深圳市华天通科技有限公司
SHENZHEN HUATIANTONG TECHNOLOGY CO.,LTD

# Specification For Approval

| | |
|---|---|
| Battery Model ： | **YLLR1865C2400WHTT** |
| Cell Model ： | **LR1865SK-2.6Ah** |
| Customer Name | |
| Revision | **A/1** |

| Manufacturer | | |
|---|---|---|
| Prepare/date | Check/date | Approval/date |
| | | |
| Customer Approval | | |
| Check/date | Approval/date | |
| | | |

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History of revision

| Revision/ | Date | Event | Remark |
|---|---|---|---|
| A/0 | 2024-12-06 | First issue | |
| A/1 | 2025-03-25 | 去掉“2A 充电” | |
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# Contents

## 1. Scope

The specification describes the requirements for lithium-ion battery pack supplied by HTT.

## 2. Adopted Standard

GB 31241-2014 Lithium ion cells and batteries used in protable electronic equipments-Safety technical specification.

## 3. Basic performance

| NO. | Items | Specification | | Remarks | |
|---|---|---|---|---|---|
| 1 | Nominal capacity | 2500mAh | | Standard charge & Standard discharge | |
| 2 | Minimum capacity | 2400mAh | | | |
| 3 | Grouping Mode | 1S1P | | | |
| 4 | Limited Charging Voltage | 4.2V | | | |
| 5 | Nominal Voltage | 3.65V | | | |
| 6 | Discharge Cut-off Voltage | 2.75V | | | |
| 7 | Standard Charge | 0.2C CC charge to 4.2V, then CV to 0.02C cut off | | 23±2℃ | |
| 8 | Standard Discharge | 0.2C CC Discharge to 2.75V | | 23±2℃ | |
| 9 | Max.Charge Current | 1.3A (Continued) | | 15℃～45℃ | |
| 10 | Max.Discharge Current | 2.0A (Continued) | | 0℃～60℃ | |
| 11 | Initial Impedance | ≤150mΩ | | AC 1KHZ | |
| 12 | Shipping Voltage | 3.5-3.9V | | | |
| 13 | Operating Current and Operating Temperature | Charge<br>Discharge | Temperature | Current & Voltage | |
| | | Charge Temperature: 0℃～45℃ | 0℃＜T≤5℃ | 260mA max CC to 4.2V, CV to 0.02C | |
| | | | 5℃＜T≤15℃ | 520mA max CC to 4.2V, CV to 0.02C | |
| | | | 15℃＜T≤45℃ | 1300mA max CC to 4.2V, CV to 0.02C | |
| | | Discharge Temperature:<br>-20℃～60℃ | -20℃≤T≤0℃ | 0.2C Max | |
| | | | 0℃＜T≤60℃ | 2.0A Max | |
| 14 | Storage Environment | Storage time | Temperature | Humidity | |
| | | Less than 6 month | -5 ～ +30℃ | ≤75% | |

## 4. Battery Configuration

| No. | Item | Model | Qty | Remarks |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | Cell | LR1865SK 2.6Ah | 1 | LS |
| 2 | PCM | HT3138 | 1 | |
| 3 | Plastic shell | / | | |
| 4 | Lable | / | | |

# 5. PCM Specification/PCM

## 5.1 PCM Electrical Characteristics（at 25℃）

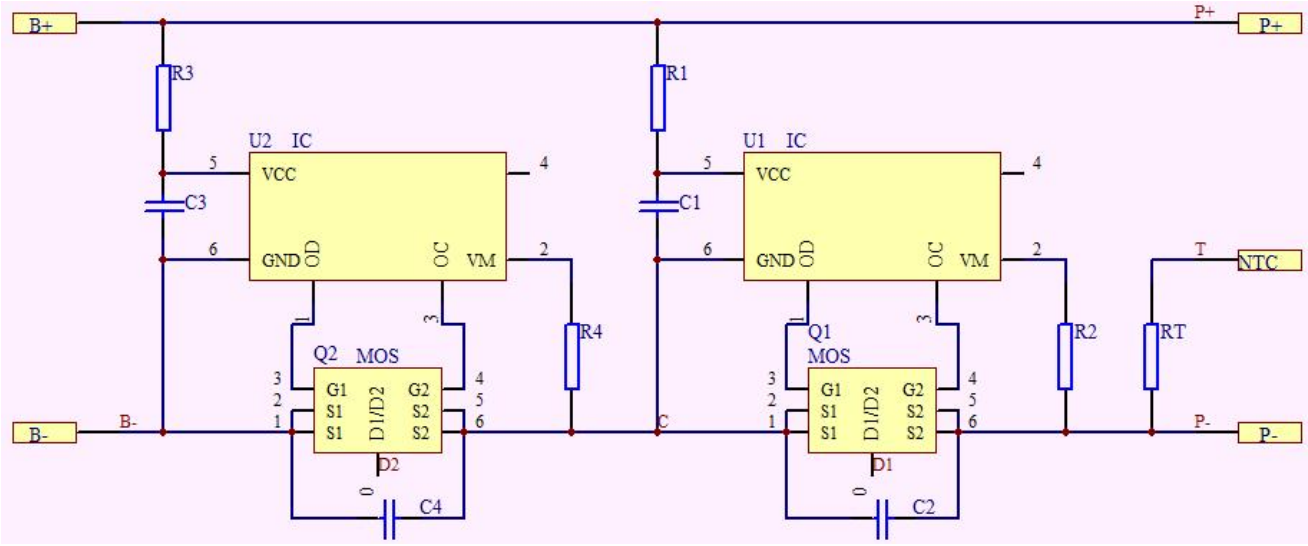
| NO. | Items | Unit. | Specification | Remarks |
|---|---|---|---|---|
| 1 | Over charge protection voltage | V | 4.28±0.03V | first |
| | | | 4.325±0.03V | second |
| 2 | Over charge release voltage | V | 4.08V±0.08V | first |
| | | | 4.075V±0.08V | second |
| 3 | Delay time for over charge protection | ms | 700～1300ms | |
| 4 | Over discharge protection voltage | V | 2.8±0.08V | first |
| | | | 2.5±0.08V | second |
| 5 | Over discharge release voltage | V | 3.0±0.10V | first |
| | | | 2.9±0.10V | second |
| 6 | Delay time for over discharge protection | ms | 89～166ms | |
| 7 | Charging over current protection current | A | 5.0-11A | |
| 8 | Charging over current protection delay | ms | 5～11ms | |
| 9 | Over current protection current | A | 5.0-11A | first |
| | | | 8.0-14A | second |
| 10 | Over current protection delay time | ms | 5～11ms | |
| 11 | Short circuit protection function | | OK | |
| 12 | Current consumption | μA | ≤10 | |
| 13 | 0V charging function | | YES | first |
| | | | NO | second |

## 5.2 Parts List

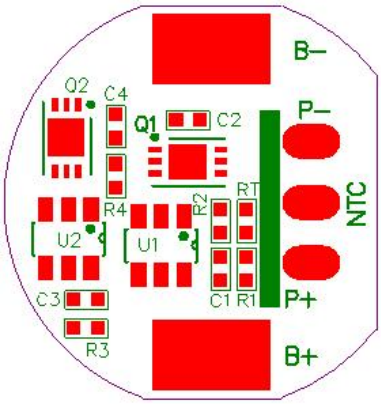
| Symbol | Parts name | Description | | Unit | Qty | Manufacturer |
|---|---|---|---|---|---|---|

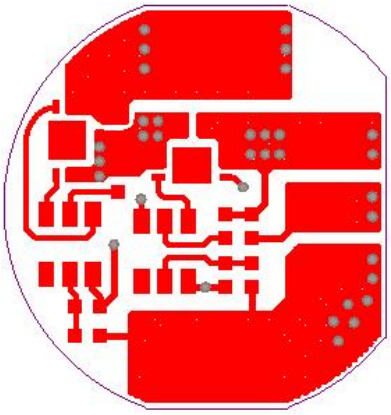
| | | | | | | |
|---|---|---|---|---|---|---|
| U1 | IC | S-8261DAX 丝印 Y1X+序号 | SOT-23-6 | PCS | 1 | |
| U2 | IC | S-8261DAC 丝印 Y1C+序号 | SOT-23-6 | PCS | 1 | |
| Q1 Q2 | MOS | CJCD2003 丝印 2003+序号 | DFN2*3-6L | PCS | 2 | |
| R1 R3 | | 330Ω±5% | 0402 | PCS | 2 | |
| R2 R4 | | 470Ω±5% | 0402 | PCS | 2 | |
| C1 C2 C3 C4 | | 0.1uF/±10%/16V | 0402 | PCS | 4 | |
| RT | | 10KΩ±1%/B=3380K | 0402 | PCS | 1 | |
| B+ B- | | 5.0*3.0*0.3mm | | PCS | 2 | |
| B+ | | 17*3*0.1mm | | PCS | 1 | |
| B- | | 83*4*0.1mm | | PCS | 1 | |
| P+ NTC P- | | | | | | |
| PCB | | HT3138 REV1.0 | | PCS | 1 | |

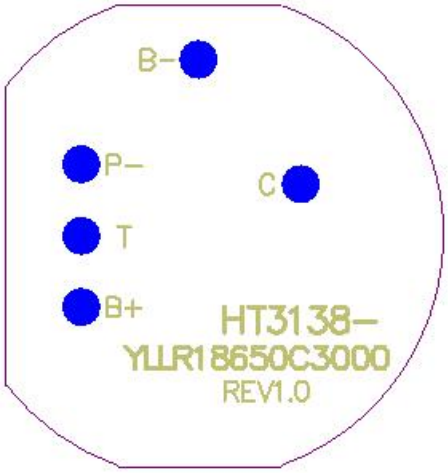
### 5.3 Circuit Diagram

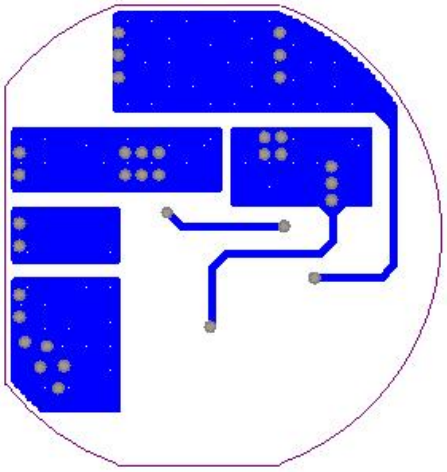



### 5.4 PCB Layout /PCB

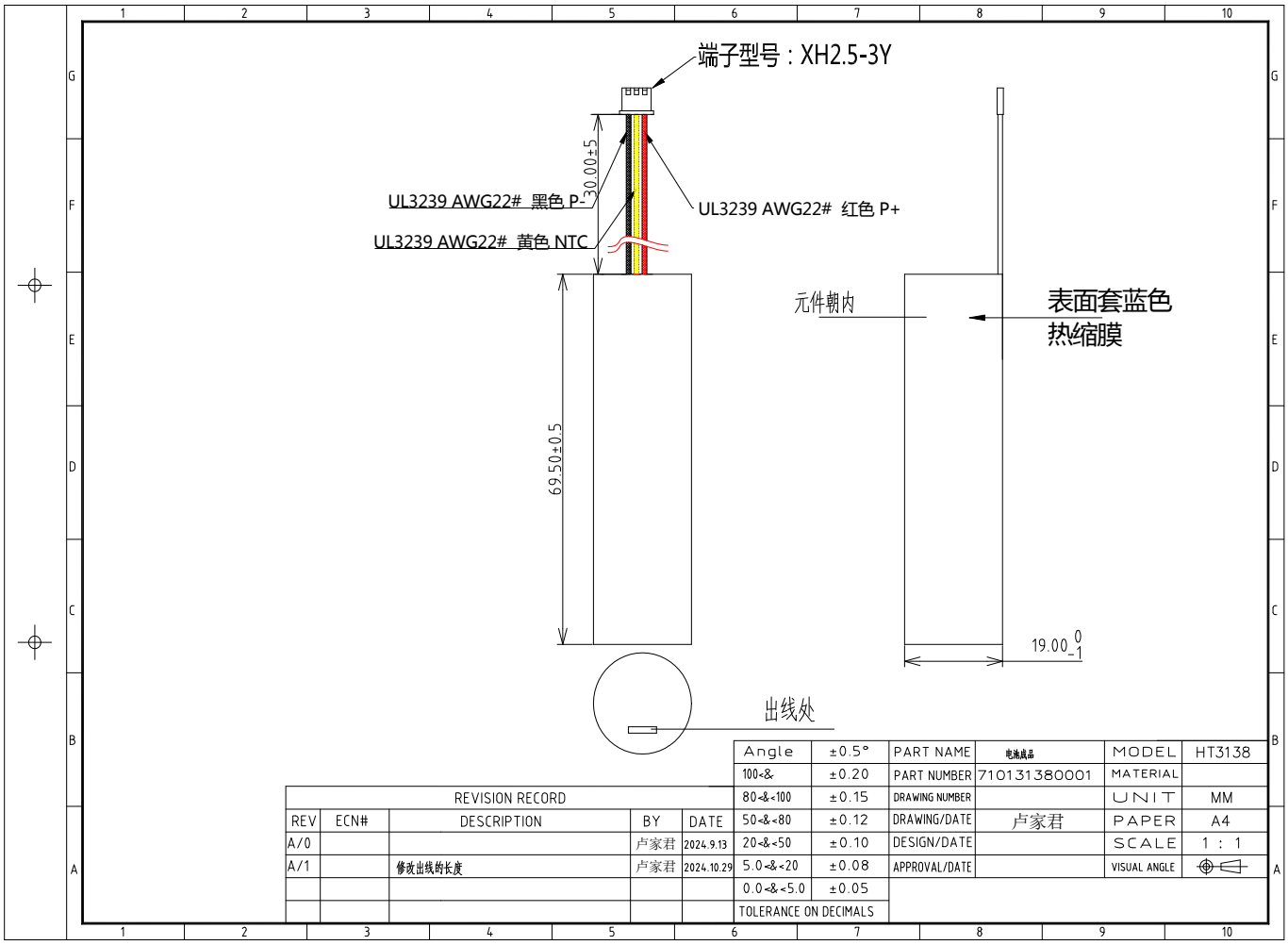

B-
P-
NTC
P+
B+
Q2
C4
Q1
C2
R4
R2
RT
U2
U1
C3
C1
R1
R3




B-
P-
C
T
B+
HT3138-
YLLR18650C3000
REV1.0



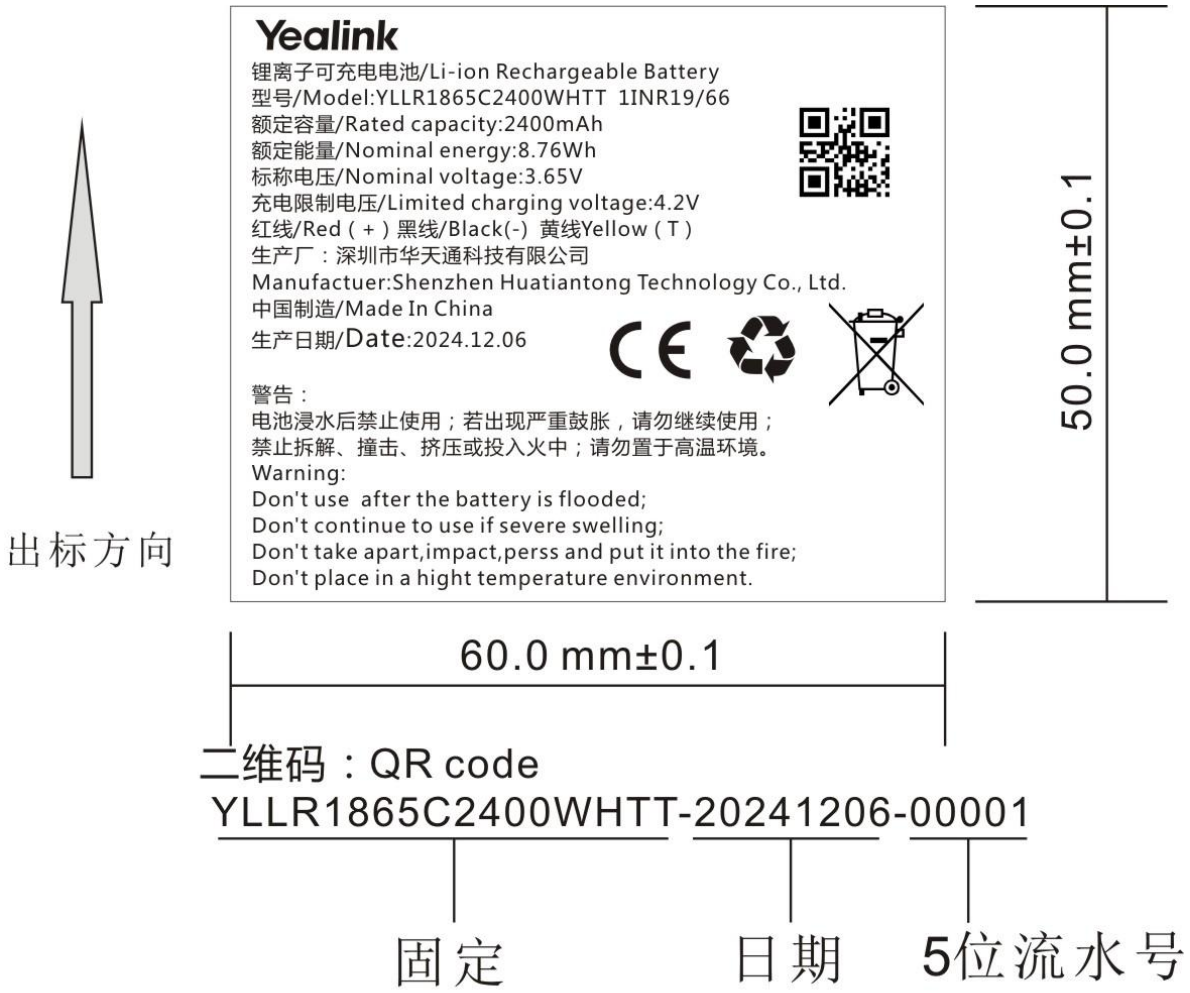
## 6. Outline Drawing




| REVISION RECORD | | | | |
|---|---|---|---|---|
| REV | ECN# | DESCRIPTION | BY | DATE |
| A/0 | | | 卢家君 | 2024.9.13 |
| A/1 | | 修改出线的长度 | 卢家君 | 2024.10.29 |
| | | | | |
| | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Angle | ±0.5° | PART NAME | 电池成品 | MODEL | HT3138 |
| 100<&< | ±0.20 | PART NUMBER | 710131380001 | MATERIAL | |
| 80<&<100 | ±0.15 | DRAWING NUMBER | | UNIT | MM |
| 50<&<80 | ±0.12 | DRAWING/DATE | 卢家君 | PAPER | A4 |
| 20<&<50 | ±0.10 | DESIGN/DATE | | SCALE | 1 : 1 |
| 5.0<&<20 | ±0.08 | APPROVAL/DATE | | VISUAL ANGLE | |
| 0.0<&<5.0 | ±0.05 | | | | |
| TOLERANCE ON DECIMALS | | | | | |

## 7. Lable

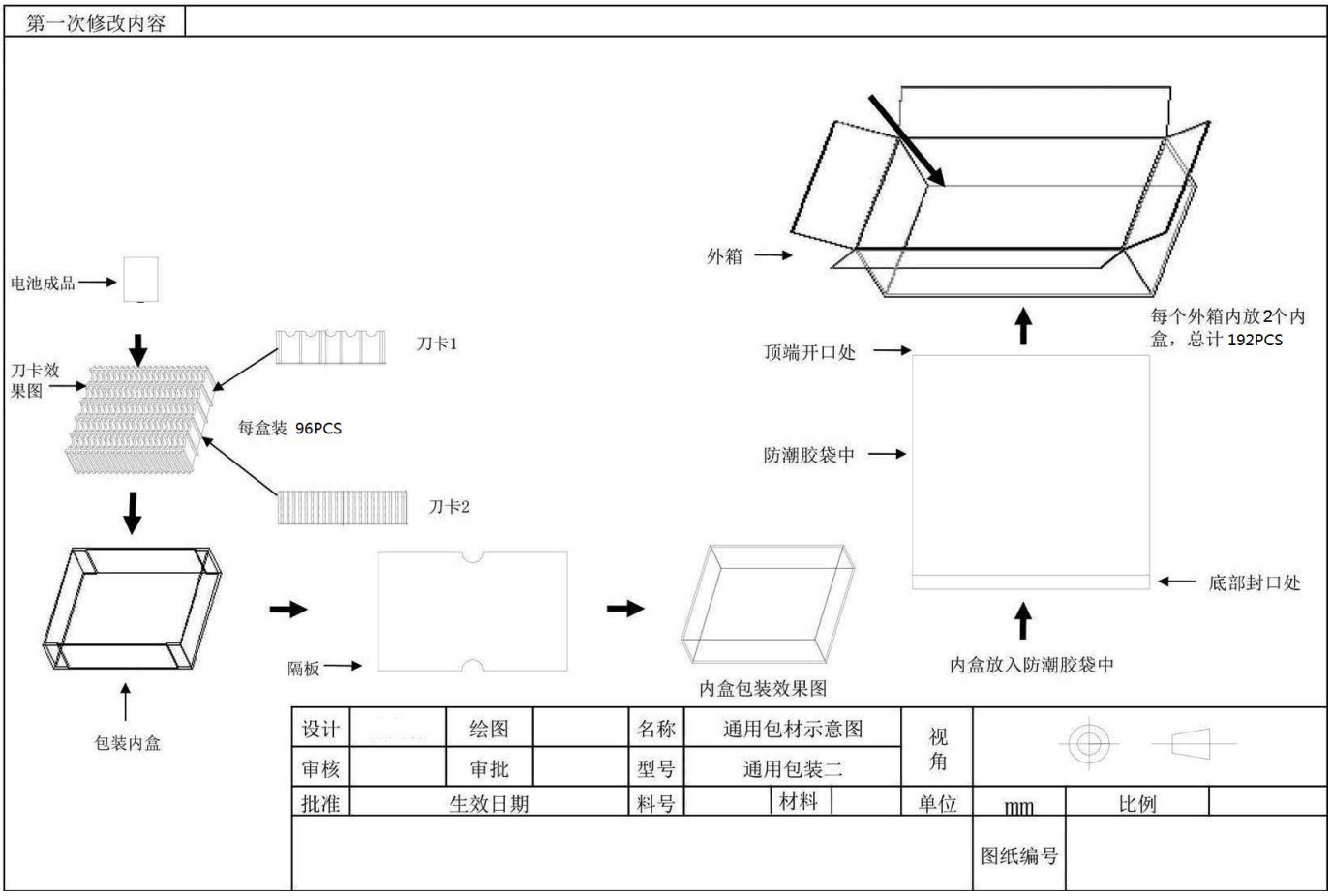



材质：合成纸+哑膜(防刮花)加粘，T=0.1mm正负0.02mm
印刷：白底黑字

## 8 Reliability Test

| Item | Inspecting Method | Standard |
|---|---|---|
| High temperature performance | When the battery has completed standard charged, it shall be put into a chamber at ( 55±2 )℃ for 2h, then discharged at 0.2C**5**A constant current to 2.75V. 。 | Discharging shall not be less than 4.75hours; and the battery appearance has no deform, no leak-out and no explosion. |
| Low temperature performance | When the battery has completed standard charged, it shall be put into chamber at ( -10±2 )℃ for 4h,then discharged at 0.2C**5**A constant current to 3.00V before it is taken out and put into the temperature of ( 23±2 )℃for 2h for its appearance check with eyes. | Discharging shall not be less than 3 hours; and the battery appearance has no deform, no leak-out and no explosion. |
| Electrical load maintenance ability | When the battery has completed standard charged, it shall be disconnected and put aside for 28 Days at (23±2)℃,then discharged at 0.2$C_5$A. | Discharging shall not be less than 4.25 hours |
| Storage performance | After charging the battery with a capacity of 40-50% at 0.2C for less than 3 months from the production date to the experimental date, it is placed in an open circuit environment with a temperature of 23 ± 3 ℃ and a humidity of 45-75% for 12 months. After the standard charging of the battery is completed, it is allowed to stand for 0.5 hours and then discharged at 0.2C to 2.75V. | Require a discharge time of ≥ 4 hours. |
| Constant Humidity&Heat Requirement | When the battery has completed standard charged,it shall be put into the (40±2) ℃ ,90%-95%RH thermos humidistat for 48h; then taken out at（23±2）℃for 2h. Check its appearance with eyes. Obtain its discharging time after it is discharged at 0.2$C_5$A to its final voltage 2.75V. | The battery appearance shall have no distortion, no explosion, no fire, no smoke and no leak-out, and its discharging time should not be less than 3hours. |
| Vibration | When the battery has completed standard charged, fixing the battery onto the vibration platform. with amplitude 0.38mm circularly scanning vibrating in the frequency of 10HZ-55HZ from three directions X、Y、Z for 30min respectively in its scanning frequency velocity 10CT/min. | No explosion<br>No fire<br>No Leakage |

| | | |
|---|---|---|
| Free Drop | When the battery has completed standard charged, the battery shall be immediately dropped from the height of 1000mm （minimum height）onto a 18mm～20mm hard board on the cement floor. Free drop one time respectively from X、Y、Z positive and negative axis(six directions). | No explosion<br>No fire<br>No Leakage |
| Overcharge Protection | When the battery is fully charged, go on loading for 7h with a twice rating voltage, 2.0C**5**A out put current, it starts the over charge protection function. | No explosion<br>No fire<br>No Leakage |
| Over discharge Protection | The battery is discharged at 0.2C**5**A in the constant current till it reaches over discharge protection voltage at （23±2）℃, connected with a 30Ω lead and discharged for 7h | No explosion<br>No fire<br>No Leakage |
| Short-circuit Protection | As the battery has completed charging, short circuit the positive and negative contacts with 0.1Ω resistor for 1h for appearance check, then disconnect the resistor between the contacts, the battery shall be charged at 1.0C**5**A mA in the constant current for 5S | No explosion<br>No fire<br>No Leakage |
| Cycle Life | Charge cell with 1.3A to 4.2V then CV to 52mA cut off;<br>Standing for 10min between charge and discharge,<br>Discharge cell with 1.3A until cell voltage reaches 2.75V.<br>Repeat to 500 cycles, record remained capacity of 500th cycle. | Capacity Retention<br>≥70% of Cmin.. |




## 9 Hazard Warning

### 9.1 Forbid Disassemble Batteries

The battery has protective component and circuit internally to avoid danger. Mishandling such as improper disassembly will destroy its protective function and make it heat, smoke, distort or burning.

### 9.2 Forbid Short-circuit Batteries

Do not touch the plus and minus contacts with metals. Do not put the battery with metal element together in either storage or movement. If the battery is short-circuit, it carries magnified current，which will cause damage and make the battery heat, smoke, distort or burning.

**9.3 Forbid heat and burn the battery**

If heating or burning the battery, it will caused the isolated element in the battery dissolved, protection function stopped or the electrode burning, over heated, which will make the battery heat, smoke, distort or burning.

**9.4 To avoid use the battery near the heat**

Do not use the battery near the fire and stove, or over 60℃, and over heating will cause the battery internal short-circuit and make it heat, smoke, distort or burning.

**9.5 Forbid bathing the battery**

Do not dampen the battery, or even immerse it in the water, which will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

**9.6 Avoid charging near fire or in the sunlight**

Otherwise, it will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

**9.7 Danger in using non-indicated chargers in**

Charging in abnormal condition, the battery will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

**9.8 Forbid directly welding on the battery**

Over-heated will cause the isolated element dissolved in the battery and losing protective function its cycle life, even will cause over-heated, distort, smoke or burning.

# 10 Cautions

## 10.1 Notice

The battery shall be prevented to be exposed in effulgence so as not to cause over-heated, distort, smoke and weaken its performance and cycle life.

## 10.2 Electro Static-free

There is a protective circuit inside the battery to prevent contingency. Do not use the battery in the Electro static circumstances, (above 1000V), for it is easily destroyed the circuit board so that the battery doses not work and causes over-heated, distort, smoke or burning.

## 10.3 Discharging Temperature Range

Recommended discharging temperature range is 0-45℃, beyond which it will result in decadence of the battery performance and shortness of its life.

## 10.4 Charging Method

Use the special chargers in the recommended charging method to charge the battery.

## 10.5 First Usage

When you use the battery for its first time, do not put it into the cellular phone or any other equipment once you find it in unusual conditions such as unclearness or odors. The battery should be returned to the vendor.

## 10.6 Children Use

When Children use the battery, they should be under their parents' instructions and superintend in use.

## 10.7 Avoid Children's Touch

Battery should keep out of the place where children in reach. Prevent children taking the battery out of the charger or the cellular phone to play.

**10.8** To avoid the leak-out liquid be exposed to the skin or clothes. If touched, please wash by clean water so as not to cause the skin uncomfortable

## 10.9 Guarantee period

Guarantee is one year since it is out of the factory. Life time:500 cycles。Any damage by incorrect use and not quality problem, even in its guarantee period, free service won't be provided by the manufacture.

**10.10** Use of the information described herein for other purposes and/or reproduction or copying without the express.