

SHENZHEN PKCELL BATTERY CO., LTD



Li-Polymer Battery Technology Specification

Model: Li-Polymer 401230 105mAh 3.7V with PCM

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| Customer confirmation | Corporate name | |
| | Checked | |
| | Approved | |
| | Corporate seal | |

Signed: _____

Drafted by: _____

Approved by: _____

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SHENZHEN PKCELL BATTERY CO., LTD

Company address: E2 Building, Guangming Technology Park, No.24 Zhonghua Road, Longhua New Area, Shenzhen Guangdong, China.

(Tel): +86-755-86670672

(Fax): +86-755-86670609

E-mail: pkcell@pkcell.net

Website: <http://www.pkcell.net>

(If manufacturer want to modify the product technology specification, we won't inform you additionally)

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| PKCELL BATTERY | Document | Technical Specification Li-Polymer 401230 105mAh 3.7V with PCM | Edition | A |
| | | | Valid Date | 2014-09-09 |
| | Number | QA.S.0228 | Drafted by | Xiao li |
| | | | Signed by | Zhijiang li |

1 Scope

This document describes the performance characteristics and testing methods for Li-polymer battery produced by SHENZHEN PKCELL BATTERY CO., LTD.

2 Product type and model number

2.1 Product type

Lithium-polymer battery

2.2 Model number

LP-401230 3.7V 105mAh with PCM

3 Rated performance

Form 1: Battery rated performance

| No | Item | Rated performance | Remark |
|----|--------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Capacity | Nominal 105mAh Minimum 95mAh | 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 | 3.0V | Discharge cut-off voltage |
| 4 | Charging voltage | 4.2V | |
| 5 | Standard charge | Constant current 0.2C ₅ A Constant voltage 4.2V Cut-off current 0.01C ₅ A | |
| 6 | Quick charge | Constant current 1C ₅ A Constant voltage 4.2V Cut-off current 0.01C ₅ A | |
| 7 | Standard discharge | Constant current 0.2 C ₅ A End voltage 3.0V | |
| 8 | Maximum continuous discharge current | 1 C ₅ A | |
| 9 | Operation temperature range | Charge: 0~45°C | 60±25%R.H |
| | | Discharge: -20~60°C | |
| 10 | Cycle life | >500cycles | Charging/discharging in the below condition: Charge: standard charge Discharge: 0.2C ₅ A to 3.0V Rest time between charge/discharge: 30min Until the discharge capacity <60% of NC |
| 11 | Storage temperature | During 1 month: -5 ~ 35°C | 60±25%R.H |
| | | During 6 months: -20 ~ 45°C | |

4 Electrical performances

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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. | 3.7V |
| 2 | Discharge performance | The discharge capacity of the battery, measured with 0.2C ₅ A down to 3.0V 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 ₅ A to 3.0V (the residual capacity is above 80% of nominal capacity) | Discharge time≥4h |
| 4 | Cycle life | Charging/discharging in the below condition: Charge: standard charge Discharge:0.2C ₅ A to 3.0V Rest time between charge/discharge:30min Until the discharge capacity <60% of NC | >500cycles |

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℃ 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.

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.

7 Battery operation instruction

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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.

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.

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

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.

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 half year from the date of shipment. Pkcell guarantees to give a replacement in caseof batteries with defects proven due to manufacturing process instead of the customers abuse and misuse.

9 Other the chemical reaction

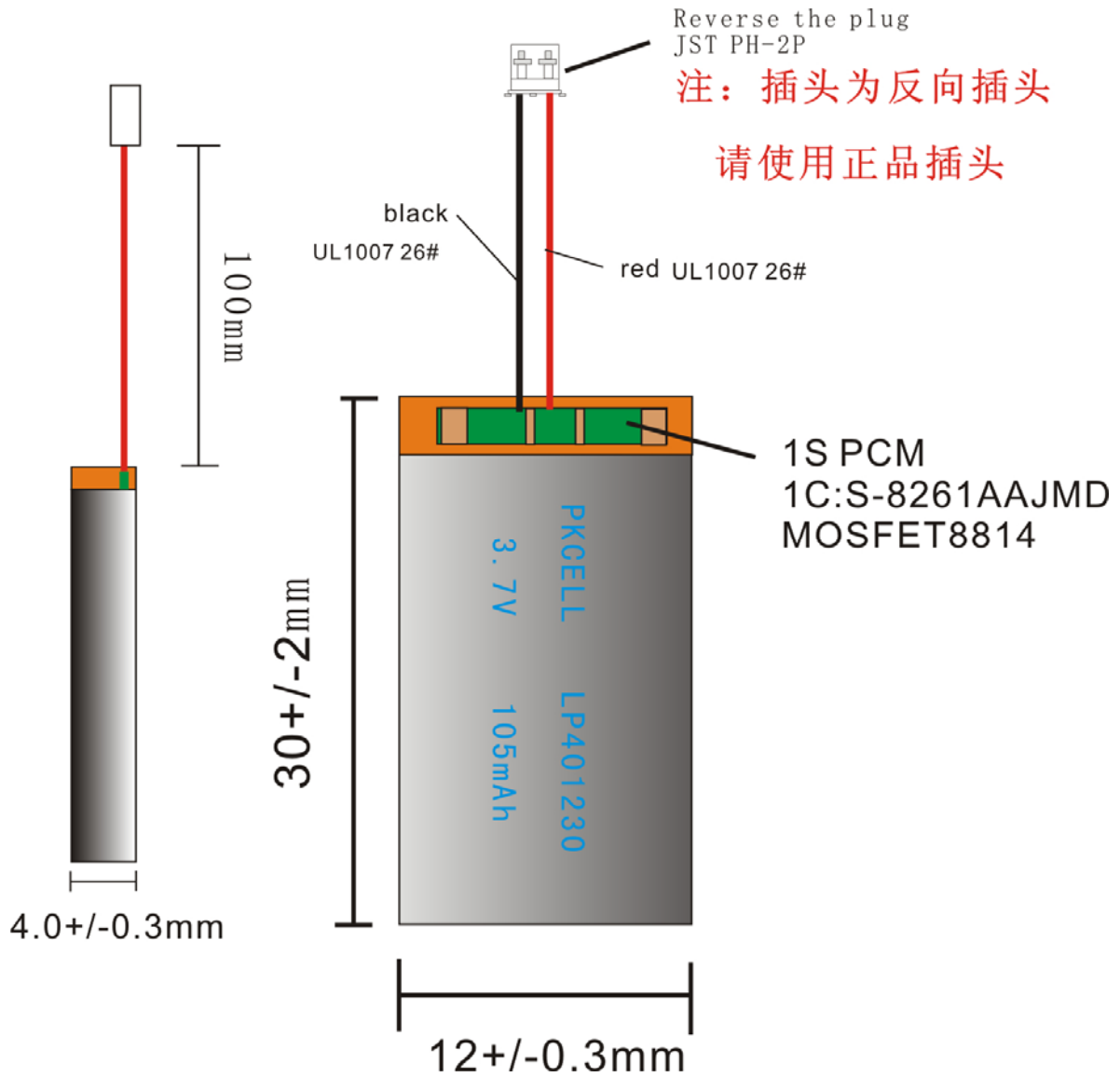
Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the 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 Battery pack drawings



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