Product Specification

Product Name	Li-ion Polymer Battery
Model Spec	LP-603759-3.7V-1500PCM
Document Number	8109006037002
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Project	/

Make	Checkup	Approved
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2012-12-7	2012-12-7	2012-12-7

Customer Confirmation	Company Chop	Signature &Date
	Company Name:	

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History of revision

Revision	Date	Reason of revision	Originator
A/0	2012-12-6	New release	Ningzong Tao

1 Scope

This document describes the performance characteristics and testing methods for Li-ion polymer battery produced by Shenzhen Ryder Electronics Co., Ltd.

2 Product type and model number

2.1 Product type

Li-ion polymer Battery

2.2 Model number

LP-603759-3.7V-1500 PCM

3 Requirements and test methods

3.1 General specifications

Table 1: General specifications

No	Item	Rated performance	Remark
1	Rated capacity	Nominal 1500mAh Min 1500mAh -5%	Standard discharge after standard charge
2	Nominal voltage	3.7V	Mean operation voltage during standard discharge after standard charge
3	Voltage at end of discharge	2.75V	Discharge cut-off voltage
4	Charging voltage	4.2V	
5	Impedance	<130mΩ	
6	Standard charge	Constant current 0.2C_5A Constant voltage 4.2V Cut-off current 0.02C_5A	
7	Standard discharge	Constant current 0.2 C_5A End voltage 2.75V	
8	Fast charge	Constant current 0.5C_5A Constant voltage4.2V 0.02 C_5A cut-off	
9	Fast discharge	Constant current 0.5C_5A End voltage2.75V	
10	Maximum charge current	1 C_5A	
11	Maximum discharge current	2 C_5A	
12	Operation temperature range	Charge: 0~45℃	60±25%R.H
		Discharge: -20~60℃	
13	Cycle life	>300cycles	Charging/discharging in the below condition: Charge: standard charge Discharge:1 C_5A to2.75V Rest time between charge/discharge:30min Until the discharge capacity <60% of NC
14	Storage temperature	≤1 month: -10 ~ 45℃	60±25%R.H， Best 10~25℃ for long-time storage
		≤3 months: 0 ~ 35℃ •	
		≤1 year: 0 ~ 30℃	

15	Weight	Approx:42g	
16	Dimension(mm)	Thickness*width*height(Max)	6.5*38*63

3.2 Appearance

There shall be no such detect as deep scratch, flaw, crack, rust, leakage, which may adversely affect commercial value of cell.

3.3 Electrical performances

Table 2: Electrical requirements and test methods

No	Items	Test procedure	Requirements
1	Nominal voltage	The average value of the working voltage during the whole discharge process.	3.7V
2	Discharge performance	The discharge capacity of the battery, measured with $0.2C_5A$ down to 2.75V within 1 hour after a standard charge	Discharge ≥Minimum capacity
3	Capacity retention	After 28 days storage at 25±5℃, after having been standard charged and discharged at $0.2C_5A$ to 2.75V (the residual capacity is above 85% of nominal capacity)	Discharge time≥4.25h
4	Cycle life	Charging/discharging in the below condition: Charge: Standard Charge Discharge:$1C_5A$ to 2.75V Rest Time between charge/discharge:30min Until the discharge capacity <60% of NC	>300cycles

4 Standard test conditions

Test should be conducted with new batteries within one week after shipment from our factory and the batteries shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 20±5℃ and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30℃ and humidity 25~85%RH.

5 Cautions in use

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

5.1 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.

5.2 Charge and discharge

Battery must be charged in appropriate charger only.

Never use a modified or damaged charger.

Do not leave battery in charge over 24 hours.

5.3 Storage

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

5.4 Disposal

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

6 Battery operation instruction

6.1 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.

6.2 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.

6.3 Electric discharge temperature

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

6.4 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, or prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

6.5 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.

7 Period of warranty

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

8 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.

9 Note

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

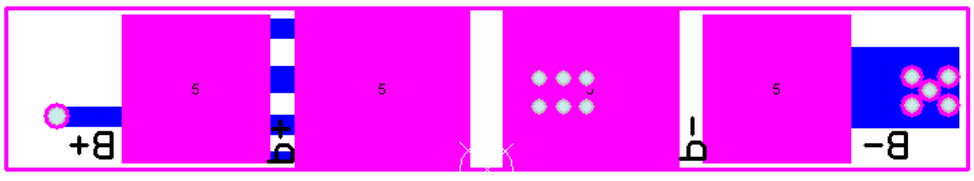
10 PCM performance

10.1 Electrical characteristics

Table 3: PCM electrical characteristics

Item	Symbol	Content	Criterion
Over charge Protection	VDET1	Over charge detection voltage	4.25±0.025V
	tVDET1	Over charge detection delay time	1.0±0.3S
	VREL1	Over charge release voltage	4.05±0.05V
Over discharge protection	VDET2	Over discharge detection voltage	2.50±0.062V
	tVDET2	Over discharge detection delay time	20±6mS
	VREL2	Over discharge release voltage	3.00±0.075V
Over current protection	VDET3	Over current detection voltage	0.2±0.015V
	IDP	Over current detection current	4.5±1.5A
	tVDET3	Detection delay time	12±4mS
		Release condition	Cut load
		Rated operational current	≤2.0A
Short protection		Detection condition	Exterior short circuit
	TSHORT	Detection delay time	230～500uS
		Release condition	Cut short circuit
Interior resistance	RSS	Main loop electrify resistance	RSS≤65mΩ
Current consumption	IDD	Current consume in normal operation	8.0μA Max
Dimension(L*W*T)		24*4.0*0.6mm	
PCM		PCM-F3.7V 2.0/4.0A RYD-01S-010 V1.0	

10.2 PCM layout



10.3 Terminal explanations

11.3.1 B+：Connected to the battery’s positive terminal

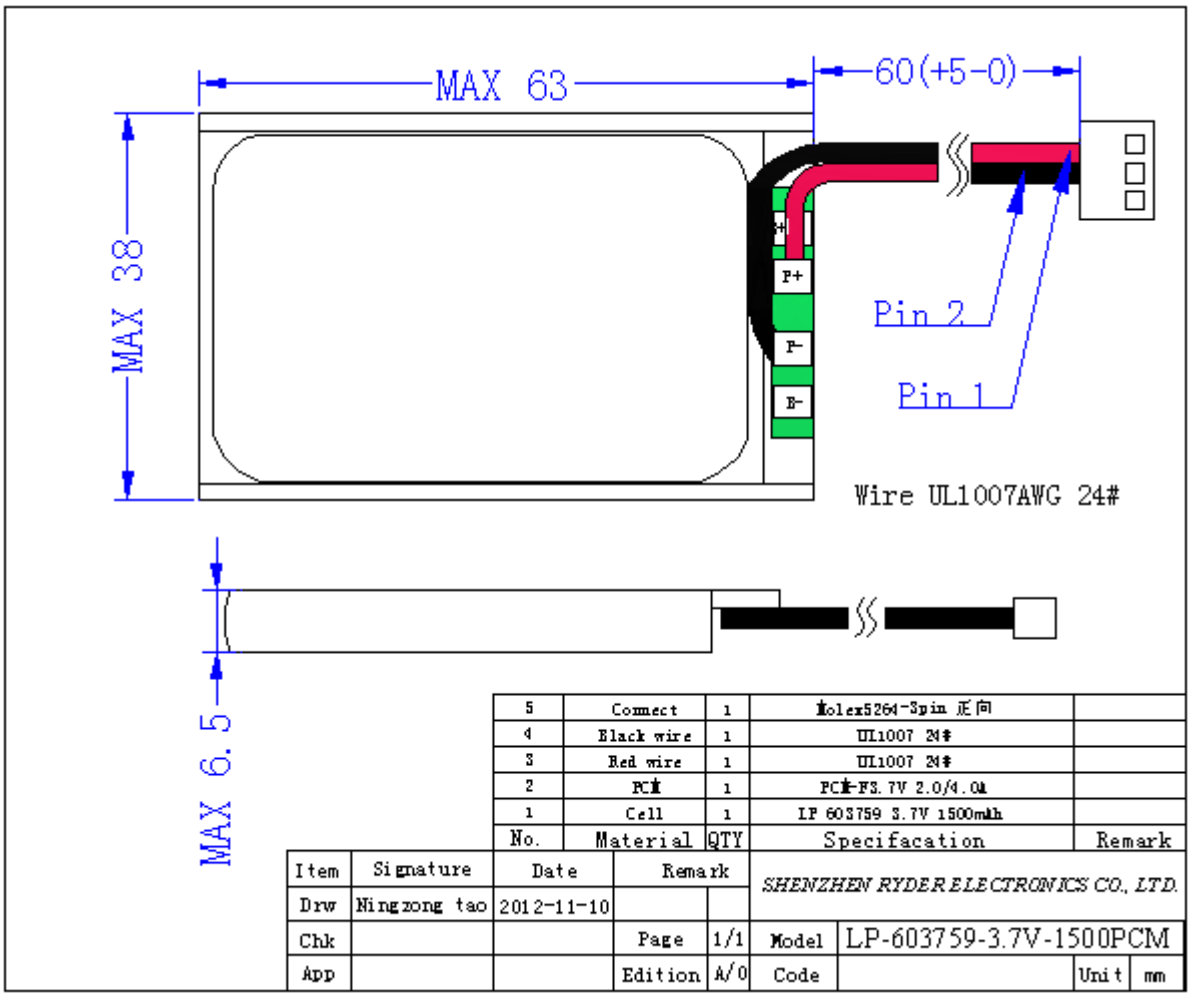
11.3.2 B-：Connected to the battery’s negative terminal

11.3.3 P+：Connected to the battery’s output or the charger’s positive terminal

11.3.4 P-：Connected to the battery’s output or the charger’s negative terminal

11 Battery pack drawing

Drawing 1: Battery pack drawing



No.	Material	QTY	Specifacation	Remark
5	Connect	1	Molex5264-3pin 正向	
4	Black wire	1	UL1007 24#	
3	Red wire	1	UL1007 24#	
2	PCM	1	PCM-FS.7V 2.0/4.0A	
1	Cell	1	LP 603759 3.7V 1500mAh	

Item	Signature	Date	Remark	SHENZHEN RYDER ELECTRONICS CO., LTD.			
Drw	Ningzong tao	2012-11-10					
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