Soshine International (H.K.) CO., Limited

Library Sort	Product Specifications	VER	A
Library Name	Li-ion Rechargeable Battery	Date	2013/06/05

Li-ion Battery

Specification

Model: 18650P-3.7-2900

Prepared	Auditing	Approved
WUYJUN	LVCHENGXUN	SILING
2013.06.01	2013.06.03	2013.06.05

Soshine Soshine International (H.K.) CO., Limited

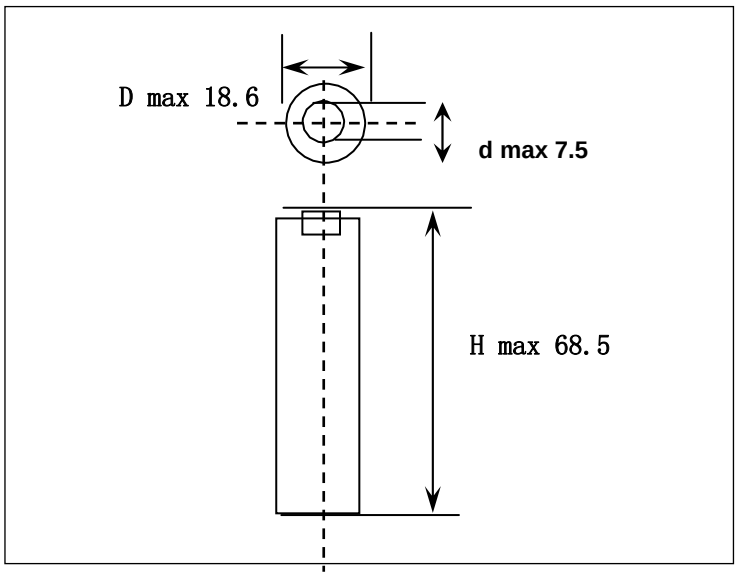
Library Sort	Product Specifications	VER	A
Library Name	Li-ion Rechargeable Battery	Date	2013/06/05

1. Primary technical Parameters

Type	Rechargeable Lithium-ion
Model	18650P-3.7-2900
Dimension	D18.6,H68.5d7.5
C_5mAh	2950
C_5mA	2950
Nominal Voltage	3.7V
Capacity	Nominal 2950mAh Minimum 2850mAh when discharged at 0.2C_5mA to 2.65V
Charging Conditions	0.2C_5mA charge termination control parameters taper current 0.01C_5mA at4.2V
Service Life	300cycles（≥60% C_5mAh,0.2C discharge）
Weight	＜ 52
Charging Voltage	4.2±0.03V
Protection Circuit Module	Over Voltage Limit: 4.275 +/- 0.04 V Under Voltage Limit: 2.5 +/- 0.5 V Over Current Protection: 4A~ 5A Max. Quiescent Drain: 7 μA
Cell protected	PTC (Positive temperature coefficient device) protect against over temperature and indirectly over current and will automatic reset CID (Current interrupt device) pressure valve, will disable the cell permanently if the pressure is to high in the cell (Can be due to over charge).
Ambient Temperature Range	Charging : 0～+45℃ Discharging :-20～+60℃ Storage :-20～+50℃

Subject to change without prior notice

Dimension (mm)



Library Sort	Product Specifications	VER	A
Library Name	Li-ion Rechargeable Battery	Date	2013/06/05

2 Characteristics

2.1 Standard Charge This "Standard Charge" means charging the cell with charge current 1450mA and constant voltage 4.2V at 25℃ for 3hours.

2.2Standard Discharge Capacity The standard discharge capacity is the initial discharge capacity of the cell, which is measured with discharge current of 570mA with 2.75V cut-off at 25℃ within 1hour after the standard charge. Standard Discharge Capacity ≥ 2850mAh

2.3 Initial internal impedance
Initial internal impedance measured at AC 1kHz after rated charge.
Initial internal impedance ≤ 160mΩ

2.4 Temperature Dependence of Discharge Capacity
Capacity comparison at each temperature, measured with discharge constant current 570mA and 2.75V cut-off after the standard charge is as follows.
Note: If charge temperature and discharge temperature is not the same, the interval for temperature change is 3 hours. Charge Temperature Discharge temperature
25℃ -10℃ 0℃ 25℃ 40℃
Relative Capacity 50% 80% 100% 80% Percentage as an index of the capacity at 25℃(=2850mAh) is 100%.

2.5 Temperature Dependence of Charge Capacity
Capacity comparison at each temperature, measured with discharge constant current 570mA and 2.75V cut-off after the standard charge is as follows.
Note: If charge temperature and discharge temperature is not the same, the interval for temperature change is 3 hours.
Percentage as an index of the capacity at 25℃(=2850mAh) is 100%.

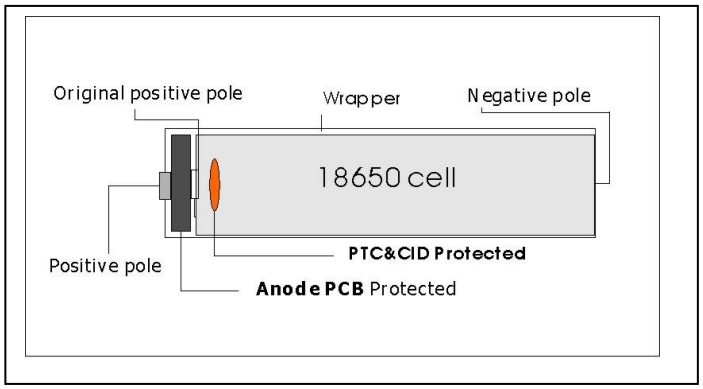
2.6 Charge Rate Capabilities
Discharge capacity is measured with constant current 570mA and 2.75V cut-off after the cell is charged with 4.2V as follows.
Note: Percentage as an index of the capacity at 25℃(=2850mAh) is 100%.

2.7 Discharge Rate Capabilities
Discharge capacity is measured with the various currents in under table and 2.75V cut-off after the standard charge.
Note: Percentage as an index of the capacity at 25℃(=2850mAh)

Soshine Soshine International (H.K.) CO., Limited

Library Sort	Product Specifications	VER	A
Library Name	Li-ion Rechargeable Battery	Date	2013/06/05

Protection



3 Polymer Li-ion Battery Pack Characteristics

Test item	Test conditions	Requirements
(1)Outside Appearance	Visual check	No abnormal stain, Deformation nor damage
(2) Standard test conditions	Measurements are carried out at 20±5℃ and relative humidity of 65 ± 20% without other specified condition. Accuracy of voltmeters and ammeters used in test is equal to or better than the grade 0.5.	
(3) Full charge	Cells shall be charged continuously at the constant current 1.45A to 4.2V, then charge at the constant voltage of 4.2V until the end current of 0.01C_5mA	
(4)Standard discharge	Cells shall be discharged continuously at the constant current of 0.29A to 2.75V	
(5) Open-circuit voltage (OCV)		≥3.7V
(6)Rated Capacity	Cells shall be charged in Item (3) and discharged in Item (4) within 10minutes after full charged. If the discharge duration does not reach the specified value, the test may be repeated up to three times in total.	Rated capacity: ≥2850mAh
(7) Cycle Life (20℃)	Cells shall be charged continuously at the constant current of 0.2C_5mA to 4.2V and discharged continuously at the constant current of 0.2C_5mA to 2.75V. A cycles defined as one charge and discharge .carry out cycles until discharge capacity <60% C_5mAh	≥300 cycles

Library Sort	Product Specifications	VER	A
Library Name	Li-ion Rechargeable Battery	Date	2013/06/05

4 Safety Evaluation :

When Li-ion rechargeable batteries are used on above the permit voltage or current, electrolyte may disassemble, this case will affect safety performance of Li-ion rechargeable batteries. So protection circuit module were used in order to prevent overcharge 、over discharge and over current .

PCM Model：SOSHINE18650-2800

Safety behavior

3.1 Short circuit behavior

The battery pack is short circuited with a 200 mΩ load.

The battery current must not exceed 30 A and the link must be cut in less than 20 ms.

3.2 Over charge protection

The battery is charged at 1C without voltage regulation. The safety IC of the battery must cut the link when battery voltage reaches (4.275 ±0.10)V

The Safety IC must keep the link cut until battery voltage becomes lower than (4.075 ±0.10)V. Then the charge must be possible

3.3 Over discharge protection

The battery is discharged at 1C until 2.50V / cell. The safety IC of the battery must cut the link when battery voltage reaches (2.50±0.10)V

The MOSFET will remain closed until the battery voltage rises above the value of (2.90+/-0.10)V and a charge current is detected.

3.4 Over current protection

The aim of this test is to check the Over current protection when there is a excess discharge current.

The safety IC (protection circuit) should trip at(5.3±0.5)A (depending to the IC used).

The battery resets after load if removed.

Test Item	Test Conditions	Requirements	Requirements
(1) Overcharge	Cells shall be charged in Item 1(3), then charged at 285mA current with a voltage limit of 6.6V. charging is continued for 8 hours.	Protection voltage: 4.275±0.04V	No fire, Nor explosion
(2)Over discharge	Cells discharged continuously at the constant current of 570mA to 2.75V, then connect cells terminals with 30Ω. Discharging is continued for 24 hours	Protection voltage: 2.65±0.08V	No fire, Nor explosion

(3)Over current	Cells shall be charged in Item 1(3), then charge current is to be raised at a rate of 0.2A per second until the battery pack is protective cut-off.	Protection current: 4-5A	No fire, Nor explosion
(4)Short Circuit Test	Cells shall be charged in Item 1(3), Connect battery terminals with electric wire (electric resistance: 0.2Ω or less), continued for 1 hours		No fire, Nor explosion

5. Duration of Guarantee the Product

We can keep on the quality in six month. In order to keeping on the quality of the batteries, it's need to charge and discharge once every three months.

6. Cell Condition at the Shipment

To be determined (Recommendation Approx. ≥3.7V about 50% charged state)

7. Storage

Far from the fire and the high temperature.

8. Handling Precautions

To assure product safety, describe the following precautions in the instruction manual of the equipment.

! Danger

- Do not heat or throw battery into a fire.
- Do not use, leave battery close to fire or inside of a car where temperature may be above 60℃. Also do not charge / discharge in such conditions.
- Hairpins, coins, or screws. Do not store batteries with such objects.
- Do not short circuit the (+) and (-) terminals with other metals.
- Do not place battery in a device with the (+) and (-) in the wrong way around.
- Do not hit with a hammer, step on or throw or drop to cause strong shock.
- Do not disassemble or modify the battery.
- Do not solder a battery directly.
- Do not use a battery with serious scar or deformation.

! Warning

- Do not use battery with dry cells and other primary batteries, or batteries of a different package, type, or brand.
- Stop charging the battery if charging is not completed within the specified time.

Library Sort	Product Specifications	VER	A
Library Name	Li-ion Rechargeable Battery	Date	2013/06/05

During use, charge, or storage.

- Keep away from fire immediately when leakage or foul odor is detected.
- If liquid leaks onto your skin or clothes, wash well with fresh water immediately.

If liquid leaking from the battery 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.
- Batteries have life cycles. If the time that the battery powers equipment becomes much shorter than usual, the battery life is at an end. Replace the battery with a new same one.
- Remove a battery whose life cycle has expired from equipment immediately.
- When the battery is thrown away, be sure it is non-conducting by applying vinyl tape to the (+) and (-) terminals.
- When not using battery for an extended period, remove it from the equipment and store in a place with low humidity and low temperature.
- While the battery pack is charged, used and stored, keep it away from objects or materials with static electric charges.
- The battery can be used within the following temperature ranges. Do not exceed these ranges.
  Charge temperature range : 0℃ to 45℃
  Discharge temperature range : -20℃ to 60℃
  (When using equipment)