <sup>2)</sup>
2 to 48	0.25 C <sub>I</sub> A for 3 h 10 min	None	0.25 C <sub>I</sub> A for 2 h 20 min <sup>2)</sup>
49	0.25 C <sub>I</sub> A for 3 h 10 min	None	0.25 C <sub>I</sub> A to 1.0V/cell
50	0.1 C <sub>I</sub> A for 16 h	1h to 4h	0.2C <sub>5</sub> A to 1.0V/cell
<ul style="list-style-type: none"> <li>● 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 interval. A similar procedure may be adopted at cycles 100,150,200,250,300,350,400and 450.</li> <li>● If cell discharge voltage drops below 1.0V/cell, discharge may be discontinued.</li> </ul>			

Cycles 1 to 50 shall be repeated until the discharge duration on any 50<sup>th</sup> 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 a discharge duration less than 3h. The number of cycles obtained when the test is completed shall be not less than 500.

## 8. ENVIRONMENTAL PROTECTION REQUIREMENT

8.1 It is hereby certified by FBTECH that there is neither RoHS (EU Directive 2002/95/EC, 2011/65/EU, 2015/863) restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes.

8.2 Battery Cells restricted substance conform to the requirements of the Battery Directive (EU Directive 2006/66/EC, 2013/56/EU)

8.3 FBTECH is not responsible for the collection and recycling of the waste battery as required in Battery Directive (EU Directive 2006/66/EC, 2013/56/EU)

8.4 If there are other environmental protection requirements, the quality agreement signed by both parties shall prevail.

## 9. WARRANTY

The battery packs are warranted to conform to the specification for 12 months from the ex-factory date.

FBTECH's warranty shall not be applicable in the cases where customer improperly handle, operate, test, install, service and disassemble the battery packs or fails to follow the instructions, cautions, warnings, notes provided in the specifications.