

Approval Sheet

Note: This Approval Sheet (Version Number: SP/2003060) prepared by Union Suppo Battery(liaoning) Co., ltd., is subject to be modified without prior notice.

1. MODEL: H E D - 9000

2. SPECIFICATION

- Chemistry: Nickel Metal Hydride
- Nominal voltage: 1.2V
- Nominal capacity: 9000 mAh
- Standard charge: 900 mA×15hrs
- Rapid charge: 3600 mA (controlled by at least 2 following methods simultaneously;
 - Delta V = 5--10mV/cell (controlling voltage-decreasing while charging);
 - $\Delta T/\Delta t = 0.8-1$ Celsius/min (controlling surface temperature increment);
 - TCO = 40-45 Celsius(controlling battery surface temperature);
 - 180 min (controlling charging time at constant current).
- Discharge end-voltage: 1.0V
- Max constant current of discharg 45000 mA (at 20 Celsius)
- Ambient temperature range (humidity: 65±10%)
 - Standard charge: 0 -- 40 Centigrade
 - Rapid charge: 10--35 Centigrade
 - Discharge .-20 -- +50 Centigrade
- Storage temperature range (humidity: 65±10%)
 - Within 12 months .-20 -- +35 Centigrade
 - Within 3 months: .-20 -- +45 Centigrade
 - Within 1 month: .-20 -- +55 Centigrade

3. Appearance & Dimension/Weight

As per attached drawing

4. Performance Testing

4.1 Test Requirement

Unless otherwise stipulated, all tests are carried out in ambient temperature 20±5 Celsius,humidity 65±10%;Tests should be made within one month after receipt of the battery.

Important: New batteries are delivered in a 0-30% charged state, discharge to 1.0V/cell before any test !

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4.2 Testing Procedure and Standard

Item	Measuring Procedure	Standard
1. Appearance	Visual check	Refusal of dirty, in shape of scratched pack
2. Dimension	Measured by calipers	As per attached drawing
3. Weight	Weighed by balance with precision of 0.1g	Max 175 g
4. Open-circuit voltage	Measure open-circuit voltage 14 days after standard charge	Min 1.25V
5. Capacity	Calculate capacity when discharge at 1800 mA to 1.0V /cell, within one hour after standard charge	Min 9000 mAh
6. Impedance	Measure the impedance of battery by applying AC with frequency of 1000Hz within one hour after standard charge (by milliohm meter)	Max 5.0 mΩ
7. Self discharge	Lay standard charged battery for 28 days at environmental temperature 20±2 Celsius, Measure capacity when discharge at 1800 mA to 1.0V/cell	Min 5400 mAh
8. Over-charge	Charge at 1800 mA for 48hrs	No abnormality on appearance and structure should be observed
9. Charge at high temperature	Put the battery in constant temperature box of 40±2 Celsius for 2 hours Charge at 3600 mA,3hrs and with - Δ V=10mV/cell rapid charge cut-off control,stand it in ambient temperature of 20±2 Celsius for 1 hour discharge at 1800 mA to 1.0V/Cell	Discharge Capacity 7200 mAh mir
10. Low-temperature discharge	Put the standard charged battery in an Constant Temperature Box at 0±2 Celsius, for 2 hours, discharge at 1800 mA to 1.0V/cell	Discharge Capacity 5400 mAh mir
11. Over-discharge	Connect standard charged batteries with a resistor of 1.7Ω/cell in series for 8 hours	No deformation
12. Cycle life	As per IEC Standard, inspect the capacity at 500th cycle	Min 5400 mAh
13. Humidity test	Put standard charged battery in ambient temperature: 33±3 Centigrade humidity:80±5% for 14 days	No deformation No leakage
14. Vibration-proof	Lay the standard charged battery for 1 hour with open-circuit, vibrate the battery Amplitude 4mm Frequence 1000times/min Direction Any Time 60min	Open circuit voltage variation below 0.02V/cell No deformation No leakage
15. Impact-proof	Lay the battery standard charged for 1 hour with open-circuit,drop with the follow conditions: Height: 45cm Target : Hard wood plate Direction: Any direction Times: 3	Open circuit voltage variation below 0.03V/cell No deformation No leakage
16. Safety	Short-circuit the positive and negative polarity for 1 hour use a leading wire of 0.75mm ²	No explosion but leakage or deformation allowed

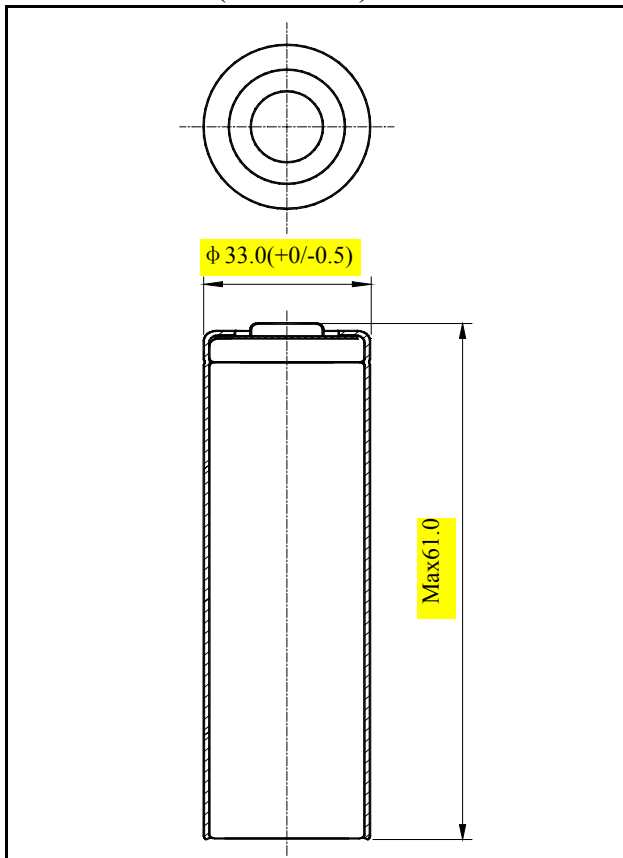
Note: If batteries are properly used, it is kept in seal status, safety vent will not active. But in case of abuse use such as long time over charge, short circuit, over-discharge etc., battery inner pressure will increase and lead to safety vent open. Read instruction carefully before using.

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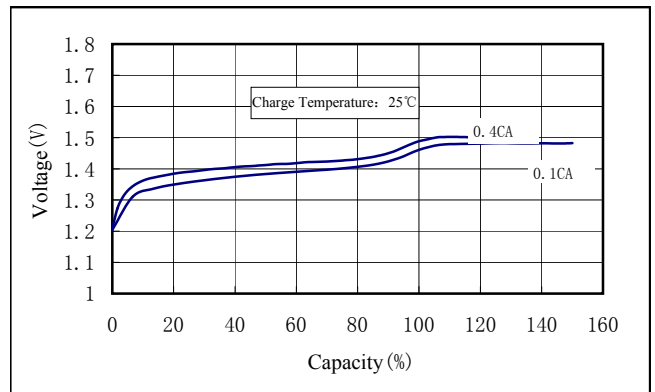
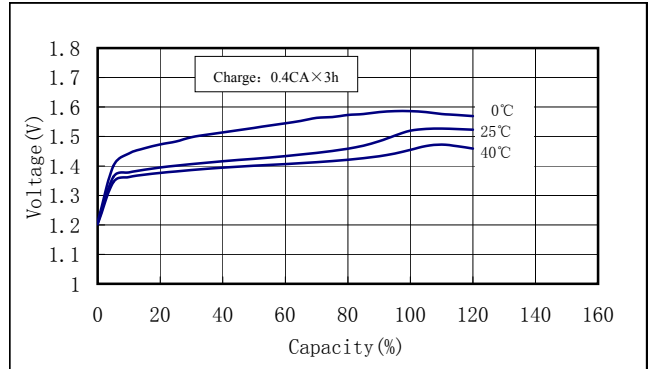
● Parameters

Nominal Voltage		1.2V
Nominal capacity(0.2C)		9000 mAh
Dimension	OD(mm)	33.0 (+0/-0.5)
	Height(mm)	61.0
	Weight(g)	175.0
Impedance (1000Hz)		5.0 mΩ
Charge	Slow Charge	900 mA×15hrs
	Rapid Charge (need control)	3600 mA×3hrs
Ambient Temperature	Charge	Slow charge: 0-40 Deg
		Rapid Charge: 10-35 Deg
	Discharge	-20 -- 50 Deg.
	Storage	1 year: -20-35 Deg.
3 months: -20- 45 Deg.		
1 month: -20-55 Deg.		

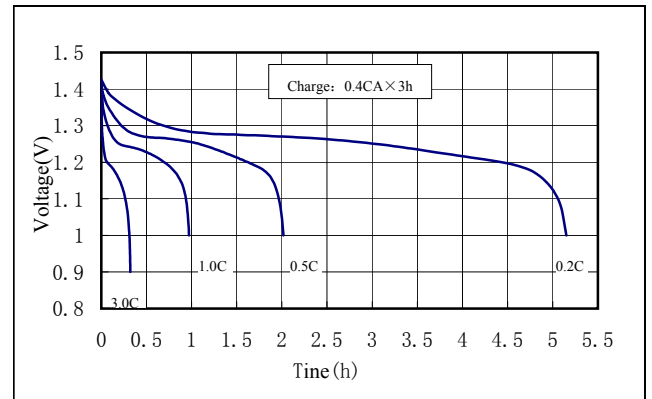
● Dimension(with tub)mm



● Charge Characteristics



● Discharge Characteristics



● Charge Retention Characteristics

