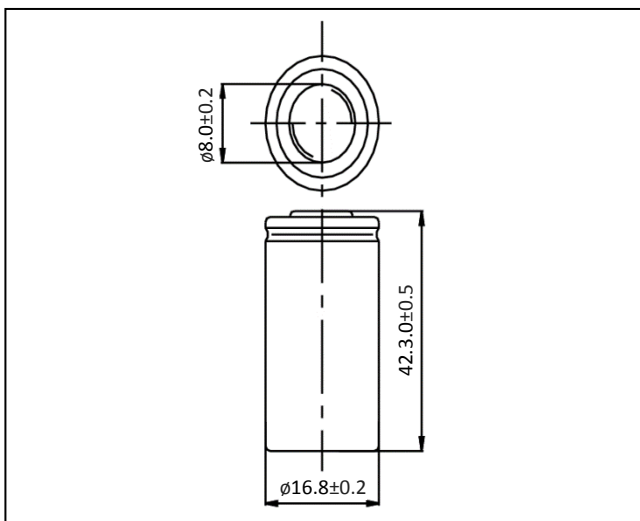




**Cell Specification:**

Nominal Voltage		1.2V	
Capacity	Discharge	0.2C	10C
	Minimum	300 min	4.8 min
	Typical	305 min	5.1 min
Dimensions (mm)	Diameter	16.8	
	Height	42.3	
Weight (g)		33	
Internal Impedance (at 1000Hz)		9.0mΩ (max)	
Charge	Standard	200mA (0.1C) x 15hrs	
	Rapid	1000mA (0.5C) x 2.1hrs	
Temp (°C)	Charge	Standard	0 – 45
		Rapid	0 – 40
	Discharge	-20 – 50	
	Storage	-20 – 50	

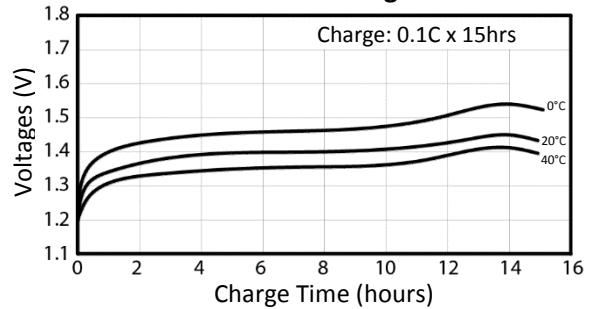
**Dimensions (mm):**



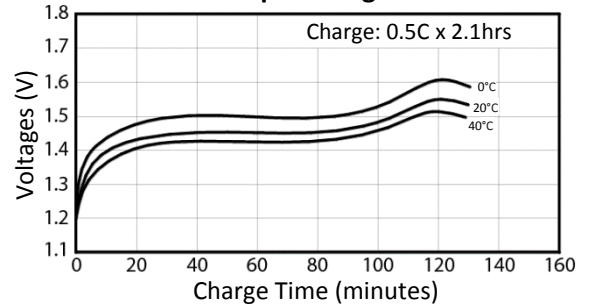
**Note:**

1. Nominal capacity rated at 0.2C 20°C
2. Weight for reference
3. Standard according as IEC of test cycle life.

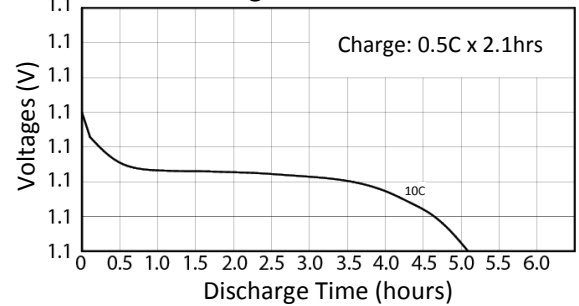
**Standard Charge**



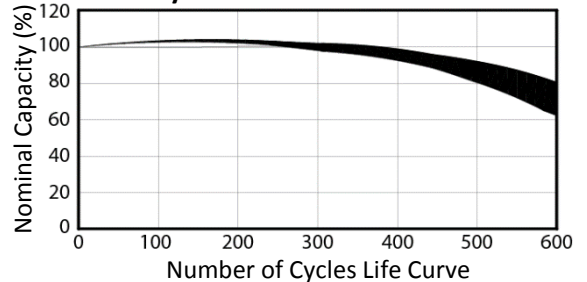
**Rapid Charge**



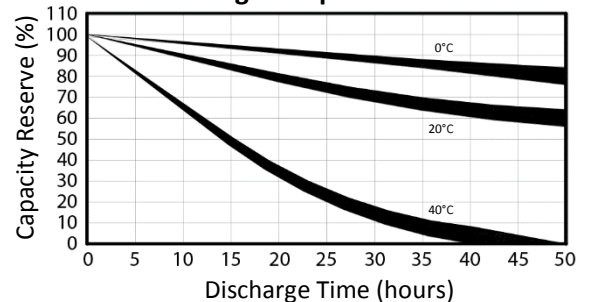
**Discharge Characteristics**



**Cycle Life Characteristics**



**Charge retention curves at various storage temperatures**





**1. PREFACE**

The specification is suitable for the performance of NI-MH rechargeable battery.

**2. MODEL**

4/5AF 2000mAh 1.2V

**3. APPEARANCE**

There shall be no such details as discoloration or electrolyte leakage or 0 voltage.

**4. RATINGS**

Description	Unit	Specification	Condition
Nominal Voltage	V	1.2	Unit cell
Typical Capacity	min	5.1	Discharge at 10C to 0.8V
Nominal Capacity	mAh	2000	Standard Charge/Discharge
Minimum Capacity	min	4.8	Discharge at 10C to 0.8V
Standard Charge	mA	200 (0.1C)	Ta=0~40°C (see note 1)
	hour	15	
Fast Charge	mA	400(0.2C)~1000(0C) with charge termination control	-ΔV=10mV/ cell Timer cutoff=110% input capacity Temp. cutoff=40~45°C dT/dt=0.8°C /min (0.5 to 1.0C); 0.8~1°C /min (1C)
	hour	6.5 approx. (0.2C) 2.1 approx. (0.5C)	
Trickle Charge	mA	100 (0.05C) ~ 200 (0.1C)	Ta=0~40°C (see note 1)
Maximum Discharging Current	C	20A	Ta =0~50°C 0.8v cut off
Storage Temperature	°C	-20~+25(within 1 year) -20~+30(within 3 month) -20~+40(within 1 month) -20~+50(within 1 week)	*
Typical Weight	g	33 approx	*

**5. PRECAUTIONS TO ENSURE THE SAFETY ON BANDING BATTERY**

1. Batteries should be charged prior to use.
2. When using a new battery for the first time or after long term storage, please fully charge the battery before use.
3. For charging methods please refer to our technical handbook.
4. Use the correct charger for Ni-Cd or Ni-MH batteries.
5. Do not reverse charge batteries.



## Product Specification: 4/5 AF 2000mAh 1.2V

SKU: 1472

6. Do not short circuit batteries, permanent damage to batteries may result.
7. Do not incinerate or mutilate batteries, may burst or release toxic material.
8. Do not solder directly to cells or batteries.
9. Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive overcharge/overdischarge.
10. Store batteries in a cool dry place.
11. Do not mix VB power batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.
12. Do not mix new batteries in use with semi-used batteries, overdischarge may occur.
13. Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment; otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source.
14. When connecting a battery pack to a charger, ensure correct polarity.
15. If find any noise, excessive temperature or leakage from a battery, please stop its use.
16. When the battery is hot, please do not touch it and handle it, until it has cooled down.
17. Do not remove the outer sleeve from a battery pack nor cut into its housing.
18. When find battery power down during use, please switch off the device to avoid overdischarge.
19. When not using a battery, disconnect it from the device.
20. Unplug a battery by holding the connector itself and not by pulling at its cord.
21. After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.
22. Never put a battery into water or seawater.
23. During long term storage, battery should be charged and discharged once every half a year.
24. Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.
25. Keep away from children. If swallowed, contact a physician at once.

### 6. APPEND:

#### **IEC61951 4.4 Endurance in cycles**

Before the endurance in cycles test, the cell shall be discharged at 0.2  $I_c$  to a final voltage of 1.0V/cell. The following endurance test shall then be carried out, irrespective of cell designation, in an ambient temperature of  $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ . Charge and discharge shall be carried out at constant current throughout, using the conditions specified in table 5. Precautions shall be taken to prevent the cell-case temperature from rising above  $35^{\circ}\text{C}$  during the test, by providing a forced air draught if necessary.

NOTE-Actual cell temperature, not the ambient temperature, determines cell performance.



Table 5-Endurance in cycles

Cycle number	Charge	Stand in Charged condition	Discharge
1	0.1C <sub>t</sub> A for 15h	None	0.25 C <sub>t</sub> A for 2 h 20 min <sup>2)</sup>
2 to 48	0.25 C <sub>t</sub> A for 3 h 10 min	None	0.25 C <sub>t</sub> A for 2 h 20 min <sup>2)</sup>
49	0.25 C <sub>t</sub> A for 3 h 10 min	None	0.25 C <sub>t</sub> A to 1.0V/cell
50	0.1 C <sub>t</sub> A for 15 h	1h to 4h	0.2C <sub>5</sub> A to 1.0V/cell
<p>It is permissible to allow sufficient open-circuit rest time after the completion of discharge at cycle 50, so as to start cycle 51 at an exact two-week interval. A similar procedure may be adopted at cycles 100,150,200,250,300,350,400and 450.</p> <p>If cell discharge voltage drops below 1.0V/cell, discharge may be discontinued.</p>			

Cycles 1 to 50 shall be repeated until the discharge duration on any 50<sup>th</sup> cycle becomes less than 3h at this stage, a further cycle as specified for cycle 50 shall be carried out.

The endurance test is considered complete when two such successive cycles give a discharge duration less than 3h. The number of cycles obtained when the test is completed shall be not less than 500.