Specification of Li-ion Polymer Battery

Model：JC 602030-300mAh/3.7V

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Customer Confirmation：

Customer Name	
Customer No.	
Comment	Customer Approval：

AMENDMENT RECORDS

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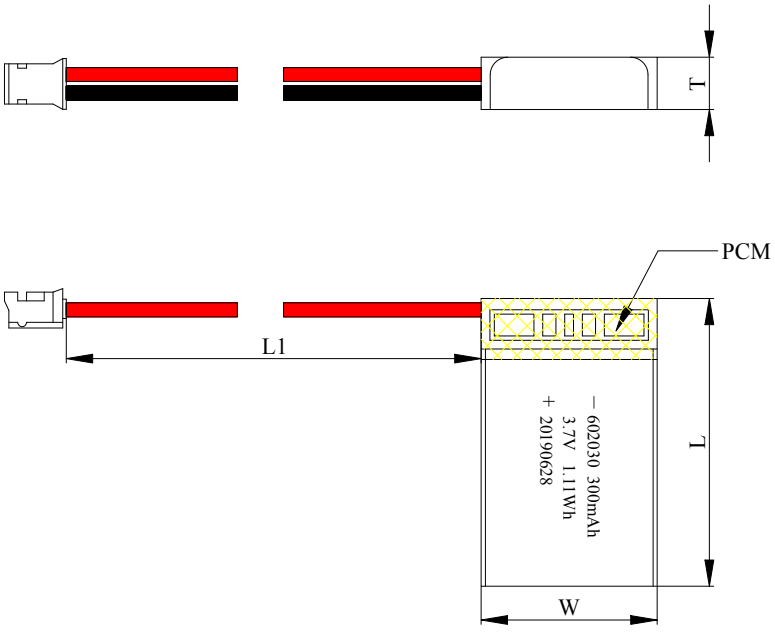
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1、Scope：

This specification describes the performance, testing method, warning and caution of the lithium-ion polymer rechargeable battery. The specification applies to polymer battery supplied by JAPCELL.

2、Model：JC 602030-300mAh/3.7V.

3、Picture of battery (Unit：mm)：



Item	T	W	L	L1
Size	MAX6.2	MAX20.5	MAX33.0	57.0±3.0
Notes	UL1007 24AWG；JST-PHR-02；PCM/DW01+1438.			

4、Single cell parameters：

No.	Item	Specification
4.1	Rated Capacity	310mAh, 0.2C discharging.
4.2	Minimum Capacity	300mAh, 0.2C discharging.
4.3	Normal Voltage	3.70V.
4.4	O.C.V	3.70~4.00V.
4.5	Charge Ending Voltage	4.20±0.03V.
4.6	Discharge Ending Voltage	3.00V。
4.7	Standard charging method	20℃～30℃ 0.2C constant current charge to 4.2V, then constant voltage 4.20V charge till charged current declines to ≤ 0.01C .
4.8	Charge current	Standard charge: 0.2C.
		Rapid charge: 0.5C.
4.9	Charging Time	Standard charge:5.5～6.5h.
		Rapid charge:2.5～3.5h.
4.10	Max. Charging Current	0.5C (0~10℃).
		1.0C (10℃～+45℃)
4.11	Standard discharging Current	-10℃～+55℃ 0.2C constant current discharge to 3.0V.
4.12	Max. Discharging Current	1.0C (-10℃～+55℃).
4.13	Cell Impedance	＜200mΩ，(4.2V AC 1KHz measured).
4.14	Operating environment	Charging : 0℃-45℃, 65%±25%RH. Discharging : -10℃-55℃, 65%±25%RH.

5、Electrical characteristics：

5.1. Normal test conditions：

Temperature： 20~30℃;
Relative humidity： 45-85%RH;
Atmospheric pressure： 86-106KPa.

5.2、Electrochemical characteristics：

No.	Item	Criterion		Test Method
5.2.1	0.2C discharging capacity	Discharging time is not less than 5h.		After Standard Charging, rest 10 minutes, then 0.2C discharge to ending voltage.
5.2.2	1.0C discharging Capacity	Discharging time is not less than 54minutes.		After standard charging, rest 10 minutes, then 1.0C discharge to ending voltage.
5.2.3	Cycle life	The cycle times is not less than 300		Test condition： Charge：0.5C to4.2V Discharge：0.5C to 3.0V When the discharge capacity reduced to 80% of rated capacity, Stop testing.
5.2.4	Self-discharge	Discharging capacity is not less than 90% initial capacity.		After standard charging. Test condition： Temperature：20±5℃ Storage Time：28days Then 0.2C discharge to ending voltage.
5.2.5	Temperature characteristics	Test temperature	Discharging time	After standard charging. Cells shall be stored for 60 minutes at the test temperature prior to discharging and then shall be discharged at the test temperature by 0.2C to 3.0V.
		-20℃	≥2.50hrs	
		50℃	≥4.25hrs	

5.3、Environment characteristics：

No.	Item	Criterion	Test Method
5.3.1	Constant temperature and constant humidity test	No explosion. No fire. No leakage. Discharging capacity is not less than 85% initial capacity.	After standard charging, test condition： Temperature：40±5℃ Relative Humidity：90~95%RH Storage Time：48 hours Then return to room temperature for 2 hours, then 1C discharged to ending voltage.
5.3.2	Vibration test	No explosion. No fire. No leakage.	After standard charging. Fixed the cell to vibration table, then subjected to vibration test for 30 minutes per axis of XYZ axes. Frequency rate：1oct/min Vibration frequency：10Hz-55Hz Excursion (single amplitude)：0.9mm
5.3.3	Drop test	No explosion. No fire. No leakage.	After standard charging. Then fall from height of 1.0m and hit onto concrete ground. A total of 2 times.

5.4、Safety characteristics：

No.	Item	Criterion	Test Method
5.4.1	Overcharge test	No explosion. No fire.	Discharge: 1.0C to3.0V. Charge: 3.0C charge to 4.6V, and maintain7hrs.
5.4.2	Forced discharge test	No explosion. No fire.	Discharge at a current of 1.0C for 2.5h.
5.4.3	Short circuit test	No explosion. No fire.	After standard charging, Short circuit the positive and negative, and the resistance of copper wire is 80±20mΩ. When the temperature falls 20% lower than the peak or short circuit time reached 24hours, stop testing.
5.4.4	Thermal test	No explosion. No fire.	After standard charging, Put cell into an hot box. Test condition: Temperature rate:5±2℃ /min, Ending temperature:130℃±2℃, Keep temperature for 10 minutes, Then stop testing.
Note: Above testing of safe characteristics must be with protective equipment.			

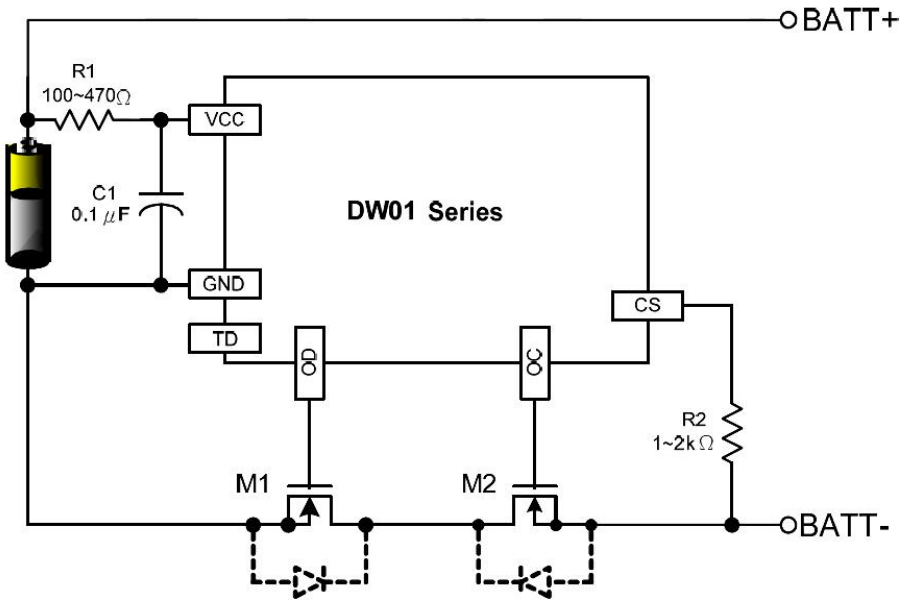
6、Protection circuit：

6.1、PCM Standard：

(Normal temperature, Relative humidity≤85%)

Item		Requirement	Unit
Over-charge protection	Overcharge protection voltage	4.30±0.05	V
	Overcharge relief voltage	4.10±0.05	V
	Overcharge protection delay time	MAX110.0	ms
Over-discharge protection	Over-discharge protection voltage	2.50±0.10	V
	Over-discharge relief voltage	2.90±0.10	V
	Over-discharge protection delay time	MAX55.0	ms
Over-current protection	Over-current protection current	1.5~3.0	A
	Over-current protection delay time	MAX20.0	ms
Short-circuit protection	Short Circuit Protection Conditions	Outer short circuit	/
	Short circuit protection delay time	MAX50.0	μs
Impedance	On-state resistance	≤60.0	mΩ
Quiescent current	Current loss during operation	≤6.0	μA
Temperature range	/	-20~65	℃

6.2、Circuit diagram：



7、Storage and shipment requirement：

Item	Requirement
Short period less than 1 month	-20°C ~ +45°C, 85%%RH MAX.
Long period less than half year	-20°C ~ + 35°C, 85%%RH MAX.
Long period less than 1 year	15°C~+30°C, 85%%RH MAX.
Long time storage : If the cell is stored for a long time, the cell's storage voltage should be 3.7-3.9V and the cell is to be stored in a condition as No.5.1. Also, it is recommended to charge the cell every six months.	

8、Period of warranty：

The period of warranty is one year from the date of shipment. Charge and activate the battery at least once in six months when it is idle. We are not responsible for battery performance damage due to long idle time. JAPCELL guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customers abuse and misuse.

9、Warning and cautions：

Danger warning (it should be described in manual or instruction for users, indicated especially) to prevent the possibility of the battery from leaking, heating, explosion. Please observe the following precautions:

Don't immerse the battery in water and seawater. Please put it in cool and dry environment if no using.

Do not discard or leave the battery near a heat source as fire or heater.

Being charged, using the battery charger specifically for that purpose.

Don't reverse the positive and negative terminals.

Don't connect the battery to an electrical outlet directly.

Don't connect the positive and negative terminal directly with metal objects such as wire. Short terminals of battery is strictly prohibited, it may damage battery.

Do not transport and store the battery together with metal objects such as necklaces, hairpins.

Do not strike , throw or trample the battery.

Do not directly solder the battery and pierce the battery with a nail or other sharp object.

Do not use lithium ion battery and others different lithium polymer battery model in mixture.

Prohibition of use of damaged cells.

Don’t bend or fold sealing edge. Don’t open or deform folding edge Don’t fillet the end of the folding edge.

Don’t fall, hit, bend battery body.

Battery pack designing and packing Prohibition injury batteries.

Never disassemble the cells.

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

Keep the battery away from babies.

Caution：

Do not use or leave the battery at very high temperature conditions (for example, strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be decreased.

Do not use it in a location where is electrostatic and magnetic greatly, otherwise, the safety devices may be damaged, causing hidden trouble of safety.

If the battery leaks, and the electrolyte get into the eyes. Do not wipe eyes, instead, rinse the eyes with clean running water, and immediately seek medical attention. Otherwise, eyes injury can result.

If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.

In case the battery terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.

Prohibition of use of damaged cells.

Be aware discharged batteries may cause fire; tape the terminals to insulate them.

10、Note：

Note (1): The customer is requested to contact in advance if and when the variations of the operating conditions described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

Note (2): take no responsibility for any accident when the cell is used under conditions outside of this specification.

Note (3): inform the customer in writing of improvement(s) regarding proper use and handling of the cell if it is deemed necessary. Energy reserves the right to revise this specification before the customer signs the datasheet. If a revision is required, notify the customer.

11、Appendix：

N/A.