

## H-48F6 Specifications

### A. Basic

Type		Sealed Rechargeable Ni-MH
Model		HPE-F6-800
Size		F6
Nominal Voltage (V)		1.2
Nominal Capacity (mAh)		800
Dimension	Width(mm)	16.7±0.2
	Height (mm)	47.5±0.3
Standard Charging	Current (mA)	80
	Time (h)	14-16
Quick Charging	Current (mA)	320
	Time (h)	3.5
Rapid Charging	Current (mA)	400
	Time (h)	2.3
Operation Temperature(°C)	Standard Charging	0~45
	Rapid Charging	10~40
	Discharging	-20~65
	Storage	-20~35(RH≤85%)
Permanent Charging Current (mA)		24~32
Maximum Discharging Current (mA)(continuous)		1200
Impedance (mΩ)		≤25 (1000Hz)
Discharge Cut-off Voltage (V)		1.00
Charge Retention (20°C)		≥65%
Weight Approx. (g)		18

### B. Test Report

Tests are carried out within one month of delivery under the following condition:

#### 1. Ambient Conditions:

Room Temperature 20±5 °C

Relative Humidity 65%±20%

#### 2. Capacity Testing

##### 2.1 Standard Charging

0.2C discharge to 1.00V/cell

0.1C charging for 14 hours

Rest: 20 minutes

0.2C discharge to 1.00V/cell.

Within 3 charge/discharge cycles, the capacity is no less than 800 mAh (100%).

##### 2.2 Quick Charging

0.2C discharge to 1.00V/cell

0.4C charging for 3.5 hours

Rest: 20 minutes

0.2C discharge to 1.00V/cell.

Within 3 charge/discharge cycles, the capacity is no less than 800 mAh (100%).

### 2.3 Rapid Charging

0.5C discharge to 1.00V/cell.

0.5C charging for 138 minutes or  $-\Delta V=10\text{mV/cell}$ .

Rest: 20 minutes

0.5C discharge to 1.00V/cell.

Within 3 charging/discharging cycles, the capacity is no less than 760 mAh (95%)

### 3. Open Circuit Voltage (OCV)

After the battery is fully charged, within 1 hour, the OCV is greater than 1.25V/cell

### 4. Internal Impedance

After the battery is fully charged, within 1 hour, the impedance is not greater than 25 mΩ, as tested by 1000Hz AC source.

### 5. Charge Retention

The fully charged battery is held under temperature of  $20\pm 2^\circ\text{C}$  for 28 days, the discharged capacity is no less than 520 mAh (65%).

### 6. Overcharging

Under temperature of  $20\pm 5^\circ\text{C}$ , the battery is charged at 0.1C rate for 48 hours. No deformation of the battery can be found. Standard capacity can be attained under normal discharging operation.

### 7. Cycle Life

#### 7.1 Normal Cycling Test:

Cycle No.	Charge	Rest	Discharge
1	$0.1\text{C} \times 16\text{hrs}$	None	$0.25\text{C} \times 2\text{hrs } 20\text{mins}$
2~48	$0.25\text{C} \times 3\text{hrs } 10\text{mins}$	None	$0.25\text{C} \times 2\text{hrs } 20\text{mins}$
49	$0.25\text{C} \times 3\text{hrs } 10\text{mins}$	None	0.25C to 1.0V/cell
50	$0.1\text{C} \times 16\text{hrs}$	1~4hrs	0.2C to 1.0V/cell

Cycle 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs

After 500 cycles of charging/discharging, capacity 480 mAh (60%) can be maintained under the cycling test.

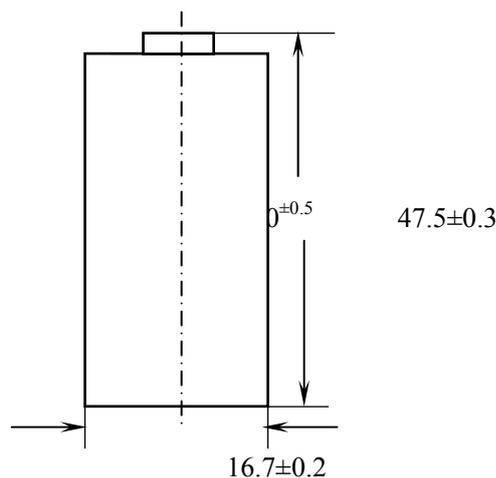
#### 7.2 Fast cycling test (reference) :

Charging: 1C for 66 minutes, under  $-\Delta V$  control (5mV/cell)

Rest: 20 minutes

Discharging: 1C to 1.00V/cell

After 200cycles of charging and discharging, capacity 480mAh (60%) can be maintained under the cycling test.



**C. Abuse Test**

Items	Test conditions	Test results
1. Overcharge test	0.1C for 48hours	No functional change
	1C for 5hours	Cell venting may occur
2. Over discharge test (Forced discharge)	Cell is discharged with 0.2C to 0.00V, then with 1C forced discharged for 1.5rs	No rupture No explosion Leakage may occur
3. Short circuit test	Cell is fully charged with 0.1C for 16hours, then shorted for 1hour or longer with a 10mΩ load or less	Operation of vent Leakage may occur
4. Vibration test	Cell is vibrated continuously lengthwise for 60minutes Amplitude: 4mm Frequency: 1000times/minutes	No physical change No leakage Cell electrical performances unchanged
5. Shock test (Drop test)	Cell is dropped 3 times from a 1.9m height onto solid wood (10mm thick) with random orientation	No rupture No leakage
6. Penetration test (Hole drilling)	Cell is drilled diameter wise with a 4mm Φ drill at a depth of less than 1mm	Temperature increased to a maximum of 43°C Leakage from hole area
7. Crush test	Cell is crushed with a vice	The compressed area heats up to between 500~800°C
8. Water immersion test	a. Cell is immersed in water for one month b. Cell is immersed in salt water with a 5% concentration for one month	No rupture No explosion
9. Fire exposure test (Incineration)	Cell is thrown into a charcoal fire	Swelling and/or breakage of seal plate