

Specification For Approval

客户承认书

Type: Li-ion polymer

类型: 聚合物锂离子电池

Model No.型号: SN-Li-P 682940 3.7V 800mAh

CUST NO.客户编号:

SANIK NO.新力编号:

DATE 日期:

Draw 制作		
Check 审核	Packing Technology Dept.工艺科	
	Quality Control Dept.品质部	
	Technology Dept.技术部	
Approve 批准		
Customer Approval		

SANIK

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History of specification

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1. Scope

The specification shall be applied to Li-ion polymer rechargeable battery of SN-Li-P 682940 3.7V 1100mAh, which is manufactured by SANIK Battery Co.,Ltd .

2. Specification

NO	Items	Criteria	Remarks
2.1	Weight (g)	Approximate15g	
2.2	Typical Capacity	800mAh	0.2C charge and 0.2C discharge for cut-off voltage
	Minimum Capacity	776mAh	
2.3	Nominal Voltage	3.70V	
2.4	Internal Impedance	$\leq 80\text{m}\Omega$	AC 1KHz after standard charge
2.5	Charge voltage	4.20V	
2.6	Standard charge current	0.2C	CC/CV
2.7	Max. charge current	1C	
2.8	Standard dis-charge current	0.2C	
2.9	Max. discharge current	1C	
2.10	Discharge cut-off voltage	2.75V	
2.11	Operating Temperature	0~+45°C	Charging
		-20~+60°C	Discharging
2.12	Storage Temperature	within 1 month: -5 °C~+45°C	Relative humidity: 65±20%RH
		within 3 months: -5 °C~+35°C	
		within 6 months: 0 °C~+35°C	

3. Battery Performance Criteria

3.1 Appearance

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

3.2 Measurement Apparatus

(1) Dimension Measuring Instrument

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

(2) Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10 K Ω /V.

(3) Ammeter

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

(4) Impedance Meter

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

3.3 standard Test Condition

Test should be conducted with new batteries within one 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 measurement shall be done under temperature of $20 \pm 5^{\circ}\text{C}$ and relative humidity of 45~85%.

3.4 Standard Charge

Full charge condition: Constant current 0.2C, Constant voltage 4.2V for 6.0hours in all at $25 \pm 2^{\circ}\text{C}$.

3.5 Electrical Performance

3.5.1 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 300mA (2.75V cut-off) after standard charge at $25 \pm 2^{\circ}\text{C}$.

Discharge Temperature	-20 $^{\circ}\text{C}$	25 $^{\circ}\text{C}$	60 $^{\circ}\text{C}$
Discharge Capacity	50%	100%	90%

3.5.2 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 discharge at $25 \pm 2^{\circ}\text{C}$.

Capacity \geq 80%

3.5.3 Shelf Life

Item	Measuring Procedure		Requirements
Storage Characteristics 1	1	The capacity on 0.5CmA discharge shall be measured after standard charge and then storage at $25\pm 2^{\circ}\text{C}$ for 30 days.	Remaining Capacity $\geq 85\%$
Storage Characteristics 2	1	The capacity on 0.5CmA discharge shall be measured after standard charge and then storage at $60\pm 2^{\circ}\text{C}$ for 7 days.	Remaining Capacity $\geq 60\%$
	2	After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge.	Recovery capacity $\geq 80\%$

3.6 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, is obtained.
Drop Test	Drop the battery in the shipment condition from 1m height onto 5cm it 3 times each of X, Y, and Z directions at $25\pm 2^{\circ}\text{C}$	No fire, no explosion, is obtained.

3.7 Safety Performance

Item	Condition	Criteria
Short circuiting Test	After standard charge (Section 4.4),the battery shall be subjected to a short-circuit condition with a wire of resistance less than $100\text{m}\Omega$ (The cell temperature shall not exceed 150°C)	No fire, no explosion, is obtained.
High temperature test	Leaving the battery at 85°C for 4hours after standard charge	No fire, no explosion, is obtained. Capacity $\geq 80\% \text{C}5$
Heating Test2	A battery is to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of $5\pm 2^{\circ}\text{C}/\text{min}$ to a temperature of $130\pm 2^{\circ}\text{C}$ at which temperature the oven is to remain for 30 minutes before the test is discontinued.	No explosion, no fire.

3.8 Rest Period

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

4. Storage and Others

4.1 Long Time Storage

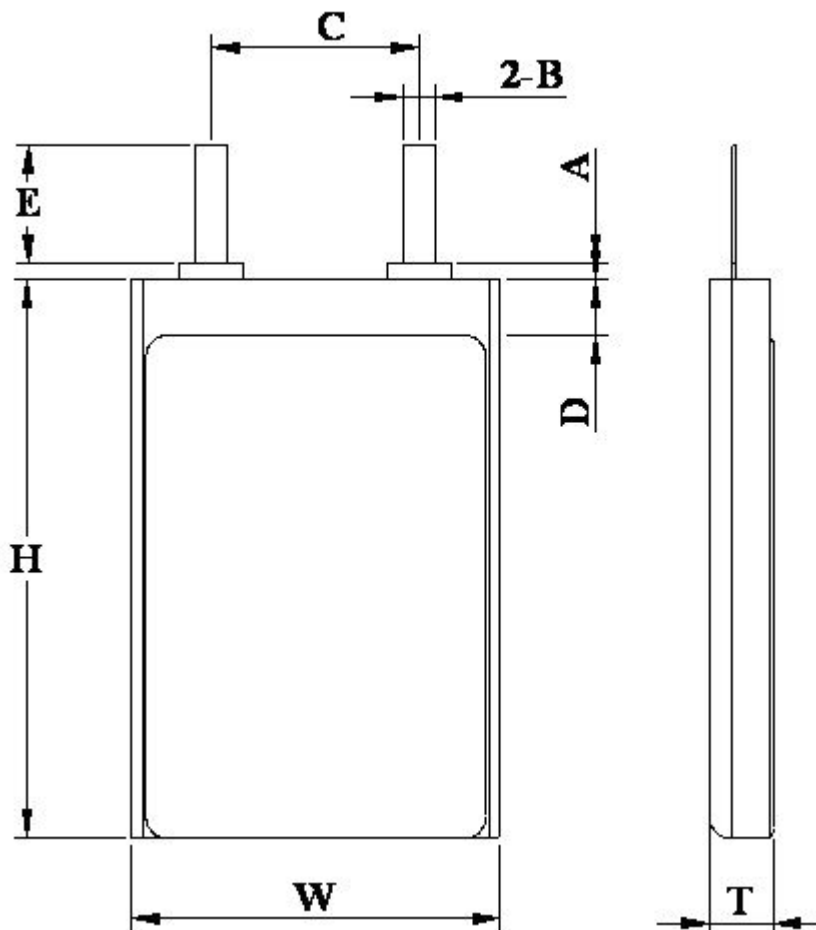
If stored for a long time(exceed three months), the cell should be stored in drying and cooling place. The cell's storage voltage should be 3.7~3.9V and the cell is to be stored in a condition as No. 4.

4.2 Others

Any matters that this specification does not cover should be conferred between the customer and SANIK.

5. Battery graphics

Items	Description	Dimension and Spec
T	Thickness	Max 7.0mm
W	Width	Max 30.0mm
H	Height	Max 41.0mm



Appendix

Handling Precautions and Guideline For LIP (Lithium-Ion Polymer) Rechargeable Batteries

Preface

This document of 'Handling Precautions and Guideline LIP Rechargeable Batteries' shall be applied to the battery cells manufactured by Foshan SANIK Battery Co.,Ltd

Note (1) :

The customer is requested to contact Foshan SANIK Battery Co.,Ltd. in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

Note (2) : 声明二

Foshan SANIK Battery Co.,Ltd. will take no responsibility for any accident when the cell is used under other conditions than those described in this Document.

1 Charging

1.1 Charging current

Charging current should be less than maximum charge current specified in the Product Specification. Charging with higher current than recommended value may cause damage to cell electrical, mechanical, and safety performance and could lead to heat generation or leakage.

1.2 Charging voltage

Charging shall be done by voltage less than that specified in the Product Specification (4.2V/cell). Charging beyond 4.30V, which is the absolute maximum voltage, must be strictly prohibited. The charger shall be designed to comply with this condition.

It is very dangerous that charging with higher voltage than maximum voltage may cause damage to the cell electrical, mechanical safety performance and could lead to heat generation or leakage.

1.3 Charging temperature

The cell shall be charged within 0°C~45 °C range in the Product Specification.

1.4 Prohibition of reverse charging

Reverse charging is prohibited. The cell shall be connected correctly. The polarity has to be confirmed before wiring. In case of the cell is connected improperly, the cell cannot be charged. Simultaneously, the reverse charging may cause damaging to the cell which may lead to degradation of cell performance and damage the cell safety, and could cause heat generation or leakage.

2 Discharging

2.1 Discharging current

The cell shall be discharged at less than the maximum discharge current specified in the Product Specification. High discharging current may reduce the discharging capacity significantly or cause over-heat.

2.2 Discharging temperature

The cell shall be discharged within -20°C~60°C range specified in the Product Specification.

2.3 Over-discharging

It should be noted that the cell would be at an over-discharged state by its self-discharge characteristics in case the cell is not used for long time. In order to prevent over-discharging, the cell shall be charged periodically to maintain between 3.7V and 3.9V.

Over-discharging may cause loss of cell performance, characteristics, or battery functions.

The charger shall be equipped with a device to prevent further discharging exceeding a cut-off voltage specified in the Product Specification. Also the charger shall be equipped with a device to control the recharging procedures as follows: The cell battery pack shall start with a low current (0.01C) for 15 - 30 minutes, i.e. pre-charging, before rapid charging starts. The rapid charging shall be started after the (individual) cell voltage has been reached above 3V within 15 - 30 minutes that can be determined with the use of an appropriate timer for pre-charging. In case the (individual) cell voltage does not rise to 3V within the pre-charging time, then the charger shall have functions to stop further charging and display the cell/pack is at abnormal state.

3. Storage

The cell shall be stored within $-5^{\circ}\text{C} \sim 45^{\circ}\text{C}$ range environmental condition.

If the cell has to be stored for a long time (Over 3 months), the environmental condition should be:

Temperature: $23 \pm 5^{\circ}\text{C}$

Humidity: $65 \pm 20\% \text{RH}$

The voltage for a long time storage shall be 3.7V~3.9V range.

4. Handling Instructions

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

Danger!

- 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 by SANIK
- 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 pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
- Do not strike, throw or subject the battery to severe physical shock.
- Do not directly solder the battery terminals.
- Do not attempt to disassemble or modify the battery in any way.
- 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.

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.

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.

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°C ~ 45°C

When discharging the battery: -20°C ~ 60°C

When stored up to 30 days: -5°C ~ +45°C

When stored up to 90 days: -5°C ~ +35°C

When stored up to 180 days: 0°C ~ +35°C

6. Amendment of this Specification

This specification is subject to change with prior notice.