



<b>Title</b>	<b>P o l y e r L i t h i u m I o n y B a t t e</b>		
<b>F i l e n o</b>	6 3 4 126090mAh	Ver 1 . 0	P a e g l / 1 0

## **P o l y e r L i i o B a t t y e P r o d u c t S p e c i f i c a t i o n s**

### Revision History

<b>REVISION</b>	<b>DATE</b>	<b>ORIGINATOR</b>	<b>REASON FOR REVISION</b>
1.0	2011-09-21	Li Dongming	Original Release

**TO:**

### Customer Approval

**Comment:**

**Customer's Signature/Data:**

<b>Prepared</b>	<b>Reviewed</b>	<b>Approved</b>
Li Dongming	Wan Gang	Ling Zhehou
Date: 2011-09-21	Date: 2011-09-21	Date: 2011-09-21



**Title**

**P o l y m e r L i t h i u m I o n y B a t t e**

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**Title**

**P o l y m e r L i t h i u m I o n y B a t t e r y**

**F i l e N o**

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**1 . S c o p e**

This specification shall be applicable to the device for Custom type.

**2. Product Name and Product Type**

**2.1 Product Name**

Polymer Li-ion Battery

**2.2 Product Type**

634169-2000mAh

**3. Product Specifications**

No.	Item	Specification
1	MIN Capacity	2000mAh
2	Typical Capacity	2000mAh
3	Nominal Voltage	3.7V
4	Charge Limited Voltage	4.20 <sup>+0.03</sup> <sub>-0.02</sub> V
5	Discharge Cut-off Voltage	The min is 2.45V, and the standard is 2.55V.
6	End-of-charge Current	10mA
7	Standard Charge	Constant Current: 1C(2000mA) Constant Voltage: 4.2V End-of-charge Current: 10mA
8	Standard Discharge	Using 0.2C(400mA) constant current discharge to the Discharge Cut-off Voltage. Quickly discharge current: 1C(2000mA)
9	Maximum Continuous Charge Current	1C (2000mA)
10	Maximum Continuous Discharge Current	1C (2000mA)
11	Operating Temperature Range	Charge: 0 ~ 45°C
		Discharge: - 20 ~ 60°C
	Storage Temperature Range	-20 ~ 60°C
12	Operating And Storage Humidity Range	Less than 85%RH
13	Weight	55.2g or less

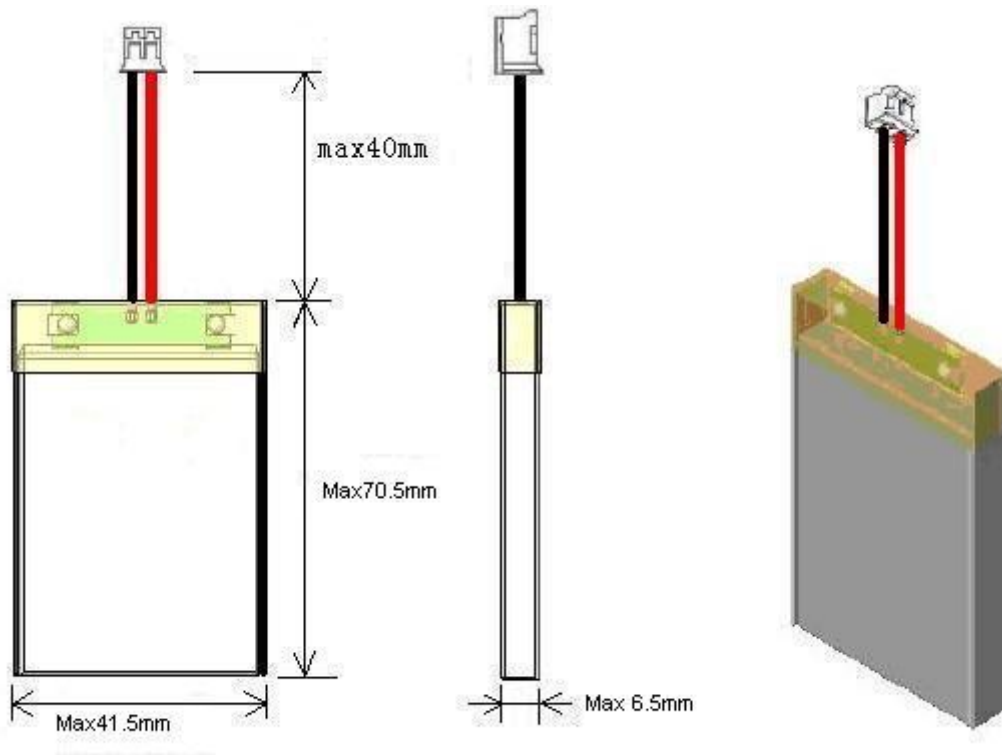
**4. External Dimension**



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Thickness: Max6.50mm (initial 50% charged ,at  $20\pm 5^{\circ}\text{C}$ )  
Width:  $41.0\pm 0.5\text{mm}$   
Height: Max:70.5mm

### 5. External Dimension Drawing



### 6. Outside Appearance

It shall be free from any defects such as remarkable scratches, breaks, cracks, discoloration, leakage, or deformation, and it shall be clean.

### 7. Basic Electrical Characteristics



**Title**

**Polymer Lithium Iony Battery**

**File No**

634126090mAh

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N o	Items	C reiirta	Te sG n ðit n s
1	O p rCi qui Volt a	3.75~ 30V	M æ sræc ksla $20 \pm 5^{\circ}\text{C}$ a tferæ e ie vd
2	Int nar Impe ðnc e	$\cong 28\text{m}\Omega$	M æ sræc k ðusi g a ra tlnat e rre nimpe ð a e me t æ tkH a $20 \pm 5^{\circ}\text{C}$ a tferæ e ie vd
3	Ra t Ca ð p iyt (0.2C <sub>5</sub> A)	$\cong 2000\text{mAh}$	St adand di s hge ð t f et ræ st adand c hge ð k l re s 0mi lra $20 \pm 5^{\circ}\text{C}$ . Thre æyc l eræspe mi t t e
4	H ih Ra t Ca ð p iyt	$\cong 2000\text{mAh}$	Disc hge ð 1C <sub>5</sub> A ra taetf etre st adand c hge ð c k l ræ s 0mi lra $20 \pm 5^{\circ}\text{C}$ . Thre æyc l æ æ pe mit t e d
5	Te mpe ar treu Cha r t æ str i c s	Re t te im Ca ð p iyt: 60°C $\cong 95\%$ ðni it a c l p a iyt 0°C $\cong 80\%$ * i n t i a p l iyt -20°C $\cong 60\%$ * i n t l i a c p iyt Appe ra æ o ðle ð rma it n, l e æ g k r u p t r e s .	M æ sræd t h high ra t c e p a iyt a she it it i a l c p a i t St r e d h r e k a g e ð k l f o r 3 h r s a $60 \pm 2^{\circ}\text{C}$ , $0 \pm 2^{\circ}\text{C}$ , $-20 \pm 2^{\circ}\text{C}$ , a d t h æ q u i k l y d i s c h g e ð a t h s æ m p e a r t r e
6	St r æ g Cha r t æ str i c s	Re t te im Ca ð p iyt: $\cong 80\%$ i i t n i a p l iyt impe ð a æ n c æ æ $\cong 40\text{m}\Omega$ Swe l n g : i $\cong 0.5\text{mm}$ Appe ra æ o ð N e æ g k	M æ sræd t h high ra t c e p a iyt a she it it i a l c p a i t St r e d h r e k a g e ð k l f o r 7 d a s a $60 \pm 2^{\circ}\text{C}$ a d t h r e t s o r f 2 h r s a r o o m t æ m p e a r t r e , s t a d a n d d i s h g e ð t f e c h e k e d h c k s f a p e r a æ a d i m p e ð a e
		Re t te im Ca ð p iyt: $\cong 90\%$ i i t n i a p l iyt Re æ v e a r b C a ð p iyt: $\cong 95\%$ i i t n i a p l iyt impe ð a æ $\cong 60\text{m}\Omega$ Impe ð a æ V a i r a n : $\cong 0 \pm 0\text{m}\Omega$ Swe l n g : $\cong 0.1\text{mm}$ Appe ra æ o ð N e æ g k d a m a g	M æ sræd t h high ra t c e p a iyt a she it it i a l c p a i t St r e d h r e k a g e ð k l f o r 30 d a s a t r o o m t æ m p e a r t r e Q u i k l y d i s h g e ð t f e c h e k e d h c k l æ s p e r a æ a d i m p e ð a e M æ s r e u d r e æ v e a r b æ q u i c l y k d i s c h g e c p a i y t a d r e æ v e a r b æ m p e ð a e
7	Cyc l l æ f e (20°C)	Re t te im Ca ð p iyt: $\cong 80\%$ i i t n i a p l iyt Impe ð a æ $\cong 120\text{m}\Omega$ Swe l n g : $\cong 0.50\text{mm}$	Ca ny o u t 300 c y c l æ e ( s t a d a n d c h g e / 1 C d i s h g e ) a t $0 \pm 5^{\circ}\text{C}$ .

**8 . Sa ð t y h æ n t æ i s æ i**



**Title**

**Polymer Lithium Iony Battery**

**File No**

634 12609mAh

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No	Items	Criteria	Test Conditions
1	Over charge Characteristics	The maximum Temperature: $\leq 150^{\circ}\text{C}$ Appearance: No rupture, fire, smoke nor leakage.	Charge the fully charged cell as 3C (2700mA) current with a voltage limit of 4.8V. Test can be terminated until constant voltage is reached in 8 hrs or charge current is $\leq 10\text{mA}$ .
2	Over-discharge Characteristics	The maximum Temperature: $\leq 150^{\circ}\text{C}$ Appearance: No rupture, fire, smoke nor leakage.	Reverse charge the standard cell at 3C (2700mA) current to -10V or until the Cell voltage is $\leq 0\text{V}$ or discharge time is more than 2.5 hrs.
3	Short-circuit Characteristics	The maximum Temperature: $\leq 150^{\circ}\text{C}$ Appearance: No rupture, fire, smoke nor leakage.	Resect for 30min at $60 \pm 2^{\circ}\text{C}$ after standard charge. Connect between Cell terminal with $1.5\text{mm}^2$ copper lead wire resistance $\leq 50\text{m}\Omega$ or less and allow for 1 hour.
4	Heat shock Characteristics	The maximum Temperature: $\leq 200^{\circ}\text{C}$ Appearance: No explosion	The standard cell should be heated in a gravity convection oven with a temperature of $5 \pm 2^{\circ}\text{C}/\text{min}$ . The oven is stable for 10 minutes at $130 \pm 2^{\circ}\text{C}$ before the test is conducted.
5	Impact Test	No explosion	After standard charge the cell should be placed on a flat surface. A 5/8" (15.8mm) diameter bar is struck on the top surface of the sample. A 20 pound (9.1kg) weight is dropped from a height of $24 \pm 1$ inch ( $610 \pm 25\text{mm}$ ) onto the sample.
6	Crush Test	No explosion	After standard charge the cell should be placed between two flat surfaces. The force for crushing is obtained by a hydraulic ram with a 1.25 inch (32mm) diameter piston. The crushing is done until a pressure of 2500 psi (17.2MPa) is reached. The hydraulic ram, a plate of 3000 pounds (13kN). Once the maximum pressure is obtained it should be released.

**9. Reliability Tests**



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N o	Items	C r e i t a	T e s t n i t n s
1	St a t i m i d y a d T e m p e r a t r e u C h a r t e s t r i c s	Re t t e m C a p a c i t y: ≧ 50% i i t n i a p l i c y t Re o v e r a b C a p a c i t y: ≧ 80% i i t n i a p l i c y t S w e l n g : i ≧ 1.5mm I m p e d a n c e ≧ 360mΩ A p p e a r a n c e o n e a g k d a m a g	M a s s e d t h i g h r a t e p a c i t a s h e i t i a l c p a i t S t r e d t h e l a g e d e l f o r 4 d a y a t 60 ± 2°C a d 95% R L , t h r e s o r 4 h r s a t r o o m t e m p e r a t r e Q u i k l y d i s h g e d t f e r c h k e d h e c e l f a s p e r a a d i m p e d a n c e M a s s e d o v e r a b e q u i c k d i s h g e c p a c i t a d r e o v e r a b e m p e d a n c e
2	V i b r a t i o C h a r t e s t r i c s	O V V a i r a n : i ≧ 0.01V I m p e d a n c e ≧ 180mΩ V a i r a n : i ≧ 5 m Ω A p p e a r a n c e : N o d e f r m a t r i , b e a g	M a s s e d h e i n i t l i Q C V a d i m p e d a n c e a f t e r s t a d a n d c h g e d 20 ± 5°C. V i b r a t t e h c e l f o r 30 m i n u t e o n e a l i e r t i n a r o o m t e m p e r a t r e i n 10 m i n . A p l i d e 1.6mm, (p-p) V i b r a t i o : 0-60Hz (swe p l o c / m i n ) D i r e c t i o n , X, Z T h e m e s u r e O V a n d i m p e d a n c e
3	70°C S t r a g C h a r t e s t r i c s	Re o v e r a b C a p a c i t y: ≧ 30% i i t n i a p l i c y t S w e l n g : i ≧ 1.5mm I m p e d a n c e ≧ 360mΩ A p p e a r a n c e o n e a g k d a m a g	M a s s e d t h i g h r a t e p a c i t a s h e i t i a l c p a i t S t r e d t h e l a g e d e l f o r 48 h r s a t 70 ± 2°C, t h r e s o r 2 h r s a r o o m t e m p e r a t r e u Q u i c k l y d i s h a g e d t f e c r h k e d t h c e l f a s p e r a a d i m p e d a n c e M a s s e d r e o v e r a b e q u i c k d i s c h g e c p a c i t a d r e o v e r a b e m p e d a n c e

**10 Protection of Overcharge**

If a Polymer Li-ion Battery is subjected to a voltage higher than the allowable voltage or is charged with an excessive current, the electrolyte may decompose, resulting possibly in degassing or compromising cell safety. If cell voltage decreases below 1.0V approx., cell performance may deteriorate. Therefore, must be equipped protection circuit that can prevent overcharge, over-discharge, and over-current.

**11. Guarantee Period of Quality**

Guarantee period of quality is 6 months after sold.

**12. Parameter of PCB**

**12.1 List of Parameter**

Parameter	Symbol	Min	Typ.	Max.	Unit	Remark
10.1 Overcharge Detection Voltage	V <sub>cu</sub>	4.255	4.3	4.35	V	
10.2 Overcharge Detection Delay Time	t <sub>cu</sub>	0.15	1.2	4.6	S	
10.3 Release Voltage of Overcharge	V <sub>HC</sub>	4.055	4.08	4.105	V	



# Title Polymer Lithium Ion Battery

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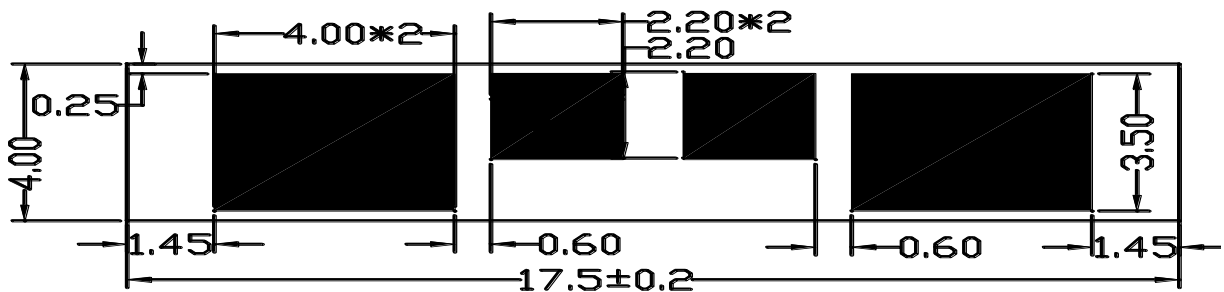
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10.4	Operating Voltage	$V_{DL}$	2.45	2.50	2.65	V	
10.5	Operating Voltage Drop Time	$T_{DL}$	36	144	290	ms	
10.6	Reverse Voltage		3.05	3.00	2.95	V	
10.7	Operating Current	$I_{CS}$	0.5	1.1	4	A	
10.8	Operating Current Drop Time	$T_{IOV}$	4.5	9	18	ms	
10.9	Current Consumption Normal	$I_{OPE}$	2	7	10	$\mu A$	$V_{DD} = 3V, V_{M} = 0$
10.10	Current Consumption Power Down	$I_{PDN}$				$\mu A$	
10.11	Impedance	$R_{PCM}$	30	70	100	m $\Omega$	

## 12.2 List of PCB BOM

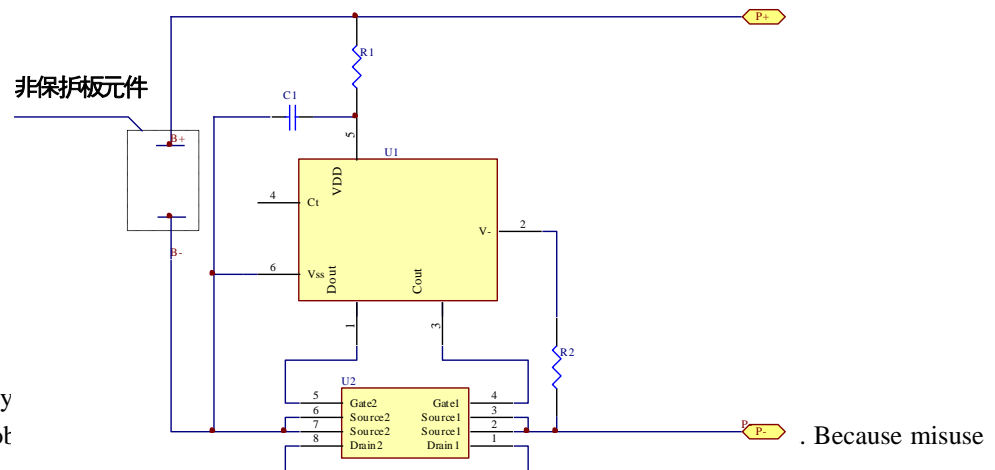
Item	Reference	Description	Type	Qty	Manufacturer
1	U1	Protection IC	Dw01+	1	For the
2	U2	Power MOSFET	8205	1	TSOP8
3	R1	Resistor	0603/ $40\Omega \pm 5\%$	1	SWELL
4	R2	Resistor	0603/ $8\Omega \pm 5\%$	1	SWELL
5	C1	Capacitor	0603/ $1\mu F / 0\% \pm 20\%$	2	SWELL
6		PCB	G030-AAA	1	ASSUN

## 12.3 Dimension of PCB



Thickness of the PCB:  $0.60 \pm 0.10\text{mm}$

## 12.4 Circuit Diagram



## 13. Product Responsibility

Using cells must be of





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may cause electric shock or fire. Do not use DTP without being properly instructed by handling instructions of the product in this specification.

### 1.4 Precautions for Charging

Always inform the user before use. Do not use with data of quality that is not specified in the manual, or in the production process or control system with the change.

### 1.5 Handling Precautions on the day of use

To assure the safety, do not follow the instructions of the manual.

## ! D a n g e r

- When charging the Cell, use the correct charger and follow the specifications.
- Use the Cell only in the specified application.
- Do not connect the Cell to a metal container or other electrical equipment.
- Do not heat or blow the Cell with a fan.
- Do not use the Cell to fire or in the case of a fire, the temperature may be above 60°C. Always do not charge / discharge in such conditions.
- Do not mine or throw, avoid the Cell with water or liquid.
- Do not put it in your pocket or bag, get it with the object such as metal, sharp, or screws. Do not use it with such objects.
- Do not connect it in the (+) and (-) terminals with the same time.
- Do not let the Cell in the inverted (+) and (-) in the wrong way around.
- Do not insert the Cell with sharp objects such as needles.
- Do not hit it with a hammer, rest on or throw or drop to cause strong shock.
- Do not disassemble or modify the Cell.
- Do not use the Cell in a closed space.
- Do not use the Cell in a fire or in a fire.
- Thoroughly read the user's manual before use and handle it according to the instructions of the Cell in the case of an emergency such as fire, smoke, or fire.

## ! W a r n i n g

- Do not put the Cell in a hot or dry place, or in a high-temperature area.
- Do not use the Cell with dry contact or primary battery or other type of battery.
- Stop charging the Cell when the temperature is not complete in the specified time.
- Stop using the Cell if a harmful odor, discoloration, deformation or abnormal condition is detected during use or storage.
- Keep away from fire or flame and avoid contact with water immediately.
- If liquid is on your skin or clothes, wash it with water immediately.



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- If liquid leaking from the Cell gets into your eyes, do not rub your eyes. Wash them well with clean water and go to see a doctor immediately.

## **! Caution**

- Store batteries out of reach of children so that they are not accidentally swallowed.
- If younger children use the Cell, their guardians should explain the proper handling.
- Before using the Cell, be sure to read the user's manual and cautions on handling thoroughly.
- Thoroughly read the user's manual for the charger before charging the Cell.
- For information on installing and removing from equipment, thoroughly read the user's manual for the specific equipment.
- Batteries have life cycles. If the time that the Cell powers equipment becomes much shorter than usual, the Cell life is at an end. Replace the Cell with a new same one.
- Remove a Cell whose life cycle has expired from equipment immediately.
- When not using Cell for an extended period, remove it from the equipment and store in a place with low humidity and low temperature.
- While the Cell pack is charged, used and stored, keep it away from objects or materials with static electric charges.
- If the terminals of the Cell become dirty, wipe with a dry clothe before using the Cell.
- The Cell can be used within the following temperature ranges. Do not exceed these ranges.

Charge temperature range : 0°C to 45°C

Discharge temperature range : -20°C to 60°C

(When using equipment)