

# NNTN8023AC battery specification

## 1. BATTERY NAME AND MATERIAL COMPOSITION:

- 1.1. Original brand , battery model : **MOTO** / NNTN8023AC
- 1.2 Applicable walkie-talkie models : MTP3550/MTP3100/3150/3250
- 1.3 Battery type: LI-ION lithium battery
- 1. 4 battery voltage/ capacity: 7.4V 290 0 mAh
- 1. 5 components: Yintai 2900mA batteries connected in series and protection control circuit.
- 1. 6 Volume: L= 104 (+0.15/-0.15)mm W= 52 (+0.15/-0.15)mm H= 17 (+0.10/-0.10)mm
- 1. 7 Assembly: Housing Ultrasonic
- 1. 8 Plastic material: ABS
- 1. 9 Weight: 83.5 g±2g

## SECOND, THE BASIC PERFORMANCE AND TESTING REQUIREMENTS OF THE BATTERY

### 2.1 BASIC PERFORMANCE OF THE BATTERY:

Name		Parameters	Remark
PACK minimum capacity		1000mAh _	0.2C
Rated voltage		7.4V _	
Discharge cut-off voltage		6.0V	0.2C Discharge _ 0.2 C discharge
Charging method (standard)		CC-CV	0° C ~ +45° C
Charging current (standard)		300 mA	
Charging voltage (standard)		8. 2V ±0.05V	
Discharge current	standard	600 mA	-20° C ~ +60° C
	maximum value	2900 mA	0 ° C ~ +45° C
ambient temperature	standard charge	0° C ~ +40° C	
	discharge	-20° C ~ + 60 ° C	
storage temperature	within a month	-20° C ~ + 60 ° C	Relative humidity: 45%-75%
	within three months	-20° C ~ + 45 ° C	

	long term within one year	- 20 ° C ~ + 20 ° C	
2 Differences Between 5 °C Battery Pack Cells	Capacity deviation (mAh)	<20mAh	
	Internal resistance deviation (mΩ)	< 5mΩ	
	Voltage deviation (mV)	<10mV	
Shipping status	charged	30%	7. 2V -7.6V

## 2. 2 TEST REQUIREMENTS:

### 2. 2 .1 Standard test conditions:

- a) Temperature: 20°C ± 5°C
- b) Relative humidity: 65±5%
- c) Atmospheric pressure: 0.8-1.1 standard atmospheric pressure
- d) Ethylene concentration: 7.8±0.5%

### 2. 2 .2 Measuring instruments and equipment requirements:

- a) The accuracy of the meter for measuring voltage should not be lower than 0.5, and the internal resistance should not be lower than 10KΩ/V;
- b) The accuracy of the instrument for measuring current should not be lower than 0.5 grade;
- c) The relative error of the instrument for measuring time is ±0.1%;
- d) The relative error of constant current adjustment of constant current load within the measured power supply voltage range is ±0.1%;
- e) The charging power supply (or charger) should be able to change to constant voltage charging after the battery voltage reaches the constant voltage value of the charging voltage;

### 2. 2 .3 Electrical performance test requirements:

project	test condition (method)	Judgment rules
Standard charging method	The battery is charged with a constant current of 0.2C until the battery voltage reaches 8.4V, and then charged with a constant voltage of 8.4V until the cut-off current is 0.02C.	
fast charging	In CC/CV mode, the charging power supply is charged with a constant current of 1C until the battery voltage reaches 8.4V, and then changed to constant voltage charging until the charging current is lower than 0.02C.	
quick discharge	After fast charging, put it aside for 1 hour, and then discharge it to 6.0V with a constant current of 1C.	
standard discharge	After standard charging, put it on hold for 1 hour, and then discharge it to 6.0V with a constant current of 0.2C.	

Rated Capacity	The rated capacity is the discharge capacity of the battery, which is the amount of electricity released when the battery is left standing for 1 hour after standard charging and discharged at 0.2C in an environment of $20\pm 5^{\circ}\text{C}$ until the end voltage is 6V.	$\geq 2900\text{mAh}$
1C discharge performance	After the standard charge, stand still for 1 hour, and discharge at 1C in an environment of $20\pm 5^{\circ}\text{C}$ , the amount of electricity discharged when the cut-off voltage reaches 6.0V.	$\geq$ Minimum capacity 90%
Internal resistance	After standard charging, test the internal resistance of the battery under the condition of 1KHz AC	discharge $\leq 250\text{m}\Omega$
		Charge /
Q	After standard charging of the battery, measure its open circuit voltage within one hour.	$\geq 8.2\text{V}$
self-discharge	After standard charging, the battery should be stored for 28 days at an ambient temperature of $25^{\circ}\text{C}$ .	$\leq 10\%$
cycle life	Under the condition of ambient temperature ( $20\pm 5^{\circ}\text{C}$ ), charge with 1C constant current, when the battery voltage reaches the charging voltage of 8.4V, change to constant voltage charging until the charging current is less than or equal to 0.02C, stop charging, and put it aside for a while (within 1 hour) and then discharge at a constant current of 1C to a voltage of 6.0V. After the discharge is completed, leave it for 1 hour before proceeding to the next charge-discharge cycle. The battery is subjected to discharge cycles up to 300 times.	$\geq 68\%$ of total capacity

#### 2.2.4 MECHANICAL PERFORMANCE TEST REQUIREMENTS:

project	test condition (method)	Judgment rules
vibration test	After standard charging, the battery is fixed on the vibrating table, and the battery is vibrated in three directions of X, Y, and Z, the frequency is from 10Hz-60Hz, and each direction is 1 hour.	The battery has no obvious damage, no leakage, no smoke, no fire, and no explosion. It is inserted into the corresponding model and the contact is good. Test Rear battery terminal voltage

		8.0V
drop test	Freely drop the fully charged battery from a height of 1.2 meters on a steel plate with a thickness of 18mm to 20mm, 20 times in the horizontal direction and 20 times in the vertical direction , a total of 40 times.	The appearance of the battery has no obvious damage and deformation, no leakage, no smoke, no fire, no explosion, and the battery capacity is $\geq 85\%$
water-proof test	Adjust parameters according to the instrument (IPX7 waterproof level) RDY: -15Kpa, DEL1sec, CHA: 7.0sec, BAL: 5.0sec, EXT: 0.2sec, PNG: -10Kpa	Leakage does not exceed $\pm 120\text{pa}$ -NG: -120pa +NG: +120pa
96H salt spray test	At room temperature, spray with 5% saline solution for 24 hours, and dry naturally for 24 hours as a cycle, and do two cycles in total. Remove to dry. When the discharge terminal is empty and has a voltage output, the discharge electrode sheet is subjected to a 96H salt spray test.	The appearance of the battery is good, no leakage, no smoke, no fire, no explosion, no corrosion or patina on the charging electrode and discharging electrode, insert the phase The model should be in good contact with each other. After the test of the single discharge electrode, the surface is smooth, free of corrosion, and free of patina and other defects.
Discharge electrode contact test	The host is in the power-on state, and the battery and the adapted host are tested for 3,000 times of adaptation and disassembly. It is required that the battery discharge electrode is completely separated from the host's power supply electrode each time it is disassembled.	The battery is in good contact with the host, and there is no lower limit phenomenon on the discharge electrode. When the battery is in contact with the host, the electrode has no ignition or black spots.

2. 2 .5 Temperature and humidity adaptability:

project	test condition (method)	Judgment rules
High temperature storage test	When the battery is discharged at 50% charge, the ambient temperature After standing at 60° C for 24 hours, then at 25° C 1C fast charge and discharge under ambient conditions.	The capacity is above 90%, the appearance of the battery is good, and the function of the protection circuit is normal.
high temperature performance	After the battery is fully charged according to the standard charging method, put it aside 0.5h~1h, put the battery in a high-temperature box at 50° C to keep the temperature constant 2h, and then discharge at 1C to the end voltage of 6.0V.	The discharge capacity is greater than the minimum capacity 90%, the appearance of the battery is good, and the function of the protection circuit is normal.
Low temperature storage test	When the battery is in the discharge state of 50% charge, it is placed at an ambient temperature of -20° C for 24 hours, and then charged and discharged in a standard charge and discharge method at 25° C.	The capacity is above 90%, the appearance of the battery is good, and the function of the protection circuit is normal.
low temperature performance	After the battery is fully charged according to the standard charging method, put it aside for 0.5h~1h, put the battery in a low-temperature box at -20° C for 24h, and then discharge it at 0.2C at -20° C until the cut-off voltage is 6.0V.	0.2C Capacity $\geq$ 70%
	After the battery is fully charged according to the standard charging method, put it aside for 0.5h~1h, put the battery in a low-temperature box at -10° C for 24h, and then discharge it at 1C to a cut-off voltage of 6.0V at -10° C.	1C capacity $\geq$ 50%
High temperature and high humidity storage test	Under the discharge state of 50% charge, the battery is left for 24 hours at a high temperature of 60 ° C and a relative humidity of 85 %, and then charged and discharged in a standard charge and discharge method at 25 ° C.	The capacity is above 90%, the appearance of the battery is good, and the function of the protection circuit is normal.
Constant	After standard charging, the battery should be	Capacity $\geq$ 80% and

heat and humidity storage performance	left on hold for 0.5h~1h, stored at $40\pm 2^{\circ}\text{C}$ and 95% relative humidity for 60 hours, and then discharged at 0.2C at $25\pm 5^{\circ}\text{C}$ to a cut-off voltage of 6.0V .	good appearance
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2. 2 .6 PACK battery safety performance:

project	test condition (method)	Judgment rules
Thermal shock (130 degrees)	The battery is fully charged and placed in a high-temperature box at a temperature of $5^{\circ}\text{C}\pm 2^{\circ}\text{C}$ /min rate to $130^{\circ}\text{C}$ , and keep warm for 30min.	The battery should not explode, fire, leak or smoke
short circuit	The battery is charged at 0.2C to 8.4V. At room temperature, use a wire with a total resistance of less than $50\text{m}\Omega$ to directly connect the positive and negative electrodes of the battery for short circuit.	It is required that the battery should not explode, catch fire, leak or smoke, and the surface temperature of the battery should not exceed 150 degrees.
forced discharge	Do this experiment in an explosion-proof box. Discharge the battery at 0.2C to the end voltage at room temperature, and then reverse charge the battery with a current of 1C. The charging voltage is the maximum voltage output by the charger, and the charging time is not less than 90 minutes.	After the experiment, the samples are required to have no fire, no explosion, and no leakage.

2. 2 .7 Cell safety performance:

project	test condition (method)	Judgment rules
Thermal Shock (130 Spend)	The battery is fully charged and placed in a high-temperature box, the temperature is raised to $130^{\circ}\text{C}$ at a rate of $5^{\circ}\text{C}\pm 2^{\circ}\text{C}/\text{min}$ , and kept for 30 minutes.	The battery should not explode, fire, leak or smoke
strike	The battery is fully charged at 0.2C (4.2V), the battery is placed on the impact platform, a 15.8mm diameter round rod is placed horizontally in the center of the battery, and a weight of 9.1Kg is freely dropped on the battery from a height of $610\pm 25\text{mm}$ on the front.	It is required that the battery does not explode, catch fire or smoke during the test.
short circuit	The battery core is charged at 0.2C to 4.20V, and at room temperature, the positive and negative poles of the battery are directly connected with a wire with a total resistance of	It is required that the battery should not explode, catch fire, leak or smoke,

	less than 50mΩ for short circuit.	and the surface temperature of the battery should not exceed 150 degrees.
overcharge	The battery is charged to 4.2V with 1C, and then the battery is charged to 4.6V with a constant current of 2C without any protection components.	It is required that the battery does not explode, catch fire, leak or smoke during the test, and the surface temperature of the battery should not exceed 150 degrees.
forced discharge	Do this experiment in an explosion-proof box. 0.2C discharge to the cut-off voltage, and then charge the battery with a current of 1C The battery is reversely charged, and the charging voltage is the output of the charger Maximum voltage, charging time not less than 90min.	After the experiment, the samples are required to have no fire, no explosion, and no leakage.

