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Polymer Lithium Ion Battery Specifications

Model: SFP-042255

Draft	
Checked	
Approval	

Specifications for SFP-042255

Contents

Note: This specification is valid for 6 months from the date of release. Because of the corresponding process changes and other factors that leads to the changes in the specifications, the product specifications should be assistant with new subjects.

Specifications for SFP-042255

1 **Scope**

This product specification is applied for SFP-042255 polymer Lithium ion battery of the Manufacturer,which must be tested in according to the methods in this secification strictly. Please contact the Manufacturer if has any dissent of the testing project or methord.

2 **Product and Model Name**

2.1 Product：Polymer Lithium Ion Battery

2.2 Model Name：FSP 042255

3 **Ratings**

Item		Rating	Note
3.1 Capacity	Standard	20mAh	Discharge:0.2CmA (4mA)cut off Voltage:2.75V for cell
3.2 Nominal Voltage		3.7V	
3.3 AC Impedance Resistance		≤700mΩ	
3.4 Discharge Cut-off Voltage		2.75V	
3.5 Charge Current		10mA	Standard Charge
3.6 Charge Voltage		4.2V	
3.7 Max. Charge Voltage		4.25V	
3.8 Charge Time		Approx 5.5h	Charge:4mA
3.9 Max. Charge Current		20mA	1.0CmA
3.10 Max. Discharge Current		20mA	1.0CmA
3.11 Weight		Approx 1g	
3.12 Operating Temperature	Charge	0~+40℃	relative humidity:45%～75%
	Discharge	0~+45℃	
3.13 Storage Temperature	<1months	0~+40℃	Recommended storage temperature: 25℃,at theshipment state
	> 6 months	0~+30℃	

4 **Outline Dimensions and Appearance**

4.1 Outline Dimensions

See attached drawing for SFP-042255(Fig.1).

Thickness：0.45mm MAX. (Measured with weighting 300gf at 25±5℃)

Width：22.5mm MAX.（Measured with weighting 300gf at 25±5℃）

Length：55.5mm MAX.（not including tabs）

This thickness will be swelling when high temperature storage or operation in high temperature.

4.2 Appearance

There shall be no such defect as scratch, flaw, crack, rust, leakage, which may adversely affectcommercial value of battery.

Specifications for SFP-042255

5 Performance

5.1 Standard Test Conditions

Test should be conducted with new batteries within half a month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measureent shall be done under temperature of 25±5 ℃ and relative humidity of 45~85%. The test results are not affected evidently by such conditions of temperature 25±5℃ or humidity 45%~75%RH.

5.2 Measuring Instrument or Apparatus

5.2.1Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or moreprecision scale of 0.01mm.

5.2.2Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10 M Ω.

5.2.3Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01 Ω.

5.2.4Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method(1kHz LCR meter).

5.3 Standard Charge 25±5 ℃

Test procedure and its criteria are referred as follows:

0.2CmA=4mA

Standard Charging: Constant current charging at 0.2CmA (4mA) to 4.2V, then constant voltage charging at 4.2V to cut-off current ≤0.02CmA(0.4mA), time≤6hours.

5.4 Rest Period

Unless otherwise defined, 30min,rest period after charge,30min,rest period after discharge.

5.5 Initial Performance Test

Item	Measuring Procedure	Requirements
(1) Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	≥4.10V
(2) AC Impedance Resistance	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 25±5℃.	≤700mΩ
(3) Minimum Capacity	The capacity on 0.2CmA(4mA)discharge shall be measured after standard charge at 25±5℃(specified CS).	CS≥20mAh

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5.6 Electrical Performance

5.6.1 Temperature Dependence of Capacity (Discharge)

Cells shall meet the discharge capacity requirements listed in the below table under respective discharge temperatures. The capacities are to be measured with constant discharge current 0.2CmA (2.75V cut-off) after standard charge at 25 ±5℃.

Discharge Temperature	0℃	25℃	45℃
Discharge Capacity	≥50%	100%	≥95%

5.6.2 Cycle Life

30min rest period after standard charge, 0.2CmA discharge to a cut-off voltage of 2.75V, 30min rest period, the capacity shall be measured after 300 cycles of standard charge and 0.2CmA discharge to a cut-off voltage of 2.75V at 25±5℃.

Capacity ≥14mAh

5.6.3 Shelf Life

Item		Measuring Procedure	Requirements
Storage Characteristi-cs 1	1	The capacity on 0.2CmA discharge shall be measured after standard charge and then storage at 25 ±5℃ for 30 days.	Remaining Capacity≥ 85% CS
	2	After above measured Remaining capacity, the capacity on 0.2CmA discharge shall be measured after 0.2CmA charge.	Recovery capacity≥90% CS
Storage Characteristi-cs 2	1	The capacity on 0.2CmA discharge shall be measured after standard charge and then storage at 60 ±2℃ for 7 days.	Remaining Capacity≥ 60% CS
	2	After above measured Remaining capacity, the capacity on 0.2CmA discharge shall be measured after 0.2CmA charge.	Recovery capacity≥80% CS

5.6.4 Long Time Storage Characteristics

New battery,after about half charge after a period of storage at 25 ±5℃ no more than 3 months (storage 180 days without load at 25±5 ℃). The remaining available capacity is ≥80% CS. The capacity is determined with the capacity of the by the most of preceding three cycles.(0.2CmA charge or discharge)

5.7 Mechanical Performance

Item	Measuring Procedure	Requirements
Vibration test	After standard charge, the battery is to be tested as following conditions: Amplitude:0.8mm Frequency:10~55Hz(sweep:1Hz/min) Direction: X/Y/Z axis for 90~100min. The battery is to be tested in three mutually perpendicular to each axis.	No fire, no explosion, no smoking is obtained.
Drop Test	Drop the battery in the shipment condition(full-charge)from 1m height onto 5cm or thicker concrete with p-tile on it 3 times each of X, Y, and Z directions at 25±5℃	No fire, no explosion, no smoking is obtained.

6 **Handling Instructions**

Read and observe the following warnings and precautions to ensure correct and safe use of Li-ion batteries.

Danger!

Failure to observe the following precautions may result in battery leakage, overheating, explosion and /or fire.

— Do not immerse the battery in water or allow it to get wet.
— Do not use or store the battery near sources of heat such as a fire or heater.
— Do not use any chargers other than those recommended.
— Do not reverse the positive(+) and negative(-) terminals.
— Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
— Do not put the battery into a fire or apply direct heat to it.
— Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
— Do not carry or put the battery together with necklaces, hairpins or other metal objects.
— Do not strike, throw or subject the battery to sever physical shock.
— Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
— Do not directly solder the battery terminals.
— Do not attempt to disassemble or modify the battery in any way.
— Do not recharge the battery near a fire or in extremely hot conditions.

6.1 PCM design

The cell/battery pack shall be with a PCM that can protect cell/battery pack properly.

The overcharge threshold voltage should not be exceed 4.3V

The over-discharge threshold voltage should not be lower than 2.2V

The PCM should have short protection function built inside.

6.2 Points for attention in processing and assembling

6.2.1 Prohibit bending the electrical core: especially including the edge banding of the tab.

6.2.2 Prohibit repeating bending the tab: process no more than 2 times generally.

6.2.3 Prohibit repeating folding the aluminum-plastic film of the side of the electrical core.

6.2.4 Prohibit heating and welding the tab for long: less than 3s commonly, to blow air quenching after welding immediately otherwise it will be lead to melt adhesive.

6.2.5 Prohibit hard matters (particularly condyloma, including tab) stabbing,needling and knocking at cells.

6.2.6 Prohibit pulling the tab fiercely (especially positive transgenic nickel belt lugs) : avoid the rolling textures pulling the tab.

6.2.7 Prohibit throwing the electrical core, move gently and avoid the core falling.

6.2.8 Prohibit to short circuit the electrical core: avoid any anomalous that cause the electrical core short circuit,such as not to put the electrical core at metal mesa; not to mixed the metal objects with the electrical core;not to put the electrical core irregularly.

6.2.9 Prohibit storing the electrical core in vacuum,if customers have the requirements, please consult with Xingke Professional Li-ion Battery Co.,ltd.

6.2.10 Prohibit installing positive and negative electrode in an opposite direction.

6.2.11 Prohibit extruding the electrical core: avoid the rolling texture extruding the design of assembling fiercely.

6.2.12 Be sure the insulation structure of the electrical core and the fender 、 used electric apparatus: particularly pay more attention to avoiding the hidden trouble of aluminum-plastic film contacted with anode when machining and assembling structure of cell, otherwise it may lead to weeping and flatulence.

6.2.13 Pay attention to avoiding electronic components bumping in assembly position withstood electrical core lest it stabbing the electrical core.

6.2.14 Pay attention to matching of electrode types、 capacities and working current with the used electric apparatus.

6.2.15 Pay attention to selecting slight fever charger when choosing the electrical core contacting with charger irectly lest it charging under high temperature condition.

Warning!

Failure to observe the following precautions may result in battery leakage, overheating, explosion and/ or fire.

— Do not place the battery in a microwave oven or pressurized container.

— Do not use the battery in combination with primary batteries(such as dry-cell batteries) or batteries of different capacity, type or brand.

— Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.

— Keep the batteries out of the reach of children. If a child somehow swallows a battery , seek medical attention immediately.

— If the battery leaks or emits an odor, immediately remove it from the proximity of any exposed flame. The leaking electrolyte can ignite and cause a fire or explosion.

— If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.

Caution!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.

Use the battery only under the following environmental conditions. Failure to do so can result in reduced performance or a shorten service life. Recharging the battery outside of these temperatures can cause the battery to overheat, explode or catch fire.

Operating environment:

When charging the battery: 0℃～45℃

When discharging the battery: -20℃～60℃

When stored up to 30 days: -20℃～45℃

When stored up to 90 days: -20℃～35℃

In cases where children use the battery, instruct them on the contents of the user’s guide and keep an eye on them to ensure that the battery is being used correctly.

If the battery leaks and electrolyte gets your skin or clothing, immediately rinse the affected area with clean running water. If left as is, skin inflammation can occur.

For directions on battery installation and removal, read the instruction manual that accompanies the equipment in which the battery will be used.

If a device is not used for an extended period, the battery should be removed and stored in a cool, dry place. Otherwise, resting or reduced performance may occur.

If the terminals of the battery are dirty, wipe them clean with dry cloth before use. Otherwise, solid electrical contact may not be charged with the equipment, and this can cause power outages or charging to fail.

7 **Period of Warranty**

The period of warranty is one year from the date of shipment. Guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customers abuse and misuse.

8 **Shipment**

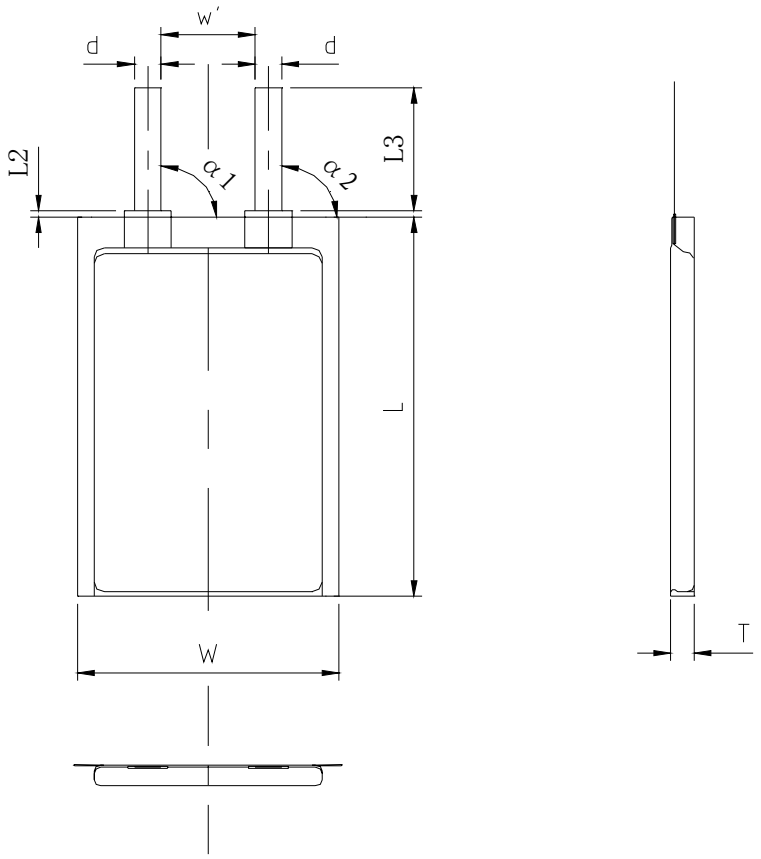
Partial charged condition.

9 **Amendment of this Specification**

This specification is subject to change with prior notice.

Specifications for SFP-042255

10 Dimensional Drawing of SFP-042255



Item	Specifications
T（MAX）	0.45mm
W（MAX）	22.5mm
L（MAX）	55.5mm
L2	1.25±1.0mm
L3	3.75±0.25mm
W'	5±1.5mm
d	3.5±0.25mm
a1	90±5°
a2	90±5°