



Specification Approval Sheet

Name : Lithium-Ion Battery

Model : AKYGA INR18650-1S2P-52M

SPEC : 3.6V / 5200mAh

Specification Modification Records

Modification Time	Descriptions	Issued Date	Approved By
	Release 1	2026-06-11	

Content

1 Scope

This specification is applied to Lithium Battery manufactured by Akyga Battery.

2 Product and Model Name

2.1 Product Lithium Battery

2.2 Model Name INR18650-5200mAh 3.6V

3 Ratings

Item		Rating	Note
3.1	Capacity	Typical	Discharge:0.2CmA ,
		Minimum	
		Energy	
3.2	Nominal Voltage	3.60V	
3.2	AC Impedance Resistance	≤ 120mΩ	With PCB
3.4	Discharge Cut-off Voltage	2.75V	
3.5	Charge Voltage	4.2V	
3.6	Max. Charge Voltage	4.25V	
3.7	Standard charge current	1040mA	Ambient temperature 0~45°C
3.8	Max. Charge Current	2600mA	Ambient temperature 20~45°C
3.9	Standard discharge current	1040mA	Ambient temperature -20~45°C
3.10	Max. discharge current	5200mA	Ambient temperature 0~45°C
3.11	Weight	Approx 100g	
3.12	Operating Temperature	Charge	0~+45°C
		Discharge	-20~+60°C
3.13	Storage Temperature	less than 1 month	Recommended storage temperature: 20-25°C, at the transportation
		less than 6 months	
3.14	Shipment voltage	3.50-4.00V	

4 Outline Dimensions and Appearance

4.1 Outline Dimensions

See attached drawing

This thickness will be swelling when high temperature storage or operation in high temperature.

4.2 Appearance

There shall be no such defect as scratch, flaw, crack, rust, leakage, which may adversely affect Commercial value of battery.

5 Performance

5.1 Standard Test Conditions

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of $25\pm 2^{\circ}\text{C}$ and relative humidity of 45~85%. The test results are not affected evidently by such conditions of temperature 15~30°C or humidity 25~85%RH.

5.2 Measuring Instrument or Apparatus

5.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more Precision scale of 0.01mm.

5.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10 M Ω

5.2.3 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

5.3 .1Standard charge current

0.2CmA

5.3.2 Max. Charge Current

0.5CmA

Full charge condition: Constant current 0.2CmA to 4.2V, Constant voltage 4.20V to 0.01C in all at $25\pm 2^{\circ}\text{C}$.

5.4 Rest Period

Unless otherwise defined, 10min, rest period after charge, 10min, rest period after discharge.

5.5 Initial Performance Test

Item	Measuring Procedure	Requirements
(1) Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	≥4.15V
(2) AC Impedance Resistance	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 25±2°C.	≤120mΩ
(3) Minimum Capacity	The capacity on 0.2CmA discharge to 2.5V shall be measured after standard charge at 25±2°C.	≥5100mAh
(4) 0.5CmA Discharge Capacity 0.5CmA	The capacity on 0.5CmA discharge shall be measured after standard charge	Discharge Capacity ≥95%

5.6 Electrical Performance

5.6.1 Cycle Life

Item	Measuring Procedure	Requirements
Cycle Life @25°C	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.	Cycle life ≥300

5.6.2 Shelf Life

Item	Measuring Procedure	Requirements
Storage Characteristics 1	1 The capacity on 0.5CmA discharge shall be measured after standard charge and then storage at 25±2°C for 30 days.	Remaining Capacity ≥85%

	2	After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge.	Recovery capacity $\geq 90\%$
Storage Characteristics 2	1	The capacity on 0.5CmA discharge shall be measured after standard charge and then storage at $60 \pm 2^\circ\text{C}$ for 7 days.	Remaining Capacity $\geq 60\%$
	2	After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge.	Recovery capacity $\geq 80\%$

5.6.3 Long Time Storage Characteristics

After about half charge after a period of storage at $25 \pm 2^\circ\text{C}$ for one year (365 days). The recovery available capacity is $\geq 85\%$. The capacity is determined with the capacity of the by the most of preceding three cycles.

5.6.4 Plants.the self-discharge

The battery charging cross-flow 180min, voltage to 4.0 V, then will the battery in normal temperature environment, open 24h, battery off pressure aside for 10 mill volts

5.7 Mechanical Performance

Item	Measuring Procedure	Requirements
Vibration test	After standard charge, the battery is to be tested as following conditions: Amplitude:0.19mm Frequency:10~55Hz(sweep:1Hz/min) Direction: X/Y/Z axis for 30min. The battery is to be tested in three mutually perpendicular to each axis.	Battery no electrolyte leakage, smoke or explosion battery voltage p 4.0 V .
Drop Test	Drop the battery in the shipment condition (full-charge) from 1m height onto 18~20 mm or thicker concrete with p-tile on it 1 times each of obverse and inverse directions at 25±2°C	No fire, no explosion, no smoking is obtained.
Constant Humidity and Temperature Characteristics	Under the temperature of 20±5°C, after charging the battery with 0.2C, then put the battery into the constant temperature and humidity oven with 55±2°C and 90~95% for 48h, the battery should be no obvious deformation, leakage, rust, smoking and explosion. After testing take out the battery then rest for 2h under the temperature of 20±5°C, discharge with 1C to 3.0V.	discharge capacity≥60%

6 Handling Instructions

Read and observe the following warnings and precautions to ensure correct and safe use of Li-ion batteries.

Danger!

Failure to observe the following precautions may result in battery leakage, overheating, explosion and/ or fire.

- Do not immerse the battery in water or allow it to get wet.
- Do not use or store the battery near sources of heat such as a fire or heater.

- Do not reverse the positive (+) and negative (-) terminals.
- Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
- Do not put the battery into a fire or apply direct heat to it.
- Do not short-circuit the battery by connecting wires or other metal objects to the positive (+) and negative (-) terminals.
- Do not carry or put the battery together with necklaces, hairpins or other metal objects.
- Do not strike, throw or subject the battery near a fire or in extremely hot conditions.

Warning!

Failure to observe the following precautions may result in battery leakage, overheating, explosion and/ or fire.

- Do not place the battery in a microwave oven or pressurized container.
- Do not use the battery in combination with primary batteries (such as dry-cell batteries) or batteries of different capacity, type or brand.
- Do not use the battery if it gives off an odor, generates heat, becomes ct the battery to sever physical shock.
- Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
- Do not directly solder the battery terminals.
- Do not attempt to disassemble or modify the battery in any way.
- Do not recharge discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.
- Keep the batteries out of the reach of children. If a child somehow swallows a battery, seek medical attention immediately.
- If the battery leaks or emits an odor, immediately remove it from the proximity of any exposed flame. The leaking electrolyte can ignite and cause a fire or explosion.
- If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.

Caution!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery

performance and/or shorten service life.

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Use the battery only under the following environmental conditions. Failure to do so can result in reduced performance or a shorten service life. Recharging the battery outside of these temperatures can cause the battery to overheat, explode or catch fire.

The isolated measures are needed between battery (the bare Al layer at side and top sealing) and the PCB, and also between battery and electric equipment: especially avoid the Al layer in packing foil contact to cathode or anode (including electric equipment, otherwise this can cause battery leakage or swelling).

When storing packs for more than 6 month, charge at least once every 6 months to prevent leakage and deterioration in performance due to self-discharging.

In cases where children use the battery, instruct them on the contents of the user's guide and keep an eye on them to ensure that the battery is being used correctly.

If the battery leaks and electrolyte gets your skin or clothing, immediately rinse the affected area with clean running water. If left as is, skin inflammation can occur.

For directions on battery installation and removal, read the instruction manual that accompanies the equipment in which the battery will be used.

If a device is not used for an extended period, the battery should be removed and stored in a cool, dry place. Otherwise, resting or reduced performance may occur.

If the terminals of the battery are dirty, wipe them clean with dry cloth before use. Otherwise, solid electrical contact may not be charged with the equipment, and this can cause power outages or charging to fail.

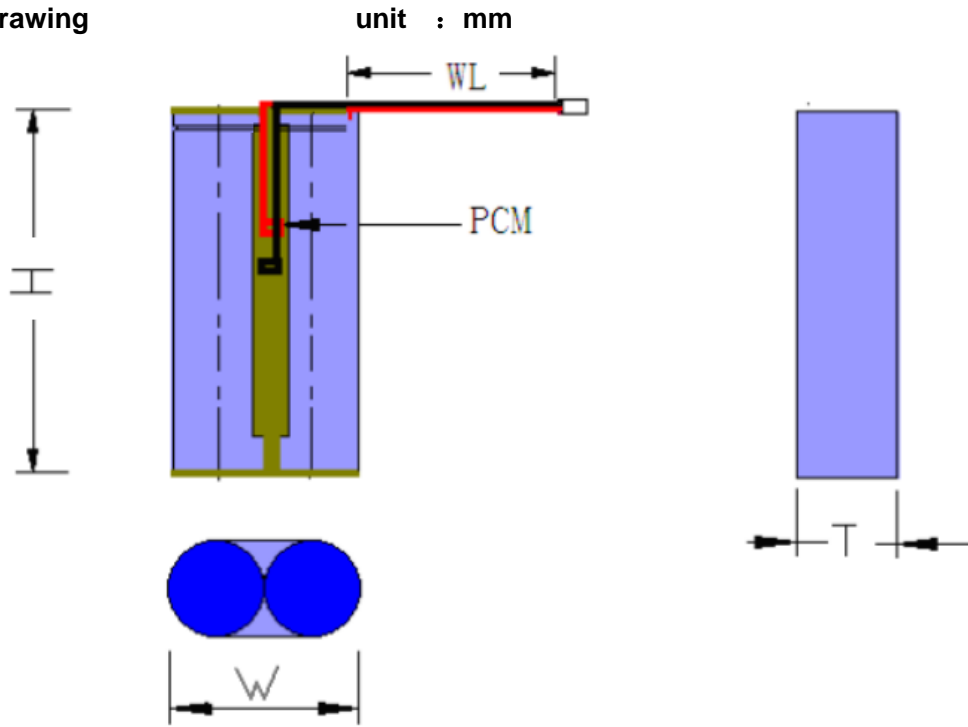
7 EXP

The Expiration Date is half a year from the date of shipment. we guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customers' abuse and misuse.

8 Amendment of this Specification

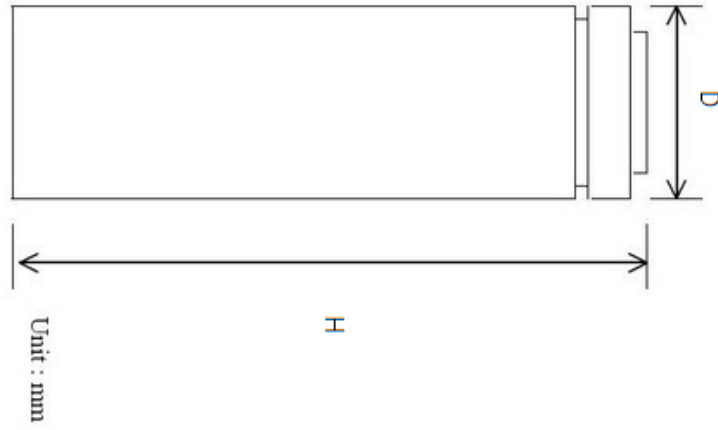
This specification is subject to change with prior notice.

9 Battery Drawing



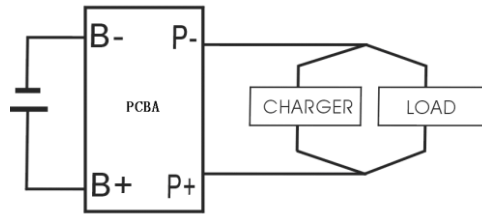
Project	Standard
L	$\leq 68\text{mm}$
W	$\leq 38\text{mm}$
D	$T \leq 20\text{mm}$
Wire length	$WL: \text{TBD} \pm 5\text{mm}$
Wire specification	UL1007# 18AWG
NTC	B=3435 10k
Connector	MOLEX-5264-03
Connecting Wires: Red: connect to "+"; Black : connect to ground "-".	

10 Cell Drawing



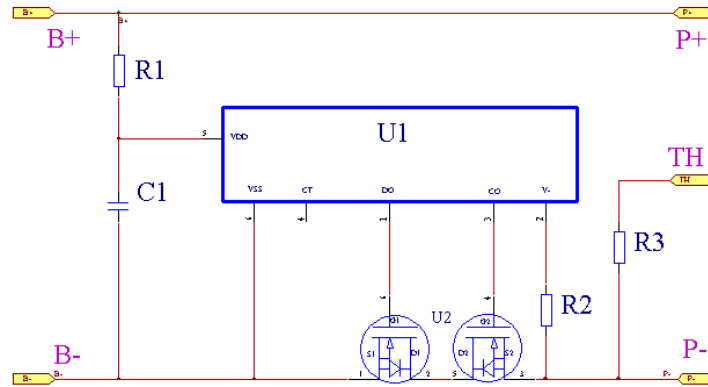
D:18.4mmMax
H:65.0mmMax

11. Circuit connection



Name	connect
B+	CELL+
B-	CELL-
P-	Output -
P+	Output +

12 PCM Diagram and Part list



NO.	Description/vendor	Symbol	Model/Spec.	unit	Q'ty
1	MOSFET	U2	8205A/ SOT-23-8	PCS	4
2	RES	R1	470R/0603/5%/1/10W	PCS	1
3	RES	R2	2K 5% 0603 1/10W	PCS	1
4	RES	R3	B=3435 10k	PCS	1
5	IC	U1	DW01 SOT-23-6	PCS	1
6	CAP	C1	100nF, ±20% 50V, 85C, X7R, 0603	PCS	1

Electrical Characteristic

No	Item	Condition	Specification
1	Input Voltage	input Voltage B+ to B-	-0.3~+12V
2	Overcharge	Detection voltage	4.30±0.05V
3		Release voltage	4.10±0.05V
4		Detection delay time	0.91~1.69S
5	Over discharge	Detection voltage	2.50±0.075V
6		Release voltage	2.90±0.0750V
7		Detection delay time	42~78ms
8	Over discharge current	Over current	5.0~8.0A
9		delay time	0.7~1.3ms
10		Short detection delay time	200~600us
11		Release Conditions	Cut off load
12	Normal current consumption	Normal current consumption of PCM	Max 7.00uA
13	0V charger	allowed 0V change	YES
14	IR resistance	IR of PCM	≦65.00 mΩ