Specification of Lithium-ion Cylindrical Rechargeable Battery



Product Type		Lithium-ion Cylindrical Rechargeable Battery
Battery N	1odel	14500
Product [Description	Single cell with PCM
Battery C	apacity	800mAh
	Company Name	2:
	Material numbe	er en
Customer Approval	Signature	
	Date	
	Company Stamp	:

1/15 V01



1. Scope/

This document describes the product specification and using condition of the Lithium-ion Cylindrical rechargeable cell supplied by Akyga battery

2. Product/

2.1 Name: Lithium-ion polymer rechargeable cell

2.2 Battery Model: 14500

3. Specification

орссии	cation					
NO.	Items	Specifications		Remark		
1	Nominal voltage	3. 7	V			
	2.1Nominal capacity	800	mAh	According to the standard charging after full charge, constant current		
2	2.2Minimum Capacity	780	mAh	discharge 0.2Cto 2.75V.		
3	Initial Impedance	≤ 145	mΩ	AC Impedance 1KHz		
4	Charge Cutoff Voltage	4. 2	V			
5	Discharge Cut-off Voltage	2. 75	V			
6	Shipment voltage	3. 5-4. 10	V			
7	Battery weight	≈ 24.5	g			
	8.1Standard Charge	0.2C CC (constant current) charge to 4.2V, then CV (constant voltage 4.2V) charge till charge current decline to 0.02C				
8	8.2Standard Discharge	.2C CC (constant current) discharge to 2.75V				
	8.3Standard testing condition	Temperature :25 \pm 2° C ; Humidity : ${\rm \leqslant}85\%{\rm RH}$ Atmospheric Pressure : 86-106kPa				
9	Max disharge current	2C		Recommended temperature 20-45℃		
10	Operating Temperature		Charge: 10 ⁴⁵ °C			
10		Discharge: -20~55℃				
	Max charge current	10~15℃: 0.2C CCCV	V to 4.2V	Charge at very low temperature such as blew 10°C, will be get a lower		
11		15~45°C: 0.5C CCC	V to 4.2V	capacity and reduce cycle life of the battery		
	W 5: 1	$(-20^{\circ}\text{C})^{\circ}$ (0°C) : 0.2C DC to 2.75V				
12	Max Discharge current	(0°C) ~ (15°C) : 0.5C DC to 2.75V				
		(15℃) ~ (55℃) : 2C DC to 2.75V				



NO.	Items	Specifications	Remark 备
		≤1 months: -20°C ~45°C	a) The capacity for storage shall be $50^{\sim}75\%$ SOC
13	Storage temperature	≤3 months: -20°C ~35°C	b) The battery should cycle once in June month. Recommended storageTemperature is 25°C of SOC 50°75%;
		≤1 year: -20°C ~30°C	次电 推荐
14	Storage Humidity	≤75% RH	



4.1 Outward appearance and Dimension

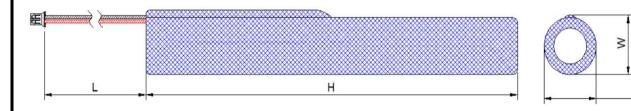
Max: 14.8

Max: 18.5

Max: 53.0

Max: 100±10

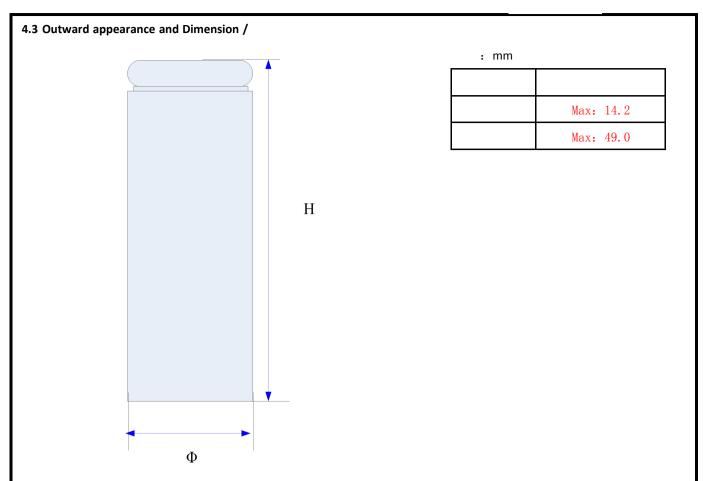
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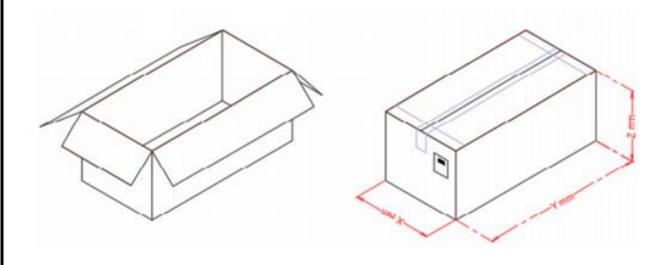
4.2 Basis BOM List/

Item	Reference	Material name	Model/Specification	Quantity	Remark
1	Cell	14500	3.7V 800mAh	1	
2	РСМ	ZN-PCM	HY-1635-S DW01+8205*2	1	
3	Red wire	UL1571 AWG26#	Red	1	
4	Black wire	UL1571 AWG26#	Black	1	
5	Connector	Molex 22013027-2P	(Red-Black)	1	
6	PVC	/	/Blue	1	





5.Packing drawing



NO.	Items	Description
1	Packing style	Carton
2	Carton Sealing method	Transparent adhesive tape



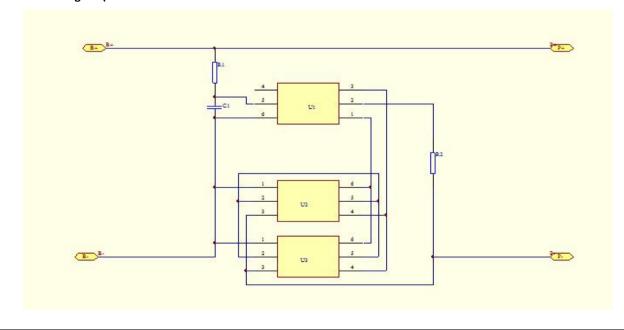
5.1 PCM/

Symbol	Name	MIN	Typical.	Max	Unit
VDET1	Over-Charge detect voltage	4.23	4.3	4.35	V
VDET2	Over-discharge detect voltage	2.30	2.45	2.60	V
IEC	Excess Current threshold	4.0		9.0	А
IDD	Supply current	1	3.5	7	μΑ
RD	Internal resistance in normal operation			60	mΩ

5.2 BOM

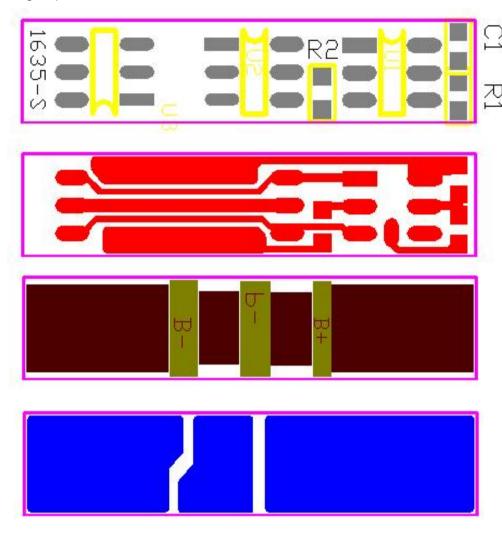
1	IC	U1	DW01 /SOT-23-6	1
2	MOSFET	U2/U3	8205 /SOT-23-6	2
3	905070000 OLULOF A	R1	$100 \Omega \pm 5\%/0402$	1
4		R2	$1 \text{K} \Omega \pm 5 \% / 0402$	1
5	STANDARD	C1	0. 1 μ F/-20%/+80%/16V/0402	1
6	1000	B-/B+	5*3*0.3	2
7	41 CERTATION OF THE	PCB	HY-1635-S	1

5.3 Schematic diagram(

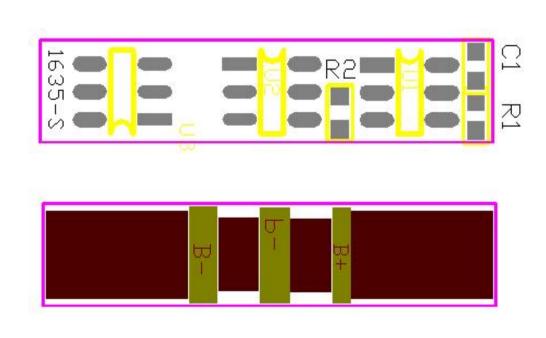




5.4. Circuit PCB diagram(



5.5. Pad description(





6. Visual Inspection/

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

7. Cell Specification/

7.1 Electrical characteristics

Items	Test Meth	Test Method and Condition			Crit	eria
7.1.1 Initial capacity	The capacity means the discharge capacity of the cell that was discharged to 2.75V with discharge current of 0.2C within one hour after the full charge.				> 780 mAh	
7.1.2 Cycle life	Cycle life is the capacity of the cell that was repeated 300 cycles with full charge and then discharging to 2.75V with discharge current of 0.2C .					capacity
7.1.3 Initial impedance	Cell resistance was measured at AC 1KHz after 50% charge and the test temperature was 25 $^{\circ}$ C. $$\leqslant 145$$ m Ω					
7.1.4 Temperature Capacity Test	The discharge capacity of contrast, under the conditions of different temperature in 25 $^{\circ}$ C under the condition of normal temperature after full charge of the battery, as shown in the table below normal temperature and high temperature to the capacity of 0.2 C to 3.0 V, low temperature is 0.2C to 2.5 V discharge capacity.the time between charging and discharging must beyond 3 hours.					
	Charge temperature	Discharge temperature				
	25℃	-10℃	0℃	25	5°C	55℃
	23 C	≥70%	≥80%	10	00%	≥85%
7.1.5 Self-discharge	28 days, then measure the capacity with discharge current of 0.2C till				Capacity ≥ 90% Initial c	apacity

7.2 Mechanical characteristics

Items	Test Method and Condition	Criteria
7.2.1 Vibration Test	Fixed the fully charged 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 and 55Hz, the excursion of the vibration is 0.8mm. The cell shall be vibrated for 90 ~100 minutes per axis of XYZ axes.	No explosion No fire, No leakage.
7.2.2 Drop Test	The cell was dropped freely from the height of 1000mm to the concrete floor, and each surface was dropped once	No explosion, No fire

7.3 Safety

Items	Test Method and Condition	Criteria
7.3.1 Crush Test	The pressure on the surface of the fully charged cell do not stop being raised until 17.2 Mpa when the cell is crushed by two flat surfaces.(Max13kN)	No explosion No fire
7.3.2 Heating	After full charging at 0.1C, put the battery in the baking oven and start , the temperature of the oven is to be raised at a rate of $5^\circ\!$	
7.3.3 Short-Circuit Test	After full charge, the positive and negative polarities are connected together by a copper wire whose resistance is less than or equal to $80\pm20m\Omega$.	No explosion, No fire .
7.3.4 Over-charge Test	The cell is overcharged to 4.6V with a current of 3C and holded for 8 hours.	



8. Standard environmental test condition/

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

Temperature: 25±2℃ Relative humidity: 65±20%

9. Charging/

Charging current and charging voltage should be less than specified in the Product Specification.

The charger shall be designed to comply with Product Specification.

It is dangerous that charging with higher current or voltage than Product Specification may cause damage to the cell electrical, mechanical safety performance.

10. warranty/

Period of warranty: 12 months after sales;

Range of warranty: There is low voltage, expansion or leakage with the correct use of the cell in the period

of warranty.

11. Liability/

Please use the Lithium-ion Polymer rechargeable cells supplied by Akyga battery under the product specification. It may cause fire or expansion if the cells are used incorrect. We will not guarantee the safety unless the cells are used under the product specification.

12. Identification/

Warnings would better be marked on the surface of the battery which is tied up by certain cells:

- *Using the charger designated by the manufacturer.
- *Don't throw the battery in fire or heat it .
- *Don't short-circuit .
- *Don't unpack the battery or change its structure.



13. Notice for Designing Battery Pack / 13 1 Battery Pack design 13.1.1 Battery shell should be with enough mechanical strength, to protect the inner cell from mechanical shock; 13 1 2 No cell movement in the battery pack should be allowed; 13.1.3 No Sharp edge or bulge components should be inside the pack containing the battery; 13.2 Avoid some components to contact the edge of packing foil of batteries; 13.3 Tab connection 13.3.1 Ultrasonic welding or spot welding is recommended to connect battery with PCM or other parts; 13.3.2 The tab is not very firm. Don't bend the tab . especially the positive pole. It will rupture easily; 13.3.3 If apply manual solder method to connect tab with PCM, below notice is very important to ensure battery performance: 1). The solder iron should be temperature controlled and ESD safe; 2). The soldering iron temperature should be 360-420°C; 3). Soldering time should not be longer than 3s; 4). Soldering times should not exceed 3 times ,secondary welding should be done after the poles are cooling; 5). Directly heat cell body is strictly prohibited; 6). Don't let the electric iron contact the surface of the cell.



Please use the battery according to the provisions as below ,Incorrect using of the battery may cause fire or expansion,and destroy its performance.

4.Warnings								
	14.1	Don't throw the cell in fire or heat it or store it in high temperature place ;						
	14.2	Don't operate or use the cell under high temperature or next to the heating material. Don't throw the cell in fire or heat it;						
	14.3.	Don't fix the positive and negative of the cell reversely to the electrical equipment ;						
	14.4	Don't connect the positive and negative polarities by metallic conductor such as a metallic wire;						
	14.5	Don't impact or scrape the surface of the cell by spiculate parts;						
	14.6	Don't stab it with a needle, beating, treading, fold or other way;						
	14.7	Don't drop or fling the cell randomly;						
	14.8	Keep the cell sealed!(Don't open or deform folding edge,Don't bend or fold sealing edge,etc);						
	14.9	Don't unpack the battery or change its structure!;						
	14.10	Don't throw the cell in water,please keep it from humidity.						



