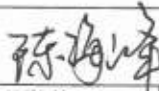
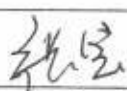
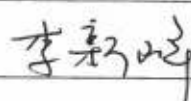


		合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022	
标题: Title:		IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell			第 1 页 共 24 页
IFR32135-15Ah 锂离子电池 产品规格书 Product Specification of IFR32135-15Ah Lithium-ion Rechargeable Cell					
制 定 Formulated by		审 核 Checked by		批 准 Approved by	
					
标准化 Standardized by		会 签 Counter Signed by			
发布日期		实施日期			

 国轩高科 GUOXUAN HIGH-TECH POWER ENERGY Co., Ltd.	合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co., Ltd	编 号 Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell	第 2 页 共 24 页
目 录		
前 言 PREFACE.....4		
修订记录 MODIFICATION RECORD5		
1.基本信息 BASIC INFORMATION 7		
1.1 适用范围 Scope7		
1.2 用途 Application 7		
1.3 产品类型 Product type7		
1.4 型号名称 Model name 7		
2.规格 SPECIFICATION7		
2.1 标准技术参数 Standard technical parameters7		
2.2 推荐充电规范 Recommended charge specification7		
2.3 工作温度范围 Working temperature range 8		
3.外观尺寸 APPEARANCE AND DIMENSION 8		
3.1 外观 Appearance 8		
3.2 尺寸 Dimension 8		
4.性能测试规范 PERFORMANCE SPECIFICATION8		
4.1 标准测试条件 Standard testing condition8		
4.2 电气特性 Electrical specification 8		
4.3 最大脉冲功率（极限能力值）Maxium plus power（Ultimate capacity value） 10		
4.5 耐久性能 Endurance performance 11		
4.6 安全测试规范 Safety test specification 12		
5.使用注意事项 NOTES14		
6.外形图纸 DRWAINGS..... 16		
附录 APPENDIX17		
A.1 阶梯充电矩阵表 Step charge table17		
A.2 单体电芯故障阈值 Single cell failure threshold19		
A.3 在选定条件下的循环寿命 Cycle life at certain condition 19		
A.4 SOC-OCV 表 SOC-OCV table 19		
A.5 不同温度&不同 SOC 的放电 DCRDischarge DCR at Different Temperature and SOC20		
A.6 不同温度&不同 SOC 充电电阻 Regeneration DCR at Different Temperature and SOC21		
A.7 不同温度&不同 SOC 脉冲放电峰值功率 Peak power pulse discharge at different temperatures and SOC21		
A.8 不同温度&不同 SOC 脉冲回馈峰值功率 Peak power pulse feedback at different temperatures and SOC21		
A.9 不同温度&不同 SOC 最大允许脉冲放电功率/倍率 Maximum allowable pulse discharge power/rate at different temperature and SOC22		

合肥国轩高科动力能源有限公司
HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd

编 号
Q/GX 023-2022

标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书

第 3 页
共 24 页

A.10 不同温度&不同 SOC 最大允许脉冲回馈功率/倍率 Maximum allowable pulse feedback power/rate at different temperature and SOC23

IFR32135-15AH 锂离子电池产品环保声明 ENVIRONMENTAL DECLARATION OF IFR32135-15AH
LITHIUM BATTERY PRODUCT 24

	合肥国轩高科动力能源有限公司		编 号
	HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书		第 4 页
	Product Specification for IFR32135-15Ah Lithium ion rechargeable cell		共 24 页

前 言

本标准为公司统一执行的企业标准。

This standard is specified to the enterprise standard of Gotion.Co.,Ltd.

本标准的编写格式符合 GB/T 1.1-2020 《标准化工作导则 第 1 部分：标准的结构和编写》的规定。

The format of this standard complies with the requirements of GB/T 1.1-2020, "standardization work guideline Part 1: Structure and Compilation of Standards"

本标准在参照 GB/T 31484-2015 《电动汽车用动力蓄电池循环寿命要求及试验方法》、GB 38031-2020 《电动汽车用动力蓄电池安全要求》、GB/T 31486-2015 《电动汽车用动力蓄电池电性能要求及试验方法》、IEC62619-2017、IEC 62660-2-2018、GB/T36276-2018、Q/GX 60013-2020 《电动汽车用锂离子动力电池单体电性能测试方法》的基础上，结合我公司产品实际和试验条件，特制定《IFR32135-15Ah 锂离子电池产品规格书》标准，并对试验方法、判定标准内容进行了阐述，以指导 IFR32135-15Ah 锂离子电池产品的性能检测。

On the basis of the references of GB/T 31484-2015 <Cycle Life Requirements and Test Methods for Power Cell for Electric Vehicles>, GB/T 38031-2020 <Electrical vehicles traction battery safety requirements>, GB/T 31486-2015 electrical performance requirements and test methods for power cell for electric vehicles, IEC62619-2017, IEC 62660-2-2018, GB/T36276-2018, Q/GX 60013-2020 electrical performance test method of lithium ion power cell for electrical vehicles. Combined with the actual and test conditions of our company's product, the standard of Q/GX 033-2021 product specification for IFR32135-15Ah Lithium ion rechargeable cell is specially formulated. The test method and criteria is revised and supplemented to guide the manufacturing and approval of IFR32135-15Ah Lithium ion Cell.

注：若修改，以最新发布标准为准。

Remark: If modified, please take the latest version as standard.

		合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022	
标题: Title:		IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell			第 5 页 共 24 页
修订记录 Modification Record					
版本号 Version Number		变更内容 Description of Changes		修订日期 Revision date	修订者 Reviser
Q/GX 023-2018		首次发布 1 st Edition		2018.03.15	臧强 Qiang Zang
Q/GX 023-2018		尺寸变更: 壳体 0.3mm 壁厚变更为 0.38mm 壁厚 Dimension:wall thickness changed from 0.3mm to		2018.09.30	臧强 Qiang Zang
Q/GX 023-2019		最大允许放电温度范围变更: 由-30℃~55℃变更为-30℃~60℃ The maximum allowable discharge temperature range changed from -30℃~55℃ to -30℃~60℃		2019.02.01	臧强 Qiang Zang
Q/GX 023-2019		变更阶梯循环制式和标准循环; 增加脉冲功率测试规范 Change step cycle system and standard cycle; Added pulse power test specification		2019.07.20	臧强 Qiang Zang
Q/GX 023-2021		阶梯充电矩阵温度范围变更: 由 0℃~55℃变更为-20℃~55℃, 以及部分温度下的充电制式 Temperature range of Step charge matrix table changed from 0℃ ~ 55℃ to -20℃ ~ 55℃, and charging system at partial temperature		2020.01.17	赵玲玲/陈海峰 Lingling Zhao Haifeng Chen
		0.68C 阶梯循环充放电后静止时间从“10min”改为“30min” 0.68C rest time after step cycle charging and discharging changed from "10min" to "30min"		2021.01.17	马建欣/陈海峰 Jianxin Ma Haifeng Chen

		合肥国轩高科动力能源有限公司		编 号			
		HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		Q/GX 023-2022			
标题: Title:		IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell			第 6 页		
					共 24 页		
Q/GX 023-2021		4.6 安全测试规范变更为 GB38031-2020 《电动汽车用动力蓄电池安全要求》 4.6 Safety test specification changed to GB38031-2020 < Electrical vehicles traction battery safety requirements>		2021.11.29		马建欣/江大光 Jianxin Ma Daguang Jiang	
Q/GX 023-2022		修订升级为双语版 Revised and upgraded to bilingual version		2022.5.23		陈海峰 Haifeng Chen	

注：具体修改见正文

Remark: See the text for specific modification.

		合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022																														
标题: Title:		IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell			第 7 页 共 24 页																													
1.基本信息 Basic information																																		
1.1 适用范围 Scope																																		
本产品规格书由合肥国轩高科动力能源有限公司提供给客户，描述了其锂离子二次电池的性能。 This specification sheet is provided to customers by HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co. Ltd., describing Lithium ion rechargeable cell properties.																																		
1.2 用途 Application: EV																																		
1.3 产品类型 Product type: 锂离子二次电池，圆柱，LFP 电芯 Lithium ion rechargeable cell																																		
1.4 型号名称 Model name: IFR32135-15Ah																																		
2.规格 Specification																																		
2.1 标准技术参数 Standard technical parameters																																		
<table><tr><th>项目 Items</th><th>参数 Specification</th><th>条件/注释 Condition/Notes</th></tr><tr><td>2.1.1 容量 Standard Capacity</td><td>15Ah</td><td>按照 4.1.1 充电和 4.1.2 放电 Charge and discharge as per 4.1.1 and 4.1.2</td></tr><tr><td>2.1.2 标称电压 Nominal Voltage</td><td>3.2V</td><td></td></tr><tr><td rowspan="2">2.1.3 充放电电压范围 Charge/Discharge Voltage Window</td><td>2.0~3.65V</td><td>>0℃</td></tr><tr><td>1.8~3.65V</td><td>≤0℃，不允许连续充电 Forbid continuous charging</td></tr><tr><td>2.1.4 重量 Weight</td><td>268±5g</td><td></td></tr><tr><td>2.1.5 质量能量密度 Weight Energy density</td><td>185Wh/kg</td><td>0.33C</td></tr><tr><td>2.1.6 体积能量密度 Volume Energy density</td><td>400Wh/L</td><td>0.33C/</td></tr><tr><td>2.1.7 交流内阻 AC Resistance</td><td>1.5mΩ≤R≤3mΩ</td><td>25℃±2℃</td></tr><tr><td>2.1.8 直流内阻 DC Resistance</td><td><8mΩ</td><td>50%SOC, 25℃±2℃</td></tr></table>						项目 Items	参数 Specification	条件/注释 Condition/Notes	2.1.1 容量 Standard Capacity	15Ah	按照 4.1.1 充电和 4.1.2 放电 Charge and discharge as per 4.1.1 and 4.1.2	2.1.2 标称电压 Nominal Voltage	3.2V		2.1.3 充放电电压范围 Charge/Discharge Voltage Window	2.0~3.65V	>0℃	1.8~3.65V	≤0℃，不允许连续充电 Forbid continuous charging	2.1.4 重量 Weight	268±5g		2.1.5 质量能量密度 Weight Energy density	185Wh/kg	0.33C	2.1.6 体积能量密度 Volume Energy density	400Wh/L	0.33C/	2.1.7 交流内阻 AC Resistance	1.5mΩ≤R≤3mΩ	25℃±2℃	2.1.8 直流内阻 DC Resistance	<8mΩ	50%SOC, 25℃±2℃
项目 Items	参数 Specification	条件/注释 Condition/Notes																																
2.1.1 容量 Standard Capacity	15Ah	按照 4.1.1 充电和 4.1.2 放电 Charge and discharge as per 4.1.1 and 4.1.2																																
2.1.2 标称电压 Nominal Voltage	3.2V																																	
2.1.3 充放电电压范围 Charge/Discharge Voltage Window	2.0~3.65V	>0℃																																
	1.8~3.65V	≤0℃，不允许连续充电 Forbid continuous charging																																
2.1.4 重量 Weight	268±5g																																	
2.1.5 质量能量密度 Weight Energy density	185Wh/kg	0.33C																																
2.1.6 体积能量密度 Volume Energy density	400Wh/L	0.33C/																																
2.1.7 交流内阻 AC Resistance	1.5mΩ≤R≤3mΩ	25℃±2℃																																
2.1.8 直流内阻 DC Resistance	<8mΩ	50%SOC, 25℃±2℃																																
2.2 推荐充电规范 Recommended charge specification																																		
<table><tr><th>项目 Items</th><th>参数 Specification</th><th>条件/注释 Condition/Notes</th></tr><tr><td>2.2.1 常规充电（慢充） Regular charge(Slow charge)</td><td>3A 3.65V 0.75A 10℃≤T<45℃</td><td>恒流 Constant current 恒压 Constant voltage 截止条件（终止） Cut off condition（Termination） 温度 temperature</td></tr><tr><td>2.2.2 阶梯充电（快充） Step charge</td><td>见附件 A.1 See appendix A.1</td><td>不同温度的快充策略 Fast charge strategy at different temperature</td></tr></table>						项目 Items	参数 Specification	条件/注释 Condition/Notes	2.2.1 常规充电（慢充） Regular charge(Slow charge)	3A 3.65V 0.75A 10℃≤T<45℃	恒流 Constant current 恒压 Constant voltage 截止条件（终止） Cut off condition（Termination） 温度 temperature	2.2.2 阶梯充电（快充） Step charge	见附件 A.1 See appendix A.1	不同温度的快充策略 Fast charge strategy at different temperature																				
项目 Items	参数 Specification	条件/注释 Condition/Notes																																
2.2.1 常规充电（慢充） Regular charge(Slow charge)	3A 3.65V 0.75A 10℃≤T<45℃	恒流 Constant current 恒压 Constant voltage 截止条件（终止） Cut off condition（Termination） 温度 temperature																																
2.2.2 阶梯充电（快充） Step charge	见附件 A.1 See appendix A.1	不同温度的快充策略 Fast charge strategy at different temperature																																



标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书
Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 8 页
共 24 页

2.3 工作温度范围 Working temperature range

项目 Items	参数 Specification	条件/注释 Condition/Notes
2.3.1 最佳工作温度 Optimum working temperature	10~35℃	
2.3.2 充电温度范围 Charge temperature range	-20~55℃	充电电流, 见附件 A.1 Charging current, see appendix A.1
2.3.3 放电温度范围 Discharge temperature range	-30~60℃	最高电芯温度≤60℃ The highest cell temperature ≤ 60℃

3. 外观尺寸 Appearance and Dimension

3.1 外观 Appearance

电池外表面无明显的划痕、裂痕、生锈、变色或电解液泄漏, 无影响电池正常使用的其它外观缺陷。

Without scratches, cracks, stains, discoloration or electrolyte leakage, no other appearance defects affecting cell normal operation.

3.2 尺寸 Dimension

直径 Diameter: (33.6⁰_{-0.4}) mm (含外包膜 Including covering envelop)

总高 Total Height: (139.7±0.5) mm

肩度 Shoulder Height: (136.3±0.3) mm (含外包膜 Including covering envelop)

4. 性能测试规范 Performance specification

4.1 标准测试条件 Standard testing condition

4.1.1 单体电池充电 Single cell charge

室温下 (25℃±2℃), 单体电池以 7.5A 电流充电至电压为 3.5V, 然后再以 3A 电流充电至电压为 3.65V 时转恒压充电, 至充电电流降至 0.75A 时停止充电, 充电后静置 30min。

At (25℃±2℃), single cell is charged at 7.5A to 3.5V, then charged at 3A to 3.65V, followed by constant voltage charge until current drops down to 0.75A, stand for 30 min.

4.1.2 单体电池放电 Single cell discharge

室温下 (25℃±2℃), 单体电池以 15A 电流放电至电压为 2.0V, 放电后静置 30min。

At (25℃±2℃), single cell is discharged at 15A to 2.0V, stand for 30 min.

4.2 电气特性 Electrical specification

项目 Items	参数 Specification	条件/注释 Condition/Notes
4.2.1 初始容量 Initial Capacity	≥15Ah	按照 4.1.1 充电和 4.1.2 放电 Charge and discharge as per 4.1.1 and 4.1.2

		合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell			第 9 页
				共 24 页
4.2.2 容量与温度的相关性 Capacity and temperature correlation	55℃, ≥95% 初始容量 Initial Capacity 25℃, 100% 初始容量 Initial Capacity 0℃, ≥85% 初始容量 Initial Capacity -10℃, ≥75% 初始容量 Initial Capacity -20℃, ≥70% 初始容量 Initial Capacity -30℃, ≥55% 初始容量 Initial Capacity	25℃±2℃温度下按照 4.1.1 充电, 在测试温度下以 1C 放电至 2.0V(0℃及以下 1.8V) At 25℃±2℃,charge as per 4.1.1, discharge at 1C to 2.0V at testing temperature (to 1.8V at or below 0℃) .		
4.2.3 SOC-OCV 表 SOC-OCV Table	见附件 A.4 See appendix A.4	按照 4.1.1 充电, 然后以 1C 放电 5%容量 (注: 此容量为按照 4.1.2 放电至对应截止电压 ([-30℃-0℃]2.0 , [0℃-10℃]2.3, [10℃-55℃] 2.5 对应的容量), 静置 1h, 重复 20 次, 记录静置后的电压数据。 Charge as per 4.1.1, then discharge for 5% capacity at 1C (The capacity is obtained by discharging to certain cut-off voltage as per 4.1.2 ([-30℃-0℃) 2.0 [0℃-10℃) 2.3 [10℃-55℃] 2.5) , standing for 1h, repeat 20 times, record voltage after standing.		
4.2.4 不同温度&不同 SOC 放电电阻 (DCR) Discharge DCR at different temperature and SOC	见附件 A.5 See appendix A.5	按照 4.1.1 充电, 然后以 1C 按照 4.2.2 不同温度下放电容量调整 SOC (截止电压参照 4.2.3) , 静置 1h, 测试 3C 放电 30s 的 DCR。放电电阻为开路电压与放电末端电压的差值除以电流, 测试 SOC 为 95%, 90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10%, 5%。		
4.2.5 不同温度&不同 SOC 充电电阻 (DCR) Charge DCR at different temperature and SOC	见附件 A.6 See appendix A.6	测试 2.25C 充电 15s 的 DCR。充电电阻为充电末端电压与开路电压的差值除以电流, 测试 SOC 为 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 95%。 Charge as per 4.1.1, then discharge at 1C to adjust SOC at different temperature as		

 国轩高科 GUOXUAN HIGH-TECH		合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022
标题: Title:		IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell		第 10 页 共 24 页
				per 4.1.2, standing for 1h, measure DCR under the condition of discharge at 3C for 30s, stand for 40s, charge at 2.25C for 15s. The discharge resistance is the difference between the open circuit voltage and the discharge end voltage divided by the current, tested SOC is 95%, 90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10%, 5%; The charging resistance is difference between the charging terminal voltage and the open circuit voltage divided by the current, tested SOC at 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 95%.

4.3 最大脉冲功率（极限能力值）Maximum plus power（Ultimate capacity value）

项目 Items	参数 Specification	条件/注释 Condition/Notes
4.3.1 不同温度&不同 SOC 脉冲放电峰值功率 Peak power pulse discharge at different temperature and SOC	见附件 A.7 See appendix A.7	按 4.2.4 测试数据计算的 DCR 和最大脉冲放电电流，计算出在不同温度规定的放电下限电压时的脉冲放电功率。 According to the DCR and the maximum pulse charging current calculated from the test data of 4.2.4, the pulse discharge power at the lowest limit voltage specified at different temperature.
4.3.2 不同温度&不同 SOC 脉冲回馈峰值功率 Peak power pulse feedback at different temperature and SOC	见附件 A.8 See appendix A.8	按 4.2.5 测试数据计算的 DCR 和最大脉冲充电电流，计算出在充电上限电压 3.65V 时的脉冲回馈功率。 According to the DCR and the maximum pulse charging current calculated from the test data of 4.2.5, the pulse feedback power at the upper charging voltage of 3.65v was calculated.

4.4 最大允许脉冲功率（使用允许值）Maximum allowable pulse charge power（Use allowable values）

项目 Items	参数 Specification	条件/注释 Condition/Notes
4.4.1 不同温度&不同 SOC 最大允许脉冲放电功率 Maximum allowable pulse discharge power at different Temperature and	见附件 A.9 See appendix A.9	依据 4.3.1 电芯最大脉冲放电倍率能力和放电过程温度保护考虑，对电芯脉冲放电功率上限进行限定。

 国轩高科 GUOXUAN HIGH-TECH		合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022
标题: Title:		IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell		第 11 页 共 24 页
SOC			According to 4.3.1 maximum pulse discharge multiplier capacity of the cell and temperature protection of the discharge process, the upper limit of the pulse discharge power of the cell is limited.	
4.4.2 不同温度&不同 SOC 最大允许脉冲回馈功率 Maximum allowable pulse feedback power at different Temperature and SOC		见附件 A.10 See appendix A.10		依据 4.3.2 电芯最大脉冲充电倍率能力, 结合电芯在大倍率下的脉冲充电可靠的上限电压和充电过程温度保护考虑, 对电芯脉冲回馈功率上限进行限定。 According to 4.3.2 maximum pulse charging capacity of the cell, the upper limit of the feedback power of the cell is limited in consideration of the reliable upper limit voltage and temperature protection of the charging process of the cell under the high voltage.

4.5 耐久性能 Endurance performance

项目 Items	参数 Specification	条件/注释 Condition/Notes
4.5.1 室温荷电保持率 Room Temperature SOC Retention Rate	≥95%	25℃, 100%SOC, 28 天 days
4.5.2 室温容量恢复率 Room Temperature Capacity Recovery Rate	≥96%	
4.5.3 高温荷电保持率 High Temperature SOC Retention Rate	≥94%	55℃, 100%SOC, 7 天 days
4.5.4 高温容量恢复率 High Temperature Capacity Recovery Rate	≥95%	
4.5.5 储存容量恢复率 Storage Capacity Recovery Rate	>93%	45℃, 50%SOC, 28 天 days
4.5.6 高温循环寿命 High Temperature Cycle Life	1000 次 times	80%容量保持率; 45℃, 按照 A.3.1 中充电方式; 1C 放电至 2.0V 80%capacity; 45℃, charge as per 2.2.2, discharge at 1C to 2.0V
4.5.7 高温循环寿命 High Temperature Cycle Life	800 次 times	80%容量保持率; 55℃, 按照 A.3.1 中充电方式; 1C 放电至 2.0V 80%capacity; 55℃, charge as per 2.2.2, discharge at 1C to 2.0V



合肥国轩高科动力能源有限公司

HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co., Ltd

编 号

Q/GX 023-2022

标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书

Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 12 页

共 24 页

4.5.8 常温循环寿命 Room Temperature Cycle Life	2000 次 times	80%容量保持率; 25℃, 按照 A.3.1 中充电方式; 1C 放电至 2.0V 80%capacity; 25℃, charge as per 2.2.2, discharge at 1C to 2.0V
4.5.9 日历寿命 Calendar Life	8 年 years	80%容量保持率; 25℃, 50%SOC 80% capacity retention rate, 25℃, 50%SOC

4.6 安全测试规范 Safety test specification

项目 Item	判断标准 Parameters	测试条件 Condition
4.6.1 过放电 Over-discharge	不起火、不爆炸 No explode or fire	电池单体按 4.1.1 方法充电, 以 1 I ₁ (A) 电流放电 90min, 试验后观察 1h。 (I ₁ =15Ah) Single cell is charged as per 4.1.1, then discharged at 1I (A) for 90 min, observed for 1 h (I ₁ =15A)
4.6.2 过充电 Over-charge	不起火、不爆炸 No explode or fire	电池单体按 4.1.1 方法充电, 以制造商规定且不小于 1/3 I ₁ (A) 电流恒流充电至制造商规定的充电终止电压的 1.1 倍或 115%SOC 后, 停止充电, 试验后观察 1h。 (I ₁ =15Ah) The single cell is charged as per 4.1.1, charge at constant current of no less than 1/3 I ₁ (A) until the voltage reaches 1.1 times of the cut off voltage specified in the enterprise technical conditions or charging capacity reaches 115%SOC, observe for 1h (I ₁ =15A)
4.6.3 外部短路 External Short circuiting	不起火、不爆炸 No explode or fire	电池单体按 4.1.1 方法充电, 将电池单体正、负极经外部短路 10min, 外部线路电阻应小于 5mΩ, 试验后观察 1h。 The single cell is charged as per 4.1.1, the positive and negative terminal of the single cell are externally short-circuited for 10 min, the external resistance should be less than 5 mΩ, observe for 1 h
4.6.4 加热 Heating test	不起火、不爆炸 No explode or fire	电池单体按 4.1.1 方法充电, 温度箱按照 5℃/min 的速率由试验室环境温度升至 130℃±2℃, 并保持此温度 30min 后停止加热, 试验后观察 1h。 The single cell is charged as per 4.1.1, the hot box temperature is raised from room temperature to 130±2℃ at a rate of 5℃/min. The heating is stopped after maintaining at this temperature for 30 min, observe for 1h



标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书
Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 13 页
共 24 页

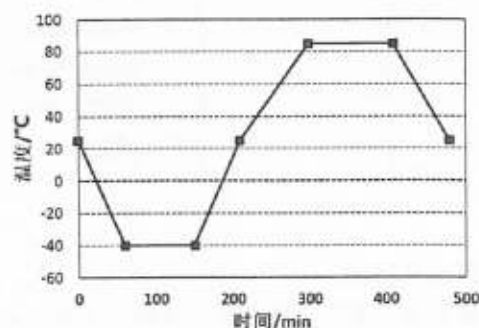
4.6.5 温度循环
Temperature
cycle test

不起火、不爆炸
No explode
or fire

电池单体按 4.1.1 方法充电，放入温度箱中，温度箱温度按照下表进行调节，循环次数 5 次，试验后观察 1h。

The single cell is charged as per 4.1.1, the cell is placed in the temperature box, the temperature is adjusted according to the following table, cycle 5 times and observe for 1 h.

温 度 Temp ℃	时间增量 Time min	累 计 时 间 Accumulative time min	温度变化率 Temp change rate ℃/min
25	0	0	0
-40	60	60	13/12
-40	90	150	0
25	60	210	13/12
85	90	300	2/3
85	110	410	0
25	70	480	6/7



 国轩高科 GUOXUAN HIGH-TECH	合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号 Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell		第 14 页 共 24 页
	4.6.6 挤 压 Crushing	不起火、不爆炸 No explode or fire	电池单体按 4.1.1 方法充电 The single cell is charged as per 4.1.1: 按下列条件进行试验 Test according to the following conditions: a) 挤压方向: 垂直于电池单体极板方向施压或与电池单体在整车布局上最容易受到挤压的方向相同 Crush direction: apply pressure perpendicular to the cell plate, or it is in the same direction as the cell is most likely to be squeezed in the vehicle layout ;; b) 挤压板形式: 半径为 75mm 的半圆柱体, 半圆柱体的长度(L) 大于被挤压电池单体的尺寸 Crushing plate:a semi-cylindrical body with a radius of 75 mm, the length (L) of the semi-cylindrical body is larger than the size of the cel; c) 挤压速度: 不大于 2mm/sCrush speed:No greater than 2mm/s; d) 挤压程度: 电压达到 0V 或变形量达到 15%或挤压力达到 100 kN 或 1000 倍试验对象重量后停止挤压 Crushing limit: Stop crushing when voltage drops to 0V or deformation reaches 15% or the force reaches100 kN or 1,000 times the weight of the test subjecCrushing limit: Stop crushing when voltage drops to 0V or deformation reaches 15% or the force reaches100 kN or 1,000 times the weight of the test subjec; e) 保持 10min Stand for 10 min; f) 试验后观察 1h Observe for 1 h.

5.使用注意事项 Notes

锂离子充电电池的使用警告。操作不当可能会造成电池发热、起火和性能劣化，务必认真阅读以下条款。

Warning for using the Lithium ion rechargeable cell, mishandling of the cell may cause heat, fire and deterioration in performance. Be sure to read the following terms carefully.

注意事项 Precautions

- 应用配有电池的设备时，使用前请参阅用户手册 When using a device equipped with a battery, refer to the user manual before use.
- 包装前请检查正极和负极端子的方向 Check the orientation of the cathode and anode terminals before packaging.
- 端子或导线与电池模块相连，注意绝缘防止短路 The terminal or wire is connected to the cell module, pay attention to the insulation to prevent short circuit.
- 长期不用时，电池要存放于阴凉干燥处 ($\leq 35^{\circ}\text{C}$, 30%~50%SOC, 3 个月进行一次充放电) Store the cell in a cool dry place ($\leq 35^{\circ}\text{C}$, 30%~50%SOC, charge and discharge once every 3 months) when not in use for a long time .
- 不要将电池放置于阳光直射处或热源 Do not place the cell in direct sunlight or heat source to prevent high temperature of the cel.

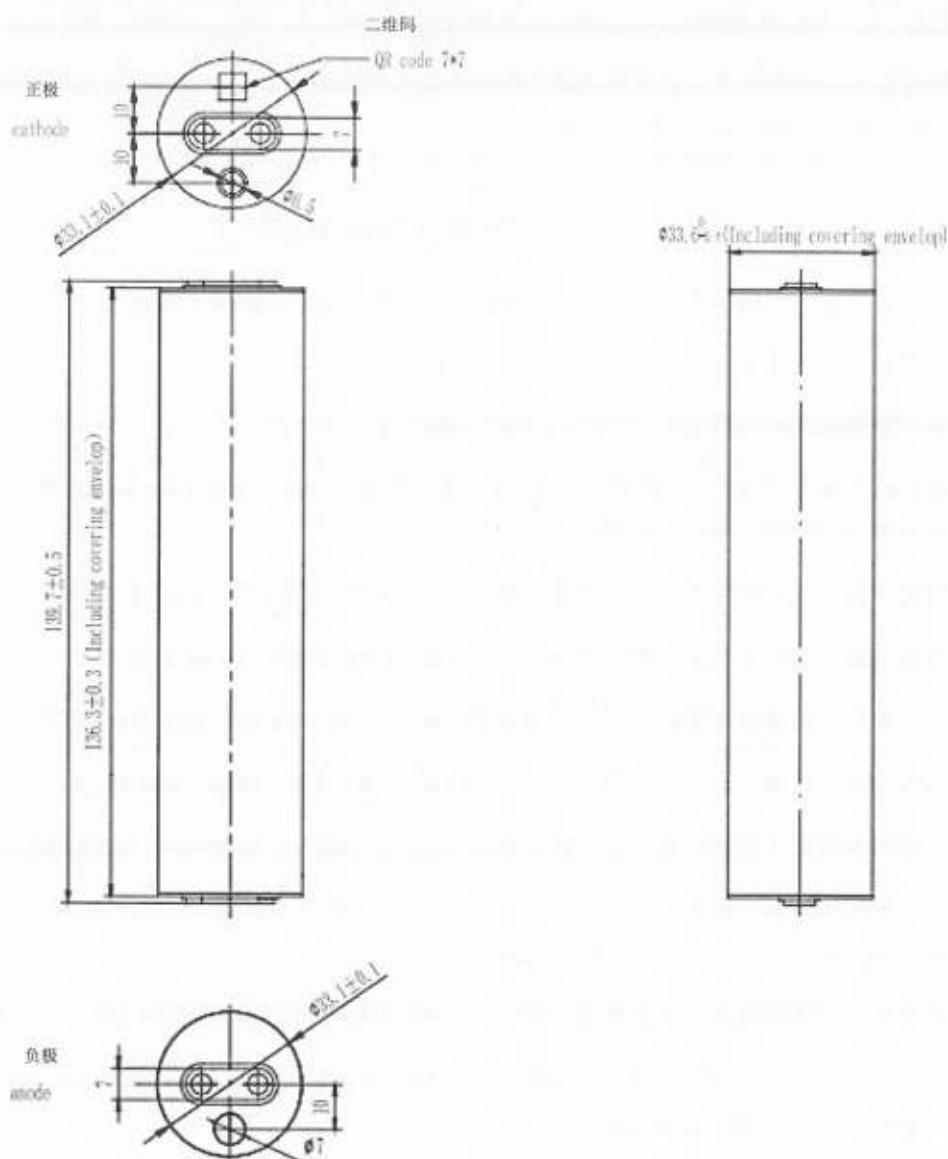
 国轩高科 GUOXUAN HIGH-TECH	合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd	编 号 Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell	第 15 页 共 24 页
• 处理电池单元时请勿穿戴金属饰品 (如戒指, 手表, 饰件等)Do not wear metal accessories (such as rings, watches, accessories, etc.) when handling cell units. . • 请勿将电池放置在本文件规定的使用温度范围之外的地方 Do not place the cell outside the operating temperature range specified in this document.		
禁止事项 Prohibited Items		
• 请勿超过最大充电倍率充电 Do not charge more than the maximum charge rate. • 请勿拆卸或改装电池 Do not disassemble or modify the Cell. • 请勿抛掷或撞击电池 Do not throw or hit the battery. • 请勿用锐器刺穿电池。(例如钉子, 刀子, 笔, 电钻) Do not pierce the battery with a sharp object. (eg nails, knives, pens, electric drills) • 请勿与其它型号电池或模块单元混用 Do not mix with other cell or module units. • 使用过程中请勿过度挤压电池 Do not over-squeeze the battery during use. • 请勿将新、旧电池在 PACK 中同时使用 Do not use both new and old cell in PACK. • 请勿将电池放置于大于 60℃ 高温处 Do not place the cell at a temperature higher than 60 °C. • 不要将电池放入微波炉或高压容器中 Do not put the cell in a microwave or high pressure container. • 请勿用导电材料连接正、负极端子。(例如金属, 电线)Do not connect the positive and negative terminals with conductive materials. (eg metal, wire) • 不允许弄湿或将电池浸入水或海水中 Do not allow to wet or immerse the cell in water or sea water. • 请勿以制造商书面协议之外的方式使用电池 Do not use the cell in any way other than the manufacturer's written agreement . • 禁止串联电芯壳体间绝缘不良 Do not connect the cells in series to prevent the insulation of “Can”. • 电池在整车中的放置方向, 必须保证电芯高度方向与车的行进方向垂直 The placement of the cell in the vehicle must ensure that the height of cell is perpendicular to the direction of the vehicle.		

标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书
Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 16 页
共 24 页

6.外形图纸 Drawings



电芯尺寸 Cell Dimension

注：图中尺寸单位为毫米（mm）

Remark: The dimensions are shown in millimeters (mm)



合肥国轩高科动力能源有限公司

HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd

编 号

Q/GX 023-2022

标题:

IFR32135-15Ah 锂离子电池产品规格书

第 17 页

Title:

Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

共 24 页

附录 Appendix

A.1 阶梯充电矩阵表 Step charge matrix table

温度 Temperature	$-20^{\circ}\text{C}\leq T<-15^{\circ}\text{C}$	$-15^{\circ}\text{C}\leq T<-10^{\circ}\text{C}$	$-10^{\circ}\text{C}\leq T<-5^{\circ}\text{C}$	$-5^{\circ}\text{C}\leq T<0^{\circ}\text{C}$	$0^{\circ}\text{C}\leq T<5^{\circ}\text{C}$	$5^{\circ}\text{C}\leq T<15^{\circ}\text{C}$	$15^{\circ}\text{C}\leq T<20^{\circ}\text{C}$	$20^{\circ}\text{C}\leq T<30^{\circ}\text{C}$	$30^{\circ}\text{C}\leq T<45^{\circ}\text{C}$	$45^{\circ}\text{C}\leq T<55^{\circ}\text{C}$
充电电流 Charge current (C)	0.03	0.05	0.1	0.15	0.2	0.33	0.68	0.68	0.68	0.33
跳转电压 Step voltage (V)	3.377	3.377	3.398	3.42	3.42	3.5	3.45	3.5	3.42	3.45
充电电流 Charge current (C)	0.02	0.03	0.05	0.1	0.15	0.2	0.5	0.5	0.5	/
跳转电压 Step voltage (V)	3.465	3.436	3.405	3.458	3.465	3.55	3.46	3.5	3.45	/
充电电流 Charge current (C)	0.015	0.025	0.03	0.07	0.1	/	/	/	0.3	/
跳转电压 Step voltage (V)	3.52	3.481	3.425	3.481	3.481	/	/	/	3.5	/
充电电流 Charge current (C)	/	0.02	0.02	0.05	0.05	/	0.2	0.3	0.2	0.2
截止电压 Step voltage (V)	/	3.62	3.55	3.483	3.5	/	3.62	3.52	3.55	3.5
充电电流 Charge current (C)	0.01	0.01	0.01	0.01	0.01	0.05	0.1	0.2	0.1	0.1
满电 Full recharge	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65

A.2 单体电芯故障阈值 Single cell failure threshold

A.2.1 单体电芯故障阈值 Single cell failure threshold

电池型号 Cell model:	数 值 Numerical Value	解释 Description	参考 Reference
------------------	------------------------	----------------	--------------



合肥国轩高科动力能源有限公司

HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co., Ltd

编 号

Q/GX 023-2022

标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书

Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 18 页

共 24 页

单体过电压严重报警阈值 Single cell over voltage critical alarm threshold V	3.8	充电时过电压超过报警阈值, 将影响电池的循环寿命, 用户充电不允许超过此电压值 When the overvoltage exceeds the alarm threshold during charging, it will affect the cycle life of the cell. User charging is not allowed to exceed this voltage value	强制断电 Forced outage
最大工作电压 Maximum working voltage V	3.65	正常工作的最大极限值 Maximum of normal operation	
单体欠压严重报警阈值 Single cell under voltage critical alarm threshold V	[-30℃-0℃) 1.8 [0℃-10℃) 2.0 [10℃-55℃) 2.0	放电时欠压超过报警阈值, 将影响电池的循环寿命, 用户放电不允许超过此电压值 When the under-voltage exceeds the alarm threshold during discharge, it will affect the cycle life of the cell. The user discharge must not exceed this voltage value	
最小工作电压 Minimum working voltage V	[-30℃-0℃) 2.0 [0℃-10℃) 2.3 [10℃-55℃) 2.5	正常工作的最小临界值 Minimum for normal operation	
电池温度过高一般报警阈值 Cell high temperature general alarm threshold℃	55	充电温度超过 55℃, 禁止充电 放电温度超过 55℃, 降功率 With higher temperature, cell power will be limited	
电池温度过高严重报警阈值 Cell high temperature critical alarm threshold℃	60	电池温度超过此报警阈值, 将会影响电池安全性能, 用户使用时不应超过此温度 If the cell temperature exceeds this alarm threshold, it will affect the cell safety performance. The user should not exceed this temperature when using it.	
电池温度过低严重报警阈值 Cell low temperature critical alarm threshold℃	-30	电池温度低于此报警阈值, 将会影响电池安全性能, 用户使用时不应低于此温度 If the cell temperature is lower than this alarm threshold, it will affect the safety performance of the cell. The user should not use it below this temperature	



合肥国轩高科动力能源有限公司

HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd

编 号

Q/GX 023-2022

标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书

Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 20 页

共 24 页

5.0%	3.306	3.318	3.306	3.315	3.321	3.327	3.332	3.332
10.0%	3.293	3.303	3.304	3.314	3.320	3.326	3.331	3.332
15.0%	3.291	3.302	3.304	3.313	3.320	3.326	3.330	3.331
20.0%	3.290	3.301	3.304	3.313	3.319	3.325	3.330	3.331
25.0%	3.288	3.299	3.303	3.312	3.319	3.325	3.330	3.331
30.0%	3.287	3.297	3.302	3.312	3.318	3.325	3.330	3.330
35.0%	3.285	3.294	3.299	3.309	3.315	3.322	3.325	3.325
40.0%	3.282	3.291	3.294	3.303	3.305	3.311	3.315	3.301
45.0%	3.280	3.287	3.287	3.290	3.292	3.294	3.299	3.299
50.0%	3.277	3.284	3.280	3.280	3.282	3.288	3.295	3.298
55.0%	3.274	3.281	3.273	3.275	3.279	3.288	3.295	3.297
60.0%	3.272	3.277	3.268	3.273	3.278	3.288	3.294	3.297
65.0%	3.269	3.274	3.266	3.272	3.277	3.287	3.291	3.293
70.0%	3.267	3.272	3.264	3.272	3.277	3.283	3.285	3.273
75.0%	3.265	3.269	3.265	3.273	3.275	3.273	3.270	3.258
80.0%	3.264	3.266	3.264	3.271	3.269	3.255	3.251	3.241
85.0%	3.262	3.263	3.262	3.265	3.253	3.228	3.225	3.214
90.0%	3.259	3.260	3.261	3.254	3.230	3.201	3.203	3.206
95.0%	3.254	3.256	3.260	3.241	3.208	3.181	3.162	3.130
100.0%	3.247	3.247	3.259	3.225	3.200	2.901	2.579	2.568

A.5 不同温度&不同 SOC 的放电 DCR Discharge DCR at Different Temperature and SOC

3C 30s 放电 Discharge DCR/mΩ

T/SOC	-30℃	-20℃	-10℃	0℃	10℃	25℃	45℃	55℃
5%	/	/	/	/	/	16.2	10.2	9.0
10%	/	/	/	/	29.1	12.0	7.0	6.1
20%	/	/	/	23.9	17.1	9.4	5.9	5.4
30%	/	58.9	31.1	19.5	13.6	8.5	5.7	5.1
40%	/	53.3	26.6	17.1	12.0	7.8	5.3	4.9
50%	98.0	48.1	23.8	15.8	11.1	7.3	5.0	4.5
60%	91.7	44.3	22.1	15.0	10.5	7.2	4.7	4.2
70%	86.1	41.7	21.1	14.6	10.4	7.1	4.9	4.4
80%	82.0	40.0	20.5	14.3	10.1	6.8	4.6	4.2
90%	78.4	38.6	19.9	14.0	9.8	6.5	4.3	3.8
95%	76.8	38.1	19.7	13.8	9.6	6.3	4.1	3.7

注: /表示不支持 30s, -30℃1.5C 测试数据, -20℃2C 测试数据

Note: / indicates that 30s, -30 °C 1.5C test data, -20 °C 2C test data are not supported.

A.6 不同温度&不同 SOC 充电电阻 Regeneration DCR at Different Temperature and SOC

2.25C 15s 充电 Charge DCR/mΩ

	合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号
			Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell		第 19 页 共 24 页

A.2.2 为 Pack 设计提供的电池信息 Cell information for PACK design

电池型号 Cell Model:	符号 Symbol	数值 Value	意见 Comments	参考 Reference
最大允许压力 Maximum allowable pressure	Fmax	TBD		250kgf, 5%SOC
最小要求压力 Minimum required pressure	Fmin	TBD		0kgf, 5%SOC

A.3 在选定条件下的循环寿命 Cycle life at certain condition

A.3.1 常温循环寿命 Room temperature cycle life

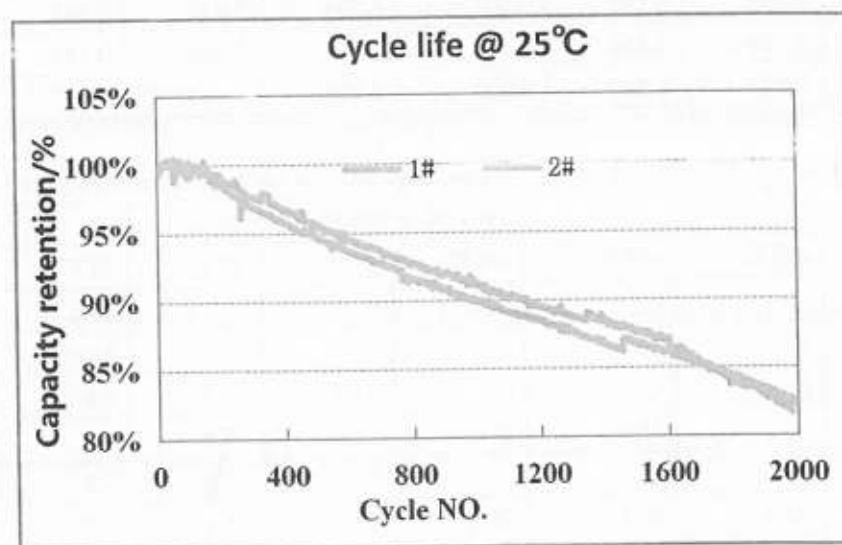
测试条件 Test conditions

充电 Charge: 阶梯恒流充电 Step constant current charge0.68C-3.5V,0.5C-3.5V,0.3C-3.52V,0.2C-3.65V

放电 Discharge: 1C 放电至截止电压 2.0V 1C discharge to cutoff voltage 2.0V

温度 Temp: 25℃

静置时间 Stand time: 充电/放电后静置 30min 30 min after charge/discharge;



A.4 SOC-OCV 表 table

T	-30℃	-20℃	-10℃	0℃	10℃	25℃	45℃	55℃
DOD	电 压 Voltage/V	电 压 Voltage/V	电 压 Voltage/V	电 压 Voltage/V	电 压 Voltage/V	电 压 Voltage/V	电 压 Voltage/V	电 压 Voltage/V
0.0%	3.391	3.421	3.342	3.343	3.336	3.335	3.339	3.336

	合肥国轩高科动力能源有限公司 HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd		编 号
			Q/GX 023-2022
标题: Title:	IFR32135-15Ah 锂离子电池产品规格书 Product Specification for IFR32135-15Ah Lithium ion rechargeable cell		第 21 页 共 24 页

T/SOC	10℃	25℃	45℃	55℃
5%	19.8	8.4	7.0	6.3
10%	19.1	7.1	5.0	4.5
20%	10.3	7.0	4.7	4.3
30%	10.2	6.9	4.6	4.1
40%	10.1	6.7	4.5	4.0
50%	10.0	6.6	4.3	3.9
60%	9.8	6.5	4.2	3.7
70%	9.8	6.5	4.4	4.0
80%	9.7	6.4	4.3	3.9
90%	9.5	6.1	4.0	3.5
95%	9.3	5.9	3.9	3.4

A.7 不同温度&不同 SOC 脉冲放电峰值功率 Peak power pulse discharge at different temperatures and SOC

30s 脉冲放电峰值功率 Peak power pulse discharge/W								
T/SOC	-30℃	-20℃	-10℃	0℃	10℃	25℃	45℃	55℃
5%	/	/	/	/	/	97.00	154.05	176.98
10%	/	/	/	/	57.54	139.53	239.2	271.32
20%	/	/	/	73.52	102.76	186.94	297.83	330.74
30%	/	30.77	58.28	92.94	133.26	213.22	317.96	352.92
40%	/	34.14	68.41	106.42	151.65	233.30	343.35	377.66
50%	18.59	37.87	76.54	115.29	164.11	249.53	364.32	400.91
60%	20.37	42.16	84.51	124.51	177.87	259.39	397.36	442.59
70%	21.97	45.36	89.65	129.56	181.88	266.41	386.02	430.70
80%	23.09	47.33	92.36	132.40	187.46	278.44	411.60	458.79
90%	24.17	49.10	95.24	135.37	193.39	291.57	440.74	495.57
95%	24.70	49.79	96.30	137.47	197.61	301.12	462.69	524.04
注: /表示不支持 30s, -30℃1.5C 测试数据, -20℃2C 测试数据 Note: / indicates that 30s, -30 °C 1.5C test data, -20 °C 2C test data are not supported.								

A.8 不同温度&不同 SOC 脉冲回馈峰值功率 Peak power pulse feedback at different temperatures and SOC

15s 脉冲回馈峰值功率 Peak power pulse feedback/W				
T/SOC	10℃	25℃	45℃	55℃



合肥国轩高科动力能源有限公司

HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co.,Ltd

编 号

Q/GX 023-2022

标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书

Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 22 页

共 24 页

5%	63.21	148.99	178.79	191.44
10%	59.16	159.14	225.98	249.14
20%	99.86	146.94	218.85	239.07
30%	94.04	139.02	208.53	228.31
40%	94.05	141.77	211.08	230.04
50%	94.75	143.56	220.35	240.85
60%	90.66	136.68	211.53	234.31
70%	87.48	131.89	194.84	212.75
80%	88.13	133.58	198.81	219.35
90%	89.73	139.75	213.12	238.81
95%	91.41	144.08	217.97	245.90

A.9 不同温度&不同 SOC 最大允许脉冲放电功率/倍率 Maximum allowable pulse discharge power/rate at different temperature and SOC

30s 最大脉冲放电功率 Maximum allowable pulse discharge power/W

T/SOC	-30℃	-20℃	-10℃	0℃	10℃	25℃	45℃	55℃
5%	3.9	4.1	4.2	8.7	13.1	34.8	65.3	43.5
10%	3.9	4.1	12.6	21.8	26.1	65.3	87.0	43.5
20%	3.9	8.1	16.8	34.8	47.9	87.0	87.0	43.5
30%	3.9	12.2	29.4	47.9	65.3	108.8	87.0	43.5
40%	3.9	16.2	33.6	52.2	65.3	108.8	87.0	43.5
50%	7.8	16.2	37.8	56.6	65.3	108.8	87.0	43.5
60%	7.8	20.3	42.0	65.3	87.0	130.5	87.0	43.5
70%	11.7	20.3	46.2	65.3	87.0	130.5	87.0	43.5
80%	11.7	24.3	46.2	65.3	87.0	130.5	87.0	43.5
90%	11.7	24.3	50.4	65.3	87.0	130.5	87.0	43.5
95%	11.7	24.3	50.4	65.3	87.0	130.5	87.0	43.5
100%	11.7	24.3	50.4	65.3	87.0	130.5	87.0	43.5

30s 最大脉冲放电倍率 Maximum pulse discharge rate/C

T/SOC	-30℃	-20℃	-10℃	0℃	10℃	25℃	45℃	55℃
5%	0.10	0.10	0.10	0.20	0.30	0.80	1.50	1.00
10%	0.10	0.10	0.30	0.50	0.60	1.50	2.00	1.00
20%	0.10	0.20	0.40	0.80	1.10	2.00	2.00	1.00
30%	0.10	0.30	0.70	1.10	1.50	2.50	2.00	1.00
40%	0.10	0.40	0.80	1.20	1.50	2.50	2.00	1.00
50%	0.20	0.40	0.90	1.30	1.50	2.50	2.00	1.00
60%	0.20	0.50	1.00	1.50	2.00	3.00	2.00	1.00
70%	0.30	0.50	1.10	1.50	2.00	3.00	2.00	1.00
80%	0.30	0.60	1.10	1.50	2.00	3.00	2.00	1.00



标题:
Title:

IFR32135-15Ah 锂离子电池产品规格书
Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

第 23 页
共 24 页

90%	0.30	0.60	1.20	1.50	2.00	3.00	2.00	1.00
95%	0.30	0.60	1.20	1.50	2.00	3.00	2.00	1.00
100%	0.30	0.60	1.20	1.50	2.00	3.00	2.00	1.00

A.10 不同温度&不同 SOC 最大允许脉冲回馈功率/倍率 Maximum allowable pulse feedback power/rate at different temperature and SOC

15s 最大脉冲回馈功率 Maximum pulse feedback power /W							
T/SOC	-10℃	-5℃	0℃	10℃	25℃	45℃	55℃
<5%	10.4	15.5	25.9	41.4	62.1	62.1	31.1
<10%	10.4	15.5	25.9	41.4	62.1	62.1	31.1
<20%	10.4	15.5	25.9	41.4	62.1	62.1	31.1
<30%	10.4	15.5	25.9	41.4	62.1	62.1	31.1
<40%	10.4	15.5	25.9	41.4	62.1	62.1	31.1
<50%	10.4	15.5	25.9	41.4	51.8	51.8	31.1
<60%	5.2	10.4	15.5	31.1	51.8	51.8	25.9
<70%	5.2	10.4	15.5	31.1	41.4	41.4	25.9
<80%	5.2	10.4	15.5	25.9	41.4	41.4	25.9
<90%	5.2	7.8	10.4	15.5	25.9	25.9	25.9
<95%	2.6	3.6	5.2	10.4	15.5	15.5	15.5
<100%	0.5	1.6	2.6	2.6	5.2	5.2	5.2

15s 最大脉冲回馈倍率 Maximum pulse feedback rate/C							
T/SOC	-10℃	-5℃	0℃	10℃	25℃	45℃	55℃
<5%	0.20	0.30	0.50	0.80	1.20	1.20	0.60
<10%	0.20	0.30	0.50	0.80	1.20	1.20	0.60
<20%	0.20	0.30	0.50	0.80	1.20	1.20	0.60
<30%	0.20	0.30	0.50	0.80	1.20	1.20	0.60
<40%	0.20	0.30	0.50	0.80	1.20	1.20	0.60
<50%	0.20	0.30	0.50	0.80	1.00	1.00	0.60
<60%	0.10	0.20	0.30	0.60	1.00	1.00	0.50
<70%	0.10	0.20	0.30	0.60	0.80	0.80	0.50
<80%	0.10	0.20	0.30	0.50	0.80	0.80	0.50
<90%	0.10	0.15	0.20	0.30	0.50	0.50	0.50
<95%	0.05	0.07	0.10	0.20	0.30	0.30	0.30
<100%	0.01	0.03	0.05	0.05	0.10	0.10	0.10

备注：脉冲回馈电流的大小必须严格遵守下表所列的所有充电状态以及电芯温度等条件。违反脉冲回馈条件可能会造成电芯永久性的损伤导致使用寿命下降。

Remark: The high/low of the pulse feedback current must strictly comply with all charging states and cell temperature listed in the table below. Violation of pulse feedback conditions may result in permanent damage to the cell and decrease of service life.



合肥国轩高科动力能源有限公司

HEFEI GUOXUAN HIGH-TECH POWER ENERGY Co., Ltd

编 号

Q/GX 023-2022

标题:

IFR32135-15Ah 锂离子电池产品规格书

第 24 页

Title:

Product Specification for IFR32135-15Ah Lithium ion rechargeable cell

共 24 页

IFR32135-15Ah 锂离子电池产品环保声明

Environmental declaration of IFR32135-15Ah Lithium battery product

根据欧盟(EU)2015/863 指令; 2006-66-EC 电池指令要求, 如下表所示 镉、铅、汞、六价铬、多溴联苯(PBB)、多溴二苯醚(PBDE)及邻苯二甲酸酯(PAEs)共计 10 种物质纳入禁用物质清单。

In accordance with EU directive 2015/863, battery instruction requirements in 2006-66-EC, as shown in the following table, a total of 10 substances are included in the RSL, for example Cadmium、Lead、Mercury、Hexavalent chromium、Polybrominated biphenyls (PBB)、Polybrominated diphenyl ethers (PBDE) and phthalate (PAEs).

A.11 十种禁用物质清单 Table A.11 List of 10 restricted substances

RoHS 禁用物质 restricted substance	最高限值 The highest limit (PPM)	说明 Description
镉 Cadmium(Cd)	20	2006-66-EC 指令要求 Directive Requirement
铅 Lead(Pb)	40	2006-66-EC 指令要求 Directive Requirement
汞 Mercury (Hg)	5	2006-66-EC 指令要求 Directive Requirement
六价铬 Hexavalent chromium (Cr^{6+})	1000	RoHS 1.0 已有限用物质 limited substance
多溴联苯 Polybrominated biphenyls (PBB)	1000	RoHS 1.0 已有限用物质 limited substance
多溴二苯醚 Polybrominated diphenyl ethers (PBDE)	1000	RoHS 1.0 已有限用物质 limited substance
邻苯二甲酸二(2-乙基己基)酯 Diphthalate (2-ethylhexyl) ester (DEHP- Di(2-ethylhexyl)Phthalate)	1000	RoHS 2.0 新增限用物质 Added restricted substances in RoHS 2.0
邻苯二甲酸丁苄酯 Benzyl butyl phthalate (BBP- Benzyl Butyl Phthalate)	1000	RoHS 2.0 新增限用物质 Added restricted substances in RoHS 2.0
邻苯二甲酸二丁酯 Dibutyl phthalate (DBP-Di-n-butyl Phthalate)	1000	RoHS 2.0 新增限用物质 Added restricted substances in RoHS 2.0
邻苯二甲酸二异丁酯 Diisobutyl phthalate (DIBP-Diiso butyl Phthalate)	1000	RoHS 2.0 新增限用物质 Added restricted substances in RoHS 2.0

从发布日期立即实施执行 Execute immediately from release date.