

# **SPECIFICATION**

CUSTOMER:			
DESC:	Ni-MH AAA 600 LT 3.6V		
DATE:	2020-12-29		
PART NO	:		

APPROVE	CONFIRM	AUTHORIZED

# **CONFIRM**

DEPT	PURCHASE	Q.C.	R&D
CONFIRM			

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# **Specification**

Type : Rechargeable Ni-MHCylindrical Cell

**Nominal Dimension** :  $\Phi$ = 10.5-0.5 mm, H=44.5-1.0mm(with sleeve)

Nominal Capacity : 600mAh (20°C,0.2C discharge to 1.0V/cell)

Nominal Voltage : 1.2V

**Internal Resistance** :  $\leq 50 \text{m}\Omega$  (at 1 kHz, fully charged, 20°C, average)

**Applications** : Recommended discharge current 0.05C to 3.0C

Standard Charge : 0.1C for 16hrs at  $20^{\circ}C$ 

Service Life : >500 cycles (20 °C, IEC Standard)

Average Weight : 11.5g

Typical Capacity : (20°C)

600mAh (0.2 C to 1.0V)

Max. Discharge Current : 3.0C (continuous)

Fast charge : 0.5C to 1.0C, Charge termination control recommended

(20°C,  $-\Delta V=5\sim 10$ mV, Timer =120% nominal input)

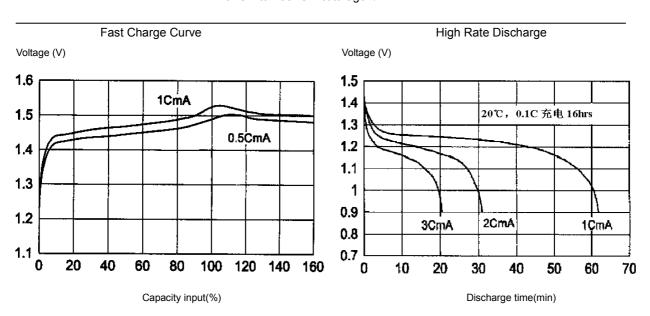
**Continuous overcharge**: 0.1C(less than 100hrs)

Permanent charge : 0.02C to 0.05C

**Operation temperatures :** 0 °C to +45 °C (standard charge)

(for recommended)  $+10\,^{\circ}\text{C}$  to  $+40\,^{\circ}\text{C}$  (fast charge)

-30 °C to +60 °C (discharge) -20 °C to +35 °C (storage)





# **Performance and Quality Assurance**

### 1. Scope

This Spec. governs the performance of Ni-MH Cylindrical pack and its stacked-up batteries. The nominal voltage of this type unit cell is 1.2V, and the voltage of the stacked-up batteries shall be equal to the value of the unit cell multiplied by the number of pack in the batteries, and the capacity shall be the capacity of the unit pack:

For example: Ni-MH AAA 600mAh Battery of 3 cell

Nominal voltage of unit cell: 1.2V

Voltage of the batteries: 1.2\*3=3.6V, Capacity of the battery: 600mAh

## 2. Ratings

The following is the basic item to rating a pack. May test the pack under demand.

Description	Unit	Specification	Conditions
Nominal Voltage	V/pack	3.6	
Nominal Capacity	mAh	600	Standard charge and discharge
Standard Charge	mA	60(0.1C)	Ambient temperature 0, 45°C
Standard Charge	hrs	16	Ambient temperature 0~45℃
	mΛ	600(1.0C)	-∆V=30 $\sim$ 60mV,ambient temperature 10 $\sim$ 40 $^{\circ}$ C
Fast Charge	mA		Timer =120% nominal input
T ast Charge	hrs 1.25	1 25	TCO: 45~50℃
		1.20	-dT/dt=0.8~1.0℃/min
Internal Resistance	mΩ/pack	≤200	at 1 kHz, fully charged, 20°C
Cut-off Voltage	V/pack	3.0	Discharge current ≤1.0C
Max. Discharge	m 1	2.00	Ambient temperature 20 . 60°C
Current	mA	3.0C	Ambient temperature -30 ~60 °C
Storage	°C	-20 ~35	Charges 80% nominal input
Temperature	C	-20 ~35	Charges 60 % Horrillar input
Average weight	g/pack	37	

#### 3. Performance

Except for special notice, the test should be carried out with a month after delivery under the following conditions:

The ambient temperature is: 20±5℃ The ambient humidity is: 65±20%

The testing instrument must meet the following:

Voltmeter: IEC 485 prescribed 0.5 grade or more, resistance must be more than  $10K\Omega/V$ 

Galvanometer : IEC 51/IEC 485 prescribed 0.5 grade or more, total resistance must be less than  $0.01\Omega$ 

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Ri ohmmeter: AC sine 1KHz, 4 terminal



Test	Unit	Specification	Conditions	Remarks
OCV	V/pack	≥3.60		
Capacity	mAh	≥100%	Standard charge and discharge	Allow 3 cycles
Internal Impedance	mΩ/packl	≤200	Fully charged, Ambient temperature 20℃	
High Rate	min	N/A	Standard Charge/rest 30min	
Discharge	min	IN/A	discharge at 10.0C to 0.8V/cell	
Low			Standard Charge,	1.0V/cell
Temperature	min	≥240	Storage:24hrs at 0±2℃	Cut-off
Discharge			0.2C discharge at 0±2℃	Out-on
Charge	min	≥180min	Standard charge Storage: 28 days	1.0V/cell
Retention	111111	210011111	Standard discharge (0.2C)	Cut-off
Discharge at		≥60%	Standard charge at 20 ℃	
Low	mAh	Nominal Capacity	0.5C discharge to 3.0V/cell at 0°C	
Temperature		Nominal Capacity	0.50 discharge to 5.0 V/cell at 0 C	
Charge at		≥80%	1.0C charge at 40°C, -ΔV=10mV	
High	mAh	Nominal Capacity	/cell, Standard discharge at 20 ℃	
Temperature		Nominal Capacity	760117 Standard discharge at 20 C	
Self-	mAh	≥60%	Standard charge, storage 28 day at 20 ℃, Standard	
discharge	1117 (11	Nominal Capacity	discharge	
Humidity		Deformation	1C fully charged, 33±3℃, 80±5%R.H., storage 14 day	
			Charge: 16hrs at 0.1C	
		The change of	Rest: 24hrs	
The Resistance		voltage:	Inspect the cell before and after vibration Vibration	
to		≤0.02V/cell	conditions:	
Vibration		The change of Ri:	Amplitude: 1.5mm	
		≤15mΩ/cell	Frequency: 3000CPM	
			at random orientation for 60 min	
		The change of	Charge: 16hrs at 0.1C	
The Resistance		voltage:	Rest: 24hrs	
to		≤0.02V/cell	Inspect the cell before and after Shock condition:	
Shock		The change of Ri:	Drop 3 times onto solid wood (10mm thickness)	
		≤15mΩ/cell	from 1.5m height at random orientation.	
Over Charge		No rupture	1C for 5hrs	
			Standard charge	
Over Discharge		No rupture	Short circuit: 1h	
			Conductor: 0.75mm <sup>2</sup> ×20mm (Cu line)	
IEC Cycles Life	cycle	≥500	IEC61951-2 ED3.0	See note 1
Accelerated Cycles Life	cycle	≥300	cutoff condition: 0.5C charged, rest 30min, 0.5C discharge to 1.0V/Cell capacity ≥60% Nominal Capacity  cutoff condition: -ΔV=10mV/packl ortimer cutoff =110% of input capacity	



#### 4. Appearance

Cell should be without any cracking rupture dirt shading leakage and deformation.

## 5. Standard of quality assurance (AQL)

All tests should be done according the following methods (ref.MIL-STD-105E)

Number	Item of test	Sampling criteria	Standard of quality assurance
1.	Cosmetic	I grade	1.5
2.	Dimension	I grade	0.65
3.	Performance	I grade	0.4

Including: capacity, performance of charge and discharge at 1C, open current voltage, Internal resistance.

#### 6. Warranty

One year's guarantee is valid for the defects caused by processing and materials.

#### 7. Caution

- 7.1 Do not dispose of cell into a fire or dismantled under any condition
- 7.2 Do not mix different cell types and capacities in the same battery assembly
- 7.3 Charge and discharge under specified current recommend to the specification
- 7.4 Short circuit leading to cell venting must be avoided
- 7.5 Never solder onto cell directly
- 7.6 Cell reversal should be avoided
- 7.7 Use batteries in extreme condition may affect the service life, such as: extreme temperature \( \) deep cycle \( \) extreme overcharge and over discharge
- 7.8 Batteries should be stored in a cool, dry place, Please discharge before mass storage or transportation
  - 7.9 Once problems be found, stop using, send batteries to local agent
- 7.10 Because the limit of the electrochemical system, charged the cell of 80%~100% nominal input under long storage is recommended
- 7.11 To maintain the performance of the cell stored for about 6 months, cycling(charging and discharging) the cell for several times is recommended

Note: IEC61951-2 (2001) 4.4 .1 Cycle Life Test:

Cycle No.	Charge	Rest	Discharge		
1	0.1C×16hrs	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	50 0.1C×16hrs 1~4hrs 0.20C to 1.0V/cell				
Repeat 1 to 50 cycles, until the discharge time of a 50 <sup>th</sup> cycle is less than 3hrs					



# 8.Pack Dimension

