Product specification

Li-MnO2 battery

Model: CP104851

	Position	Signature	Date
Edit	Product Engineer	胡邦	2019.8.1
Check	Technical Manager	周军	2019.8.1
Approval	General Manager	陈伏良	2019.8.1

WUHAN FANSO TECHNOLOGY CO.,LTD

Rd.5, Sitai Industrial Park, Yongfeng Avenue, Hanyang District, Wuhan City, China

POSTAL CODE: 434000 TEL: 027-84458099

Email: overseas@fansobattery.com

1. Scope

The document applies to CP104851 battery supplied by WUHAN FANSO TECHNOLOGY CO.,LTD. Specify quality, test method, performance, quality assurance and matters need attention.

2. Battery type

Lithium Manganese Dioxide-Spiral type.

3. General characteristics

Table 1

No.	Item	Characteristic	Remarks
3.1	Model	CP104851	
3.2	Voltage	3.0V	
3.3	Capacity	380mAH	1mA,25±3℃,1.8V cut off
3.4	Max constant current	30mA	23±3℃,1.8V cut off, 50% of standard capacity
3.5	Max pulse current	50mA	23±3℃, 1mA current discharge 50% of standard capacity, 15seconds at 50mA current, voltage no less than 1.8volt.
3.6	Operate temperature	-20—+60℃	If over +60℃ or lower -20℃, please consult FANSO.
3.7	Dimension	Max1.1*48.75*51	See attached dimension image
3.8	Weight	About 4g	
3.9	Annual self-discharge rate	≤2%	233℃、RH<70% storage
4.0	Storage	Temp.:0～30℃ Humidity:<70% RH	

4. Appearance

4.1 Appearance

Cell appearance, no scratch, swelling, deformation, corrosion, electrolyte leakage and other defects.

4.2 Mark and label

4.2.1 Mark

The battery label contains the following: model, type, company name, voltage, positive and negative mark, safety warning content, certification mark, no littering sign.

4.2.2 Manufacture date

DD/MM/YY print on battery sleeve.

eg: DD/MM/YY: DD-day, MM-month, YY- year.

5. Typical electrical performances

Table 2

Item	Test condition	Initial Values
Open Circuit Voltage	23±3℃	3.0-3.3V
Capacity 1	23±3℃,1mA,1.8V cut off	≥350mAH
Capacity 2	23±3℃,10mA,1.8Vcut off	≥300mAH
Load voltage	23±3℃,200Ω,1seconds	≥2.8V

6. Inspection items, order, sampling method and capacity judgment basis

6.1 Inspection items, order, sampling method

Table 3

No.	Item	Sampling（GB2828.1.2012）	
		QC level	AQL
6.1	Open voltage	Ⅱ	0.065
6.2	Load voltage	Ⅱ	0.065
6.3	Appearance	Ⅱ	1.0

6.4	Dimension	S-1	1.0
6.5	Capacity	As destructive testing, the customer can determine on the basis of the actual situation	

Note: Unless other specified, the above items should be tested within 45 days since receipt of the battery

6.2 capacity judgment

6.2.1 If the average capacity is not less than the standard value specified in Table 2, and no battery below 90% of the value, the battery capacity is qualified.

6.2.2 If the average capacity is lower than the standard value specified in Table 2, and some battery below 90% of the value, do re-sample test, If the average capacity is not less than the standard value specified in Table 2, and no battery below 90% of the value, the battery capacity is qualified.

6.2.3 if the average capacity is lower than the standard value specified in Table 2 and some battery below 90% of the value during the second test, the battery capacity is unqualified.

7. Safety and environmental performance

7.1 Environmental performance

7.1.1 Heating cycle test

Batteries are placed in a test chamber and subjected to the following cycles:

a= 30min raise to 70±3℃, maintaining 4h。

b= 30min release to 20±3℃, maintaining 2h。

c= 30min release to -40±3℃, maintaining 4h。

d= 30min release to 20±3℃。

e=Repeating the sequence for a 9cycles.

f= after 10 cycles, battery be static placed for 7 days.

Pass/Fail criteria: the samples shall not explode or catch fire. In addition, the samples shall no leakage.

7.1.2 Altitude Simulation

sample batteries are to be stored for 6h at an absolute pressure of 11.6KPa(1.68psi) and a temperature of 20±3℃（68±5°F）

Pass/Fail criteria: The batteries shall be no explosion or catch fire as a result of the altitude simulation test. In addition the samples shall be no vent or leakage.

7.1.3 Fall test

cell drop from 1.9m height onto cement ground (total 10 times).

Pass/Fail criteria: The battery samples shall be no explosion or catch fire. In addition, the samples shall no vent or leakage.

7.1.4 Vibration test

battery vibration frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, and return in not less than 90 or more than 100 minutes. test in three mutually perpendicular directions

Pass/Fail criteria: The battery samples shall be no explosion or catch fire. In addition, the samples shall no vent or leakage.

7.2 Safety test

7.2.1 heating

Battery is heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of 5±3℃ per minute to a temperature of 130±2℃ and remain for 10 minutes at that temperature before the test is discontinued.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire.

7.2.2 Impact

A test sample cell was placed on a flat surface. A 5/8 in. (15.8 mm) diameter steel bar was placed across the center of the sample. The length of the bar should be at least as long as the width of the sample. A 20 pound (9.1 kg) weight was dropped from a height of 24 ± 1 in. (610 ± 25 mm) on to the sample.

Pass/Fail criteria: The samples shall not explode or catch fire.

7.2.3Crush test

A cell was crushed between two flat hard surfaces (i.e. steel). The crushing was continued until a force of 3000 pounds (13kN±0.78kN) was applied by hydraulic piston with a diameter of 32mm. press continue until pressure reach up to 17.2Mpa. Once the maximum pressure was obtained, it was released.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire.

7.2.4 forced discharging

a completely discharged cell is to be force-discharged by connecting it in series with fully charged cells of the same kind. The number of fully charged cells to be connected in series with the discharged cell is to equal the maximum number less one of the cells to be covered for series use, the circuit load resistance less than0.1Ω. The sample is to discharge

until a fire or explosion is obtained, or until it has reached a completely discharge state of less than 0.2V and battery case temperature has returned to ±10℃(+18ºF) of ambient temperature.

Pass/Fail criteria： The samples shall be no explosion or catch fire.

7.2.5 External Short-circuit

Connect the battery positive and negative terminal with Cu wire(internal resistance ＜ 0.1 ohm), battery was discharged until a fire or explosion was obtained, or until it had reached a completely discharged and the cell case temperature had returned to ambient temperature.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire.

7.2.6 forced recharging

Tested battery is subjected to a charging current of three times of the current specified by the manufacturer by connecting dc-power. The specified charging current is to be obtained by connecting a resistor of specified size and value.

The test time is calculated from the formula:

$$T_c=2.5*C/(3*I_c)$$

In which

T_c——charge time, hour, Tc ≥7Hour;

C——Nominal capacity, Ah；

I_c——Max. charging current,mA. ER18505 maximum charge current is 0.010A.

Pass/Fail criteria： The samples shall be no explosion or catch fire.

8. Safety terms

8.1 Before use, do not remove the battery from the original packaging.

8.2 Do not scattered placed the battery together in order to avoid accidental short circuit.

8.3 Do not heat the battery above 100 ℃ or incinerated.

8.4 Do not recharge the battery.

8.5 Do not mixed with different brand, model or type batteries.

8.6 Do not mix the new and used batteries.

8.7 Do not disassembly or open battery.

8.8 Do not short circuit the battery or reversely contact the positive and negative terminals.

8.9 Do not solder on the battery surface.

8.10 Do not test environment and safety under extrusion without any protection.

8.11 Do not use or store batteries under wet conditions without protection.

8.12 Batteries are not allowed to be used excessively in the equipment without setting the cut-off voltage. After reaching the cut-off voltage, it should be removed from the equipment immediately to stop working.

8.13 Stop using if the battery is found to have heat, odor, discoloration, deformation, or other abnormalities during using or storage.

8.14 Batteries used should be handled in accordance with local environmental regulations and buried deep underground or into brine.

8.15 If the liquid is splashed on the skin, eyes and clothes, rinse immediately with plenty of water, and then seek medical care immediately.

9. Storage

9.1 Batteries should be used and stored away from static electricity

9.2 Batteries shall be stored not exceeding 30 DEG C and relative humidity of 45% - 75%.

9.3 Keep the battery away from the heat source, away from corrosive gas, avoid direct sunlight, and make sure the storage area is clean, cool, dry and ventilated.

9.4 The battery packing carton height shall not exceed 1.5 meters, and the wooden box shall not exceed 3 meters.

9.5 Batteries should keep the original storage state when not using, after removing the packaging, the battery should not be piled up irregularly.

10.Transportation

10.1 Batteries should be protected against sunlight, fire, rain, immersion, and corrosive substances in transportation.

10.2 Handling and loading should be with care.

10.3 For long transportation, such as shipping, should be kept away from the engine. And in summer should not be prolonged in an airless environment.

11.Effective

11.1In practical applications, customer should be responsible for the compatibility and reliability of the battery and the device.

11.2 In any of the following circumstances, FANSO will not take any responsibility: the client's fails of appropriate treatment, operation, installation, testing, maintenance and inspection of the battery, or do not follow the instructions

provided in the specification, notes, terms, and other FANSO instructions.

11.3 This specification is accepted after 6 months from the date of issues if not be refunded.

12. Statement

If you have any questions on the product specifications, please contact with Wuhan Fanso Technology Co. ltd. Wuhan Fanso Technology Co. Ltd. Reserves the right to amend the product specification.

13. Battery dimension