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		<b>REV</b>	<b>A/0</b>
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# Product Specification

<b>Product Name</b>	<b>Li-ion Polymer Battery</b>
<b>Model Spec</b>	<b>LP702235</b>
<b>File Number</b>	<b>8169070201018</b>
<b>File Revision</b>	<b>A0</b>

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Yingchen	Bingliu	
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<b>Customer Confirmation</b>	<b>Company Chop</b>	<b>Signature &amp; Date</b>
	<b>Company Name:</b>	



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## 1 Scope

This document describes the performance characteristics and testing methods for Li-ion polymer battery LP702235.

## 2 Product type and model number

### 2.1 Product type

Li-ion polymer battery


### 2.2 Model number

LP702235

## 3 Rated performance

**Form 1: Battery rated performance**

N	Item	Rated performance	Remark
1	Rated capacity	Nominal 500mAh Minimum 500mAh -5%	Standard discharge after standard charge
2	Nominal voltage	7.4V	Mean operation voltage during standard discharge after standard charge
3	Voltage at end of discharge	5.5V	Discharge cut-off voltage
4	Charging voltage	8.4V	
5	Impedance	<150mΩ	
6	Standard charge	Constant current 0.2C <sub>5</sub> A Constant voltage 8.4V Cut-off current ≤ 0.02C <sub>5</sub> A	
7	Standard discharge	Constant current 0.2 C <sub>5</sub> A End voltage 5.5V	
8	Fast charge	Constant current 0.5C <sub>5</sub> A Constant voltage 8.4V Cut-off current ≤ 0.02C <sub>5</sub> A	
9	Fast discharge	Constant current 0.5C <sub>5</sub> A End voltage 5.5V	
10	Maximum continuous discharge current	2.0 C <sub>5</sub> A	Pulse Current: 3.0 C <sub>5</sub> A
11	Operation temperature range	Charge: 0~45°C Discharge: -20~60°C	60±25%R.H
12	Cycle life	>300cycles	Charging/discharging in the below condition: Charge: standard charge Discharge: 0.2C <sub>5</sub> A to 5.5V Rest time between charge/discharge: 30min Until the discharge capacity <80% of NC
13	Storage temperature	≤ 1 month: -20~45°C ≤ 6 months: -20~35°C ≤ 1 year: 0~25°C	60±25%R.H Best 10~25°C for long-time Storage
14	Weight	Approx: 25g	
15	Dimension(mm)	Thickness*width*height(Max)	17*27.5*49

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## 4 Electrical performances

### Form 2: Battery electrical performances

No	Items	Test procedure	Requirements
1	Nominal voltage	The average value of the working voltage during the whole discharge process.	7.4V
2	Discharge performance	The discharge capacity of the battery, measured with 0.2C <sub>5</sub> A down to 5.5V within 1 hour after a standard charge	Discharge time ≥ minimum capacity
3	Capacity retention	After 28 days storage at 25±5°C, after having been standard charged and discharged at 0.2C <sub>5</sub> A to 5.5V (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: 0.2C <sub>5</sub> A to 5.5V Rest Time between charge/discharge: 30min Until the discharge capacity < 80% of NC	> 300 cycles

## 5 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°C 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°C and humidity 25~85%RH.

## 6 Cautions in use

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

### 6.1 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.

### 6.2 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.

### 6.3 Storage

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

### 6.4 Disposal

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

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## 7 Battery operation instruction

### 7.1 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.

Charging temperature: The battery must charge in the ambient temperature scope which this specification book stipulated. Use the constant electric current and constant voltage to charge. Do not reverse charge. When the positive electrode and the cathode meet together, damage can be made for the battery.

### 7.2 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.

### 7.3 Electric discharge temperature

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

### 7.4 Over-discharges

Short time of excessively discharge will not affect the usage. But the long time excess discharge can damage the battery performance and cause the function losing. When the battery is not used for a long time, because of its automatic flashover characteristic, it may excessively discharges. To prevent excessively discharge occur, the battery should maintain certain electric quantity.

### 7.5 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.

## 8 Period of warranty

The period of warranty is one year from the date of shipment. Replacement battery may be provided if in case of batteries with defects proven due to manufacturing process instead of the customers abuse and misuse.

## 9 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.

## 10 Note

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

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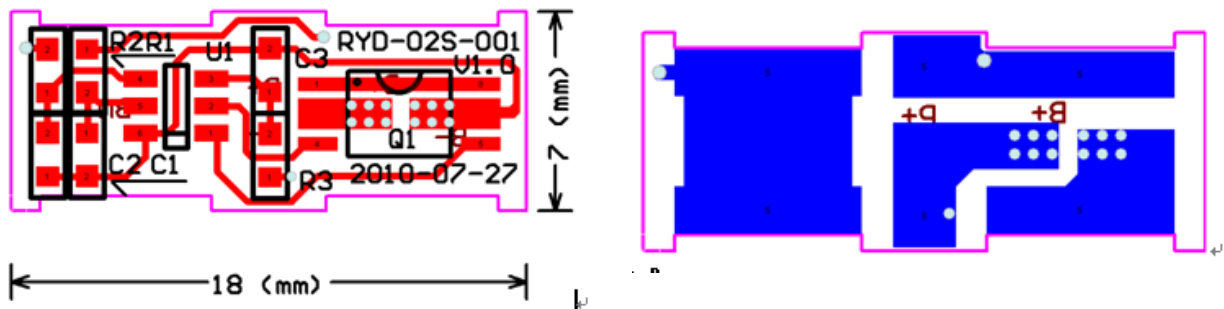
## 11 PCM performance

### 11.1 Electrical characteristics

**Table 3: PCM electrical characteristics**

Item	Content	Criterion
Over charge Protection	Over charge detection voltage	4.28±0.025V
	Over charge release voltage	4.13±0.05V
Over discharge protection	Over discharge detection voltage	2.4±0.05V
	Over discharge release voltage	2.9±0.1V
	Rated operational current	≤2A
Over current protection	Over current detection current	4±2A
	Release condition	Cut load
	Detection delay time	7.2-11ms
Short protection	Detection condition	Exterior short circuit
	Protection	Have
	Release condition	Cut short circuit
Interior resistance	Main loop electrify resistance	$R_{DS} \leq 65m\Omega$
Current consumption	Current consume in normal operation	8.0μA Max
PCB Dimension(L*W*H)	18*7*2.5mm	
PCM	PCM -F7.4V 2/4A	

### 11.2 PCB LAYOUT



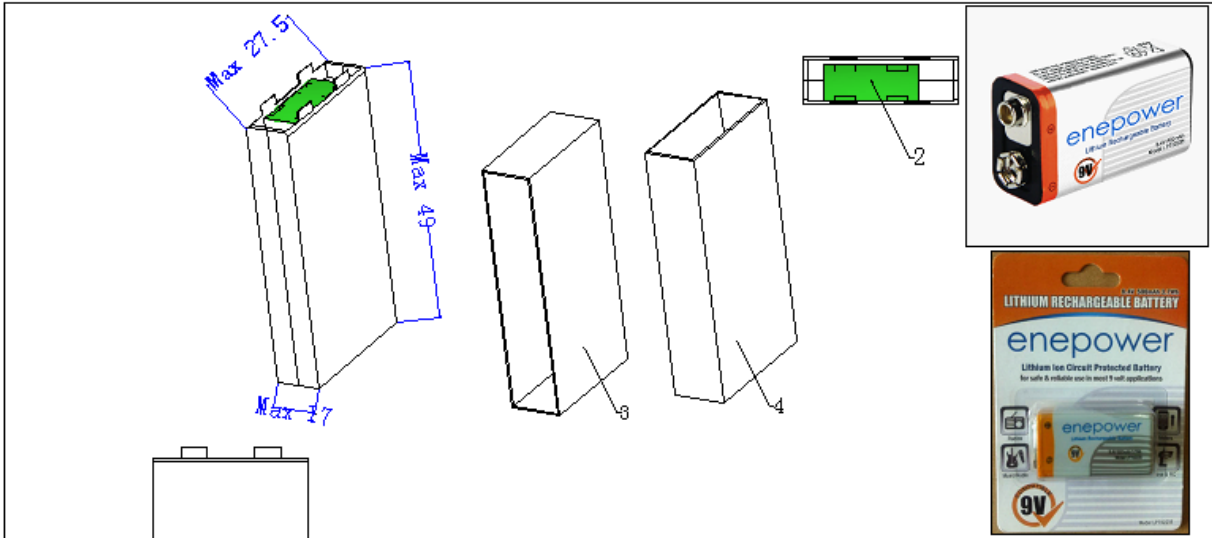
### 11.3 Terminal explanations

- 11.3.1 B+: Connected to the second battery's positive terminal
- 11.3.2 BM: Connected to the first battery's positive terminal
- 11.3.3 B-: Connected to the first battery's negative terminal
- 11.3.4 P+: Connected to the battery's output or the charger's positive terminal
- 11.3.5 P-: Connected to the battery's output or the charger's negative terminal

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12 Battery pack drawing

Drawing 1: Battery pack drawing



1	PVC		1	
5	PVC		1	
2	PCB	PCB-F1: 1V 2/1A	1	
1	Cell	LP 702235 5.7V 500mAh	2	
No	Material	Description	Qty	Remark

Item	Signature	Date	Remark				
Drw	Yingchen	2014-4-10		page	1/1	Hot el	LP-702235-2S1P 7.4V 500mAh-PCM
App				edition	A/0	code	Unit mm