



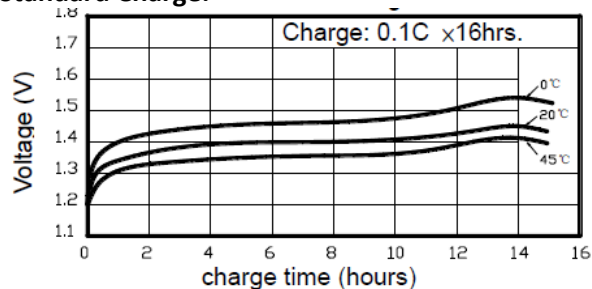
# Overlander 300mAh 2/3 AAA Cell SKU: 2212

## Cell Specifications:

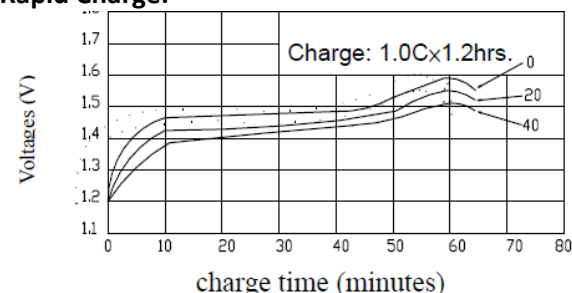
|                              |           |                       |              |
|------------------------------|-----------|-----------------------|--------------|
| Nominal Voltage              |           | 1.2V                  |              |
| Capacity                     |           | 0.2C Discharge        | 1C Discharge |
|                              | Minimum   | 290min                | 56min        |
|                              | Typical   | 300min                | 58min        |
| Dimensions                   | Diameter  | 10.0 $\pm$ 0.7        | mm           |
|                              | Height    | 29.0 $\pm$ 1.0        | mm           |
| Weight (approximately)       |           | 8                     | g            |
| Internal Impedance at 1000Hz |           | 80m $\Omega$ (max)    |              |
| Charge                       | Standard  | 30mA (0.1C) x 16hrs   |              |
|                              | Rapid     | 300mA (1.0C) x 1.2hrs |              |
| Ambient Temperature          | Charge    | Standard              | 0 – 45 °C    |
|                              |           | Rapid                 | 0 – 45 °C    |
|                              | Discharge |                       | 0 – 45 °C    |
|                              | Storage   |                       | 0 – 35 °C    |

## Typical Characteristics:

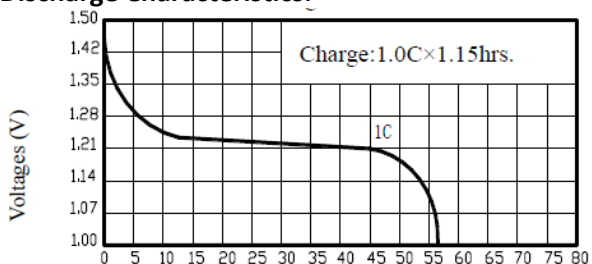
### Standard Charge:



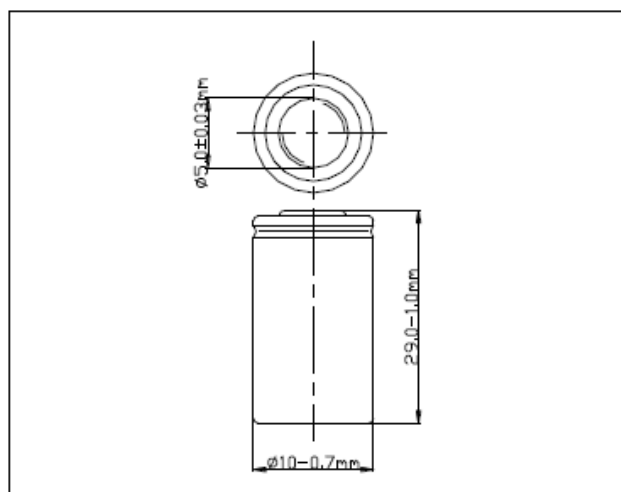
### Rapid Charge:



### Discharge Characteristics:



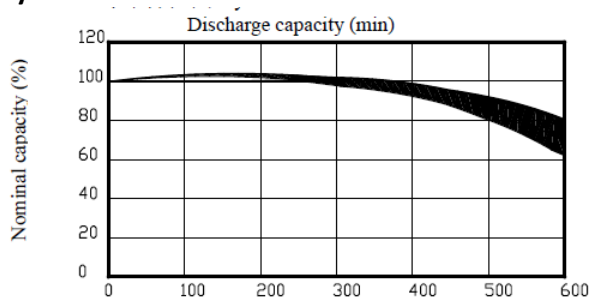
## Dimensions with PVC tube (mm):



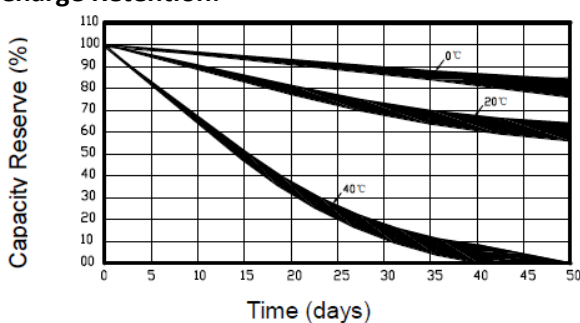
## Please note:

- 1) Nominal capacity is rated at 0.2C 20°C.
- 2) Weight for reference.
- 3) Standard according as IEC of test cycle life.

## Cycle Life Characteristics:



## Charge Retention:





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### 1. PREFACE

The specification is suitable for the performance of NI-MH rechargeable battery

### 2. MODEL

2/3AAA 300mAh 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  | 58                                                                                                     | Discharge at 0.5C to1.0V                                                                                                                |
| Nominal Capacity    | mAh  | 300                                                                                                    | Standard Charge/Discharge                                                                                                               |
| Minimum Capacity    | min  | 56                                                                                                     | Discharge at 0.5C to1.0V                                                                                                                |
| Standard Charge     | mA   | 30(0.1C)                                                                                               | Ta=0~40°C<br>(see note 1)                                                                                                               |
|                     | hour | 15                                                                                                     |                                                                                                                                         |
| Fast Charge         | mA   | 60(0.2C)~300(1.0C)<br>with charge termination control                                                  | - $\Delta V$ =10mV/ cell<br>Timer cutoff=105%input capacity<br>Temp. cutoff=40~45°C<br>dT/dt=0.8°C/min(0.5 to 1.0C);<br>0.8~1°C/min(1C) |
|                     | hour | 6.5 approx.(0.2C)<br>1.2 approx(1.0C)                                                                  |                                                                                                                                         |
| Trickle Charge      | mA   | 6(0.02C)~15(0.05C)                                                                                     | Ta=0~40°C<br>(see note 1)                                                                                                               |
| Storage Temperature | °C   | -20~+25(within 1 year)<br>-20~+30(within 3 month)<br>-20~+40(within 1 month)<br>-20~+50(within 1 week) | *                                                                                                                                       |
| Typical Weight      | g    | 8 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:



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Ambient temperature: 20°C ±5°C

Relative Humidity: 65±20%

Note Standard Charge/Discharge Conditions:

Charge: 30 mA(0.1C)×15hrs

Discharge: 60mA(0.2C) to 1.0V/cell

| Test                       | Unit  | Specification                             | Condition                                                                                                                                                                                             | Remarks                                               |
|----------------------------|-------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Capacity                   | min   | ≥290                                      | Discharge at 0.2C to 1.0V                                                                                                                                                                             | 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    | ≤80                                       | Upon fully charge at 1kHz                                                                                                                                                                             | *                                                     |
| Low Temperature Discharge  | min   | ≥270                                      | Standard Charge,<br>Storage:24hrs at 0±2°C<br>0.2C discharge at 0±2°C                                                                                                                                 | 1.0V/cell<br>Cut-off                                  |
| Overcharge                 | N/A   | No conspicuous deformation and/or leakage | 0.1C charge for 28 days                                                                                                                                                                               | *                                                     |
| Charge reserve             | min   | ≥180                                      | Standard charge Storage: 180 days<br>Standard discharge (0.2C)                                                                                                                                        | 1.0V/cell<br>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 0.75mm <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   | ΔV<0.02V/cell<br>ΔRi<5%/cell              | Charge at 0.1C for 16hrs,and then leave for 24hrs,check battery before / after drop<br>Height: 50 cm<br>Thickness of wooden board: 30mm<br>Direction is not specified<br>Test for 3 times             | *                                                     |



## **Overlander 300mAh 2/3 AAA Cell**

### **SKU: 2212**

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#### 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:  
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.

#### **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
3. use.
4. For charging methods please reference to our technical handbook.
5. Use the correct charger for Ni-Cd or Ni-MH batteries.
6. Do not reverse charge batteries.
7. Do not short circuit batteries, permanent damage to batteries may result.
8. Do not incinerate or mutilate batteries, may burst or release toxic material.
9. Do not solder directly to cells or batteries.
10. Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive overcharge/overdischarge.
11. Store batteries in a cool dry place.
12. Do not mix VB power batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.
13. Do not mix new batteries in use with semi-used batteries, overdischarge may occur.
14. 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.
15. When connecting a battery pack to a charger, ensure correct polarity.
16. If find any noise, excessive temperature or leakage from a battery, please stop its use.
17. When the battery is hot, please do not touch it and handle it, until it has cooled down.
18. Do not remove the outer sleeve from a battery pack nor cut into its housing.
19. When find battery power down during use, please switch off the device to avoid overdischarge.
20. When not using a battery, disconnect it from the device.
21. Unplug a battery by holding the connector itself and not by pulling at its cord.
22. After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.
23. Never put a battery into water or seawater.
24. During long term storage, battery should be charged and discharged once every half a year.
25. 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.
26. Keep away from children. If swallowed, contact a physician at once.

#### **7. APPENDIX: IEC61951 4.4 Endurance in cycles**



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Before the endurance in cycles test, the cell shall be discharged at 0.2  $I_t$ A 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  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . 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  $35^{\circ}\text{C}$  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<br>Charged condition | Discharge                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|-------------------------------------------|
| 1                                                                                                                                                                                                                                                                                                                                       | 0.1 $C_t$ A for 15 h        | None                          | 0.25 $C_t$ A for 2 h 20 min <sup>2)</sup> |
| 2 to 48                                                                                                                                                                                                                                                                                                                                 | 0.25 $C_t$ A for 3 h 10 min | None                          | 0.25 $C_t$ A for 2 h 20 min <sup>2)</sup> |
| 49                                                                                                                                                                                                                                                                                                                                      | 0.25 $C_t$ A for 3 h 10 min | None                          | 0.25 $C_t$ A to 1.0V/cell                 |
| 50                                                                                                                                                                                                                                                                                                                                      | 0.1 $C_t$ A for 15 h        | 1h to 4h                      | 0.2 $C_5$ A to 1.0V/cell                  |
| 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 100,150,200,250,300,350,400 and 450.<br>If cell discharge voltage drops below 1.0V/cell, discharge may be discontinued. |                             |                               |                                           |

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.