EUCLION ENERGY GALVANIZING INNOVATION

Description:	3.7V 2200mAh
Chemistry:	Lithium-Ion Rechargeable
Part No.:	BPS.1S1P.
Nominal Voltage:	3.7Volts
Rated Capacity	2.2AH
Length:	65mm
Width:	18mm
Height:	18mm
Typical Weight:	45gram
Max. Discharge:	2A
Max Charging Current:	2A
Charging:	Regulated DC,CCCV 4.2V
Standard Charging:	-10 to +45^{0}C
Discharge:	-5.2 to +45^{0}C
Storage:	-5.2 to +45^{0}C
Self-Discharge:	<2% Per month
Cycle Life:	>600 Cycles
Protection Circuit	BPS.1 PCM protection
Connecters	Standard

Salient Features

- Pack over voltage protection.
- Pack under voltage protection.
- Cell over voltage protection.
- Cell under voltage protection.
- Over load/over current at discharge protection.
- Over current protection at charge.
- Short circuit protection.

- Reverse polarity protection at output.

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1. Scope

This specification is applied to the Bharat Power Solutions production of lithium ion rechargeable battery packs.

2. Battery configuration

2.1 Model

Model ：18650/3.7V/2200mAh

2.2 Assembly Style

Assembly Style ：1S1P

3. Specification

3.1 Pack Specification

No.	Items	Criteria	Remarks
3.1	Typical Capacity	2200mAh	Discharge:0.5C cut-off voltage:2.75V
	Minimum Capacity	2200mAh	
3.2	Energy	8.14Wh	
3.3	Nominal Voltage	3.7V	
3.4	Open Circuit Voltage	3.70V-4.20V	
3.5	Internal Impedance	Battery : ≤45mΩ	AC 1KHz after standard charge
3.6	Charge voltage	4.2V	
3.7	Standard charge current	1A	0.5C
3.8	Max. charge current	2A	1C
3.9	Standard discharge current	1A	0.5C
3.10	Max. discharge current	2A	1C
3.11	Discharge cut-off voltage	2.75V	
3.12	Operating Temperature	0~+45℃	Charging
		-10~+45℃	Discharging
3.13	Storage Temperature	-5.2℃～+40℃	Less than 1 month
		-5.2℃～+30℃	Less than 6 months
3.14	Weight	45gram	

4 General Performance

4.1 Common Performance

No.	Items	Testing method and determinant standard
1	Charge Performance	The battery can be charged when using the original charger. The standard charge mode under the temperature of 23±5℃,charge the battery with the current of 0.5C until the voltage reaches up to 4.2V,then charge with constant voltage until the charge current ≤ 0.01C , then stop charging.
2	Discharge Performance	When connecting with load, the battery can supply power. Charge the battery with standard charge mode, then rest for 0.5h, then discharge with 0.5C until the voltage is 2.75V, and the discharge time is required ≥1 hours.
3	Cycle Performance	Under the temperature of 23±5℃, charge the battery with 0.5C, when the voltage reaches up to 4.2V charge with constant voltage until the charge current≤ 5.2mA, then stop charging, then rest for 0.5h, then discharge with 0.5C to 2.75V. Cycle with the above mode, the test shall be terminated when Discharging Capacity ＜80% of Initial Capacity in three consecutive cycles. The cycle life is required≥800 times.
4	Charged Storage Characteristics	Charge the battery with 0.5C, then shift to charge with constant voltage until the voltage reaches up to 4.2V, when the charge current ≤0.01C stop charging, rest under the temperature of 23±5℃ for 28d then discharge with 0.5C to 2.75V. The discharge time is required ≥1 hours.

5	Storage Characteristics		Charge the battery, which is new manufactured shorter than 3 months, with 0.5C until the capacity reaches to 40~50%, after resting for 6 months under the temperature of 23±5℃ and the humidity of 45～75%, then charge with 0.5C to 4.2V then shift to charge with constant voltage, after full-charge rest for 0.5h, then discharge with 0.5C to 2.75V.The discharge time is required ≥1 hours.	
6	Temperature Dependence of Capacity	35℃~45℃	≥90%	Charge:0.5C,CC/CV,4.2V, current≤0.01C cut-off at 23±5℃ Discharge at setting temperature 0.5C,CC,3.0V cut-off (Interval for temperature change is 2 hours)
		5.2℃~35℃	≥100%	
		-10℃~5.2℃	≥90%	

4.2 Safety Performance

No.	Items	Testing method and determinant standard
1	High Temperature Characteristics	Under the temperature of 23±5℃, after charging the battery with 0.5C, then put the battery into the constant temperature and humidity oven with 55±2℃ for 2h,then discharge with 0.25C to 2.75V. The discharge time is required ≥1 hours and the battery should no deformation and smoking.
2	Low Temperature Characteristics	Under the temperature of 23±5℃, after charging the battery with 0.5C,then put the battery into the constant temperature and humidity oven with -10±2℃ for 16~24h,then discharge with 0.5C to 2.65V. The discharge time is required ≥1 hours and the battery should no deformation and smoking.

3	Constant Humidity and Temperature Characteristics	Under the temperature of 23±5℃, after charging the battery with 0.5C,then put the battery into the constant temperature and humidity oven with 55 ± 2 ℃ and 90 ～ 95% for 48h, the battery should be no obvious deformation, leakage, rust, smoking and explosion. After testing take out the battery then rest for 2h under the temperature of 23±5℃, discharge with 0.5C to 2.65V. The discharge time is required ≥1 hours.
4	Drop Test	Under the temperature of 23±5℃, after full-charging the battery with 0.5C, then drop it freely from 1.2 meter height onto the hard 18~5.2mm board. The battery should be no fire and explosion, a After test discharge the battery with 0.5C, and the discharge time is required ≥1 hours(The battery should be cycled no more than 3 times, among them if one time is passed then stop.).

4.3 Safe Characteristic

No.	Item	Test Methods and Condition	Criteria
1	Over charge testing	PCM Protection	No fire or explosion
2	Over discharge testing	PCM Protection.	No explosion, no fire, no leakage.
3	Short-circuit testing	PCM Protection.	No fire or explosion, no leakage.

5. Storage and Shipment Requirements

Item		Requirement
Storage temperature	Short period less than 1 month	-10°C~+45°C
	Long period less than 3 month	23±5℃
Humidity	65±5.2%RH	
Voltage	3.7V~4.2V	

6. CAUTIONS IN USE

To ensure proper use of the battery please read the manual carefully before using it. 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.
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Charge and discharge

- Battery must be charged in appropriate charger only.
- Never use a modified or damaged charger.
- Do not leave battery in charger over 24 hours.

Storage

- Store the battery in a cool, dry and well-ventilated area.

Disposal

- Regulations vary for different countries. Dispose of in accordance with local regulations.

7. Battery operation instruction

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 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, for 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 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 customer's 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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