SPECIFICATION OF PRODUCT

FOR LITHIUM-ION POLYMER RECHARGEABLE BATTERY

MODEL: LP906090-2P

SPECIFICATION FOR LP906090

1.0 SCOPE

This Specification describes the requirements of the lithium ion polymer rechargeable battery supplied by Akyga battery .

2.0 BASIC CHARACTERISTICS

2.1	Battery Type	LP 906090
2.2	Material of Case	Soft aluminum packing foil
2.3	Nominal Voltage	3.7V
2.4	Nominal Capacity	12000mAh
2.5	Internal Resistance	≤110mΩ
2.6	Discharge Cut-off Voltage	3.0V/Battery
2.7	Nominal Charge/Discharge	0.5C
2.8	Max Charge Current	0.5C
2.9	Max Discharge Current	1C
2.10	Max Charge Voltage	4.2V
2.11	Charge method	CC/CV (constant current/constant voltage)
2.12	Dimension	Thickness: 11±0.2mm Width:61.5±0.5mm Height: 194.5±0.5 mm
2.13	Weight	About 240g
2.14	Operating Temperature:	Charging Temperature: 0~45℃ Discharging Temperature: -20~60℃
2.15	Storage Temperature	1 month -20~60℃ 3 month -20~45℃ 1 year -20~25℃
2.16	Relative Humidity	65±20%
2.17	Visual Requirements	Defects, such as scratches, flaws, dirty spots, rust, deformation, discoloration, leakage, etc., which damage commercial values shall not be presented.
2.18	Voltage of shipment	3.80-4.05V

3.0 TECHNICAL REQUIREMENTS

3.1 Testing Conditions (unless otherwise specified)

Temperature: 15~35℃

Relative Humidity: 45%~75%

Atmospheric pressure: 86~106Kpa

3.2 Electrical Characteristics

NO	ITEM	TESTING INSTRUCTION	REQUIREMENTS
1	Complete Charge	Charge the battery to 4.2V with 1C constant current of and then charge at constant voltage till the charging current is less than 0.01 C.	\
2	Nominal Capacity	Measure discharge capacity with discharge current 0.2C to cut-off voltage of 2.75V after more than 1 hour of been completely charged.	12000mAh
3	Cycle Life	Measure the capacity after the 300th cycle of complete charge and discharge at 1C current to cut-off voltage of 2.75V.	≥ 80% of initial Capacity
4	Storage	Capacity after 30days storage at 25℃ from complete charge	Retention capacity ≥ 90%
		Capacity after 7days storage at 45℃ from complete charge	Recovery capacity ≥ 90%

3.3 Environmental Characteristic

NO	ITEM	TESTING INSTRUCTION	REQUIREMENTS
1	Temperature testing	Measure capacity with constant discharge current 1C to 2.75V cut-off at each temperature after complete charge at 25℃, Percentage as an index of the capacity compared with 100% at 25℃	75% at -10℃ 85% at 0℃ 100% at 25℃ 98% at 60℃
2	Constant temperature /humidity	Keep the battery at 40℃ and 90%RH for 96hrs	Recovery capacity ≥ 85%
3	Vibration	The battery will be vibrated 10 times in three mutually perpendicular directions with amplitude of 0.35mm and changing frequency between 10 and 55Hz. The rate of scanning frequency is from 10HZ to 55 HZ with the rate of 1HZ per min.	The battery shall not rupture, smoke, catch fire, vent or leak.
4	Impacting Testing	The battery will be impacted 1000±10 times with the acceleration of 100 m/s^2 and pulse lasting time 16ms.	

5	Free fall	The battery will be dropped free five times in three mutually perpendicular directions from the height of 1.0m onto a hard board with the thickness of 20mm	

3.4 Safe Characteristic

NO	ITEM	TESTING INSTRUCTION	REQUIREMENTS
1	Short Circuit	The battery is to be short-circuited by connecting the positive and negative terminals of the battery with an external load of less than 50 mΩ	The battery shall not rupture, smoke, catch fire, vent or leak.
2	Over charge testing	The battery charged completely will be charged continuously for 8hrs with the external power supply of the limit voltage of 5.0V and the current of 1.2C	
3	Over discharge testing	After complete charge, the battery will be discharged to end voltage. Then connect with external load of 30Ω for 24hrs.	

4.0 REQUIRED PROTECTION FUNCTIONS

To insure the safety, charger and the protection circuit shall be satisfied the items below. As safety device, please use in combination with the temperature fuse. The standard charge method is CC/CV (constant current/constant voltage)

NO	Device	Items	Requirements
1	Charger	Charge termination voltage	4.25±0.05V
2	Protection Functions (For reference)	Excess Charge detection voltage.	4.325±0.1V
3		Excess Charge release voltage.	4.1±0.1V
4		Discharge termination voltage.	3.0±0.1V
5		Excess discharge detection voltage.	2.5±0.1V
6		Excess discharge release voltage	3.0±0.1V
7		Excess current detection value	10-13A

5.0 WARRANTY PERIOD & PRODUCT LIABILITY

Warranty period of this product is 6 months from manufacturing code.

Akyga battery is not responsible for the troubles caused by mishandling of the battery which is clearly against the instructions in this specification.

When Akyga battery find any new facts which require modification of this document, we will inform you again.

6.0 INDICATIONS ON BATTERY PACK

The following warnings should be indicated on the battery packs.

- Use a specified charger .
- Do not throw the battery into fire , or heat.
- Do not short-circuit the battery terminals
- Do not disassemble the battery.

7.0 WARNINGS AND CAUTIONS IN HANDLING THE Lithium-ion BATTERY

To prevent a possibility of the battery from leaking, heating or explosion please observe the following precautions:

WARNINGS!

1. Do not immerse the battery in water or seawater, and keep the battery in a cool dry surrounding if it stands by.
2. Do not use or leave the battery near a heat source as fire or heater
3. When recharging, use the battery charger specifically for that purpose
4. Do not reverse the position (+) and negative (-) terminals
5. Do not connect the battery to an electrical outlet
6. Do not discard the battery in fire or heat it
7. Do not short-circuit the battery by directly connecting the positive (+) and negative (-) terminal with metal objects such as wire.
8. Do not transport or store the battery together with metal objects such as necklaces, hairpins etc.
9. Do not strike or throw the battery
10. Do not directly solder the battery and pierce the battery with a nail or other sharp object.

CAUTIONS!

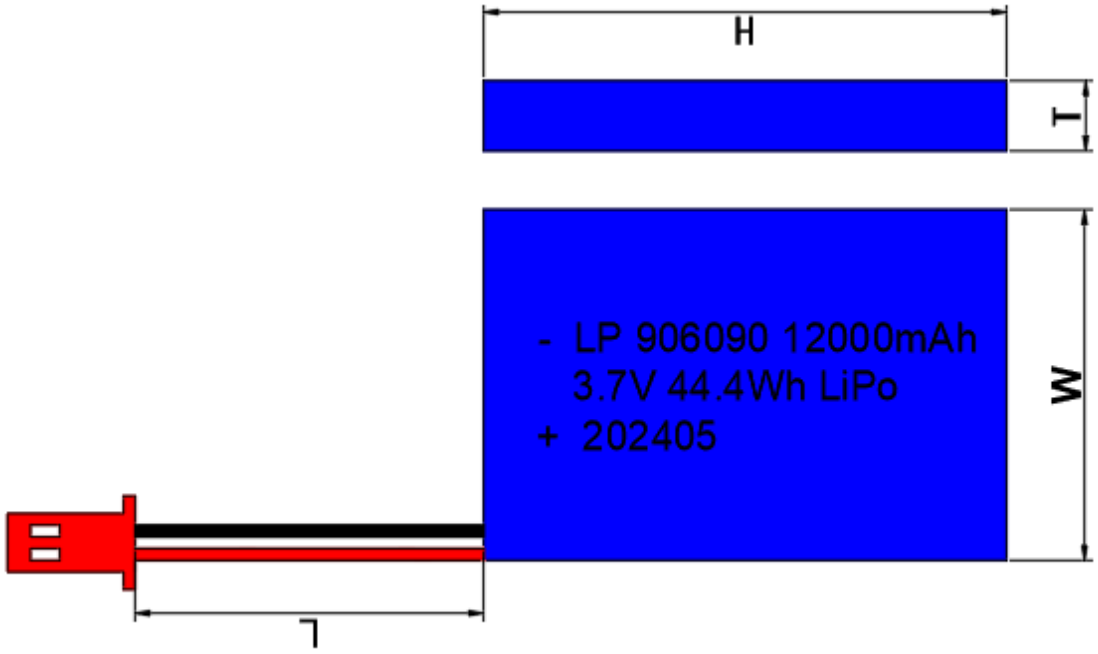
1. Do not use or leave the battery at very high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be decreased.
2. Do not use it in a location where static electricity is great, otherwise, the safety devices may be damaged, causing hidden trouble of safety.
3. If the battery leaks, and the electrolyte get into the eyes. Do not rub eyes, instead, rinse the eyes with clean running water, and immediately seek medical attention. Otherwise, it may injure eyes or cause a loss of sight.
4. If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charger and stop using it.
5. In case the battery terminals are dirt, clean the terminals with a dry cloth before use.

Otherwise power failure or charge failure may occur due to the poor connection with the instrument.

6. Be aware discarded batteries may cause fire, tape the battery terminals to insulate them

8.0 Appearance Drawing

Bare Battery LP906090-2P



Width: 61.5±0.5mm LL:150±5mm

Thickness: 11±0.5mm TERMINAL: JST-XH2.54-2P

Length: 194.5 ±0.5 mm

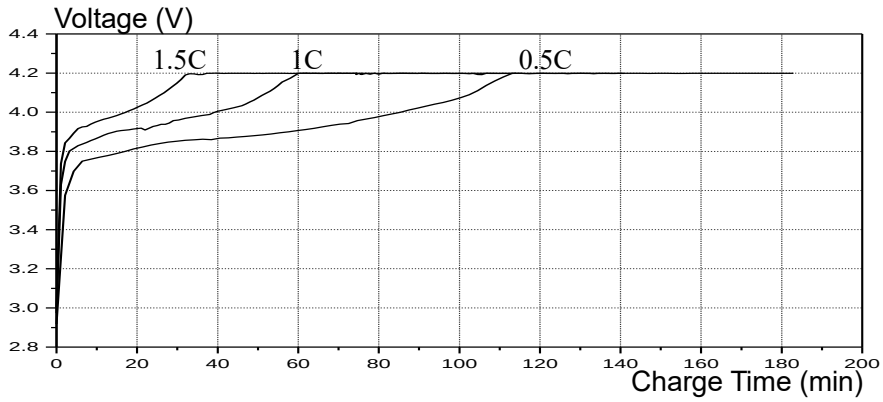
SPECIFICATION FOR LP906090

9.0 Characteristics **MODEL: LP906090** **Nominal Capacity: 12000 mAh**

9.1 Charge Rate Characteristics

Charge:CC/CV,4.2V

Temperature：25℃



9.2 Discharge Rate Characteristics

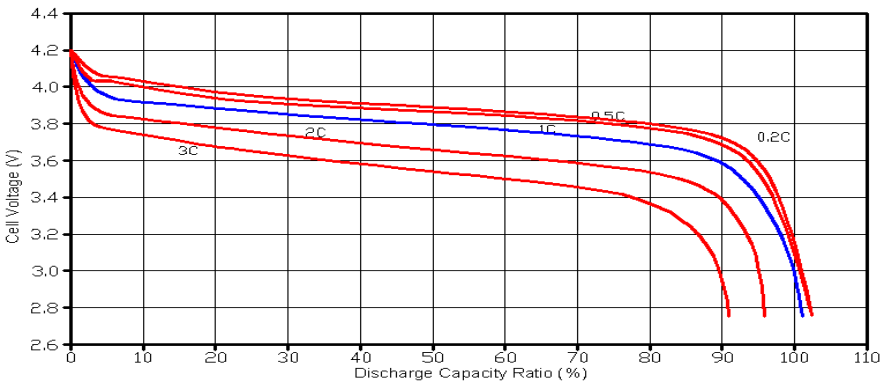
Charge:CC/CV,4.2V,

1C×2.5hrs

Temperature:25℃

Discharge: Constant current

to 3.0V



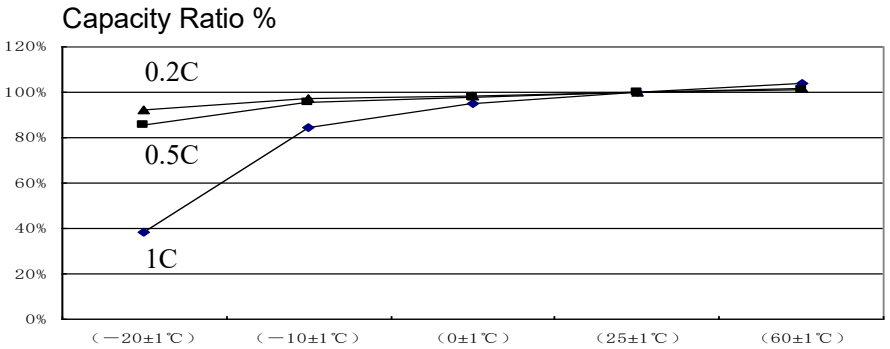
9.3 Discharge Temperature Characteristics

Charge:CC/CV,4.2V,

1C×2.5hrs

Discharge: Constant current

To3.0V



9.4 Cycle Life Characteristics

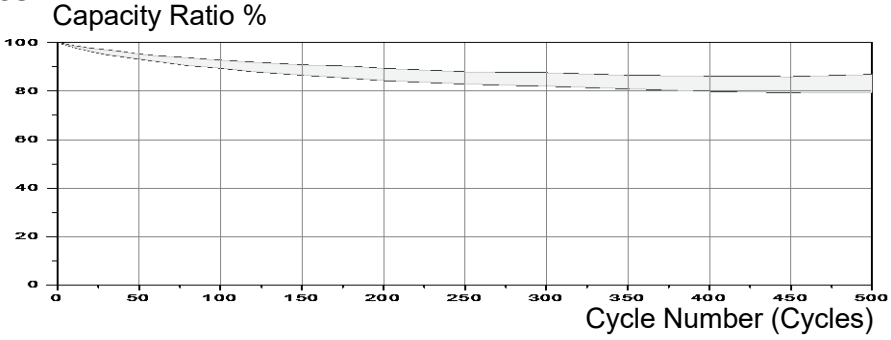
Charge: CC/CV,4.2V,

1C×2.5hrs

Temperature:25℃

Discharge: Constant current 1C

to 3.0V



Note: The curve is based on the test result of 20 pcs of batteries