akyga battery

MODEL NO.: 13350 500mAh

1. PREFACE

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

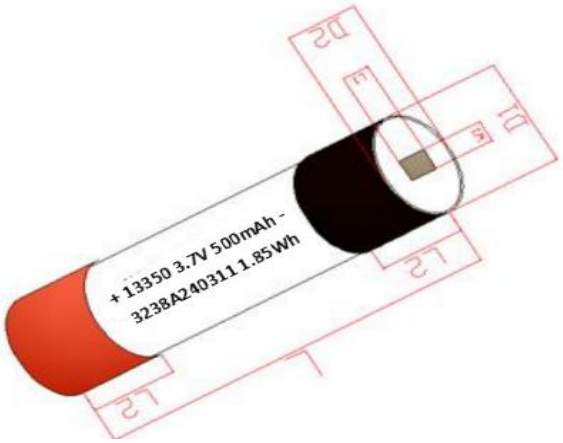
2. MODEL

13350-500mAh

3. SPECIFICATION

NO.	Item		Data
1	Typical Capacity①		500mAh
2	High Rate Discharge		≥460mAh（5A ）
3	Nominal Voltage		3.7V
4	Max.Current		500mA
5	Voltage		4.20V
6	Nominal Continuous Current		250mA
7	Max. Continuous Current		5000mA
8	Cut-off Voltage		3.0V
9	Impedance		≤60 mΩ
10	Operating Temp.	Charge	5℃~45℃
		Discharge	-10℃~45℃
11	Dimension	Diameter	13.0±0.5 mm
		Length	35.0±1.0 mm
12	Weight		10.0g
13	Delivery Condition		4.0V-4.10V
Remarks	① Typical Capacity:0.5CmA,4.2V~3.0V@23℃±2℃ ②		

4.电芯结构与尺寸示意图 STRUCTURE AND DIMENSION



Unit (mm)					
Diameter	13.0±0.5	Diameter 径 D2	13.0±0.5	Length	35.0±1.0
Electrode length	3.0±1.0	Electrode width 度 W1	3.0±0.2	Gummed paper length	7.0±1.0

remarks

Diameter: 13.0±0.5mm (When measuring, the pressure of the instrument acting on the battery is 300gf.)

Length: 35.0±1.0mm (not cluding tab-film)

5. BATTERY CELL PERFORMANCE CRITERIA

5.1

Before proceed the following tests, the cells should be discharged at 0.2C to 3.0V cutoff. Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

Ambient temperature: 23℃±5℃

Relative Humidity: 60±15%RH

5.2 tandard Charge/Discharge Conditions:

The battery will be charged to 4.2V with 0.5C from constant current to constant voltage, when the current is 0.02C, stop to charge.

5.3 ELECTRICAL PERFORMANCE

Test		Unit	Specification	Condition	Remarks
Typical Capacity		mAh	500	Standard Charge / Discharge	*
High Rate Discharge		mAh	≥460	Standard Charge/rest 5 min discharge at 5A to 3.0V	*
Temperature Discharge performance	Normal Temperature		100%	Standard Charge / Discharge	3.0V/cell Cut-off
	High Temperature		≥90%	Standard Charge Storage:2 hoors at 45±2℃ 0.5C discharge at 45±2℃	
Storage performance	23℃ 30days		Residual capacity ≥85% First capacity)	Standard full charge, Storage at 23 degree for 30days, Standard discharge (0.5C)to test residual capacity	3.0V/cell Cut-off
			Recovery capacity ≥90% First capacity)	Standard Charge/discharge for 3 cycles, to test recovery capacity	

5.4 SAFETY TEST

Test	Specification	Condition	Remarks
High Temperature Short-Circuit Test	No fire and no explosion	After standard charge, the battery is short-circuited by using the copper wire with a resistance of 80±20mΩ at 57±4℃ for 30 minutes. The test is terminated when either the battery surface temperature decreases to 20% lower than the peak value	*
Overcharge testing	No fire and no explosion	After discharge 1C to 3.0V cut-off, constant charge current 1C to 4.6V, then charge on 4.6V no less than 7hours	*
Forced Discharging Test	No fire and no explosion	Discharge the battery according to the standard discharge mode in the specification, then reverse charge the battery at 1C current and hold it for 90 minutes.	*
Thermal shock test	No fire and no explosion	After standard charge, the battery is placed in an oven and is heated up at a rate of 5℃/min ± 2℃/min until the temperature reaches 130℃± 2℃. The oven shall be maintained at 130℃±2℃ for 30 minutes.	*

Test	Specification	Condition	Remarks
Low pressure	No fire and no explosion、no leakage.	After fully charge, the battery was placed in an empty chamber at 20 ° C ±5 ° C. The pressure in the chamber was reduced to 11.6 kPa (simulated altitude 15240 m) by vacuuming and maintained for 6 h.	*
Temperatu re cycle	No fire and no explosion、no leakage.	After fully charged,The battery was placed in a controlled chamber with a temperature of 20 ℃± 5 ℃ for the following steps: a) The temperature of the test chamber was raised to 72 ℃±2 ℃ and maintained for 6 h; b) Reduce the temperature of the test chamber to -40 ℃ ±2℃ and keep it for 6h; c) Repeat steps a) to b) for 10 cycles; d) Store at room temperature 20 ℃±5℃ for at least 6h. During the test, the conversion time between each two temperatures is no more than 30 min	*

5.5 MECHANICAL CHARACTER

Test	Specification	Condition	Remarks
Vibration	No fire and no explosion、no leakage.	Battery are firmly secured to the platform of the vibration machine without distorting the battery in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.	*
Drop Test	No fire and no explosion	After standard charge, drop the battery freely from the height of 1 meter (3.28ft) onto a concrete surface, and each battery should fall once along the positive and negative directions of the three mutually perpendicular axes, 4 times in total.	*
Crush Test	No fire and no explosion	A battery is to be crushed between two flat surfaces. The flat surfaces are to be brought in contact with the cells and the crushing is to be continued until an applied force of 13 ±0.78 kN is reached. Once the maximum force has been obtained it is to be released.	*
Impact Test	No fire and no explosion	After full charging, the battery is impacted between bar(15.8±0.2mm diameter) and 9.1±0.1 Kg falling material (at a height of 610mm±25mm). Bar is laid across the center of the test sample.	*

6. STORAGE AND OTHERS

6.1 Ambient temperature: 23℃±5℃

Relative Humidity: 65±20%

6.2

3.9V。

Please activate the battery once every 3 months according to the following method:

Charge at 0.2C to 4.2V, rest 5 min, then discharge with 0.2C to 3.0V/cell,rest 5 min, then charge at 0 2C to 3 9V

7. HANDLING PRECAUTIONS AND GUIDLINE

Note(1):

The customer is requested to contact in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions

Note(2):

Y will take no responsibility for any accident when the cell is used under other conditions than those described in this Document.

Note(3):

will inform, in a written form, the customer of improvement(s) regarding proper use and handing of the cell, if it is deemed necessary.

7.1. Charging

7.1.1 Charging current:

Charging current should be less than maximum charge current specified in the Product Specification. Charging with higher current than recommended value may cause damage to cell electrical, mechanical and safety performance and could lead to heat generation or leakage.

7.1.2 Charging voltage:

Charging shall be done by voltage less than that specified in the Product Specification (4.2V/cell). Charging beyond 4.25V, 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.

7.1.3. Charging temperature:

The cell shall be charged within 5℃~45℃ range in the Product Specification.

7.1.4. 电 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.

7.2. Discharging

7.2.1. 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.

7.2.2. Discharging temperature

The cell shall be discharged within -10℃~45℃ range specified in the Product Specification.

7.2 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 3.9V. 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.

7.3 Storage:

If the cell has to be storied for a long time (Over 3 months),the environmental condition should be;Temperature: 23±5℃

Humidity: 65±20%RH, The voltage for a long time storage shall be 3.6V~3.9V range.

7.4. 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;

7.4.1.

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;

7.4.2

Don’t bend or fold sealing edge.

7.4.3

Don’t open or deform folding edge;

7.4.

Don’t bend tab

7.4.6

Don’t Fall, hit, bend battery body;

7.4.7

Short terminals of battery is strictly prohibited, it may damage battery;

7.5 Notice Designing Battery Pack;

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;

7.6. Notice for Assembling Battery Pack

7.6.1. Tab connection

Ultrasonic welding or spot welding is recommended to connect battery with PCM or other parts. If apply manual solder method to connect tab with PCM, below notice is very important to ensure battery performance.

a)

The solder iron should be temperature controlled and ESD safe

b)

Soldering temperature should not exceed 350℃

c)

Soldering time should not be longer than 3s

d)

Soldering time should not exceed 5 times Keep battery tab cold down before next time soldering

e)

Directly heat cell body is strictly prohibited, Battery may be damaged by heat above approx. 100℃

7.6.2. 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

8. OTHERS

8.1 Prevention of short circuit within a battery pack

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

8.2. Prohibition of disassembly

8.2.1.

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

8.2.2.

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.

8.3

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

8.4

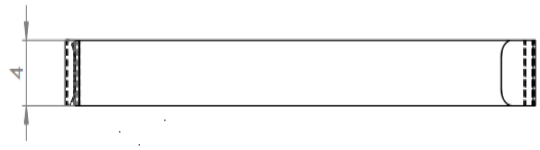
The cells shall never be soaked with liquids such as water, seawater drinks such as soft drinks, juices coffee or others.

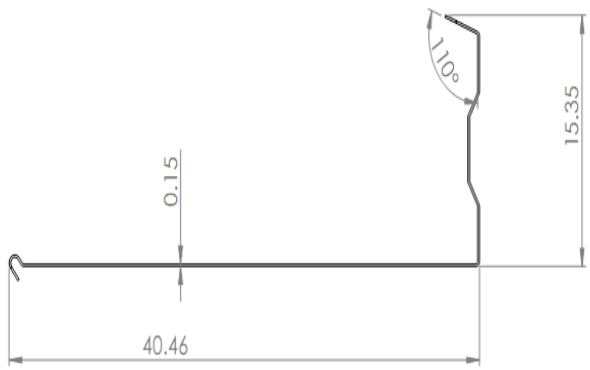
8.5

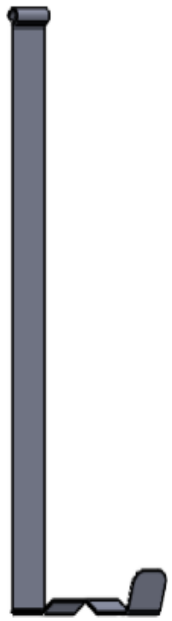
The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

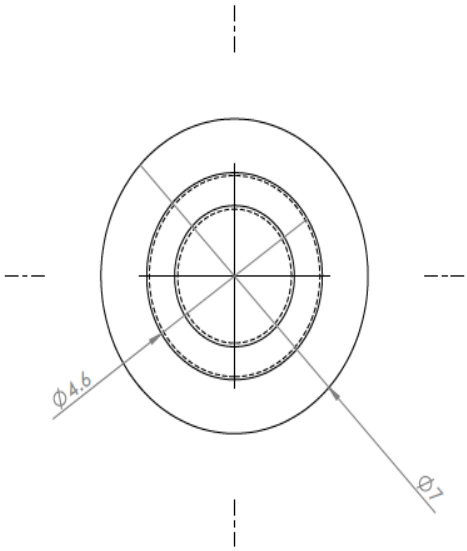
8.6

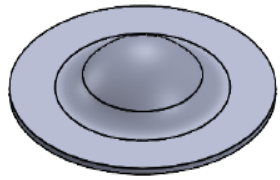
The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in a plastic envelop of the cell, deformation of the cell package, smelling of electrolyte, electrolyte leakage and others, the cells shall never be used any more.
The cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing.

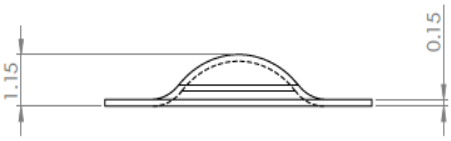

4


110°
15.35
0.15
40.46




Ø4.6
Ø7




1.15
0.15