Report No.:
报告编号：FLS2F8803W01

TEST REPORT
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：**	FLA48500TG2, 51.2V, 500Ah, 25kWh
Test Classification: **检测类别：**	Commission test 委托检测
Issue Date: **签发日期：**	2025-10-20

Tested by/测试	**Reviewed by/审核**	**Approved by/批准**
Guangwei Li	Owen Huang	Hongbin Xu
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 Website: /
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：	FLA48500TG2, 51.2V, 500Ah, 25kWh
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 Website: /
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：	IEC 62619:2022 unite with IEC 63056:2020 IEC 62619:2022 联合 IEC 63056:2020
Deviation Description: 偏差描述：	None

Product Information/产品信息：

1. This battery assembly whose watt-hour rating is more than 6200Wh, is constructed with 4 Lithium ion Battery Modules (Model: 2P4S), and has overcharge, over-discharge, over current and short-circuits proof circuit.
这个电池总成由 4 个锂离子电池模组（型号：2P4S）组成，
额定瓦时数大于 6200Wh，具有过充、过放、过流和短路保护电路。

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

Mass 质量	187kg	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）：

Device Under Test 待检器件		Battery system 电池系统
Model 型号		FLA48500TG2
Nominal Capacity 额定容量	(Ah)	500
Nominal Voltage 额定电压	(V)	51.2
Nominal Charge Current 额定充电电流	(A)	125
Nominal Discharge Current 额定放电电流	(A)	125
Maximum Charge Current 最大充电电流	(A)	250
Maximum Discharge Current 最大放电电流	(A)	250
Maximum Charge Voltage 最大充电电压	(V)	58.4
Cut-off Voltage 放电截止电压	(V)	44.8

Remark/备注：

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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**
(1)	Verification of overcharge protection 过充电保护验证	BP1#	P	/
(2)	Verification of short circuit protection 短路保护验证	BP1#	P	
(3)	Verification of overdischarge protection 过放电保护验证	BP1#	P	
Ambient Temperature: 环境温度：		20 ± 5°C		
Receipt Date: 接收日期：		2025-08-11		
Test Date: 测试时间：		2025-08-11 ～ 2025-09-18		

Test Conclusion/测试结论：

The sample submitted by Guangzhou Felicity Solar Technology Co., Ltd has been tested according to the Customer-defined methods and met their requirements.

由广州菲利斯太阳能科技有限公司送检的样品按照客户提供的方法进行测试，并满足其要求。

Seal:
检测专用章：

IEC 62619:2022 unite with IEC 63056:2020 IEC 62619:2022 联合 IEC 63056:2020			
Clause **条款**	**Requirement + Test** **要求+测试方法**	**Result - Remark** **备注-结果**	**Verdict** **判断**
(1)	**Verification of overcharge protection** **过充电保护验证**	Complied 符合要求	**P**
Reference: 标准参考:	IEC 62619:2022 Cl.8.2.2 Overcharge control of voltage (battery system) IEC 62619:2022 8.2.2 节（电池系统）过充电电压控制		—
	The test shall be carried out in an ambient temperature of 25 °C ± 5 °C and under normal operating conditions with the cooling system (if any) operating (main contactors are closed with the battery system controlled by the BMS) 试验应在环境温度 25°C±5°C 和冷却系统（如有）正常运行的条件下进行（主接触器关闭，电池系统由 BMS 控制） Each test battery system shall be discharged at a constant current of 0,2It A, to a final voltage specified by the manufacturer. 每个测试电池系统应在 0.2I_tA 的恒定电流下放电，直到制造商指定的最终电压	Discharge Current=100A 放电电流=100A Discharge Final Voltage=44.8V 放电终止电压=44.8V	P
	Sample batteries shall then be charged at the maximum current of the recommended charger with set voltage exceeding the upper limit charging voltage by 10 % for each cell in the battery 然后，样品电池应以推荐充电器的最大电流充电，设定电压超过电池中每个电池单元的上限充电电压 10% The exceeded voltage can be applied by an additional charger if it is difficult to do it by the original charger 超出的电压可以由一个额外的充电器施加，如果原来的充电器很难做到这一点 Also the exceeded voltage can be applied to only a part of the system such as the cell(s) in the battery system if it is difficult to do so using the whole battery system 此外，如果使用整个电池系统很难做到这一点，则只能将超出的电压施加到系统的一部分，例如电池系统中的电池	Maximum Charge Current=250A 最大充电电流=250A Test Charge Voltage =110%*58.4 = 64.24V 测试的充电电压 =110%*58.4 = 64.24V	P
	The test shall be carried out until the BMS terminates the charging. 测试一直进行到 BMS 停止充电为止 Data acquisition/monitoring shall be continued for 1 h after charging is stopped 数据采集/监测应在停止充电后持续 1 小时	During the test, the alarm of "High voltage of cell" triggered, and the BMS stops charging 测试过程中触发“电芯电压高”警报，BMS 停止充电	P
	During the test, all functions of the battery system shall be fully operational, as designed 在测试过程中，电池系统的所有功能应完全按照设计运行		P
	If the BMS fails to terminate the charging, the test should be stopped at the proper timing for safety reasons, for example when the cell voltage reaches 103 % of the upper limit charging voltage or 1 min after having exceeded the upper limit charging voltage, etc 如果 BMS 无法终止充电，出于安全考虑，应在适当的时间停止测试，例如当电池电压达到充电上限电压的 103%或超过充电上限电压后 1 分钟等		N/A

IEC 62619:2022 unite with IEC 63056:2020 IEC 62619:2022 联合 IEC 63056:2020			
Clause **条款**	**Requirement + Test** **要求+测试方法**	**Result - Remark** **备注-结果**	**Verdict** **判断**
Acceptance criteria 验收标准	BMS terminates charging before exceeding the upper limit charging voltage BMS 在超过充电电压上限前终止充电	BMS operated before the voltage upper limit BMS 在电压上限前动作	P
	Should not fire or explosion 应不起火，不爆炸	No fire, no explosion 不起火、不爆炸	P
(2)	**Verification of short circuit protection** **短路保护验证**	Complied 符合要求	**P**
Reference: 标准参考：	IEC 63056:2020 Cl.7.6 Protection for short circuit during transport and installation IEC 63056:2020 7.6 节 运输和安装过程中的短路保护		—
	A safeguard is provided to prevent the risk of short circuit for personnel during transport and installation 为防止人员在运输和安装过程中发生短路风险，提供了安全防护措施		P
	Safeguards are provided for battery system and for each part when the battery system is divided into parts for transportation 电池系统分为部件运输时，对电池系统和各部件都有保障措施		P
	Fully charged DUT is discharged to SOC (state of charge) for installation or maintenance, which is specified by the manufacturer 充满电的 DUT 被放电到由制造商指定的用于安装或维护的 SOC（充电状态） Unless otherwise specified by the manufacturer, tests are carried out without discharging after charging in accordance with 7.2 除非制造商另有规定，按照 7.2 充电后不放电进行测试	Adjusted SOC=50% 调节 SOC=50%	P
	DUT is stored in an ambient temperature until its temperature is stabilized at 25 °C ± 5 °C. Then, DUT is short-circuited by connecting the positive and negative terminals DUT 在环境温度下存储，直到其温度稳定在 25°C ±5°C。然后将 DUT 的正负极连接，实现 DUT 的短路	Test ambient temperature=25±2°C 试验温度=25±2°C	P
	The external resistance to short circuits is (30 mΩ ± 10 mΩ) × module configuration (= number of series connections / number of parallel connections) or less than 5 mΩ, whichever is higher; total external resistance less than 100mΩ 短路的外部电阻为(30mΩ±10mΩ)×模块配置(=串联连接数/并联连接数)或小于 5mΩ，以高者为准；总外阻小于 100mΩ	Module configuration=16/2=8 模块配置=16/2=8 Tested External resistance =30*8>100mΩ, take 90mΩ 测试的外部电阻=30*8>100mΩ，取用 90mΩ	P
	Test is continued for 6 hours or the case temperature declined by 80 % of maximum temperature rise, whichever is sooner 试验持续 6 小时或温度下降至最高温升的 80%，以较早者为准	Test lasted for 6 hours 试验持续 6 小时	P
Acceptance criteria 验收标准	Should no rupture, fire or explosion 应不破裂、不起火、不爆炸	No rupture, no fire, no explosion 不破裂、不起火、不爆炸	P
(3)	**Verification of overdischarge protection** **过放电保护验证**	Complied 符合要求	**P**

IEC 62619:2022 unite with IEC 63056:2020 IEC 62619:2022 联合 IEC 63056:2020			
Clause **条款**	**Requirement + Test** **要求+测试方法**	**Result - Remark** **备注-结果**	**Verdict** **判断**
Reference: 标准参考：	IEC 63056:2020 Cl.7.8 Overdischarge control of voltage test (battery system) IEC 63056:2020 7.8 节 （电池系统）过放电电压控制		—
	The BMS controls the cell voltage during discharging above the lower limit discharging voltage of the cells BMS 在放电过程中控制电池电压高于电池的放电电压下限		P
	The cooling system remains functional during the test and the main contactors are closed with the battery system controlled by the BMS 在测试过程中，冷却系统保持正常工作，主接触器关闭，电池系统由 BMS 控制		P
	The battery system is discharged at a constant current of 0,2 It A to 30 % of the rated capacity, and then is discharged at the specified maximum discharging current 电池系统以 0.2I_tA 恒流放电到额定容量的 30%，然后以规定的最大放电电流放电	Discharge Current=100A 放电电流=100A Test Discharge Current=250A 测试放电电流=250A	P
	The discharge is continued until the BMS terminates the discharging before exceeding the lower limit discharging voltage of the cells 继续放电，直到 BMS 在超过电池的放电电压下限之前终止放电	During the test, the alarm of "Low voltage of cell" triggered, and the BMS stops discharging 测试过程中触发“电芯电压低”警报，BMS 停止放电	P
	If difficult to overdischarge the whole system, the exceeded voltage applied to the cell(s) in the battery system 如果整个系统难以过放电，则在电池系统中将超过的电压施加到电池单元上		N/A
	Data acquisition/monitoring was continued for 1 h after discharging is stopped 停止放电后继续数据采集/监测 1 小时		P
Acceptance criteria 验收标准	Should not fire or explosion 应不起火，不爆炸	No fire, no explosion 不起火、不爆炸	P
	The BMS interrupts the discharging before exceeding the lower limit discharging voltage of the cells BMS 在超过电池放电电压下限之前中断放电	BMS operated before the voltage lower limit BMS 在电压下限前动作	P
	All functions of the battery system are fully operational as designed during the test 在测试过程中，电池系统的所有功能完全按照设计运行		P

(1)	**Verification of overcharge protection** **过充电保护验证**	P
Sample No. 样品编号	BP1#	
Voltage before test 试验前电压	51.7V	
Test Charge Current 设定的充电电流	250A	
Test Charge Voltage 设定的充电电压	64.24V	
Test result's Description 试验结果描述	BMS terminates charging before exceeding the upper limit charging voltage as the alarm of "High voltage of cell" triggered BMS 在超过充电电压上限前终止充电，由于“电芯电压高”警报触发 No fire, no explosion 不起火、不爆炸	
Verdict 结果判定	Meet test requirement 满足测试要求	

(2)	**Verification of short circuit protection** **短路保护验证**	P
Sample No. 样品编号	BP1#	
Voltage before test 试验前电压	52.5V	
Tested External resistance 外部电阻	90mΩ	
Duration of short-circuit 短路持续时间	6hr	
Test result's Description 试验结果描述	No rupture, no fire, no explosion 不破裂、不起火、不爆炸	
Verdict 结果判定	Meet test requirement 满足测试要求	

(3)	**Verification of overdischarge protection** **过放电保护验证**	P
Sample No. 样品编号	BP1#	
Voltage before test 试验前电压	51.5V	
Test Discharge Current 设定的放电电流	250A	
Test result's Description 试验结果描述	BMS terminates discharging before exceeding the lower limit discharging voltage as the alarm of "Low voltage of cell" triggered BMS 在超过放电电压下限前终止放电，由于“电芯电压低”警报触发 No fire, no explosion 不起火、不爆炸	
Verdict 结果判定	Meet test requirement 满足测试要求	

Photos of the Battery
电池照片

Battery System: FLA48500TG2, 51.2V, 500Ah, 25kWh

--End of the report--

Important Note
注意事项

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6. This test report is only responsible for the received samples.
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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 test results, “N/A” means “Not applicable”, “P” means “Pass” and “F” means “Fail”.
   本检测结果中“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.
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