



# Technical Specification      Model:JPNA2A2100

## 1. Scope

This specification is suitable for the performance of following Jeff Power Nickel-Alkaline cylindrical cell and its stack-up battery packs:

**Model: JPNA2A2100**

**Size: AA**

## 2. Ratings

Nominal Voltage		1.2V
Nominal Capacity		2100 mAh
Standard Charge		200mA(0.1C)×16hrs
Rapid Charge(with - ΔV control system)		1200 mA(0.6C)×2hrs - ΔV=5mV
Trickle Charge current		200mA
Discharge cut-off Voltage		1.0V
Maximum continuous discharge current		4000mA
Temperature Range for Operation	Standard charge	0 ~ +45°C
	Rapid charge	0 ~ +40°C
	Trickle Charge	0 ~ +45°C
	Discharge	-20 ~ +65°C
Temperature Range for Storage	Within 1 years	-20 ~ 35°C
Humidity for operation and storage		Max 85%
Dimension	Diameter	14.0±0.5mm
	Height	50.5±1.0 mm ( Button Top dia5.5mm x 2.3mm)
Outgoing Charge State		Max. 90% charged before shipment
Approx weight		28g

## 3. Performance and Test Methods

**Unless specially stated, tests should be carried out within one month of delivery under the following conditions:**

**Ambient Temperature: 20±5°C.**

**Ambient Humidity: 65±20%.**



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Test Item	Test Conditions	Requirements																				
<b>1. Standard Charge</b>	Charge is conducted continuously for 16 hours at the constant current of 200mA after pre-discharge at the constant current of 400mA up to an cut-off voltage of 1.0V.																					
<b>2. Open-circuit Voltage</b>	Voltage between terminals of the charged battery specified in item (1) is measured after rest for 1 hour.	≥1.25V																				
<b>3. Capacity</b>	Discharge time of the charged battery specified in item (1) is measured at 400mA up 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																				
<b>4. Capacity (high-rate Discharge)</b>	Discharge time of the charged battery specified in item (1) is measured at 2000mA up 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.	≥48 minutes																				
<b>5. Cycle Life</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Cycle No.</th> <th style="width: 30%;">Charge</th> <th style="width: 15%;">Rest</th> <th style="width: 45%;">Discharge</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">200mA×16h</td> <td style="text-align: center;">None</td> <td style="text-align: center;">500mA×140min</td> </tr> <tr> <td style="text-align: center;">2-49</td> <td style="text-align: center;">500 mA× 190min</td> <td style="text-align: center;">None</td> <td style="text-align: center;">500 mA× 140min</td> </tr> <tr> <td style="text-align: center;">49</td> <td style="text-align: center;">500 mA× 190min</td> <td style="text-align: center;">None</td> <td style="text-align: center;">500 mA×1.0V</td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">200 mA×16h</td> <td style="text-align: center;">1 h</td> <td style="text-align: center;">400 mA×1.0V</td> </tr> </tbody> </table>	Cycle No.	Charge	Rest	Discharge	1	200mA×16h	None	500mA×140min	2-49	500 mA× 190min	None	500 mA× 140min	49	500 mA× 190min	None	500 mA×1.0V	50	200 mA×16h	1 h	400 mA×1.0V	≥300 cycles
	Cycle No.	Charge	Rest	Discharge																		
	1	200mA×16h	None	500mA×140min																		
	2-49	500 mA× 190min	None	500 mA× 140min																		
	49	500 mA× 190min	None	500 mA×1.0V																		
50	200 mA×16h	1 h	400 mA×1.0V																			
Cycles 1 to 50 shall be repeated until the discharge duration on any 50 <sup>th</sup> cycle becomes less than 3h. <b>Note :refer to IEC 61436 (1998)</b>																						
<b>6. Charge Retention ( at 20°C±5°C )</b>	-Standard Charge as 1. -Store with open circuit for 28days -discharge at 0.2C until 1.0V	≥246 minutes																				
<b>7. Charge Retention ( at 20°C±5°C )</b>	-Standard Charge as 1. -Store with open circuit for 3months -discharge at 0.2C until 1.0V	≥240 minutes																				
<b>8. Charge Retention ( at 20°C±5°C )</b>	-Standard Charge as 1. -Store with open circuit for 6months -discharge at 0.2C until 1.0V	≥225 minutes																				
<b>9. Charge Retention ( at 20°C±5°C )</b>	-Standard Charge as 1. -Store with open circuit for 12months -discharge at 0.2C until 1.0V	≥210 minutes																				



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<b>10. Internal Resistance</b>	The battery is measured at 1000Hz with charge state.	≤35mΩ
<b>11.Over-charge</b>	Charge is conducted continuously for 48 hours at 200mA after the capacity test specified in item (4).	No deformation and leakage
<b>12.Over-discharge</b>	Discharge is conducted with a 1.0Ω/cell load for 24 hours.	No external deformation
<b>13. Humidity</b>	The charged battery is stored for 10 days at 33±3 °C and 80±5% of relative humidity.	No electrolyte leakage
<b>14. Safety Valve Operation</b>	Forced discharge is conducted for 30 minutes at a constant current of 400mA after pre-discharge at a constant current of 400mA up to 0V.	Not explode or disrupt*
<b>15. External Short-circuit</b>	The charged battery specified in item (1) is short-circuited for 1 hour.	Not explode*
<b>15. Drop Test</b>	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>Note:</b> Electrolyte leakage and deformation of battery by abuse tests are acceptable.		

### 4. Suggestions & Cautions:

#### 4.1 Charge batteries prior to use

- I. Do not disassemble batteries
- II. Do not Short circuit terminals
- III. Do not Throw of into fire or immerse in water
- IV. Do not direct soldering
- V. Do not use with inverse polarities
- VI. Slow charge and discharge a few cycles before use after long term storage
- VII.Avoid mix use old and new batteries together
- VIII. Charge with approved chargers
- IX. Consult specialist before assembling batteries