



# Yuasa Battery Sales (UK) Ltd

**Model No:-**1QQMH4-0

**Description:** 4000mAh HIGH TEMPERATURE 18670 SIZE NI-MH

## 1. Scope

This specification is suitable for the performance of following nickel metal hydride cylindrical cell and its stack-up battery packs:

The data involving nominal voltage and approximate weight of a battery pack shall be equal to the value of the unit cell multiplied by the number of unit cells in the battery pack.

An example, for a battery pack which consists of 3 cells:

Nominal voltage of unit cell = 1.2V

So, nominal voltage of the battery pack =  $1.2V \times 3 = 3.6V$

## 2 Ratings

Type: <b>Ni-MH</b>		Model: 1QQMH4-0 (4000mAh High Temperature)
Nominal Specifications	Nominal Capacity: 4000mAh	Nominal Voltage: 1.2V
	Standard Charge: 0.1C×16h	Fast Charge: -----
	Trickle Charge: 0.03C~0.05CmA	Cut-off Voltage: 1.0V
Temperature Range	Standard Charge: 0 ~ 56°C	Fast Charge: -----
	Standard discharge: 0~70°C	Trickle Charge: -20 ~ 56°C
	Storage ( Within one year ) : -20~ 45°C	
Humidity Range	65 ± 20%	
Approx Weight	64g	
Dimension (with tube)	Diameter(mm)	18.5+0/-0.7
	Height (mm)	68.0+0/-1.0
Appearance	There shall be no such defects as deformation, flaw, stain, discoloration or electrolyte leakage, which may adversely affect the commercial value of the battery.	



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### 3. Performance and Test Methods

Unless special stated, tests should be done within one month of delivery under, the following conditions:

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

Ambient Humidity:  $65 \pm 20\%$ .

Test Item	Test Conditions				Request
1. Standard Charge	Charge is conducted continuously for 16 hours at the constant current of 0.1C after pre-discharge at the constant current of 0.2C to cut-off voltage of 1.0V.				
2.Open-Circuit Voltage	Voltage between terminals of the charged battery specified in item (1) is measured after rest for 1 hour.				≥1.25V
3.Capacity	Discharge time of the charged battery specified in item (1) is measured at 0.2C to an cut-off voltage of 1.0V after rest for 30 minutes. If the discharge time doesn't reach the specified value, the test may be carried out further twice, up to three times in total.				≥290 minutes
4.Cycle Life	Cycles	Charge	Rest	Discharge	≥500cycles
	1	0.1C×16h	None	0.25C×140min	
	2-48	0.25C×190min	None	0.25C×140min	
	49	0.25C×190min	None	0.25C to 1.0V/Cell	
	50	0.1C×16h	1-4h	0.2C to4.0V/Cell	
	Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3h. Note: IEC 61436 0.1C=4000mA×0.1=400mA , the rest may be deduced by analogy.				
5.Potential	Discharge time of the charged battery specified in item(1) is measured at 0.2C up to an cut-off voltage of 1.20V .				≥240 minutes



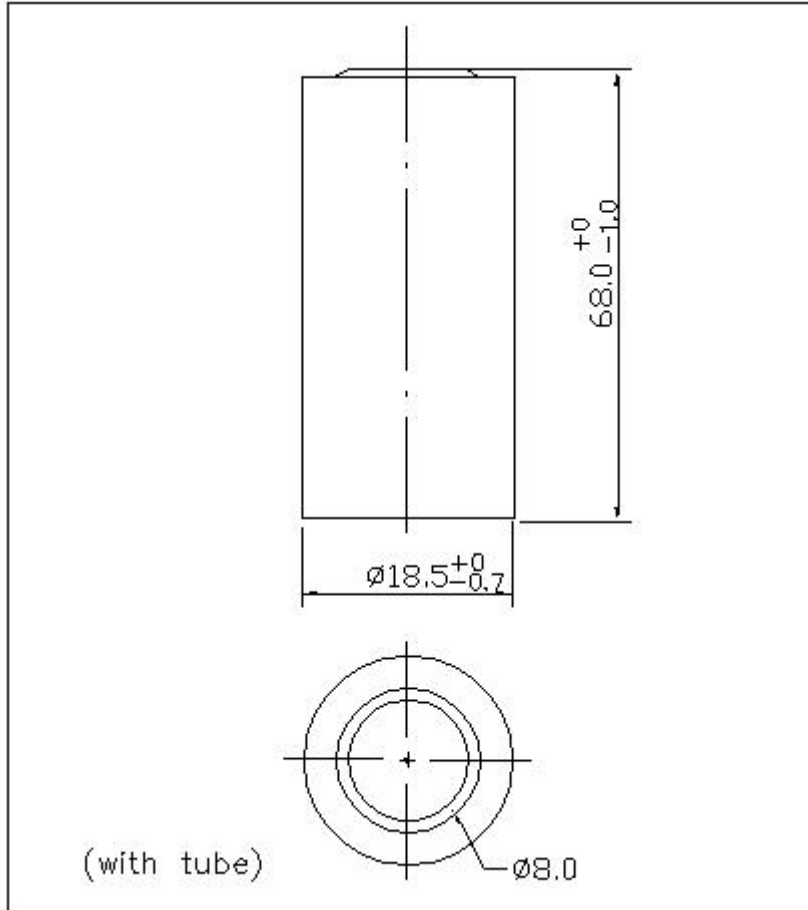
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6.Internal Resistance	The battery is measured at 1KHz with charge state.	$\leq 20\text{m}\Omega/\text{cell}$
7.Over-charge	Charge is conducted continuously for 48 hours at 0.1C after the capacity test specified in item(3).	No deformation and Leakage
8.Over-discharge	Discharge is conducted with a $0.15\Omega/\text{cell}$ load for 24 hours.	No external deformation
9.Self-discharge	The charged battery specified in item(1) is stored for 28 days at $20^{\circ}\text{C}$ , and the discharge time is measured at 0.2C.	$\geq 180$ minutes
10.Storage	The capacity test conducted as specified in item(3) after the battery discharged with 0.2C and stored for 18 months under standard condition.	$\geq 290$ minutes
11.Humidity	The charged battery is stored for 10 days at $33\pm 3^{\circ}\text{C}$ and $80\pm 5\%$ of relative humidity.	No electrolyte leakage
12.Safety Valve Operation	Forced discharge is conducted for 30 minutes at a constant current of 1C after pre-discharge at a constant current of 0.2C up to 0V.	Not explode or disrupt. *
13. Short-circuit	The charged battery specified in item(1) is short-circuited for 1 hour.	Not explode. *
14.Drop Test	The battery is subjected to a drop, which has a height of 45cm (17.7 inches) to an oak board of 10mm or more thick in a voluntary axis respectively 3 times.	Mechanically and electrically normal
<b>Remarks:</b> * Electrolyte leakage and deformation of battery are acceptable.		



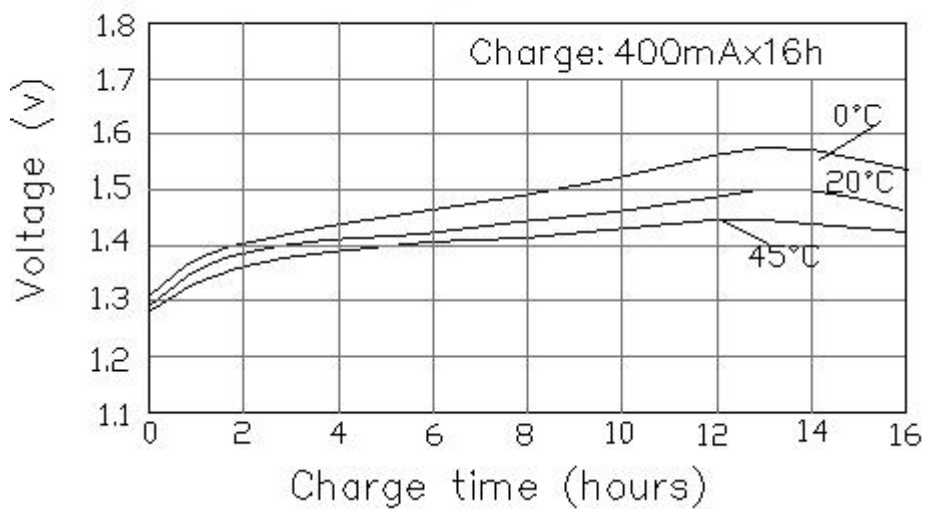
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### 4. Configuration, Dimensions and Markings



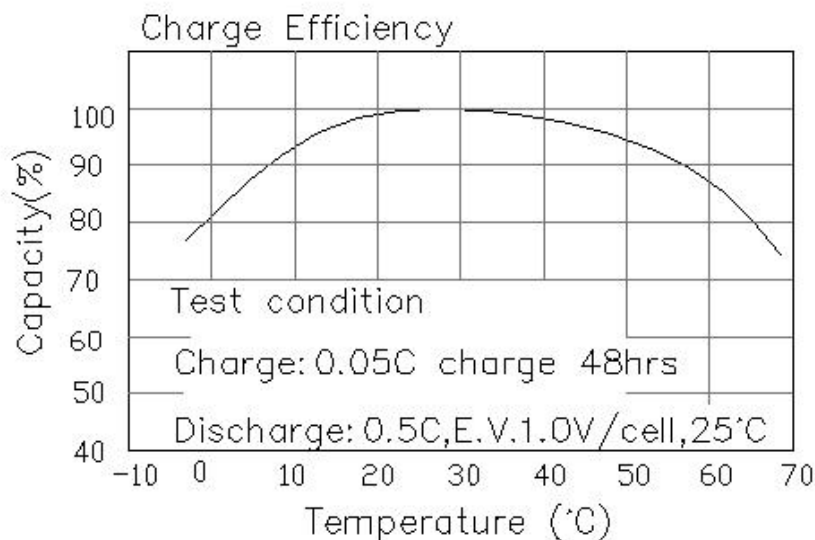
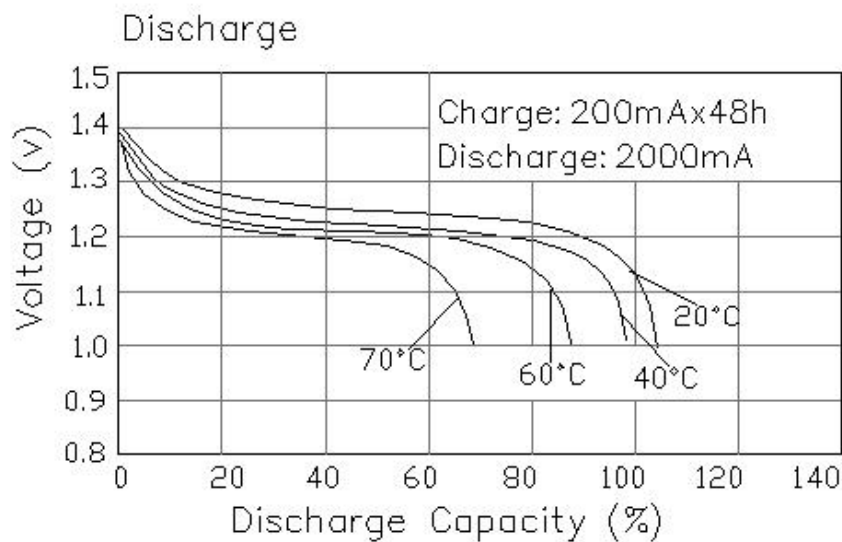
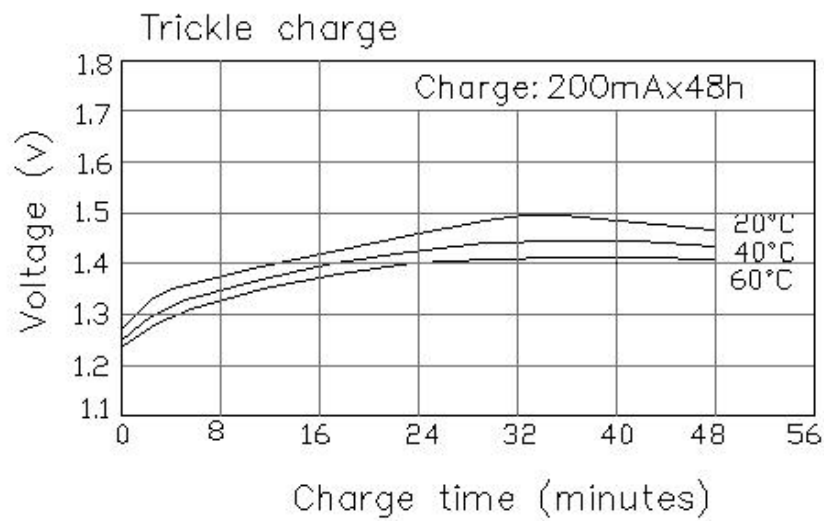
### 5. General Characteristics

Standard charge





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### **6. Suggestions & Cautions:**

- 6.1 The cut-off voltage is recommended at  $1.0 \pm 0.1\text{V}/\text{cell}$  during standard charge and discharge.
- 6.2 Charge the batteries prior to use.
- 6.3 Don't solder directly to the battery.
- 6.4 Don't short circuit and reverse charge.
- 6.5 Do not dispose of in fire and keep away from damage.
- 6.6 Store the batteries uncharged in a cool and dry place.
- 6.7 The batteries' life may be reduced if they are subjected to adverse conditions such as: extreme temperature, deep cycling, excessive overcharge/discharge.