

SPECIFICATION

SEALED RECHARGEABLE NICKEL METAL HYDRIDE BATTERY

1. Scope

This specification can be applied to nickel metal hydride single battery.

Model No.: LTT-AA1700mAh 1.2V

Single battery type: AA

2. This specification suits to the cylindrical batteries listed below:

A. Single battery nominal voltage: 1.2V.

B. Battery pack voltage can be got by one single cell voltage multiply the quantity of the single cells.

3. Specification

The table below can be taken as the basic guideline of evaluation the battery quality.

ITEM	UNIT	SPEC.	CONDITION
Norminal Voltage.	V/pc	<u>1.20</u>	Single battery
Norminal Capacity	mAh	<u>1700</u>	Standard charge and discharge
Standard charge	mA	<u>170</u> (0.1C)	Environment Temperature: 20±5°C
	hrs	<u>15</u>	
Rapid Charge	mA	<u>1700</u> (1C)	-ΔV=5~10mV, Environment Temperature 0~45°C -dT/dt=1.0~3.0°C/min
	hrs	<u>1.2</u>	
Trickel Charge	mA	<u>32~80</u> (0.02C~0.05C)	Ta=0~45 °C (Suggest trickle charge less than 24hrs.)
Internal Impedance	mΩ/pc	≤ <u>30</u>	Fully charged battery, test under 20°C(1KHz)
Discharge cut-off voltage	V/pc	<u>1.0</u> (Standard)	
Storage Temperature	°C	0~35°C	Charge the battery to the full condition of 80%
Working Environment	°C	0~45 °C	The allowed working environment of battery
Average Weight	g	<u>25</u>	

4. PERFORMANCE

4.1 The battery should be tested with the condition below except special instruction:

Working Temperature: 20±5°C

Relative Humidity: 65±20%

4.2 Caution: Standard charge and discharge condition:

Charge: 170mA (0.1C) × 15hrs

Discharge: 340mA (0.2C) to 1.0V/pc

4.3 Testing facility must conform to the condition:

Voltage meter: IEC 51/IEC 485 stipulated grade 0.5 or above. Resistance more than 10KΩ/V

Ampere meter : IEC 51/IEC 485 stipulated grade 0.5 or above, including the down-lead resistance totally less than 0.01Ω.

BVIR: AC 1KHz sine wave 4 terminals testing equipment.

TESTING ITEM	UNIT	SPECIFICATION	CONDITION	REMARKS
Open circuit voltage	V/pc	≥ 1.25	Test after standard charged and placed for one hour time	
Capacity	mAh	≥ 1700	Standard charge and discharge	Allows 3 times recycling
Discharge at 0.5C	min	Discharge time ≥ 108	Standard charge, then shelve for 60min, discharge at 0.5C to 1.0V	
Discharge at 1C	min	Discharge time ≥ 54	Standard charge, shelve for 60min, discharge at 1C to 1.0V	
Self-discharge	mAh	Discharge capacity $\geq 60\%$ of normal capacity (1020 mAh)	Standard charge, storage for 28days with the temperature 20°C, and standard discharge	
Constant humidity and hot performance		No damage	Full charge the battery at current 0.5C, 33 \pm 3°C, 80 \pm 5%R.H., storage 14 days.	
Vibration		Voltage variety: $\leq 0.02V/cell$ Internal impedance: $\leq 5 m\Omega/cell$	Charge at current 0.1C for 15hrs, place for 24 hrs, check the battery before and after vibration. Vibration condition: Swing: 1.5mm, Frequency: 3000CPM, Vibrate for 1hr to any direction.	
Fall down test		Voltage variety: $\leq 0.02V/cell$ Internal impedance: $\leq 5 m\Omega/cell$	Charge at current 0.1C for 15hrs, place for 24 hrs, check the battery before and after fall down test; Impact condition: Fall down from height 1.5m to any direction on the board(Thickness:10mm), test for 3 times	
Safety		No rupture, explosion, but leakage, distortion and package damaged allowed.	Short circuit the battery by the load less than 4 Ω after standard charge the battery	
Over discharge		No explode.	Discharge the battery at current 0.2C to 0V, then over discharge the battery at current 1C for 60mins	
Recycling test(IEC standard)	cycle	≥ 500	IEC standard	Refer to Remarks 1

5. Structure, size and marks.

Please refer to the attached diagram.

6. Appearance

There should be no craft, scratch, breakage, dust, color changed, leakage and deformed.

7. Warranty

Guarantee time for one year due to the processing and raw material defectiveness.

Suggestion: The products before delivery would be charged 20-80% capacity according to the transportation distance and packing condition. While checking the capacity, please discharge the battery at 0.2C to 1.0V; then charge and discharge the battery at by standard current. If the storage time over 2 months or above, please discharge the battery at the current 0.2C to 1.0V, then charge the battery at 0.1C for 15 hours, after that place for 20mins, discharge the battery at 0.2C to 1.0V. After

this activation, check the capacity by the standard current charge and discharge the battery
 The first time use suggested to take standard charge method to charge the battery to prevent from damage to battery.

8. Caution:

- A. Please do not throw into fire or try to open it.
- B. Please do not mix use with other type of batteries or old one.
- C. Please do not discharge the battery at the current exceeds the stipulated one on specification.
- D. Please do not short circuit the battery prevent from permanent damage.
- E. Please do not jointing the batteries.
- F. Please do not reverse load the batteries.
- G. If use the battery at the utmost condition, it could be shorten the battery recycling life, such as utmost temperature, recycling and utmost charge and discharge it.
- H. The battery should be place in cool and dry environment with the charged condition. And should be discharged before mass delivery.
- I. The battery should be stopped using while abnormal happened during working process, please send the battery to the distributor for handling.
- J. Due to the controlled by electrochemistry system, for long time storage situation, suggested to charge the battery to 80%~100% of its capacity.
- K. In order to maintain the battery performance, after storage over 6months, suggest to charge and discharge the battery(Discharge the battery at current 0.2C to 1.0V before charge the battery). Then can use or stock it.
- L. The full charged battery or battery pack should be put separately before completely getting cool, otherwise the short circuit could be happened due to the heat from the batteries stocking together.

REMARKS:

1. Temperature

2. IEC standard recycling life.

Recycling time	Charge	STAND BY	Discharge
1	0.1C×15hrs	0	0.25C×2hrs 20min
2~48	0.25C×3hrs 10min	0	0.25C×2hrs 20min
49	0.25C×3hrs 10min	0	0.25C to 1.0V/cell
50	0.1C×15hrs	1~4hrs	0.20C to 1.0V/cell
Repeat 1-50 times recycling, until that the battery discharge time less than 3hrs at the 50 times.			

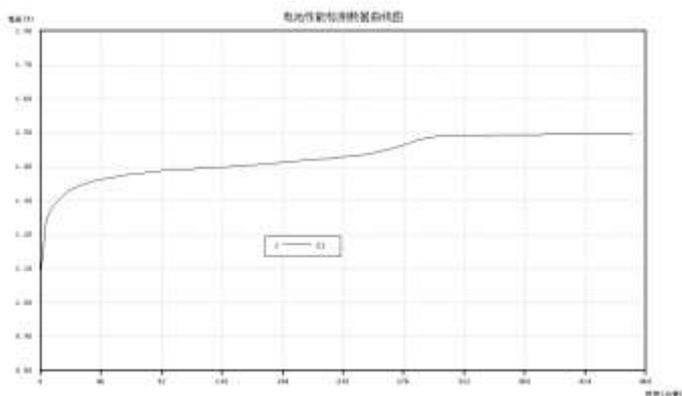
Attached Diagram:

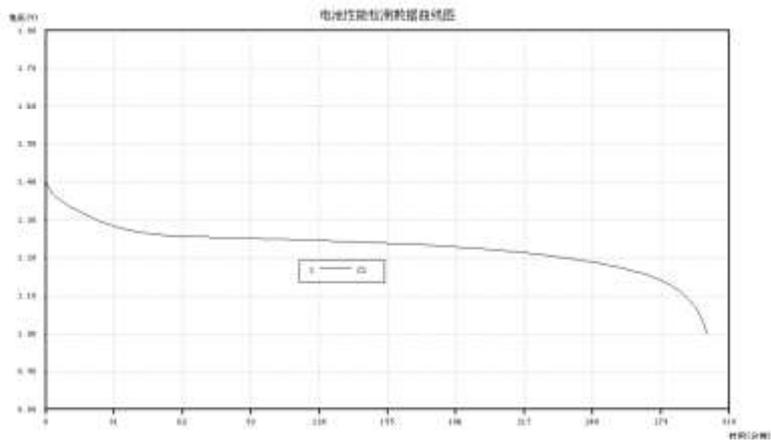
LTT-AA1700 single battery performance specification

Product Specification (This charge and discharge method can be used to the battery, but would not be the inspection condition)

Battery type	NI-MH rechargeable single battery	
Model No.	LTT-AA1700	
Norminal voltage	1.2V	
Application	170-1700mA(suggested discharge current)	
Capacity	Discharge at current 340mA to 1.0V under the temperature 20°C	
	Norminal capacity 1700mAh	
	Minimum capacity 15300mAh	
Size	Dia.	14.5-0.7mm
	Height	50.0-1.0mm
Charge Condition	Charge the battery with the current 170mA for 15hrs	
Rapid Charge	850mA to 1700mA (0.5C to 1C) Charge cut off condition : Stop charging the battery if reach 120% of the norminal capacity; $-\Delta V = 5-10\text{mV/pc}$; $dT/dt = 1\sim 2^\circ\text{C}/3\text{min}$ Cut off temperature = 50°C (122°F); Environment temperature = 10~45°C	
Internal impedance	The average of internal resistance with full charged condition is 30mΩ	
Recycling life time(IEC standard)	≥500 times	
Weight	About 25g	
Temperature Scope	Standard Charge	0°C to 45°C
	Rapid charge	10°C to 45°C
	Discharge	0°C to 45°C
	Stock	0°C to 30°C

The curve of 0.2C charging





The curve of 0.2C discharging

