



Specification Approval Sheet

Name: Nickel Cadmium Cylindrical Cell

Model: 20203

SPEC: 4/5A, 1200mAh, 1.2V

Approved By	Checkup	Make

Customer Confirmation	Signature	Date
	Company Name :	
	Stamp :	

436 Kato Terrace, Fremont, CA 94539 U.S.A.

Tel: 510.687.0388 Fax: 510.687.0328

www.TenergyBattery.com



1. APPLICATION

This specification applies to the Nickel- Cadmium Cylindrical Cell.

Model: 20203

Cell type: 4/5A

2. Specification

Description	Specification	Conditions
Nominal Voltage	1.2 V	
Nominal Capacity	1200mAh	Standard Charge/Discharge
Minimum Capacity	1160mAh	Standard Charge/Discharge
Standard Charge	120mA(0.1C) × 16 hrs	Ta=0~45°C (see Note 1)
Rapid Charge	600mA(0.5C) × 2.1 hrs approx. (see Note 2)	(With -ΔV or dT/dt or TCO control) Timer Cut-Off =105% -ΔV= 10-20mV/cell dT/dt= 1~2°C/3min Temp. Cut-Off = 50°C (122°F) Ta=10~45°C
Trickle Charge	60.0-120mA(0.05C-0.1C)	Ta=0~45°C
Discharge Cut-off Voltage	1.0V	
Maximum Discharging Current	1200mA(1C)	Ta= -20°C~50°C
Storage Temperature	-20°C~35°C	Discharged state
Typical Weight(approximate)	26.5 g	

3. Performance

3.1 TEST CONDITIONS

Unless otherwise stated, tests should be done within one month after receipt under the following conditions:

Ambient Temperature, Ta: 20±5°C and

Relative Humidity: 65±20%

Notes: Standard Charge/Discharge Conditions:



Charge: 120mA (0.1C) × 16 hrs

Discharge: 240mA (0.2C) to 1.0V/cell

3.2 TEST MOTHOD & PERFORMANCE

Test	Specification	Conditions	Remarks
Capacity	≥1160mAh	Standard Charge/Discharge	Up to 3 cycles are allowed
Open Circuit Voltage(OCV)	≥1.25V	Within 1hr after standard charge	
Internal Impedance (Ri)	≤40mΩ	Upon fully charge(1000Hz)	
High Rate Discharge (0.5C)	≥108min	Standard Charge, 1hr rest before discharge	
High Rate Discharge (1 C)	≥54min	Standard Charge, 1hr rest before discharge	
Overcharge	No leakage Nor explosion	120mA(0.1C) charge 28 days	
Charge Retention	≥720mAh	Standard Charge, Storage : 28 days, Standard Discharge	
IEC Cycle Test	≥500 Cycle	IEC 61951-1 : 2003	(see Note 3)
Leakage	No leakage Nor deformation.	Fully charged at 600mA(0.5C), Stand for 14 days	Unit cell
External Short Circuit	No fire and No explosion.	After standard charge, short circuit the cell(s) at 20+/-5°C until the cell(s) temperature returns to ambient temperature (The resistance of the inter-connecting circuitry shall not exceed 0.1ohm).	Unit cell
Vibration Resistance	Charge of voltage Should be under 0.02V/cell, Change of Impedance should be under 5 milli-ohm/cell.	Charge the battery 0.1C 16hrs, then leave for 24hrs, check battery before/after vibration, Amplitude : 1.5mm Vibration : 3000CPM Any direction for 60mins.	Unit cell
Impact Resistance	Change of voltage should be under 0.02V/cell, Change of impedance should be under 5 milli-ohm/cell.	Charge the battery 0.1C 16hrs, then leave for 24hrs, check battery before/after dropped, Height : 50cm Wooden board (thickness 30mm) Direction not specified 3times.	Unit cell



4. ASSEMBLY & DIMENSIONS

As per attached drawing.

5. EXTERNAL APPEARANCE

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation.

6. CAUTION

6.1 Reverse charging is not acceptable.

6.2 Charge before use. The cells / batteries are delivered in an uncharged state.

6.3 Do not charge / discharge with more than the specified current.

6.4 Do not short circuit the cell / battery. Permanent damage to the cell / battery may result.

6.5 Do not incinerate or mutilate the cell /battery.

6.6 Do not solder directly to the cell /battery.

6.7 The life expectancy may be reduced if the cell / battery is subjected to adverse conditions like: extreme temperature, deep cycling, excessive overcharge / over-discharge.

6.8 Store the cell / battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment.

6.9 For storage of cells/ batteries over one year, in order to prevent the degrading of the function of cells, cells / batteries should be at least charged and discharged once trimester.

6.10 Keep away from children. If swallowed, contact a physician at once.

6.11 Air ventilation should be provided in the plastic case of batteries, otherwise it may have a risk of accumulating gas (oxygen gas, hydrogen gas) generated inside the cell resulting in explosion triggered by fire sources (motors or switches). Airtight battery compartments are strongly discouraged.

7. Notes

7.1 Ta: Ambient Temperature

7.2 Approximate charge time from discharged state, for reference only.

7.3 IEC 61951: 2003 Cycle Life Test:

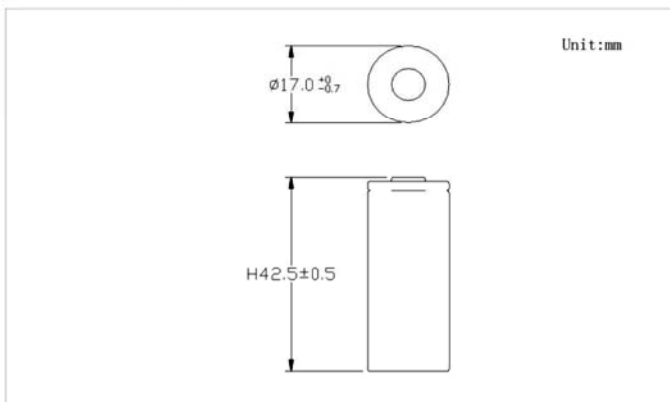
Cycle number	Charge	Rest	Discharge
1	0.1C × 16hrs	None	0.25C× 2hrs20mins
2-48	0.25C × 3hrs10mins	None	0.25C×2hrs20mins
49	0.25C × 3hrs10mins	None	0.25C× 1.0V/cell
50	0.1C × 16hrs	1-4hr(s)	0.2C×1.0V/cell

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



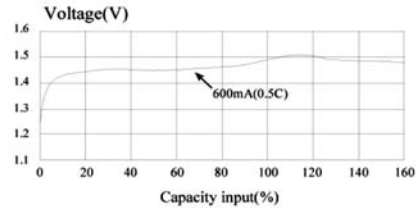
Data Sheet for 20203

Specifications	
Type	Rechargeable Nickel Cadmium Cylindrical Cell
Model	20203
Nominal Voltage	1.2V
Applications	120-1200mA(Recommended Discharge Current)
Capacity	when discharge at 240mA to 1.0V at 20°C
	Nominal 1200mAh
Dimensions	Diameter 17.0 ^{+0.7} mm
	Height 42.5 ± 0.5mm
Charge Condition	120mA for 16hrs at 20°C
Rapid Charge	600mA(0.5C) Charge termination control recommended control parameters: Timer CutOff=105% -ΔV= 10-20mV/cell dT/dt= 1~2°C/3min Temp. CutOff= 50°C (122° F) Ta=10~45°C
Internal Resistance	Average 25mΩ upon fully charged (Range 20-40mΩ) at 1000Hz
Service Life(IEC standard)	≥500 cycles
Weight	About 26.5g
Ambient Temperature	Standard Charging 0°C to 45°C
	Fast Charging 10°C to 45°C
	Discharging -20°C to 65°C
	Storage -20°C to 35°C

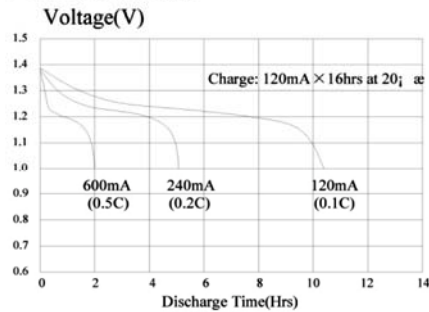


Characteristics

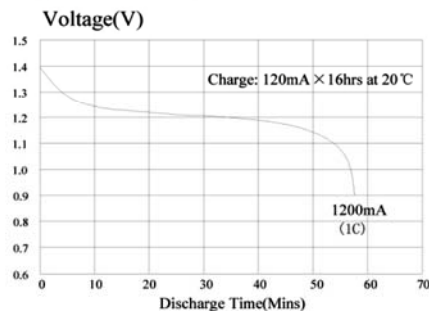
Fast Charge (Charge control required)



Low Rate Discharge



High Rate Discharge



Note:

1. Nominal capacity rated at 0.2C, 20°C.
2. The above information is generally descriptive only and is not intended as guarantee or warranty cell and battery specifications are subject to change without notice. All descriptions or warranties are contained solely in specification sheets accompanying formal offers.