201819013627

中国认可
国际互认
检测
TESTING
CNAS L4065

Report No.:
报告编号：GDFLS2F3L04U01

UN38.3 TEST REPORT
UN38.3 检 测 报 告

Product Name: **产品名称：**	Lithium iron phosphate battery 磷酸铁锂电池
Model and Parameters: **型号参数：**	FLA48100-EU, 51.2V, 100Ah, 5.12kWh
Test Classification: **检测类别：**	Commission test 委托检测
Issue Date: **签发日期：**	2025-04-27

Tested by/测试	Reviewed by/审核	Approved by/批准
Test Engineer	Audit Engineer	Approval Engineer

Guangzhou MCM Certification & Testing Co., Ltd.

广州邦禾检测技术有限公司

General Information
基本信息

Application Information/申请信息：	
Applicant: 申请单位：	Guangzhou Felicity Solar Technology Co., Ltd 广州菲利斯太阳能科技有限公司
Address: 申请单位地址：	No. 2, Donghua Huaye Road, Renhe Town, Baiyun Area, Guangzhou 广州市白云区人和镇东华华业路 2 号
Contact Information: 联系方式：	Tel: 13580621578 E-mail: hailin.wu@felicitysolar.com
General Information/基本信息：	
Product Name: 产品名称：	Lithium iron phosphate battery 磷酸铁锂电池
Product Classification: 产品分类：	Lithium ion Battery 锂离子电池
Trade Mark: 商标名称：	--
Model and Rating: 型号和额定值：	FLA48100-EU, 51.2V, 100Ah, 5.12kWh
Manufacturer: 制造单位：	Guangzhou Felicity Solar Technology Co., Ltd 广州菲利斯太阳能科技有限公司
Address: 制造单位地址：	No. 2, Donghua Huaye Road, Renhe Town, Baiyun Area, Guangzhou 广州市白云区人和镇东华华业路 2 号
Contact Information: 联系方式：	Tel: 13580621578 E-mail: hailin.wu@felicitysolar.com
Factory: 生产单位：	Guangzhou Felicity Solar Technology Co., Ltd 广州菲利斯太阳能科技有限公司
Address: 生产单位地址：	No. 2, Donghua Huaye Road, Renhe Town, Baiyun Area, Guangzhou 广州市白云区人和镇东华华业路 2 号
Testing Laboratory/测试实验室：	
Laboratory: 测试单位：	Guangzhou MCM Certification & Testing Co., Ltd. 广州邦禾检测技术有限公司
Address: 测试单位地址：	Building 2 No. 45 Zhong Er Section of Shiguang Road, Zhongcun Street, Panyu District, Guangzhou City, Guangdong Province, China. 中国 广东省广州市番禺区钟村街市广路钟二路段 45 号 2 栋
Testing Location: 测试实验室地址：	As above 同上
Test Standard/测试标准：	
Standard Used: 使用标准：	UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8, section 38.3 联合国《试验和标准手册》ST/SG/AC.10/11/Rev.8,section 38.3
Deviation Description: 偏差描述：	None

Product Information/产品信息：

1. This battery assembly whose watt-hour rating is not more than 6200Wh, is constructed with 2 Lithium ion Battery Module (Model: 1P8S), and has overcharge, over-discharge, over current and short-circuits proof circuit.
这个电池总成由 2 个锂离子电池模组（型号：1P8S）通过串并联组成，额定瓦时数不大于 6200Wh，具有过充、过放、过流和短路保护电路。

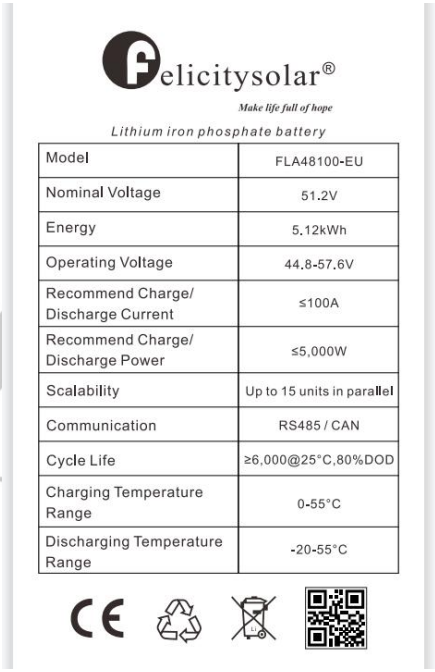
2. The assembled batteries inside the battery assembly is tested according to the requirements of Rev.7 Amend.1 version and met the requirements (Test report shown as below)
电池总成中的组成电池按照第七版修订一的要求进行测试并满足其要求（测试报告如下）

TR no. 测试报告号	Model 型号	Rating 额定值
FLS20240131U01	1P8S	(1P8S) 25.6V, 100Ah, 2560Wh

3. This battery assembly's mass and size
组装电池质量和尺寸

Mass 质量	48±2kg	Size 尺寸	/

Label/标签：



Technical Parameters (The following parameters are all provided by the applicant)
技术参数（以下参数均由客户提供）：

Object 测试对象		Battery Module 电池模组	Battery system 电池系统
Model 型号		1P8S	FLA48100-EU
Rated Capacity 额定容量	(Ah)	100	100
Nominal Voltage 标称电压	(V)	25.6	51.2
Standard Charge Current 标准充电电流	(A)	50	50
Standard Discharge Current 标准放电电流	(A)	50	50
Maximum Charge Current 最大充电电流	(A)	100	100
Maximum Discharge Current 最大放电电流	(A)	100	100
Maximum Charge Voltage 最大充电电压	(V)	29.2	58.4
Cut-Off Voltage 放电截止电压	(V)	22.4	44.8

Remark/备注：

/

Test Conclusion 测试结论				
Clause 条款	**Test Item 测试项目**	**Sample No. 样品编号**	**Test Result 测试结论**	**Remark 备注**
38.3.3.1(f)	(Small battery assembly to LBs) （小型电池总成，锂电池）	BP1#, BP2#	P	/
38.3.3.1(g)	(Large battery assembly to LBs) （大型电池总成，锂电池）	/	N/A	/
38.3.3.2(d)	(Small battery assembly to SIBs) （小型电池总成，钠离子电池）	/	N/A	/
38.3.3.2(e)	(Large battery assembly to SIBs) （大型电池总成，钠离子电池）	/	N/A	/
38.3.4.1	Altitude simulation 高度模拟	/	N/A	/
38.3.4.2	Thermal test 温度循环测试	/	N/A	/
38.3.4.3	Vibration 振动	BP1#	P	/
38.3.4.4	Shock 冲击		P	/
38.3.4.5	External short circuit 外部短路		P	/
38.3.4.6	Impact/Crush 撞击/挤压	/	N/A	/
38.3.4.7	Overcharge 过度充电	BP2#	P	/
38.3.4.8	Forced discharge 强制放电	/	N/A	/

Ambient Temperature: 环境温度：	20 ± 5°C
Receipt Date: 接收日期：	2025-03-20
Test Date: 测试时间：	2025-03-20 ～ 2025-04-25

Test Conclusion/测试结论：

The samples submitted by Guangzhou Felicity Solar Technology Co., Ltd have passed the test items of UN Manual of Test and Criteria ST/SG/AC.10/11/Rev.8, section 38.3.

由广州菲利斯太阳能科技有限公司送检的样品符合联合国《试验和标准手册》ST/SG/AC.10/11/Rev.8, section 38.3 的要求。

Seal:
检测专用章:

UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8, section 38.3 联合国《试验和标准手册》ST/SG/AC.10/11/Rev.8,section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 结果-备注**	**Verdict 判断**
38.3.2	**Scope 范围**		**P**
38.3.3	**Number and condition of cells and batteries to be tested 待测电芯/电池的数量与状态**		**P**
38.3.3.1	Testing of lithium cells and batteries 锂电芯和电池的测试		**P**
38.3.3.1 (a)~(e)	(Number and condition of cells and batteries under T.1~T.8) T.1~T.8 下的电芯/电池的数量与状态	Tests are made with the number of batteries specified in Section 38.3 Table 38.3.3 测试根据 38.3 章 38.3.3 表中的电池数量进行	P
38.3.3.1 (f)	(Small battery assembly to LBs) （小型电池总成，锂电池）	Complied 符合要求	P
	The assembled battery which the aggregate lithium content of all anodes, when fully charged, is not more than 500g; or in the case of a lithium ion battery, with a Watt-hour rating of tot more than 6200Wh. 集成电池组在完全充电时所有正极的合计锂含量不超过 500g；或在锂离子电池组的情况下，如额定的瓦特小时数不超过 6200Wh	Lithium ion battery, The total watt-hour rating is **5.12kWh** 锂离子电池， 总瓦时数为 **5.12kWh**	P
	Batteries that have passed all applicable tests. 电池总成的组成电池通过适用的所有测试	The battery module passes all applicable tests of UN 38.3. And See test report **FLS20240131U01** 电池模块通过 UN 38.3 的适用的所有测试，见测试报告 **FLS20240131U01**	P
	A battery assembly in a fully charged state shall be tested under tests T3, T4 and T5 完全充电状态的电池总成做试验 T.3、T.4 和 T5	Tested complied 测试执行	P
	In addition, test T7 in the case of a rechargeable battery 另外，如果是可充电池总成，则还需进行 T.7 试验	Tested complied 测试执行	P
38.3.3.1 (g)	(Large battery assembly to LBs) （大型电池总成，锂电池）	Not large battery assembly 非大型电池总成	N/A
38.3.3.2	Testing of sodium ion cells and batteries 钠离子电池和电池的测试	NOT Sodium ion Batteries 非钠离子电池	**N/A**
38.3.3.2 (a)~(c)	(Number and condition of cells and batteries under T.1~T.7) T.1~T.7 下的电芯/电池的数量与状态		N/A
38.3.3.2 (d)	(Small battery assembly to SIBs) （小型电池总成，钠离子电池）		N/A
38.3.3.2 (e)	(Large battery assembly to SIBs) （大型电池总成，钠离子电池）		N/A
38.3.4	**Procedure 程序**		**P**
38.3.4.1	**Altitude Simulation 高度模拟**	No testing required 无需进行测试	**N/A**

UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8, section 38.3 联合国《试验和标准手册》ST/SG/AC.10/11/Rev.8,section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 结果-备注**	**Verdict 判断**
38.3.4.2	**Thermal Test 温度试验**	No testing required 无需进行测试	**N/A**
38.3.4.3	**Vibration 振动**		**P**
	For cells and small batteries: from 7 Hz a peak acceleration of 1g_n is maintained until 18 Hz reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8g_n occurs (approximately 50Hz). A peak acceleration of 8g_n is then maintained until the frequency is increased to 200Hz. 对于电芯和小电池：保持峰值加速度 1g_n，从 7Hz 到 18Hz。然后振幅保持在 0.8mm（总偏移量为 1.6mm），增加频率，直到峰值加速度达到 8g_n（约 50Hz）。然后保持 8g_n 的峰值加速度，直到频率增加到 200Hz。 For large batteries: from 7 Hz to a peak acceleration of 1g_n is maintained until 18 Hz reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2g_n occurs (approximately 25 Hz). A peak acceleration of 2g_n is then maintained until the frequency is increased to 200 Hz. 对于大电池：保持峰值加速度 1g_n，从 7Hz 到 18Hz。然后振幅保持在 0.8mm（总偏移量为 1.6mm），增加频率，直到峰值加速度达到 2g_n（约 25Hz）。然后保持 2g_n 的峰值加速度，直到频率增加到 200Hz。		P
	Requirements: no leakage, no venting, no disassembly, no rupture, no fire, and open circuit voltage of each test cell or battery after testing is not less than 90 % of its voltage immediately prior to this procedure. 要求：无泄漏、无排气、无解体、无破裂、无着火和每个试验电芯和电池在试验后的开路电压不小于其在进行试验前电压的 90%。	See the TABLE: 38.3.4.3	P
	The requirement relating to voltage is not applicable to test cells and batteries at fully discharge states. 测试电压的要求不适用于完全放电的电芯和电池。		--
38.3.4.4	**Shock 冲击**		**P**
	Each cell shall be subjected to a half-sine shock of peak acceleration of 150g_n and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50g_n and pulse duration of 11 milliseconds. 每一个电芯应承受峰值加速度为 150g_n、脉宽为 6 毫秒的半正弦冲击。或者，大电芯可以按峰值加速度为 50g_n、脉宽为 11 毫秒的半正弦冲击。 Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for		P

UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8, section 38.3 联合国《试验和标准手册》ST/SG/AC.10/11/Rev.8,section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 结果-备注**	**Verdict 判断**
	small batteries and 11 milliseconds for large batteries. 每个电池应承受的峰值加速度取决于电池的质量。小电池的脉宽应为 6 毫秒，大电池的脉宽应为 11 毫秒。 - For small battery, smaller one of 150g_n or $\sqrt{100850/mass}$ - For large battery, smaller one of 50g_n or $\sqrt{30000/mass}$		
	Peak acceleration and pulse duration: 峰值加速度和脉宽	26.08g_n, 11ms	P
	Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks. 每一个电芯或电池在安装位置的 3 个垂直的轴向的正方向和负方向各进行 3 次冲击，总共 18 次。		P
	Requirements: no leakage, no venting, no disassembly, no rupture, no fire, and open circuit voltage of each test cell or battery after testing is not less than 90 % of its voltage immediately prior to this procedure. 要求：无泄漏、无排气、无解体、无破裂、无着火和每个试验电芯和电池在试验后的开路电压不小于其在进行试验前电压的 90%。	See the TABLE: 38.3.4.4	P
	The requirement relating to voltage is not applicable to test cells and batteries at fully discharge states. 测试电压的要求不适用于完全放电的电芯和电池。		--
38.3.4.5	**External Short Circuit 外部短路**		**P**
	The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4°C, measured on the external case. 待测电芯或电池应加热一段时间，以稳定均衡在 57±4°C 的温度，并测量外壳上的温度。		P
	The exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. 小电芯或小电池的暴露/加热时间应至少为 6 小时，大电芯或大电池的暴露/加热时间应至少为 12 小时		P
	Then the cell or battery at 57± 4°C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm. 然后，在 57±4°C 下的电芯或电池应经受一次短路，外部线路总的电阻小于 0.1 欧姆。	See the TABLE: 38.3.4.5	P
	This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57 ± 4°C, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the		P

UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8, section 38.3 联合国《试验和标准手册》ST/SG/AC.10/11/Rev.8,section 38.3			
Clause 条款	**Requirement + Test 要求+测试方法**	**Result - Remark 结果-备注**	**Verdict 判断**
	test and remains below that value. 在电芯或电池外部外壳温度恢复到 57±4°C 后，短路状态继续持续至少一小时，或对于大电池的情况下，降至试验期间观察到的最大温升的一半，并保持在该值以下。		
	The short circuit and cooling down phases shall be conducted at least at ambient temperature. 短路和冷却阶段应至少在环境温度下进行。		P
	Requirements: external case temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after the test. 要求：外部温度不超过 170°C，试验期间和试验后 6 小时内，无解体、破裂或起火现象。	See the TABLE: 38.3.4.5	P
38.3.4.6	**Impact, Crush 撞击，挤压**	No testing required 无需进行测试	**N/A**
38.3.4.7	**Overcharge 过度充电**		**P**
	Applicable to rechargeable lithium cell/battery with overcharge protection. 适用于具有过充电保护功能的可充电锂电芯/电池。		P
	The charge current shall be twice the manufacturers' recommended maximum continuous charge current. 充电电流应为制造商推荐的最大持续充电电流的两倍	200A	P
	- When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V. 制造商建议的充电电压不大于 18 伏时，实验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者。	70.08V	P
	- When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times maximum charge voltage. 制造商建议的充电电压大于 18 伏时，实验的最小电压应是最大充电电压的 1.2 倍。		
	Tests are to be at ambient temperature. The duration of the test shall be 24 hours. 测试在室温下进行，测试时间为 24h。		P
	Requirements: there is no disassembly and no fire during the test and within seven days after this test. 要求：试验期间和试验后 7 天内，无解体或起火现象。	See the TABLE: 38.3.4.7	P
38.3.4.8	**Forced Discharge 强制放电**	No testing required 无需进行测试	**N/A**

TABLE: 38.3.4.3 Vibration 振动							P
Sample No.	Before Test		After Test		Mass loss (%)	Residual OCV (%)	Results
	Mass(kg)	OCV(V)	Mass(kg)	OCV(V)			
Fully charged at first cycle 一次循环后完全充电状态							
BP1#	48.273	53.5	48.265	53.4	0.017	99.81	O
Results: O = no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%							

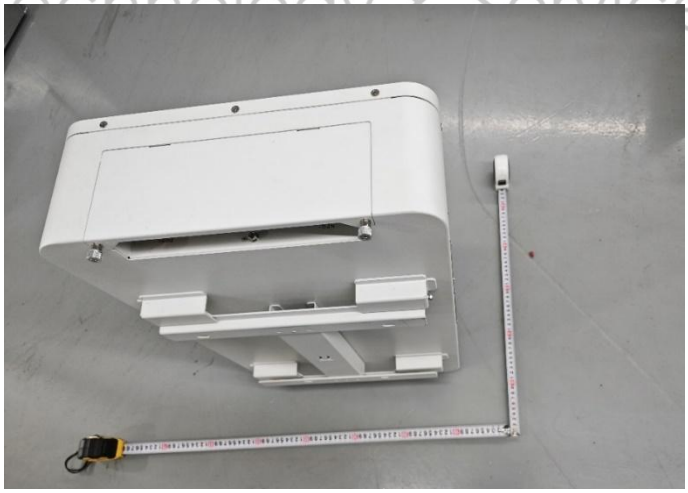
TABLE: 38.3.4.4 Shock 冲击							P
Sample No.	Before Test		After Test		Mass loss (%)	Residual OCV (%)	Results
	Mass(kg)	OCV(V)	Mass(kg)	OCV(V)			
Fully charged at first cycle 一次循环后完全充电状态							
BP1#	48.265	53.4	48.263	53.4	0.004	100.00	O
Results: O = no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage drop not less than 90%							

TABLE: 38.3.4.5 External Short-circuit 外部短路				P
Sample No.	Ambient(ºC) (At 57± 4ºC)	Testing resistance (mΩ)	Max. External Temperature(ºC)	Results
Fully charged at first cycle 一次循环后完全充电状态				
BP1#	57.5	84.6	57.6	O
Results: O = no disassembly, no rupture, no fire during the test and within six hours after the test.				

TABLE: 38.3.4.7 Overcharge 过度充电				P
Sample No.	The test current (A)	The test voltage (V)	OCV(V)	Results
Fully charged at first cycle 一次循环后完全充电状态				
BP2#	200	70.08	53.5	O
Results: O = no disassembly, no fire during the test and within seven days after this test.				

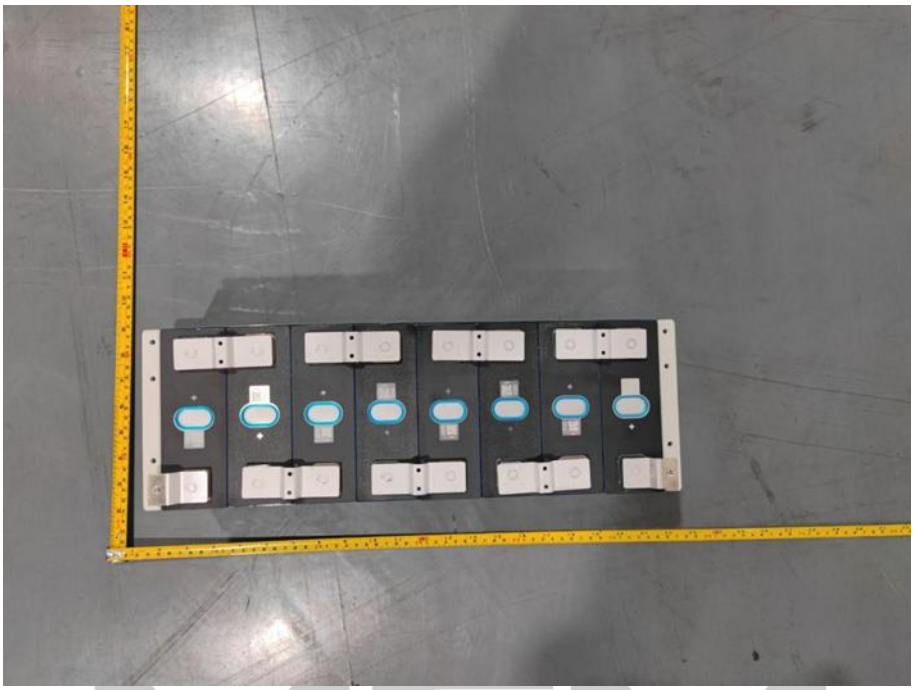
Photos of the Battery
电池照片

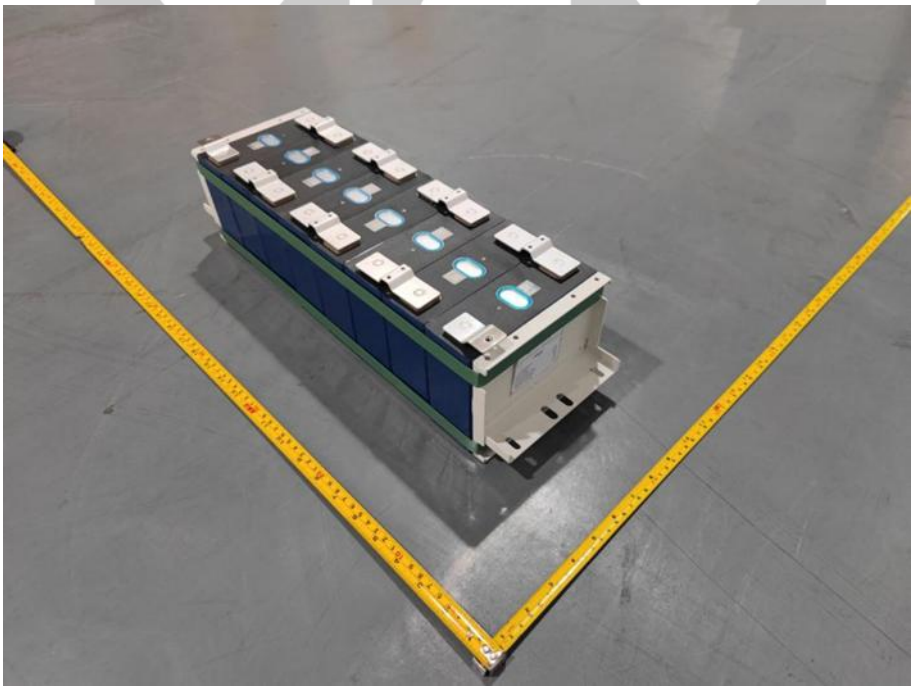
Battery system: FLA48100-EU, 51.2V, 100Ah, 5.12kWh



Photos of the Battery
电池照片

Battery module: 1P8S, 25.6V, 100Ah, 2560Wh





-- End of Report --

Important Note
注意事项

1. This inspection report is invalid without special inspection seal and cross-page seal of Guangzhou MCM Certification & Testing Co., Ltd.
本检验报告无广州邦禾检测技术有限公司检验专用章、骑缝章无效。

2. Nobody is allowed to partly photocopy this inspection report without written permission of Guangzhou MCM Certification & Testing Co., Ltd.
未经广州邦禾检测技术有限公司书面同意，不得部分复印本检验报告。

3. This inspection report is invalid without the signatures of Approver, Reviewer and Inspector.
本检验报告无批准人、审核人及检验员签名无效。

4. This inspection report is invalid if altered.
本检验报告涂改无效。

5. Objection to this inspection report must be submitted to Guangzhou MCM Certification & Testing Co., Ltd. within 15 days after the publication of the report.
若对检验报告有异议，必须在报告发布之日起十五天内向广州邦禾检测技术有限公司提出。

6. This report is only responsible for the received samples.
本报告仅对来样负责。

7. We are not responsible for the authenticity of information (including sample information) provided by customers.
客户提供的信息（包括样品信息），本公司不对其真实性负责。

8. As for the inspection results, “N/A” means “Not applicable”, “P” means “Pass” and “F” means “Fail”.
本检验结果中“N/A”表示“不适用”，“P”表示“通过”，“F”表示“不通过”。

Testing Lab.:	Guangzhou MCM Certification & Testing Co., Ltd.
检测单位：	广州邦禾检测技术有限公司
Address:	Building 2 No. 45 Zhong Er Section of Shiguang Road, Zhongcun Street, Panyu District, Guangzhou City, Guangdong Province, China.
地址：	中国 广东省广州市番禺区钟村街市广路钟二路段 45 号 2 栋
Tel/电话:	+86-20-3477 7662 或 0086-020-3477 7662
Email/电子邮箱：	service@mcmtek.com
Web/公司网址：	https://www.mcmtek.com