金美储能产品规格承认书

JINMCN SPECIFICATION FOR APPROVAL

客　　户：_____

CUSTOMER ：_____

品　　名：JINMCN3R8LLC8071840

DESCRIPTION：800F 3.8V-2.5V 1840

承制方

制定	审查	批准
袁泉	张广发	

使用方

审核人员	确认

请核实本规格书内容，若无异议请签名盖章回传以表示知晓该规格书承诺的全部内容

深圳前海金裕美程储能技术有限公司
Shenzhen QH JinYMC Energy Storage Co.,Ltd.

金美储能官网:http://www.jinmcn.com

地址：广东省深圳市南山区前海深港合作区前海华润金融中心A栋

金美储能提示您：

1. 金裕美程的电芯应在额定电压和规定工作温度区间使用， 并远离超过工作温度区间的热源

2. 金美系列电芯在使用前需确认正/负极，禁止反向充电

3. 金美系列电芯在使用前用干布对正/负极端子进行清洁

4. 金美系列电芯禁止投入火中或进行高压加热

5. 金美系列电芯禁止直接与水、油、酸或碱接触

6. 金美系列电芯禁止挤压、钉刺和拆解

7. 金美系列电芯禁止将带有 0.5V 以上电压进行正/负极短接

8. 金美系列电芯在使用或储存期间如发现有散发气味、变色、变形或其它反常停止使用

9. 金美系列电芯所使用的电解液极易挥发，请不要随意分解

10. 金美系列电芯不能随意丢弃，需请根据国家环保标准进行处理

11. 系统应配备保护板，避免电压低于金美系列电芯规格书中规定的充放电截止电压

12. 金美系列电芯应在规定的温度范围内储存。会导致电芯性能的损失，漏液或生锈

13. 金美系列电芯、不支持与其他品牌电芯焊接、使用前请先联系金裕美程确认

14. 本规格书未提及到的事项、应同金裕美程确认是否可以进行、私自进行情况下、
深圳金裕美程储能技术有限公司不承担责任

Cautions from JinYMC Energy Storage Co.,Ltd

1. The cells of JinYMC should be used within the rated voltage and the specified operating temperature range, and kept away from heat sources exceeding the operating temperature range.
2. Before using JinYMC series cells, confirm the positive/negative poles and prohibit reverse charging.
3. Before using JinYMC series cells, clean the positive/negative terminals with a dry cloth.
4. JinYMC series cells are prohibited from being put into fire or subjected to high - pressure heating.
5. JinYMC series cells are prohibited from direct contact with water, oil, acid or alkali.
6. JinYMC series cells are prohibited from being squeezed, punctured and disassembled.
7. For JinYMC series cells, it is prohibited to short - circuit the positive/negative poles with a voltage above 0.5V.
8. During the use or storage of JinYMC series cells, if there are abnormal phenomena such as odor emission, discoloration, deformation or others, stop using them immediately.
9. The electrolyte used in JinYMC series cells is highly volatile. Please do not disassemble them at will.
10. JinYMC series cells cannot be discarded casually and should be disposed of according to national environmental protection standards.
11. The system should be equipped with a protection board to avoid the voltage being lower than the charge - discharge cut - off voltage specified in the specification sheet of JinYMC series cells.
12. JinYMC series cells should be stored within the temperature range specified in the specification sheet. Otherwise, it may lead to the loss of cell performance, leakage or rust.
13. JinYMC series cells do not support welding with cells of other brands. Please contact JinYMC for confirmation before use.
14. For matters not mentioned in this specification sheet, please confirm with JinYMC whether they can be carried out. In case of unauthorized actions, Shenzhen QH JinYMC Energy Storage Co., Ltd. will not bear any responsibility.

1. 适用范围 Scope

此金美储能规格书对产品的性能，测试方法进行了规范，作为技术确认的依据。
As a JinYMC basis for technical confirmation, this sheet specifies the performance and test methods of the product .

2. 产品特性&应用领域 Features & Applications

产品特性 Features	应用领域 Applications
工作电压高 High working voltage	消费电子 Consumer Electronics
高能量 high energy density	物联网 Internet of Things
长寿命-金久耐用 long cycle life	智能仪器 Intelligent Instrument
安全可靠 safe and reliable	电动玩具 Electric toys
低碳环保 environment-friendly	自动化设备 automation equipment
免维护为您省钱 maintenance-free	不间断电源 UPS
充放电速度可达秒级（部分毫秒级）charge-discharge speed at the scale of second some can reach millisecond level	程控交换机 SPC exchange
从结构到整件遵循金美jinmcn的抗震设计 from the structure to the whole piece follow the seismic design of jinmcn	电动汽车 electric vehicle

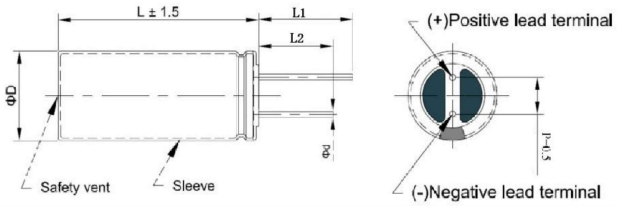
3. 外形尺寸(单位：mm) Dimensions (Units : mm)

①.JMX商标 JMX trademark

②.JMX网址 JMX website

③.型号代码 Model code

④.电压及容量 Voltage and Capacity



ΦD (mm)	L (mm)	Φd (mm)	P (mm)	重量 (g)
18 + 1.5 Max	40±1.5	Φ0.8±0.1	7.5±0.5	≤21

4. 性能参数 Parameters

电气性能 Electrical Performance		
容量 Capacitance	额定容量，Rated Capacitance, F	800F
	容量偏差，Capacitance Tolerance, %	-10%~+30%
电压 Voltage	额定电压，Rated Voltage, V.DC	3.8
	推荐工作电压区间 work voltage	3.8V-2.5V
内阻 Internal Resistance	AC 1kHz/mΩ@25℃	≤25
电流 Current	漏电流 leakage current@25℃ 72h	≤12.0μA
	持续最大放电流maximum current	3.0A
	1s最大峰值电流，1sMaximumpeakCurrent,A	30.0A
最大充电电压/电流 Max charge voltage/current	最大充电电压 Max charge voltage	4.2V
	最大充电电流 Max charge current	5.0A
温度 Temperature		
温度区间 Temperature Range	工作温度范围，Temperature for Operation, ℃	-40 ~ +70
	存储温度范围，Temperature for Storage,℃	-10~ +50
寿命 Life		
使用期限 Life Time	额定电压下工作 250000次	

5. 性能特性 Technical Information

序号	项目 Items	性能 Properties
5.1	High-low temperature properties 高低温特性	Capacitance (-20℃): ≥ 70% of initial measured value 电容(-20℃): ≥初始测量值的 70% Internal resistance (-20℃): ≤10 times the initial specified value 内阻(-20℃): ≤初始规定值的 10 倍 Capacitance (+65℃): ≥ 70% of initial measured value 电容(+65℃): ≥初始测量值的 70% Internal resistance (+65℃): ≤2 times the initial specified value 内阻(+65℃): ≤初始规定值的 2 倍
5.2	High temperature and high humility storage properties 高温高湿存储特性	Capacitance: ≥ 70% of initial measured value 电容: ≥初始测量值的 70% Internal resistance: ≤2 times the initial specified value 内阻: ≤初始规定值的 2 倍
5.3	Floating test at high temperature 高温浮充性能	Capacitance: ≥ 70% of initial measured value 电容: ≥初始测量值的 70% Internal resistance: ≤4 times the initial specified value 内阻: ≤初始规定值的 4 倍

6. Electrochemical performance test 电化学性能测试

6.1 Testing Conditions 测试条件

This specification followed the standard testing criteria: 1 atm, 25±3℃ and a relative humidity < 65%.
本产品规格书标准测试条件为：标准大气压下，温度 25±3℃，相对湿度小于 65%。

6.2 Testing Demands for Tools 测量工具要求

(1) Size: Need to use JIS B 7503 / KS B 5206 (Micrometer), JIS B 7507 / KS B 5203-2(Vernier caliper) JIS B 7502 / KS B 5205 / KS B 5202(External micrometer) or other same precision grade devices.

尺寸：必须使用 JIS B 7503 / KS B 5206(千分尺), JIS B 7507 / KS B 5203-2(游标卡尺) JIS B 7502 / KS B 5205 / KS B 5202（外部千分尺）或精度等级相同的仪表。

(2) DC Voltmeter： Need to use 0.2 grade type JIS C 1102 / KS C 1303-2(Electric Indicator) or much high precision devices, its internal resistance should over 10MΩ.

直流电压表：必须使用0.2级的JIS C 1102 / KS C 1303-2（电动指示仪）度相同或更高等级的仪表，其输入电阻超过10MΩ。

(3) DC Ammeter and AC Voltmeter： Need to use 0.2 grade type JIS C 1102 / KS C 1303-2(Electric Indicator) or much high precision devices.

直流电流表和交流电流表：必须使用0.2级的JIS C 1102 / KS C 1303-2（电动指示仪）度相同或更高等级的仪表，其输入电阻超过10MΩ。

6.3 Test for Capacitance 容量测试

At 25±3℃, discharge the battery with a constant current I to 2.5V before testing. Charge the product at 1C to the set voltage of U_R, Constant voltage charging for 30 min and cut off the current. Then, discharge the product at 1C to 2.5V. After standing for 30 seconds, repeat the above process again, and take the capacity value after the third discharge as the capacity value of the product.

在25±3℃条件下，在测试前，先将电池用恒定电流I放电至2.5V。将产品以1C充电至设定电压U_R后恒压充电30min，紧接着，以1C电流将产品放电至U_1。静置30s后，再次重复上述过程，取第3次放电后的容量值为产品的容量值。

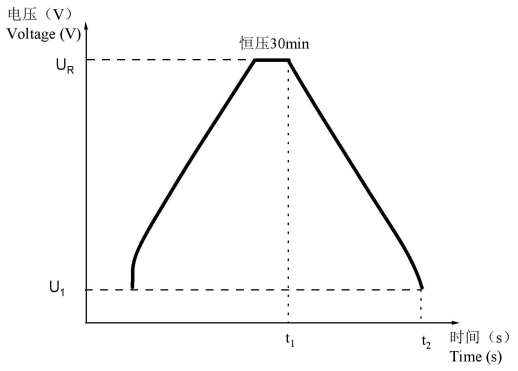


图1 样品的充放电曲线
Fig1. Charge/Discharge curves for Sample

$$C = I * (t_2 - t_1)/(U_R - U_1)$$

The formula：公式中：

I—Discharge Current 1C(mA)	I—:放电电流 1C(mA)；
U_R—Voltage before test:UR=3.8(V)	U_R—测量初始电压:UR=3.8(V)；
U_1—Voltage after test:U=2.5(V)	U_1—测量结束电压:U2=2.5(V)；
t_1—Discharge time from U_R	t_1—从 UR 开始放电时间
t_2—Timing from discharging to U_1；	t_2—放电开始到测量结束电压 U_1 的时间(s)；

6.4 Direct current Resistance Test (DCR) 直流内阻测试

Charge the Li-ion capacitor at constant current (I) at room temperature to 3.8 V. Charge at 3.8V constant voltage for 30 minutes, and record the end moment as t_0. Discharge the capacitor again at constant current (I) to 2.5 V, and record the voltage U at t_0+10 ms. Repeat the above steps 3 times, and calculate the DC internal resistance of the 3rd cycle as the DC internal resistance of the Li-ion supercapacitor according to the following formula.

在室温下将锂离子电容器恒流(I)充电至3.8V，并恒压充电30min，将结束时刻记录为t_0。再以恒定电流(I)放电至2.5V，记录t_0+10ms时的电压U。重复上述步骤3次，根据下述公式计算第3次循环的直流内阻作为锂离子超级电容器的直流内阻（DCR）。

DCR = (3.8-U)/I

6.5 Alternating current Resistance Test (ACR)交流内阻测试

Charge the cell to 3.6V and keep this voltage for 30min, then using the AC Internal resistance to test its AC Resistance at 1kHz.

常温下，将单体充电至3.6V并恒压充电30min后，在1kHz条件下，采用交流阻抗仪进行交流内阻测试。

6.6 High-low temperature properties 高低温性能测试

Based on the 《8.3 Test for Capacitance》 charging the cell to 3.8V at 25±3℃, and move the cell to a fixed temperature (-20±3℃,25±3℃,65±3℃), meantime charge the cell by constant voltage for 1h. After this, the cell's capacitance was tested At a current value of 1C.

25±3℃条件下，将单体参照《6.3容量测试》方式充电至3.8V后，紧接着将其转移至设定温度(设定温度分别为-20±3℃，25±3℃，65±3℃)条件下，在3.8V持续稳压的同时将样品放置1h。此后，将产品以1C放电电流要求在设定温度条件下进行容量测试。

6.7 High temperature and high humidity storage properties 高温高湿存储特性

At a current value of 1C, and the charge 1h at constant voltage condition at room temperature. After this, put the cell to 60±3℃、90±3% RH conditions to storage 1000h. Finally, cooling the cell at room temperature and check its electrochemical properties by 《6.3 Test for Capacitance》 and 《6.5 Test for AC Resistance》.

常温条件下，将产品以1C电流充电至3.6V并恒压充电1h，后将其放置在60±3℃、90±3% RH的条件下存储1000h。接着将其冷却至室温，并参照《6.3容量测试》和《6.5交流内阻测试》方法测试样品的电化学特性。

6.8 Charge/discharge cycling properties 充/放电循环性能测试

At a current value of 1 C, charge the cell to 3.7V at room temperature, and the discharge it to 3.1V at the same current. Once cycling 250000times, re-checking its electrochemical properties by 《6.3 Test for Capacitance》and 《6.5 Test for AC Resistance》.

常温条件下，以 1 C电流将单体充电至3.7V，紧接着将其以该电流放电至3.1V循环250000次后，参照《6.3容量测试》和《6.5交流内阻测试》要求测量其电化学特性。

6.9 The floating test properties at high temperature 高温浮充性能测试

At a current value of 10C, charge the cell to 3.8V at 65±3℃, and kept the cell at this condition for 1000h. After this, cooling the cell to room temperature and testing its electrochemical properties by 《6.3 Test for Capacitance》and 《6.5 Test for AC Resistance》.

将产品置于65±3℃条件下以10C电流值将单体充电至3.8V，后在该条件下稳压1000h。紧接着将其自然冷却至室温，并参照《6.3 容量测试》和《6.5 交流内阻测试》要求进行电化学特性测试。

7. Safety Test 安全测试

Series 序号	Test Item 测试项目	Test Method 测试方法	Criteria 检验标准
1	Drop Test 跌落测试	A fully charged cell drop onto the cement floor from 1.5m height t in a vertical direction, then observed for 1h. 电芯从 1.5m 的高度以正负极柱的方向跌落至水泥地面，实验后放置 1h 后进行外观检查。	No explosion, no fire 不爆炸、不起火

2	Crush Test 挤压测试	A cell is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar force mechanism. The flat surfaces are to be brought in contact with the cells and the crushing is to be continued until an applied force of 13±1 KN is reached. Once the maximum force has been obtained is to be released. 将电芯置于挤压设备的两个挤压平面之间，用液压油缸或类似的力挤压，挤压面与电芯接触，逐渐增加压力至 13±1KN 后停止。	No explosion, no fire 不爆炸、不起火
3	Heating Test 加热测试	A cell 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°C±3°C per minute to a temperature of 130°C±3°C and remain for 30 min and observed 1h. 将电芯放在电热鼓风干燥箱中加热，温度以 5°C±3°C/min 的速率由室温升至 130°C±3°C 并保持 30min，观察 1h。	No explosion, no fire 不爆炸、不起火
4	Sea Water Immersion Test 海水浸泡	The cell was immersed in 3.5%Nacl solution (mass fraction, simulated seawater composition at normal temperature) for 2h. 将电芯完全浸入 3.5%Nacl 溶液（质量分数，模拟常温下的海水成分）中搁置 2h。	No explosion, no fire 不爆炸、不起火
5	Over-discharge Test 过放电	Constant discharge with 1C current for 90min ，then observed for 1h. 以 1C 电流恒流放电 90min，观察 1h。	No explosion, no fire, no leakage 不爆炸、不起火、不漏液
6	Over-charge Test 过充电	Stop charging after charging with constant 1C current until reaching 1.5 times of the charging termination voltage stipulated by the enterprise or charging time reaching 1.5h. 以 1C 电流恒流充电至达到企业规定的充电终	No explosion, no fire 不爆炸、不起火

		止电压的 1.5 倍，或充电时间达到 1.5h 后停止充电。	
7	Short-circuit Test 短路测试	Short-circuit the standard charged cell by connecting positive and negative terminal by less 5 mΩ wire, until the cell case temperature has returned to be 20% less then peak temperature. 短接电芯的正负极，外部线路总电阻＜5mΩ，当电芯温度下降到比峰值低约 20%，结束实验。	No explosion, no fire 不爆炸、不起火

常见的使用过程产品短路情形
Familiar short circuit situation

自出货之日起，电容的保质期限依合同而定。但是，在此期限内，如果非本公司的制程原因而是客户的误用造成的电容质量问题，不承诺免费更换