



## Specification Approval Sheet

Name : Polymer Lithium-Ion Battery

Model : AKYGA LP98118230-6S1P


SPEC : 22.2V 6000mAh

### Specification Modification Records

Modification Time	Descriptions	Issued Date	Approved By
	Release 1	2024-12-04	

Content

1. Scope

The specification is suitable for the performance of Lithium-Polymer (LiPo) rechargeable battery produced by the 

2.Model: LP98118230-6S1P

3.Specification

NO.	Items	Specifications
1	Nominal capacity	<u>6000mAh @ 0.5C</u> Discharge
2	Nominal voltage	3.87V
3	Internal impedance	≤2.0mΩ
4	Dimension	T / : 9.8±0.3mm
		W / : 118.0±1.0mm
		L / :230.0±1.0mm
		Tab width/ 度:25mm
5	Cell weight	: 135g
6	Standard charge	0.5C CC(constant current)charged to4.45v, then CV(constant voltage 4.45v)charge till charge current decline to0.02C at 25°C
7	Rapid charge	At 25°C, charge with 1 CC (constant current) to 4.45v, and then the CV (constant Press) Charge until the charge current decline to 0.02C
8	Charging time	Standard charging:3.0 hours(ref.)
		Rapid charge: 2.0 hours(ref.)
9	Standard discharge	0.5C constant discharged to 3.0V at 25°C
10	Operating temperature	Charging( ) : 0-40°C
		Discharge( ) : -10-40°C

4.1.Package specification			
NO.	Items	Specifications	
1	Combination method	6S1P	
2	Combination standard	Capacity difference	≤100mAh
		Resistance difference(	≤0.mΩ
		Voltage difference	≤20mV
3	Nominal capacity	6000mAh @ 0.5C Discharge	
4	Minimum capacity	5750mAh @ 0.5C Discharge	
5	Nominal Voltage	23.22v	
6	Standard Charging Current	0.5C CC(constant current)charged to26.7v, then CV(constant voltage 26.7v)charge till charge current decline to0.02C at 25°C	
7	Max.Charging Current	1C CC(constant current)charged to26.7v, then CV(constant voltage 26.7v)charge till charge current decline to0.02C at 25°C	
8	PACK voltage(As of shipment)	22.5-23.7V (cell3.75-4.05V)	
9	Internal impedance	≤9.0mΩ	
10	Max dimensions	60*120.0*140.0H*W*L)	
11	Pack weight	MAX: 900.0g	

4.2 Mechanical characteristics

NO.	Items	Test Method and Condition	Criteria
1	Vibration Test	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz,the excursion of the vibration is 1.6mm.The cell shall be vibrated for 30 minutes per axis of XYZ axes	No leakage No fire
2	Drop Test	The cell is to be dropped from a height of meter twice onto concrete ground.	No fire no leakage

4.3 Visual inspection

There shall be no such defect as scratch, flaw, crack, and leakage, which may adversely affect commercial value of the cell.

4.4 Standard environmental test condition

Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition:

Temperature :  $23 \pm 5^{\circ}\text{C}$

Humidity:  $65 \pm 20\% \text{RH}$

5 Storage and Others

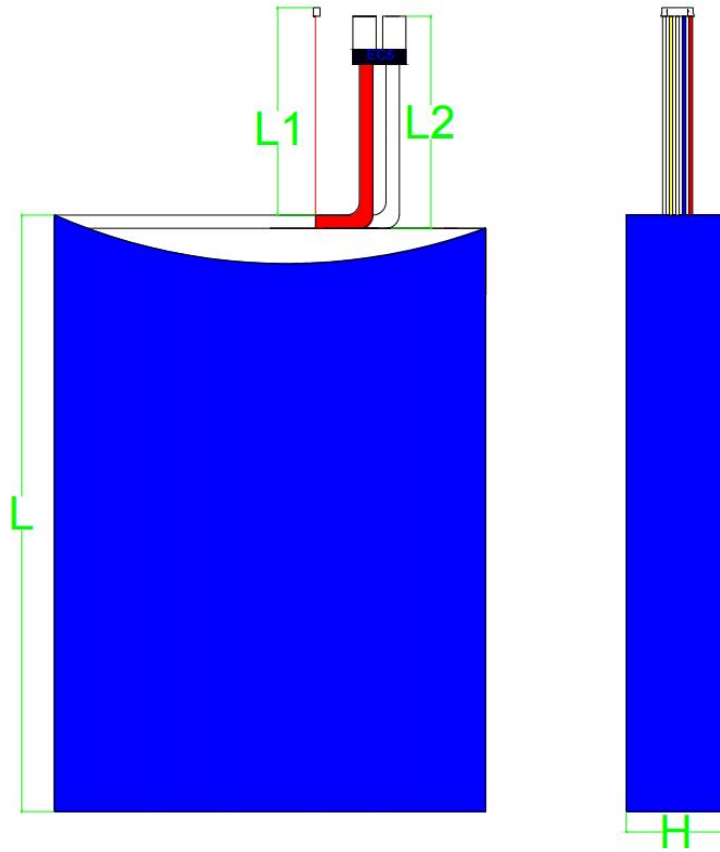
a) Long Time Storage

If the Cell is stored for a long time, the cell's storage should be 3.6~3.18v and the cell is to be stored in a condition as No 4 4

b) Others

Any matters that this specification does not cover should be conferred between the customer and

6.PACK Drawing



No.	Item	Size	Remarks
1	H	Max60.0mm	
2	W	Max120.0mm	
3	L	Max140.0mm	
4	L1	20#PH2.0-9P	Wire length:65 ± 5mm
5	L2	10#XT60	Wire length:100 ± 3mm

Note: the above material for easy material BOM, reference use only

7. Performance Data				
7.1 Electrochemical Characteristics				
NO.	Item	Criterion	Test Method	
1	C-rate characteristics	1C	Test Temperature at 25±2°C Charging: 0.5C constant current constant pressure charged to 26.7v, cut-off current 0.02C <b>Discharge: Each rate, CC, 18.0v cut-off</b>	
		5C		≥90%
2	Temperature Dependence of capacity	40°C	Charge: 0.5C, CC/CV, 26.7v, current ≤ 0.05C cut-off, at 25±2°C Discharge: 0.2C, CC, 18.0v cut-off at setting temperature Interval for temperature's change is 2Hrs	
		25°C		100%
		0°C		≥85%
		-10°C		≥70%
3	Cycle Life Characteristics	≥1700cycle	Capacity Nominal capacity of * 70% mAh Charge: 0.2C CC/CV, 26.7v, 0.05C cut-off Discharge: 0.2C CC 18.0v cut-off	
4	Self-discharge	≥85%	Standard charge, under the condition of 25±2°C storage one month, tests of 0.5C till 18.0v discharge capacity	
5	High temperature performance	≥85%	After standard charge in 55±2°C environment on hold for 4 hours, the test of 0.5C till 18.0v discharge capacity	

### 1.2 Charging voltage:

Charging shall be done by voltage less than that specified in the Product Specification (4.45v/cell). Charging beyond 4.45v, which is the absolute maximum voltage, must be strictly prohibited. The charger shall be designed to comply with this condition.

It is very dangerous that charging with higher voltage than maximum voltage may cause damage to the cell electrical, mechanical safety performance and could lead to heat generation or leakage.

### 1.3 Charging temperature:

The cell shall be charged within 0 °C ~40 °C range in the Product Specification.

### 1.4 Prohibition of reverse charging:

Reverse charging is prohibited. The cell shall be connected correctly. The polarity has to be confirmed before wiring, In case of the cell is connected improperly, the cell cannot be charged. Simultaneously, the reverse charging may cause damaging to the cell which may lead to degradation of cell performance and damage the cell safety, and could cause heat generation or leakage.

## 2. Discharging

### 2.1 Discharging current

The cell shall be discharged at less than the maximum discharge current specified in the Product Specification. High discharging current may reduce the discharging capacity significantly or cause over-heat.

### 2.2 Discharging temperature

The cell shall be discharged within -10 °C ~40 °C range specified in the Product Specification.

### 2.3 Over-discharging:

It should be noted that the cell would be at over-discharged state by its self-discharge characteristics in case the cell is not used for long time. In order to prevent over-discharging, the cell shall be charged periodically to maintain between 3.6V and 3.18v.

Over-discharging may causes loss of cell performance, characteristics, or battery functions.

The charger shall be equipped with a device to prevent further discharging exceeding a cut-off voyage specified in the Product Specification. Also the charger shall be equipped with a device to control the recharging procedures as follows:

The cell battery pack shall start with a low current (0.01C) for 15-30 minutes, i.e.-charging, before rapid charging starts. The rapid charging shall be started after the (individual) cell voltage has been reached above 3V within 15-30 minutes that can be determined with the use of an appropriate timer for pre-charging. In case the (individual) cell voltage does not rise to 3V within the pre-charging time, then the charger shall have functions to stop further charging and display the cell/pack is at abnormal state.

### 3. Storage

The cell shall be storied within 0 °C~45 °C range environmental condition.

If the cell has to be storied for a long time (Over 3 months),the environmental condition should be:

Temperature:  $23 \pm 5^{\circ}\text{C}$

Humidity:  $65 \pm 20\%RH$

The voltage for a long time storage shall be 3.6V~4.05v range.

### 4. Handling of Cells

Since the battery is packed in soft package, to ensure its better performance, it's very important to carefully handle the battery

#### 4.1 Soft Aluminum foil

The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs, pins and needles.



- Don't strike battery with any sharp edge parts
- Trim your nail or wear glove before taking battery
- Clean worktable to make sure no any sharp particle

#### 4.2 Folding edge

The folding edge is form in battery process and passed all hermetic test

- Don't open or deform folding edge

#### 4.3 Mechanical shock

- Don't Fall, hit, bend battery body

### 5. Notice Designing Battery Pack

#### 5.1 Pack design

- Battery pack should have sufficient strength and battery should be protected from mechanical shock
- No Sharp edge components should be inside the pack containing the battery.

### 6. Notice for Assembling Battery Pack

#### 6.1 Cell fixing

- The battery should be fixed to the battery pack by its large surface area.
- No cell movement in the battery pack should be allowed.

### 7. Others

#### 7.1 Prevention of short circuit within a battery pack

Enough insulation layers between wiring and the cells shall be used to maintain extra safety protection.

#### 7.2 Prohibition of disassembly

1) Never disassemble the cells

The disassembling may generate internal short circuit in the cell, which may cause gassing, firing, or other problems.

2) Electrolyte is harmful

LIP battery should not have liquid from electrolyte flowing, but in case the electrolyte come into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

7.3 Prohibition of dumping of cells into fire

Never incinerate nor dispose the cells in fire. These may cause firing of the cells, which is very dangerous and is prohibited.

7.4 Prohibition of cells immersion into liquid such as water

The cells shall never be soaked with liquids such as water, seawater drinks such as soft drinks, juices coffee or others.

7.5 Battery cells replacement

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

7.6 Prohibition of use of damaged cells

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in a plastic envelop of the cell, deformation of the cell package, smelling of electrolyte, electrolyte leakage and others, the cells shall never be used any more.

The cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing.