

Technical specifications for li-ion battery

Name of products: Cylindrical Li-FePO4 battery

Model : HW38140S

Specification : 12000mAh/3.2V

Design	Check	Audit
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1、 Range of application**2、 kinds of models**

2.1 kind: Cylindrical Li-FePO4 battery

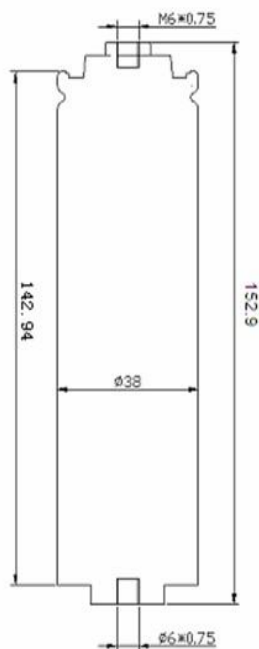
2.2 model: HW38140S

3、 technology parameter

No.	Item		specification
3-1	normal capacity		12000mAh (0.5c)
3-2	normal voltage		3.2V
3-3	Inter impedance		≤4mΩ
3-4	Maximum Charge Current		3C (36A)
3-5	Maximum Charge Voltage		3.65±0.05V
3-6	Maximum continuous Discharge Current		5C (60A)
3-7	Maximum Discharge Current		10 (120A)
3-8	discharge stop voltage		2.0V
3-9	dimension	Diameter	38±1mm
		Height	142 ±1mm
3-10	weight		Approve.400g
3-11	Work temperature	charge	0~45°C
		discharge	-20~60°C
3-12	Store temperature	In one month	-20~45°C
		In six month	-20~35°C

*The battery need to be in the condition of half full charge or the voltage about 3.2-3.3

Dimension of battery



4 Test conditions

4.1 experiment and test should at the normal temperature ($20 \pm 5^\circ\text{C}$) or the normal humidity ($65 \pm 20\%$).

Normal charge: adopt to constant current then constant voltage: constant current is $0.5C_5(6000\text{mA})$, constant voltage is 3.65V , charge is stopped when the current low to 250mA during constant voltage process.

Normal discharge: discharge with constant current 6000mA and discharge to 2.0V .

4.2 the equipments of Test

Voltmeter	Impedance $>1000\Omega/\text{one}$
Ammeter	total resistance (ammeter and line) $<0.01\Omega$
Vernier caliper	precision 0.02mm

5.Li-ion Battery Characteristics

Test item	Test conditions	Requirements
(1)Outside Appearance	Visual check	No abnormal stain, Deformation nor damage
(2) starting voltage	Starting voltage in an hour After the normal charge	$\geq 3.3\text{V}$
(3) Standard charge	Battery shall be charged continuously at the constant current of $0.2C_5\text{mA}$ to 3.65V , then charge at the constant voltage of 3.65V until the end current of $0.01C_5\text{mA}$	
(4)Standard discharge	Battery shall be discharged continuously at the constant current of $0.2C_5\text{mA}$ to 2.0V	

(5)Rated Capacity	Battery shall be charged in Item (3) and discharged in Item (4) within 10 minutes after full charged. If the discharge capacity does not reach the specified value ,the test may be repeated up to three times in total.	Capacity \geq 12000mAh
(6)Cycle Life(20°C)	Battery shall be charged continuously at the constant current of 0.5C ₅ mA to 3.65V then charge at the constant voltage of 3.65V until the current of 200mA and discharged continuously at the constant current of 0.5C ₅ mA to 2.0V.A cycles defined as one charge and discharge, carry out cycles until discharge capacity <70% C ₅ mAh.	\geq 2000cycles
(7)High temperature discharge	Battery shall be charged in Item (3) and discharged at the constant current of 1.0C ₅ mA to 2.0V within 10 minutes after full charged. If the discharge capacity does not reach the specified value, the test may be repeated up to three times in total.	Capacity \geq 10800mAh
(8)Low temperature discharge	Battery shall be stored under -10°C \pm 2°C for 4h after charged in Item (3),then discharged at constant current of 0.5C ₅ mA to 2.0V	Capacity \geq 7200mAh
(9)Drop Test	Drop 100% charged test sample from 1 meter above onto concrete board with more than 5cm thickness two times each for every direction after rated charge. After test , cells are discharge at constant current of 0.2 C ₅ mA	No rupture, fire, smoke, Nor critical damage \geq 90% C ₅ mAh
(10)Vibration Test	Vibrate test sample for 90minutes per each of the three mutually perpendicular axis(x,y,z)after rated charge. Amplitude: 0.38mm(10-30Hz) ; 0.19mm (30-55Hz) Frequency: 10-55Hz(1oct/min)Direction: X, Y,Z.	No rupture, fire, smoke, Nor critical damage \geq 90% C ₅ mAh
(11)Hot Oven Test	The charged batteries are to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of 5 \pm 2°C per minute. The oven is to remain for 30 minutes at 130 \pm 2°C before the test is discontinued.	No fire, Nor explosion
(12)Over charge	Battery should be tested at 20 \pm 5°C,Battery shall be discharged at 1C ₅ mA current until end voltage. then connect cathode on DC power, adjust the output current to 15I ₅ A , output voltage shouldn't lower than 10V .charging is continued for 7 hours or voltage will not improve and the current will reached 0.	No fire, Nor explosion
(13)Over discharge	Battery is tested at 20 \pm 5°C, Battery discharged continuously with I ₅ A to end voltage. then Reverse charge 90 min. with 5I ₅ A.	No fire, Nor explosion
(14)Short Circuit Test	Battery shall be charged in item(3),Connect battery terminals with electric wire(electric resistance: 50m Ω or	No fire, Nor explosion

	less),short circuit , when the temperature will be lower than 10, the test will be end.	
(16)Storage characteristics	Battery shall be charged in Item (3) ,and stored in a temperature-controlled environment at $20\pm 5^{\circ}\text{C}$ for 30 days. After storage, Battery shall be discharged in Item (4) to obtain the remaining capacity.	Remaining capacity $\geq 90\%C_5\text{mAh}$

6. Remark

6.1 please don't let the battery near to hot, fire etc.

6.2 please use special charger.

6.3 polarity is not reversed.

6.4 The battery has the safe equipment, please don't dissect the battery or change the structure of battery for your safe.

6.5 Ban to connect directly anode and cathode of battery with the metal.

6.6 Ban to beat or throw the battery.

6.7 Battery should keep it in the dry and cool place. ban to put the battery into the water

6.8 Charging before using if the battery haven't be used in 6 month.

7. Quality guarantee period

7.1 quality guarantee period: 2 years from the date of original shipment.

7.2 our company has no responsibility, if using the battery without regulation ways,

7.transport

battery should avoid to Vibration , impact , exposed to the sun and rain. And battery is half-full capacity on passage.
