Specification Approval Sheet

Name：Polymer Lithium-Ion Battery

Model： AKYGA INR18500-2S1P-20M

SPEC：7.4V / 2000mAh

Specification Modification Records

Modification Time	Descriptions	Issued Date	Approved By
	Release 1	2022-05-07	

Content

Any copies are invalid without our company's approval

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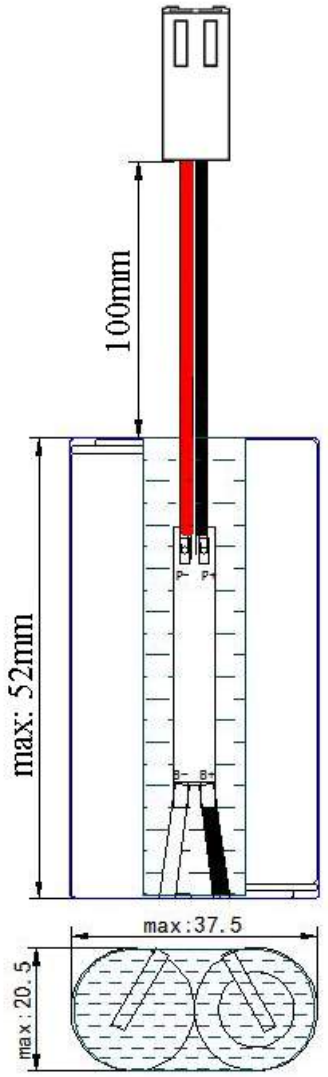
2 .Scope

This specification describes the basic performance, technical requirement, testing method, warning and caution of the Li- ion Cylindrical rechargeable battery .The specification only applies to Akyga Battery

3. Initial Dimension



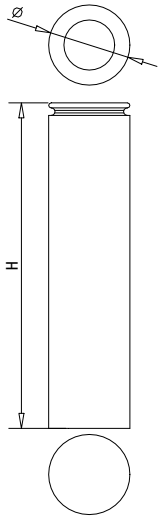
		PVC
UL1571 22#	JXK-2S-S8252AA0-002	025
Molex NX-22-01-3027	IC:S-8252AAO; MOS*2	

4.Battery pack Specifications

NO.	Item		Specifications
4.1	Typical Capacity		2000mAh @ 0.2C Discharge
	Minimum capacity		1950mAh @ 0.2C Discharge
4.2	Nominal voltage		7.40V
4.3	Charge	Max input voltage	12.0V±0.05V
		Max Charge voltage	8.40V±0.05V
		Standard charge current	1000mA
		Max Charge current	2000mA
4.4	Discharge	Min Discharge voltage	5.0±0.05V (PCB End-of-charge Voltage
		Fast Discharge current	2000mA
		Max continuous discharge current	4000mA
4.5	Initial Impedance		Max: 120mΩ
4.6	Weight		Approx :100g±2
4.7	Operating temperature		Charging : 0℃~45℃ Discharging : -20℃~60℃
4.8	Storage temperature		-40℃~85℃
4.9	Storage Humidity		≤75% RH
4.10	Appearance		Without scratch, distortion, contamination and leakage
4.11	Standard environmental condition		Temperature : 25±2℃ Humidity : 45-75%RH Atmospheric Pressure : 86-106 KPA

5. Cell Dimensions

Max(H) 65.2mm	Max (D)18.5 (mm)



6.Cell Specifications

NO.	Item	Specification
6.1	Typical Capacity	2000mAh @ 0.2C Discharge
	Minimum capacity	1950mAh @ 0.2C Discharge
6.2	Nominal voltage	3.70V
6.3	Standard Charge	CC/CV,0.2C5A, 4.20V
6.4	Standard Discharge	CC,0.2C5A, 3.00V
6.5	End-of-charge Voltage	4.20V±0.05V
6.6	End-of-charge Current	0.02C5A （At CV mode）
6.7	End-of-discharge Voltag	3.00 V±0.05V
6.8	Charging Time	8.0hours（standard charge）
6.9	Quick Charge Current	2000mA （1.0C5rate）
5.10	Quick Discharge Current	4000mA （2.0C5rate）
6.11	Maximum instantaneous pulse discharge current	6000mA （3.0C5rate）
6.12	Initial Impedance	Max:20mΩ
6.13	Weight	Approx ： 35.5±2g
6.14	Operating temperature	Charging ： 0℃~45℃ Discharging ： -20℃~60℃
6.15	Storage temperature	-20℃~45℃
6.16	Storage Humidity	≤75% RH
6.17	Appearance	Without scratch, distortion, contamination and leakage
6.18	Standard environmental condition	Temperature ： 25±2℃ Humidity ： 45-75%RH Atmospheric Pressure ： 86-106 KPA
6.19	Temperature Dependence of Discharge Capacity @ 0.2C Discharge to 2.5V	

Charge temperature	Discharge temperature				
25℃	-10℃	0℃	15℃	25℃	40℃
Relative Capacity	50%	80%	90%	100%	100%

7 Cell General Performance

No.	Item	Test Methods and Condition	Criteria
7.1	0.2C Capacity	After standard charging, rest battery for 10min, then discharging at 0.2C to voltage 3.0V, recording the discharging time.	⩾300min
7.2	Cycle Life	Constant current 0.5C charge to 4.2V, then constant voltage charge to current declines to 0.01C, rest 10min， constant current 0.5C discharge to 3.0V， rest 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells	⩾300 times
7.3	Capability of keeping electricity	20±5℃, After standard charging, rest the battery 28days, discharging at 0.2C to voltage 3.0V, recording the discharging time.	⩾240min

8 Cell Environment Performance

No.	Item	Test Methods and Condition	Criteria
8.1	Discharge at high temperature	After standard charging, rest the cells 4h at 60 ± 2 ℃ , then discharging at 1C to voltage 3.0V, recording the discharging time.	⩾54min
8.2	Thermal shock	Put the cells in the oven. The temperature of the oven is to be raised at 5±2℃ per minute to a temperature of 130±2℃ and remains 30 minutes.	No fire, no smoke

9 Cell Safe Characteristic

No.	Item	Test Methods and Condition	Criteria
9.1	Over charge testing	At 23±5℃, charging cells with constant current 2C to voltage 5.0V, Stop test till cells temperature 10℃ lower than max temperature.	No smoke or fire

9.2	Over discharge testing	At 23 ± 5 ℃, According to the requirements of standard charge, the cells will be discharge to cut-off voltage, then connect with external load of 30 ohm for 24 hours.	No fire, no smoke, no leakage.
9.3	Short-circuit testing	At 23 ± 5 ℃, After standard charging, connect cells anode and cathode by wire which impedance less than 80 ± 20mΩ, keep 6h.	No smoke or fire

※ Above testing of safe characteristic must be with protective equipment.

10.Protective circuits

10.1 PCM Standard

No	Item	Condition	Specification
1	input Voltage	input Voltage B+ to B-	-0.3~+8.0V
2	Overcharge	Detection voltage	4.25±0.025V
3		Release voltage	4.10±0.05V
4		Detection delay time	800～1200mS
5	Over discharge	Detection voltage	2.50±0.05V
6		Release voltage	3.00±0.10V
7		Detection delay time	102～154mS
8	Over discharge current	Over current	12～18A
9		delay time	5～14mS
10		Short detection delay time	MAX380us
11		Release Conditions	Cut off load
12	Normal current consumption	Normal current consumption of PCM	Max 8.00uA
13	0V charger	allowed 0V change	YES

Specification Approval sheet

Location	Description	Specification	Size	Qty	Vendor	ROHS	Remark
U1	Protection IC	S-8252AAO-M6T1U	SOT-23-6	1		ROHS	
U2，U3	SMD MOSFET	PE2012 SL2012	TSSOP-8	2	SEMI-ONE		
R1 R2	SMD Resistance	470Ω，±5%，1/16W	0603	2	YAGEO		
R3	SMD Resistance	2KΩ，±5%，1/16W	0603	1	YAGEO		
C1C2	SMD Capacitance	0.1uF，-20% +80%，50V	0603	2	YAGEO		
C3	SMD Capacitance	/	/	/	/		
B+,B-		4*2*0.3mm	/	2			
BM		3*2*0.3mm	/	1			
PCB	PCB	JXK-BFN-2S-S8252AAH-001	41*6*0. 8 mm，ROHS	1			2-LAYER

11. CAUTIONS IN USE

To ensure proper use of the battery please read the manual carefully before using it. Handling

- Do not expose to, dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid shorting the battery
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different make, type, or model batteries.
- Keep out of the reach of children.

charge and discharge

- Battery must be charged in appropriate charger only.
- Never use a modified or damaged charger.
- Do not leave battery in charger over 24 hours.

. storage

- Store the battery in a cool, dry and well-ventilated area.

. disposal

- Regulations vary for different countries. Dispose of in accordance with local regulations.

12. Battery operation instruction

12.1 Charging

Charging current：Cannot surpass the biggest charging current which in this specification book stipulated。

Charging voltage：Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage。

Charge temperature： The battery must carry on the charge in the ambient temperature scope which this specification book stipulated。

Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the

battery positive electrode and the cathode meet instead, can damage the battery。

12.2 Discharging current

The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the oversized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat。

12.3 discharge temperature

The battery discharge must carry on in the ambient temperature scope which this specification book stipulated

12.4 Over-discharges

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity。

12.5 Storing the Batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for six months the long time storage, suggested you should carry on additional charge to the battery。

13. Period of Warranty

The period of warranty is one year from the date of shipment. guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customers abuse and misuse.

14. Other The Chemical Reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

15.Note:

Any other items which are not covered in this specification shall be agreed by both parties.