



金美储能产品规格承认书

JINMCN SPECIFICATION FOR APPROVAL

客 户：_____

CUSTOMER : _____

品 名：_____ 石墨烯超级电容

DESCRIPTION: _____ 800F-3000F 3.0V 60MM 系列

承制方确认			使用方确认		
制定	审查	批准	开发/工程 审核	IQC/IQE 审核	批准
吴刚	张华				

深圳前海金裕美程储能技术有限公司

Shenzhen QH JinYMC Energy Storage Co.,Ltd

地址：深圳市宝安41区尔体产业园D栋

技术支持：133 0293 4141

金美储能官网：<http://www.jinmcn.com>



金美储能提示您：

- 1.金裕美程储能公司提供的超级电容器应在额定电压和规定工作温度区间使用，不宜超过65℃，并远离超过工作温度区间的热源；
- 2.金美系列超级电容器在使用前需确认正/负极，禁止反向充电。若正负极接反，会降低超级电容器的充放电性能，并会导致发热、泄露和使用寿命快速衰减。
- 3.金美系列超级电容器在使用前用干布对正/负极端子进行清洁，避免接触电阻过大降低超级电容使用性能。
- 4.禁止将金美储能超级电容器投入火中或进行高压加热。
- 5.禁止将金美储能超级电容直接与水、油、酸或碱接触。
- 6.禁止挤压、钉刺和拆解金美储能超级电容器。
- 7.禁止将带有 0.5V 以上电压的金美储能超级电容器进行正/负极短接；
- 8.在使用或储存期间如发现金美储能超级电容器有散发气味、变色、变形或其它反常之处应停止使用。
- 9.超级电容器所使用的电解液极易挥发，请不要随意分解金美储能超级电容器。
- 10.金美储能超级电容器不能随意丢弃，需请根据国家环保标准进行处理。

Cautions from JinYMC Energy Storage Co.,Ltd

- 1.The capacitor of JinYMC should be used in the rated voltage and specified operating temperature range with no more than 65℃, and stay away from heat sources that exceed the operating temperature range;
- 2.The positive/negative electrodes of the capacitor of JinYMC must be confirmed before use, and reverse charging is prohibited. The reverse connection will reduce the performances of the capacitor and cause heat cause heat generation, leakage and rapid deterioration of servicelife
- 3.Clean the positive/negative terminals with a dry cloth before use to avoid excessive contact resistance, which would degrade the performances of the JinYMC capacitor;
- 4.Do not put the JinYMC capacitor into fire or heat it under high pressure
- 5.Do not contact directly the JinYMC capacitor with water, oil, acid or alkali
- 6.Do not squeeze, prick and disassemble the JinYMC capacitor;
- 7.Do not short-circuit the positive/negative electrodes of the JinYMC capacitor with voltages above 0.5V;
- 8.Stop using the JinYMC capacitor if it is found to emit odor, discoloration, deformation or other abnormalities during use or storage;
- 9.Do not disassemble the JinYMC capacitor at will because the electrolyte is volatile;
- 10.Do not discard the JinYMC capacitor at will, Please dispose of it according to national environmental protection standards.



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。

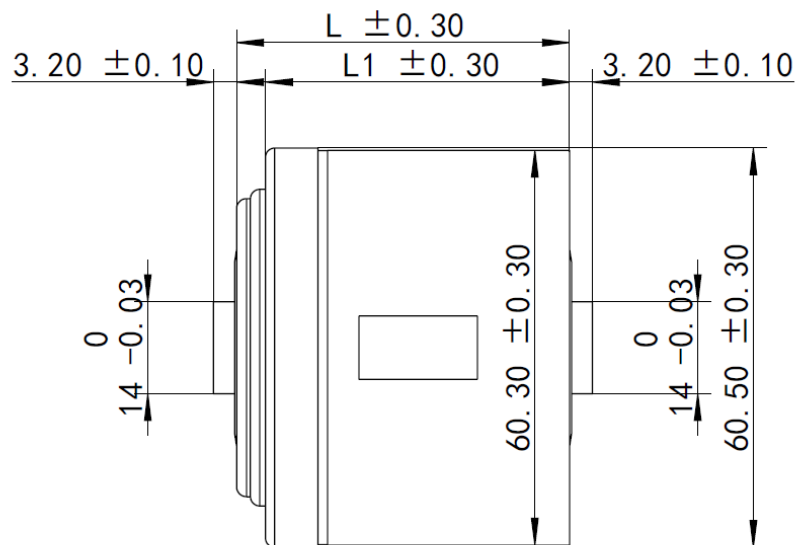
As a JinYMC basis for technical confirmation, this sheet specifies the performance and test methods of the product .

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
高功率 High power 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	储能系统 Energy storage system
低碳环保 Environment-friendly	自动化设备 Automation equipment
免维护 为您省钱 Maintenance-free	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	风力变桨 Variable wind power propellers
从结构到整件遵循金美jinmcm的抗震设计 From the structure to the whole piece, follow the seismic design of Jinmcm	轨道交通 Rail transit

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

容量F	高度 Height
800	54
1000	54
1500	84
2000	84
3000	138





4. 性能参数 Parameters

电气性能 Electrical Performance							
容量 Capacitance	容量偏差, Capacitance Tolerance, %			-0%+20%			
电压 Voltage	额定电压, Rated Voltage, V.DC			3.0			
	浪涌电压, Surge Voltage, V.DC			3.2			
温度 Temperature							
温度区间 Temperature Range	工作温度范围, Temperature for Operation, °C			-40~+65			
	存储温度范围, Temperature for Storage, °C			-40~+70			
寿命 Life							
使用期限 Life Time	额定电压下工作 10 年 After 10 years at rated voltage(25°C)						
	容量变化 (初始值衰减) Capacitance change (decrease from initial value)			≤20%			
	内阻变化 (初始值增大) Internal Resistance (increase from initial value)			≤2倍 (times)			
耐久性 Endurance	额定电压下工作1000小时After1000hoursatratedvoltage(65°C)						
	容量变化 (初始值衰减) Capacitance change (decrease from initial value)			≤20%			
	内阻变化 (初始值增大) Internal Resistance (increase from initial value)			≤2倍(times)			
保存期限 Shelf Life	4 年 (25°C, 未充电) 4 years (25°C, uncharged)						
循环寿命 Cycle Life	25°C恒定电流, 额定电压到 1/2 额定电压之间循环 100 万次 Constantcurrentat25°C,1,000,000cyclesbetweenratedand1/2ratedvoltages						
	容量变化 (初始值衰减) Capacitance Change (decrease from initial value)			≤20%			
	内阻变化 (初始值增大) Internal Resistance (increase from initial value)			≤2倍 (times)			
规格参数							
Capacitance 容量 (F)	ESR漏电流 (mΩ)		最大工 作电流 (A)	漏电流 (mA)	最大能量 (Wh)	能量密度 (W.h/kg)	功率密度 (kW/kg)
	AC (1kHz/mΩ)	DC (25°C/mΩ)					
800	0.3	0.8	63	1.8	1	5.1	6.8
1000	0.4	0.95	58	2.3	1.25	6.3	5.7
1500	0.24	0.45	84	3.0	1.88	6.03	7.7
2000	0.3	0.5	84	3.5	2.5	8.04	6.94
3000	0.17	0.29	128	5.2	3.75	7.3	7.35



5. 标准测试条件 Test Conditions

环境温度 Ambient temperature: 15°C ~ 35°C

湿度 Humidity: 25%RH ~ 75%RH

气压 Pressure: 86kPa~106kPa

*电容量、内阻和漏电流尤其受温度的影响很大，如对结果有疑问，应按以下条件进行测量：

The capacitance, internal resistance and leakage current are particularly affected by temperature.

If in doubt about results, make measurements under the following conditions:

环境温度 Ambient temperature: 20°C±2°C

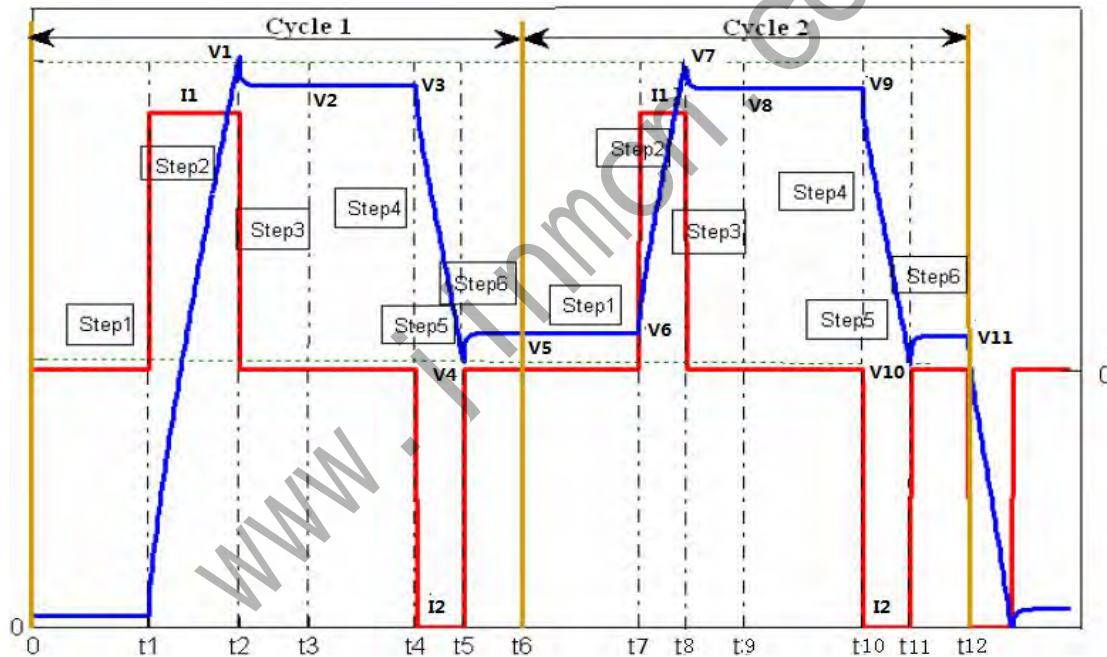
湿度 Humidity: 63%RH ~ 67%RH

气压 Pressure: 86kPa~106kPa

6. 金美储能的测试方法 testing method of jinmcm

6.1 Rated Capacitance (six-step, F) and DC internal resistance (six-step, Ω)

额定容量(六步法, F)和直流内阻(六步法, Ω)



No.	Items 项目	Condition 条件	Record 记录
1	Lay up for 10s 搁置10s		V_0
2	Charge I_1 with constant current 恒流充电 I_1	Charge to the rated voltage U_R with the constant current I_1 以 I_1 恒流充电至额定电压 U_R	I_1 、 V_1
3	Lay up for 5s 搁置5s		
4	Lay up for 10s 搁置10s		V_3 、 t_4



5	Charge I_2 with constant current 恒流放电 I_2	Discharge at a constant current of I_2 to 50% U_R 以 I_2 恒流放电至50% U_R	I_2 、 V_4 、 t_5
6	Lay up for 5s 搁置5s		V_5 、 t_6
7	Repeat steps 1-6, once 重复步骤1-6, 重复1次		t_{10} 、 t_{11} 、 V_9 、 V_{10} 、 V_{11}
8	The end 结束	Discharge to below 0.1V with the constant current I_2 以 I_2 恒流放电至0.1V以下	

Parameter calculation 参数计算:

- Two-cycle discharge capacity 两次循环放电容量:

$$Cd_{ch1} = I_2 \times \frac{t_5 - t_4}{V_3 - V_4};$$

$$Cd_{ch2} = I_2 \times \frac{t_{11} - t_{10}}{V_9 - V_{10}}$$

- Discharge capacity 放电容量:

$$Cd_{ch} = \frac{Cd_{ch1} + Cd_{ch2}}{2}$$

- Two-cycle discharge DC internal resistance 两次循环放电直流内阻:

$$ESR_{dch1} = \frac{V_5 - V_4}{I_2};$$

$$ESR_{dch2} = \frac{V_{11} - V_{10}}{I_2}$$

- DC discharge resistance 直流放电内阻:

$$ESR_{dch} = \frac{ESR_{dch1} + ESR_{dch2}}{2}$$

Among them: $I_1 = I_2$, in the parameter table, the DC internal resistance refers to the six-step DC discharge internal resistance.

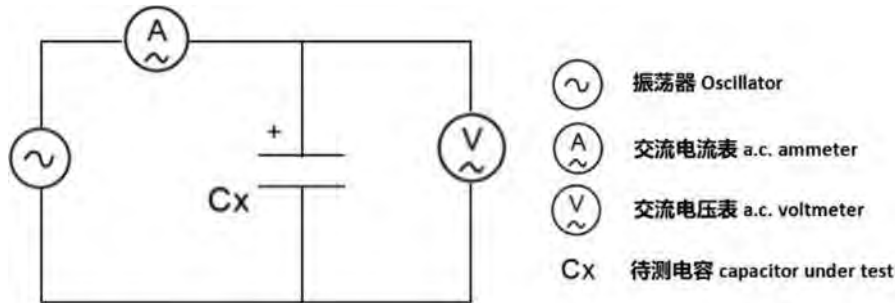
*其中: $I_1 = I_2$ 参数表中 直流内阻 ESR_{DC} 指六步法直流放电内阻。

Capacitance 容量 (F)	$I_1 = I_2$
800	26
1000	33
1500	50
2000	66
3000	100



6.2 交流内阻 AC ESR (Ω):

测量电路: Measurement circuit:



内阻计算公式: ESR calculation : $R_{AC} = \frac{U}{I}$

U: 交流电压有效值, AC voltage rms, (V r.m.s)

I: 交流电流有效值, AC current rms, (A r.m.s)

测量电压的频率, Measurement frequency of the voltage should be : 1 kHz;

交流电流应为, The AC current should be : 1mA ~ 10mA

6.3 最大持续电流 Maximum Continuous Current :

最大持续工作电流 ($\Delta T=15^{\circ}\text{C}$) : Maximum continuous working current within 15°C of

temperature change (A) : $I_{cc} = \sqrt{\frac{\Delta T}{ESR_{DC} * R_{th}}}$

6.4 最大峰值电流 Maximum Peak Current :

一秒钟放电至一半额定电压的最大放电电流 (A) : Maximum current needed to discharged

from rated voltage to half rated voltage in 1 second (A) : $I_{max} = \frac{\frac{1}{2}U_R}{ESR_{DC} + \frac{1}{C}}$

6.5 能量与功率 Energy and Power:

最大储存能量 Maximum stored energy (Wh) : $E_{max} = \frac{\frac{1}{2} \times C \times U_R^2}{3600}$

能量密度 Specific Energy (Wh/kg) : $E_d = \frac{\frac{1}{2} \times C \times U_R^2}{3600 \times \text{mass}}$

功率密度 Usable Specific Power (W/kg) : $P_d = \frac{0.12 \times U_R^2}{ESR_{DC} \times \text{mass}}$

自出货之日起, 电容的保质期依合同而定。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