





中国认可 国际互认 检测 TESTING CNAS L5473

UN38.3

Report No.:CESUN201116010

检测报告

TEST REPORT

Name of Sample:	Li-ion Battery Pack
产品名称 :	锂离子电池组
Model Specification:	
产品型号:	LFP25150
Client:	Mica Power Co., Ltd
委托单位 :	东莞市米卡新能源有限公司
Classification of Test: 检测类别:	Commission Test 委托检测

先进储能材料国家工程研究中心有限责任公司检测中心
Test Center of National Engineering Research Center of Advanced Energy Storage Materials Co., Ltd.

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说明

Marking

1. 报告无"报告专用章"无效。

The test report is invalid without "Special seal for report".

2. 报告无批准人、审核人和主检人签名无效。

The test report is invalid without the signatures of Approver, Reviewer and Testing engineer.

3. 报告涂改无效。

The test report is invalid if altered.

4. 对检测报告若有异议,应于收到报告之日起十五天内向检测单位提出。

Objections to the test report must be submitted to Test Center within15 days.

5. 报告仅对送检样品负责。

The test report is Valid for the tested samples only.

- 6. 本报告检测结论中"N/A"表示"不适用", "P"表示"符合标准要求", "F"表示"不符合标准要求"。 As for test result, "N/A" means is "not applicable", "P" means "pass", "F" means "fail".
- 7. 未经实验室书面批准,不得部分复制本报告书。

The partial replica of this report is prohibited without the written approval of CES.

检测单位地址: 广东省深圳市宝安区新安街道宝石路29号蓝坤集团大厦B栋一楼B102 Lab Address: No.B102, 1/F., Lankun Group Building B, No.29, Baoshi Road, Xin'an Street, Bao'an District, Shenzhen, Guangdong, China

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TEST REPORT

	T			•		
Name of sample 样品名称	Li-ion Bat 锂离子电	ttery Pack 池组				
Model /Type 型号规格	LFP2515 (25.6V 15	0 50Ah 3840Wh)	Size 样品尺寸	522.0mm×238.0mm×222.0mm (L×W×T)		
Appearance 样品外观	Prismatic 棱柱形,		Trade mark 商标	mica°		
Quantity 样品数量	30 cells, 4 30 个电芯	4 battery 5,4 个电池组	Mass 样品质量	约/Approx.: 30.7Kg		
Receiving Date 接样日期	2020-11-	16	Testing Date 测试日期	2020-11-17~2020-12-15		
	Name 名称	Mica Power Co., L 东莞市米卡新能源				
Client 委托单位	3rd Floor of chuangxin kong jian Building, song Hu Yun Gu Meng Industrial park.No.153 of she Gui Ling, Chang Tang District, Dalang, Dongguan, china 广东省东莞市大朗镇长塘社区蛇归岭 153 号松湖云谷梦工厂-创新空间三楼					
	NameMica Power Co., Ltd名称东莞市米卡新能源有限公司					
Manufacturer 生产单位	Address 地址	3rd Floor of chuangxin kong jian Building, song Hu Yun Gu Meng Industrial park.No.153 of she Gui Ling, Chang Tang District, Dalang, Dongguan, china 广东省东莞市大朗镇长塘社区蛇归岭 153 号松湖云谷梦工厂-创新空间三楼				
工) 平位	Tel. 电话	0769-82677106	E-mail 邮箱	judy.zhang@micapower.com		
	Website 网址	-				
Tested standard 测试标准	the Trans (ST/SG/A	port of Dangerous 0 .C.10/11/Rev.6/Ame	Soods, Manual of nd.1/Section 38.3			
The sample has passed the test items of UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3 经测试,该批样品符合联合国《关于危险品货物运输的建议书 试验和标准手册》 ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3 标准要求						
Issue date 签发日期	2020-12-	18		整 报告专用章 彦		
Tested by 主检	邻华	了 Reviewed by 审核	到其	Approved by 批准		
陈其平 Cherry Ch 廖宇平 Richie Liae			echnical Manage eputy Centre Dir			



TEST REPORT

Description and illustration of the sample/样品说明及描述:

The sample is a lithium ion battery(8S1P), the sample's status is good /样品为锂离子电池组(8S1P),样品状况良好。

测试项目及结论/ Test items and conclusion。

Test item 测试项目	Sample No. 样品编号	Verdict 判定
T.1 Altitude simulation 高度模拟	B1#~B4#	Р
T.2 Thermal test 温度试验	B1#~B4#	Р
T.3 Vibration 振动	B1#~B4#	Р
T.4 Shock 加速度冲击	B1#~B4#	Р
T.5 External Short Circuit 外部短路	B1#~B4#	Р
T.6 Impact /Crush 撞击/挤压	C1#~C5#, C6#~C10#	Р
T.7 Overcharge 过充电	B1#~B4#	Р
T.8 Forced discharge 强制放电	C11# ~ C20#, C21# ~C30#	Р

Sample pretreatment/样品预处理:

B1#~B2#:..... Batteries at first cycle, in fully charged state.

第1个充放电周期完全充电状态的电池。

B3#~B4#:..... Batteries after 25th cycle, in fully charged state.

第25个充放电周期后完全充电状态的电池。

C1# ~ C5#:..... Cells at first cycle at 50% of the design rated capacity.

第1个充放电周期充电到设计额定容量的50%的电芯。

C6# ~ C10#:..... Cells after 25th cycle at 50% of the design rated capacity.

第25个充放电周期后充电到设计额定容量的50%的电芯。

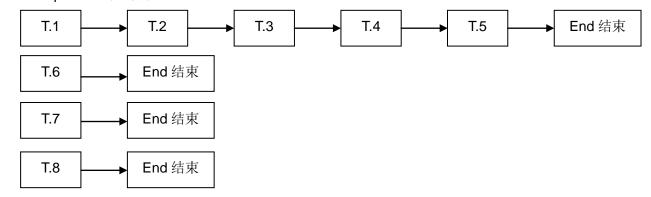
C11# ~ C20#:..... Cells at first cycle, in fully discharged state.

第1个充放电周期完全放电状态的电芯。

C21# ~C30#:..... Cells after 25th cycles, ending in fully discharged state.

第25个充放电周期完全放电状态的电芯。

Test sequence/试验顺序:





Photos of Samples and Labels/样品照片及标识

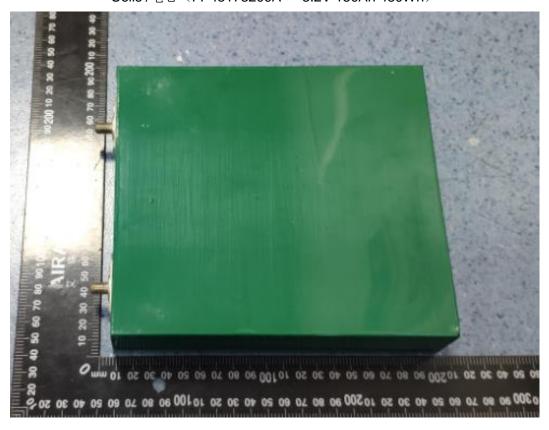
Samples /样品(LFP25150 25.6V 150Ah 3840Wh)

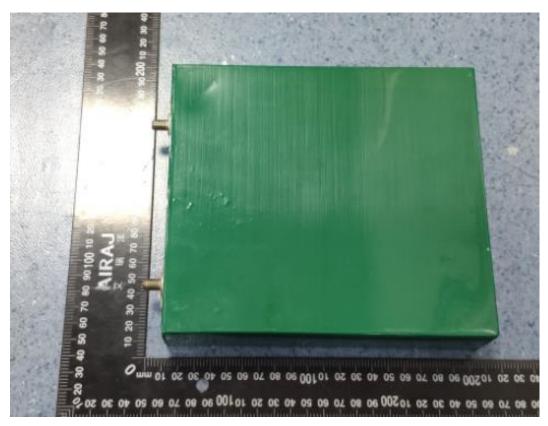














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	ST/SG/AC.10/11/Rev.6/ Amend.1/Sec	tion 38.3				
Clause	Requirements	Result	Verdict			
章节	标准要求	测试结果	判定			
38.3.4	Procedure/测试步骤		_			
	Test 1: Altitude simulation/测试 1: 高度模拟					
	Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hour at ambient temperature (20±5℃)/ 将电池和电池组在温度为 20±5℃, 压力为不大于 11.6kpa 的环境中贮存不少于 6 个小时。					
	Requirement/标准要求:	The samples B1#~B4#:				
	1. Cells and batteries Mass loss limit: ≤0.1% /样品质	no leakage, no venting,				
	量损失≤0.1%。	no disassembly, no				
38.3.4.1	2. Open circuit voltage not less than 90%, The	rupture and no fire/样品	P			
	requirement relating to voltage is not applicable to test	B1#~B4#: 无渗漏、无				
	cells and batteries at full discharged states/样品试验	排气、无解体、无破裂				
	后开路电压应不低于试验前开路电压的90%,此要求不	以及无着火现象				
	适用于完全放完电的电池和电池组。	The test data see				
	3. No leakage, no venting, no disassembly, no rupture	table1 /测试数据见表1				
	and no fire /样品(电池)应无渗漏、无排气、无解体、					
	无破裂以及无着火现象的发生。					
	Test 2: Thermal test/测试 2: 温度试验					
	Test cells and batteries are to be stored for/电池和电池组存储条件如下:					
	1.one temperature cycle: 72±2℃(6h) —-40±2℃(6h) /一次温度循环为72±2℃					
	(6h)—-40±2℃(6h)。					
	2. The maximum time interval between test temperature	extremes is 30 minutes/				
	温度转换最大间隔时间为30min。					
	3.This procedure is to be repeated 10 times/重复10次循					
	4.after which all test cells and batteries are to be stored for 24 hours at ambient					
	temperature (20±5℃)/循环结束后,电池和电池组在20±5℃的条件下搁置24小时。					
	For large cells and batteries the duration of exposure to the test temperature					
38.3.4.2	extremes should be at least 12 hours/对于大型电池和电池组,暴露于极端试验温度的时间至少为12小时。					
	Requirement/标准要求:	The samples B1#~B4#:				
	1. Cells and batteries Mass loss limit: ≤0.1% /样品质	no leakage, no venting,				
	量损失≤0.1%。	no disassembly, no				
	2. Open circuit voltage not less than 90%, The	rupture and no fire/样品				
	requirement relating to voltage is not applicable to test	B1#~B4#: 无渗漏、无				
	cells and batteries at full discharged states/样品试验	排气、无解体、无破裂				
	后开路电压应不低于试验前开路电压的90%,此要求不	以及无着火现象				
	适用于完全放完电的电池和电池组。	The test data see				
	3. No leakage, no venting, no disassembly, no rupture	table1 /测试数据见表1				
	and no fire /样品(电池)应无渗漏、无排气、无解体、					
	无破裂以及无着火现象的发生。					



ST/SG/AC.10/11/Rev.6/ Amend.1/Section 38.3					
Clause	Requirements	Result	Verdict		
章节	标准要求	测试结果	判定		
38.3.4.3	Test 3: Vibration/测试 3: 振动 1. Cells and batteries are firmly secured to the platform /电池和电池组牢固地安装在振动台(的台面)上。 2. The vibration :a sinusoidal waveform with a logarithm and 200Hz and back to 7Hz traversed in 15 minutes/振增加至200Hz,然后再回到7Hz为一个循环,时间跨度为 3. The logarithmic frequency sweep is as follows/对数左(1)For cells and small batteries: from 7 Hz a peak : maintained until 18 Hz is reached, The amplitude is the (1.6 mm total excursion) and the frequency increased to 8gn occurs (approximately 50Hz), A peak acceleration maintained until the frequency is increased to 200Hz/对赫兹开始保持1gn的最大加速度直到频率为18赫兹,然后偏移1. 6毫米)并增加频率直到最大加速度达到8gn(频频加速度保持在8gn直到频率增加到200赫兹。 (2) For large batteries: from 7Hz to a peak acceler maintained until 18Hz is reached. The amplitude is the (1.6 mm total excursion) and the frequency increased to 200Hz/对开始保持1gn的最大加速度直到频率为18赫兹,然后将扩移1.6毫米)并增加频率直到最大加速度达到2gn(频率等速度保持在2gn直到频率增加到200赫兹。 4.This cycle repeated 12 times for a total of 3 hours for perpendicular mounting position of the cell /振动的其中品校性,对每个电池从三个互相垂直的方向上循环12 次小时。 Requirement/标准要求: 1. Cells and batteries Mass loss limit: ≤0.1% /样品质量损失≤0.1%。 2. Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states/样品试验后开路电压应不低于试验前开路电压的90%,此要求不适用于完全放完电的电池和电池组。 3. No leakage, no venting, no disassembly, no rupture and no fire /样品(电池)应无渗漏、无排气、无解体、无破裂以及无着火现象的发生。	of the vibration machine nic sweep between 7Hz 动以正弦波形式,以7Hz 对15分钟。 加频为: acceleration of 1gn is n maintained at 0.8 mm antil a peak acceleration on of 8gn is then 于电池和小型电池:从7 将振幅保持在0.8毫米(总率约为50赫兹),将最大 ration of 1gn is n maintained at 0.8 mm antil a peak acceleration on of 2gn is then 于大型电池组:从7赫兹。有一个方面的15种位,将最大加 each of three mutually 一个方面必须是垂直于样	P		



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ST/SG/AC.10/11/Rev.6/ Amend.1/Section 38.3									
Clause	•								
章节	标准要求	测试结果	判定						
	Requirements	Result 测试结果 g machine/以稳固的托架 eak acceleration of by, large cells may be logn and pulse duration of lightly by a machine/以稳固的托架 eak acceleration of lightly by a machine end pulse duration of lightly by a machine end pulse duration of lightly by a machine shock of peak lightly by a machine end pulse duration of lightly by a machine end pulse e	Verdict 判定						



ST/SG/AC.10/11/Rev.6/ Amend.1/Section 38.3						
Clause	Requirements	Result	Verdict			
章节	标准要求	测试结果	判定			
38.3.4.5	Test 5: External Short Circuit/测试 5:外部短路 1.The cell or battery to be tested shall be temperature sexternal case temperature reaches 57±4℃/保持试验环以使电池或电池样品外表温度稳定达到57±4℃。 2. the cell or battery shall be subjected to a short circuit external resistance of less than 0,1 ohm at 57±4℃, This continued for at least one hour after the cell or battery enhas returned to 57±4℃, or in the case of the large batthalf of the maximum temperature increase observed dubelow that value/将电池或电池正负极用小于0.1Ω的总电电池的外表温度恢复到57±4℃之后保持短路状态1小时外壳温度下降至最大温升的一半即可。 3. the cell or battery must be observed for a further six concluded/对电池或电池必须进一步观察 6 个小时才能可以可以使用的一个时间,是他的时间,我们可以可以使用的时间,我们可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的时间,可以使用的可以使用的可以使用的时间,可以可以使用的时间,可以使用的时间,可以可以使用的时间,可以可以使用的时间,可以可以使用的时间,可以可以使用的可以可以使用的可以可以使用的可以可以使用的可以使用的可以可以使用的可以使用的	r境温度稳定在57±4℃, condition with a total short circuit condition is external case temperature deries, has decreased by by tring the test and remains 出阻回路进行短路,电池或以上,对于大型电池组其 thour for the test to be	P			
	Test 6: Impact / Crush / 测试 6: 撞击/挤压		Р			
38.3.4.6	Test 6: Impact / Crush / 测试 6: 撞击/挤压 Impact (applicable to cylindrical cells not less than 18mm in diameter) /撞击(适用于直径不小于18毫米的圆柱形电池) 1. This test sample cell or component cell is to be placed on a flat smooth surface/将试验样品用的电池或组件电池放在一个平坦光滑的平面上。 2. A 15.8±0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, type 316 stainless bar is to be placed across the center of the sample, A 9.1kg mass is to be dropped from a height of 61±2.5cm					



ST/SG/AC.10/11/Rev.6/ Amend.1/Section 38.3						
Clause	Requirements	Result	Verdict			
章节	标准要求	测试结果	判定			
	surface and perpendicular to the longitudinal axis of the diameter curved surface lying across the centre of the is to be subjected to only a single impact/接受撞击的战平行并与横放在试样中心的直径15.8±0.1毫米弯曲表面只经受一次撞击。	test sample. Each sample 样,纵轴应与平坦的表面				
	Requirements/标准要求: 1. Cells external temperature not exceed 170℃/电池的最高表面温度应不超过170℃。 2. No disassembly, no rupture and no fire within six hours of this test./试验结束后6 个小时之内,电池应无解体和无着火现象发生。 Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less					
38.3.4.6	Crush (applicable to prismatic, pouch, coin/button cell than 18mm in diameter)/挤压(适用于棱柱形、袋装、18毫米的圆柱形电池) 1. A cell or component cell is to be crushed between to crushing is to be gradual with a speed of approximatel of contact. The crushing is to be continued until the first below is reached/将电池或元件电池放在两个平面之间在第一个接触点上的速度大约为1.5厘米/秒。挤压持续情况之一: (a) The applied force reaches 13kN ± 0.78kN /施加的元(b) The voltage of the cell drops by at least 100mV/电池(c) The cell is deformed by 50% or more of its original 厚度的50%以上。 2. A prismatic or pouch cell shall be crushed by applying side. A button/coin cell shall be crushed by applying side. A button/coin cell shall be crushed by applying the 棱柱形或袋装电池应从最宽的一面施压。纽扣/硬币形电圆柱形电池应从与纵轴垂直的方向施压。	wo flat surfaces. The y 1.5cm/s at the first point at of the three options 归挤压,挤压力度逐渐加大,连进行,直到出现以下三种力达到13千牛±0.78千牛也的电压下降至少100毫伏thickness/电池变形达原始的g the force to the widest a force on its flat surfaces/	P			
38.3.4.7	Test 7: Overcharge/测试 7: 过充电 1. The charge current shall be twice the manumaximum continuous charge current/以2倍制造厂推着品充电 2.The minimum voltage of the test shall be as follows/	的最大持续充电电流对样	Р			



ST/SG/AC.10/11/Rev.6/ Amend.1/Section 38.3						
Clause	·					
章节	标准要求	测试结果	判定			
38.3.4.7	a) 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/如果厂家推荐的充电电压不超过18V,本测试的最小充电电压应是厂家标定最大充电电压的两倍或者是22V之中的较小者。b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be1.2 times the maximum charge voltage/如果厂家推荐的充电电压超过18V,本测试的最小充电电压应是厂家标定最大充电电压的1.2倍。C)Tests are to be conducted at ambient temperature 20±5℃, The duration of the test shall be 24 hours/20±5℃的环境温度下,试验持续24小时。	The voltage of the test is 35.04V and the current is 60A 试验的电压为35.04V,电流为60A	Р			
	Requirements/标准要求: No disassembly and no fire within seven days of this test/试验样品在试验中和试验后7天内,应无解体和无着火现象发生。	The samples B1#~B4#: no disassembly and no fire/样品B1#~B4#: 无解体、无着火现象。The test data see table3/测试数据见表3				
	Test 8: Forced discharge/测试 8: 强制放电					
	Each cell shall be forced discharged at ambient tempe series with a 12 V D.C. power supply at an initial curre discharge current specified by the manufacturer/20±5 电池连接在12V 的直流电源上进行强制放电,此直流电流为制造厂指定的最大放电电流。	nt equal to the maximum ℃的环境温度下,将单个 源提供给每个电池初始电				
38.3.4.8	The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere)/指定的放电电流通过串联在测试电池上的合适大小和功率的负载来获得,每个电池的强制放电时间(小时)为额定容量除以初始电流(安培)。					
	Requirements/标准要求: No disassembly and no fire within seven days of this test/试验样品在试验中和试验后7天内,应无解体和无着火现象发生。	The samples C11#~C30#: no disassembly and no fire /样品C11#~C30#: 无解 体、无着火现象 The test data see table4 /测试数据见表4				



Table1: T1~T5 / 表1, 试验1~试验5						
项	目	B1#	B2#	B3#	B4#	
OCV prio 试验前		27.247	27.265	27.228	27.256	
Mass pri 试验前		30675	30690	30655	30680	
Test 1: Altitude	Mass loss 质量损失(%)	0.000	0.000	0.000	0.000	
Simulation 测试 1: 高度 模拟	Change ratio 电压比(%)	99.993	99.989	99.985	99.985	
Test 2: Thermal test 测试 2: 温度 试验	Mass loss 质量损失(%)	0.033	0.016	0.016	0.033	
	Change ratio 电压比(%)	98.690	98.654	98.626	98.653	
Test 3: Vibration	Mass loss 质量损失(%)	0.000	0.000	0.000	0.000	
测试 3: 振动	Change ratio 电压比(%)	100	100	100	100	
Test 4: Shock	Mass loss 质量损失(%)	0.000	0.000	0.000	0.000	
测试 4: 加速 度冲击	Change ratio 电压比(%)	100	100	100	100	
Test 5: External Short Circuit 测试 5 外接 短路	Temp (℃) 温度 (℃)	57.8	57.7	57.6	57.7	

	Table2: ☐ Impact 撞击/ ⊠Crush 挤压										
Test 6:	Sample No, 样品号	C1#	C2#	C3#	C4#	C5#	C6#	C7#	C8#	C9#	C10#
Impact 撞击/	OCV prior to test 试验前电压(V)	3.297	3.299	3.301	3.298	3.298	3.301	3.299	3.299	3.298	3.300
Crush 挤压	Temp, (℃) 温度 (℃)	23.8	23.2	23.5	23.8	23.5	23.6	23.6	23.4	23.7	23.8



Table3: Overcharge Test of batteries/ 表 3 电池过充试验							
Test 7: Overcharge	Sample No, 样品号	B1#	B2#	B3#	B4#		
测试7:过充电	OCV prior to test 试验前电压(V)	27.238	27.260	27.228	27.256		

Table 4: Forced discharge / 表 4: 强制放电											
Test 8: Forced discharge 测试8:强 制放电	Sample No, 样品号	C11#	C12#	C13#	C14#	C15#	C16#	C17#	C18#	C19#	C20#
	OCV prior to test 试验前电压(V)	2.864	2.832	2.826	2.866	2.853	2.856	2.834	2.843	2.857	2.855
	Sample No, 样品号	C21#	C22#	C23#	C24#	C25#	C26#	C27#	C28#	C29#	C30#
	OCV prior to test 试验前电压(V)	2.834	2.795	2.824	2.834	2.866	2.854	2.850	2.863	2.847	2.832

⁻⁻ End of Report --