



危险物品 DANGEROUS GOODS

# 仅限货机运输

# 航空运输条件鉴别报告书

Identification and Classification Report for Air Transport of Goods

报告编号:

PEKSZ202212315084PXY370001

此报告本年度有效 有效期至2023年12月31日

Issued No.:

生效日期:
Effective Date:

2023.01.04

委托单位:

云南路飞新能源材料有限公司

Applicant:

Yunnan Road Fei New Energy Materials Co., Ltd.

物品名称:

锂离子电芯 645464 3.85V 4000mAh 15.4Wh

Name of Goods:

Lithium ion cell 645464 3.85V 4000mAh 15.4Wh

# 北京迪捷姆空运技术开发有限公司

Beijing DGM Air Transport Technology Development Co.,Ltd.



# 报告书使用约定

## Terms of the Using of the Report

1. 本公司依据本年度国际航协《危险品规则》以及委托人(托运人或其代理人)提供的物品及其运输信息,确定货物的航空运输条件并出具此报告书。

The report is issued by DGM China according to IATA *Dangerous Goods Regulations* published in the current year and the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要,本公司要求委托人提供真实、完整的货物样品及资料。

According to the demand of identification and classification, DGM China requires the applicant to provide true and exact sample and data of the cargo.

3. 委托人保证申报的物品和/或提供的样品与交运的货物是同一种物质。

The applicant guarantees that the declared goods and/or the sample who provides should be identical with the contents of cargo that is to be transported.

4. 本公司仅对样品的鉴别结果负责。

DGM China is only responsible for the identification and classification of the sample provided by the applicant.

5. 本报告书经主检员、审核人和批准人签字并加盖本公司印章后生效。

This report will be effective only after it is signed by the inspector, checker and approver, and stamped by DGM China.

6. 未经本公司书面批准,不得复制本报告书。

The duplicating of this report is prohibited without the written approval of DGM China.

7. 私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。

The report is invalid when anything of the following happens - illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.

8. 为适应国际航协《危险品规则》的年度变化,报告书仅在本年度内有效。

This report is only valid within the year in which the IATA Dangerous Goods Regulations is effective.

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项目编号 Item No.		PEKSZ202212315084	签发日期 Issued Date	2023. 01. 04
鉴别目的 Identification Purpose		是否属于航空运输危险物品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2023. 01. 03
	依据 ion Criteria	IATA DGR 64th, 2023	IRA /	
物品名称	中文 Chinese	锂离子电芯 645464 3.85V 4000mAh 15.4		CHI
Name of Goods	英文 English	Lithium ion cell 645464 3.85V 4000mA	h 15.4Wh	
生产 Heer Manuf	厂家 acturer	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materia	als Co.,Ltd.	1 /
件 Air way Man 目的 Goe Destir	ees 色号 bill No.		书时候填写的运输信信息与报告书的关联书的一致性由托运人	人或其代理人在使用本报告息,不属于鉴定内容。运输性以及实际运输货物与报告或其代理人保证,如发生日或其代理人承担全部责任。 容,并盖章) 联系方式:
hden 物品 物品 Nature of t	信息 the goods	该样品为银色长方体电芯。型号: 645464 尺寸: 65.0×55.0×6.5mm 每包装件中电池/电芯数量: 189 每包装件中电池/电芯净重: 9.809kg 该电芯已经做好防短路措施并装入坚固的。 该锂电芯不属于召回电芯,不属于废弃和造 根据委托方所提供的声明: 本报告所述锂、 额定容量的30%。 (注: 单块电芯重量为51.9g。该电芯的UN3号: ORTSZB01210601025。该电芯的1.2米量 告编号: TSZ22120267-P03-R03。堆码试验 TSZ22120267-P03-R04。该电芯由塑料袋单 This sample is silver cuboid cell.	回收电芯,并按照DGR3.9.2.0 离子电池(或电芯)交付运输 38.3报告由深圳市优瑞特检测 跌落测试报告由深圳天溯计量 2报告由深圳天溯计量检测股	时,其荷电状态不超过设计 则技术有限公司出具,报告编 战检测股份有限公司出具,报
		Model: 645464 Size: 65.0×55.0×6.5mm Number of batteries / cells per packa Net quantity of batteries/cells per p Cells have been protected so as to pr outer packagings. The lithium cells don't belong to ce reasons, are not waste lithium cells or disposal, are manufactured under a 3.9.2.6.1(e). Lithium ion cells and batteries must not exceeding 30% of their rated desi	cackage: 9.809kg revent short circuits and ells returned to the manuf and not lithium cells bei a quality management progra be offered for transport	Facturer for safety ing shipped for recycling ram as described in

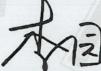


	目编号 m No.	PEKSZ202212315084			
物品名称	中文 Chinese	锂离子电芯 645464 3.85V 4000mAh 15.4Wh		X 1 7 2	
Name of Goods	英文 English	Lithium ion cell 645464 3.85V 4000mAh 15.4	1Wh		
iojenh		该货物为锂离子/聚合物电芯,单独包装。额定瓦特小时验,包装件通过3米堆码试验,每个包装件上均有锂电池	为15.4Wh。已通过 UN38.3 测试,已 标记。	· · · · · · · · · · · · · · · · · · ·	米跌落试
	制结论 clusions	参考有关资料,根据DGR有关规定,该物质分类识别为第 This goods is lithium ion/polymer cell, packed ind a type proved to meet the Requirements of each tel III, sub-section 38.3, Each package is capable of we damage to the cells contained therein, without shows	ividually. Watt-hour rating is 15 st in the UN MANUAL OF TESTS ANI ithstanding a 1.2m drop test in ifting of the contents so as to	O CRITERIA, Par any orientationallow cell to	rt on withou
78, te		contact and without release of contents, The package package is marked with lithium battery mark.  According to IATA DGR this substance is classified	ge is capable of withstanding th		
Police Name	UN/ID 编号 UN/ID No.	package is marked with lithium battery mark.	ge is capable of withstanding the		<b>包装等</b>
Marie - Nacional - Marie - Mar		package is marked with lithium battery mark. According to IATA DGR this substance is classified 运输专用名称	ge is capable of withstanding the	类或项 Class or Div. (次要危险性)	包装等约 Packing
建议运输 条件 uggestion	UN/ID No.	package is marked with lithium battery mark.  According to IATA DGR this substance is classified	ge is capable of withstanding the	类或项 Class or Div. (次要危險性) (Subsidiary Risk)	包装等约 Packing
建议运输条件	UN/ID No. UN3480	package is marked with lithium battery mark.  According to IATA DGR this substance is classified	ge is capable of withstanding the das dangerous goods Class (or come	类或项 Class or Div. (次要危險性) (Subsidiary Risk)	包装等约 Packing

全主检员 Prepared by: Sagar



审核人 Checked by:



批准人 Approved by:

报告单位(盖章) Stamp

制单:

彭新玉

第4页共4页



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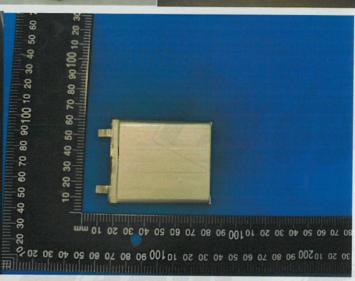
# 锂离子电芯 645464 3.85V 4000mAh 15.4Wh

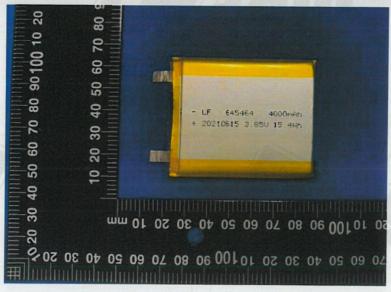
PEKSZ202212315084











# 锂电池 UN38.3 试验概要 Lithium Battery Test Summary

项目编号: PEKSZ202212315084

		单位信息 C	ompan	y Informa	ation		NH/X S
委托单位 Consignor	云南路飞 Yunnan Ro 云南省保 NO.1 hig cooperation	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd. 云南省保山市腾冲市边境经济开发合作区高新 NO.1 high tech industrial Park,Tengchong b cooperation zone ,Baoshan City,yunnan Province			l. 新技术产业员 border eco ce	nomic d	evelopment an
生产单位 Manufacturer	云南路飞 Yunnan Ro 云南省保 NO.1 hig cooperatio	电话/Tel: 0875-5189928 邮箱/Mail: 2411318566@qq.com 云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd. 云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province 电话/Tel: 0875-5189928 邮箱/Mail: 2411318566@qq.com					
测试单位 Test Lab	深圳市龙 电话/Tel:	瑞特检测技术》 岗区龙岗街道; 0086-755-278 site: http://ww	有限公司 南联第六 17553 曲	工业区方兴 『箱/Mail:	科技园 C 区 1	5 栋一楼	4
		电池信息 1	Battery	Informat	tion		1-7
名称 Name	COLUMN F. ASSESSMENT	里离子电芯 nium ion cell	Ba	电池/电动 ttery/Cell Cl	The second secon		离子电芯 i-ion Cell
型号 Type	645464			商标 Trademark			11
额定电压 Normal Voltage		3.85V		额定容量 Rated Capacity		4	000mAh
额定能量 Watt-hour rating		15.4Wh		外观/Appearance			色长方体 ver Cuboid
质量/Mass		51.9g		锂含量/Li Content		不	适用 N/A j
Links		测试信息	Test In	formatio	n		CH
测试报告编号 Test Report Number	ORTSZ	B01210601025		测试报告签 Date of Test		20	21-08-02
测试标准 Edition of UN Manual of Tests and Criteria Used	UN Recomi	关于危险货物运 mendations on SG/AC.10/11/R	the Transp	oort of Dang	erous Goods I	第 6 版修 Manual of	多订 1)38.3 节 f Tests and
T.1: 高度模拟 Altitude Simulation	通过 Pass	T.2: 温度 Thermal		通过 Pass	T.3: 振		通过
T.4: 冲击 Shock	通过 Pass	T.5: 外部 External Shor	短路	通过 Pass	Vibrati T.6: 撞击 Impact/0	/挤压	Pass 通过
T.7: 过度充电 Overcharge	不适用 N/A	不适用 T.8: 强制放电		通过 Pass	impact/C	TUSH THE	Pass
UN38.3.3(f)	不适	用 N/A	4	UN38.3.3	3(g)	1	适用 N/A
签名 Signatory 职务 Title	<b>不成</b> 检验员	3	签发E Issued		115	및	DGM-CH



# 货物运输条件鉴定报告

# **Certificate for Safe Transport of Goods**

(空运/By Air)

危险物品 DANGEROUS GOODS

# 锂电池-符合包装说明 965 第 IB 部分

物品名称:

锂离子电芯 645464 3.85V, 4000mAh, 15.4Wh

**Goods Name** 

Lithium ion cell 645464 3.85V, 4000mAh, 15.4Wh

委托单位:

云南路飞新能源材料有限公司

Client

Yunnan Lufei New Energy Materials Co., Ltd.

报告编号:

DGT2021DL0812F

Report No.

2021-07-06

签发日期:
Issued Date

中国民用航空总局第二研究所
The Second Research Institute of CAAC



## 声 明 STATEMENT

1.本《鉴定报告》依据本年度国际航协《危险品规则》、委托人(托运人或代理人)提供的物品及其运输信息出具。

The certificate is issued by The Second Research Institute of CAAC according to IATA DGR published in the current year and the information of the goods and its shipment provided by the client (shipper or its agent).

2.本《鉴定报告》的鉴定结论仅对样品负责。

The certificate is only responsible for the sample provided by the client.

3.客户必须如实提供样品及资料,并保证申报品名和样品与运输货物相同。

The client should provide samples and relevant data, at the same time, and they should guarantee that the name they declared is the same as the samples they provided and the goods to be transported.

4.本《鉴定报告》经检验人、审核人、批准人签字并加盖检验印章后生效。

The certificate will be effective only after it is signed by the inspector, checker, and approver, and stamped.

5.本《鉴定报告》不得全部或部分复制,复制无效。本鉴定报告私自转让、复制、盗用、冒用、涂改或以任何媒体形式篡改的均属无效。

The certificate must not be copied wholly or partly. The certificate is invalid if anything of the following happens, such as illegal transfer, reproduction, embezzlement, imposture, modification or tampering in any media form.

6.本《鉴定报告》不考虑国家及经营人差异。

The certificate takes no account of the State and Operator Variations.

7.为适应国际航协《危险品规则》的年度变化,本《鉴定报告》仅在本年度内有效。

This certificate is only valid within the year in which the IATA Dangerous Goods Regulations is effective.

8.对《鉴定报告》若有异议,应于收到报告之日起十五日内向本机构提出。

Objections to the certificate must be submitted to The Second Research Institute of CAAC within 15 days.

地址:成都双流西航港经济开发区腾飞路 765 号

Address: No.765, Tengfei Road, Xihanggang Economic Development Zone, Shuangliu, Chengdu, Sichuan

电话(Tel): 028-64458155 028-64458195

传真(Fax): 028-64458195 邮编(Post Code): 610200

报告查询网址: http://www.caacdgt.com

#### 货物运输条件鉴定报告

Certificate for Safe Transport of Goods

	Certificate for Safe Transp	ort of Goods			
鉴定目的	是否属于航空运输危险品				
<b>Inspection Purpose</b>	Dangerous Goods or not restricted				
样品编号	DGT2021DL0812	接样日期	2021-07-5		
Sample No.	DG12021DL0812	Receiving Date	2021-07-3		
鉴定依据	国际航空运输协会《危险品规则》62	版			
Criteria	IATA Dangerous Goods Regulations (Do	GR) 62nd Edition			
样品名称	锂离子电芯 645464 3.85V, 4000mAh,	15.4Wh			
Sample Name	Lithium ion cell 645464 3.85V, 4000mA	.h, 15.4Wh			
委托单位	云南路飞新能源材料有限公司				
Client	Yunnan Lufei New Energy Materials Co	., Ltd.			
电池生产商	云南路飞新能源材料有限公司				
Manufacturer	Yunnan Lufei New Energy Materials Co	., Ltd.			
物品信息 Sample Information	-电池信息/Battery information: 型号/Model: 645464 3.85V, 4000mAh, 15.4Wh 类型/Type: 锂离子电芯/lithium ion cell 商标/Mark brand: / -包装信息/Package information: 每个包装件中锂电池净重不超过 10.0kg。 Net quantity of lithium battery per package is no more than 10.0kg. 包装件内含 189 个锂电池。 The package contains 189 lithium batteries.				
鉴定结论 Conclusion	1.危险性识别(Hazards Identification) 危险类别/Class: 9 UN Number: UN 3480 Proper Shipping Name: Lithium ion batteries  2.按照 IATA DGR 办理的类型(Suggestion according to IATA DGR) 该样品满足包装说明 965 一般要求和第 IB 部分的规定。 The sample meets the requirements in General Requirements and section IB of Packing Instruction 965.  3.包装要求(Packing requirements) 按包装说明 965 第 IB 部分要求办理。 The sample is packaged according to the Packing Instruction 965 section IB.  4.仅限货机运输 Cargo Aircraft Only.				
备注(Comment)	/	签发日期(Issued Date)	<b>企验专用于</b>		

<sup>を验</sup> (Inspected by): 本体 (Checked by): 本体 (Approved by): まばば





# 货物运输条件鉴定报告

# **Certificate for Safe Transport of Goods**

	检验结果及其他事项
	Inspection results and other information
	本报告所述锂电池按照《危险品规则》(62版)3.9.2.6.1(e)规定的质量管理体系进行制造。
	Lithium batteries listed in this report are manufactured under the quality management program as
	described in IATA DGR 62nd Edition 3.9.2.6.1 (e) .
	本报告所述锂电池不属于有缺陷和因安全原因而召回的锂电池。
1	Lithium batteries listed in this report are not defective and returned to the manufacturer for safety
	reasons.
	本报告所述锂电池不属于以回收或处置为目的的航空运输,不属于废弃锂电池。
	Lithium batteries listed in this report are not waste, shipped for recycling or disposal ones.
	本报告所述锂电池已经通过联合国《试验与标准手册》第III部分第 38.3 节的测试。测试摘要详
	见附件。
2	Lithium batteries listed in the report are of type proved to meet the requirements of each test of the
	UN Manual of Tests and Criteria, Part III, subsection 38.3. The test summary is attached.
	本报告所述锂电池包装件能够承受 1.2 米跌落试验。 The package is capable of withstanding a 1.2 m drop test.
	根据委托人声明,本报告所述锂电池的荷电量不超过其设计容量的 30%。
3	According to the statement from the client, the state of charge (Soc) of Lithium cells and batteries
	listed in this report is not exceeding 30% of their rated design capacity.
	本报告所述锂电池放在完全封闭的内包装中,然后再放在坚固的外包装内。
	Lithium batteries must be placed in inner packaging that completely enclose the cell or battery then
4	placed in strong outer packaging.
7	本报告所述锂电池具有适当的防外部短路措施。
	Lithium batteries are equipped with an effective means of preventing external short circuits.
	电池已固定不能移位。
5	The battery is fixed and can't move.
	本报告所述锂电池不得与第1类爆炸品(1.4S项除外),2.1项易燃气体,第3类易燃液体,4.1项
	易燃固体和5.1项氧化性物质包装在同一个外包装中。
6	Lithium batteries must not be packed in the same outer packaging with dangerous goods classified in
	Class 1(explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable
	liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).
	每个包装件必须耐久清晰的标识第9类锂电池危险性标签、锂电池标记及仅限货机标签。包装件必须有足够的位置使得所要求的标记贴在包装件的同一面,而不使标记折叠。
7	Each package must be durably and legibly marked with the Class 9-Lithium Battery hazard label, the
/	lithium battery mark and the Cargo Aircraft Only label. The package must be of such size that there is
	adequate space to affix the mark on one side of the package without the mark being folded.
8	附图

# 电池/Battery 7 mm 01 02 0€ 0⊅ 03 09 07 08 0 包装件/Package: **一下**无正文内容 一位验专用章

# 附件:

# 测试摘要 TEST SUMMARY

电池生产商信息/Manufa	acturer information	l			
电池生产商	云南路飞新能源材料有限公司				
Manufacturer	Yunnan Lufei New Energy Materials Co., Ltd.				
生产商地址	云南省保山市腾冲市边境经济开发合作区高新技术产				
Address	业园1号				
	No.1 high tech	Industr	rial l	Park, T	Tengchong border
	economic develop	ment a	nd co	operation	on zone, Baoshan
	City, Yunnan Provi	nce		***	
联系电话	0875-5189928	电子曲	『箱	135309	940968@163.com
Tell		E-mail	l		
网站地址/website	/				
电池信息/Battery inform	nation				
电池类型	锂离子电芯		型号	ļ	645464
Type	Lithium ion cell		Mod	lel	
额定能量	3.85V, 4000mAh, 1	5.4W	电池	质量	约 52.0g
Capacity			Mas	S	
物理形状说明	黑色长方体				
Physical description	Black cuboid				
测试机构信息/Test labor	atory information				
测试机构	深圳市优瑞特检测	则技术有	限公	司	
test laboratory	Shenzhen ORT Tec	hnical S	Servic	es Co., l	Ltd.
机构地址	广东省深圳市龙岗	岗区龙岗	讨街道	南联第	5六工业园方兴科
Address	技园 C 区 15 栋一	楼			
	1/F, Building 15, F	angxing	g Scie	nce and	Technology Park,
	Nanlian No. 6	Industr	ial 2	Zone,	Longgang Street,
	Longgang District,	Shenzh	en, G	uangdor	ng, China
联系电话/Tell	0755-27817553		电子	邮箱	battery@ort-ts.c
			E-m	ail	om
网站地址/website	网站地址/website http://www.ort-ts.com				
测试报告信息/Test repor	t information				
报告编号/Test report ID	ORTSZ210520010	212	3000.3304 FFSS		
接样日期	2021-05-31	测试日	期	2021-0	05-31 至
Receiving date	27 20 20 20	Test da	Γest date 2021-06-15		06-15
测试人员	刘文威	批准人员		周志弘	虽
Tester	Approver				

#### 测试项目及结论/Test item and result

		T	
条款/Clause	测试项目/Test Item	结论/Result	备注/Remark
38.3.3(f)	小型集成电池	不适用	/
36.3.3(1)	small battery assemblies	N/A	
29 2 2(g)	大型集成电池	不适用	1
38.3.3(g)	Large battery assemblies	N/A	
38.3.4.1	高度模拟/Altitude simulation	通过/Pass	/
38.3.4.2	温度试验/Thermal test	通过/Pass	/
38.3.4.3	振动/Vibration	通过/Pass	/
38.3.4.4	冲击/Shock	通过/Pass	/
38.3.4.5	外部短路/External short circuit	通过/Pass	/
20.2.4.6	重物冲击/Impact	不适用 N/A	/
38.3.4.6	挤压/Crush	通过/Pass	1
38.3.4.7	过度充电/Overcharge	不适用 N/A	/
38.3.4.8	强制放电/Forced discharge	通过/Pass	/
CO 19 37 85			

#### 结论/Result:

样品满足联合国《关于危险货物运输的建议书—试验与标准手册》<u>第6修</u>订版修正1第38.3节的测试要求。

The sample meets the requirement of UNITED NATION Recommendation on the Transport of Dangerous Goods Manual of Test and Criteria ST/SG/AC.10/11/Rev.6,amend1 section 38.3.

The information of Test Summary about UN38.3 is provided by client.



<sup>\*</sup>测试摘要信息由委托客户提供。





版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

# **Product Specification**

# for Polymer Lithium-ion Batteries

聚合物锂离子电芯产品规格书

Model Number: 645464-4000mAh

产品型号: 645464-4000mAh

Prepared By	Verified By	Approved By
编制	审核	批准

	Signature	Date
	签署	日期
Customer		
Approval	Company name:	
客户方确认	公司名称	
	Company Stamp:	
	盖章	
客户代码		



版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

## PRODUCT SPECIFICATION FOR645464-4000mAh

版本号	内容描述	修改人	生效日期
A.0	新版发行		2021-4-29



PRODUCT SPECIFICATION FOR645464-4000mAh

版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

#### 1. SCOPE

范围

This document describes the performance characteristics and testing methods for Polymer Li ion batteries produced by Yunnan Road Fei New Energy Materials Co.,Ltd.

本文件描述了云南路飞新能源材料有限公司出品的聚合物锂离子电池的产品规格、性能测试方法

2. PRODUCT TYPE AND MODEL NUMBER

产品类别和产品型号

2.1 PRODUCT TYPE

类别

Polymer Lithium-ion Battery

聚合物锂离子电池

2.2 MODEL NUMBER

产品型号: 645464

3. SPECIFICATION

产品基本特性

	· 一		
No.	Item	Characteristics	Remarks
序号	项目	特性	备注
3.1	Capacity 容量	Minimum: 4000mAh 最小: 4000mAh 典型: 4020mAh Typical:4020mAh	According to the standard charging after full charge, constant current discharge 0.2C to 3.0V. 按标准充电方式充满电后,以 0.2C 恒流放电到 3.0V
3.2	Nominal Voltage 工作电压	3.85V	
3.3	Charging Cut-off Voltage 最大充电终止电压	4.4V	
3.4	Discharge Cut-off Voltage 最小放电终止电压	3.0V	
3.5	Max. Constant Charge Current 最大持续充电电流	2000mA (0.5C)	
3.6	Max. Continuous Discharge Current 最大持续放电电流	2000mA (0.5C)	
		Chanaina/玄中	5~15°C: 0.2C CCCV to 4.4V
	Operating Temperature 工作温度范围	Charging/充电	15~45℃: 0.5C CCCV to 4.4V
3.7	(不可在极限温度下长时间持续充放		-20~10°C: 0.2C DC to 3.0V
	电)	Discharging/放电	11~50°C: 0.5C DC to 3.0V



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#### PRODUCT SPECIFICATION FOR645464-4000mAh

3.8	Storage Condition (50% of fully charge state ) 存储条件(带电量 50%)	1 个月内 -10~45℃ -10~45℃ for 1Month 6 个月内 -10~35℃ -10~35℃ for 6Months
3.9	Weight 重量	Approximate value 约 51g
3.10	Storage Voltage 存储电压	3.70-4.00V
3.11	Environmental request 环保要求	the materials of the product and packaging accord with RoHS standard,there will be a RoHS Id on the box. 满足 ROHS 要求

#### 4. Dimensions

外形尺寸

Please refer the drawing in appendix.

见附图

#### 5. Appearance

外观

No scratches, dirt, defect, leakage of electrolyte or gassing should be observed as a new product.

电池表面无划伤、脏点、变形、漏液、鼓气等缺陷。

#### 6. Characteristics

特性

#### 6.1 Electrochemical performance characteristics

电性能

No.	Item	Testing Method	Requirements
序号	项目	测试方法	标准
1	Standard Charge 标准充电	0.2C constant current charge to4.4V, then constant Voltage until the charge current decrease to 0.01C. 0.2C 恒流充电至 4.4V,再 4.4V 恒压至 0.01C	Charge Time ≤6.5hrs 充电时间≤6.5 小时
2	Rapid Charge 快速充电	0.5C constant current charge to4.4V, then constant Voltage until the charge current decrease to 0.01C. 0.5C 恒流充电至 4.4V,再 4.4V 恒压至 0.01C	Charge Time ≤3.5hrs 充电时间≤3.5 小时
3	Nominal Capacity 标称容量	(per 6.1.1) at room temp. (23 $\pm$ 2 $^{\circ}$ C ), rest for 0.5-1 hrs then discharge at a constant current of 0.2C to 3.0V. 在环境温度为(23 $\pm$ 2) $^{\circ}$ C的条件下按6.1.1完全充电后静置0.5 $^{\circ}$ 1 小时,以 0.2C 放电至 3.0V。	≥4000mAh



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4	Cycle (23℃) 循环寿命	At 23 ± 2 °C an discharging, betwee 300C.	way for F	Remaining capacity≥859 Nominal capacity.		
	(23℃)	在 23℃±2℃的环 之间搁置 10 分钟,		C 充电和放电,每		剩余容量≥85%标称容量
5	Internal Impedance 内阻	Internal impedance i AC at ambient tempe 环境温度(23±2) 得的内部阻抗。	erature $(23\pm2)$ °C	C.		≤45m Ω
6	Capacity Retention 荷电保持能力	After fully charged (temperature, discharged standard charging mo全充电后在(23±23.0V。然后按标准3	to the in to th	Remaining capacity≥859 nitial capacity. 放电容量≥85%标称容量 ecovery capacity≥909 nitial capacity 恢复容量≥90%标称容量		
	Discharge Rate	Charge current/		Discharge curr	ent/放电电	
		充电电流	(0.2C)	(0.5C)		(1.0C)
7		(0.2C)	100%	95%		90%
	倍率放电特性	3.0V. The cells shoul	d be performed at 2	23°C±2 °C		rent current respectively E 23℃±2 ℃的温度下途
		Discharge		Discharge temper	rature/放电	温度
		current/放电电流	-20°C	0℃	25℃	50℃
8	Temperature Characteristic	(0.2C)	30%	85%	100%	95%
O	温度特性	respectively to 3.0V temperature before d	at 0.2C.The cel ischarge.	ls must be stored	for two ho	ith different temperatu ours at the correspondin 必须在对应温度下储存
9	The factory voltage 出厂电压	Check open circuit v customers 出货之后检验	voltage (OCV) of o	cells prior to the de	livery to	3.8~3.95V



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#### 6.2 Safety characteristic

	全特性 	Tack Md 1	D. annier
No. 序号	Item 项目	Test Method 测试方法	Requirements 标准
1	Overcharge 过充	Discharge cells to $3.0V$ at $0.2C_5A$ , then charge to $4.6V$ at $3C_5A$ and rest for 7 hours. 电池以 $0.2C_5A$ 电流恒流放电至 $3.0V$ ,以电流 $3$ $C_5A$ 限制电压 $4.6V$ 的制式充电 7 小时。	No fire No explosion 不爆炸、不起火
2	Over Discharge 过放	Fully charge cells per 6.1.1, then discharge the battery to 3.0V with 0.2C <sub>5</sub> A mA at room temperature, connect with external load of 30 Ω for 7hours. 将电池按 6.1.1 充满电后,在环境温度 23±2°C的条件下,以 0.2C <sub>5</sub> A 放电至终止电压后,外接 30 Ω 负载电阻放电 7h.	No fire No explosion 不爆炸、不起火
3	Heat Cycle 温度循环	The cell is fully charged with standard charging method, and then it is to be stored for 6 hour at a test temperature equal to $75\pm2^{\circ}\mathbb{C}$ , followed by a storage for 6 hour at a test temperature equal to $-40\pm2^{\circ}\mathbb{C}$ , the maximum time interval between test temperature extremes is 30 min, this procedure is to be repeated for 10 times, after which all test cells are to be stored for 6 hours at ambient temperature $(23\pm2^{\circ}\mathbb{C})$ . 将用标准充电方法充满电的电芯放入 $75\pm2^{\circ}\mathbb{C}$ 的环境中搁置 $6h$ ,再在- $40\pm2^{\circ}\mathbb{C}$ 条件下搁置 $6h$ ,两个极端温度的变化时间间隔最长为 $30$ min,如此循环 $10$ 次,试验结束后将电芯取出,在 $23\pm2^{\circ}\mathbb{C}$ 环境中搁置 $6h$ 。	No leakage, no fire and no explosion 不泄露、不起火、不爆 炸
4	Mechanical shock 机械冲击	The battery is fixed on the test equipment. Each in three perpendicular directions under the impact of an equivalent. At least one direction perpendicular to the width of the battery. Each shock according to the following method: within the first 3 ms, minimum average speed of 735 m/s², peak acceleration should be between 1225 m/s² and 1715 m/s², pulse duration for ms to 6 ms + 1. 将电池固定在试验设备上。在三个相互垂直的方向上各承受一次等值的冲击。至少一个方向垂直于电池的宽面。每次冲击按下述方法进行:在最初的 3ms 内,最小平均加速为735m/s²,峰值加速应该在1225m/s²和1715 m/s²之间,脉冲持续时间为6ms±1ms。	No leakage, no fire and no explosion, 不泄露、不起火、不爆炸



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#### 6.3 Reliability

环境适	应性		
No.	Item	Test Method	Requirements
序号	项目	测试方法	标准
1	Humidity Test 高温高湿	Fully charge cells per $6.1.1$ , stored them at $40\pm2^{\circ}$ C with $90\%\sim95$ RH% for 48 hours. Then the cells are placed at room temperature to "dry out" for 2 hours. then discharge the cells to $3.0$ V at $0.2$ C <sub>5</sub> A. 将按 $6.1.1$ 充满电的电池放入 $40\pm2^{\circ}$ C、相对湿度为 $90\%\sim95\%$ 的恒温湿箱中搁置 $48h$ 后,取出电池在环境温度 $20\pm5^{\circ}$ C的条件下搁置 $2h$ 。以 $0.2$ C <sub>5</sub> A 电流放电至 $3.0$ V	No deformation, no corrosion, no leakage, no leakage, no leakage, no fire and no explosion, discharge time shall not be less than 3h. 无变形、无锈蚀、不泄漏、不泄气、不破裂、不起火和不爆炸,放电时间应不低于 3h。
	Low Pressure	The fully charged cell is to be stored for 6 hours at an absolute pressure	No explosion, no fire
2	Test 低压测试	of 11.6kpa and a temperature of 23±2℃. 将充满电的电芯在绝对压力为 11.6kpa、23±2℃条件下贮存 6 小时。	and no leakage 不爆炸、不起火、不泄 露
3	Drop Test 跌落测试	The cell is fully charged with standard charging method, standby for one hour and then it is submitted to free fall at a height of 1.0m down to one solid board with thickness of 20mm. It should be fallen for 2 times on each direction. 将电芯用标准充电方法充满电,放置 1h,将电芯从 1.0m 高度自由 落到 20mm 厚的硬木板上。每个方向上各试验 2 次。	No leakage, no smoke, no explosion and no fire 不泄露、不冒烟,不起 火,不爆炸
4	Vibration 振动	Battery charged by the regulation, after the battery is fixed on the vibration table, don't make the battery out of shape, with sinusoidal vibration, and within 15 min in logarithmic sweep from 7 hz frequency sweep to 200 hz and return to the 7 hz. Vibration along three mutually perpendicular direction of sample (one direction is perpendicular to the plane of the cathode) must match the sample, according to the logarithmic sweep in each direction way to 12 repetitions, vibration 3h. Logarithmic frequency sweeping method is as follows: 7 hz ~ 18 hz maintain peak acceleration of 9.8 m/s2. Hold the amplitude at 0.8 mm (displacement of 1.6 mm) until the peak acceleration of 78.4 m/s 2 (frequency is about 50 hz). Keep 78.4 m/s2 peak acceleration until the frequency increased to 200 hz. 电池按规定充满电后,将电池固定在振动台上,不可使电池变形,采用正弦波进行振动,并以对数扫频方式在15min 内从7Hz 扫频到 200Hz 并返回到7Hz。振动沿样品互相垂直的三个方向(其中一个方向必须与样品正负极所在平面垂直)进行,每个方向按上述对数扫	no explosion. 不泄露、不起火、不爆



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频方式重复 12 次,振动 3h。

对数扫频方式如下:  $7Hz\sim18Hz$  保持 9.8m/s2 的峰值加速度。将振幅保持在 0.8mm (位移为 1.6mm) 直至峰值加速度达到 78.4m/s 2 (频率约为 50Hz)。保持 78.4m/s2 的峰值加速度直到频率增长到 200Hz。

#### 7. Standard Testing Environment

标准测试环境

Temperature:  $23 \pm 2^{\circ}$ C

温度: 23±2℃

Relative humidity:  $45\pm20\%$  (unless specially requested)

相对湿度: 45±20% (除非另外要求)

#### 8. Warranty

保质期限

Warranty period for this product is 12 months starting from the date when the products left the door of manufacturer. 保质期是从出厂日期(喷码)开始起十二个月.

#### 9. Liability

产品责任

The user has to operate the products according to the instructions printed on the battery label or follow the advice described in this "Product Specification for Polymer Lithium Ion Batteries published by Yunnan Road Fei New Energy Materials Co.,Ltd. In case the battery were overheated or even catch fire or explosion caused by mishandling of the user side, Yunnan Road Fei New Energy Materials Co.,Ltd. will not be liable for the lose caused by any of such mishandling.

Yunnan Road Fei New Energy Materials Co.,Ltd.will notify the users in written form if any modifications in specification, raw material, production process control.

您必须严格遵守云南路飞新能源材料有限公司规格书和文件后面的注释使用电池,由于误用会引起电池过热,发生火灾或爆炸。对于没有按照规格书进行操作所造成的任何以外事故,云南路飞新能源材料有限公司不负担任何责任。如果规格书、原材料、生产过程或生产控制系统发生改变,改变的信息将会随质量和可靠性数据以书面形式通知消费者。

#### 10. Battery Packing Label

包装电池上的标示

The following warnings should be indicated on the battery pack labels.

以下警告应注明在包装后的电池上

Use a specified charger.

使用规定的充电器。

Do not throw the battery into fire, or heat.

不要将电池投入火中或加热。

Do not short-circuit the battery terminals.

不要将电池两端短路。



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Do not disassemble the battery.

不要将电池分解拆散。

11. Warnings and Cautions in Handling the Lithium-ion Battery

电池使用时警告事项及注意事项

To prevent potential leaking, overheating or explosion of batteries please be advised to take following precautions:

为防止电池可能发生泄漏,发热、爆炸,请注意以下预防措施

#### WARNINGS!

#### 警告!

Do not immerse the battery in water or seawater, and keep the battery in a cool dry environment during stands by period. 严禁将电池浸入海水或水中,保存不用时,应放置于阴凉干燥的环境中。

Do not use or leave the battery near a heat source such as fire or heater.

禁止将电池在热高温源旁,如火、加热器等使用和留置。

When recharging, use the battery charger specifically for that purpose.

充电时请选用锂离子电池专用充电器。

Do not reverse the position (+) and negative (-) terminals.

严禁颠倒正负极使用电池。

Do not connect the battery to an electrical outlet.

严禁将电池直接接入电源插座。

Do not dispose the battery in fire or heat.

禁止将电池丢于火或加热器中。

Do not short-circuit the battery by directly connecting the positive (+) and negative (-) terminal with metal objects such as wire.

禁止用金属直接连接电池正负极短路

Do not transport or store the battery together with metal objects such as necklaces, hairpins etc.

禁止将电池与金属,如发夹、项链等一起运输或贮存。

Do not strike or throw the battery against hard surface.

禁止敲击或抛掷、踩踏电池等。

Do not directly solder the battery and pierce the battery with a nail or other sharp object.

禁止直接焊接电池或用指甲或其它尖锐物体刺穿电池。

Outer metal conduct can not contact the aluminum layer in AL laminate film, especially with electrification , which will be "black spot" and swelling easily.

禁止外层金属导体与铝塑膜中的铝层接触,尤其是带电情况,易产生"黑点"现象,引起鼓胀。

Do not use sharp things to hit the battery.

禁止用尖锐部件碰撞电池。



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#### **CAUTIONS!**

#### 注意

Do not use or leave the battery at very high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be shortened. 禁止在高温下(炙热的阳光下或很热的汽车中)使用或放置电池,可能会引起电池过热、起火或功能失效、寿命减短。

Do not use it in a location where static electricity is rich, otherwise, the safety devices may be damaged, causing a harmful situation.

禁止在强静电和强磁场的地方使用,否则易破坏电池安全保护装置,带来不安全的隐患。

In case the electrolyte get into the eyes due to the leakage of battery, do not rub the eyes! Rinse the eyes with clean running water, and seek medical attention immediately. Otherwise, it may injure eyes or cause a loss of sight.

如电池泄露,电解液进入眼睛,请不要揉擦,用清水冲洗眼睛,立即送医治疗,否则会伤害眼睛

If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charger and place it in a contained vessel such as a metal box.

如果电池发出异味、发热、变色、变形或使用、贮存,充电过程中出现任何异常,立即将电池从装置或充电器中移离并停用。

In case the battery terminals are contaminated, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection between the battery and the electronic circuitry of the instrument.

如果电池发出异味、发热、变色、变形或使用、贮存,充电过程中出现任何异常,立即将电池从装置或充电器中移离并停用。

Be aware discarded batteries may cause fire, tape the battery terminals to insulate them before disposal. 废弃之电池应用绝缘纸包住电极,以防起火、爆炸。



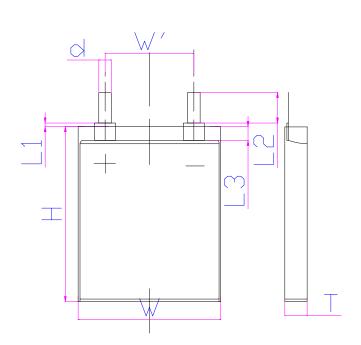
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附图: 单位: mm Attachment: Unit: mm



项目		技术规格
Items	Description	Dimension and Spec
T	厚度(不含膜)/thickness before shipping	≤ 6.5 mm
W	宽度/width	≤ 55.0 mm
Н	高度(不含极耳胶)/length	≤65.0 mm
L1	极耳胶外漏长度/sealant length	0.2-2.0 mm
L2+L1	极耳外露长度(含极耳胶)/tab length	6.0±1.0 mm
L3	顶封高度/sealing height	3.5±0.5 mm
d	极耳宽度/ tab width	5.0±0.2 mm
W'	极耳中心距/distance between center of 2 tabs	36.0±2.0 mm
备注	————————————————————————————————————	· 茶色胶纸

备注:1.正极本司使用直转镍铝极耳无需弯折

另注: 您还有任何疑问, 请在 48H 内告知我们, 否则我们将认为您已经同意以上标准, 谢谢!



Page 1 of 13



# 深圳市优瑞特检测技术有限公司

# Shenzhen ORT Technical Services Co., Ltd.

# UN38.3 检测报告 Test Report

The state of the s					
Ort. tour.	and the state	Report Nu			
	A September 1 Sept.	ORTSZB0121			
样品名称	锂离子电芯		型号	645464	
Sample name:	Lithium ion cell		Model:	OFT BEATING	
商标			检测类别	委托测试	Marie V
Brand:	,		Test Classification	COMMISSION	TEST
REAL PROPERTY OF THE PARTY OF T	云南路飞新能源	材料有限公司			
委托单位	Yunnan Lufei Ne	ew Energy Materials	Co., Ltd.		
Applicant			作区高新技术产业园		
		ndustrial Park, Teng e, Baoshan City, Yu	ćȟong border econoi nnan Province	mic development	and
	云南路飞新能源				
生产单位	Yunnan Lufei Ne	ew Energy Materials	Co., Ltd.		
Manufacturer	20000 14		作区高新技术产业园		
OF.		ndustrial Park, Teng e, Baoshan City, Yu	chong border econoi nnan Province	mic development	and
收样日期		试验时间	2021-05-31 to	报告日期	
Received date:	2021-05-31	Detection date:	2021-06-15	Report date:	2021-08-02
试验依据	联合国《关于危	险货物运输的建议书	-试验和标准手册》	第6版)38.3寸	5修订1
Test Method	UN Recommend	dations on the Trar	nsport of Dangerous	Goods Manua	of Tests and
orten de l'IOG	Criteria ST/SG/A	AC.10/11/Rev.6/Subs	section 38.3 Amend	1	Miss
试验结论 Test	该电池样品通过	所有项目检测,符合	该条款的性能要求。		
Conclusion:	The samples ha	ve passed all test ite	ems.		
主检	刘文威	日期 Date:			
工型 Tested by:	刘立成		N. S.	感和激发	
resied by.	2/2/1	2021-06-15	深圳市仗	瑞特检测技术有	限公司
审核	吴雄	日期 Date:	Shenzhen OR	Γ Technical Servi	es Co., Ltd.
Checked by:	Et 1		THE STATE OF THE S	The state of the s	-/
Checked by.	75.120	2021-08-02	Serve	是第 <b>stamp</b> )	
批准	周志强	日期 Date:		2021-08-02	
лите Approved by:	dans	2021-08-02		(c)	
rippioved by.	Del rechite	ZUZ 1-UU-UZ		Mar	

则:本测试报告无检测报告专用章、签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日 起 15 日内对提出投诉或要求进行复测。

电话: 0086-755-27817553

公司名称:深圳市优瑞特检测技术有限公司 网址: http://www.ort-ts.com







#### I 电池描述 Battery Description

K	电池信息 Information for Ba	ittery	and the state of t		
	型号	D. Ort.	额定能量		
	Model		Rated Energy		8
	额定容量	,	标称电压		
	Rated Capacity	<u></u>	Nominal Voltage		
	充电限制电压	and a service	充电电流		
),	Max. Charging Voltage		Charging Current		
	放电电流		最大连续充电电流	of the state of th	
	Discharge current		Max. Charging Current		
	最大放电电流		充电截至电流		
	Max. Discharging Current		Charge Cut-off Current		
	放电终止电压	S. B.	电芯组合方式		
	Discharge Cut-off Voltage		Cell Combination Mode		
	外观形状		电芯生产厂家	and the state of t	
	Appearance		Manufacturer of cell	-	

and the same of th			•
电芯信息 Information for	Cell	۵	
型号	645464	额定能量	15.4Wh
Model	043404	Rated Energy	13,44411
额定容量	4000mAh	标称电压	3.85V
Rated Capacity	4000IIIAII	Nominal Voltage	3.03V
充电限制电压	4.4V	充电电流	800mA
Max. Charging Voltage	4.47	Charging Current	OUUIIIA
放电电流	800mA	最大连续充电电流	2000mA
Discharge current	OUIIIA	Max. Charging Current	2000IIIA
最大放电电流	2000	充电截至电流	40 mm A
Max. Discharging Current	2000mA	Charge Cut-off Current	40mA
放电终止电压	2.01/	外观形状	银色长方体
Discharge Cut-off Voltage	3.0V	Appearance	Silvery cuboid
	Br sedili.		

使明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

> 公司 电话: 0086-755-27817553

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#### Ⅱ 试验记录 Test Records

AKIN MEN	rest Necolus				
序号 No.		标准要求或标准条款号 Standard requirement or the clause number of standard	测试结果 Test result	本项结论 conclusion	备注 Remarks
lo 1	高度模拟 Altitude simulation	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.1 Test T.1	见附表 1 See Appendix 1	合格 Passed	
2	温度试验 Thermal test	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.2 Test T.2	见附表 2 See Appendix 2	合格 Passed	1
3	振动 Vibration	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.3 Test T.3	见附表 3 See Appendix 3	合格 Passed	1
4	冲击 Shock	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.4 Test T.4	见附表 4 See Appendix 4	合格 Passed	,
5	外部短路 External short circuit	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.5 Test T.5	见附表 5 See Appendix 5	合格 Passed	1
6	撞击 Impact	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.6 Test T.6	见附表 6 See Appendix 6	合格 Passed	The state of the s
7	过度充电 Overcharge	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.7 Test T.7	见附表 7 See Appendix 7	不适用 N/A	
8	强制放电 Forced discharge	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.8 Test T.8	见附表 8 See Appendix 8	合格 Passed	

备注 Remark:

测试样品已按 UN38.3 经过循环处理,由客户提供.

Before the samples were sent for testing, the client has already carried out cyclic tests according to the requirements of UN38.3.

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#### 附表 1 Appendix 1

	All Sold Serve	,	and the same of th		Appendix 1				
K	序号	A NOTE AND A	测试项	目名称	. see a single since		高度模拟		
>	No.	1	Name of	Test Items	A State of the latest and the latest	Alti	itude simula	tion	
			测试前	Before	测试后	After	质量损失	电压损失	17
	编号	样品状态	1 11 2 0				Mass	Voltage	测试结果
	No .	Sample status	电池质量	开路电压	电池质量	开路电压	loss	loss	result
		and services	<i>m</i> ₁(g)	V <sub>1</sub> (V)	$m_2(g)$	$V_2(V)$	(%)	(%)	
/	Otil stol	首次完全充电					(//	(75)	
	C01	1st CYC Fully	51.416	4.384	51.415	4.379	0.002	0.114	0
>.		Charged	Notice.		And server				
		首次完全充电		4.000	Orten	4.004		echina an	
	C02	1st CYC Fully	51.953	4.386	51.952	4.381	0.002	0.114	0
		Charged 首次完全充电					All S		No.
	C03	1st CYC Fully	51.597	4.386	51.596	4.382	0.002	0.091	O
		Charged							
	ORTH	首次完全充电	and the service						_
/	C04	1st CYC Fully	52.034	4.387	52.033	4.382	0.002	0.114	0
		Charged 首次完全充电			All South of the				
	C05	1st CYC Fully	51.784	4.384	51.784	4.378	0.000	0.137	0 /
		Charged	0101	1.001			O.O.O.O.	0.101	
		第25次完全充电							
	C06	25th CYC Fully	51.542	4.385	51.541	4.379	0.002	0.137	0
ď		Charged							
1	C07	第 25 次完全充电 25th CYC Fully	51.378	4.386	51.377	4.380	0.002	0.137	0
2	007	Charged	OFTIME	4.000	01.077	7.000	0.002	0.107	
		第25次完全充电			OF TECHNICAL		7	The serve	
	C08	25th CYC Fully	51.846	4.387	51.845	4.382	0.002	0.114	0
		Charged							
	C09	第 25 次完全充电 25th CYC Fully	51.737	4.386	51.736	4.381	0.002	0.114	O
	000	Charged	01.707	4.000	01.700	4.001	0.002	0.114	
	Ortion	第25次完全充电							Me
\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	C10	25th CYC Fully	51.939	4.387	51.938	4.381	0.002	0.137	0
	1,1,7	Charged	ORTE		and the series				
	以下				OFTIECH		,i	<b>.</b>	
	空白						J 12 7 20	A BELLIN	
							ONTRE		
						4	White the second		
		and gerill							
	ORT IS	F .	11/2						
			Treamed b		. 📣				
-)	1		05	1	Sept 100		1	i	1

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire

O-No leakage, no venting, no disassembly, no rupture, no fire.

电话: 0086-755-27817553

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公司名称:深圳市优瑞特检测技术有限公司 网址: http://www.ort-ts.com 地址:深圳市龙岗区龙岗街道南联第二企业区方兴科技园 C 区 15 栋一枝传真: 0755-27817553 邮箱: battery@ort-ts.com



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#### 附表 2 Appendix 2

ALL STATE OF THE PARTY OF THE P	<b>9</b>			Appendix 2				
序号	_	测试项	[目名称			温度试验。		
No.	2	Name of	Test Items "	A State of the disposit		Thermal test	Peg.	
			Before	测试后	f After	质量损失	电压损失	
編号	样品状态	0/1 (113	20.0.0	0.3 10 (7)	7 (110)	Mass	Voltage	测试结
No.		电池质量	开路电压	电池质量	开路电压	loss	loss	果 result
INO	Sample status	<i>m</i> ₁(g)	V <sub>1</sub> (V)	$m_2(g)$	$V_2(V)$			* Tesuit
No. of the second	V. V. A. A. A. I.					(%)	(%)	
C01	首次完全充电	51.415	4.379	51.409	4.308	0.012	1.621	0
CUT	1st CYC Fully Charged	08184 13	4.379	51.409	4.300	0.012	1.021	
	首次完全充电			The last rich		48	Control of the section	
C02		51.952	4.381	51.947	4.311	0.010	1.598	0
	Charged							and h
	首次完全充电							
C03	Called Colo	51.596	4.382	51.591	4.306	0.010	1.734	O
A STATE	Charged							
C04	首次完全充电 1st CYC Fully	52.033	4.382	52.028 🦼	4.307	0.010	1.712	0
004	Charged	102,000	7.002	JZ.020	» 4.007	0.010	1.7 12	
	首次完全充电			W. J. Berning			A Chica	
C05	1st CYC Fully	51.784	4.378	51.778	4.314	0.012	1.462	0
	Charged					Of Off		
	第 25 次完全充			Y .				
C06	电	51.541	4.379	51.536	4.310	0.010	1.576	0
A STATE OF THE STA	25th CYC Fully							
GHIL	Charged 第 25 次完全充	and the state of t		4				
	电	OFT BOTH			rice			
C07	25th CYC Fully	51.377	4.380	51.372	4.306	0.010	1.689	0
	Charged	Y				dr.	lectiv.	
	第 25 次完全充							
C08	电	51.845	4.382	51.839	4.309	0.012	1.666	OF W
	25th CYC Fully							
No. of the	Charged 第 25 次完全充							Alles.
	H-	And the state of t						
C09	25th CYC Fully	51.736	4.381	51.730	4.304	0.012	1.758	0
	Charged			OK TECHNIC				
	第 25 次完全充			3			d service	
C10	电	51.938	4.381	51.933	4.307	0.010	1.689	0
	25th CYC Fully	01.000	1.551	01.000	1.507		1.500	
DI a	Charged							
以下 空自	thrick							
TH		The state of the s						
		ORT SON.		and the same	p			
				A STATE OF THE PARTY.				
				ORT		7.5	Post and a service of the service of	

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire

O-No leakage, no venting, no disassembly, no rupture, no fire.

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#### 附表3 Appendix3

	Marie Barrico				Appendix 3					
K	序号		测试项	目名称			振动			
>	No.	3	Name of <sup>-</sup>	Гest Items "	The street see		Vibration	E) Crice		
			测试前		测试后	After	质量损失	电压损失		
	編号	样品状态	100 100 110	Deloie	1)(1) (1)(1)	Aitei	Mass	Voltage	测试结果	B
			电池质量	开路电压	电池质量	开路电压		_		
	No	Sample status	<i>m</i> ₁(g)	$V_1(V)$	<i>m</i> <sub>2</sub> (g)	$V_2(V)$	loss	loss	result	
//	S. S. Sectivical	,	, (9)	- / ( - /	2 (9)	-2(-)	(%)	(%)		
	Ok.	首次完全充电	Marie Company							
/	C01	1st CYC Fully	51.409	4.308	51.408	4.306	0.002	0.046	0	
		Charged	Or.		activited 5th		ies	- All Santo		
	C02	首次完全充电 1st CYC Fully	51.947	4.311	51.945	4.310	0.004	0.023	0	
	002	Charged	31.341	4.511	01.343	4.510	0.004	0.023		Á
		首次完全充电					Alles.			J.
	C03	1st CYC Fully	51.591	4.306	51.589	4.304	0.004	0.046	O	
	The state of the s	Charged								
	ORTE	首次完全充电	A STORY OF THE STO							
	C04	1st CYC Fully	52.028	4.307	52.027	4.305	0.002	0.046	0	
		Charged	0.		and the second	. And .				
	C05	首次完全充电	E1 770	4 24 4	51.776	4.311	0.004	0.070	0	The state of
	005	1st CYC Fully Charged	51.778	4.314	31.116	4.311	0.004	0.070	0	1
		第 25 次完全充								
		电								
	C06	25th CYC	51.536	4.310	51.534	4.308	0.004	0.046	0	
THE STREET	The State of the S	Fully Charged	and the same							
1		第 25 次完全充	A Salah Bernital B		in the state of th					
2	C07	电	51.372	4.306	51.371	4.305	0.002	0.023	o	
	001	25th CYC	01.072	4.500	OFT BOTT	4.000	0.002	0.023		
		Fully Charged					OF.			
		第 25 次完全充								أفد
	C08	电	51.839	4.309	51.837	4.307	0.004	0.046	0/1	17 M
		25th CYC Fully Charged							(0)	
	13 Table	第 25 次完全充	A Section 1							
		电	Articl Bernico		- A				_	
	C09	25th CYC	51.730	4.304	51.728	4.302	0.004	0.046	0	
		Fully Charged			OK TROPING					
		第 25 次完全充						al service		
	C10	电	51.933	4.307	51.931	4.305	0.004	0.046	0	
		25th CYC	31.333	4.507	31.331	4.000	0.004	0.040		1
		Fully Charged					Ollin.			
	以下	»"								
	空白	ش.	The second section							
			ORT sethin		and the same of th	ø				
					A STATE OF SOLIT	•				

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire

O-No leakage, no venting, no disassembly, no rupture, no fire.

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#### 附表 4 Appendix 4

	All South Service				Appendix 4				
N	序号	4	测试项	目名称			冲击。		
\	No.	4	Name of <sup>-</sup>	Test Items	7 Schuld Street Berne		Shock	nice.	
		测试前 Before		Before /	测试后 After		质量损失	电压损失	
	编号	样品状态	<b>山洲 医</b> 具	开路电压	电池质量	开路电压	Mass	Voltage	测试结果
	No	Sample status	电池质量				loss	loss	result
			<i>m</i> ₁(g)	V <sub>1</sub> (V)	$m_2(g)$	$V_2(V)$	(%)	(%)	
		首次完全充电							
	C01	1st CYC Fully	51.408	4.306	51.407	4.306	0.002	0.000	0
	Or.	Charged	agrice .						
	2	首次完全充电	W. Janestrica		A. C.				
	C02	1st CYC Fully	51.945	4.310	51.944	4.309	0.002	0.023	0
		Charged			OFTIER		2 2	Strice See	
		首次完全充电					dri		
	C03	1st CYC Fully	51.589	4.304	51.588	4.304	0.002	0.000	0 🥒
		Charged							
İ	.82	首次完全充电							
	C04	1st CYC Fully	52.027	4.305	52.026	4.304	0.002	0.023	0
	ORTE	Charged	and the service						
	3	首次完全充电	A sectrical		A.				
	C05	1st CYC Fully	51.776	4.311	51.775	4.310	0.002	0.023	0
		Charged			Chr. techn		446	S. J. Berlice	
İ		第 25 次完全充			(0)		18.30	ETHIRE	
		电		4 000	-1 -01	4.00=	on on		
	C06	25th CYC Fully	51.534	4.308	51.534	4.307	0.000	0.023	0
	e d	h Charged							_
ł		第 <b>25</b> 次完全充							
	A Lectrical Party Rectified	电	anice of the second						_
	C07	25th CYC Fully	51.371	4.305	51.370	4.305	0.002	0.000	0
12	>	Charged	OKTE		- 11 10 H	Brice			
		第 25 次完全充			Tr.T leather			All of the second	
		电					Mary Miles	Recht	
	C08	25th CYC Fully	51.837	4.307	51.837	4.306	0.000	0.023	0
		Charged					Miller		7 .4
ł		第 25 次完全充							To do
		190							
	C09	电 0/0 5 4	51.728	4.302	51.727	4.301	0.002	0.023	0
		25th CYC Fully	atri serita						
	7	Charged	Okt. Both.		A Partie	Ø .			
		第 25 次完全充			Marine Barrier				
	C10	电	51.931	4.305	51.930	4.304	0.002	0.023	0
		25th CYC Fully			Mr.		A SAME OF THE PERSON NAMED IN	Jal alo	
-	1.1	Charged					OFTE		
	以下								
	空白	S. A. A. C.					V.		
	THE PERSON	lija.							
	2	de	A STATE OF THE PARTY OF THE PAR						
	7		Opt seeth.		Age.	8			
			D		ich seri	r			
-					Chi leeth.		al a	al service	
ļ								and thirties	

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire O-No leakage, no venting, no disassembly, no rupture, no fire.

则:本测试报告无检测报告专用章、签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

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Report Date: 2021-08-02

#### 附表 5

#### Appendix 5

May May.	and the second s	Appendix 5			
序号	5 William Bart	测试项目名称		短路	
No.	of the state of th	Name of Test Items	External short circuit		
编号	样品状态	样品表面最高温度 Max. External	测试结果	备注	
No	Sample status	Temperature (℃)	Test result	Remark	
C01	首次完全充电 1st CYC Fully Charged	104.6	0	1	
C02	首次完全充电 1st CYC Fully Charged	105.7	0	1	
C03	首次完全充电 1st CYC Fully Charged	109.2 grand	0	A State of the Sta	
C04	首次完全充电 1st CYC Fully Charged	110.3	0	1	
C05	首次完全充电 *** 1st CYC Fully Charged	107.6	0	1	
C06	第 25 次完全充电 25th CYC Fully Charged	101.5	0	1	
C07	第 25 次完全充电 25th CYC Fully Charged	104.2	O	1	
C08	第 25 次完全充电 25th CYC Fully Charged	101.7	O M	September 1	
C09	第 25 次完全充电 25th CYC Fully Charged	105.2	O	1	
C10	第 25 次完全充电 25th CYC Fully Charged	106.1	Ο	1	
以下 空白	A Contraction of the Contraction		, res		
		No. of the state o	The state of the s	Sept of the sept o	
				7 4	
	perior .				
Orting	A STATE OF THE STA				
	27 mg 15 mg				

注: 外表温度不超过 170℃

D-解体, R-破裂, F-起火, O-无解体、无破裂、无起火

Note: External temperature not exceed 170 ℃

D-Disassembly, R-Rupture, F-Fire, O-No disassembly, no rupture, no fire.

Harden Correction

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The state of the s

产明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带 "\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。



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Report Date: 2021-08-02

#### 附表 6

#### Appendix 6

William Mag		Appendix o			
序号	6 Billing Learning to the Company of	测试项目名称		挤压 Crush	
No.	or or	Name of Test Items	OTC.	isn	
编号	样品状态	样品表面最高温度 Max. External	测试结果	备注	
州 与 No	Sample status	Temperature	例 风 海 未 Test result	<sup></sup> Remark	
INU	Sample status	remperature (°C)	restresuit	Remark	
	首次 50%容量	, ,	•		
C11	1st CYC 50% Capacity	24.1	0	/	
	首次 50%容量				
C12	1st CYC 50% Capacity	24.2	0		
040	首次 50%容量	O A SE SECULIAR DE LA CONTROL	•	A CONTRACTOR OF THE PROPERTY O	
C13	1st CYC 50% Capacity	24.1	O	actificate to	
C14	首次 50%容量	24.1	0	1	
014	1st CYC 50% Capacity	<b>∠</b> 4.1			
C15	首次 50%容量	24.2	0		
010	1st CYC 50% Capacity	27.2		,	
C16	25 次 50%容量	24.1	0	1	
	25th CYC 50% Capacity			,	
C17	25 次 50%容量	24.2	O	1	
	25th CYC 50% Capacity	Strate de la la la la la la la la la la la la la		A particle	
C18	25 次 50%容量	24.2	O NOT WELL	striker 1	
	25th CYC 50% Capacity 25 次 50%容量		0		
C19	25 次 50%吞里 25th CYC 50% Capacity	24.1	0	1	
	25 次 50% 容量		<u> </u>		
C20	25th CYC 50% Capacity	24.2	0	1	
以下	20th 010 00% Capacity				
空白	the state of the s		Reference Company of the Company of		
		A Section of the sect		Contraction of the second	
			A STATE OF THE STA	Beckfor	
		<u> </u>			
A Secretary					
ORTE					

注: 外表温度不超过 170℃

D-解体; F-起火; O-无解体、无起火

Note: External temperature not exceed 170°C

D-Disassembly, F-Fire, O-No disassembly, no fire.

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电话: 0086-755-27817553

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使明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

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Page 10 of 13 附表 7 不适用

#### Appendix 7 N/A

Report Date: 2021-08-02

		Appendix / N/A		
序号 No.	7	测试项目名称 Name of <b>Te</b> st Items	过度充电 Overcharge	
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			A CONTRACTOR OF THE PARTY OF TH	N.
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声明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 好项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

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电话: 0086-755-27817553

地址: 深圳市龙岗区龙岗街道南联 7.2 业区方兴科技园 C 区 15 栋一楼 传真: 0755-27817553 邮箱: battery@ort-ts.com OFT LOSING



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Report Date: 2021-08-02

#### 附表 8

#### Appendix 8

Marie Marie		Appendix o	
序号	8 Salah Salah Baran	测试项目名称	强制放电
No.	O Odrie	Name of Test Items	Forced discharge
编号	样品状态	测试结果	备注
No	Sample status	Test result	Remark
	首次完全放电	_	
C21	1st CYC Fully Discharged	0	
	首次完全放电		
C22	1st CYC Fully Discharged	Ο	/
Office .	首次完全放电		
C23		0	/
	1st CYC Fully Discharged	A State of the Sta	
C24	首次完全放电	M. Artiser O	A Bertie
	1st CYC Fully Discharged	0.0	Mary bearing
C25	首次完全放电	O	
023	1st CYC Fully Discharged		
000	首次完全放电	0	
C26	1st CYC Fully Discharged	Ο	1
A Lactinic	首次完全放电		
C27	1st CYC Fully Discharged	0	/
	首次完全放电		
C28	1st CYC Fully Discharged	1 Street of the	
	首次完全放电	Martine.	A STATE OF THE STA
C29		0	The state of the s
	1st CYC Fully Discharged		
C30	首次完全放电	0	
	1st CYC Fully Discharged		
C31	第 25 次完全放电	0	/
W. Bertine	25th CYC Fully Discharged		'
C32	第 25 次完全放电	O	,
032	25th CYC Fully Discharged	All Market	
000	第 25 次完全放电	No. of Contract of	and the state of t
C33	25th CYC Fully Discharged	0	A State of the Sta
	第 25 次完全放电		
C34	25th CYC Fully Discharged	0	
0.5	第 25 次完全放电		W W
C35	25th CYC Fully Discharged	0	
A Technic	第 25 次完全放电		
C36		0	/
	25th CYC Fully Discharged	The state of the s	
C37	第 25 次完全放电	N. Consultation	/
	25th CYC Fully Discharged	OKE TO SEE	
C38	第 25 次完全放电	O	I I
	25th CYC Fully Discharged		Warren .
C39	第 25 次完全放电	0	
	25th CYC Fully Discharged		
A CAD	第 25 次完全放电		
C40	25th CYC Fully Discharged	0	/
注: D	-解体: <b>F</b> -起火: <b>O</b> -无解体、无起	1.k	ı

注: D-解体; F-起火; O-无解体、无起火

Note: D-Disassembly, F-Fire, O- No disassembly, no fire.

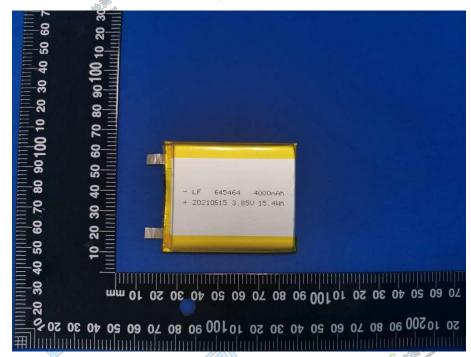
时的:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 为项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用,委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

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Report Date: 2021-08-02

电芯 Cell



备注 note: 仅对原报告照片中的样品负责 Authenticate the photo on original report only

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与中带 "\*"

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#### IV 试验设备 Test Equipment

Гest Equipment			
名称 Name	规格参数 Model specifications	设备编号 Device No.	有效期至 Calibration validity
电池低压高空模拟试验机 Battery low pressure high altitude simulation testing machine	GX-3020-ZC80	ORT-DQY-01	2021-07-18
电子天平 Electronic balance	HZK-JA510S	ORT-DZTP-02	2021-07-18
振动试验台 Electromagnetic vibration tester	MPA406/M232A	ORTZD2000-01	2022-01-03
Multimeter	17B+	ORT-WYB-01	2021-07-20
Rapid temperature change test chamber	F15H1000-70W	ORTKWB1000-0	2022-03-03
High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-21	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-22	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-23	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-24	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-25	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-26	2021-07-20
High-performance battery testing	CT-4008-5V6A-S1	ORT-5V/6A-27	2021-07-20
冲击试验台 Mechanical Shock tester	IS500	ORTCJ-01	2022-05-27
数据采集仪 Data acquisition instrument	DC5508U	ORT-CJY-01	2022-05-27
Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-01	2021-07-18
温控型电池短路试验机 Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-02	2021-07-20
电池挤压针刺试验机 Crush / needle tester	GX-5067-BM3T	ORT-JYZC-01	2022-05-27
电子负载 Electronic load	EL160LB	ORT-DZFZ-03	2021-07-20
直流电源 DC power supply	IT6723	ORT-DY-03	2022-05-27
20 March 20	电池低压高空模拟试验机 Battery low pressure high altitude simulation testing machine 电子天平 Electronic balance 振动试验台 Electromagnetic vibration tester 万用表 Multimeter 快速温变试验箱 Rapid temperature change test chamber 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 Temperformance battery testing system 冲击试验台 Mechanical Shock tester 数据采集仪 Data acquisition instrument 温控型电池短路试验机 Temperature controlled External short-circuit testing system 温控型电池短路试验机 Temperature controlled External short-circuit testing system 电池挤压针刺试验机 Crush / needle tester 电子负载 Electronic load 直流电源	Aph Name   Med   Specifications   Pattern   Pattern   Med   Med   Specifications   Pattern   名称 Name	

\*\*\* End of Report \*\*\*

应明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*"的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。







# Shenzhen ORT Technical Services Co., Ltd.

# **TEST REPORT**

40	Report Number ORTSZB01210602002					
Sample name:	Li-ion Cell	Mode	el:	645464		
Ratings	3.85V, 4000mAh, 1	5.4Wh Samp	ole status	Received inta	ct	
Brand:	N/A	Samp	ple source:	Submitted by	applicant	
Testing Laboratory	Shenzhen ORT Teo F1, Building 15, Fa Zone, Longgang Si	ngxing Science a	and Technology		o. 6 Industrial	
Applicant and address	Yunnan Lufei New No.1 high tech Indu cooperation zone, OF CHINA	ustrial Park, Teng	chong border ed	. 2007	iggs	
Manufacturer and Address	Yunnan Lufei New No.1 high tech Indu cooperation zone, OF CHINA	ustrial Park, Teng	chong border ed			
Received date:	2021-07-06 Te	esting date:	2021-07-06 to 2021-07-19	Report date:	2021-07-19	
Test Requirement	, 100 W	ts for portable se	aled secondary	cells, and for b	acid electrolytes – atteries made from	
Tested by:	Jeff Liu	Date: 2021-07-19	Shenzhen	SECHNICAL SE	Sewices Co., Ltd.	
OR.	Gary Wu	Date:	SHEHZHEH	(stamp)	dis Old	
olgitatare.	Leo Zhou	2021-07-19 Date:		2021-07-1	y Marketon	
Signature:	les zhou	2021-07-19		Ole of the season of the seaso		

Declaration: this test report is invalid without special seal for test report. The test results of this test report are only responsible for the tested samples; This report shall not be partially copied without the written permission of urette testing; The items with "\*" in the report are subcontracted inspection items; The project with "\$\pm\$" in the report has not obtained qualification recognition or recognition, and is only used for scientific research, teaching or internal quality control; Without the qualification identification mark (CMA), it does not have the function of proving the society; If the client has any objection to the test results, it shall make a complaint or request

for retesting within 15 days after receiving the report.

Shenzhen ORT technical services Co., Ltd.

Site Location: Fangxing science park, Nanlian sixth industrial zone, Longgang street, longgang district, Shenzhen , Guangdong province, China (all: 0086-755-27817553)

Email: battery@ort-ts.com



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Report Date: 2021-07-19

## Test specification

Standard..... IEC 62133-2:2017

Test procedure ...... Test report

Procedure deviation..... N/A

Non-standard test method...... N/A

## Test Report Form/blank test report

Test Report Form No......ORT62133-2-2017A

Test Report Form(s) Originator...... ORT

Master TRF...... Dated 2019-05

#### **Summary of testing:**

## Tests performed (name of test and test clause):

cl.7.1 Charging procedure for test purposes (for cells)

cl.7.2.1 Continuous charging at constant voltage (cells)

cl.7.3.1 External short circuit (cells)

cl.7.3.3 Free fall (cells)

cl.7.3.4 Thermal abuse (cells)

cl.7.3.5 Crush (cells)

cl.7.3.7 Forced discharge (cells)

cl.7.3.9 Forced internal short-circuit (cell)

# **Testing location:**

Shenzhen ORT Technical Services Co., Ltd.

F1, Building 15, Fangxing Science and Technology Park, Nanlian No. 6 Industrial Zone, Longgang Street, Longgang District, Shenzhen







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### Copy of marking plate

This is reference label, final label should be including the content of it.

- LF 645464 4000mAh + 20210615 3.85V 15.4Wh

Remark: By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked.

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Test item particulars	<b>3</b>			
Classification of install	ation and use	Build-in and use i	in portable application	s
Supply connection	Both technic	Supply by Tap		>
Recommend charging manufacturer			until the current reduc	A STATE OF THE STA
Discharge current(0.2	/tA)	800mA		
Specified final voltage	The state of the s	3.0V	rec	
Upper limit charging v			REAL PROPERTY.	Street Book
Maximum charging cu	rrent	2000mA		
Charging temperature	upper limit	45°C		
Charging temperature	lower limit	5°C		
Polymer cell electrolyt	e type	gel polymer	☐ solid polymer	⊠ N/A
Test case verdicts		A State of the sta		a de la companya del companya de la companya del companya de la co
Test case does not ap	ply to the test object	N/A	No. of the last	and the second
Test item does meet t	he requirement	P (Pass)		
Test item does not me	eet the requirement	F (Fail)		v
List of Attachments	The state of the s			
Appendix 1	My Marthalin	Photos of produc	et	
Appendix 2		Test Equipments	No. of the second	State of the state
General remarks				
This report shall not be	e reproduced except in	n full without the writte	n approval of the testi	ng laboratory.
The test results prese	nted in this report relat	e only to the item test	ed.	
"(See remark #)" refer	s to a remark appende	ed to the report.		<u> </u>
"(See appended table	)" refers to a table app	ended to the report.		
Throughout this report	a point is used as the	decimal separator.		A service
	the requirements of E	N 62133-2: 2017	All September 1	
Report Revise Recor	rd:			
Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	Trice .	2021-07-19	Valid	Original report
Name and address of	factory (ies):	Same as n	nanufacturer	

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### **General product information**

The product covered by this report is Li-ion Cell.

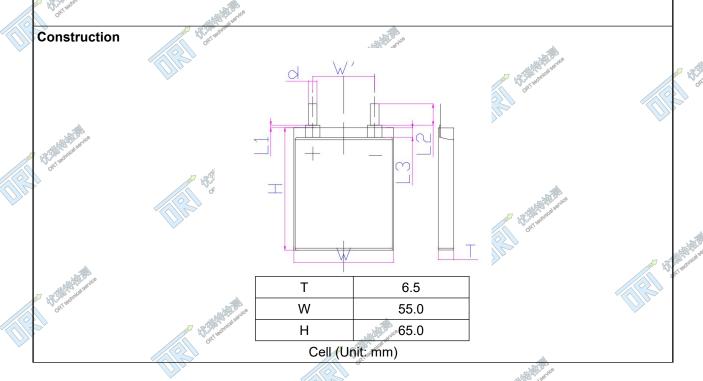
The main features of the cell are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
645464	4000mAh	3.85V	800mA	800mA	2000mA	2000mA	4.4V	3.0V

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The main features of the cell are shown as below (clause 7.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
645464	4.4V	200mA	5°C	45°C



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	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdic
1	Parameter measurement tolerances	All files and security	Р
	Parameter measurement tolerances	Comply with relevant requirements.	P
	) 		
5 Charlestonica	General safety considerations		Р
5.1	General		Р
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse	If the state of th	Р
5.2	Insulation and wiring		N/A
Ort best led of	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 $\mbox{M}\Omega$	No metal case exists.	N/A
	Insulation resistance (MΩ) :	18 Streethold	_
ace the design of the second	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N/A
	Orientation of wiring maintains adequate clearance and creepage distances between conductors	The state of the s	N/A
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		N/A
5.3	Venting		P
M. C. Lang	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and	The second secon	P
	self-ignition  Encapsulation used to support cells within an	102 Marie	
Oxteornal o	outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	Temperature, voltage and current management		N/A
	Batteries are designed such that abnormal temperature rise conditions are prevented	And the state of t	N/A
- A	Patteries are designed to be within temperature		NVA

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N/A

Batteries are designed to be within temperature,



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	IEC 62133-2: 20°	17	
Clause	Requirement – Test	Result – Remark	Verdict
Martinical b	voltage and current limits specified by the cell		
	manufacturer	a till de de la company de la company de la company de la company de la company de la company de la company de	
	Batteries are provided with specifications and	A State of the late	
	charging instructions for equipment manufacturers		No.
Á	so that specified chargers are designed to		N/A
The state of the s	maintain charging within the temperature, voltage		
ORT BEET.	and current limits specified		
5.5	Terminal contacts	<u></u>	N/A
	The size and shape of the terminal contacts	A September of the sept	
	ensure that they can carry the maximum	Och Park	N/A
	anticipated current		
	External terminal contact surfaces are formed		
A State of the sta	from conductive materials with good mechanical		N/A
Other	strength and corrosion resistance		
<del>'</del>	Terminal contacts are arranged to minimize the	s <sup>2</sup>	A1/A
	risk of short-circuit	and the late of th	N/A
5.6	Assembly of cells into batteries	the street of th	N/A
5.6.1	General		N/A
ed servi	Each battery have an independent control and		
OFT technil	protection for current, voltage, temperature and		N1/A
>	any other parameter required for safety and to	n de la companya de l	N/A
	maintain the cells within their operating region	and the state of t	
	This protection may be provided external to the	W. A. C.	
	battery such as within the charger or the end		N/A
and the	devices		No.
7 P. J. Marchicel of	If protection is external to the battery, the		1
OKITE	manufacturer of the battery provide this safety		NI/A
>*	relevant information to the external device		N/A
	manufacturer for implementation		
	If there is more than one battery housed in a single	and the state of t	
	battery case, each battery have protective circuitry	A Cort Booking	NI/A
Jan Park	that can maintain the cells within their operating		N/A
To the state of	regions		
ORTH	Manufacturers of cells specify current, voltage and		
	temperature limits so that the battery		NI/A
	manufacturer/ designer may ensure proper design		N/A
	and assembly	The state of the s	
	Batteries that are designed for the selective	dr.	N1/A
			N/A

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discharge of a portion of their series connected

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	132B01210602002 Page 8 0	пероп	Date: 2021-0
	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
T bestrical	cells incorporate circuitry to prevent operation of		
	cells outside the limits specified by the cell	a de la companya de l	
	manufacturer	18 th annual a	
	Protective circuit components added as		
ه ک	appropriate and consideration given to the		N/A
7 miles and services	end-device application		
ORTHER	The manufacturer of the battery provide a safety		
	analysis of the battery safety circuitry with a test		
	report including a fault analysis of the protection	All and the second seco	N/A
	circuit under both charging and discharging	Registration 1	
	conditions confirming the compliance		
5.6.2	Design recommendation		N/A
The second second	For the battery consisting of a single cell or a		
Ortream	single cellblock, it is recommended that the		
	charging voltage of the cell does not exceed the		N/A
	upper limit of the charging voltage specified in	a to the state of	
	Table 2	Range Control of the	
	For the battery consisting of series-connected		
	plural single cells or series-connected plural		
AND THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS	cellblocks, it is recommended that the voltages of		
OKT technik	any one of the single cells or single cellblocks		N/A
	does not exceed the upper limit of the charging		
	voltage, specified in Table 2, by monitoring the	The state of the s	
	voltage of every single cell or the single cellblocks	and hill dry south	
	For the battery consisting of series-connected		
	plural single cells or series-connected plural		N.
The State of the S	cellblocks, it is recommended that charging is		
ORTE	stopped when the upper limit of the charging		N/A
>	voltage is exceeded for any one of the single cells		
	or single cellblocks by measuring the voltage of		
	every single cell or the single cellblocks	and the state of t	
	For batteries consisting of series-connected cells	All Options	
JA V	or cell blocks, nominal charge voltage not be		N/A
Third se	counted as an overcharge protection		
OFTE	For batteries consisting of series-connected cells		
>"	or cell blocks, cells have closely matched		N/A
	capacities, be of the same design, be of the same		IN/A
	chemistry and be from the same manufacturer	The state of the s	
	It is recommended that the cells and cell blocks	O OKA	NI/A
	not discharged beyond the cell manufacturer's		N/A

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Clause Requirement – Test Result – Remark  specified final voltage  For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer	Verdict
specified final voltage  For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	No.
Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	INIPA
prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	14/74
battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	MILT
building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	Mary 1
designed to accommodate cell dimensional tolerances during charging and discharging as	
tolerances during charging and discharging as	
	N/A
recommended by the cell manufacturer	
For batteries intended for building into a portable	
end product, testing with the battery installed	N/A
within the end product considered when	
conducting mechanical tests	
5.7 Quality plan	Р
The manufacturer prepares and implements a	
quality plan that defines procedures for the	<i>2</i> 7 3
inspection of materials, components, cells and	P
batteries and which covers the whole process of Quality plan provided.	Mer
producing each type of cell or battery	
5.8 Battery safety components	N/A
See TABLE: Critical components	N1/A
According annex F information.	N/A

6	Type test and sample size		P
OFTE	Tests are made with the number of cells or		
	batteries specified in Table 1 using cells or		Р
	batteries that are not more than six months old		
	Coin cells with resistance $\leq 3 \Omega$ (measured	Not coin cells	N/A
	according annex D) are tested according table 1	Not com cens	IN/A
	Unless otherwise specified, tests are carried out in		P

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		IEC 62133-2	: 2017		
Clause	Requirement – Test		Result – Re	emark	Verdict
all lastried	an ambient temperat	ure of 20 °C ± 5 °C			
,	The safety analysis of	of 5.6.1 identify those	We.	is the late of the service	
	components of the p	rotection circuit that are		Mary Contractor of the Contractor	N/A 🌌
	critical for short-circu	it, overcharge and			IN/A
	overdischarge protec	ction			
Trical car	When conducting the	e short-circuit test,			
ORTIN	consideration given t	o the simulation of any sin	gle		
	fault condition that is	likely to occur in the	See clause	7.3.2.	N/A
	protecting circuit that	would affect the short-circ	uit	A STATE OF THE STA	
	test	OF OF		M. Ser technical	

			Mark I
7	Specific requirements and tests		Pol
7.1	Charging procedure for test purposes		P
7.1.1	First procedure	b	Р
	This charging procedure applies to subclauses other than those specified in 7.1.2	RECEIVED AND THE PARTY OF THE P	Р
A Turburd Borto	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer	See page 5.	P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage	See page 5.	Р
7.1.2	Second procedure		Р
A STATE OF THE PARTY OF THE PAR	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
7.2	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 lt A, using a constant voltage charging method	Charging temperature specified by client is: 5 ~ 45°C 45°C used for upper limit tests; 0°C used for lower limit tests.	P
7.2.1	Continuous charging at constant voltage (cells)		P
and the second	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer	Charging for 7 days with 800mA	P

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IEC 62133-2: 2017			
Clause	Requirement – Test	Result – Remark	Verdict
St. Land Trick	Results: No fire. No explosion. No leakage:	(See appended table 7.2.1)	Р
7.2.2	Case stress at high ambient temperature (battery)	And the state of t	N/A
	Oven temperature (°C) :	of the second second	
	Results: No physical distortion of the battery case		
Crest technical	resulting in exposure of internal protective components and cells		N/A
7.3	Reasonably foreseeable misuse		Р
7.3.1	External short-circuit (cell)	Tested complied	Р
A	The cells were tested until one of the following occurred:		P
A State of the last	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		Р
	Results: No fire. No explosion :	(See appended table 7.3.1)	Р
7.3.2	External short-circuit (battery)	Tested complied.	N/A
And Server	The batteries were tested until one of the following occurred:		N/A
Oct. term	- 24 hours elapsed; or	<b>&gt;</b>	N/A
	- The case temperature declined by 20 % of the maximum temperature rise	The state of the s	N/A
18 State of the last of the la	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test	A State of the Sta	N/A
A Control of the Cont	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		N/A
	Results: No fire. No explosion :	(See appended table 7.3.2)	N/A
7.3.3	Free fall	Tested complied.	Р
	Results: No fire. No explosion	No fire. No explosion.	P
7.3.4	Thermal abuse (cells)	Tested complied.	P

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	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
Rectifical b	Oven temperature (°C) :	130°C	_
	Results: No fire. No explosion	No fire. No explosion	Р
7.3.5	Crush (cells)	Tested complied.	Р
	The crushing force was released upon:		P
OK Technical and	- The maximum force of 13 kN $\pm$ 0,78 kN has been applied; or		Р
	- An abrupt voltage drop of one-third of the original voltage has been obtained	A State of the Sta	N/A
	Results: No fire. No explosion :	(See appended table 7.3.5)	Р
'.3.6	Over-charging of battery		N/A
Will Bernied ber	The supply voltage which is:		N/A
>	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or	The state of the s	N/A
and the state of t	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A
Off technics	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		N/A
	Test was continued until the temperature of the outer casing:	Off the Part of th	N/A
	- Reached steady state conditions (less than 10°C change in 30-minute period); or		N/A
OFFIRE	- Returned to ambient		N/A
	Results: No fire. No explosion :	(See appended table 7.3.6)	N/A
.3.7	Forced discharge (cells)	Tested complied.	Р
Market of the land	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration.	A Contraction	N/A
and the same	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration	A State of the sta	P

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			////
	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
SFT technical	Results: No fire. No explosion :	(See appended table 7.3.7)	Р
7.3.8	Mechanical tests (batteries)	15 State Barbo	N/A
7.3.8.1	Vibration	Tested complied.	N/A
A State of the Sta	Results: No fire, no explosion, no rupture, no leakage or venting.	(See appended table 7.3.8.1)	N/A
7.3.8.2	Mechanical shock	Tested complied.	N/A
	Results: No leakage, no venting, no rupture, no explosion and no fire :	(See appended table 7.3.8.2)	N/A
7.3.9	Design evaluation – Forced internal short-circuit (cells)		P
	The cells complied with national requirement for:		
Odiles	The pressing was stopped upon:		Р
	- A voltage drop of 50 mV has been detected; or	, ,	N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N	P
	Results: No fire :	(See appended table 7.3.9)	P

8 orties	Information for safety		Р	
8.1	General	into and the state of the state	Р	
A Secretaria	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products  Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales,	Information of safety mentioned in manufacturer's specification.	P N/A	
	end-users are provided with information to minimize and mitigate hazards		IN/A	
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during	Cott of the state	N/A	
Market Barren	use of a product.  As appropriate, any information relating to hazard avoidance resulting from a system analysis		N/A	
	provided to the end user  Do not allow children to replace batteries without adult supervision	R. S. Market British	N/A	
8.2	Small cell and battery safety information		N/A	K

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IEC 62133-2: 2017			
Clause	Requirement – Test	Result – Remark	Verdict
T. Ledghirde	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:	A State of the Sta	N/A
and the second	- Keep small cells and batteries which are considered swallowable out of the reach of children		N/A
Oct. W	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion	and the state of t	N/A
	- In case of ingestion of a cell or battery, seek medical assistance promptly	de de la companya del companya de la companya del companya de la c	N/A

-			
9	Marking		P
9.10 <sup>r.1</sup>	Cell marking		Р
	Cells marked as specified in IEC 61960, except coin cells		N/A
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity	Not coin cells	N/A
Contraction of the Contraction o	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked	AND SECRETARIO	Р
9.2	Battery marking	O. O. O. O. C.	N/A
	Batteries marked as specified in IEC 61960, except for coin batteries		N/A
OK Technic	Coin batteries whose external surface area is too small to accommodate the markings on the		
	batteries show the designation and polarity.  Batteries also marked with an appropriate caution statement	Not coin batteries	N/A
	Terminals have clear polarity marking on the external surface of the battery		N/A
Off learning	Batteries with keyed external connectors designed for connection to specific end products need not		
,	be marked with polarity markings if the design of the external connector prevents reverse polarity connections	Harall Marie Control of the Control	N/A
9.3	Caution for ingestion of small cells and batteries		N/A

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	IEC 62133-2: 20°	17	
Clause	Requirement – Test	Result – Remark	Verdict
Set Telephore	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2	A State of the Sta	N/A
A Total Marine Burk	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	Other information to the control of	and the state of t	Р
	Storage and disposal instructions	Information for storage and disposal instructions mentioned in manufacturer's specifications.	P
Oct. Telephore	Recommended charging instructions	Information for recommended charging instructions mentioned in manufacturer's specifications.	Р

10	Packaging and transport		P
	Packaging for coin cells not small enough to fit	Not coin cell	N/A
A STATE OF THE STA	within the limits of the ingestion gauge of Figure 3	Not conticent	IN/A
OFT BOTTING	The materials and packaging design are chosen		
	so as to prevent the development of unintentional	ke*	P
	electrical conduction, corrosion of the terminals	A STATE OF THE STA	F
	and ingress of environmental contaminants	All String	

Annex A	Charging and discharging range of secondary lithium ion cells for safe use		
A.1	General		P
A.2	Safety of lithium ion secondary battery	Complied.	Р
A.3	Consideration on charging voltage	Complied.	Р
A.3.1	General	different distribution of the second	Р
A.3.2	Upper limit charging voltage	4.4V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint	4.4V applied.	N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	To Oct. British and the	N/A
A.4	Consideration of temperature and charging current		P

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	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
A.4.1	General Additional Section 1997		Р
A.4.2	Recommended temperature range	Charging temperature declared by client is: 5 ~45°C	Р
A.4.2.1	General		N/A
A.4.2.2	Safety consideration when a different recommended temperature range is applied		N/A
A.4.3	High temperature range	Charging high temperature declared by client is 45°C	N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range	45°C applied.	N/A
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		N/A
A.4.4	Low temperature range	Charging low temperature declared by client is 5°C	P
A.4.4.1	General		Р
A.4.4.2	Explanation of safety viewpoint		Р
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range	No. of the state o	Р
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	0°C applied.	P
A.4.5	Scope of the application of charging current	, and the second	P
A.4.6	Consideration of discharge		P
A.4.6.1	General		Р
A.4.6.2	Final discharge voltage and explanation of safety viewpoint	Battery specified final discharge voltage 3.0V, not exceed 3.0V specified by cell manufacturer.	P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging current		Р
A.5	Sample preparation	<u>.</u>	Р
A.5.1	General	light the state of	Р
A.5.2	Insertion procedure for nickel particle to generate internal short	Or John	P

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D.2

Method

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	IEC 62133-2: 20°	17	
Clause	Requirement – Test	Result – Remark	Verdict
A.5.3	Disassembly of charged cell		Р
A.5.4	Shape of nickel particle	Life Handis British	Р
A.5.5	Insertion of nickel particle in cylindrical cell	get to	N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell	And the state of t	Р
A.6	Experimental procedure of the forced internal short-circuit test	All Republic	P
A.6.1	Material and tools for preparation of nickel particle		Po
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		Р
A.6.4	Damaged separator precaution	a grand	Р
A.6.5	Caution for rewinding separator and electrode	No. of the state o	P
A.6.6	Insulation film for preventing short-circuit		Р
A.6.7	Caution when disassembling a cell		Р
A.6.8	Protective equipment for safety	140°	Р
A.6.9	Caution in the case of fire during disassembling	La Salla Barrella Bar	Р
A.6.10	Caution for the disassembling process and	Oct.	Р
70110	pressing the electrode core		
A.6.11	Recommended specifications for the pressing device		P
100	A CONTRACTOR OF THE PROPERTY O		
Annex B	Recommendations to equipment manufacturers an	d battery assemblers	N/A
Г		K. J. British Co.	
Annex C	Recommendations to the end-users		N/A
Annex	, as the state of		
D	Measurement of the internal ac resistance for coin	cells	N/A
D.1	General	Not coin cells	N/A

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A sample size of three coin cells is required for this

N/A

N/A

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Clause

3 Ω require no further testing

2	TSZB01210602002 Page 18	3 of 26	Report Date: 2021-07-19
	IEC 62133-2: 20	)17	
	Requirement – Test	Result – Remark	Verdict
	measurement:		
	Coin cells with an internal resistance of less than	at the last of the second	
	or equal to 3 $\Omega$ are subjected to the testing	A State of the sta	N/A
	according to Clause 6 and Table 1		OFT THE PARTY OF T
6	Coin cells with an internal resistance greater than		

N/A

	- Carrier Carrier			
Annex	Packaging and transport	and the state of t		D
E	Packaging and transport	Rafill to the last	M. S. C. Land B. C. Land	ı
•		0.	20 AND AND	

Annex			SON.
_	Component standards references	N/A	ļ
I F	·		

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Supplementary information:--

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`				Ĭ	
	Ta	able: Critical cor	mponents information		Р
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity
-Electrolyte	Zhuhai Guangrui	CR-ATJ005A	LiPF <sub>6</sub> , DMC, EMC, EC	IEC6213	Test with
	New Material Co., Ltd	Ollien	and the second second	3-2:2017	cell
-Separator	Shenzhen Zhuolang	7+2.5+3*60	PP+PE+PP three layers,	IEC6213	Test with
St. Way	New Energy Technology Co., Ltd		Shutdown temperature: 130°C	3-2:2017	cell
-Positive	Shenzhen Walworth	ZH5000B	LiCoO <sub>2</sub> , Conductive Additive	IEC6213	Test with
electrode	Technology Co., Ltd		PVDF, Aluminum Foil	3-2:2017	cell
					Man A
-Negative	Yuanjiang Ducheng	AG-1	Graphite, Conductive	IEC6213	Test with
electrode	New Material Technology Co., Ltd		Additive, Copper Foil	3-2:2017	cell
-Positive	Dongguan Oct testing	0.08*5*56*4.5	Aluminum belt,	IEC6213	Test with
electrode tab	xinjingyuan	*4.5	5mm*0.08mm	3-2:2017	cell
	Electronic Technology Co., Ltd		The state of the s	griffed a	
-Negative	Dongguan	0.08*5*56*4.5	Nickel belt, 5mm*0.08mm	IEC6213	Test with
electrode tab	xinjingyuan	*4.5		3-2:2017	cell
64.	Electronic Technology Co., Ltd	projection of the contract of	All the state of t		
-Aluminium	Shenzhen anborui	0.113µm	Nylon, PP, Aluminum	IEC6213	Test with
plastic film	New Material Co., Ltd		V Vota	3-2:2017	cell

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7.2.1	TABLE: Continuous charging at constant voltage (cells)								
Sample no.		Recommended charging voltage Vc (Vdc)	Recommended charging current I <sub>rec</sub> (A)	OCV before test (Vdc)	Resi	ılts			
C01		4.4	0.8	4.393	Р				
C02		4.4	0.8	4.393	Р				
C03		4.4	0.8	4.393	Р				
C04		Returned 4.4	0.8	4.393	P				
C05		4.4	0.8	4.393	P P				

# Supplementary information:

- No fire or explosion
- No leakage

				, Q <sub>E</sub> ,	Willes May		
7.3.1	ТАВ	LE: External short-	circuit (cell)			Р	
Sample no.		Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature rise ∆T (°C)	Results	
Samples charged at charging temperature upper limit ( 45°C)							
C06		56.0	4.365	81	107.3	Р	
C07		56.0	4.362	85	103.5	Р	
C08		56.0	4.363	80	106.7	P	
C09		56.0	4.365	80	105.9	P	
C10		56.0 <sub>g-t-t-</sub>	4.364	83	114.3	Р	
		Samples cha	rged at charging	temperature low	er limit ( 0°C)		
C11		56.3	4.261	86	98,5	Р	
C12		56.3	4.264	82	98.0	Р	
C13		56.3	4.263	81	95.2	Р	
C14		56.3	4.263	84	103.9	Р	
C15		56.3	4.266	Oct testing 81	103.6	Р	

# **Supplementary information:**

- No fire or explosion

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7.3.2	TABLE: External short-circuit (battery)							
Sample r	10.	Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature rise ∆T (°C)	Component single fault condition	Results	
		V						
All find the state of								
Opt been			and the series					
		Ort.	rition .	a Service Market Berker				
			,	O Oct 1		A Christmen agent		

## **Supplementary information:**

- No fire or explosion

A tectnica					
7.3.5	TABLE	:: Crush (cells)			Р
Sample no.		OCV before test (Vdc)	OCV at removal of crushing force (Vdc)	Maximum force applied to the cell during crush (kN)	Results
		Samples charged at	charging temperature	upper limit ( 45°C)	
C2	6	4.359	4.358	13.10	Р
C2 <sup>-</sup>	7	4.362	4.361	13.09	Р
C28	8	4.358	4.357	13.11 13.11	Р
C29	9	4.365	4.364	13.08	Р
C3(	0	4.360	4.359	13.10	Р
		Samples charged a	t charging temperature	e lower limit ( 0°C)	
C3	1	4.261	4.260	13.11	Р
C3:	2	4.259	4.258	13.13	Р
C3:	3	4.262	4.261	13.09 gr. agent and a	Р
<b>©</b> 34	4	4.264	4.263	13.10	Р
Martin C3	5	4.261	4.260	13.11	Р
		Markey Mark			

#### Note:

# Supplementary information:

- No fire or explosion

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for retesting within 15 days after receiving the report.

Shenzhen ORT technical services Co., Ltd.

Web: <a href="http://www.ort-is.com">http://www.ort-is.com</a>

Site Location: Fangxing science park, Nanlian sixth industrial zone, Longgang street, longgang district, Shenzhen , Guangdong province, China Email: battery@ort-is.com

Call: 0086-755-27817553

Email: battery@ort-is.com



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7.3.6	TABL	E: Over-charging of bat	tery			N/A
Constant	charging	g current (A)	:			_
Supply vo	oltage (V	/dc)		arute .		_
Sampl	e no.	OCV before charging (Vdc)		rging time nute)	Maximum outer case temperature (°C)	Results
The little and the li	ø					
	<	12 th and the second	16	Act desired street	and the state of t	>
Suppleme	entary in	formation:			A STATE OF THE STA	

	7.3.7 TABLE: Forced discharge (cells)				Р		
	Sample	no.	OCV before application of reverse charge (Vdc)	Measured reverse charge It (A)	Lower limit discharge voltage (Vdc)	Re	sults
	Griedin C36		3.448	4.0	3.0		Р
1	C37		3.457	4.0	3.0	and the state of t	Р
	C38		3.450	4.0	3.0	Martinical Control	Р
	C39		3.435	4.0	3.0		P
	C40		3.461	4.0	3.0		P

# Supplementary information:

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7.3.8.1	TABL	E: Vibration				N/A
Sample	no.	OCV before	OCV after test	Mass before	Mass after test	Results
		test (Vdc)	(Vdc)	test (g)	(g)	
					O. J. Skilan	, in the
	,		_			
A Contract of the Contract of						
Supplemer	ntary in	formation:				
- No fire or	explosio	on	Marie 1	The thirty of the second	all de la la la la la la la la la la la la la	
- No rupture	е	A Comment		Q.	A Carl technical	
- No leakag	je					W W

7.3.8.2	TAI	BLE: Mechanical s	shock	and the service		N/A
Sample	no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results
A State of the second			ortice .			
		B. Contractive	0	Al Market		

#### Supplementary information:

- No fire or explosion
- No rupture

No venting

- No leakage



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7.3.9	ТАВ	LE: Forced internal	l short circuit (ce	lls)		Р
Sample i	no.	Chamber ambient T (°C)	OCV before test (Vdc)	Particle location <sup>1)</sup>	Maximum applied pressure (N)	Results
		Samples	charged at charg	ing temperature	upper limit	
C44	s .	45	4.363	1	400	Р
c. C45		45	4.363	1	400	Р
C46		45 or territory	4.365	1 1	400	Р
C47		45	4.362	orteeth 1	400	Р
C48		45	4.364	1	400	P
A STORY OF THE PERSON OF THE P	9	Samples	charged at charg	ing temperature	lower limit	
C49		0	4.260	1	400	Р
C50		O Martinetti	4.266	1	400	Р
C51		0	4.263	dri 1	400	Р
C52		0	4.261	1	400	P
C53		0	4.262	1	400	Р

D.2	TABLE: Internal AC resistance for coin cells				N/A
Sample	e no.	Ambient T (°C)	Store time (h)	Resistance Rac (Ω)	Results 1)
Orther		A BOOK OF THE PARTY OF THE PART			
		Ortende Ortende	A Table and the state of the st		
			OF ORTH	A STATE OF THE STA	

# Supplementary information:

<sup>1)</sup> Coin cells with internal resistance less than or equal to 3  $\Omega$ , see test result on corresponding tables

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Email: battery@ort-ts.com

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Email: battery@ort-ts.com

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Report Date: 2021-07-19

# Appendix 1 Photos of product



Fig. 1—Front view of Cell

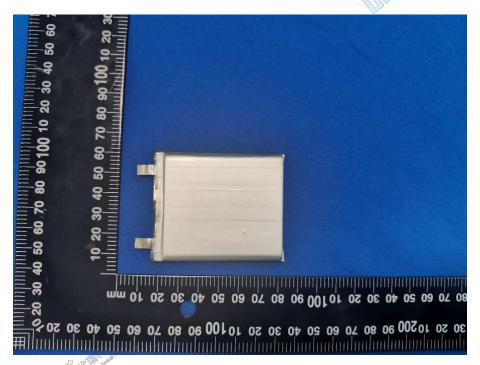


Fig. 2-Back view of Cell

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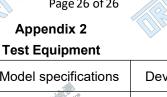
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Report Date: 2021-07-19

# Appendix 2



No	Name	Model specifications	Device Number	Calibration validity
1	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-01	2022-07-13
2	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-10	2022-07-13
3	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-11	2022-07-13
4 Ortinger	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-12	2022-07-13
5	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-13	2022-07-13
6	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-14	2022-07-13
7	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-15	2022-07-13
8	Programmable constant temperature and humidity test chamber	WTH-225-40-OYO	ORTWD225-01	2022-05-27
9	Multimeter	17B+	ORT-WYB-01	2022-07-13
10	DC power supply	IT6723	ORT-DY-01	2022-05-27
11	Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-01	2022-07-13
12	Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-02	2022-07-13
13	Data acquisition instrument	2635A	ORT-CJY-02	2022-07-13
14	Drop test table	LX-DL-315	ORT-DL-01	2022-03-03
15	Thermal shock tester	GX-3020-B150T	ORT-RCJ-01	2022-07-13
16	Crush / needle tester	GX-5067-BM3T	ORT-JYZC-01	2022-05-27
17	Electromagnetic vibration tester	MPA406/M232A	ORTZD2000-01	2022-01-03
18	Electronic balance	HZK-JA510S	ORT-DZTP-02	2022-07-13
19	Mechanical Shock tester	IS500	ORTCJ-01	2022-03-03

End of Report \*\*\*

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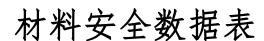
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Report No.: TSZ22120267-P03-R02



# Material Safety Data Sheet

报告本年度有 有效期至 2023 年 12 月 31 日

样品名称: 锂离子电芯

Sample name: Lithium ion cell

样品型号:

Sample model:

云南路飞新能源材料有限公司

645464

委托单位:

Yunnan Road Fei New Energy Materials

Applicant:

Co.,Ltd.

签发时间 Date of issue: 2022.12.29 Dec. 29, 2022

Written by

Approved by 段亿序

有限公司

Shenzhen Tiansu Calibration and Testing Co., Ltd.

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China Web: www.tiansu.org E-mail: tsjc@tiansu.org Tel: 0755-89457984





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Report No.: TSZ22120267-P03-R02

\* The MSDS is prepared based on the information provided by client. The contents and formats of this MSDS are revised as per client's request. 这份材料安全数据表是根据客户提供的信息编辑,其内容和格式按客户要求来修订。

第一部分-化学品及企业标识

Section 1	-Chemical	Product	and	Company	Identification
立旦夕和	细商工由サ				

产品名称	锂离子电芯
Product Name	Lithium ion cell
型号	645464
Model	040404
商标	
Trade Mark	
额定参数	3.85V/4000mAh/15.4Wh
Ratings	3.85V/4000IIIAII/13.4VVII
重量	51.9g
Weight	51.9g
制造商	云南路飞新能源材料有限公司
Manufacturer	Yunnan Road Fei New Energy Materials Co.,Ltd.
制造商地址	云南省保山市腾冲市边境经济开发合作区高新技术产业园1号
Manufacturer	NO.1 high tech industrial Park,Tengchong border economic
Address	development and cooperation zone ,Baoshan City,yunnan Province
应急电话	0875-5189928
Emergency Telephone	0075-5169926
传真	
Fax	

# 第二部分-成分信息

# Section 2- Composition Information

化学成分	化学式	CAS号	重量含量(%)
Chemical Composition	Chemical Formula	CAS No.	Weight (%)
钴酸锂	LiCoO <sub>2</sub>	10100 70 2	15 - 40
Lithium cobaltate		12190-79-3	15 - 40
石墨	С	7782-42-5	10 - 30
Graphite	C	1102-42-0	10 - 30
六氟磷酸锂			
Lithium	LiPF <sub>6</sub>	21324-40-3	10 - 30
hexafluorophosphate			
铜箔	Cu	7440-50-8	7-13
Copper	Cu	/ 440-50-0	1-13

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	1 agc	3/ II Fages		
铝箔 Aluminium	Al	7429-90-5	5-10	
· · · · · · · · · · · · · · · · · · ·				
.,	Ni	7440-02-0	1-5	
Nickel	<b>放一</b> 和 //	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
	第二部分	~- 危险性概述		
	Section 3- Haz	zards Identification		
紧急情况概述	不适用			
Emergency overview	N/A			
标签元素 Label elements:				
危险标签图	 不适用			
Hazard pictogram(s)	Not Applicable			
提示语				
Signal word	Not Applicable			
危险声明	不适用			
Hazard statement(s)	Not Applicable			
预防声明	, , , , ,			
Precautionary statemen	t (s) :			
预防	不适用			
Prevention	Not Applicable			
反应	不适用			
Response	Not Applicable 不适用			
废弃处理   Dianagal	へ進用   Not Applicable			
Disposal 环境危害	Not Applicable 无相关信息			
小児厄吉				
<b>Environmental nazaros:</b> No relevant information  重要症状 见第11部分更多信息				
里女並化   光泉11印分文夕信息   Namportant symptoms:   See section 11 for more information				
importunt symptoms.		分-急救措施		
	知 知 知 知 知 知 知 知 知 知 知 知 知 知 如	刀 心然泪地		
	Section 4- Fi	rst Aid Measures		
	万一接触,立即,	用大量的清水冲洗至少15分钟,	翻起上下眼睑,直到化学的残	
眼睛接触	留物消失为止,	迅速就医。		
Eye contact	Flush eyes with	Flush eyes with plenty of water for least 15 minutes, occasionally lifting the		
	upper and lowe	r eyelids. Get medical aid.		
	万一接触,用大	量的水冲洗至少15分钟,同时图	余去污染的衣物和鞋子, 迅速就	
皮肤接触	医。			
Skin contact	Remove contaminated clothes and rinse skin with plenty of water or shower			
		Get medical aid.		
吸入		至空气清新处,如果呼吸困难约		
Inhalation		Remove from exposure and move to fresh air immediately. Use oxygen if		
	available.	1 1 11 11 11 11 11 11 11 11 11 11 11 11	(are the color of	
摄入			取催吐的方法,并且立即就医。	
Ingestion		_	uce vomiting unless patient is	
	unconscious. C	ali a pnysician.		

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第五部分-消防措施				
Section 5- Fire Fighting Measures				
燃点	不适用			
Flash Point	N/A			
自燃温度	不适用			
Auto-Ignition Temperature	N/A			
灭火介质	水,二氧化碳			
Extinguishing Media	$H_2O$ , $CO_2$			
特殊灭火程序	自给式呼吸器			
Special Fire-Fighting Procedures	Self-contained breathing apparatus			
异常火灾或爆炸	   当电芯暴露于过热的环境中时,安全阀可能会打开			
Unusual Fire and Explosion Hazards	Cell may vent when subjected to excessive heat-exposing battery contents			
燃烧产生的危险物品	一氧化碳,二氧化碳,锂氧化物烟气			
Hazardous Combustion Products	Carbon monoxide, carbon dioxide, lithium oxide fumes.			

第六部分-泄露应急处理

# Section 6- Accidental Release Measures

#### 个人预防措施、保护设备和应急程序:

如果电池被泄露,让人员离开该区域直到烟雾消散。提供最大限度的通风,清除有害气体。首选的反应就是离开这个地区并消散气体,避免皮肤和眼睛接触或吸入气体。用吸收剂清除溢出的液体然后焚烧。如果电池泄漏发生时,液体可以用砂、泥土或其他惰性物质来吸收,污染区域应该保持通风。

### Personal precautions, protective equipment and emergency procedures:

If the battery is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate, Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage of the battery happens, liquid could be absorbed by using sand, earth or other inert substance and contaminated area should be ventilated meantime.

## 环境预防措施:

不允许产品到达排水系统或任何水源。 如果渗透进排水系统或任何水源,通知相应的部门。

不允许进入下水道/表面或地下水。

## **Environment precautions:**

Do not allow product to reach sewage system or any water source.

Inform respective authorities in case of seepage into water course or sewage system.

Do not allow to enter sewers/ surface or ground water.

#### 抑制和清理材料的方法:

如果电池外壳被拆除,少量电解液可能会泄漏。收集所有材料放进一个塑料容器。根据当地的法律法规来处置,避免可溶物质进入大地、下水道或水源。

# Methods and material for containment and cleaning up:

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic

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lined container. Dispose off according to the local law and rules, Avoid leached substances to get into the earth, canalization or waters.

第七部分-操作处置和储存				
Section 7- Handling and Storage				
操作处置 <b>Handling</b>	禁止打开、毁坏或焚烧电池,因为电池有可能在这些处理过程中发生爆炸、破裂或泄露等事故。 禁止将电池短路、过充、强制放电或扔入火中。 禁止挤压或刺穿电池,或将电池浸入溶液中。 The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.			
储存 Storage	禁止物理或电滥用,禁止高温储存,最好将电池储存在阴凉、干燥、通风及温度变化较小的环境中。 禁止将电池接触加热设备,或将电池长时间直接暴露在阳光中。 Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.			
其他要注意的防范措施 Other Precautions	拆解、挤压、直接放入火中或高温条件下,电池可能发生爆炸和燃烧。禁止短接或将电池正负极错误的安装在设备中。 The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.			
第八部分-接触控制和个体防护 Section 8- Exposure Controls/Personal Protection				
设计控制 Engineering Controls	设计局部排气通风或其它设计来控制粉尘、雾、烟雾和气体。 Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor.  Keep away from heat and open flame. Store in a cool, dry place.			

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其它防护装备

Other Protective Equipment

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	呼吸防护:在正常情况下不需要。
	皮肤和身体防护:在正常情况下不需要,如果处理一个裂开的或泄漏的电池需
	要穿戴适当的防护服和手套。
	手保护: 如果处理一个裂开的或泄漏的电池需要戴适当手套。
	眼睛保护:在正常情况下不需要,如果处理一个裂开的或泄漏的电池需要戴上
│ │ 个人防护装备	安全眼镜。
Personal Protective Equipment	Respiratory Protection: Not necessary under normal conditions.
Personal Protective Equipment	Respiratory Protection: Not necessary under normal conditions.  Skin and body Protection: Not necessary under normal conditions, Wear
Personal Protective Equipment	
Personal Protective Equipment	Skin and body Protection: Not necessary under normal conditions, Wear
Personal Protective Equipment	Skin and body Protection: Not necessary under normal conditions, Wear suitable protective clothing and gloves if handling an open or leaking battery.
Personal Protective Equipment	Skin and body Protection: Not necessary under normal conditions, Wear suitable protective clothing and gloves if handling an open or leaking battery.  Hand protection: Wear suitable gloves if handling an open or leaking battery.

卫生措施在工作区域不得进食,饮水或吸烟。Hygiene MeasuresDo not eat, drink, or smoke in work area. Maintain good housekeeping.

immediate work area.

在工作区域应该有一个立即可以使用的安全淋浴和喷水洗眼器。

Have a safety shower and eye wash fountain readily available in the

# 第九部分-物理和化学特性

# Section 9- Physical and Chemical Properties

颜色	银色
Color	Silver
气味	不适用
Odour	Not Applicable
酸碱度	不适用
рН	Not Applicable
熔点/凝固点	不适用
Melting point/freezing point	Not Applicable
沸点、沸点范围:	不适用
Boiling Point and Boiling range	Not Applicable
易燃度	不适用
Flash Point	Not Applicable
自燃或爆炸的上、下极限	アギ田
Upper/lower flammability or	不适用
explosive limits	Not Applicable
蒸汽压	不适用
Vapor Pressure	Not Applicable

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rean Sa	Page 7 / 11 Pages		
蒸汽密度	不适用		
Vapor Density	Not Applicable		
相对密度	不适用		
Relative density	Not Applicable		
水溶性	不适用		
Solubility in Water	Not Applicable		
自燃温度	不适用		
Auto-ignition temperature	Not Applicable		
分解温度	不适用		
Decomposition temperature	Not Applicable		
蒸发速率	不适用		
Evaporation rate	Not Applicable		
易燃性(土壤、天然气)	不适用		
Flammability (soil, gas)	Not Applicable		
粘性	不适用		
Viscosity	Not Applicable		
	第十部分 稳定性和反应活性		
Secti	on 10- Stability and reactivity		
Occi	on 10 Stability and reactivity		
稳定性	产品在第七部分所述的条件下稳定		
Stability	The product is stable under conditions described Section 7		
	加热 70℃ 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路,长时间暴		
应避免的条件	露在潮湿的条件下。		
Conditions to Avoid	Heat above 70°C or incinerate. Deform, Mutilate, Crush, Disassemble,		
	Overcharge, Short circuit, Expose over a long period to humid conditions.		
不兼容的材料	氧化剂,酸,碱。		
Incompatible Materials	Oxidizing agents, acid, base.		
□ · · · · · · · · · · · · · · · · · · ·			
旭型分解物   Hazardous Decomposition	一氧化碳、二氧化碳、氧化锂烟雾。		
Products	Carbon monoxide, carbon dioxide, lithium oxide fumes.		
危险反应的可能性			
Possibility of Hazardous	不适用		
Reaction	Not Applicable		
	第十一部分-毒理学资料		
Section 11 - Toxicological Information			
刺激	如果电芯的外壳受到机械、热或电的滥用到达一定程度,会发生刺激的风险。		

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Irritation	Page 8 / 11 Pages 如果发生这种情况,可能会刺激皮肤、眼睛和呼吸道。
	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
致过敏	不适用
Sensitization	Not Applicable
影响神经系统	不适用
Neurological Effects	Not Applicable
致畸	不适用
Teratogenicity	Not Applicable
再生毒性	不适用
Reproductive Toxicity	Not Applicable
诱变(遗传效应)	不适用
Mutagenicity (Genetic Effects)	Not Applicable
附带材料毒理性	不适用
Toxicologically Synergistic Materials	Not Applicable
	第十二部分-生态学资料
Sect	ion 12- Ecological Information
生态毒性	不适用
<b>Ecological Toxicity</b>	Not Applicable
在土壤中的流动性	不适用
Mobility in soil	Not Applicable
持久性和分解性	不适用
Persistence and Degradability	Not Applicable
	不适用
生物聚积	
生物聚积 Bioaccumulation potential	Not Applicable
	Not Applicable  不适用

第十三部分-废弃处置

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Section 13- Disposal Considerations		
产品废弃处理建议 Product disposal recommendation	遵守当地、州和联邦法律和法规。 Observe local, state and federal laws and regulations.	
包装处理建议 Packaging disposal recommendation	废弃处理必须根据当地法规 Disposal must be made according to official regulations	
	第十四部分-运输信息	
Secti	on 14 - Transport Information	
运输标签 Label for conveyance	锂电池标签 Lithium Battery Label	
UN 编号 UN Number	UN 3480 或 UN 3481 UN 3480 or UN 3481	
运输风险类别 Transport hazard class(es)	9	
包装等级 Packing group		
海洋污染物 Marine pollutant	无污染 No	
联合国运输专用名称 UN Proper shipping name	锂离子电池(包括锂离子聚合物电池) Lithium ion Batteries (Including lithium ion polymer batteries) 锂离子电池和设备包装在一起(包括锂离子聚合物电池) Lithium ion Batteries packed with equipment (Including lithium ion polymer batteries) 设备里内含锂离子电池(包括锂离子聚合物电池) Lithium ion Batteries contained in equipments (Including lithium ion polymer batteries)	
ICAO/IATA	可根据国际民用航空组织(ICAO),TI 或国际航空协会(IATA) DGR 64 版本包装说明 965 第 IB 节规定或 966~967 第 II 节规定进行空运 Can be shipped by air in accordance with international Civil Aviation Organization (ICAO),TI or International Air Transport Association(IATA)DGR 64 <sup>th</sup> Packing Instructions Section IB of 965 or Section II of 966~967 appropriately.	

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IMDG CODE	《国际海运危险货物规则》特殊规定 188 IMDG CODE (Amdt 41-22) International Maritime Dangerous Goods Code under Special Provision 188 IMDG CODE (Amdt 41-22)
ADR	《国际危险货物道路运输欧洲协定》(ADR)根据特殊规定 188 European Agreement concerning the International Carriage of Dangerous Goods by Road under Special Provision 188
RID	《国际危险货物铁路运输欧洲协定》(RID)根据特殊规定 188 Regulations concerning the International Carriage of Dangerous Goods by Rail under Special Provision 188

危险品规例规定,运输前,每一个电池设计须通过联合国试验和标准手册38.3节所载的测试。

The dangerous goods regulations require that each battery design be subject to tests contained in Section 38.3 of the UN Manual of Tests and Criteria prior to being offered for transport.

第十五部分 法规信息

# Section 15- Regulatory information

#### 法律信息

#### Law information

《危险物品规则》

《Dangerous Goods Regulations》

《对危险货物运输的有关规定的建议》

《Recommendation on the Transport of Dangerous Goods Model Regulations》

《国际海运危险货物规则》

《International Maritime Dangerous Goods》

《危险品安全运输技术指令》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物分类和品名编号》

《Classification and code of dangerous Goods》

《消费产品安全法》

《Consumer Product Safety Act》(CPSA)

《联邦环境污染控制法》

《Federal Environmental Pollution Control Act》(FEPCA)

《资源保护及恢复法案》

《Resource Conservation and Recovery Act》 (RCRA)

《国际危险货物道路运输欧洲协定》

《European Agreement concerning the International Carriage of Dangerous》

《国际危险货物铁路运输欧洲协定》

《Regulations concerning the International Carriage of Dangerous》

根据所有联邦、州和地方法律。

In according with all Federal, State and local laws.

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# 第十六部分-其它信息

# Section 16- Other Information

上面的信息被认为是准确代表了目前最好的信息提供给我们。然而,飞机没有对商品性能保证或任何其他保证,包括明示或暗示,对这类信息的使用我们不承担责任。用户应作出自己的调查,以确定是否适合其特定用途的信息。虽然在此处所包含的数据的准备已经采取了合理的预防措施,这是仅为你提供的信息、考虑和调查。这个化学品安全技术说明书为本产品提供了安全操作指南和使用指南,它并不能对所有可能发生的情况提供建议,因此,您特殊使用该产品应先进行评估,以确定是否需要额外的预防措施。

The information above is believed to be accurate and represents the best information currently available to us. However, concorde makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

-- End of Report ---- 报告结束 --

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中国认可 国际互认 检测 **TESTING CNAS L5138** 

# 1.2m 跌落测试报告 1.2m Drop Test Report

样品名称: 锂离子电芯

Lithium ion cell Sample name:

> 样品型号: 645464

Sample model:

云南路飞新能源材料有限公司 委托单位:

Yunnan Road Fei New Energy Materials

Applicant: Co.,Ltd.

有限公司

and Testing Co., Ltd. Shenzhen Tiansu Callbration

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China Web: www.tiansu.org

E-mail: tsjc@tiansu.org Tel: 0755-89457984





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W.C 2		Page 275 Pages			
委托单位	名称 Name		云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.		
Applicant	地址 Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园1号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province			
	名称 Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.		Co.,Ltd.	
制造单位	地址 Address	云南省保山市腾冲市边场 NO.1 high tech industria development and coope	l Park,Tengchong		
Manufacturer	电话 Phone number	0875-5189928	邮箱 Email address	2411318566@qq.com	
	网址 Website				
测试实验室	名称 Name	深圳天溯计量检测股份有限公司 Shenzhen Tiansu Calibration and Testing Co., Ltd.			
Testing laboratory	地址 Address	深圳市龙岗区宝龙街道银 B/1,4, NO.2 Jinlong F		、4 栋 District, Shenzhen, China	
测试标准	联合国《关于危险货物运输的建议书一规章范本》第 3. 3 章节 188 款 ST/SG/AC. 10/1/Rev. 21 Chapter3. 3/Special provisions 188				
Test Standard	United nations "recommendations on the TRANSPORT OF DANGEROUS GOODS" model Regulations (21 Rev. Edition) Chapter3. 3/Special provisions 188.				
测试日期 Test date	2022.12.14 to 2022.12.16				

#### Test conclusion:

#### 检测结论:

由 云南路飞新能源材料有限公司送检的锂离子电芯 的包装件 1.2m 跌落测试依据《关于危险货物运输的建议书》规章范本 第21修订版进行检测。试验结果符合《关于危险货物运输的建议书》规章范本第21修订版相关要求。

The 1.2m drop test of the packages for Lithium ion cell submitted by Yunnan Road Fei New Energy Materials Co.,Ltd. is tested according to the 21st Revised Edition of the Recommendations on the Transport of Dangerous Goods, Model Regulations (ST/SG/AC. 10/1/Rev. 21).

签发日期 Date of issue: 2022.12.16

陈伟悦 Reviewed by 中伟超



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# 一、基本信息 Basic information

样品名称	锂离子电芯	样品型号	645464
Sample name	Lithium ion cell	Sample model	
标称电压 Nominal voltage	3.85V	额定能量 Ratings energy	15.4Wh
内含数量 Number	189 PCS	商标 Trade mark	
包装件重量	10.9kg	包装件尺寸	L*W*T(365mm*270mm*160
Packaging weight		Packaging dimensions	mm)
外包装	瓦楞纸	内包装	塑料
Outer packing	Corrugated paper	Inside packing	Plastics
包装方式	单独运输电池		
Type of packing	Cells or batteries only		
每包装件电池净重 Net quantity of batteries per package	9.809kg		

#### 二、1.2米跌落测试 1.2m drop test

— ( :: = x   x   x   x   x   x   x   x   x   x				
No.	Test item	Test method	Result	Remark
序号	试验项目	试验依据	结果	备注
1	1.2米跌落测试 1.2m drop test	联合国《关于危险货物运输的建议书一规章范本》第3.3章节188款ST/SG/AC. 10/1/Rev. 21 Chapter3. 3/Special provisions 188 United nations "recommendations on the TRANSPORT OF DANGEROUS GOODS" model Regulations (21 Rev. Edition) Chapter3. 3/Special provisions 188.	合格 Pass	

# Drop position跌落方向:

Drop position 跌落方向	Top 上面	Front 前面	Side 侧面	Edge 棱	Angle <sup>街</sup>
Status	→ 上四 合格/Pass	合格/Pass	合格/Pass		合格/Pass
包装状态	合格/Pass	合格/Pass	合格/Pass	合格/Pass	合俗/Pass

## 三、测试要求描述 Testing requirements description:

每个电芯或电池的包装件或者完全包装件必须能承受 1.2 米跌落测试,每个包装件进行 5 次不同方向的跌落测试,而不造成包含在其中的电池或电芯的损坏,不造成使电池与电池(电芯与电芯)接触的内含物的移动和内含物的释出。

The package of batteries is dropped from 1.2m 5 times per package. Each package is capable of withstanding a 1.2m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the content so as to allow battery to battery (cell to cell) contact and without release of contents.

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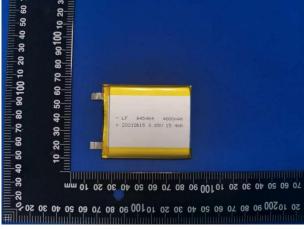
Report No.: TSZ22120267-P03-R03

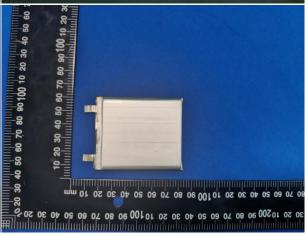
# THE PHOTO OF SAMPLE 样品图片











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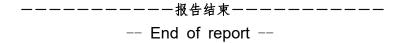
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# 声明

# **STATEMENTS**

- 1. 本报告无检测单位印章无效。
  The test report is invalid without the official stamp of Tiansu.
- 2. 除非全部复制,否则无深圳天溯计量检测股份有限公司书面批准本报告不得部分复制。 This report shall not be copied partly without the written approval of Shenzhen Tiansu Calibration and Testing Co., Ltd.
- 3. 本报告无批准人、审核人及检测人签名无效。
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- 4. 私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。
  The report is invalid when anything of following happens illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.
- 5. 本报告仅与送检样品有关。
  The test report is valid for the tested samples only.
- 6. 样品信息和客户信息由申请人提供,本实验室不对其真实性负责。
  Product information and customer information provided by the applicant, we are not responsible for its authenticity.
- 7. 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 Tiansu within 15 days.



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中国认可 国际互认 检测 TESTING CNAS L5138

# 堆码试验报告 Stacking test Report

样品名称: 锂离子电芯

Sample name: Lithium ion cell

样品型号:

645464

Sample model:

云南路飞新能源材料有限公司

委托单位:

Yunnan Road Fei New Energy Materials

**Applicant:** 

Co.,Ltd.

深圳天洲計量检测股份有限公司

Shenzhen Tiansu Calibration and Testing Co., Ltd.

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China Web: www.tiansu.org E-mail: tsjc@tiansu.org

E-mail: tsjc@tiansu.org Tel: 0755-89457984





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名称	一十四、水处下11四十四八口
Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.
地址 Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province
名称 Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.
地址 Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province
名称 Name	开平市开隆纸品包装有限公司 Kaiping Kailong Paper Packaging Co., LTD
地址 Address	开平市水口镇新风开发区长安西街 6-8 号 No.6-8, West Chang 'an Street, Xinfeng Development Zone, Shuikou Town, Kaiping City
名称 Name	深圳天溯计量检测股份有限公司 Shenzhen Tiansu Calibration and Testing Co., Ltd.
地址 Address	深圳市龙岗区宝龙街道锦龙大道 2 号 1 栋、4 栋 B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China
联合国《关于危险货物运输的建议书》规章范本 UN/ST/SG/AC.10/1/Rev.22/6.1.5.6 条款.  Test standard: 22st Revised Edition of the Recommendations on the Transport of Dangerous Good Model Regulations (ST/SG/AC.10/1/Rev.22) Clause 6.1.5.6.	
2022.12.14 to 2022.12.17	
	地址 Address 名称 Name 地址 Address 名称 Name 地址 Address 名称 Name 地址 Address 名称 Name 地址 Address  Fract standard: 22st Fract standard: 22st Frace Model Regulations (S

## Test conclusion:

#### 检测结论:

由 云南路飞新能源材料有限公司送检的锂离子电芯 的包装件堆码测试依据《关于危险货物运输的建议书》规章范本第22修订版进行检测。试验结果符合《关于危险货物运输的建议书》规章范本第22修订版相关要求。

The Stacking test of the packages for Lithium ion cell submitted by Yunnan Road Fei New Energy Materials Co.,Ltd. is tested according to the 22st Revised Edition of the Recommendations on the Transport of Dangerous Goods, Model Regulations (ST/SG/AC.10/1/Rev.22).

签发日期 Date of issue: 2022.12.17

主 检 Tested by 陈伟悦 Reviewed by 环纬超



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# 一、基本信息 Basic information

	外包装材料 Outer packing materials	瓦楞纸 Corrugated paper	内包装材料 Inside packing materials	塑料 Plastics
包装件信息	封闭装置 Closures	胶封	最大容量 Maximum capacity	189PCS
Information about the package	包装件尺寸 Packaging dimensions	L*W*T(365mm*270mm*160mm)	包装件重量 Packaging weight	10.9kg
	制造方法 method of manufacture	/	每包装件电池净重 Net quantity of batteries per package	9.809kg
内部电池 信息	样品名称 Sample name	锂离子电芯 Lithium ion cell	样品型号 Sample model	645464
Information about the	标称电压 Nominal voltage	3.85V	额定能量 Ratings energy	15.4Wh
battery inside	尺寸 Dimension	L*W*T(65.0mm*55.0mm*6.5mm)	重量 Weight	51.9g

# 二、堆码测试 Stacking test

No.	Test item	Test method	Result	Remark
序号	试验项目	试验依据	结果	备注
		联合国《关于危险货物运输的建议书》规章范本		
		UN/ST/SG/AC.10/1/Rev.22/6.1.5.6条款.		
4	堆码测试	Test standard: 22st Revised Edition of the	Pass	
1	Stacking test	Recommendations on the Transport of Dangerous	合格	
		Goods, Model Regulations (ST/SG/AC.10/1/Rev.22)		
		Clause 6.1.5.6.		

测试时的温度	测试时的湿度	加载的负荷
21.8℃	51%RH	1922.8N

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China





Page 4 / 6 Pages

Report No.: TSZ22120267-P03-R04

#### 三、测试要求描述 Testing requirements description:

在试验样品的顶部表面施加一力量,此力相当于运输时可能堆叠在它上面的同样数量包装件的总重量。如果试验样品内装的液体相对密度与待运液体不同,则该力应按后者计算。包括试验样品在内的最小堆码高度应是 3 米。试验时间为 24 小时,但拟装的塑料桶、罐和复合包装 6HH1 和 6HH2,应在不低于 40℃的温度下经受 28 天的堆码试验。

The test sample shall be subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during transport; Where the contents of the test sample are liquids with relative density different from that of the liquid to be transported, the force shall be calculated in relation to the latter. The minimum height of the stack including the test sample shall be 3 meters. The duration of the test shall be 24 hours except that plastics drums, jerricans, and composite packagings 6HHl and 6HH2 intended for liquids shall be subjected to the stacking test for a period of 28 days at a temperature of not less than 40°C.

试验样品不得泄漏。对复合或组合包装而言,不得有所装的物质从内贮器和内包装中漏出。试验样品不得显出可能对运输安全有不利影响的损坏,或者可能降低其强度或造成包装件堆码不稳定的变形。在进行评估之前,塑料包装应该冷却至环境温度。

No test sample may leak. In composite packagings or combination packagings, there shall be no leakage of the filling substance from the inner receptacle or inner packaging. No test sample may show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages. Plastics packagings shall be cooled to ambient temperature before the assessment.





Page 5 / 6 Pages

Report No.: TSZ22120267-P03-R04

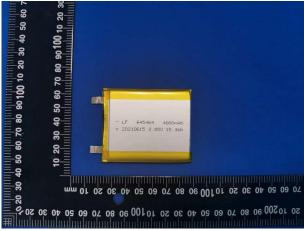
# THE PHOTO OF SAMPLE 样品图片

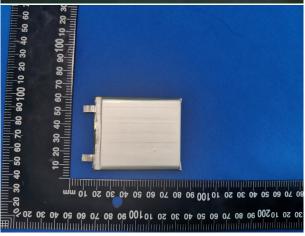












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Report No.: TSZ22120267-P03-R04

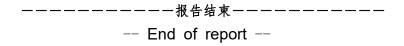
# 声明

# **STATEMENTS**

- 1. 本报告无检测单位印章无效。 The test report is invalid without the official stamp of Tiansu.
- 2. 除非全部复制,否则无深圳天溯计量检测股份有限公司书面批准本报告不得部分复制。 This report shall not be copied partly without the written approval of Shenzhen Tiansu Calibration and Testing Co., Ltd.
- 3. 本报告无批准人、审核人及检测人签名无效。
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- 5. 本报告仅与送检样品有关。
  The test report is valid for the tested samples only.
- 6. 样品信息和客户信息由申请人提供,本实验室不对其真实性负责。
  Product information and customer information provided by the applicant, we are not responsible for its authenticity.
- 7. 准备提交运输的包装已按照本章的有关要求进行试验,使用其他打包方法或部件可能使其失效。

The packaging prepared as for transport was tested in accordance with the appropriate requirements of this Chapter and that the use of other packaging methods or components may render it invalid.

8. 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 Tiansu within 15 days.



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J3-2022-A01-0122



Page 1 / 5 Pages

Report No.: TSZ22120267-P03-R05

# 锂电池

符合特殊规定 188

# 海运运输条件鉴别报告书

Identification and Classification Report for Sea Transport of Goods

本 报 告 本 年 度 有 效 有效期至 2023 年 12 月 31 日

样品名称: 锂离子电芯

Sample name: Lithium ion cell

样品型号: 645464

Sample model:

云南路飞新能源材料有限公司

委托单位:
Yunnan Road Fei New Energy Materials

Applicant: Co.,Ltd.

深圳天洲計量检测股份有限公司

Shenzhen Tiansu Calibration and Testing Co., Ltd.

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China





Page 2 / 5 Pages

Report No.: TSZ22120267-P03-R05

	Page 275 Pages		
鉴别目的 Identification Purpose	是否属于海运危险品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2022.12.29 Dec. 29, 2022
鉴别依据 Identification Criteria	IMDG CODE (Amdt 41-22)		
委托单位 Client	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.		
地址 Client Address	云南省保山市腾冲市边境经济开发合作区 NO.1 high tech industrial Park,Tengchon development and cooperation zone ,Bao	g border economic	vince
制造商 Manufacturer	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials	Co.,Ltd.	
地址 Manufacturer Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province		
物品名称 Name of Goods	锂离子电芯 Lithium ion cell		
	型号规格: Model/Type	645464/3.85V/15.4	Wh
	尺寸 Dimensions	65.0mm*55.0mm*6	.5mm
物品信息	外观 Appearance	近长方体 Approximate Cuboi	d
Nature of the goods	每包装件电池/电芯数目 Net number of batteries/cell per package	189 PCS	
	UN38. 3 报告编号 UN38. 3 report No.	ORTSZB01210601	025
	1. 2m 跌落测试报告为 1. 2m drop test report No.	TSZ22120267-P03	-R03
鉴别结论 Conclusion	非限制性 Not subject these Regulations 根据特殊规定 188,该物品不受 IMDG CODE 限制。 The article is not restricted to IMDG CODE according to special provision 188		
备注 Comment	每一电池必须做好防短路措施,并装入坚固外包装内。 Each single battery must be packed in such a way as to prevent short circuits normal conditions and packed in strong outer packaging.		

王 检 Tested by 陈伟悦

<sup>軍 核</sup> ア Reviewed by

虾伟超

批准 Approved by Report Seal (01-03)

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China





7ian Su Page 3/5 Page	Report No.: TSZ22120267-P03-R05
鉴别项目名称	检查结果
Item	Inspection Result
该电池额定瓦特小时数为 15.4Wh Watt-hour rating of the battery is 15.4Wh	≤20 Wh
该电池已通过 UN38. 3 测试 Each battery is of a type proved to meet the Requirements of each test in the UN MANUAL OF TESTING AND CRITERIA, Part III, sub-section 38.3	符合 Conform
电池按照规定的质量管理体系进行制造 Batteries be manufactured under a quality management programmer.	符合 Conform
该锂电池不属于召回电池,不属于废弃和回收电池 The lithium batteries don't belong to batteries returned to the manufacturer for safety reasons, are not waste lithium batteries and not lithium cells being shipped for recycling or disposal.	符合 Conform
通过包装件 1.2 米跌落试验 Each package is capable of withstanding a 1.2m drop test in any orientation	符合 Conform
每个包装件上均有锂电池操作标签。 每票货物均有随附文件说明:包装件内装锂离子电池;必须 小心操作。如包装件破损,有易燃危险品;包装件破损时应 采取的特殊措施,包括必要时的检查和重新包装;应急电话 号码。 Each package is labeled with lithium battery handing label. Each consignment is accompanied with a document with an indication that: The package contains lithium ion batteries; The package must be handled with care, and that a flammability hazard exists if the package is damaged; Special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and A telephone number for	符合 Conform

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additional information





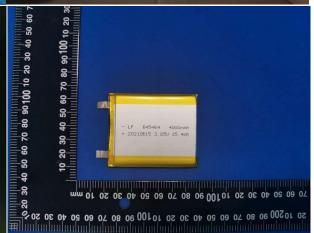
Report No.: TSZ22120267-P03-R05 Page 4 / 5 Pages

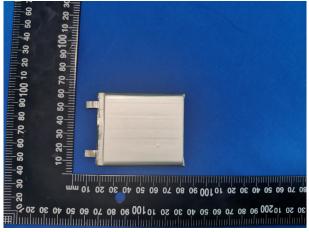
# THE PHOTO OF SAMPLE 样品图片











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Report No.: TSZ22120267-P03-R05

# **STATEMENTS**

I. 本公司依据委托人(托运人或其代理人)提供的物品及其运输信息,确定货物的运输条件并出具此报告书。

The report is issued by Shenzhen Tiansu Calibration and Testing Co., Ltd according to the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要,本公司要求委托人提供真实、完整的货物样品及资料。

According to the demanded of identification and classification, SHENZHEN TIANSU CALIBRATION AND TESTING CO., LTD requires the applicant to provide true and exact sample and data of the cargo.

3. 委托人保证申报的物品/或提供的样品与交运的货物是同一种物质。

The applicant guarantees that the declared goods and/or the sample who provides should be identical with the contents of cargo that is to be transported.

4. 本公司仅对样品的鉴别结果负责。

SHENZHEN TIANSU CALIBRATION AND TESTING CO., LTD is only responsible for the identification and classification of the sample provided by the applicant.

5. 本报告书经主检员、审批人和批准人签字并加盖本公司印章后生效。

This report will be effective only after is signed by inspector, checker and approver, and stamped by SHENZHEN TIANSU CALIBRATION AND TESTING CO., LTD.

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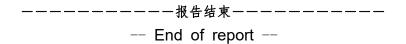
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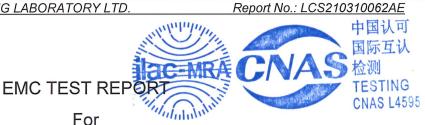
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This report is only valid within the year.



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Shenzhen yanbu technology co. LTD

Magnetic absorption wireless charging mobile power supply

Test Model: E29B

Additional Model No.: E29A

Prepared for

: Shenzhen yanbu technology co. LTD

Address

: 6 / f, building B, xinyongfeng industrial park, lezhujiao

village, xixiang, baoan district, shenzhen

Prepared by

: Shenzhen LCS Compliance Testing Laboratory Ltd.

Address

: Room 101, 201, Building A and Room 301, Building C,

Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao' an District, Shenzhen, Guangdong, China

(+00)755 00504000

Tel

: (+86)755-82591330

Fax Web : (+86)755-82591332

Mail

: www.LCS-cert.com

: webmaster@LCS-cert.com

Date of receipt of test sample

: March 11, 2021

Number of tested samples

: 1

Serial number

: Prototype

Date of Test

: March 11, 2021~ March 16, 2021

Date of Report

: March 17, 2021

# **EMC TEST REPORT**

EN 55032: 2015+A11: 2020

Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN 55035: 2017+A11: 2020

Electromagnetic compatibility of multimedia equipment – Immunity requirements

Report Reference No. ......: LCS210310062AE

Date of Issue.....: : March 17, 2021

Testing Laboratory Name.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Address ...... : Room 101, 201, Building A and Room 301, Building C, Juji

Industrial Park, Yabianxueziwei, Shajing Street, Bao' an

Report No.: LCS210310062AE

District, Shenzhen, Guangdong, China

Testing Location/ Procedure... : Full application of Harmonised standards

Partial application of Harmonised standards

Other standard testing method

Applicant's Name.....: : Shenzhen yanbu technology co. LTD

Address ...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village,

xixiang, baoan district, shenzhen

Test Specification

Standard ...... : EN 55032: 2015+A11: 2020

EN 55035: 2017+A11: 2020 EN IEC 61000-3-2: 2019 EN 61000-3-3: 2013+A1: 2019

Test Report Form No. ..... : LCSEMC-1.0

TRF Originator.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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Test Item Description........... Magnetic absorption wireless charging mobile

power supply

Trade Mark .....: N/A

Test Model ..... : E29B

Ratings ..... Please Refer to Page 9

Result ..... : Positive

Compiled by:

Supervised by:

Cindy Nie

Tom . Wong

Gavin Liang/ Manager

Cindy Nie/ File administrators Tom Wang / Technique principal

# **EMC -- TEST REPORT**

Test Report No.: LCS210310062AE 

March 17, 2021

Date of issue

Test Model.....: : E29B Magnetic absorption wireless charging mobile power EUT..... supply Applicant.....:: Shenzhen yanbu technology co. LTD Address...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village, xixiang, baoan district, shenzhen Telephone.....::/ Fax..... : / Manufacturer.....: Shenzhen weiduli technology co., LTD Address...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village, xixiang, baoan district, shenzhen Telephone.....:: : / Fax..... : / Factory.....:: Shenzhen weiduli technology co., LTD Address...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village, xixiang, baoan district, shenzhen Telephone.....::/ Fax..... : /

Test Result	Positive
-------------	----------

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

C	ì-	IF	-۷	17	<b>'</b> -	ΙF	M	1	$\sim$	2	$C_{i}$	٦,٨	ΛF	1	IΔ	M	CF	- 7	F	٦T	7/	C	1	Δ	R	$\gamma_{E}$	₹/	17	$^{\circ}$	R	V	17	מ	
	"	,,,	-11	ı		_	ıv	L		<b>7</b>	-	JΝ	// [	ட	_	ıv	$\smile$	_ ,	-	) I	IIV		ட	м.	$\mathbf{D}$	JI	<b>`</b>	۱ I		$\boldsymbol{\Gamma}$	1 1		,,	

Report No.: LCS210310062AE

# **Revision History**

Revision	Issue Date	Revisions	Revised By
000	March 17, 2021	Initial Issue	Gavin Liang

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# Report No.: LCS210310062AE

# 1. TEST STANDARDS

# The tests were performed according to following standards:

EN 55032: 2015+A11: 2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements

<u>EN 55035: 2017+A11: 2020</u> Electromagnetic compatibility of multimedia equipment – Immunity characteristics

EN IEC 61000-3-2: 2019 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase) EN 61000-3-3: 2013+A1: 2019 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

# Report No.: LCS210310062AE

# 2.SUMMARY OF STANDARDS AND RESULTS

# 2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Emission (EN 55032: 2015+A11: 2020)									
Description of Test Item	Standard	Limits	Results						
Conducted disturbance at mains terminals	EN 55032: 2015+A11: 2020	Class B	PASS						
Conducted disturbance at telecommunication port	EN 55032: 2015+A11: 2020	Class B	N/A						
Radiated disturbance	EN 55032: 2015+A11: 2020	Class B	PASS						
Harmonic current emissions	EN IEC 61000-3-2: 2019	Class A	N/A						
Voltage fluctuations & flicker	EN 61000-3-3: 2013+A1: 2019		PASS						
	munity (EN 55035: 2017+A11:								
Description of Test Item	Basic Standard	Performance Criteria	Results						
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	В	PASS						
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A2: 2010	Α	PASS						
Electrical fast transient (EFT)	EN 61000-4-4: 2012	В	PASS						
Surge (Input a.c. power ports)	EN 61000-4-5: 2014+A1: 2017	В	PASS						
Surge (Telecommunication ports)	EN 01000-4-3. 2014+A1. 2017	В	N/A						
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2014	Α	PASS						
Power frequency magnetic field	EN 61000-4-8: 2010	Α	PASS						
Voltage dips, >95% reduction		В	PASS						
Voltage dips, 30% reduction	EN 61000-4-11: 2004+A1: 2017	С	PASS						
Voltage interruptions	ion for Not Applicable	С	PASS						
***Note: N/A is an abbreviation for Not Applicable.									

Test mode:								
Mode 1	Charging	Record						
Mode 2	Discharging	Pre-scan						
***Note: All test modes were tested, but we only recorded the worst case in this report.								

# 2.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

Report No.: LCS210310062AE

- essential operational modes and states;

#### 2.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deriver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 2.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be deriver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 2.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be loss.

# 3. GENERAL INFORMATION

# 3.1. Description of Device (EUT)

EUT : Magnetic absorption wireless charging mobile power supply

Report No.: LCS210310062AE

Trade Mark : N/A

Test Model : E29B

Additional Model : E29A

Model Declaration : PCB board, structure and internal of these model(s) are the

same, So no additional models were tested.

Power Supply : Input: Type C: 9V-2.25A

Output: Type C: 9V-2.25A

PD-QC: 20W

Wireless charging output: 15W

Highest internal frequency (Fx)	Highest measured frequency					
Fx ≤ 108 MHz	1 GHz					
108 MHz < Fx ≤ 500 MHz	2 GHz					
500 MHz < Fx ≤ 1 GHz	5 GHz					
Fx > 1 GHz	5 × Fx up to a maximum of 6 GHz					

NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz

# 3.2. Description of Support Device

Name	Manufacturers	M/N	S/N
1	1	1	1

# 3.3. Description of Test Facility

Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

# 3.4. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

# 3.5. Measurement Uncertainty

Test	Parameters	Expanded uncertainty (U <sub>lab</sub> )	Expanded uncertainty (U <sub>cispr</sub> )
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	$\pm$ 3.8 dB $\pm$ 3.4 dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	± 2.90dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	$\pm$ 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	$\pm$ 5.2 dB
Mains Harmonic	Voltage	± 0.510%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.510%	N/A
EMF		± 21.59%	N/A

<sup>1)</sup> Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

<sup>2)</sup> The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

# 4. MEASURING DEVICES AND TEST EQUIPMENT

#### LINE CONDUCTED EMISSION

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EZ	EZ-EMC	1	N/A	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2020-06-22	2021-06-21
3	Artificial Mains	R&S	ENV216	101288	2020-06-22	2021-06-21
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-003 2	2020-06-22	2021-06-21
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2020-10-20	2021-10-19

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## RADIATED DISTURBANCE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	E3	E3-EMC	1	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26	2021-07-25
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02	2021-07-01
4	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22	2021-06-21
5	Broadband Preamplifier	1	BP-01M18G	P190501	2020-06-22	2021-06-21

## VOLTAGE FLUCTUATION AND FLICKER/HARMONIC CURRENT EMISSIONS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Analyzer Test System	Voltech	PM6000	200006700523	2020-06-22	2021-06-21

## ELECTROSTATIC DISCHARGE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	SCHLODER	SESD 230	604035	2020-07-21	2021-07-20

## RF ELECTROMAGNETIC FIELD

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESG Vector Signal Generator	Agilent	E4438C	MY42081396	2020-11-21	2021-11-20
2	RF POWER AMPLIFIER	OPHIR	5225R	1052	NCR	NCR
3	RF POWER AMPLIFIER	OPHIR	5273F	1019	NCR	NCR
4	Stacked Broadband Log Periodic Antenna	SCHWARZBEC K	STLP 9128	9128ES-145	NCR	NCR
5	Stacked Mikrowellen LogPer Antenna	SCHWARZBEC K	STLP 9149	9149-484	NCR	NCR
6	Electric field probe	Narda S.TS./PMM	EP601	611WX80208	2020-03-26	2021-03-25

# **ELECTRICAL FAST TRANSIENT IMMUNITY**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2020-06-22	2021-06-21

## SURGES, LINE TO LINE AND LINE TO GROUND

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2020-06-22	2021-06-21

# RF COMMON MODE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2020-06-22	2021-06-21
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2020-06-22	2021-06-21
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2020-06-22	2021-06-21

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## MAGNETIC FIELD SUSCEPTIBILITY TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2020-06-22	2021-06-21

## **VOLTAGE DIPS/INTERRUPTIONS IMMUNITY TEST**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2020-06-22	2021-06-21

Note: All equipment is calibrated through CHINA CEPREI LABORATORY and GUANGZHOU LISAI CALIBRATION AND TEST CO., LTD.

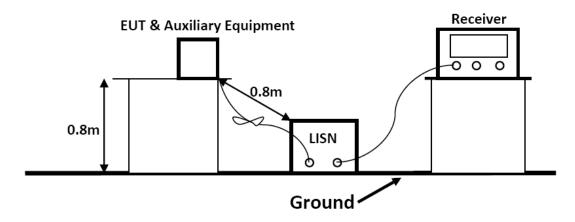
NCR --- No calibration requirement.

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# 5. TEST RESULTS

## 5.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

# 5.1.1. Block Diagram of Test Setup



#### 5.1.2. Test Standard

EN 55032: 2015+A11: 2020 Class B

Power Line Conducted Emission Limits (Class B)					
Frequency Limit (dBμV)					
(MHz)	Quasi-peak Level	Average Level			
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *			
0.50 ~ 5.00	56.0	46.0			
5.00 ~ 30.00	60.0	50.0			

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

# 5.1.3. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the EN 55032 requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

# 5.1.4. Operating Condition of EUT

- 5.1.4.1. Setup the EUT as shown on Section 5.1.1
- 5.1.4.2. Turn on the power of all equipments.
- 5.1.4.3.Let the EUT work in measuring mode(1) and measure it.

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## 5.1.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided 50-ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz in 150kHz~30MHz. The frequency range from 150kHz to 30MHz is investigated.

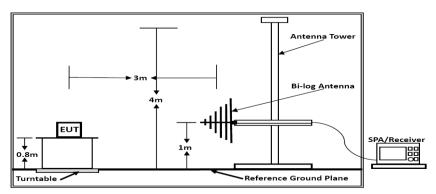
## 5.1.6. Test Results

PASS.

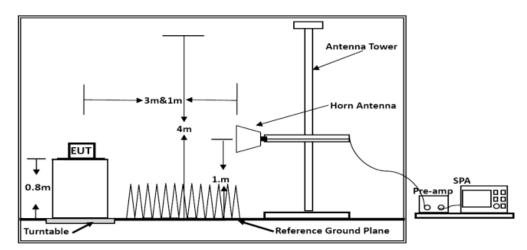
Refer to attached Annex B.1

# **5.2. RADIATED EMISSION MEASUREMENT**

# 5.2.1. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

# 5.2.2. Test Standard

EN 55032: 2015+A11: 2020 Class B

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

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Limits for Radiated Emission Below 1GHz						
Frequency Distance Field Strengths Limit						
(MHz)	(Meters)	(dBµV/m)				
30 ~ 230	3	40				
230 ~ 1000	3	47				

<sup>\*\*\*</sup>Note:

<sup>(2)</sup> Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

Limits for Radiated Emission Above 1GHz						
Frequency Distance Peak Limit Average Limit						
(MHz)	(Meters)	(dBµV/m)	(dBµV/m)			
1000 ~ 3000	3	70	50			
3000 ~ 6000 3 74 54						
***Note: The lower limit applies at the transition frequency.						

# 5.2.3. EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

# 5.2.4. Operating Condition of EUT

5.2.4.1.Turn on the power.

5.2.4.2.Let the EUT work in the test mode(1) and measure it.

#### 5.2.5. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the EMI test receiver is set at RBW/VBW=120kHz/300kHz.

The frequency range from 30MHz to 1000MHz is checked.

The bandwidth of the Spectrum analyzer is set at RBW/VBW=1MHz/3MHz.

The frequency range from 1GHz to the frequency which about 5th carrier harmonic or 6GHz is checked.

# 5.2.6. Test Results

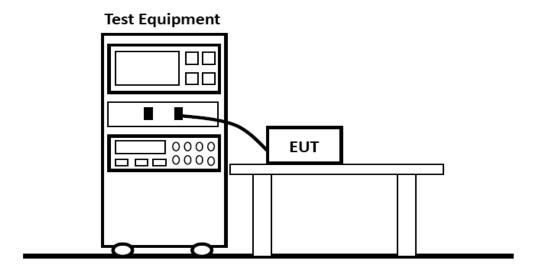
## PASS.

Refer to attached Annex B.2

<sup>(1)</sup> The smaller limit shall apply at the combination point between two frequency bands.

## 5.3. HARMONIC CURRENT EMISSION MEASUREMENT

# 5.3.1. Block Diagram of Test Setup



## 5.3.2. Test Standard

EN IEC 61000-3-2: 2019

# 5.3.3. Operating Condition of EUT

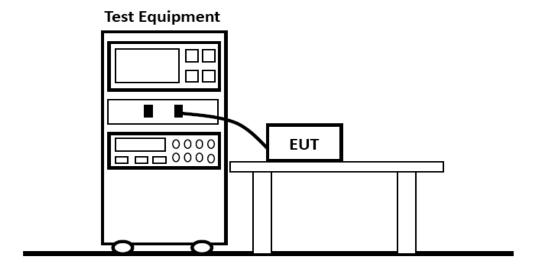
Same as Section 5.2.4, except the test setup replaced as Section 5.3.1.

# 5.3.4. Test Results

Refer to attached Annex B.3

## 5.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

## 5.4.1. Block Diagram of Test Setup



## 5.4.2. Test Standard

EN 61000-3-3: 2013+A1: 2019

# 5.4.3. Operating Condition of EUT

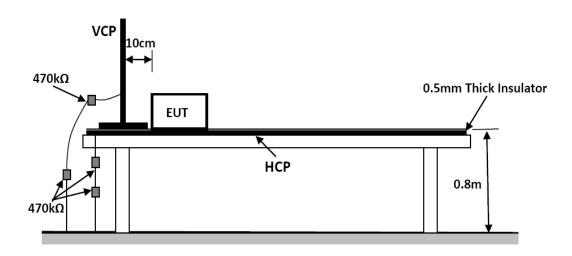
Same as Section 5.2.4, except the test setup replaced as Section 5.4.1.

#### 5.4.4. Test Results

PASS.

#### 5.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST

## 5.5.1. Block Diagram of Test Setup



#### 5.5.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge:

±8KV, Level: 2 / Contact Discharge: ±4KV)

## 5.5.3. Severity Levels and Performance Criterion

5.5.3.1. Severity level

Level	Test Voltage	Test Voltage			
	Contact Discharge (KV)	Air Discharge (KV)			
1	±2	±2			
2	±4	±4			
3	±6	±8			
4	±8	±15			
X	Special	Special			

5.5.3.2. Performance Criterion

Performance Criterion: B

### 5.5.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.5.1.

# 5.5.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 5.1.4. Except the test set up replaced by Section 5.5.1.

#### 5.5.6. Test Procedure

#### 5.2.6.1. Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the Electrostatic Discharge simulator shall be approached as fast as possible then to touch the EUT. After each discharge, the simulator shall be removed from the EUT. The simulator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

### 5.2.6.2. Contact Discharge

All the procedure shall be same as air discharge, except using the acute discharge tip. The top end of the Electrostatic Discharge simulator is touch the EUT all the time when the simulator is re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

### 5.2.6.3. Indirect Discharge For Horizontal Coupling Plane

The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 25 times discharge.

## 5.2.6.4. Indirect Discharge For Vertical Coupling Plane

The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the horizontal coupling plane(HCP). At least 25 times discharge should be done for every pre-selected point around EUT.

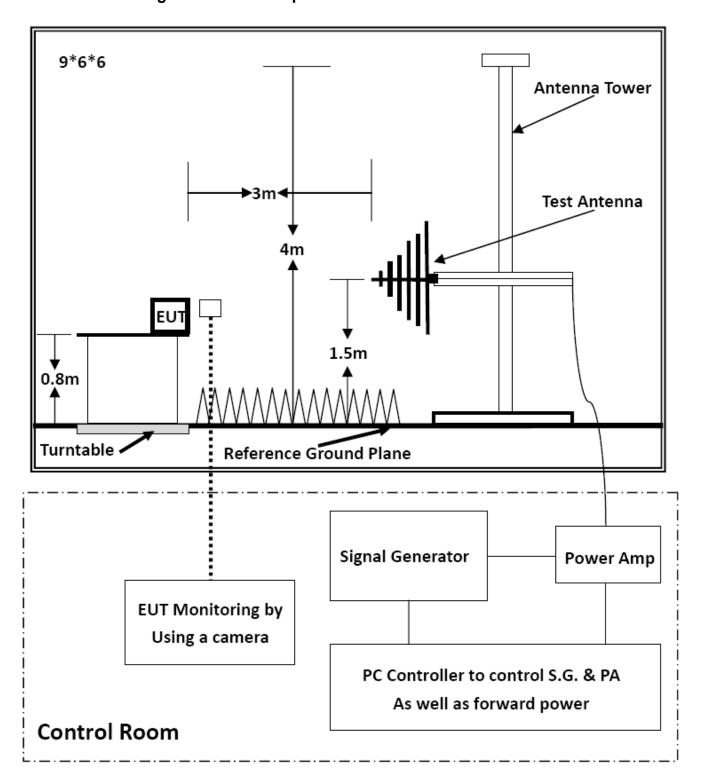
Record any performance degradation of the EUT during the test and judge the test result according to ce criterion.

#### 5.5.7. Test Results

#### PASS.

## 5.6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

# 5.6.1. Block Diagram of Test Setup



#### 5.6.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-3: 2006+A2: 2010 Severity Level: 2, 3V/m)

#### 5.6.3. Severity Levels and Performance Criterion

5.6.3.1. Severity level

Level	Field Strength (V/m)		
1	1		
2	3		
3	10		
X	1		

# 5.6.3.2. Performance Criterion Performance Criterion: A

## 5.6.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.6.1.

## 5.6.5. Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 5.2..4, except the test setup replaced as Section 5.6.1.

#### 5.6.6. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD Recording is used to monitor its screen. All the scanning conditions are as following:

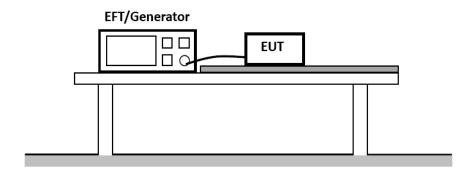
Condition of Test	Remark		
Fielded Strength	3 V/m (Severity Level 2)		
Radiated Signal	Unmodulated		
Test Frequency Range (swept test)	80-1000MHz		
Test Frequency (spot test)	1800MHz, 2600MHz, 3500MHz, 5000MHz		
Dwell time of radiated	0.0015 decade/s		
Waiting Time	3 Sec.		

## 5.6.7. Test Results

#### PASS.

#### 5.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

## 5.7.1. Block Diagram of Test Setup



#### 5.7.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-4: 2012, Severity Level, Level 2: 1KV)

## 5.7.3. Severity Levels and Performance Criterion

5.7.3.1. Severity level

on to the control of						
Open Circuit Output Test Voltage ±10%						
Level	Level On Power Supply Lines					
1	0.5 KV	0.25 KV				
2	1 KV	0.5 KV				
3	2 KV	1 KV				
4	4 KV	2 KV				
X	Special	Special				

# 5.7.3.2. Performance Criterion Performance Criterion: B

## 5.7.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.7.1.

## 5.7.5. Operating Condition of EUT

- 5.7.5.1. Setup the EUT as shown in Section 5.7.1.
- 5.7.5.2. Turn on the power of all equipments.
- 5.7.5.3. Let the EUT work in test mode(1) and measure it.

#### 5.7.6. Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

#### 5.7.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 mins.

5.7.6.2. For signal lines and control lines ports: It's unnecessary to test.

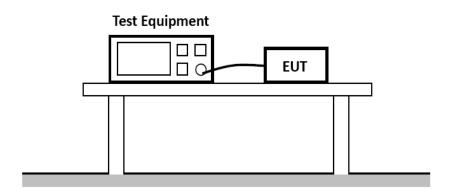
5.7.6.3. For DC output line ports: It's unnecessary to test.

#### 5.7.7. Test Results

PASS.

#### **5.8. SURGE IMMUNITY TEST**

## 5.8.1. Block Diagram of Test Setup



#### 5.8.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-5: 2014+A1: 2017, Severity Level: Line to Line: Level 2, 1.0KV, Line to Earth: Level 3, 2.0KV)

## 5.8.3. Severity Levels and Performance Criterion

5.8.3.1. Severity level

Severity Level	Open-Circuit Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

# 5.8.3.2. Performance Criterion Performance Criterion: B

## 5.8.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.8.1.

## 5.8.5. Operating Condition of EUT

- 5.8.5.1. Setup the EUT as shown in Section 5.8.1.
- 5.8.5.1. Turn on the power of all equipments.
- 5.8.5.1.Let the EUT work in test mode (1) and measure it.

#### 5.8.6. Test Procedure

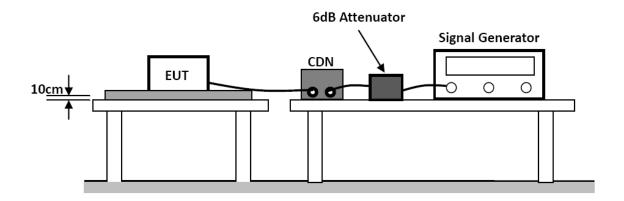
- 5.8.6.1. Set up the EUT and test generator as shown on Section 5.8.1.
- 5.8.6.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 5.8.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 5.8.6.4. Different phase angles are done individually.
- 5.8.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

#### 5.8.7. Test Results

PASS.

#### 5.9. INJECTED CURRENTS SUSCEPTIBILITY TEST

## 5.9.1. Block Diagram of Test Setup



#### 5.9.2. Test Standard

EN 55035: 2017+A11: 2020(EN 61000-4-6: 2014, Severity Level: Level 2, (0.15MHz ~ 80MHz))

## 5.9.3. Severity Levels and Performance Criterion

5.9.3.1. Severity level

Level	Field Strength (V)		
1	1		
2	3		
3	10		
X	Special		

5.9.3.2. Performance Criterion Performance Criterion: A

## 5.9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.9.1.

## 5.9.5. Operating Condition of EUT

- 5.9.5.1. Setup the EUT as shown in Section 5.9.1.
- 5.9.5.2. Turn on the power of all equipments.
- 5.9.5.3.Let the EUT work in test mode(1) and measure it.

#### 5.9.6. Test Procedure

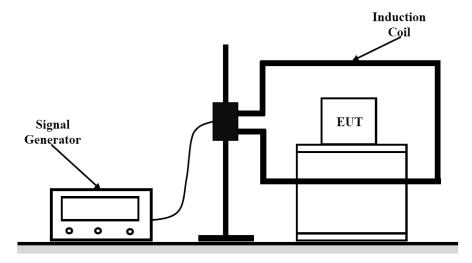
- 5.9.6.1. Set up the EUT, CDN and test generators as shown on Section 5.9.1.
- 5.9.6.2. Let the EUT work in test mode and measure it.
- 5.9.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 5.9.6.4. The disturbance signal described below is injected to EUT through CDN.
- 5.9.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5.9.6.6. The frequency range is swept from 150kHz to 10MHz using 3V signal level,10MHz to 30MHz using 3V to 1V signal level,30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave. 5.9.6.7. The rate of sweep shall not exceed 1.5\*10-3decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 5.9.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

#### 5.9.7. Test Results

#### PASS.

#### 5.10. MAGNETIC FIELD SUSCEPTIBILITY TEST

## 5.10.1. Block Diagram of Test Setup



#### 5.10.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-8: 2010, Severity Level: Level 1, 1A/m)

## 5.10.3. Severity Levels and Performance Criterion

5.10.3.1. Severity level

Level	Field Strength (A/m)	
1	1	
2	3	
3	10	
4	30	
5	100	
X	Special	

#### 5.10.3.2. Performance Criterion

Performance Criterion: A

## 5.10.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.10.1.

#### 5.10.5. Test Procedure

EUT is placed on an insulating support of 0.1m high above a table of 0.8m high. There is a minimum 1m\*1m ground metallic plane put on this table. EUT is put in the center of the magnetic coil then two orientations of the magnetic coil, horizontal and vertical, shall be rotated in order to expose the EUT to the difference polarization magnetic field.

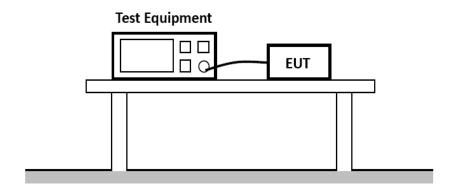
Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

#### 5.10.6. Test Results

#### PASS.

#### 5.11. VOLTAGE DIPS AND INTERRUPTIONS TEST

## 5.11.1. Block Diagram of Test Setup



#### 5.11.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-11: 2004+A1: 2017)

## 5.11.3. Severity Levels and Performance Criterion

5.11.3.1. Severity level

Test Level  Voltage Reduction Voltage Dips Duration						
Voltage Reduction	Duration (in Period)					
	$%U_{T}$ % $U_{T}$					
100	0	0.5				
100	0	1				
30	70	5				
Voltage Reduction	Voltage Dips	Duration				
¯ %U <sub>T</sub>	%U <sub>⊤</sub>	(in Period)				
100	0	250				

5.11.3.2. Performance Criterion Performance Criterion: B&C

## 5.11.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.11.1.

## 5.11.5. Operating Condition of EUT

- 5.11.5.1. Setup the EUT as shown in Section 5.11.1.
- 5.11.5.2. Turn on the power of all equipments.
- 5.11.5.3. Let the EUT work in test mode (1) and measure it.

#### 5.11.6. Test Procedure

- 5.11.6.1. Set up the EUT and test generator as shown on Section 5.11.1.
- 5.11.6.2. The interruptions are introduced at selected phase angles with specified duration.
- 5.11.6.3. Record any degradation of performance.

#### 5.11.7. Test Results

#### PASS.

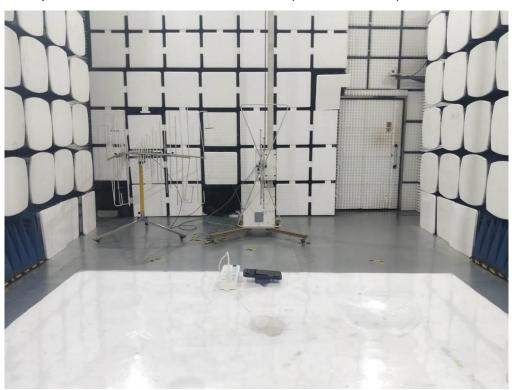
## **ANNEX A**

(Test photograph)

# A.1 Test Setup Photo of Power Line Conducted Measurement



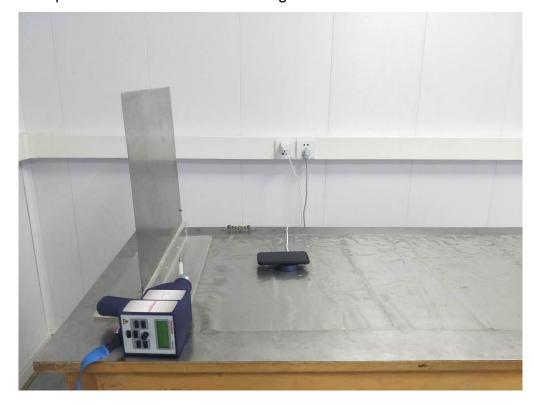
# A.2 Test Setup Photo of Radiated Measurement (30MHz~1GHz)



# A.3 Test Setup Photo of Harmonic & Flicker Measurement



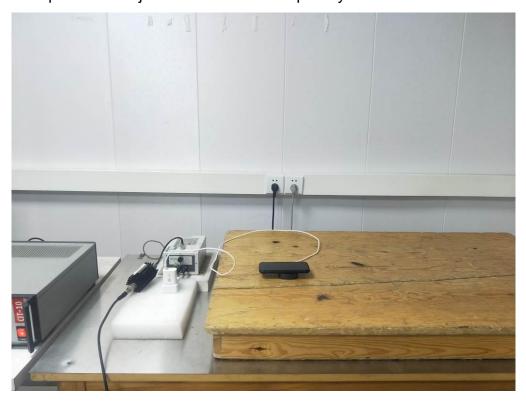
# A.4 Test Setup Photo of Electrostatic Discharge Test



## A.5 Photo of Electrical Fast Transient/Burst Test & Surge Immunity Test



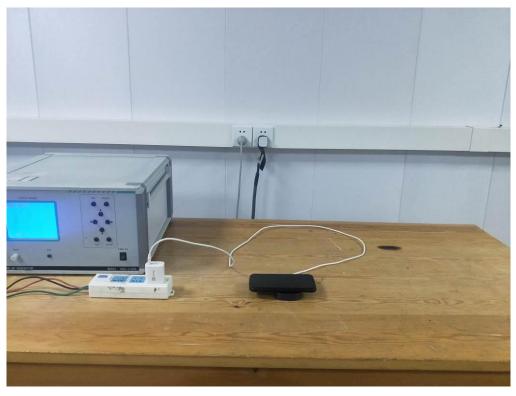
## A.6 Test Setup Photo of Injected Currents Susceptibility Test



# A.7 Test Setup Photo of Magnetic Field Immunity Test



# A.8 Test Setup Photo of Voltage Dips and Interruptions Test



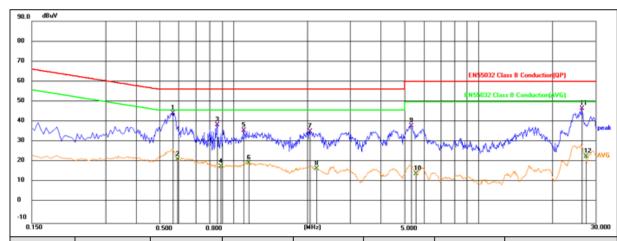
## **ANNEX B**

(Emission and Immunity test results)

## **B.1 POWER LINE CONDUCTED EMISSION MEASUREMENT**

Environmental Conditions:	22.7℃, 53. 7 % RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Line

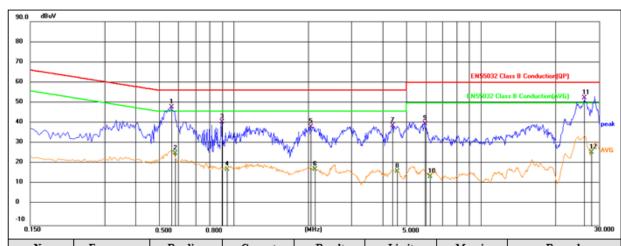
## Detailed results are shown below



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.5641	23.94	20.67	44.61	56.00	-11.39	QP
2	0.5911	0.94	20.64	21.58	46.00	-24.42	AVG
3	0.8566	18.49	20.21	38.70	56.00	-17.30	QP
4	0.8881	-1.78	19.90	18.12	46.00	-27.88	AVG
5	1.0951	16.75	19.26	36.01	56.00	-19.99	QP
6	1.1491	0.55	19.27	19.82	46.00	-26.18	AVG
7	2.0446	16.16	19.40	35.56	56.00	-20.44	QP
8	2.1751	-2.43	19.41	16.98	46.00	-29.02	AVG
9	5.2936	18.71	19.50	38.21	60.00	-21.79	QP
10	5.5861	-5.08	19.52	14.44	50.00	-35.56	AVG
11	26.3311	26.72	20.08	46.80	60.00	-13.20	QP
12	27.3616	2.89	20.11	23.00	50.00	-27.00	AVG

Environmental Conditions:	22.7℃, 53. 7 % RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Neutral

## Detailed results are shown below

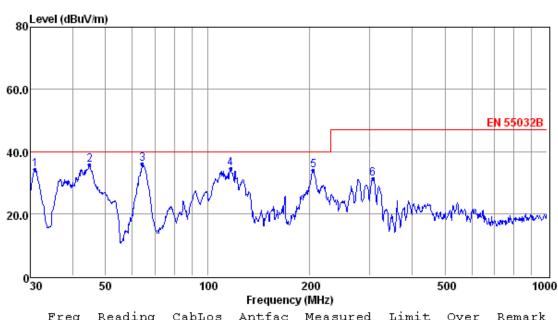


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.5596	27.26	20.68	47.94	56.00	-8.06	QP
2	0.5776	4.63	20.66	25.29	46.00	-20.71	AVG
3	0.8926	20.80	19.85	40.65	56.00	-15.35	QP
4	0.9376	-1.86	19.40	17.54	46.00	-28.46	AVG
5	2.0491	19.19	19.40	38.59	56.00	-17.41	QP
6	2.1301	-1.75	19.41	17.66	46.00	-28.34	AVG
7	4.3891	19.52	19.47	38.99	56.00	-17.01	QP
8	4.5781	-2.96	19.48	16.52	46.00	-29.48	AVG
9	5.9056	20.53	19.53	40.06	60.00	-19.94	QP
10	6.2431	-5.48	19.54	14.06	50.00	-35.94	AVG
11	26.2636	32.42	20.08	52.50	60.00	-7.50	QP
12	27.9421	5.85	20.15	26.00	50.00	-24.00	AVG

#### B.2 Radiated Disturbance Test Results (30MHz to 1000MHz)

Environmental Conditions:	22.1°C, 53.2% RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Vertical

Detailed results are shown below



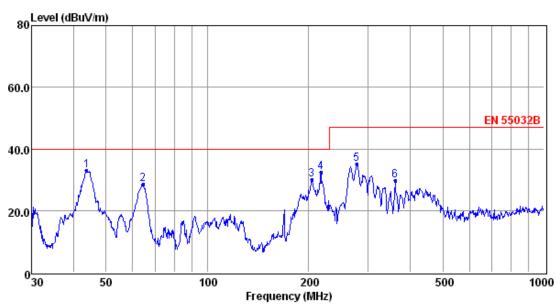
	30	30	100	Frequenc	v (MHz)		300	1000
	Freq	Reading	CabLos		Measured	Limit	Over	Remark
	MHz	dBuV	dВ	dB/m	dBuV/m	dBuV/m	dВ	
1	30.96	51.46	0.39	12.32	34.22	40.00	-5.78	QP
2	44.90	51.76	0.41	13.55	35.73	40.00	-4.27	QP
3	64.21	54.36	0.52	11.02	35.85	40.00	-4.15	QP
4	116.95	52.83	0.68	11.02	34.37	40.00	-5.63	QP
5	204.96	52.49	0.99	10.73	33.85	40.00	-6.15	QP
6	306.75	47.56	1.05	13.15	31.23	47.00	-15.77	QP

Note: 1. All readings are Quasi-peak values.

- 2. Measured= Reading + Antenna Factor + Cable Loss
- 3. The emission that are 20db below the official limit are not reported

Environmental Conditions:	22.1°C, 53.2% RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Horizontal

#### Detailed results are shown below



Freq Reading CabLos Antfac Measured Limit Over Remark

	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	43.81	49.07	0.41	13.56	33.05	40.00	-6.95	
2	64.43	47.15	0.52	10.93	28.55	40.00	-11.45	QP
3	204.24	48.77	0.99	10.70	30.10	40.00	-9.90	QP
4	217.54	50.69	0.88	11.12	32.31	40.00	-7.69	QP
5	278.07	51.91	1.01	12.61	35.06	47.00	-11.94	QP
6	361.71	44.94	1.17	14.44	29.83	47.00	-17.17	QP

Note: 1. All readings are Quasi-peak values.

- 2. Measured= Reading + Antenna Factor + Cable Loss
- 3. The emission that are 20db below the official limit are not reported

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.	Report No.: LCS210310062AE
GHENZITEN EGG GGMI EN INGE TEGTING EN IDGIN (TONT ETD.	Nopoletion Edge 100 10002712
B.3 HARMONIC CURRENT EMISSION MEASUREMENT	
Pass Because the power of EUT is less than 75W, accord harmonic current unnecessary to test.	ing to standard EN 61000-3-2,

# **B.4 VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT**

Test Model	E29B		Test Engineer	DAIWEI DAI
Test Voltage	AC 230V/50H	Ηz		
	Notes:			
PASS	Measurement method	- Voltage		
	Pst	dc (%)	dmax (%)	Tmax(> 3.3%)(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.088	0.005	0.190	0

## **B.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST**

Electrostatic Discharge Test Results					
Standard	☐ IEC 61000-4-2 ☐ EN 61000-	4-2			
Applicant	Shenzhen yanbu technology co. LT	D			
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	24.8℃		
M/N	E29B	Humidity	53.8%		
Criterion	В	Pressure	1021mbar		
Test Mode	Mode 1	Test Engineer	DAIWEI DAI		

Test Mode	Mode 1			Test Eng	Test Engineer DAIWEI	
		Λ	ir Diochara			
	<u> </u>		ir Discharge	<del>)</del>	Das	
Test Points	Test Levels			Res	Sults	
	± 2kV	± 4kV	± 8kV	Passed	Fail	Performance Criterion
Front						□A ⊠B
Back						□A ⊠B
Left	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
Right	$\boxtimes$		$\boxtimes$			□A ⊠B
Тор		$\boxtimes$	$\boxtimes$	$\boxtimes$		□A ⊠B
Bottom		$\boxtimes$	$\boxtimes$	$\boxtimes$		□A ⊠B
		Con	tact Discha	rge		
		Test Levels	3		Res	sults
Test Points	± 2 kV		±4 kV	Passed	Fail	Performance
Front			$\square$			Criterion  □A □B
Back						□A ⊠B
Left						□A ⊠B
Right			$\boxtimes$			□A ⊠B
Top			$\boxtimes$			□A ⊠B
Bottom			$\boxtimes$			□A ⊠B
200000		harge To H	Horizontal C		ine	
	1	Test Levels				sults
Side of EUT				Porforman		
	± 2 kV		± 4 kV	Passed	Fail	Criterion
Front			$\boxtimes$	$\boxtimes$		□A ⊠B
Back	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
Left	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
Right	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
	Dis		Vertical Co	upling Plan		
011 (5115		Test Levels	3		Res	sults
Side of EUT	± 2 kV		± 4 kV	Passed	Fail	Performance Criterion
Front			$\boxtimes$			□A ⊠B
Back	$\boxtimes$		$\boxtimes$			□A ⊠B
Left			$\boxtimes$	$\boxtimes$		□A ⊠B
Right			$\boxtimes$	$\boxtimes$		□A ⊠B

## **B.6 RF FIELD STRENGTH SUSCEPTIBILITY TEST**

RF Field Strength Susceptibility Test Results					
Standard	☐ IEC 61000-4-3 ☐ EN 61000	-4-3			
Applicant	Shenzhen yanbu technology co. L	ΓD			
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	22.8℃		
M/N	E29B	Humidity	53.0%		
Field Strength	3 V/m	Criterion	Α		
Test Mode	Mode 1	Test Engineer	DAIWEI DAI		
Test Frequency	80MHz to 1000MHz (swept test) 1800MHz, 2600MHz, 3500MHz, 5000MHz (spot test)				
Modulation	□None □ Pulse	☑AM 1KHz 80%	)		
Steps	1%				

	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

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- 1.ESG Vector Signal Generator
- 2.RF POWER AMPLIFIER
- 3.RF POWER AMPLIFIER
- 4.Stacked Broadband Log Periodic Antenna
- 5.Electric field probe

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# **B.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST**

Electrical Fast Transient/Burst Test Results				
Standard	□ IEC 61000-4-4 ☑ EN 61000-	-4-4		
Applicant	Shenzhen yanbu technology co. LTD			
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	22.9℃	
M/N	E29B	Humidity	53.4%	
Test Mode	Mode 1	Criterion	В	
Test Engineer	DAIWEI DAI			

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			
Note:	1		

Note:

## **B.8 SURGE IMMUNITY TEST**

Surge Immunity Test Result					
Standard	□ IEC 61000-4-5 ☑ EN 61000-4	□ IEC 61000-4-5 ☑ EN 61000-4-5			
Applicant	Shenzhen yanbu technology co. LTD				
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	22.9℃		
M/N	E29B	Humidity	53.4%		
Test Mode	Mode 1	Criterion	В		
Test Engineer	DAIWEI DAI				

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	90°	5	1.0	PASS
L-IN	-	270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					

## **B.9 INJECTED CURRENTS SUSCEPTIBILITY TEST**

Injected Currents Susceptibility Test Results					
Standard	□ IEC 61000-4-6 ☑ EN 6100	□ IEC 61000-4-6 ☑ EN 61000-4-6			
Applicant	Shenzhen yanbu technology co. LTD				
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	23.5℃		
M/N	E29B	Humidity	53.2%		
Test Mode	Mode 1	Criterion	Α		
Test Engineer	DAIWEI DAI				

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 10		3V		
10 ~ 30	AC Mains	3V ~ 1V	Α	PASS
30 ~ 80		1V		

## Remark:

- 1. Modulation Signal:1kHz 80% AM
- 2. Measurement Equipment:

Simulator: CIT-10 (FRANKONIA)

CDN : ☑CDN-M2 (FRANKONIA)

□CDN-M3 (FRANKONIA)

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## **B.10 MAGNETIC FIELD SUSCEPTIBILITY TEST**

Magnetic Field Immunity Test Result				
Standard	□ IEC 61000-4-8 ☑ EN 61000-4-8			
Applicant	Applicant Shenzhen yanbu technology co. LTD			
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	24.4℃	
M/N	E29B	Humidity	54.1%	
Test Mode	Mode 1	Criterion	Α	
Test Engineer	DAIWEI DAI			

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
1	5 mins	X	Α	PASS
1	5 mins	Y	А	PASS
1	5 mins	Z	А	PASS

Note:

## **B.11 VOLTAGE DIPS AND INTERRUPTIONS TEST**

Voltage Dips And Interruptions Test Results				
Standard	□ IEC 61000-4-11 ☑ EN 61000-4-11			
Applicant	Shenzhen yanbu technology co. LTD			
EUT	Magnetic absorption wireless charging mobile power supply  Temperature 22.3°C			
M/N	E29B <b>Humidity</b> 54.4%			
Test Mode	Mode 1	Criterion	B&C	
Test Engineer	DAIWEI DAI			

Test Level % U <sub>T</sub>	Voltage Dips & Short Interruptions % U <sub>T</sub>	Duration (in periods)	Criterion	Result
0	100	0.5P	В	PASS
70	30	25P	С	PASS
0	100	250P	С	PASS

Note:

# **ANNEX C**

(External and internal photos of the EUT)



Fig. 1



Fig. 2

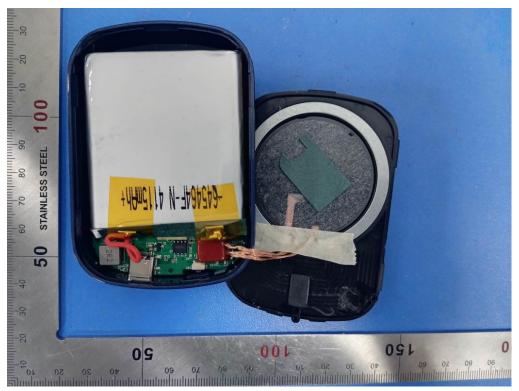


Fig. 3

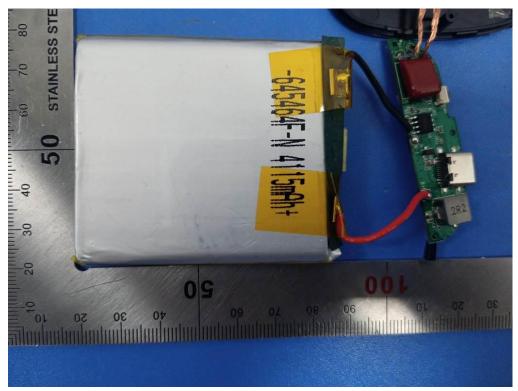


Fig. 4

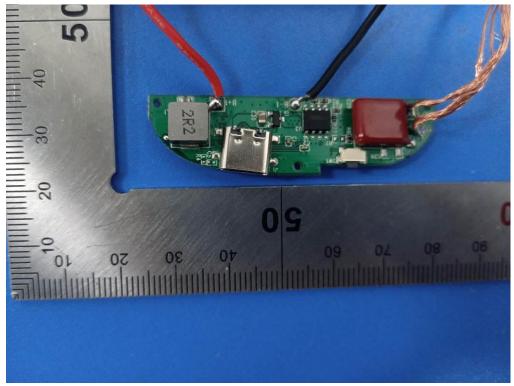


Fig. 5

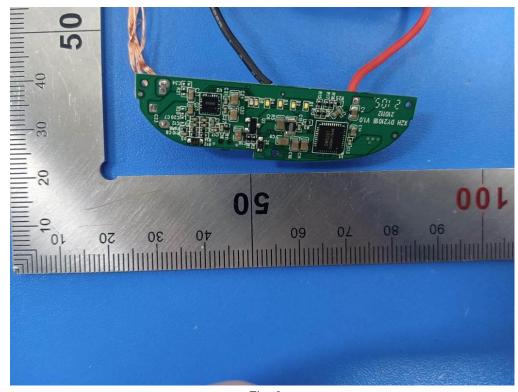


Fig. 6

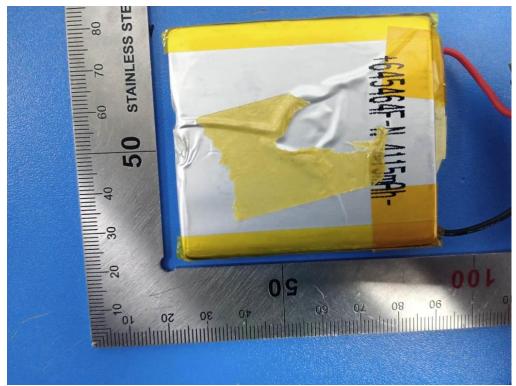


Fig. 7

-----THE END OF TEST REPORT -----





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Date: 2021.03.02

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**Applicant** 

: Shenzhen yanbu technology co. LTD

Address

6/f, building B, xinyongfeng industrial park, lezhujiao village, xixiang,

baoan district, shenzhen

Report on the submitted samples said to be:

Sample Name

: Magnetic absorption wireless charging mobile power supply

**Trade Mark** 

: N/A

Style No.

: E29A, E29B

**Testing Period** 

: February 25, 2021 ~ March 02, 2021

Results

: Please refer to next page(s).

TEST REQUEST	CONCLUSION
According to the customer's request, based on the performed tests on submitted sample, the result of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, Dibuyl Phthalate(DBP), Benzylbutyl Phthalate(BBP), Bis(2-ethylhexyl) Phthalate(DEHP), Diispbutyl phthalate(DIBP) content comply with the limit requirement as set of RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.	Pass

Signed for and on behalf of LCS





# **TEST REPORT**



#### Results:

## A.EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results						Date of sample
		Cd	Pb	Hg	Cr <sup>▼</sup>	Br <sup>▼</sup>		submission/resu
						PBBs	PBDEs	bmission
1	Blue plastic shell	BL	BL	BL	BL	BL	BL	2021-02-25
2	Black soft plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
3	Black plastic sheet	BL (	BL	BL	BL	BL	BL	2021-02-25
4	Silver metal ring	BL	BL	BL	BL	/	1	2021-02-25
5	White plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
6	Black plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
7	Silver metal shrapnel	BL	BL	BL	BL	100	1	2021-02-25
8	Silver sheet metal	BL	BL	BL	BL	1	0 1	2021-02-25
9	Black plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
10	Silver metal needle	BL	BL	BL	BL	1	1	2021-02-25
11	Grey ceramics	BL /	BL	BL	BL	BL	BL	2021-02-25
12	Red wire	BL	BL	BL	BL	/	1	2021-02-25
13	Red plastic thread	BL	BL	BL	BL	BL	BL	2021-02-25
14	Silver wire	BL	BL	BL	BL	/	/	2021-02-25
15	Black triode	BL	BL	BL	BL	BL	BL	2021-02-25
16	Black IC	BL	BL	BL	BL	BL	BL	2021-02-25
17	Red capacitor	BL	BL	BL	BL	BL	BL	2021-02-25
18	Black plastic thread	BL	BL	BL	BL	BL	BL	2021-02-25
19	Brown capacitor	BL /	BL	BL	BL	BL	BL	2021-02-25
20	light-emitting diode	BL	BL	BL	BL	BL	BL	2021-02-25
21	Tin solder	BL	BL	BL	BL	/	/	2021-02-25
22	PCB board	BL	BL	BL	BL	BL	BL	2021-02-25
23	Black IC	BL	BL	BL	BL	BL	BL	2021-02-25
24	Chip resistor	BL	BL	BL	BL	BL	BL	2021-02-25
25	Black diode	BL	BL	BL	BL	BL	BL	2021-02-25
26	Silver plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25

\*\*\*\*\*\*\*\*\*\*\*\*\*





#### Note:

(1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	ma/ka	BL≤70-3σ <x< td=""><td>BL≤70-3σ<x< td=""><td>BL≤50-3σ<x< td=""></x<></td></x<></td></x<>	BL≤70-3σ <x< td=""><td>BL≤50-3σ<x< td=""></x<></td></x<>	BL≤50-3σ <x< td=""></x<>
Cd	mg/kg	<130+3σ≤OL	<130+3σ≤OL	<150+3σ≤OL
Pb	ma/ka	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>
PD	mg/kg	<1300+3σ≤OL	<1300+3σ≤OL	<1500+3σ≤OL
Цa	malka	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>
Hg	mg/kg	<1300+3σ≤OL	<1300+3σ≤OL	<1500+3σ≤OL
Cr	mg/kg	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>
Br	mg/kg	BL≤300-3σ <x< td=""><td></td><td>BL≤250-3σ<x< td=""></x<></td></x<>		BL≤250-3σ <x< td=""></x<>

#### Note:

BL = Below Limit
OL = Over Limit
X = Inconclusive

- (2) The XRF screening test for RoHS elements The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2015/863/EC amending RoHS directive 2011/65/EU:
- (4) ▼=For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr(VI), and the results showed the total Cr content

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000
Dibuyl Phthalate(DBP)	1000
Benzylbutyl Phthalate(BBP)	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	1000
Diispbutyl phthalate(DIBP)	1000

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*





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#### Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

B. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

#### Test method:

Lead(Pb) & Cadmium(Cd) Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

#### Mercury(Hg) Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

#### Hexavalent Chromium(Cr(VI)) Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

#### PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

#### BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)







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#### Note:

- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm<sup>2</sup>
- = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13ug/cm<sup>2</sup>. The sample coating is considered to contain Cr(VI)

   b. The sample is negative for Cr(VI) if Cr(VI) is N.D.(concentration less than 0.10ug/cm<sup>2</sup>). The

sample coating is considered a non- Cr(VI) based coating

- c. The result between 0.10µg/cm² and 0.13µg/cm² is considered to be inconclusive, unavoidable coating variations may influence the determination
- Information on storage conditions and production date of the tested samples is unavailable and thus Cr(VI) results represent status of the sample at the time of testing
- mg/kg = ppm=parts per million
- N.D.=Not Detected(<MDL or LOQ)</li>
- #1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).
- #3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact is exempted.
- #7 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its Amendments. Lead is exempted in steel for machining purposes and in galvanised steel containing up to 0.35% (3500ppm) by weight.











Page 6 of 10

Report No.: LCS210203039AR Date: 2021.03.02

#### 1) The test results of DBP, BBP, DEHP & DIBP

Item	l lmit	MDI	Results	Limit	
item	Unit MDL		1+2+3+5+6+9	Limit	
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000	
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000	
Di-(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000	
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000	

lto	11:4:4	MDI	Results	l imais
Item	Unit	MDL	11+13+15+16+17+18	Limit
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000

Item	Unit	MDL	Results	- Limit	
(GS)	Onit	WIDE	19+20+22+23+24+25+26	(G)	
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000	
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000	
Di-(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000	
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000	

#### Remark:

- mg/kg = ppm
- N.D. = Not detected
- MDL=Method detected limited
- Flow chart appendix is included
- Photo appendix is included.







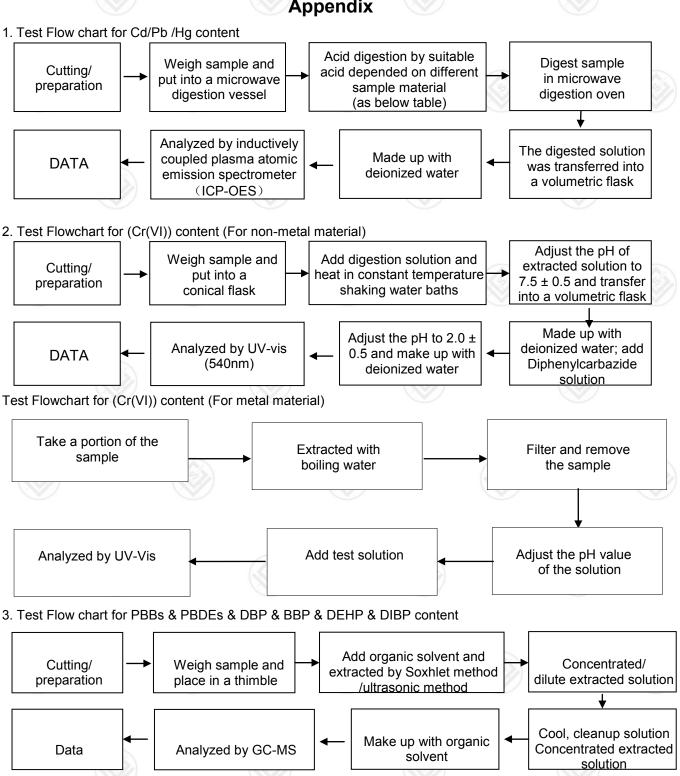








#### **Appendix**

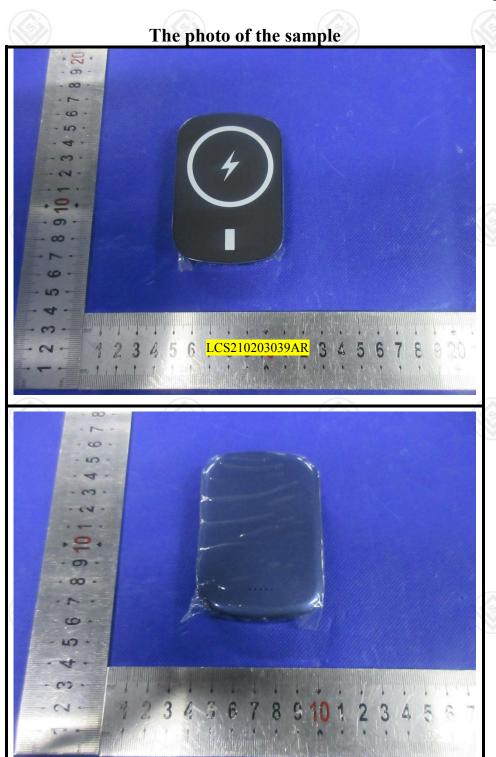


\*\*\*\*\*\*\*\*\*\*\*\*



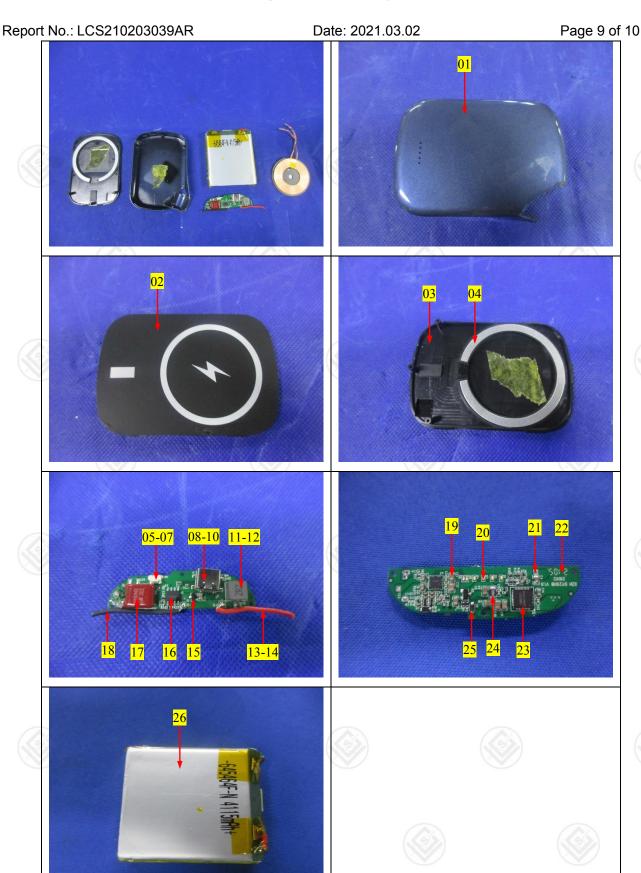


Report No.: LCS210203039AR Date: 2021.03.02 Page 8 of 10









\*\*\*\*\*\* End of Report \*\*\*\*\*\*\*\*\*







Report No.: LCS210203039AR Date: 2021.03.02 Page 10 of 10

#### Statement:

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- 2. The result(s) shown in this report refer only to the sample(s) tested.
- 3. Without written approval of LCS, this report can't be reproduced except in full.
- 4. The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which LCS hasn't verified.
- 5. In case of any discrepancy between the English version and Chinese version of the testing reports(if generated), the Chinese version shall prevail.







危险物品 DANGEROUS GOODS

# 仅限货机运输

# 航空运输条件鉴别报告书

Identification and Classification Report for Air Transport of Goods

报告编号:

PEKSZ202212315084PXY370001

此报告本年度有效 有效期至2023年12月31日

Issued No.:

生效日期:
Effective Date:

2023.01.04

委托单位:

云南路飞新能源材料有限公司

Applicant:

Yunnan Road Fei New Energy Materials Co., Ltd.

物品名称:

锂离子电芯 645464 3.85V 4000mAh 15.4Wh

Name of Goods:

Lithium ion cell 645464 3.85V 4000mAh 15.4Wh

# 北京迪捷姆空运技术开发有限公司

Beijing DGM Air Transport Technology Development Co.,Ltd.



# 报告书使用约定

## Terms of the Using of the Report

1. 本公司依据本年度国际航协《危险品规则》以及委托人(托运人或其代理人)提供的物品及其运输信息,确定货物的航空运输条件并出具此报告书。

The report is issued by DGM China according to IATA *Dangerous Goods Regulations* published in the current year and the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要,本公司要求委托人提供真实、完整的货物样品及资料。

According to the demand of identification and classification, DGM China requires the applicant to provide true and exact sample and data of the cargo.

3. 委托人保证申报的物品和/或提供的样品与交运的货物是同一种物质。

The applicant guarantees that the declared goods and/or the sample who provides should be identical with the contents of cargo that is to be transported.

4. 本公司仅对样品的鉴别结果负责。

DGM China is only responsible for the identification and classification of the sample provided by the applicant.

5. 本报告书经主检员、审核人和批准人签字并加盖本公司印章后生效。

This report will be effective only after it is signed by the inspector, checker and approver, and stamped by DGM China.

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This report is only valid within the year in which the IATA Dangerous Goods Regulations is effective.

地址:北京首都国际机场货运北路天竺综合保税区BGS货运楼249室

邮编: 101300

电话: 010-69479673

传真: 010-69479621

网址: www.dgmchina.com.cn

E-mail: test@dgmchina.com.cn



	l编号 n No.	PEKSZ202212315084	签发日期 Issued Date	2023. 01. 04
鉴别目的 Identification Purpose		是否属于航空运输危险物品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2023. 01. 03
鉴别依据 Identification Criteria		IATA DGR 64th, 2023	IRA /	
物品名称	中文 Chinese	锂离子电芯 645464 3.85V 4000mAh 15.4		CHI
Name of Goods	英文 English	Lithium ion cell 645464 3.85V 4000mA	h 15.4Wh	
生产 Heer Manuf	厂家 acturer	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materia	als Co.,Ltd.	1 /
件 Air way Man 目的 Goe Destir	ees 色号 bill No.		书时候填写的运输信信息与报告书的关联书的一致性由托运人	人或其代理人在使用本报告息,不属于鉴定内容。运输性以及实际运输货物与报告或其代理人保证,如发生日或其代理人承担全部责任。 容,并盖章) 联系方式:
hden 物品 物品 Nature of t	信息 the goods	该样品为银色长方体电芯。型号: 645464 尺寸: 65.0×55.0×6.5mm 每包装件中电池/电芯数量: 189 每包装件中电池/电芯净重: 9.809kg 该电芯已经做好防短路措施并装入坚固的。 该锂电芯不属于召回电芯,不属于废弃和造 根据委托方所提供的声明: 本报告所述锂、 额定容量的30%。 (注: 单块电芯重量为51.9g。该电芯的UN3号: ORTSZB01210601025。该电芯的1.2米量 告编号: TSZ22120267-P03-R03。堆码试验 TSZ22120267-P03-R04。该电芯由塑料袋单 This sample is silver cuboid cell.	回收电芯,并按照DGR3.9.2.0 离子电池(或电芯)交付运输 38.3报告由深圳市优瑞特检测 跌落测试报告由深圳天溯计量 2报告由深圳天溯计量检测股	时,其荷电状态不超过设计 则技术有限公司出具,报告编 战检测股份有限公司出具,报
Idea A Man		Model: 645464 Size: 65.0×55.0×6.5mm Number of batteries / cells per packa Net quantity of batteries/cells per p Cells have been protected so as to pr outer packagings. The lithium cells don't belong to ce reasons, are not waste lithium cells or disposal, are manufactured under a 3.9.2.6.1(e). Lithium ion cells and batteries must not exceeding 30% of their rated desi	cackage: 9.809kg revent short circuits and ells returned to the manuf and not lithium cells bei a quality management progra be offered for transport	Facturer for safety ing shipped for recycling ram as described in

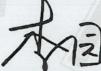


项目编号 Item No. PEKSZ202212315084					
物品名称	中文 Chinese	锂离子电芯 645464 3.85V 4000mAh 15.4Wh		X 1 7 2	
Name of Goods	英文 English	Lithium ion cell 645464 3.85V 4000mAh 15.4	1Wh		
iojenh		该货物为锂离子/聚合物电芯,单独包装。额定瓦特小时验,包装件通过3米堆码试验,每个包装件上均有锂电池	为15.4Wh。已通过 UN38.3 测试,已 标记。	· · · · · · · · · · · · · · · · · · ·	米跌落试
物品。 Non <b>鉴别结论</b> Conclusions		参考有关资料,根据DGR有关规定,该物质分类识别为第 This goods is lithium ion/polymer cell, packed ind a type proved to meet the Requirements of each tel III, sub-section 38.3, Each package is capable of we damage to the cells contained therein, without shows	ividually. Watt-hour rating is 15 st in the UN MANUAL OF TESTS ANI ithstanding a 1.2m drop test in ifting of the contents so as to	O CRITERIA, Par any orientationallow cell to	rt on withou
78, te		contact and without release of contents, The package package is marked with lithium battery mark.  According to IATA DGR this substance is classified	ge is capable of withstanding th		
Police Name	UN/ID 编号 UN/ID No.	package is marked with lithium battery mark.	ge is capable of withstanding the		<b>包装等</b>
Marie - Nacional - Marie - Mar		package is marked with lithium battery mark. According to IATA DGR this substance is classified 运输专用名称	ge is capable of withstanding the	类或项 Class or Div. (次要危险性)	包装等约 Packing
建议运输 条件 uggestion	UN/ID No.	package is marked with lithium battery mark.  According to IATA DGR this substance is classified	ge is capable of withstanding the	类或项 Class or Div. (次要危險性) (Subsidiary Risk)	包装等约 Packing
建议运输条件	UN/ID No. UN3480	package is marked with lithium battery mark.  According to IATA DGR this substance is classified	ge is capable of withstanding the das dangerous goods Class (or come	类或项 Class or Div. (次要危險性) (Subsidiary Risk)	包装等约 Packing

全主检员 Prepared by: Sagar



审核人 Checked by:



批准人 Approved by:

报告单位(盖章) Stamp

制单:

彭新玉

第4页共4页



D

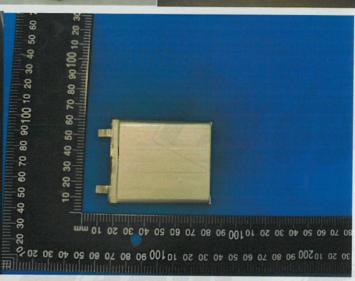
# 锂离子电芯 645464 3.85V 4000mAh 15.4Wh

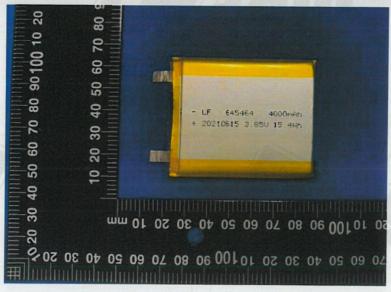
PEKSZ202212315084











# 锂电池 UN38.3 试验概要 Lithium Battery Test Summary

项目编号: PEKSZ202212315084

		单位信息 C	ompan	y Informa	ation		NH/X S
委托单位 Consignor	云南路飞 Yunnan Ro 云南省保 NO.1 hig cooperation	新能源材料有 oad Fei New En 山市腾冲市边 th tech indus on zone, Baosh	限公司 ergy Mate 境经济开 trial Park an City,yu	erials Co.,Ltd 发合作区高 x,Tengchong nnan Provin	l. 新技术产业员 border eco ce	nomic d	evelopment an
生产单位 Manufacturer	云南路飞 Yunnan Ro 云南省保 NO.1 hig cooperatio	0875-5189928 新能源材料有 pad Fei New End 山市腾冲市边 h tech indust on zone ,Baosha 0875-5189928	限公司 ergy Mate 境经济开 trial Park an City,yu	erials Co.,Ltd 发合作区高 ,Tengchong nnan Province	新技术产业员 border econ	回1号 nomic de	evelopment an
测试单位 Test Lab	深圳市龙 电话/Tel:	瑞特检测技术》 岗区龙岗街道; 0086-755-278 site: http://ww	有限公司 南联第六 17553 曲	工业区方兴 『箱/Mail:	科技园 C 区 1	5 栋一楼	4
		电池信息 1	Battery	Informat	tion		1-7
名称 Name	COLUMN F. ASSESSMENT	里离子电芯 nium ion cell	Ba	电池/电动 ttery/Cell Cl	The second secon		离子电芯 i-ion Cell
型号 Type		645464		商材 Traden	nark		11
额定电压 Normal Voltage		3.85V		额定容 Rated Ca		4	000mAh
额定能量 Watt-hour rating		15.4Wh		外观/Appe	earance		色长方体 ver Cuboid
质量/Mass		51.9g		锂含量/Li(	The state of the s	不	适用 N/A j
Links		测试信息	Test In	formatio	n		CH
测试报告编号 Test Report Number	ORTSZ	B01210601025		测试报告签 Date of Test		20	21-08-02
测试标准 Edition of UN Manual of Tests and Criteria Used	UN Recomi	关于危险货物运 mendations on SG/AC.10/11/R	the Transp	oort of Dang	erous Goods I	第 6 版修 Manual of	多订 1)38.3 节 f Tests and
T.1: 高度模拟 Altitude Simulation	通过 Pass	T.2: 温度 Thermal		通过 Pass	T.3: 振		通过
T.4: 冲击 Shock	通过 Pass	T.5: 外部 External Shor	短路	通过 Pass	Vibrati T.6: 撞击 Impact/0	/挤压	Pass 通过
T.7: 过度充电 Overcharge	不适用 N/A	T.8: 强制 Forced Disc	放电	通过 Pass	impact/C	TUSH THE	Pass
UN38.3.3(f)	不适	用 N/A	4	UN38.3.3	3(g)	1	适用 N/A
签名 Signatory 职务 Title	<b>不成</b> 检验员	3	签发E Issued		115	및	DGM-CH



# 货物运输条件鉴定报告

# **Certificate for Safe Transport of Goods**

(空运/By Air)

危险物品 DANGEROUS GOODS

# 锂电池-符合包装说明 965 第 IB 部分

物品名称:

锂离子电芯 645464 3.85V, 4000mAh, 15.4Wh

**Goods Name** 

Lithium ion cell 645464 3.85V, 4000mAh, 15.4Wh

委托单位:

云南路飞新能源材料有限公司

Client

Yunnan Lufei New Energy Materials Co., Ltd.

报告编号:

DGT2021DL0812F

Report No.

2021-07-06

签发日期:

**Issued Date** 

中国民用航空总局第二研究所
The Second Research Institute of CAAC



## 声 明 STATEMENT

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The certificate is issued by The Second Research Institute of CAAC according to IATA DGR published in the current year and the information of the goods and its shipment provided by the client (shipper or its agent).

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The client should provide samples and relevant data, at the same time, and they should guarantee that the name they declared is the same as the samples they provided and the goods to be transported.

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Objections to the certificate must be submitted to The Second Research Institute of CAAC within 15 days.

地址:成都双流西航港经济开发区腾飞路 765 号

Address: No.765, Tengfei Road, Xihanggang Economic Development Zone, Shuangliu, Chengdu, Sichuan

电话(Tel): 028-64458155 028-64458195

传真(Fax): 028-64458195 邮编(Post Code): 610200

报告查询网址: http://www.caacdgt.com

#### 货物运输条件鉴定报告

Certificate for Safe Transport of Goods

	Certificate for Safe Transp	ort of Goods	
鉴定目的	是否属于航空运输危险品		
<b>Inspection Purpose</b>	Dangerous Goods or not restricted		
样品编号	DGT2021DL0812	接样日期	2021-07-5
Sample No.	DG12021DL0812	Receiving Date	2021-07-3
鉴定依据	国际航空运输协会《危险品规则》62	版	
Criteria	IATA Dangerous Goods Regulations (Do	GR) 62nd Edition	
样品名称	锂离子电芯 645464 3.85V, 4000mAh,	15.4Wh	
Sample Name	Lithium ion cell 645464 3.85V, 4000mA	.h, 15.4Wh	
委托单位	云南路飞新能源材料有限公司		
Client	Yunnan Lufei New Energy Materials Co	., Ltd.	
电池生产商	云南路飞新能源材料有限公司		
Manufacturer	Yunnan Lufei New Energy Materials Co	., Ltd.	
物品信息 Sample Information	-电池信息/Battery information: 型号/Model: 645464 3.85V, 4000mAh, 类型/Type: 锂离子电芯/lithium ion cel商标/Mark brand: / -包装信息/Package information: 每个包装件中锂电池净重不超过 10.0k Net quantity of lithium battery per packa包装件内含 189 个锂电池。 The package contains 189 lithium batteri	kg。 age is no more than10.0	)kg.
鉴定结论 Conclusion		stion according to IAT 第 IB 部分的规定。 eneral Requirements a	nd section IB of Packing 65 section IB.
备注(Comment)	/		<b>企验专用于</b>

<sup>を验</sup> (Inspected by): 本体 (Checked by): 本体 (Approved by): まばば





# 货物运输条件鉴定报告

# **Certificate for Safe Transport of Goods**

	检验结果及其他事项				
	Inspection results and other information				
	本报告所述锂电池按照《危险品规则》(62版)3.9.2.6.1(e)规定的质量管理体系进行制造。				
	Lithium batteries listed in this report are manufactured under the quality management program as				
	described in IATA DGR 62nd Edition 3.9.2.6.1 (e) .				
	本报告所述锂电池不属于有缺陷和因安全原因而召回的锂电池。				
1	Lithium batteries listed in this report are not defective and returned to the manufacturer for safety				
	reasons.				
	本报告所述锂电池不属于以回收或处置为目的的航空运输,不属于废弃锂电池。				
	Lithium batteries listed in this report are not waste, shipped for recycling or disposal ones.				
	本报告所述锂电池已经通过联合国《试验与标准手册》第III部分第 38.3 节的测试。测试摘要详				
	见附件。				
2	Lithium batteries listed in the report are of type proved to meet the requirements of each test of the				
	UN Manual of Tests and Criteria, Part III, subsection 38.3. The test summary is attached.				
	本报告所述锂电池包装件能够承受 1.2 米跌落试验。 The package is capable of withstanding a 1.2 m drop test.				
	根据委托人声明,本报告所述锂电池的荷电量不超过其设计容量的 30%。				
3	According to the statement from the client, the state of charge (Soc) of Lithium cells and batteries				
	listed in this report is not exceeding 30% of their rated design capacity.				
	本报告所述锂电池放在完全封闭的内包装中,然后再放在坚固的外包装内。				
	Lithium batteries must be placed in inner packaging that completely enclose the cell or battery then				
4	placed in strong outer packaging.				
7	本报告所述锂电池具有适当的防外部短路措施。				
	Lithium batteries are equipped with an effective means of preventing external short circuits.				
	电池已固定不能移位。				
5	The battery is fixed and can't move.				
	本报告所述锂电池不得与第1类爆炸品(1.4S项除外),2.1项易燃气体,第3类易燃液体,4.1项				
	易燃固体和5.1项氧化性物质包装在同一个外包装中。				
6	Lithium batteries must not be packed in the same outer packaging with dangerous goods classified in				
	Class 1(explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable				
	liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers).				
	每个包装件必须耐久清晰的标识第9类锂电池危险性标签、锂电池标记及仅限货机标签。包装件必须有足够的位置使得所要求的标记贴在包装件的同一面,而不使标记折叠。				
7	Each package must be durably and legibly marked with the Class 9-Lithium Battery hazard label, the				
/	lithium battery mark and the Cargo Aircraft Only label. The package must be of such size that there is				
	adequate space to affix the mark on one side of the package without the mark being folded.				
8	附图				

# 电池/Battery 7 mm 01 02 0€ 0⊅ 03 09 07 08 0 包装件/Package: **一下**无正文内容 一位验专用章

# 附件:

# 测试摘要 TEST SUMMARY

电池生产商信息/Manufacturer information						
电池生产商	云南路飞新能源林	材有限	经司			
Manufacturer	Yunnan Lufei New	Energy	Mate	rials Co	o., Ltd.	
生产商地址	云南省保山市腾江	中市边均	竟经济	开发台	作区高新技术产	
Address	业园1号					
	No.1 high tech	Industr	rial l	Park, T	Tengchong border	
	economic develop	ment a	nd co	operation	on zone, Baoshan	
	City, Yunnan Provi	nce		***		
联系电话	0875-5189928 电子邮箱 13530940968@163.com					
Tell		E-mail	l			
网站地址/website	1					
电池信息/Battery inform	nation					
电池类型	锂离子电芯		型号	ļ	645464	
Type	Lithium ion cell		Mod	lel		
额定能量	3.85V, 4000mAh, 1	5.4W	电池	质量	约 52.0g	
Capacity			Mas	S		
物理形状说明	黑色长方体					
Physical description	Black cuboid					
测试机构信息/Test labor	atory information					
测试机构	深圳市优瑞特检测	则技术有	限公	司		
test laboratory	Shenzhen ORT Tec	hnical S	Servic	es Co., l	Ltd.	
机构地址	广东省深圳市龙岗	岗区龙岗	讨街道	南联第	5六工业园方兴科	
Address	技园 C 区 15 栋一	楼				
	1/F, Building 15, F	angxing	g Scie	nce and	Technology Park,	
	Nanlian No. 6	Industr	ial 2	Zone,	Longgang Street,	
	Longgang District,	Shenzh	en, G	uangdor	ng, China	
联系电话/Tell	0755-27817553		电子	邮箱	battery@ort-ts.c	
			E-m	ail	om	
网站地址/website	http://www.ort-ts.c	om				
测试报告信息/Test repor	t information					
报告编号/Test report ID	ORTSZ210520010	212	3000.3304 F P.S.			
接样日期	2021-05-31	测试日	期	2021-0	05-31 至	
Receiving date	27 00 00 000	Test da	ate	2021-0	06-15	
测试人员	刘文威	批准人	、员	周志弘	虽	
Tester		Approver				

#### 测试项目及结论/Test item and result

		T	
条款/Clause	测试项目/Test Item	结论/Result	备注/Remark
38.3.3(f)	小型集成电池	不适用	/
36.3.3(1)	small battery assemblies	N/A	
29 2 2(g)	大型集成电池	不适用	1
38.3.3(g)	Large battery assemblies	N/A	
38.3.4.1	高度模拟/Altitude simulation	通过/Pass	/
38.3.4.2	温度试验/Thermal test	通过/Pass	/
38.3.4.3	振动/Vibration	通过/Pass	/
38.3.4.4	冲击/Shock	通过/Pass	/
38.3.4.5	外部短路/External short circuit	通过/Pass	/
20.2.4.6	重物冲击/Impact	不适用 N/A	/
38.3.4.6	挤压/Crush	通过/Pass	1
38.3.4.7	过度充电/Overcharge	不适用 N/A	/
38.3.4.8	强制放电/Forced discharge	通过/Pass	/
CO 19 37 85			

#### 结论/Result:

样品满足联合国《关于危险货物运输的建议书—试验与标准手册》<u>第6修</u>订版修正1第38.3节的测试要求。

The sample meets the requirement of UNITED NATION Recommendation on the Transport of Dangerous Goods Manual of Test and Criteria ST/SG/AC.10/11/Rev.6,amend1 section 38.3.

The information of Test Summary about UN38.3 is provided by client.



<sup>\*</sup>测试摘要信息由委托客户提供。





版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

# **Product Specification**

# for Polymer Lithium-ion Batteries

聚合物锂离子电芯产品规格书

Model Number: 645464-4000mAh

产品型号: 645464-4000mAh

Prepared By	Verified By	Approved By
编制	审核	批准

	Signature	Date
	签署	日期
Customer		
Approval	Company name:	
客户方确认	公司名称	
	Company Stamp:	
	盖章	
客户代码		



版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

## PRODUCT SPECIFICATION FOR645464-4000mAh

版本号	内容描述	修改人	生效日期
A.0	新版发行		2021-4-29



PRODUCT SPECIFICATION FOR645464-4000mAh

版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

#### 1. SCOPE

范围

This document describes the performance characteristics and testing methods for Polymer Li ion batteries produced by Yunnan Road Fei New Energy Materials Co.,Ltd.

本文件描述了云南路飞新能源材料有限公司出品的聚合物锂离子电池的产品规格、性能测试方法

2. PRODUCT TYPE AND MODEL NUMBER

产品类别和产品型号

2.1 PRODUCT TYPE

类别

Polymer Lithium-ion Battery

聚合物锂离子电池

2.2 MODEL NUMBER

产品型号: 645464

3. SPECIFICATION

产品基本特性

	· 一		
No.	Item	Characteristics	Remarks
序号	项目	特性	备注
3.1	Capacity 容量	Minimum: 4000mAh 最小: 4000mAh 典型: 4020mAh Typical:4020mAh	According to the standard charging after full charge, constant current discharge 0.2C to 3.0V. 按标准充电方式充满电后,以 0.2C 恒流放电到 3.0V
3.2	Nominal Voltage 工作电压	3.85V	
3.3	Charging Cut-off Voltage 最大充电终止电压	4.4V	
3.4	Discharge Cut-off Voltage 最小放电终止电压	3.0V	
3.5	Max. Constant Charge Current 最大持续充电电流	2000mA (0.5C)	
3.6	Max. Continuous Discharge Current 最大持续放电电流	2000mA (0.5C)	
		Chanaina/玄中	5~15°C: 0.2C CCCV to 4.4V
3.7	Operating Temperature 工作温度范围 (不可在极限温度下长时间持续充放 电)	Charging/充电	15~45°C: 0.5C CCCV to 4.4V
			-20~10°C: 0.2C DC to 3.0V
		Discharging/放电	11~50°C: 0.5C DC to 3.0V



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#### PRODUCT SPECIFICATION FOR645464-4000mAh

3.8	Storage Condition (50% of fully charge state ) 存储条件(带电量 50%)	1 个月内 -10~45℃ -10~45℃ for 1Month 6 个月内 -10~35℃ -10~35℃ for 6Months
3.9	Weight 重量	Approximate value 约 51g
3.10	Storage Voltage 存储电压	3.70-4.00V
3.11	Environmental request 环保要求	the materials of the product and packaging accord with RoHS standard,there will be a RoHS Id on the box. 满足 ROHS 要求

#### 4. Dimensions

外形尺寸

Please refer the drawing in appendix.

见附图

#### 5. Appearance

外观

No scratches, dirt, defect, leakage of electrolyte or gassing should be observed as a new product.

电池表面无划伤、脏点、变形、漏液、鼓气等缺陷。

#### 6. Characteristics

特性

#### 6.1 Electrochemical performance characteristics

电性能

No.	Item	Testing Method	Requirements
序号	项目	测试方法	标准
1	Standard Charge 标准充电	0.2C constant current charge to4.4V, then constant Voltage until the charge current decrease to 0.01C. 0.2C 恒流充电至 4.4V,再 4.4V 恒压至 0.01C	Charge Time ≤6.5hrs 充电时间≤6.5 小时
2	Rapid Charge 快速充电	0.5C constant current charge to4.4V, then constant Voltage until the charge current decrease to 0.01C. 0.5C 恒流充电至 4.4V,再 4.4V 恒压至 0.01C	Charge Time ≤3.5hrs 充电时间≤3.5 小时
3	Nominal Capacity 标称容量	(per 6.1.1) at room temp. (23 $\pm$ 2 $^{\circ}$ C ), rest for 0.5-1 hrs then discharge at a constant current of 0.2C to 3.0V. 在环境温度为(23 $\pm$ 2) $^{\circ}$ C的条件下按6.1.1完全充电后静置0.5 $^{\circ}$ 1 小时,以 0.2C 放电至 3.0V。	≥4000mAh



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4	Cycle (23℃) 循环寿命	At $23 \pm 2$ °C ambient temperature, With 0.2C charging and discharging, between each cycle for 10 minutes, in this way for 300C.			way for F	Remaining capacity≥859 Nominal capacity.	
	(23℃)	在 23℃±2℃的环 之间搁置 10 分钟,		C 充电和放电,每		剩余容量≥85%标称容量	
5	Internal Impedance 内阻	Internal impedance i AC at ambient tempe 环境温度(23±2) 得的内部阻抗。	erature $(23\pm2)$ °C	C.		≤45m Ω	
6	Capacity Retention 荷电保持能力	After fully charged (23 ± 2) in the 28 days of storage environment temperature, discharge at 0.2C5A to 3.0V. Then according to the standard charging mode, and then discharge at 0.2C₅A to 3.0V.完全充电后在 (23±2)℃的环境中储存 28 天,以 0.2C₅A 放电至 3.0V。然后按标准充电方式充电后,再以 0.2C₅A 放电至 3.0V。				Remaining capacity≥85 initial capacity. 放电容量≥85%标称容量 recovery capacity≥90 initial capacity 恢复容量≥90%标称容量	
		Charge current/		Discharge curr	ent/放电电		
		充电电流	(0.2C)	(0.5C)		(1.0C)	
7	Discharge Rate Characteristic	(0.2C)	100%	95%		90%	
	倍率放电特性	3.0V. The cells shoul	d be performed at 2	23°C±2 °C		rent current respectively E 23℃±2 ℃的温度下途	
		Discharge		Discharge temper	rature/放电	温度	
		current/放电电流	-20°C	0℃	25℃	50℃	
8	Temperature Characteristic	(0.2C)	30%	85%	100%	95%	
O	温度特性	Cell shall be charged according to Per.6.1.1,and discharged with different temper respectively to 3.0V at 0.2C.The cells must be stored for two hours at the correspondence temperature before discharge. 电芯按 6.1.1 充满电,分别在不同温度放电到 3.0V。在放电前电芯必须在对应温度下储水时					
9	The factory voltage 出厂电压	小时。 Check open circuit voltage (OCV) of cells prior to the delivery to customers 出货之后检验				3.8~3.95V	



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## PRODUCT SPECIFICATION FOR645464-4000mAh

#### 6.2 Safety characteristic

	全特性   <sub>Itam</sub>	Tack Md 1	D. annier
No. 序号	Item 项目	Test Method 测试方法	Requirements 标准
1	Overcharge 过充	Discharge cells to $3.0V$ at $0.2C_5A$ , then charge to $4.6V$ at $3C_5A$ and rest for 7 hours. 电池以 $0.2C_5A$ 电流恒流放电至 $3.0V$ ,以电流 $3$ $C_5A$ 限制电压 $4.6V$ 的制式充电 $7$ 小时。	No fire No explosion 不爆炸、不起火
2	Over Discharge 过放	Fully charge cells per 6.1.1, then discharge the battery to 3.0V with 0.2C <sub>5</sub> A mA at room temperature, connect with external load of 30 Ω for 7hours. 将电池按 6.1.1 充满电后,在环境温度 23±2°C的条件下,以 0.2C <sub>5</sub> A 放电至终止电压后,外接 30 Ω 负载电阻放电 7h.	No fire No explosion 不爆炸、不起火
3	Heat Cycle 温度循环	The cell is fully charged with standard charging method, and then it is to be stored for 6 hour at a test temperature equal to $75\pm2^{\circ}\mathbb{C}$ , followed by a storage for 6 hour at a test temperature equal to $-40\pm2^{\circ}\mathbb{C}$ , the maximum time interval between test temperature extremes is 30 min, this procedure is to be repeated for 10 times, after which all test cells are to be stored for 6 hours at ambient temperature $(23\pm2^{\circ}\mathbb{C})$ . 将用标准充电方法充满电的电芯放入 $75\pm2^{\circ}\mathbb{C}$ 的环境中搁置 $6h$ ,再在- $40\pm2^{\circ}\mathbb{C}$ 条件下搁置 $6h$ ,两个极端温度的变化时间间隔最长为 $30$ min,如此循环 $10$ 次,试验结束后将电芯取出,在 $23\pm2^{\circ}\mathbb{C}$ 环境中搁置 $6h$ 。	No leakage, no fire and no explosion 不泄露、不起火、不爆 炸
4	Mechanical shock 机械冲击	The battery is fixed on the test equipment. Each in three perpendicular directions under the impact of an equivalent. At least one direction perpendicular to the width of the battery. Each shock according to the following method: within the first 3 ms, minimum average speed of 735 m/s², peak acceleration should be between 1225 m/s² and 1715 m/s², pulse duration for ms to 6 ms + 1. 将电池固定在试验设备上。在三个相互垂直的方向上各承受一次等值的冲击。至少一个方向垂直于电池的宽面。每次冲击按下述方法进行:在最初的 3ms 内,最小平均加速为735m/s²,峰值加速应该在1225m/s²和1715 m/s²之间,脉冲持续时间为6ms±1ms。	No leakage, no fire and no explosion, 不泄露、不起火、不爆炸



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#### 6.3 Reliability

环境适应性					
No.	Item	Test Method	Requirements		
序号	项目	测试方法	标准		
1	Humidity Test 高温高湿	Fully charge cells per $6.1.1$ , stored them at $40\pm2^{\circ}$ C with $90\%\sim95$ RH% for 48 hours. Then the cells are placed at room temperature to "dry out" for 2 hours. then discharge the cells to $3.0$ V at $0.2$ C <sub>5</sub> A. 将按 $6.1.1$ 充满电的电池放入 $40\pm2^{\circ}$ C、相对湿度为 $90\%\sim95\%$ 的恒温湿箱中搁置 $48h$ 后,取出电池在环境温度 $20\pm5^{\circ}$ C的条件下搁置 $2h$ 。以 $0.2$ C <sub>5</sub> A 电流放电至 $3.0$ V	No deformation, no corrosion, no leakage, no leakage, no leakage, no fire and no explosion, discharge time shall not be less than 3h. 无变形、无锈蚀、不泄漏、不泄气、不破裂、不起火和不爆炸,放电时间应不低于 3h。		
	Low Pressure	The fully charged cell is to be stored for 6 hours at an absolute pressure	No explosion, no fire		
2	Test 低压测试	of 11.6kpa and a temperature of 23±2℃. 将充满电的电芯在绝对压力为 11.6kpa、23±2℃条件下贮存 6 小时。	and no leakage 不爆炸、不起火、不泄 露		
3	Drop Test 跌落测试	The cell is fully charged with standard charging method, standby for one hour and then it is submitted to free fall at a height of 1.0m down to one solid board with thickness of 20mm. It should be fallen for 2 times on each direction. 将电芯用标准充电方法充满电,放置 1h,将电芯从 1.0m 高度自由 落到 20mm 厚的硬木板上。每个方向上各试验 2 次。	No leakage, no smoke, no explosion and no fire 不泄露、不冒烟,不起 火,不爆炸		
4	Vibration 振动	Battery charged by the regulation, after the battery is fixed on the vibration table, don't make the battery out of shape, with sinusoidal vibration, and within 15 min in logarithmic sweep from 7 hz frequency sweep to 200 hz and return to the 7 hz. Vibration along three mutually perpendicular direction of sample (one direction is perpendicular to the plane of the cathode) must match the sample, according to the logarithmic sweep in each direction way to 12 repetitions, vibration 3h. Logarithmic frequency sweeping method is as follows: 7 hz ~ 18 hz maintain peak acceleration of 9.8 m/s2. Hold the amplitude at 0.8 mm (displacement of 1.6 mm) until the peak acceleration of 78.4 m/s 2 (frequency is about 50 hz). Keep 78.4 m/s2 peak acceleration until the frequency increased to 200 hz. 电池按规定充满电后,将电池固定在振动台上,不可使电池变形,采用正弦波进行振动,并以对数扫频方式在15min 内从7Hz 扫频到 200Hz 并返回到7Hz。振动沿样品互相垂直的三个方向(其中一个方向必须与样品正负极所在平面垂直)进行,每个方向按上述对数扫	no explosion. 不泄露、不起火、不爆		



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频方式重复 12 次,振动 3h。

对数扫频方式如下:  $7Hz\sim18Hz$  保持 9.8m/s2 的峰值加速度。将振幅保持在 0.8mm (位移为 1.6mm) 直至峰值加速度达到 78.4m/s 2 (频率约为 50Hz)。保持 78.4m/s2 的峰值加速度直到频率增长到 200Hz。

#### 7. Standard Testing Environment

标准测试环境

Temperature:  $23 \pm 2^{\circ}$ C

温度: 23±2℃

Relative humidity:  $45\pm20\%$  (unless specially requested)

相对湿度: 45±20% (除非另外要求)

#### 8. Warranty

保质期限

Warranty period for this product is 12 months starting from the date when the products left the door of manufacturer. 保质期是从出厂日期(喷码)开始起十二个月.

#### 9. Liability

产品责任

The user has to operate the products according to the instructions printed on the battery label or follow the advice described in this "Product Specification for Polymer Lithium Ion Batteries published by Yunnan Road Fei New Energy Materials Co.,Ltd. In case the battery were overheated or even catch fire or explosion caused by mishandling of the user side, Yunnan Road Fei New Energy Materials Co.,Ltd. will not be liable for the lose caused by any of such mishandling.

Yunnan Road Fei New Energy Materials Co.,Ltd.will notify the users in written form if any modifications in specification, raw material, production process control.

您必须严格遵守云南路飞新能源材料有限公司规格书和文件后面的注释使用电池,由于误用会引起电池过热,发生火灾或爆炸。对于没有按照规格书进行操作所造成的任何以外事故,云南路飞新能源材料有限公司不负担任何责任。如果规格书、原材料、生产过程或生产控制系统发生改变,改变的信息将会随质量和可靠性数据以书面形式通知消费者。

#### 10. Battery Packing Label

包装电池上的标示

The following warnings should be indicated on the battery pack labels.

以下警告应注明在包装后的电池上

Use a specified charger.

使用规定的充电器。

Do not throw the battery into fire, or heat.

不要将电池投入火中或加热。

Do not short-circuit the battery terminals.

不要将电池两端短路。



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Do not disassemble the battery.

不要将电池分解拆散。

11. Warnings and Cautions in Handling the Lithium-ion Battery

电池使用时警告事项及注意事项

To prevent potential leaking, overheating or explosion of batteries please be advised to take following precautions:

为防止电池可能发生泄漏,发热、爆炸,请注意以下预防措施

#### WARNINGS!

#### 警告!

Do not immerse the battery in water or seawater, and keep the battery in a cool dry environment during stands by period. 严禁将电池浸入海水或水中,保存不用时,应放置于阴凉干燥的环境中。

Do not use or leave the battery near a heat source such as fire or heater.

禁止将电池在热高温源旁,如火、加热器等使用和留置。

When recharging, use the battery charger specifically for that purpose.

充电时请选用锂离子电池专用充电器。

Do not reverse the position (+) and negative (-) terminals.

严禁颠倒正负极使用电池。

Do not connect the battery to an electrical outlet.

严禁将电池直接接入电源插座。

Do not dispose the battery in fire or heat.

禁止将电池丢于火或加热器中。

Do not short-circuit the battery by directly connecting the positive (+) and negative (-) terminal with metal objects such as wire.

禁止用金属直接连接电池正负极短路

Do not transport or store the battery together with metal objects such as necklaces, hairpins etc.

禁止将电池与金属,如发夹、项链等一起运输或贮存。

Do not strike or throw the battery against hard surface.

禁止敲击或抛掷、踩踏电池等。

Do not directly solder the battery and pierce the battery with a nail or other sharp object.

禁止直接焊接电池或用指甲或其它尖锐物体刺穿电池。

Outer metal conduct can not contact the aluminum layer in AL laminate film, especially with electrification , which will be "black spot" and swelling easily.

禁止外层金属导体与铝塑膜中的铝层接触,尤其是带电情况,易产生"黑点"现象,引起鼓胀。

Do not use sharp things to hit the battery.

禁止用尖锐部件碰撞电池。



PRODUCT SPECIFICATION FOR645464-4000mAh

版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

#### **CAUTIONS!**

#### 注意

Do not use or leave the battery at very high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be shortened. 禁止在高温下(炙热的阳光下或很热的汽车中)使用或放置电池,可能会引起电池过热、起火或功能失效、寿命减短。

Do not use it in a location where static electricity is rich, otherwise, the safety devices may be damaged, causing a harmful situation.

禁止在强静电和强磁场的地方使用,否则易破坏电池安全保护装置,带来不安全的隐患。

In case the electrolyte get into the eyes due to the leakage of battery, do not rub the eyes! Rinse the eyes with clean running water, and seek medical attention immediately. Otherwise, it may injure eyes or cause a loss of sight.

如电池泄露,电解液进入眼睛,请不要揉擦,用清水冲洗眼睛,立即送医治疗,否则会伤害眼睛

If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charger and place it in a contained vessel such as a metal box.

如果电池发出异味、发热、变色、变形或使用、贮存,充电过程中出现任何异常,立即将电池从装置或充电器中移离并停用。

In case the battery terminals are contaminated, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection between the battery and the electronic circuitry of the instrument.

如果电池发出异味、发热、变色、变形或使用、贮存,充电过程中出现任何异常,立即将电池从装置或充电器中移离并停用。

Be aware discarded batteries may cause fire, tape the battery terminals to insulate them before disposal. 废弃之电池应用绝缘纸包住电极,以防起火、爆炸。



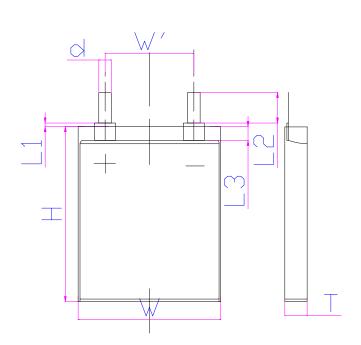
PRODUCT SPECIFICATION FOR645464-4000mAh

版本: A.0

电芯型号: 645464/4.4V

日期: 2021-4-29

附图: 单位: mm Attachment: Unit: mm



项目		技术规格
Items	Description	Dimension and Spec
T	厚度(不含膜)/thickness before shipping	≤ 6.5 mm
W	宽度/width	≤ 55.0 mm
Н	高度(不含极耳胶)/length	≤65.0 mm
L1	L1 极耳胶外漏长度/sealant length	
L2+L1	极耳外露长度(含极耳胶)/tab length	6.0±1.0 mm
L3	顶封高度/sealing height	3.5±0.5 mm
d	极耳宽度/ tab width	5.0±0.2 mm
W'	极耳中心距/distance between center of 2 tabs	36.0±2.0 mm
备注	————————————————————————————————————	· 茶色胶纸

备注:1.正极本司使用直转镍铝极耳无需弯折

另注: 您还有任何疑问, 请在 48H 内告知我们, 否则我们将认为您已经同意以上标准, 谢谢!



Report No.: ORTSZB01210601025

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# 深圳市优瑞特检测技术有限公司

# Shenzhen ORT Technical Services Co., Ltd.

# UN38.3 检测报告 Test Report

The state of the s					
Ort. tour.	and the state	Report Nu			
	A September 1 Sept	ORTSZB0121			
样品名称	锂离子电芯		型号	645464	
Sample name:	Lithium ion cell		Model:	OFT BEATING	
商标			检测类别	委托测试	Marie V
Brand:	,		Test Classification	COMMISSION	TEST
REAL PROPERTY OF THE PARTY OF T	云南路飞新能源	材料有限公司			
委托单位	Yunnan Lufei Ne	ew Energy Materials	Co., Ltd.		
Applicant			作区高新技术产业园		
		ndustrial Park, Teng e, Baoshan City, Yu	ćȟong border econoi nnan Province	mic development	and
	云南路飞新能源				
生产单位	Yunnan Lufei Ne	ew Energy Materials	Co., Ltd.		
Manufacturer	200007 14		作区高新技术产业园		
OF.		ndustrial Park, Teng e, Baoshan City, Yu	chong border econoi nnan Province	mic development	and
收样日期		试验时间	2021-05-31 to	报告日期	
Received date:	2021-05-31	Detection date:	2021-06-15	Report date:	2021-08-02
试验依据	联合国《关于危	险货物运输的建议书	-试验和标准手册》	第6版)38.3寸	5修订1
Test Method	UN Recommend	dations on the Trar	nsport of Dangerous	Goods Manua	of Tests and
orten de l'IOC	Criteria ST/SG/A	AC.10/11/Rev.6/Subs	section 38.3 Amend	1	Miss
试验结论 Test	该电池样品通过	所有项目检测,符合	该条款的性能要求。		
Conclusion:	The samples ha	ve passed all test ite	ems.		
主检	刘文威	日期 Date:			
土心 Tested by:	刘立成		N. S.	感和激发	
resied by.	2/2/1	2021-06-15	深圳市仗	瑞特检测技术有	限公司
审核	吴雄	日期 Date:	Shenzhen OR	Γ Technical Servi	ees Co., Ltd.
Checked by:	Et 1		THE STATE OF THE S	The state of the s	-/
Checked by.	75.120	2021-08-02	Serve	是第 <b>stamp</b> )	
批准	周志强	日期 Date:		2021-08-02	
лите Approved by:	dans	2021-08-02		(c)	
rippioved by.	Del rechite	ZUZ 1-UU-UZ		Mar	

则:本测试报告无检测报告专用章、签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日 起 15 日内对提出投诉或要求进行复测。

电话: 0086-755-27817553

公司名称:深圳市优瑞特检测技术有限公司 网址: <u>http://www.ort-ts.com</u>



Report No.: ORTSZB01210601025





#### I 电池描述 Battery Description

K	电池信息 Information for Ba	ittery	and the state of t		
	型号	D. Ort.	额定能量		
	Model		Rated Energy		8
	额定容量	,	标称电压		
	Rated Capacity	<u></u>	Nominal Voltage		
	充电限制电压	and a service	充电电流		
),	Max. Charging Voltage		Charging Current		
	放电电流		最大连续充电电流	of the state of th	
	Discharge current		Max. Charging Current		
	最大放电电流		充电截至电流		
	Max. Discharging Current		Charge Cut-off Current		
	放电终止电压	S. B. B. Berne	电芯组合方式		
	Discharge Cut-off Voltage		Cell Combination Mode		
	外观形状		电芯生产厂家	and the state of t	
	Appearance		Manufacturer of cell	-	

and the second s			•
电芯信息 Information for	Cell Section	۵	
型号	645464	额定能量	15.4Wh
Model	043404	Rated Energy	13,40011
额定容量	4000mAh	标称电压	3.85V
Rated Capacity	4000111A11	Nominal Voltage	3.65V
充电限制电压	4.4V	充电电流	800mA
Max. Charging Voltage	4.40	Charging Current	OUUIIA
放电电流	800mA	最大连续充电电流	2000mA
Discharge current	OUTIA	Max. Charging Current	2000IIIA
最大放电电流	2000	充电截至电流	40 mg A
Max. Discharging Current	2000mA	Charge Cut-off Current	40mA
放电终止电压	2.01/	外观形状	银色长方体
Discharge Cut-off Voltage	3.0V	Appearance	Silvery cuboid
	A. Seeth.		

使明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

> 公司 电话: 0086-755-27817553

Report No.: ORTSZB01210601025

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#### Ⅱ 试验记录 Test Records

AKIN MEN	rest Necolus				
序号 No.		标准要求或标准条款号 Standard requirement or the clause number of standard	测试结果 Test result	本项结论 conclusion	备注 Remarks
lo 1	高度模拟 Altitude simulation	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.1 Test T.1	见附表 1 See Appendix 1	合格 Passed	
2	温度试验 Thermal test	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.2 Test T.2	见附表 2 See Appendix 2	合格 Passed	1
3	振动 Vibration	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.3 Test T.3	见附表 3 See Appendix 3	合格 Passed	1
4	冲击 Shock	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.4 Test T.4	见附表 4 See Appendix 4	合格 Passed	,
5	外部短路 External short circuit	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.5 Test T.5	见附表 5 See Appendix 5	合格 Passed	1
6	撞击 Impact	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.6 Test T.6	见附表 6 See Appendix 6	合格 Passed	The state of the s
7	过度充电 Overcharge	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.7 Test T.7	见附表 7 See Appendix 7	不适用 N/A	
8	强制放电 Forced discharge	ST/SG/AC.10/11/Rev.6/Amend 1, 38.3 试验 T.8 Test T.8	见附表 8 See Appendix 8	合格 Passed	

备注 Remark:

测试样品已按 UN38.3 经过循环处理,由客户提供.

Before the samples were sent for testing, the client has already carried out cyclic tests according to the requirements of UN38.3.

应明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*"的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。



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# 附表 1 Appendix 1

	All Sold Serve	,	and the same of th		Appendix 1				
K	序号	A NOTE OF	测试项	目名称	. see a single since		高度模拟		
>	No.	1	Name of	Test Items	A State of the latest and the latest	Alti	itude simula	tion	
			测试前	Before	测试后	After	质量损失	电压损失	17
	编号	样品状态	1 11 2 0				Mass	Voltage	测试结果
	No .	Sample status	电池质量	开路电压	电池质量	开路电压	loss	loss	result
		and services	<i>m</i> ₁(g)	V <sub>1</sub> (V)	$m_2(g)$	$V_2(V)$	(%)	(%)	
/	Otil stol	首次完全充电					(//	(75)	
	C01	1st CYC Fully	51.416	4.384	51.415	4.379	0.002	0.114	0
>.		Charged	Notice.		And server				
		首次完全充电		4.000	Orten	4.004		aching and	
	C02	1st CYC Fully	51.953	4.386	51.952	4.381	0.002	0.114	0
		Charged 首次完全充电					All S		No.
	C03	1st CYC Fully	51.597	4.386	51.596	4.382	0.002	0.091	O
		Charged							
	ORTH	首次完全充电	and the service						_
/	C04	1st CYC Fully	52.034	4.387	52.033	4.382	0.002	0.114	0
		Charged 首次完全充电			All South of the				
	C05	1st CYC Fully	51.784	4.384	51.784	4.378	0.000	0.137	0 /
		Charged	0101	1.001			O.O.O.O.	0.101	
		第25次完全充电							
	C06	25th CYC Fully	51.542	4.385	51.541	4.379	0.002	0.137	0
ď		Charged							
1	C07	第 25 次完全充电 25th CYC Fully	51.378	4.386	51.377	4.380	0.002	0.137	0
2	007	Charged	OF THE PERSON OF	4.000	01.077	7.000	0.002	0.107	
		第25次完全充电			OF TECHNICAL		7	The serve	
	C08	25th CYC Fully	51.846	4.387	51.845	4.382	0.002	0.114	0
		Charged							
	C09	第 25 次完全充电 25th CYC Fully	51.737	4.386	51.736	4.381	0.002	0.114	O
	000	Charged	01.707	4.000	01.700	4.001	0.002	0.114	
	Ortion	第25次完全充电							Me
\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	C10	25th CYC Fully	51.939	4.387	51.938	4.381	0.002	0.137	0
	1,1,7	Charged	ORTE		and the series				
	以下				OFTIECH		,i	<b>.</b>	
	空白						J 12 7 20	A BETTIL	
							ONTRE		
						4	White the second		
		and gerill							
	ORT IS	F .	11/2						
			Treamed b		. 📣				
-)	1		05	1	Sept 100		1	i	1

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire

O-No leakage, no venting, no disassembly, no rupture, no fire.

电话: 0086-755-27817553

则:本测试报告无检测报告专用章、签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

公司名称:深圳市优瑞特检测技术有限公司 网址: http://www.ort-ts.com 地址:深圳市龙岗区龙岗街道南联第二企业区方兴科技园 C 区 15 栋一枝传真: 0755-27817553 邮箱: battery@ort-ts.com



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## 附表 2 Appendix 2

ALL STATE OF THE PARTY OF THE P	<b>9</b>			Appendix 2				
序号	_	测试项	[目名称			温度试验。		
No.	2	Name of	Test Items "	A State of the disposit		Thermal test	Peg.	
			Before	测试后	f After	质量损失	电压损失	
編号	样品状态	0/1 (113	20.0.0	0.3 10 (7)	7 (110)	Mass	Voltage	测试结
No.		电池质量	开路电压	电池质量	开路电压	loss	loss	果 result
INO	Sample status	<i>m</i> ₁(g)	V <sub>1</sub> (V)	$m_2(g)$	$V_2(V)$			* Tesuit
No. of the second	V. V. A. A. A. I.					(%)	(%)	
C01	首次完全充电	51.415	4.379	51.409	4.308	0.012	1.621	0
CUI	1st CYC Fully Charged	0818413	4.379	51.409	4.300	0.012	1.021	
	首次完全充电			The last rice		48	Control of the section	
C02		51.952	4.381	51.947	4.311	0.010	1.598	0
	Charged							and h
	首次完全充电							
C03	Called Colo	51.596	4.382	51.591	4.306	0.010	1.734	O
A STATE	Charged							
C04	首次完全充电 1st CYC Fully	52.033	4.382	52.028 🦼	4.307	0.010	1.712	0
004	Charged	102,000	7.002	JZ.020	» 4.007	0.010	1.7 12	
	首次完全充电			W. J. Berning			A Chica	
C05	1st CYC Fully	51.784	4.378	51.778	4.314	0.012	1.462	0
	Charged					Of Off		
	第 25 次完全充			Y .				
C06	电	51.541	4.379	51.536	4.310	0.010	1.576	0
A STATE OF THE STA	25th CYC Fully							
GHIL	Charged 第 25 次完全充	and the state of t		4				
	电	OFT BOTH			rice			
C07	25th CYC Fully	51.377	4.380	51.372	4.306	0.010	1.689	0
	Charged	Y				dr.	Bech.	
	第 25 次完全充							
C08	电	51.845	4.382	51.839	4.309	0.012	1.666	OF W
	25th CYC Fully							
No. of the	Charged 第 25 次完全充							Alles.
	H-	A STATE OF THE PROPERTY OF THE PARTY OF THE						
C09	25th CYC Fully	51.736	4.381	51.730	4.304	0.012	1.758	0
	Charged			OK TECHNIC				
	第 25 次完全充			3			d service	
C10	电	51.938	4.381	51.933	4.307	0.010	1.689	0
	25th CYC Fully	01.000	1.551	01.000	1.507		1.500	
DI a	Charged							
以下 空自	thrick							
TH		The state of the s						
		ORT SON.		and the same	p			
				A STATE OF THE PARTY.				
				ORT		7.5	Post and a service of the service of	

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire

O-No leakage, no venting, no disassembly, no rupture, no fire.

则:本测试报告无检测报告专用章、签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

公司名称:深圳市优瑞特检测技术有限公司 网址: http://www.ort-ts.com



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# 附表3 Appendix3

	Marie Barrico				Appendix 3					
K	序号		测试项	目名称			振动			
>	No.	3	Name of <sup>-</sup>	Гest Items "	The street see		Vibration	E) Crice		
			测试前		测试后	After	质量损失	电压损失		
	編号	样品状态	100 100 110	Deloie	1)(1) (1)(1)	Aitei	Mass	Voltage	测试结果	B
			电池质量	开路电压	电池质量	开路电压		_		
	No	Sample status	<i>m</i> ₁(g)	$V_1(V)$	<i>m</i> <sub>2</sub> (g)	$V_2(V)$	loss	loss	result	
//	S. S. Sectivical	,	, (9)	- / ( - /	2 (9)	-2(-)	(%)	(%)		
	Ok.	首次完全充电	Marie Company							
/	C01	1st CYC Fully	51.409	4.308	51.408	4.306	0.002	0.046	0	
		Charged	Or.		activited 5th		ies	- All Service		
	C02	首次完全充电 1st CYC Fully	51.947	4.311	51.945	4.310	0.004	0.023	0	
	002	Charged	31.341	4.511	01.343	4.510	0.004	0.023		Á
		首次完全充电					Alles.			J.
	C03	1st CYC Fully	51.591	4.306	51.589	4.304	0.004	0.046	O	
	The state of the s	Charged								
	ORTE	首次完全充电	A STORY OF THE STO							
	C04	1st CYC Fully	52.028	4.307	52.027	4.305	0.002	0.046	0	
		Charged	0.		and the second	. And .				
	C05	首次完全充电	E1 770	4 24 4	51.776	4.311	0.004	0.070	0	The state of
	005	1st CYC Fully Charged	51.778	4.314	31.116	4.311	0.004	0.070	0	1
		第 25 次完全充								
		电								
	C06	25th CYC	51.536	4.310	51.534	4.308	0.004	0.046	0	
THE STREET	The State of the S	Fully Charged	and the same							
1		第 25 次完全充	A Salah Barriera Barriera		in the state of th					
2	C07	电	51.372	4.306	51.371	4.305	0.002	0.023	o	
	001	25th CYC	01.072	4.500	OFT BOTT	4.000	0.002	0.023		
		Fully Charged					OF.			
		第 25 次完全充								أفد
	C08	电	51.839	4.309	51.837	4.307	0.004	0.046	0/1	17 M
		25th CYC Fully Charged								
	13 Table	第 25 次完全充	A Section 1							
		电	Articl Bernico		- A				_	
	C09	25th CYC	51.730	4.304	51.728	4.302	0.004	0.046	0	
		Fully Charged			OK TROPING					
		第 25 次完全充						al service		
	C10	电	51.933	4.307	51.931	4.305	0.004	0.046	0	
		25th CYC	31.333	4.507	31.331	4.000	0.004	0.040		1
		Fully Charged					Ollin.			
	以下	»"								
	空白	ش.	The second section							
			ORT sethin		and the same of th	ø				
					A STATE OF SOLIT	•				

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火

Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire

O-No leakage, no venting, no disassembly, no rupture, no fire.

则:本测试报告无检测报告专用章、签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

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# 附表 4 Appendix 4

	at service			F	Appendix 4				
N	序号	4	测试项	目名称			冲击。		
	No.	4	Name of <sup>-</sup>	Test Items	7 Schuld Street Berne		Shock	nice.	
			测试前	Before /	测试后	After	质量损失	电压损失	
	编号	样品状态	<b>山洲 医</b> 具	开路电压	电池质量	开路电压	Mass	Voltage	测试结果
	No	Sample status	电池质量				loss	loss	result
			<i>m</i> ₁(g)	V <sub>1</sub> (V)	$m_2(g)$	$V_2(V)$	(%)	(%)	
		首次完全充电							
	C01	1st CYC Fully	51.408	4.306	51.407	4.306	0.002	0.000	0
	Or.	Charged	agrice .						
	2	首次完全充电	W. Janestrica		A. C.				
	C02	1st CYC Fully	51.945	4.310	51.944	4.309	0.002	0.023	0
		Charged			OFTIER		2 2	Strice See	
		首次完全充电					dri		
	C03	1st CYC Fully	51.589	4.304	51.588	4.304	0.002	0.000	0 🥕
		Charged							
İ	.83	首次完全充电							
	C04	1st CYC Fully	52.027	4.305	52.026	4.304	0.002	0.023	0
	ORTE	Charged	and the service						
	3	首次完全充电	A Bachica						
	C05	1st CYC Fully	51.776	4.311	51.775	4.310	0.002	0.023	0
		Charged		-	The All State County		l l	Service .	
İ		第 25 次完全充					The Walter	Section 2	
		电					of the		
	C06	25th CYC Fully	51.534	4.308	51.534	4.307	0.000	0.023	0
	e d	h Charged							
ł		第 <b>25</b> 次完全充							
	A Lectrical Party Rectified	电	anice of the second						_
	C07	25th CYC Fully	51.371	4.305	51.370	4.305	0.002	0.000	0
12	>	Charged	OKTE		- 11 10 H	Brice			
		第 25 次完全充			Tr.T leather			All of the second	
		电					Mary Miles	Recht	
	C08	25th CYC Fully	51.837	4.307	51.837	4.306	0.000	0.023	0
		Charged					Miller		7 .4
ł		第 25 次完全充							To do
		190							
	C09	电 0/0 5 4	51.728	4.302	51.727	4.301	0.002	0.023	0
		25th CYC Fully	atri serita						
	7	Charged	Okt. Both.		A Partie	Ø .			
		第 25 次完全充			Marine Barrier				
	C10	电	51.931	4.305	51.930	4.304	0.002	0.023	0
		25th CYC Fully			112		A STATE OF THE PARTY OF THE PAR	Jal alo	
-	1.1	Charged					OFTE		
	以下								
	空白	S. A. A. C.					V.		
	THE PERSON	lija.							
	11 0	de	ach service						
	7		Opt seeth.		Age.	8			
			D		ich seri	r			
-					Chi leeth.		al a	al service	
ļ								and thirties	

注: L-泄露; V-排气; D-解体; R-破裂; F-起火; O-无泄露、无排气、无解体、无破裂、无起火 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire O-No leakage, no venting, no disassembly, no rupture, no fire.

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### 附表 5

#### Appendix 5

Man Man		Appendix o		
序号	5 Marie Barrier Barrier	测试项目名称		短路
No.	, okr.	Name of Test Items	External s	hort circuit
编号	样品状态	样品表面最高温度 Max. External	测试结果	备注
No	Sample status	Temperature (℃)	Test result	Remark
C01	首次完全充电 1st CYC Fully Charged	104.6	0	1
C02	首次完全充电 1st CYC Fully Charged	105.7	0	1
C03	首次完全充电 1st CYC Fully Charged	109.2 ort and the	0	And the state of t
C04	首次完全充电 1st CYC Fully Charged	110.3	0	1
C05	首次完全充电 *** 1st CYC Fully Charged	107.6	0	1
C06	第 25 次完全充电 25th CYC Fully Charged	101.5	0	1
C07	第 25 次完全充电 25th CYC Fully Charged	104.2	O	1
C08	第 25 次完全充电 25th CYC Fully Charged	101.7	O M	September 1
C09	第 25 次完全充电 25th CYC Fully Charged	105.2	o Olika	1
C10	第 25 次完全充电 25th CYC Fully Charged	106.1	0	1
以下 空白	1 July 2 July 1		rite .	
		O Harry		September 1
				A
	Service .			
Chi legina				
	The state of the s		0	

注: 外表温度不超过 170℃

D-解体, R-破裂, F-起火, O-无解体、无破裂、无起火

Note: External temperature not exceed 170 ℃

D-Disassembly, R-Rupture, F-Fire, O-No disassembly, no rupture, no fire.

电话: 0086-755-27817553

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邮箱: battery@ort

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Report Date: 2021-08-02

#### 附表 6

#### Appendix 6

William Man		Appendix o		
序号	6 Billing Learning to the Company of	测试项目名称	挤	
No.	or or	Name of Test Items	Cru	isn
编号	样品状态	样品表面最高温度 Max. External	3回2十4大田	备注
州 「No	特丽仏念 Sample status	Temperature	测试结果 Test result	<sup>食注</sup> Remark
INO	Sample status	remperature (°C)	restresuit	Remark
	首次 50%容量	, ,	V	
C11	1st CYC 50% Capacity	24.1	0	1
A CONTRACTOR OF THE PARTY OF TH	首次 50% 容量			
C12	1st CYC 50% Capacity	24.2	0	/
	首次 50% 容量	A State of the sta	_	and the same
C13	1st CYC 50% Capacity	24.1 Oct.	0	activities and
0.1.1	首次 50%容量		a det	,
C14	1st CYC 50% Capacity	24.1	0	1
045	首次 50%容量	04.0		
C15	1st CYC 50% Capacity	24.2	0	
OA'S	25 次 50%容量	04.4	0	1
C16	25th CYC 50% Capacity	24.1	0	1
C17	25 次 50%容量	04.0	C C	
C17	25th CYC 50% Capacity	24.2	0	
C18	25 次 50%容量	24.2	0	Company and the company of the compa
C 10	25th CYC 50% Capacity	24.2	O OFFER	
C19	25 次 50%容量	24.1	O	
CIS	25th CYC 50% Capacity	24.1	O W	1
C20	25 次 50%容量	24.2	0	1
Man Rectific	25th CYC 50% Capacity	24.2	0	I
以下	A STATE OF THE PARTY OF THE PAR			
空白	CF.		and the state of t	
		OKT BEATH		A State of the sta
	<u> </u>		OF.	tegr.
		-		
1300	- Tries			
actrice	P*			
ORTE				

注: 外表温度不超过 170℃

D-解体; F-起火; O-无解体、无起火

Note: External temperature not exceed 170°C

D-Disassembly, F-Fire, O- No disassembly, no fire.

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# Appendix 7 N/A

Report Date: 2021-08-02

		Appendix / N/A		
序号 No.	7	测试项目名称 Name of Test Items	过度充电 Overcharg	e
以下 空白	O. O. O. C. C. C. C. C. C. C. C. C. C. C. C. C.	15 State adverted to the control of	The state of the s	
			W. F. W.	No.
	life.			
Off. Bernico	,			
	12 St. St. St. St. St. St. St. St. St. St.	and the state of t		
		The state of the s	Car Bertham Berth	
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声明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*" 好项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。

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# 附表 8

### Appendix 8

all light agent		Appendix 8	
序号	8 Karantahan	测试项目名称	强制放电
No.	- OK-	Name of Test Items	Forced discharge
编号	样品状态	测试结果	备注
No	Sample status	Test result	Remark
C21	首次完全放电	0	
OZ I	1st CYC Fully Discharged	<u> </u>	1
✓ C22	首次完全放电	0	
OK THOUGH	1st CYC Fully Discharged	0	,
C23	首次完全放电	<b>O</b>	,
C23	1st CYC Fully Discharged	Service Committe	1
004	首次完全放电	No. of the last of	and the state of
C24	1st CYC Fully Discharged	Oct. O	A Life active
005	首次完全放电		
C25	1st CYC Fully Discharged	0	
000	首次完全放电	^	
C26	1st CYC Fully Discharged	Ο	1
The Court of State of the Court	首次完全放电	^	,
C27	1st CYC Fully Discharged	0	/
200	首次完全放电	and the same of th	
C28	1st CYC Fully Discharged	No. of the state o	
200	首次完全放电	Opt.	and a second second
C29	1st CYC Fully Discharged	0	Per de la companya del companya de la companya del companya de la
	首次完全放电		
C30	1st CYC Fully Discharged	0	
	第 25 次完全放电		,
C31	25th CYC Fully Discharged	Ο	/
Ort	第 25 次完全放电	_ 🖒	,
C32	25th CYC Fully Discharged	O <sub>3</sub> J <sub>4</sub> J <sub>4</sub> J <sub>6</sub>	/
	第 25 次完全放电	A State of the sta	and the second
C33	25th CYC Fully Discharged	0	Resident Committee
	第 25 次完全放电		
C34	25th CYC Fully Discharged	0	
94	第 25 次完全放电		
C35	25th CYC Fully Discharged	0	
A Secretary Secretary	第 25 次完全放电		
C36	25th CYC Fully Discharged	0	/
	第 25 次完全放电	and the state of t	
C37	25th CYC Fully Discharged		/
	第 25 次完全放电	or or	and the second s
C38	25th CYC Fully Discharged	0	No. of the state o
	第 25 次完全放电		
C39	25th CYC Fully Discharged	0	1
	第 25 次完全放电		
C40	25th CYC Fully Discharged	0	1
注: D	25th CTC Fully Discharged    -解体;F-起火;O-无解体、无起		
		= /\	

注: D-解体; F-起火; O-无解体、无起火

Note: D-Disassembly, F-Fire, O- No disassembly, no fire.

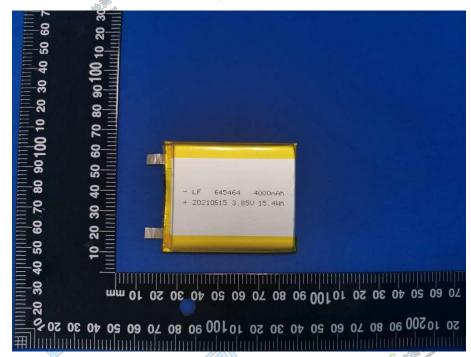
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#### IV 试验设备 Test Equipment

Гest Equipment			
名称 Name	规格参数 Model specifications	设备编号 Device No.	有效期至 Calibration validity
电池低压高空模拟试验机 Battery low pressure high altitude simulation testing machine	GX-3020-ZC80	ORT-DQY-01	2021-07-18
电子天平 Electronic balance	HZK-JA510S	ORT-DZTP-02	2021-07-18
振动试验台 Electromagnetic vibration tester	MPA406/M232A	ORTZD2000-01	2022-01-03
Multimeter	17B+	ORT-WYB-01	2021-07-20
Rapid temperature change test chamber	F15H1000-70W	ORTKWB1000-0 2	2022-03-03
High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-21	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-22	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-23	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-24	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-25	2021-07-20
高性能电池检测系统 High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-26	2021-07-20
High-performance battery testing	CT-4008-5V6A-S1	ORT-5V/6A-27	2021-07-20
冲击试验台 Mechanical Shock tester	IS500	ORTCJ-01	2022-05-27
数据采集仪 Data acquisition instrument	DC5508U	ORT-CJY-01	2022-05-27
Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-01	2021-07-18
温控型电池短路试验机 Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-02	2021-07-20
电池挤压针刺试验机 Crush / needle tester	GX-5067-BM3T	ORT-JYZC-01	2022-05-27
电子负载 Electronic load	EL160LB	ORT-DZFZ-03	2021-07-20
直流电源 DC power supply	IT6723	ORT-DY-03	2022-05-27
20 March 20	电池低压高空模拟试验机 Battery low pressure high altitude simulation testing machine 电子天平 Electronic balance 振动试验台 Electromagnetic vibration tester 万用表 Multimeter 快速温变试验箱 Rapid temperature change test chamber 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 High-performance battery testing system 高性能电池检测系统 Temperformance battery testing system 冲击试验台 Mechanical Shock tester 数据采集仪 Data acquisition instrument 温控型电池短路试验机 Temperature controlled External short-circuit testing system 温控型电池短路试验机 Temperature controlled External short-circuit testing system 电池挤压针刺试验机 Crush / needle tester 电子负载 Electronic load 直流电源	Aph Name   Med   Specifications   Pattern   Med   Specifications   Pattern   Med   Specifications   Pattern   Med   Specifications   Pattern   Med   Specifications   Pattern   Med   Specifications   Pattern   Med   Specifications   Pattern   Med   Specifications   Pattern   Pattern   Med   Med   Specifications   Pattern	名称 Name

\*\*\* End of Report \*\*\*

应明:本测试报告无检测报告专用章 签名无效;本测试报告检测结果仅对被测样品负责;未经优瑞特检测书面许可,不得部分复制本报告;报告中带"\*"的项目为分包检验项目;未取得资质认定或认可的检测项目,仅作为科研、教学或内部质量控制之用;委托方对检测结果有异议时,须在收到报告之日起 15 日内对提出投诉或要求进行复测。







# Shenzhen ORT Technical Services Co., Ltd.

# **TEST REPORT**

40		Report Nur ORTSZB01210		Company of the state of the sta		
Sample name:	Li-ion Cell	Mode	el:	645464		
Ratings	3.85V, 4000mAh, 1	5.4Wh Samp	ole status	Received inta	ct	
Brand:	N/A	Samp	ple source:	Submitted by	applicant	
Testing Laboratory	Shenzhen ORT Teo F1, Building 15, Fa Zone, Longgang Si	ngxing Science a	and Technology		o. 6 Industrial	
Applicant and address	Yunnan Lufei New No.1 high tech Indu cooperation zone, OF CHINA	ustrial Park, Teng	chong border ed	. 2007	iggs	
Manufacturer and Address	Yunnan Lufei New Energy Materials Co., Ltd.  No.1 high tech Industrial Park, Tengchong border economic development and cooperation zone, 678000 Baoshan City, Yunnan Province, PEOPLE'S REPUBLIC OF CHINA					
Received date:	2021-07-06 Te	esting date:	2021-07-06 to 2021-07-19	Report date:	2021-07-19	
Test Requirement	, 100 W	ts for portable se	aled secondary	cells, and for b	acid electrolytes – atteries made from	
Tested by:	Jeff Liu	Date: 2021-07-19	Shenzhen	SECHNICAL SE	Sewices Co., Ltd.	
OR.	Gary Wu	Date:	SHEHZHEH	(stamp)	dis Old	
olgitatare.	Leo Zhou	2021-07-19 Date:		2021-07-1	y Marketon	
Signature:	les show	2021-07-19		Ole of the season of the seaso		

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for retesting within 15 days after receiving the report.

Shenzhen ORT technical services Co., Ltd.

Site Location: Fangxing science park, Nanlian sixth industrial zone, Longgang street, longgang district, Shenzhen , Guangdong province, China (all: 0086-755-27817553)

Email: battery@ort-ts.com



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Report Date: 2021-07-19

#### Test specification

Standard..... IEC 62133-2:2017

Test procedure ...... Test report

Procedure deviation..... N/A

Non-standard test method...... N/A

#### Test Report Form/blank test report

Test Report Form No......ORT62133-2-2017A

Test Report Form(s) Originator...... ORT

Master TRF...... Dated 2019-05

#### **Summary of testing:**

#### Tests performed (name of test and test clause):

cl.7.1 Charging procedure for test purposes (for cells)

cl.7.2.1 Continuous charging at constant voltage (cells)

cl.7.3.1 External short circuit (cells)

cl.7.3.3 Free fall (cells)

cl.7.3.4 Thermal abuse (cells)

cl.7.3.5 Crush (cells)

cl.7.3.7 Forced discharge (cells)

cl.7.3.9 Forced internal short-circuit (cell)

### **Testing location:**

Shenzhen ORT Technical Services Co., Ltd.

F1, Building 15, Fangxing Science and Technology Park, Nanlian No. 6 Industrial Zone, Longgang Street, Longgang District, Shenzhen







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#### Copy of marking plate

This is reference label, final label should be including the content of it.

- LF 645464 4000mAh + 20210615 3.85V 15.4Wh

Remark: By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked.

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Call: 0086-755-27817553

Email: battery@c

onggang district, Shenzhen ,Guangdong province, China Email: battery@ort-ts.com



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Test item particulars	<b>3</b>			
Classification of install	ation and use	Build-in and use i	in portable application	s
Supply connection	Both technic	Supply by Tap		>
Recommend charging manufacturer			until the current reduc	A STATE OF THE STA
Discharge current(0.2	/ <sub>t</sub> A)	800mA		
Specified final voltage	The state of the s	3.0V	rec	
Upper limit charging v			REAL PROPERTY.	Street Book
Maximum charging cu	rrent	2000mA		
Charging temperature	upper limit	45°C		
Charging temperature	lower limit	5°C		
Polymer cell electrolyt	e type	gel polymer	☐ solid polymer	⊠ N/A
Test case verdicts		A State of the sta		a de la companya del companya de la companya del companya de la co
Test case does not ap	ply to the test object	N/A	No. of the state o	and the second
Test item does meet t	he requirement	P (Pass)		
Test item does not me	eet the requirement	F (Fail)		v
List of Attachments	The state of the s			
Appendix 1	My Marthalin	Photos of produc	et	
Appendix 2		Test Equipments	No. of the second	State of the state
General remarks				
This report shall not be	e reproduced except in	n full without the writte	n approval of the testi	ng laboratory.
The test results prese	nted in this report relat	e only to the item test	ed.	
"(See remark #)" refer	s to a remark appende	ed to the report.		<u> </u>
"(See appended table	)" refers to a table app	ended to the report.		
Throughout this report	a point is used as the	decimal separator.		A service
	the requirements of E	N 62133-2: 2017	All September 1	
Report Revise Recor	rd:			
Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	Trice .	2021-07-19	Valid	Original report
Name and address of	factory (ies):	Same as n	nanufacturer	

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Site Location: Fangxing science park, Nanlian sxxth industrial zone, Longgang street, longgang district, Shenzhen , Guangdong province, China province, C



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#### **General product information**

The product covered by this report is Li-ion Cell.

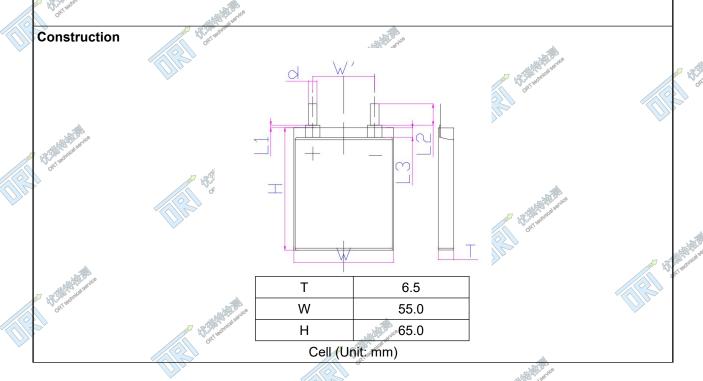
The main features of the cell are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
645464	4000mAh	3.85V	800mA	800mA	2000mA	2000mA	4.4V	3.0V

Report Date: 2021-07-19

The main features of the cell are shown as below (clause 7.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
645464	4.4V	200mA	5°C	45°C



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Web: http://www.ort-ts.com







	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdic
1	Parameter measurement tolerances	All files and security	Р
	Parameter measurement tolerances	Comply with relevant requirements.	P
	) 		
5 Charlestonica	General safety considerations		Р
5.1	General		Р
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse	If the state of th	Р
5.2	Insulation and wiring		N/A
Ort best led of	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 $\mbox{M}\Omega$	No metal case exists.	N/A
	Insulation resistance (MΩ) :	18 Streethold	_
ace the desired serve	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N/A
	Orientation of wiring maintains adequate clearance and creepage distances between conductors	The state of the s	N/A
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		N/A
5.3	Venting		P
M. C. Lang	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and	The second secon	P
	self-ignition  Encapsulation used to support cells within an	102 Marie	
Oxteornal o	outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	Temperature, voltage and current management		N/A
	Batteries are designed such that abnormal temperature rise conditions are prevented	And the state of t	N/A
- A	Patteries are designed to be within temperature		NVA

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N/A

Batteries are designed to be within temperature,



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	IEC 62133-2: 20°	17	
Clause	Requirement – Test	Result – Remark	Verdict
Martinical b	voltage and current limits specified by the cell		
	manufacturer	a till de de la company de la company de la company de la company de la company de la company de la company de	
	Batteries are provided with specifications and	A State of the late	
	charging instructions for equipment manufacturers		No.
Á	so that specified chargers are designed to		N/A
The state of the s	maintain charging within the temperature, voltage		
ORT BEET.	and current limits specified		
5.5	Terminal contacts	<u></u>	N/A
	The size and shape of the terminal contacts	A September of the sept	
	ensure that they can carry the maximum	Och Park	N/A
	anticipated current		
	External terminal contact surfaces are formed		
A State of the last of the las	from conductive materials with good mechanical		N/A
Other	strength and corrosion resistance		
<del>'</del>	Terminal contacts are arranged to minimize the	s <sup>2</sup>	A1/A
	risk of short-circuit	and the late of th	N/A
5.6	Assembly of cells into batteries	the street of th	N/A
5.6.1	General		N/A
ed servi	Each battery have an independent control and		
OFT technil	protection for current, voltage, temperature and		N1/A
>	any other parameter required for safety and to	n de la companya de l	N/A
	maintain the cells within their operating region	and the state of t	
	This protection may be provided external to the	W. A. C. C. C. C. C. C. C. C. C. C. C. C. C.	
	battery such as within the charger or the end		N/A
and the	devices		No.
7 P. College Control of	If protection is external to the battery, the		1
ORTIES	manufacturer of the battery provide this safety		NI/A
>*	relevant information to the external device		N/A
	manufacturer for implementation		
	If there is more than one battery housed in a single	and the state of t	
	battery case, each battery have protective circuitry	Mary Region	NI/A
Jan Park	that can maintain the cells within their operating		N/A
To the state of	regions		
ORTH	Manufacturers of cells specify current, voltage and		
	temperature limits so that the battery		NI/A
	manufacturer/ designer may ensure proper design		N/A
	and assembly	A State of the sta	
	Batteries that are designed for the selective	dr.	N1/A
			N/A

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discharge of a portion of their series connected

for retesting within 15 days after receiving the report.

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Web: http://www.ort-ts.com

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Email: battery@ort-ts.com



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	IEC 62133-2: 20°	17	
Clause	Requirement – Test	Result – Remark	Verdict
T lastrical	cells incorporate circuitry to prevent operation of		
D.	cells outside the limits specified by the cell	a de la companya de l	
	manufacturer	18 the transfer	
	Protective circuit components added as		
Jan P	appropriate and consideration given to the		N/A
The state of the s	end-device application		
Okties	The manufacturer of the battery provide a safety		
	analysis of the battery safety circuitry with a test		
	report including a fault analysis of the protection	all the state of t	N/A
	circuit under both charging and discharging	The State of the S	
	conditions confirming the compliance		No.
5.6.2	Design recommendation		N/A
A Santaka se	For the battery consisting of a single cell or a		
ORTE	single cellblock, it is recommended that the		
	charging voltage of the cell does not exceed the	,	N/A
	upper limit of the charging voltage specified in	and the second	
	Table 2	B. R. Harden	
	For the battery consisting of series-connected		
	plural single cells or series-connected plural		
A description of the service	cellblocks, it is recommended that the voltages of		
OFT section	any one of the single cells or single cellblocks		N/A
	does not exceed the upper limit of the charging		
	voltage, specified in Table 2, by monitoring the	a will be the state of the stat	
	voltage of every single cell or the single cellblocks	Ox. teach	
	For the battery consisting of series-connected		
	plural single cells or series-connected plural		Marin Ra
A State of the Sta	cellblocks, it is recommended that charging is		
ORTE	stopped when the upper limit of the charging		N/A
>*	voltage is exceeded for any one of the single cells		
	or single cellblocks by measuring the voltage of	_	
	every single cell or the single cellblocks	and the state of t	
	For batteries consisting of series-connected cells	A Children	
	or cell blocks, nominal charge voltage not be		N/A
The state of the s	counted as an overcharge protection		
OKTA	For batteries consisting of series-connected cells		
>	or cell blocks, cells have closely matched		NI/A
	capacities, be of the same design, be of the same		N/A
	chemistry and be from the same manufacturer	W. Carlotte and Ca	
	It is recommended that the cells and cell blocks	okt.	N1/A
	not discharged beyond the cell manufacturer's		N/A

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Report No.: ORTSZB01210602002 Page 9 of 26 Report Date: 2021-07-19

Clause Requirement – Test Result – Remark  specified final voltage  For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer	Verdict
specified final voltage  For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
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into the battery management system  Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
Mechanical protection for cells and components of batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
batteries  Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	No.
Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	INIPA
prevent damage as a result of intended use and reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
reasonably foreseeable misuse  The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	14/74
battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	
product enclosure for those batteries intended for building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	MILT
building into an end product  The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	N/A
The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as	Mary 1
designed to accommodate cell dimensional tolerances during charging and discharging as	
tolerances during charging and discharging as	
	N/A
recommended by the cell manufacturer	
For batteries intended for building into a portable	
end product, testing with the battery installed	N/A
within the end product considered when	
conducting mechanical tests	
5.7 Quality plan	Р
The manufacturer prepares and implements a	
quality plan that defines procedures for the	<i>2</i> 7 3
inspection of materials, components, cells and	P
batteries and which covers the whole process of Quality plan provided.	Mer
producing each type of cell or battery	
5.8 Battery safety components	N/A
See TABLE: Critical components	N1/A
According annex F information.	N/A

6	Type test and sample size		P
OFTE	Tests are made with the number of cells or		
	batteries specified in Table 1 using cells or		Р
	batteries that are not more than six months old		
	Coin cells with resistance $\leq 3 \Omega$ (measured	Not coin cells	N/A
	according annex D) are tested according table 1	Not com cens	IN/A
	Unless otherwise specified, tests are carried out in		P

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		IEC 62133-2	: 2017		
Clause	Requirement – Test		Result – Re	emark	Verdict
all lastried	an ambient temperat	ure of 20 °C ± 5 °C			
,	The safety analysis of	of 5.6.1 identify those	We.	is the late of the service	
	components of the p	rotection circuit that are		Mary Contractor of the Contractor	N/A 🌌
	critical for short-circu	it, overcharge and			IN/A
	overdischarge protec	ction			
The latest	When conducting the	e short-circuit test,			
ORTIN	consideration given t	o the simulation of any sin	gle		
	fault condition that is	likely to occur in the	See clause	7.3.2.	N/A
	protecting circuit that	would affect the short-circ	uit	A STATE OF THE STA	
	test	OF OF		M. Ser technical	

			Mark I
7	Specific requirements and tests		Pol
7.1	Charging procedure for test purposes		P
7.1.1	First procedure	b	Р
	This charging procedure applies to subclauses other than those specified in 7.1.2	RECEIVED AND THE PARTY OF THE P	Р
A The transfer of the last of	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer	See page 5.	P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage	See page 5.	Р
7.1.2	Second procedure		Р
A STATE OF THE PARTY OF THE PAR	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
7.2	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 lt A, using a constant voltage charging method	Charging temperature specified by client is: 5 ~ 45°C 45°C used for upper limit tests; 0°C used for lower limit tests.	P
7.2.1	Continuous charging at constant voltage (cells)		P
and the second	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer	Charging for 7 days with 800mA	P

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	IEC 62133-2: 20 <sup>-</sup>	17	
Clause	Requirement – Test	Result – Remark	Verdict
St. Landing	Results: No fire. No explosion. No leakage:	(See appended table 7.2.1)	Р
7.2.2	Case stress at high ambient temperature (battery)	And the state of t	N/A
	Oven temperature (°C) :	of the second second	
	Results: No physical distortion of the battery case		
Crest technical	resulting in exposure of internal protective components and cells		N/A
7.3	Reasonably foreseeable misuse		Р
7.3.1	External short-circuit (cell)	Tested complied	Р
A	The cells were tested until one of the following occurred:		P
A State of the last	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		Р
	Results: No fire. No explosion :	(See appended table 7.3.1)	Р
7.3.2	External short-circuit (battery)	Tested complied.	N/A
And Server	The batteries were tested until one of the following occurred:		N/A
Oct. term	- 24 hours elapsed; or	<b>&gt;</b>	N/A
	- The case temperature declined by 20 % of the maximum temperature rise	The state of the s	N/A
18 State of the last of the la	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test	A State of the Sta	N/A
A Control of the Cont	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		N/A
	Results: No fire. No explosion :	(See appended table 7.3.2)	N/A
7.3.3	Free fall	Tested complied.	Р
	Results: No fire. No explosion	No fire. No explosion.	P
7.3.4	Thermal abuse (cells)	Tested complied.	P

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	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
Rectifical b	Oven temperature (°C) :	130°C	_
	Results: No fire. No explosion	No fire. No explosion	Р
7.3.5	Crush (cells)	Tested complied.	Р
	The crushing force was released upon:		P
OK Technical and	- The maximum force of 13 kN $\pm$ 0,78 kN has been applied; or		Р
	- An abrupt voltage drop of one-third of the original voltage has been obtained	A Total Marie Control	N/A
	Results: No fire. No explosion :	(See appended table 7.3.5)	Р
'.3.6	Over-charging of battery		N/A
Will Bernied by	The supply voltage which is:		N/A
>	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or	The state of the s	N/A
and the state of t	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A
Off technics	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		N/A
	Test was continued until the temperature of the outer casing:	Off the Part of th	N/A
	- Reached steady state conditions (less than 10°C change in 30-minute period); or		N/A
OFFIRE	- Returned to ambient		N/A
	Results: No fire. No explosion :	(See appended table 7.3.6)	N/A
.3.7	Forced discharge (cells)	Tested complied.	Р
Market of the land	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration.	A Contraction	N/A
and the same	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration	A State of the sta	P

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			////
	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
Set technical	Results: No fire. No explosion :	(See appended table 7.3.7)	Р
7.3.8	Mechanical tests (batteries)	15 State Barbo	N/A
7.3.8.1	Vibration	Tested complied.	N/A
A State of the Sta	Results: No fire, no explosion, no rupture, no leakage or venting.	(See appended table 7.3.8.1)	N/A
7.3.8.2	Mechanical shock	Tested complied.	N/A
	Results: No leakage, no venting, no rupture, no explosion and no fire :	(See appended table 7.3.8.2)	N/A
7.3.9	Design evaluation – Forced internal short-circuit (cells)		P
	The cells complied with national requirement for:		
Odiles	The pressing was stopped upon:		Р
	- A voltage drop of 50 mV has been detected; or	, ,	N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N	P
	Results: No fire :	(See appended table 7.3.9)	P

8 orties	Information for safety		Р	
8.1	General	into and the state of the state	Р	
A Secretaria	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products  Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales,	Information of safety mentioned in manufacturer's specification.	P N/A	
	end-users are provided with information to minimize and mitigate hazards		IN/A	
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during	Cott of the state	N/A	
Market Barren	use of a product.  As appropriate, any information relating to hazard avoidance resulting from a system analysis		N/A	
	provided to the end user  Do not allow children to replace batteries without adult supervision	R. S. Market British	N/A	
8.2	Small cell and battery safety information		N/A	K

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IEC 62133-2: 2017				
Clause	Requirement – Test	Result – Remark	Verdict	
T. Ledghirds	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:	A State of the Sta	N/A	
A STATE OF THE STA	- Keep small cells and batteries which are considered swallowable out of the reach of children		N/A	
Oct. W	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion	and the state of t	N/A	
	- In case of ingestion of a cell or battery, seek medical assistance promptly	de de la companya del companya de la companya del companya de la c	N/A	

-			
9	Marking		P
9.10 <sup>r.1</sup>	Cell marking		Р
	Cells marked as specified in IEC 61960, except coin cells		N/A
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity	Not coin cells	N/A
Contraction of the Contraction o	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked	AND SECRETARIO	Р
9.2	Battery marking	O. O. O. O. C. C. C. C. C. C. C. C. C. C. C. C. C.	N/A
	Batteries marked as specified in IEC 61960, except for coin batteries		N/A
OK Technic	Coin batteries whose external surface area is too small to accommodate the markings on the		
	batteries show the designation and polarity.  Batteries also marked with an appropriate caution statement	Not coin batteries	N/A
	Terminals have clear polarity marking on the external surface of the battery		N/A
Off learning	Batteries with keyed external connectors designed for connection to specific end products need not		
,	be marked with polarity markings if the design of the external connector prevents reverse polarity connections	Harall Marie Control of the Control	N/A
9.3	Caution for ingestion of small cells and batteries		N/A

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	IEC 62133-2: 20°	17	
Clause	Requirement – Test	Result – Remark	Verdict
Set Telephore	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2	A State of the Sta	N/A
A Total Marine Burk	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	Other information to the control of	and the state of t	Р
	Storage and disposal instructions	Information for storage and disposal instructions mentioned in manufacturer's specifications.	P
Oct. Telephore	Recommended charging instructions	Information for recommended charging instructions mentioned in manufacturer's specifications.	Р

10	Packaging and transport		P
	Packaging for coin cells not small enough to fit	Not coin cell	N/A
A STATE OF THE STA	within the limits of the ingestion gauge of Figure 3	Not conticent	IN/A
OFT BOTTING	The materials and packaging design are chosen		
	so as to prevent the development of unintentional	ke*	P
	electrical conduction, corrosion of the terminals	A STATE OF THE STA	F
	and ingress of environmental contaminants	All String	

Annex A	Charging and discharging range of secondary lithiu	m ion cells for safe use	P
A.1	General		P
A.2	Safety of lithium ion secondary battery	Complied.	Р
A.3	Consideration on charging voltage	Complied.	Р
A.3.1	General	different distribution of the second	Р
A.3.2	Upper limit charging voltage	4.4V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint	4.4V applied.	N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	To Oct. British British	N/A
A.4	Consideration of temperature and charging current		P

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	IEC 62133-2: 20	17	
Clause	Requirement – Test	Result – Remark	Verdict
A.4.1	General Additional Section 1997		Р
A.4.2	Recommended temperature range	Charging temperature declared by client is: 5 ~45°C	Р
A.4.2.1	General		N/A
A.4.2.2	Safety consideration when a different recommended temperature range is applied		N/A
A.4.3	High temperature range	Charging high temperature declared by client is 45°C	N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range	45°C applied.	N/A
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		N/A
A.4.4	Low temperature range	Charging low temperature declared by client is 5°C	P
A.4.4.1	General		Р
A.4.4.2	Explanation of safety viewpoint		Р
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range	No. of the state o	Р
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	0°C applied.	P
A.4.5	Scope of the application of charging current	, and the second	P
A.4.6	Consideration of discharge		P
A.4.6.1	General		Р
A.4.6.2	Final discharge voltage and explanation of safety viewpoint	Battery specified final discharge voltage 3.0V, not exceed 3.0V specified by cell manufacturer.	P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging current		Р
A.5	Sample preparation	<u>.</u>	Р
A.5.1	General	light the state of	Р
A.5.2	Insertion procedure for nickel particle to generate internal short	Or John	P

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D.2

Method

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	IEC 62133-2: 20°	17						
Clause	Requirement – Test	Result – Remark	Verdict					
A.5.3	Disassembly of charged cell		Р					
A.5.4	Shape of nickel particle	Life Handis British	Р					
A.5.5	A.5.5.1 Insertion of nickel particle in winding core							
A.5.5.1	Insertion of nickel particle in winding core		N/A					
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A					
A.5.6	Insertion of nickel particle in prismatic cell	And the state of t	Р					
A.6	Experimental procedure of the forced internal short-circuit test	P						
A.6.1	Material and tools for preparation of nickel particle		Po					
A.6.2	Example of a nickel particle preparation procedure		P					
A.6.3	Positioning (or placement) of a nickel particle		Р					
A.6.4	Damaged separator precaution	a grand	Р					
A.6.5	Caution for rewinding separator and electrode	No. of the state o	P					
A.6.6	Insulation film for preventing short-circuit		Р					
A.6.7	Caution when disassembling a cell		Р					
A.6.8	Protective equipment for safety	140°	Р					
A.6.9	Caution in the case of fire during disassembling	La Salla Barrella Bar	Р					
A.6.10	Caution for the disassembling process and	Oct.	Р					
70110	pressing the electrode core							
A.6.11	Recommended specifications for the pressing device		P					
100	A CONTRACTOR OF THE PROPERTY O							
Annex B	Recommendations to equipment manufacturers an	d battery assemblers	N/A					
Г		K. J. British Co.						
Annex C	Recommendations to the end-users		N/A					
Annex	, as the state of							
D	Measurement of the internal ac resistance for coin	cells	N/A					
D.1	General	Not coin cells	N/A					

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A sample size of three coin cells is required for this

N/A

N/A

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Clause

3 Ω require no further testing

2	TSZB01210602002 Page 18	3 of 26	Report Date: 2021-07-19
	IEC 62133-2: 20	)17	
	Requirement – Test	Result – Remark	Verdict
	measurement:		
	Coin cells with an internal resistance of less than	at the last of the second	
	or equal to 3 $\Omega$ are subjected to the testing	A State of the sta	N/A
	according to Clause 6 and Table 1		OFT THE PARTY OF T
6	Coin cells with an internal resistance greater than		

N/A

	- Carrier Carrier			
Annex	Packaging and transport	and the state of t		D
E	Packaging and transport	Rafill to the last	M. S. C. Land B. C. Land	I
•		0.	20 AND AND	

Annex			SON.
	Component standards references	N/A	ļ
I F	·		

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Supplementary information:--

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`				Ĭ	
	Table: Critical components information				
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity
-Electrolyte	Zhuhai Guangrui	CR-ATJ005A	LiPF <sub>6</sub> , DMC, EMC, EC	IEC6213	Test with
	New Material Co., Ltd	Ollien	and the second second	3-2:2017	cell
-Separator	Shenzhen Zhuolang	7+2.5+3*60	PP+PE+PP three layers,	IEC6213	Test with
St. Way	New Energy Technology Co., Ltd		Shutdown temperature: 130°C	3-2:2017	cell
-Positive	Shenzhen Walworth	ZH5000B	LiCoO <sub>2</sub> , Conductive Additive	IEC6213	Test with
electrode	Technology Co., Ltd		PVDF, Aluminum Foil	3-2:2017	cell
					Man A
-Negative	Yuanjiang Ducheng	AG-1	Graphite, Conductive	IEC6213	Test with
electrode	New Material Technology Co., Ltd		Additive, Copper Foil	3-2:2017	cell
-Positive	Dongguan Oct testing	0.08*5*56*4.5	Aluminum belt,	IEC6213	Test with
electrode tab	xinjingyuan	*4.5	5mm*0.08mm	3-2:2017	cell
	Electronic Technology Co., Ltd		The state of the s	griffed a	
-Negative	Dongguan	0.08*5*56*4.5	Nickel belt, 5mm*0.08mm	IEC6213	Test with
electrode tab	xinjingyuan	*4.5		3-2:2017	cell
64.	Electronic Technology Co., Ltd	projection of the contract of	All the state of t		
-Aluminium	Shenzhen anborui	0.113µm	Nylon, PP, Aluminum	IEC6213	Test with
plastic film	New Material Co., Ltd		V Vota	3-2:2017	cell

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7.2.1 TABLE: Continuous charging at constant voltage (cells)						Р
Sample i	no.	Recommended charging voltage Vc (Vdc)	Recommended charging current $I_{rec}$ (A)	OCV before test (Vdc)	Resi	ılts
C01		4.4	0.8	4.393	Р	
C02		4.4	0.8	4.393	Р	
C03		4.4	0.8	4.393	Р	
C04		Returned 4.4	0.8	4.393	P	
C05		4.4	0.8	4.393	P P	

#### Supplementary information:

- No fire or explosion
- No leakage

				, Q <sub>E</sub>	all less at the	
7.3.1	ТАВ	LE: External short-	circuit (cell)			Р
Sample ı	10.	Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature rise ∆T (°C)	Results
		Samples char	ged at charging t	emperature uppe	er limit ( 45°C)	
C06		56.0	4.365	Oct. 81	107.3	Р
C07		56.0	4.362	85	103.5	Р
C08		56.0	4.363	80	106.7	P
C09		56.0	4.365	80	105.9	P
C10		56.0 st. day	4.364	83	114.3	Р
		Samples cha	rged at charging	temperature low	er limit ( 0°C)	
C11		56.3	4.261	86	98,5	Р
C12		56.3	4.264	82	98.0	Р
C13		56.3	4.263	81	95.2	Р
C14		56.3	4.263	84	103.9	Р
C15		56.3	4.266	Ort technical 81	103.6	Р

#### **Supplementary information:**

- No fire or explosion

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7.3.2	TA	TABLE: External short-circuit (battery)							
Sample r	10.	Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature rise ∆T (°C)	Component single fault condition	Results		
		V							
All files of the state of	í								
Chr. Bech.			and the series						
		S. Carrie	rille.	The state of the s					
			,	O October		A Charlestrich aus			

#### **Supplementary information:**

- No fire or explosion

A tectnica					
7.3.5	TABLE	:: Crush (cells)			Р
Sample	Sample no. OCV before test (Vdc)		OCV at removal of crushing force applied to the cell during crush (kN)		Results
		Samples charged at	charging temperature	upper limit ( 45°C)	
C2	6	4.359	4.358	13.10	Р
C2 <sup>-</sup>	7	4.362	4.361	13.09	Р
C28	8	4.358	4.357	13.11 13.11	Р
C29	9	4.365	4.364	13.08	Р
C3(	0	4.360	4.359	13.10	Р
		Samples charged a	t charging temperature	e lower limit ( 0°C)	
C3	1	4.261	4.260	13.11	Р
C3:	2	4.259	4.258	13.13	Р
C3:	3	4.262	4.261	13.09 gr. agent and a	Р
<b>©</b> 34	4	4.264	4.263	13.10	P
Martin C3	5	4.261	4.260	13.11	Р
		Markey Mark			

#### Note:

#### Supplementary information:

- No fire or explosion

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Site Location: Fangxing science park, Nanlian sixth industrial zone, Longgang street, longgang district, Shenzhen , Guangdong province, China 

Email: battery@ort-is.com

province, China 

Email: battery@ort-is.com



Report No.: ORTSZB01210602002 Page 22 of 26 Report Date: 2021-07-19

7.3.6	TABL	TABLE: Over-charging of battery					
Constant	_						
Supply vo	oltage (V	/dc)		arte de la companya della companya della companya de la companya della companya d		_	
Sample no. OCV before charg		OCV before charging (Vdc)	Total charging time (minute)		Maximum outer case temperature (°C)	Results	
The little and the li	\$						
	<	12 th and the second	18	Act desired street	and the state of t	)	
Suppleme	entary in	formation:			A STATE OF THE STA		

	7.3.7	TABL	ABLE: Forced discharge (cells)						
	Sample	no.	OCV before application of reverse charge (Vdc)	Measured reverse charge It (A)	Lower limit discharge voltage (Vdc)	Re	sults		
	orted C36		3.448	4.0	3.0		Р		
1	C37		3.457	4.0	3.0	and The state of t	Р		
	C38		3.450	4.0	3.0	Martinital State of the Control of t	Р		
	C39		3.435	4.0	3.0		P		
	C40		3.461	4.0	3.0		P		

#### Supplementary information:

- No fire or explosion

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A State of the sta

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7.3.8.1	TABLI	E: Vibration				N/A
Sample	no.	OCV before	OCV after test	Mass before	Mass after test	Results
		test (Vdc)	(Vdc)	test (g)	(g)	
					O. J. Skilan	· ·
	,		_			
La Carl Berthird Bon and Carl						
Suppleme	ntary inf	ormation:				
- No fire or	explosio	n of other	Marie 1	The thirty of the second	all de la la la la la la la la la la la la la	
- No rupture	e	(Illian)		OT.	All Sall bearings	
- No leakag	je					A STATE OF THE STA

7.3.8.2	TA	BLE: Mechanical s	shock	and the state of t		N/A
Sample	no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results
A State of the servic			ortice .			
		B. Cr. testrice		al de Africa		

#### Supplementary information:

- No fire or explosion
- No rupture

No venting

- No leakage



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7.3.9	TABI	LE: Forced internal	l short circuit (ce	lls)		Р
Sample no.		Chamber ambient T (°C)	OCV before test (Vdc)	Particle location <sup>1)</sup>	Maximum applied pressure (N)	Results
		Samples	charged at charg	ing temperature	upper limit	
C44		45	4.363	1	400	Р
c. C45		45	4.363	. 1	400	Р
C46		45 of the first of the state of	4.365	1	400	Р
C47		45	4.362	of the state of th	400	Р
C48		45	4.364	1	400	P
A STORY OF THE PARTY OF THE PAR	3	Samples	charged at charg	ing temperature	lower limit	
C49		0	4.260	1	400	Р
C50		O Rockstanding	4.266	A STATE OF THE STA	400	Р
C51		0	4.263	Ort or 1	400	Р
C52		0	4.261	1	400	P
C53		0	4.262	1	400	Р

D.2	TABLE:	TABLE: Internal AC resistance for coin cells					
Sample	e no.	Ambient T (°C)	Store time (h)	Resistance Rac (Ω)	Results 1)		
Orther		A STATE OF THE STA					
		Ottern	A State of the sta				
			OF ORTH	A STATE OF THE STA			

#### Supplementary information:

<sup>1)</sup> Coin cells with internal resistance less than or equal to 3  $\Omega$ , see test result on corresponding tables

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The state of the s

Report Date: 2021-07-19

# Appendix 1 Photos of product



Fig. 1—Front view of Cell

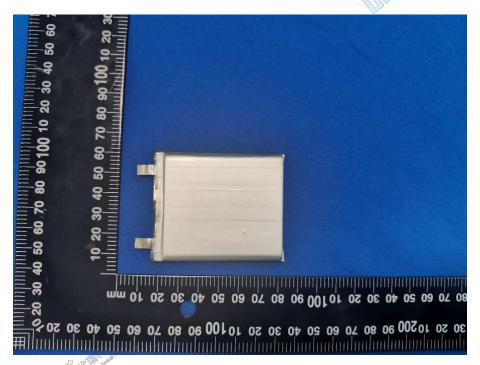


Fig. 2-Back view of Cell

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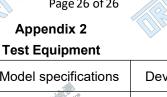
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# Appendix 2



No	Name Name	Model specifications	Device Number	Calibration validity
1	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-01	2022-07-13
2	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-10	2022-07-13
3	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-11	2022-07-13
4 distribution	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-12	2022-07-13
5	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-13	2022-07-13
6	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-14	2022-07-13
7	High-performance battery testing system	CT-4008-5V6A-S1	ORT-5V/6A-15	2022-07-13
8	Programmable constant temperature and humidity test chamber	WTH-225-40-OYO	ORTWD225-01	2022-05-27
9	Multimeter	17B+	ORT-WYB-01	2022-07-13
10	DC power supply	IT6723	ORT-DY-01	2022-05-27
11	Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-01	2022-07-13
12	Temperature controlled External short-circuit testing system	GX-6055-B	ORT-WDL-01-02	2022-07-13
13	Data acquisition instrument	2635A	ORT-CJY-02	2022-07-13
14	Drop test table	LX-DL-315	ORT-DL-01	2022-03-03
15	Thermal shock tester	GX-3020-B150T	ORT-RCJ-01	2022-07-13
16	Crush / needle tester	GX-5067-BM3T	ORT-JYZC-01	2022-05-27
17	Electromagnetic vibration tester	MPA406/M232A	ORTZD2000-01	2022-01-03
18	Electronic balance	HZK-JA510S	ORT-DZTP-02	2022-07-13
19	Mechanical Shock tester	IS500	ORTCJ-01	2022-03-03

End of Report \*\*\*

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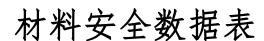
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Report No.: TSZ22120267-P03-R02



# Material Safety Data Sheet

报告本年度有 有效期至 2023 年 12 月 31 日

样品名称: 锂离子电芯

Sample name: Lithium ion cell

样品型号:

Sample model:

云南路飞新能源材料有限公司

645464

委托单位:

Yunnan Road Fei New Energy Materials

Applicant:

Co.,Ltd.

签发时间 Date of issue: 2022.12.29 Dec. 29, 2022

Written by

Approved by 段亿序

有限公司

Shenzhen Tiansu Calibration and Testing Co., Ltd.

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China Web: www.tiansu.org E-mail: tsjc@tiansu.org Tel: 0755-89457984





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Report No.: TSZ22120267-P03-R02

\* The MSDS is prepared based on the information provided by client. The contents and formats of this MSDS are revised as per client's request. 这份材料安全数据表是根据客户提供的信息编辑,其内容和格式按客户要求来修订。

K	部分-化学品及企	11. 1- 17
第一	前分一化字而及作	W 76T 151

# Section 1-Chemical Product and Company Identification

产品名称	锂离子电芯
Product Name	Lithium ion cell
Model	645464
商标	
Trade Mark	
额定参数	2.05\//4000; Ab./45.4\Alb
Ratings	3.85V/4000mAh/15.4Wh
重量	54.0a
Weight	51.9g
制造商	云南路飞新能源材料有限公司
Manufacturer	Yunnan Road Fei New Energy Materials Co.,Ltd.
制造商地址	云南省保山市腾冲市边境经济开发合作区高新技术产业园1号
Manufacturer	NO.1 high tech industrial Park,Tengchong border economic
Address	development and cooperation zone ,Baoshan City,yunnan Province
应急电话	0875-5189928
Emergency Telephone	0070-0108820
传真	
Fax	<del></del>

# 第二部分-成分信息

# **Section 2- Composition Information**

化学成分	化学式	CAS号	重量含量(%)
Chemical Composition	Chemical Formula	CAS No.	Weight (%)
钴酸锂	LiCoO <sub>2</sub>	12190-79-3	15 - 40
Lithium cobaltate		12190-79-3	15 - 40
石墨	С	7782-42-5	10 - 30
Graphite	C	1102-42-3	10 - 30
六氟磷酸锂			
Lithium	LiPF <sub>6</sub>	21324-40-3	10 - 30
hexafluorophosphate			
铜箔	Cu	7440-50-8	7-13
Copper	Cu	/ 440-50-0	1-13

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	1 agc	3/ II Fages			
铝箔 Aluminium	Al	7429-90-5	5-10		
· · · · · · · · · · · · · · · · · · ·					
.,	Ni	7440-02-0	1-5		
Nickel	<b>放一</b> 和 //	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
	第二部分	~- 危险性概述			
	Section 3- Hazards Identification				
紧急情况概述	不适用				
Emergency overview	N/A				
标签元素 Label elements:					
危险标签图	 不适用				
Hazard pictogram(s)	Not Applicable				
提示语					
Signal word	Not Applicable				
危险声明	不适用				
Hazard statement(s)	Not Applicable				
预防声明	, , , , ,				
Precautionary statemen	t (s) :				
预防	不适用				
Prevention	Not Applicable				
反应	不适用				
Response	Not Applicable				
废弃处理   Dianagal	不适用				
Disposal 环境危害	Not Applicable				
小児児古   Environmental hazards:	无相关信息 ental hazards: No relevant information				
重要症状	S: NO relevant information     见第11部分更多信息				
主文 並 \( \text{Important symptoms:} \)					
See section 11 for more information					
· · · · · · · · · · · · · · · · · · ·					
	Section 4- Fi	rst Aid Measures			
	万一接触,立即,	用大量的清水冲洗至少15分钟,	翻起上下眼睑,直到化学的残		
眼睛接触	留物消失为止,	迅速就医。			
Eye contact	Flush eyes with	plenty of water for least $15\ \mathrm{m}$	inutes, occasionally lifting the		
	upper and lowe	r eyelids. Get medical aid.			
	万一接触,用大	量的水冲洗至少15分钟,同时图	余去污染的衣物和鞋子, 迅速就		
皮肤接触	医。				
Skin contact			with plenty of water or shower		
		Get medical aid.			
吸入		至空气清新处,如果呼吸困难约			
Inhalation		xposure and move to fresh a	ir immediately. Use oxygen if		
	available.	1 1 11 11 11 11 11 11 11 11 11 11 11 11	(are the color of		
摄入			取催吐的方法,并且立即就医。		
Ingestion		_	uce vomiting unless patient is		
	unconscious. C	ali a pnysician.			

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Report No.: TSZ22120267-P03-R02

第五部分-消防措施		
Section 5- Fire Fighting Measures		
燃点	不适用	
Flash Point	N/A	
自燃温度	不适用	
Auto-Ignition Temperature	N/A	
灭火介质	水, 二氧化碳	
Extinguishing Media	H <sub>2</sub> O, CO <sub>2</sub>	
特殊灭火程序	自给式呼吸器	
Special Fire-Fighting Procedures	Self-contained breathing apparatus	
异常火灾或爆炸	   当电芯暴露于过热的环境中时,安全阀可能会打开	
Unusual Fire and Explosion Hazards	Cell may vent when subjected to excessive heat-exposing battery contents	
燃烧产生的危险物品	一氧化碳,二氧化碳,锂氧化物烟气	
<b>Hazardous Combustion Products</b>	Carbon monoxide, carbon dioxide, lithium oxide fumes.	

第六部分-泄露应急处理

## Section 6- Accidental Release Measures

#### 个人预防措施、保护设备和应急程序:

如果电池被泄露,让人员离开该区域直到烟雾消散。提供最大限度的通风,清除有害气体。首选的反应就是离开这个地区并消散气体,避免皮肤和眼睛接触或吸入气体。用吸收剂清除溢出的液体然后焚烧。如果电池泄漏发生时,液体可以用砂、泥土或其他惰性物质来吸收,污染区域应该保持通风。

#### Personal precautions, protective equipment and emergency procedures:

If the battery is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate, Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage of the battery happens, liquid could be absorbed by using sand, earth or other inert substance and contaminated area should be ventilated meantime.

#### 环境预防措施:

不允许产品到达排水系统或任何水源。 如果渗透进排水系统或任何水源,通知相应的部门。

不允许进入下水道/表面或地下水。

#### **Environment precautions:**

Do not allow product to reach sewage system or any water source.

Inform respective authorities in case of seepage into water course or sewage system.

Do not allow to enter sewers/ surface or ground water.

#### 抑制和清理材料的方法:

如果电池外壳被拆除,少量电解液可能会泄漏。收集所有材料放进一个塑料容器。根据当地的法律法规来处置,避免可溶物质进入大地、下水道或水源。

#### Methods and material for containment and cleaning up:

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic

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lined container. Dispose off according to the local law and rules, Avoid leached substances to get into the earth, canalization or waters.

第七部分-操作处置和储存				
Section 7- Handling and Storage				
操作处置 <b>Handling</b>	禁止打开、毁坏或焚烧电池,因为电池有可能在这些处理过程中发生爆炸、破裂或泄露等事故。 禁止将电池短路、过充、强制放电或扔入火中。 禁止挤压或刺穿电池,或将电池浸入溶液中。 The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.			
储存 Storage	禁止物理或电滥用,禁止高温储存,最好将电池储存在阴凉、干燥、通风及温度变化较小的环境中。 禁止将电池接触加热设备,或将电池长时间直接暴露在阳光中。 Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.			
其他要注意的防范措施 Other Precautions	拆解、挤压、直接放入火中或高温条件下,电池可能发生爆炸和燃烧。禁止短接或将电池正负极错误的安装在设备中。 The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.			
第八部分-接触控制和个体防护 Section 8- Exposure Controls/Personal Protection				
设计控制 Engineering Controls	设计局部排气通风或其它设计来控制粉尘、雾、烟雾和气体。 Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor.  Keep away from heat and open flame. Store in a cool, dry place.			

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	呼吸防护:在正常情况下不需要。
	  皮肤和身体防护:在正常情况下不需要,如果处理一个裂开的或泄漏的电池需
	要穿戴适当的防护服和手套。
	手保护: 如果处理一个裂开的或泄漏的电池需要戴适当手套。
	   眼睛保护:在正常情况下不需要,如果处理一个裂开的或泄漏的电池需要戴上
   个人防护装备	安全眼镜。
Personal Protective Equipment	Respiratory Protection: Not necessary under normal conditions.
	Skin and body Protection: Not necessary under normal conditions, Wear suitable protective clothing and gloves if handling an open or leaking battery.
	Hand protection: Wear suitable gloves if handling an open or leaking battery.
	Eye Protection: Not necessary under normal conditions, Wear safety glasses if handling an open or leaking battery.
11 . 3 . 15 . 31. 4.	在工作区域应该有一个立即可以使用的安全淋浴和喷水洗眼器。
其它防护装备 Other Protective Equipment	Have a safety shower and eye wash fountain readily available in the
Other Protective Equipment	immediate work area.
   卫生措施	在工作区域不得进食,饮水或吸烟。
Hygiene Measures	Do not eat, drink, or smoke in work area. Maintain good housekeeping.
Hygiene Measures	Do not eat, drink, or smoke in work area. Maintain good housekeeping. 第九部分-物理和化学特性
	第九部分-物理和化学特性
Section 9-	第九部分-物理和化学特性 Physical and Chemical Properties
Section 9- 颜色 Color	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver
Section 9-  颜色 Color	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver 不适用
Section 9- 颜色 Color 气味 Odour	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver 不适用 Not Applicable
Section 9-  颜色 Color  气味 Odour  酸碱度	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver  不适用 Not Applicable  不适用
Section 9-  颜色 Color  气味 Odour  酸碱度 pH	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable
Section 9-  颜色 Color 气味 Odour 酸碱度 pH 熔点/凝固点	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver  不适用 Not Applicable  不适用 Not Applicable  不适用
Section 9-  颜色 Color  气味 Odour  酸碱度 pH  熔点/凝固点 Melting point/freezing point	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable
Section 9-  颜色 Color  气味 Odour  酸碱度 pH  熔点/凝固点 Melting point/freezing point 沸点、沸点范围:	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Total
Section 9-  颜色 Color 气味 Odour 酸碱度 pH 熔点/凝固点 Melting point/freezing point 沸点、沸点范围: Boiling Point and Boiling range	第九部分-物理和化学特性  Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable
Section 9-  颜色 Color  气味 Odour  酸碱度 pH  熔点/凝固点 Melting point/freezing point 沸点、沸点范围: Boiling Point and Boiling range	第九部分-物理和化学特性 Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable
Section 9-  颜色 Color 气味 Odour 酸碱度 pH 熔点/凝固点 Melting point/freezing point 沸点、沸点范围: Boiling Point and Boiling range 易燃度 Flash Point	第九部分-物理和化学特性 Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable
Section 9-  颜色 Color  气味 Odour  酸碱度 pH  熔点/凝固点 Melting point/freezing point 沸点、沸点范围: Boiling Point and Boiling range 易燃度 Flash Point 自燃或爆炸的上、下极限 Upper/lower flammability or explosive limits	第九部分-物理和化学特性 Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable
Section 9- 颜色 Color 气味 Odour 酸碱度 pH 熔点/凝固点 Melting point/freezing point 沸点、沸点范围: Boiling Point and Boiling range 易燃度 Flash Point 自燃或爆炸的上、下极限 Upper/lower flammability or	第九部分-物理和化学特性 Physical and Chemical Properties  银色 Silver 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable 不适用 Not Applicable

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蒸汽密度	不适用			
Vapor Density	Not Applicable			
相对密度	不适用			
Relative density	Not Applicable			
水溶性	不适用			
Solubility in Water	Not Applicable			
自燃温度	不适用			
Auto-ignition temperature	Not Applicable			
分解温度	不适用			
Decomposition temperature	Not Applicable			
蒸发速率	不适用			
Evaporation rate	Not Applicable			
易燃性(土壤、天然气)	不适用			
Flammability (soil, gas)	Not Applicable			
粘性	不适用			
Viscosity	Not Applicable			
	第十部分 稳定性和反应活性			
Sect	ion 10- Stability and reactivity			
稳定性	产品在第七部分所述的条件下稳定			
Stability	The product is stable under conditions described Section 7			
应避免的条件	加热 70°C 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路,长时间暴露在潮湿的条件下。			
Conditions to Avoid	Heat above 70°C or incinerate. Deform, Mutilate, Crush, Disassemble, Overcharge, Short circuit, Expose over a long period to humid conditions.			
	氧化剂,酸,碱。			
Incompatible Materials	Oxidizing agents, acid, base.			
-	Ondizing agente, adia, base.			
危险分解物	一氧化碳、二氧化碳、氧化锂烟雾。			
Hazardous Decomposition Products	Carbon monoxide, carbon dioxide, lithium oxide fumes.			
危险反应的可能性	アゾロ			
Possibility of Hazardous	不适用			
Reaction	Not Applicable			
	第十一部分-毒理学资料			
Section	n 11 - Toxicological Information			
刺激	如果电芯的外壳受到机械、热或电的滥用到达一定程度,会发生刺激的风险。			
	•			

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Irritation

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Risk of irritation occurs only if the cell is mechanically, thermally or
如果发生这种情况,可能会刺激皮肤、眼睛和呼吸道。

electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.

致过敏 不适用

Not Applicable Sensitization

影响神经系统 不适用

Not Applicable **Neurological Effects** 

致畸 不适用

Not Applicable **Teratogenicity** 

再生毒性 不适用

Not Applicable **Reproductive Toxicity** 

诱变(遗传效应) 不适用

Not Applicable **Mutagenicity (Genetic Effects)** 

附带材料毒理性

**Toxicologically Synergistic Materials** 

Not Applicable

不适用

# Section 12- Ecological Information

第十二部分-生态学资料

生态毒性 不适用 Not Applicable **Ecological Toxicity** 

在土壤中的流动性 不适用

Not Applicable Mobility in soil

持久性和分解性 不适用

Not Applicable Persistence and Degradability

生物聚积 不适用

Not Applicable **Bioaccumulation potential** 

其他不利影响 不适用

Not Applicable Other Adverse Effects

第十三部分-废弃处置

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Section 13- Disposal Considerations	
产品废弃处理建议 Product disposal recommendation	遵守当地、州和联邦法律和法规。 Observe local, state and federal laws and regulations.
包装处理建议 Packaging disposal recommendation	废弃处理必须根据当地法规 Disposal must be made according to official regulations
	第十四部分-运输信息
Secti	on 14 - Transport Information
运输标签 Label for conveyance	锂电池标签 Lithium Battery Label
UN 编号 UN Number	UN 3480 或 UN 3481 UN 3480 or UN 3481
运输风险类别 Transport hazard class(es)	9
包装等级 Packing group	
海洋污染物 Marine pollutant	无污染 No
联合国运输专用名称 UN Proper shipping name	锂离子电池(包括锂离子聚合物电池) Lithium ion Batteries (Including lithium ion polymer batteries) 锂离子电池和设备包装在一起(包括锂离子聚合物电池) Lithium ion Batteries packed with equipment (Including lithium ion polymer batteries) 设备里内含锂离子电池(包括锂离子聚合物电池) Lithium ion Batteries contained in equipments (Including lithium ion polymer batteries)
ICAO/IATA	可根据国际民用航空组织(ICAO),TI 或国际航空协会(IATA) DGR 64 版本包装说明 965 第 IB 节规定或 966~967 第 II 节规定进行空运 Can be shipped by air in accordance with international Civil Aviation Organization (ICAO),TI or International Air Transport Association(IATA)DGR 64 <sup>th</sup> Packing Instructions Section IB of 965 or Section II of 966~967 appropriately.

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IMDG CODE	《国际海运危险货物规则》特殊规定 188 IMDG CODE (Amdt 41-22) International Maritime Dangerous Goods Code under Special Provision 188 IMDG CODE (Amdt 41-22)
ADR	《国际危险货物道路运输欧洲协定》(ADR)根据特殊规定 188 European Agreement concerning the International Carriage of Dangerous Goods by Road under Special Provision 188
RID	《国际危险货物铁路运输欧洲协定》(RID)根据特殊规定 188 Regulations concerning the International Carriage of Dangerous Goods by Rail under Special Provision 188

危险品规例规定,运输前,每一个电池设计须通过联合国试验和标准手册38.3节所载的测试。

The dangerous goods regulations require that each battery design be subject to tests contained in Section 38.3 of the UN Manual of Tests and Criteria prior to being offered for transport.

第十五部分 法规信息

# Section 15- Regulatory information

#### 法律信息

#### Law information

《危险物品规则》

《Dangerous Goods Regulations》

《对危险货物运输的有关规定的建议》

《Recommendation on the Transport of Dangerous Goods Model Regulations》

《国际海运危险货物规则》

《International Maritime Dangerous Goods》

《危险品安全运输技术指令》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物分类和品名编号》

《Classification and code of dangerous Goods》

《消费产品安全法》

《Consumer Product Safety Act》(CPSA)

《联邦环境污染控制法》

《Federal Environmental Pollution Control Act》(FEPCA)

《资源保护及恢复法案》

《Resource Conservation and Recovery Act》(RCRA)

《国际危险货物道路运输欧洲协定》

《European Agreement concerning the International Carriage of Dangerous》

《国际危险货物铁路运输欧洲协定》

《Regulations concerning the International Carriage of Dangerous》

根据所有联邦、州和地方法律。

In according with all Federal, State and local laws.

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#### 第十六部分-其它信息

## Section 16- Other Information

上面的信息被认为是准确代表了目前最好的信息提供给我们。然而,飞机没有对商品性能保证或任何其他保证,包括明示或暗示,对这类信息的使用我们不承担责任。用户应作出自己的调查,以确定是否适合其特定用途的信息。虽然在此处所包含的数据的准备已经采取了合理的预防措施,这是仅为你提供的信息、考虑和调查。这个化学品安全技术说明书为本产品提供了安全操作指南和使用指南,它并不能对所有可能发生的情况提供建议,因此,您特殊使用该产品应先进行评估,以确定是否需要额外的预防措施。

The information above is believed to be accurate and represents the best information currently available to us. However, concorde makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

-- End of Report ---- 报告结束 --

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中国认可 国际互认 检测 **TESTING CNAS L5138** 

# 1.2m 跌落测试报告 1.2m Drop Test Report

样品名称: 锂离子电芯

Lithium ion cell Sample name:

> 样品型号: 645464

Sample model:

云南路飞新能源材料有限公司 委托单位:

Yunnan Road Fei New Energy Materials

Applicant: Co.,Ltd.

有限公司

and Testing Co., Ltd. Shenzhen Tiansu Callbration

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China Web: www.tiansu.org

E-mail: tsjc@tiansu.org Tel: 0755-89457984





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W.C 2		Page 275 Pages		
委托单位	名称 Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.		
Applicant	地址 Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province		
	名称 Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.		Co.,Ltd.
地址 Address 制造单位 本 Address 和 Address 本 Address 本 Address 本 Address 本 Address 本 Address 本 Address 和 Address 和 Address 和 Address 和 Address 和 Address 和 Address		border economic		
Manufacturer	电话 Phone number	0875-5189928	邮箱 Email address	2411318566@qq.com
	网址 Website			
测试实验室	名称 Name	深圳天溯计量检测股份有限公司 Shenzhen Tiansu Calibration and Testing Co., Ltd.		
Testing laboratory	地址 Address	深圳市龙岗区宝龙街道银 B/1,4, NO.2 Jinlong F		、4 栋 District, Shenzhen, China
测试标准	联合国《关于危险货物运输的建议书一规章范本》第 3. 3 章节 188 款 ST/SG/AC. 10/1/Rev. 21 Chapter3. 3/Special provisions 188			
Test Standard	United nations "recommendations on the TRANSPORT OF DANGEROUS GOODS" model Regulations (21 Rev. Edition) Chapter3. 3/Special provisions 188.			
测试日期 Test date	2022.12.14 to 2022.12.16			

#### Test conclusion:

#### 检测结论:

由 云南路飞新能源材料有限公司送检的锂离子电芯 的包装件 1.2m 跌落测试依据《关于危险货物运输的建议书》规章范本 第21修订版进行检测。试验结果符合《关于危险货物运输的建议书》规章范本第21修订版相关要求。

The 1.2m drop test of the packages for Lithium ion cell submitted by Yunnan Road Fei New Energy Materials Co.,Ltd. is tested according to the 21st Revised Edition of the Recommendations on the Transport of Dangerous Goods, Model Regulations (ST/SG/AC. 10/1/Rev. 21).

签发日期 Date of issue: 2022.12.16

陈伟悦 Reviewed by 中伟超



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# 一、基本信息 Basic information

样品名称 Sample name	锂离子电芯 Lithium ion cell	样品型号 Sample model	645464
标称电压 Nominal voltage	3.85V	额定能量 Ratings energy	15.4Wh
内含数量 Number	189 PCS	商标 Trade mark	
包装件重量 Packaging weight	10.9kg	包装件尺寸 Packaging dimensions	L*W*T(365mm*270mm*160 mm)
外包装 Outer packing	瓦楞纸 Corrugated paper	内包装 Inside packing	塑料 Plastics
包装方式 Type of packing	单独运输电池 Cells or batteries only		
每包装件电池净重 Net quantity of batteries per package	9.809kg		

#### 二、1.2米跌落测试 1.2m drop test

_ \ = \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				
No.	Test item	Test method	Result	Remark
序号	试验项目	试验依据	结果	备注
1	1.2米跌落测试 1.2m drop test	联合国《关于危险货物运输的建议书一规章范本》第3.3章节188款ST/SG/AC. 10/1/Rev. 21 Chapter3. 3/Special provisions 188 United nations "recommendations on the TRANSPORT OF DANGEROUS GOODS" model Regulations (21 Rev. Edition) Chapter3. 3/Special provisions 188.	合格 Pass	

## Drop position跌落方向:

Drop position 跌落方向	Top 上面	Front 前面	Side 侧面	Edge 棱	Angle <sup>街</sup>
Status	→ 上四 合格/Pass	合格/Pass	合格/Pass		合格/Pass
包装状态	合格/Pass	合格/Pass	合格/Pass	合格/Pass	合俗/Pass

#### 三、测试要求描述 Testing requirements description:

每个电芯或电池的包装件或者完全包装件必须能承受 1.2 米跌落测试,每个包装件进行 5 次不同方向的跌落测试,而不造成包含在其中的电池或电芯的损坏,不造成使电池与电池(电芯与电芯)接触的内含物的移动和内含物的释出。

The package of batteries is dropped from 1.2m 5 times per package. Each package is capable of withstanding a 1.2m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the content so as to allow battery to battery (cell to cell) contact and without release of contents.

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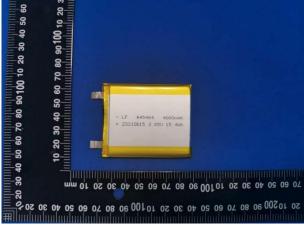
Report No.: TSZ22120267-P03-R03

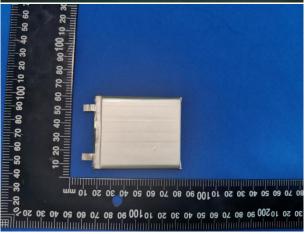
# THE PHOTO OF SAMPLE 样品图片











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Report No.: TSZ22120267-P03-R03

# 声明

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- 1. 本报告无检测单位印章无效。
  The test report is invalid without the official stamp of Tiansu.
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- 5. 本报告仅与送检样品有关。
  The test report is valid for the tested samples only.
- 6. 样品信息和客户信息由申请人提供,本实验室不对其真实性负责。
  Product information and customer information provided by the applicant, we are not responsible for its authenticity.
- 7. 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 Tiansu within 15 days.

————————报告结束———————
End of report

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Report No.: TSZ22120267-P03-R04





中国认可 国际互认 检测 TESTING CNAS L5138

# 堆码试验报告 Stacking test Report

样品名称: 锂离子电芯

Sample name: Lithium ion cell

样品型号:

645464

Sample model:

云南路飞新能源材料有限公司

委托单位:

Yunnan Road Fei New Energy Materials

**Applicant:** 

Co.,Ltd.

深圳天洲計量检测股份有限公司

Shenzhen Tiansu Calibration and Testing Co., Ltd.

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China Web: www.tiansu.org E-mail: tsjc@tiansu.org

E-mail: tsjc@tiansu.org Tel: 0755-89457984





Report No.: TSZ22120267-P03-R04 Page 2 / 6 Pages

ACCEPTAGE SECTION		Page 276 Pages	
委托单位	名称 Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.	
Applicant	地址 Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province	
包装件	名称 Name	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.	
制造单位 Manufacturer	地址 Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province	
包装容器 制造商	名称 Name	开平市开隆纸品包装有限公司 Kaiping Kailong Paper Packaging Co., LTD	
Manufacturer of packing containers	地址 Address	开平市水口镇新风开发区长安西街 6-8 号 No.6-8, West Chang 'an Street, Xinfeng Development Zone, Shuikou Town, Kaiping City	
测试实验室	名称 Name	深圳天溯计量检测股份有限公司 Shenzhen Tiansu Calibration and Testing Co., Ltd.	
Testing laboratory	地址 Address	深圳市龙岗区宝龙街道锦龙大道 2 号 1 栋、4 栋 B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China	
测试标准 Test Standard	联合国《关于危险货物运输的建议书》规章范本 UN/ST/SG/AC.10/1/Rev.22/6.1.5.6 条款. Test standard: 22st Revised Edition of the Recommendations on the Transport of Dangerous Goods, Model Regulations (ST/SG/AC.10/1/Rev.22) Clause 6.1.5.6.		
测试日期 Test date	2022.12.14 to 2022.12.17		
T4			

# Test conclusion:

#### 检测结论:

由 云南路飞新能源材料有限公司送检的锂离子电芯 的包装件堆码测试依据《关于危险货物运输的建议书》规章范本第22 修订版进行检测。试验结果符合《关于危险货物运输的建议书》规章范本第22修订版相关要求。

The Stacking test of the packages for Lithium ion cell submitted by Yunnan Road Fei New Energy Materials Co., Ltd. is tested according to the 22st Revised Edition of the Recommendations on the Transport of Dangerous Goods, Model Regulations (ST/SG/AC.10/1/Rev.22).

签发日期 Date of issue: 2022.12.17



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Report No.: TSZ22120267-P03-R04

## 一、基本信息 Basic information

	外包装材料 Outer packing materials	瓦楞纸 Corrugated paper	内包装材料 Inside packing materials	塑料 Plastics
包装件信息	封闭装置 Closures	胶封	最大容量 Maximum capacity	189PCS
Information about the package	包装件尺寸 Packaging dimensions	L*W*T(365mm*270mm*160mm)	包装件重量 Packaging weight	10.9kg
	制造方法 method of manufacture	/	每包装件电池净重 Net quantity of batteries per package	9.809kg
内部电池 信息	样品名称 Sample name	锂离子电芯 Lithium ion cell	样品型号 Sample model	645464
Information about the	标称电压 Nominal voltage	3.85V	额定能量 Ratings energy	15.4Wh
battery inside	尺寸 Dimension	L*W*T(65.0mm*55.0mm*6.5mm)	重量 Weight	51.9g

# 二、堆码测试 Stacking test

No.	Test item	Test method	Result	Remark
序号	试验项目	试验依据	结果	备注
		联合国《关于危险货物运输的建议书》规章范本		
		UN/ST/SG/AC.10/1/Rev.22/6.1.5.6条款.		
4	堆码测试	Test standard: 22st Revised Edition of the	Pass	
1	Stacking test	Recommendations on the Transport of Dangerous	合格	
		Goods, Model Regulations (ST/SG/AC.10/1/Rev.22)		
		Clause 6.1.5.6.		

测试时的温度	测试时的湿度	加载的负荷
21.8℃	51%RH	1922.8N

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Report No.: TSZ22120267-P03-R04

#### 三、测试要求描述 Testing requirements description:

在试验样品的顶部表面施加一力量,此力相当于运输时可能堆叠在它上面的同样数量包装件的总重量。如果试验样品内装的液体相对密度与待运液体不同,则该力应按后者计算。包括试验样品在内的最小堆码高度应是 3 米。试验时间为 24 小时,但拟装的塑料桶、罐和复合包装 6HH1 和 6HH2,应在不低于 40℃的温度下经受 28 天的堆码试验。

The test sample shall be subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during transport; Where the contents of the test sample are liquids with relative density different from that of the liquid to be transported, the force shall be calculated in relation to the latter. The minimum height of the stack including the test sample shall be 3 meters. The duration of the test shall be 24 hours except that plastics drums, jerricans, and composite packagings 6HHl and 6HH2 intended for liquids shall be subjected to the stacking test for a period of 28 days at a temperature of not less than 40°C.

试验样品不得泄漏。对复合或组合包装而言,不得有所装的物质从内贮器和内包装中漏出。试验样品不得显出可能对运输安全有不利影响的损坏,或者可能降低其强度或造成包装件堆码不稳定的变形。在进行评估之前,塑料包装应该冷却至环境温度。

No test sample may leak. In composite packagings or combination packagings, there shall be no leakage of the filling substance from the inner receptacle or inner packaging. No test sample may show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages. Plastics packagings shall be cooled to ambient temperature before the assessment.

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Report No.: TSZ22120267-P03-R04

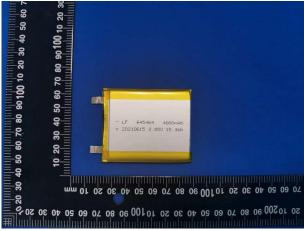
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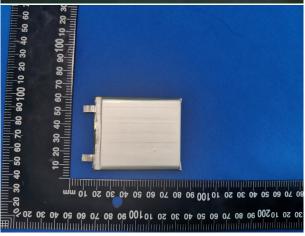












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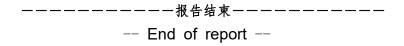
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- 6. 样品信息和客户信息由申请人提供,本实验室不对其真实性负责。
  Product information and customer information provided by the applicant, we are not responsible for its authenticity.
- 7. 准备提交运输的包装已按照本章的有关要求进行试验,使用其他打包方法或部件可能使其失效。

The packaging prepared as for transport was tested in accordance with the appropriate requirements of this Chapter and that the use of other packaging methods or components may render it invalid.

8. 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 Tiansu within 15 days.



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J3-2022-A01-0122



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Report No.: TSZ22120267-P03-R05

# 锂电池

符合特殊规定 188

# 海运运输条件鉴别报告书

Identification and Classification Report for Sea Transport of Goods

本 报 告 本 年 度 有 效 有效期至 2023 年 12 月 31 日

样品名称: 锂离子电芯

Sample name: Lithium ion cell

样品型号: 645464

Sample model:

云南路飞新能源材料有限公司

委托单位:
Yunnan Road Fei New Energy Materials

Applicant: Co.,Ltd.

深圳天洲計量检测股份有限公司

Shenzhen Tiansu Calibration and Testing Co., Ltd.

Address: B/1,4, NO.2 Jinlong Road, Longgang District, Shenzhen, China





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Report No.: TSZ22120267-P03-R05

	Page 275 Pages		
鉴别目的 Identification Purpose	是否属于海运危险品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2022.12.29 Dec. 29, 2022
鉴别依据 Identification Criteria	IMDG CODE (Amdt 41-22)		
委托单位 Client	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials Co.,Ltd.		
地址 Client Address	云南省保山市腾冲市边境经济开发合作区 NO.1 high tech industrial Park,Tengchon development and cooperation zone ,Bao	g border economic	vince
制造商 Manufacturer	云南路飞新能源材料有限公司 Yunnan Road Fei New Energy Materials	Co.,Ltd.	
地址 Manufacturer Address	云南省保山市腾冲市边境经济开发合作区高新技术产业园 1 号 NO.1 high tech industrial Park,Tengchong border economic development and cooperation zone ,Baoshan City,yunnan Province		
物品名称 Name of Goods	锂离子电芯 Lithium ion cell		
	型号规格: Model/Type	645464/3.85V/15.4	Wh
	尺寸 Dimensions	65.0mm*55.0mm*6	.5mm
物品信息	外观 Appearance	近长方体 Approximate Cuboid	
Nature of the goods	每包装件电池/电芯数目 Net number of batteries/cell per package	189 PCS	
	UN38. 3 报告编号 UN38. 3 report No.	ORTSZB01210601	025
	1. 2m 跌落测试报告为 1. 2m drop test report No.	TSZ22120267-P03	-R03
鉴别结论 Conclusion	非限制性 Not subject these Regulations 根据特殊规定 188,该物品不受 IMDG CODE 限制。 The article is not restricted to IMDG CODE according to special provision 188		
备注 Comment	每一电池必须做好防短路措施,并装入坚固外包装内。 Each single battery must be packed in such a way as to prevent short circuits normal conditions and packed in strong outer packaging.		

王 检 Tested by 陈伟悦

<sup>軍 核</sup> ア Reviewed by

虾伟超

批准 Approved by Report Seal (01-03)

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7ian Su Page 3/5 Page	Report No.: TSZ22120267-P03-R05
鉴别项目名称	检查结果
Item	Inspection Result
该电池额定瓦特小时数为 15.4Wh Watt-hour rating of the battery is 15.4Wh	≤20 Wh
该电池已通过 UN38. 3 测试 Each battery is of a type proved to meet the Requirements of each test in the UN MANUAL OF TESTING AND CRITERIA, Part III, sub-section 38.3	符合 Conform
电池按照规定的质量管理体系进行制造 Batteries be manufactured under a quality management programmer.	符合 Conform
该锂电池不属于召回电池,不属于废弃和回收电池 The lithium batteries don't belong to batteries returned to the manufacturer for safety reasons, are not waste lithium batteries and not lithium cells being shipped for recycling or disposal.	符合 Conform
通过包装件 1.2 米跌落试验 Each package is capable of withstanding a 1.2m drop test in any orientation	符合 Conform
每个包装件上均有锂电池操作标签。 每票货物均有随附文件说明:包装件内装锂离子电池;必须 小心操作。如包装件破损,有易燃危险品;包装件破损时应 采取的特殊措施,包括必要时的检查和重新包装;应急电话 号码。 Each package is labeled with lithium battery handing label. Each consignment is accompanied with a document with an indication that: The package contains lithium ion batteries; The package must be handled with care, and that a flammability hazard exists if the package is damaged; Special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and A telephone number for	符合 Conform

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additional information





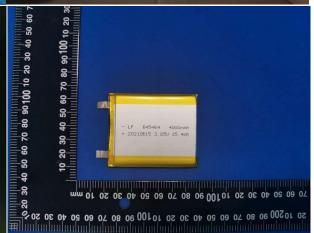
Report No.: TSZ22120267-P03-R05 Page 4 / 5 Pages

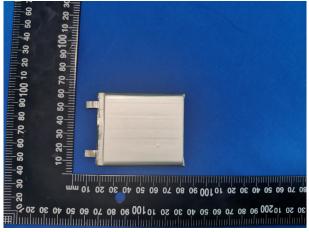
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Report No.: TSZ22120267-P03-R05

# **STATEMENTS**

I. 本公司依据委托人(托运人或其代理人)提供的物品及其运输信息,确定货物的运输条件并出具此报告书。

The report is issued by Shenzhen Tiansu Calibration and Testing Co., Ltd according to the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要,本公司要求委托人提供真实、完整的货物样品及资料。

According to the demanded of identification and classification, SHENZHEN TIANSU CALIBRATION AND TESTING CO., LTD requires the applicant to provide true and exact sample and data of the cargo.

3. 委托人保证申报的物品/或提供的样品与交运的货物是同一种物质。

The applicant guarantees that the declared goods and/or the sample who provides should be identical with the contents of cargo that is to be transported.

4. 本公司仅对样品的鉴别结果负责。

SHENZHEN TIANSU CALIBRATION AND TESTING CO., LTD is only responsible for the identification and classification of the sample provided by the applicant.

5. 本报告书经主检员、审批人和批准人签字并加盖本公司印章后生效。

This report will be effective only after is signed by inspector, checker and approver, and stamped by SHENZHEN TIANSU CALIBRATION AND TESTING CO., LTD.

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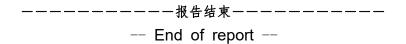
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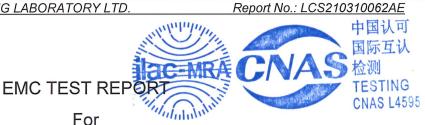
8. 报告书仅在本年度有效。

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Shenzhen yanbu technology co. LTD

Magnetic absorption wireless charging mobile power supply

Test Model: E29B

Additional Model No.: E29A

Prepared for

: Shenzhen yanbu technology co. LTD

Address

: 6 / f, building B, xinyongfeng industrial park, lezhujiao

village, xixiang, baoan district, shenzhen

Prepared by

: Shenzhen LCS Compliance Testing Laboratory Ltd.

Address

: Room 101, 201, Building A and Room 301, Building C,

Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao' an District, Shenzhen, Guangdong, China

(+00)755 00504000

Tel

: (+86)755-82591330

Fax Web : (+86)755-82591332

Mail

: www.LCS-cert.com

: webmaster@LCS-cert.com

Date of receipt of test sample

: March 11, 2021

Number of tested samples

: 1

Serial number

: Prototype

Date of Test

: March 11, 2021~ March 16, 2021

Date of Report

: March 17, 2021

# **EMC TEST REPORT**

EN 55032: 2015+A11: 2020

Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN 55035: 2017+A11: 2020

Electromagnetic compatibility of multimedia equipment – Immunity requirements

Report Reference No. ......: LCS210310062AE

Date of Issue.....: : March 17, 2021

Testing Laboratory Name.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Address ...... : Room 101, 201, Building A and Room 301, Building C, Juji

Industrial Park, Yabianxueziwei, Shajing Street, Bao' an

Report No.: LCS210310062AE

District, Shenzhen, Guangdong, China

Testing Location/ Procedure... : Full application of Harmonised standards

Partial application of Harmonised standards

Other standard testing method

Applicant's Name.....: : Shenzhen yanbu technology co. LTD

Address ...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village,

xixiang, baoan district, shenzhen

Test Specification

Standard ...... : EN 55032: 2015+A11: 2020

EN 55035: 2017+A11: 2020 EN IEC 61000-3-2: 2019 EN 61000-3-3: 2013+A1: 2019

Test Report Form No. ..... : LCSEMC-1.0

TRF Originator.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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Test Item Description........... Magnetic absorption wireless charging mobile

power supply

Trade Mark .....: N/A

Test Model ..... : E29B

Ratings ..... Please Refer to Page 9

Result ..... : Positive

Compiled by:

Supervised by:

Cindy Nie

Tom . Wong

Gavin Liang/ Manager

Cindy Nie/ File administrators Tom Wang / Technique principal

# **EMC -- TEST REPORT**

Test Report No.: LCS210310062AE 

March 17, 2021

Date of issue

Test Model.....: : E29B Magnetic absorption wireless charging mobile power EUT..... supply Applicant.....:: Shenzhen yanbu technology co. LTD Address...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village, xixiang, baoan district, shenzhen Telephone.....::/ Fax..... : / Manufacturer.....: Shenzhen weiduli technology co., LTD Address...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village, xixiang, baoan district, shenzhen Telephone.....:: : / Fax..... : / Factory.....:: Shenzhen weiduli technology co., LTD Address...... : 6 / f, building B, xinyongfeng industrial park, lezhujiao village, xixiang, baoan district, shenzhen Telephone.....::/ Fax..... : /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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Report No.: LCS210310062AE

# **Revision History**

Revision	Issue Date	Revisions	Revised By
000	March 17, 2021	Initial Issue	Gavin Liang

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## Report No.: LCS210310062AE

## 1. TEST STANDARDS

# The tests were performed according to following standards:

EN 55032: 2015+A11: 2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements

<u>EN 55035: 2017+A11: 2020</u> Electromagnetic compatibility of multimedia equipment – Immunity characteristics

EN IEC 61000-3-2: 2019 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase) EN 61000-3-3: 2013+A1: 2019 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

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## 2.SUMMARY OF STANDARDS AND RESULTS

# 2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Emission (EN 55032: 2015+A11: 2020)							
Description of Test Item	Standard	Limits	Results				
Conducted disturbance at mains terminals	EN 55032: 2015+A11: 2020	Class B	PASS				
Conducted disturbance at telecommunication port	EN 55032: 2015+A11: 2020	Class B	N/A				
Radiated disturbance	EN 55032: 2015+A11: 2020	Class B	PASS				
Harmonic current emissions	EN IEC 61000-3-2: 2019	Class A	N/A				
Voltage fluctuations & flicker	EN 61000-3-3: 2013+A1: 2019		PASS				
	munity (EN 55035: 2017+A11:						
Description of Test Item	Basic Standard	Performance Criteria	Results				
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	В	PASS				
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A2: 2010	Α	PASS				
Electrical fast transient (EFT)	EN 61000-4-4: 2012	В	PASS				
Surge (Input a.c. power ports)	EN 61000-4-5: 2014+A1: 2017	В	PASS				
Surge (Telecommunication ports)	EN 01000-4-3. 2014+A1. 2017	В	N/A				
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2014	Α	PASS				
Power frequency magnetic field	EN 61000-4-8: 2010	Α	PASS				
Voltage dips, >95% reduction		В	PASS				
Voltage dips, 30% reduction	EN 61000-4-11: 2004+A1: 2017	С	PASS				
Voltage interruptions C PASS							
***Note: N/A is an abbreviation for Not Applicable.							

Test mode:										
Mode 1	Charging	Record								
Mode 2	Discharging	Pre-scan								
***Note: All test modes were tested, but we only recorded the worst case in this report.										

## 2.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

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- essential operational modes and states;

#### 2.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deriver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 2.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be deriver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 2.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be loss.

## 3. GENERAL INFORMATION

## 3.1. Description of Device (EUT)

EUT : Magnetic absorption wireless charging mobile power supply

Report No.: LCS210310062AE

Trade Mark : N/A

Test Model : E29B

Additional Model : E29A

Model Declaration : PCB board, structure and internal of these model(s) are the

same, So no additional models were tested.

Power Supply : Input: Type C: 9V-2.25A

Output: Type C: 9V-2.25A

PD-QC: 20W

Wireless charging output: 15W

Highest internal frequency (Fx)	Highest measured frequency
Fx ≤ 108 MHz	1 GHz
108 MHz < Fx ≤ 500 MHz	2 GHz
500 MHz < Fx ≤ 1 GHz	5 GHz
Fx > 1 GHz	5 × Fx up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz

# 3.2. Description of Support Device

Name	Manufacturers	M/N	S/N
1	1	1	1

## 3.3. Description of Test Facility

Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0. FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

## 3.4. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## 3.5. Measurement Uncertainty

Test	Parameters	Expanded uncertainty (U <sub>lab</sub> )	Expanded uncertainty (U <sub>cispr</sub> )
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	$\pm$ 2.63 dB $\pm$ 2.35 dB	± 3.8 dB ± 3.4 dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	± 2.90dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB
Mains Harmonic	Voltage	± 0.510%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.510%	N/A
EMF		± 21.59%	N/A

<sup>1)</sup> Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

<sup>2)</sup> The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

## 4. MEASURING DEVICES AND TEST EQUIPMENT

#### LINE CONDUCTED EMISSION

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EZ	EZ-EMC	1	N/A	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2020-06-22	2021-06-21
3	Artificial Mains	R&S	ENV216	101288	2020-06-22	2021-06-21
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-003 2	2020-06-22	2021-06-21
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2020-10-20	2021-10-19

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#### RADIATED DISTURBANCE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	E3	E3-EMC	1	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26	2021-07-25
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02	2021-07-01
4	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22	2021-06-21
5	Broadband Preamplifier	1	BP-01M18G	P190501	2020-06-22	2021-06-21

#### VOLTAGE FLUCTUATION AND FLICKER/HARMONIC CURRENT EMISSIONS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Analyzer Test System	Voltech	PM6000	200006700523	2020-06-22	2021-06-21

#### ELECTROSTATIC DISCHARGE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	SCHLODER	SESD 230	604035	2020-07-21	2021-07-20

#### RF ELECTROMAGNETIC FIELD

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESG Vector Signal Generator	Agilent	E4438C	MY42081396	2020-11-21	2021-11-20
2	RF POWER AMPLIFIER	OPHIR	5225R	1052	NCR	NCR
3	RF POWER AMPLIFIER	OPHIR	5273F	1019	NCR	NCR
4	Stacked Broadband Log Periodic Antenna	SCHWARZBEC K	STLP 9128	9128ES-145	NCR	NCR
5	Stacked Mikrowellen LogPer Antenna	SCHWARZBEC K	STLP 9149	9149-484	NCR	NCR
6	Electric field probe	Narda S.TS./PMM	EP601	611WX80208	2020-03-26	2021-03-25

## **ELECTRICAL FAST TRANSIENT IMMUNITY**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2020-06-22	2021-06-21

#### SURGES, LINE TO LINE AND LINE TO GROUND

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2020-06-22	2021-06-21

## RF COMMON MODE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2020-06-22	2021-06-21
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2020-06-22	2021-06-21
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2020-06-22	2021-06-21

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#### MAGNETIC FIELD SUSCEPTIBILITY TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2020-06-22	2021-06-21

#### **VOLTAGE DIPS/INTERRUPTIONS IMMUNITY TEST**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2020-06-22	2021-06-21

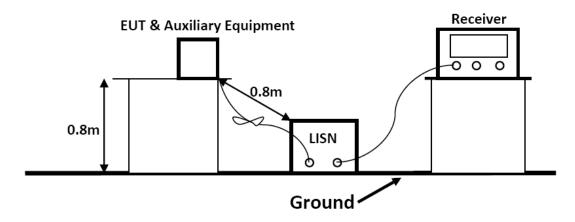
Note: All equipment is calibrated through CHINA CEPREI LABORATORY and GUANGZHOU LISAI CALIBRATION AND TEST CO., LTD.

NCR --- No calibration requirement.

## 5. TEST RESULTS

#### 5.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

## 5.1.1. Block Diagram of Test Setup



#### 5.1.2. Test Standard

EN 55032: 2015+A11: 2020 Class B

Power Line Conducted Emission Limits (Class B)					
Frequency	Limit (dBμV)				
(MHz)	Quasi-peak Level Average Level				
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *			
0.50 ~ 5.00	56.0	46.0			
5.00 ~ 30.00	60.0 50.0				

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

# 5.1.3. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the EN 55032 requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

## 5.1.4. Operating Condition of EUT

- 5.1.4.1. Setup the EUT as shown on Section 5.1.1
- 5.1.4.2. Turn on the power of all equipments.
- 5.1.4.3.Let the EUT work in measuring mode(1) and measure it.

#### 5.1.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided 50-ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement.

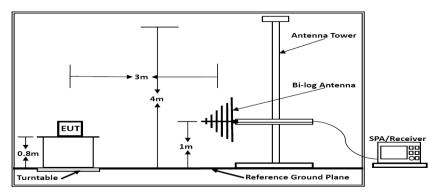
The bandwidth of the field strength meter is set at 9kHz in 150kHz~30MHz. The frequency range from 150kHz to 30MHz is investigated.

#### 5.1.6. Test Results

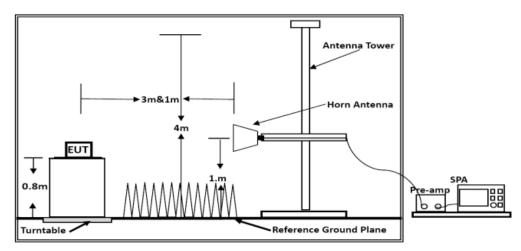
PASS.

## **5.2. RADIATED EMISSION MEASUREMENT**

# 5.2.1. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

## 5.2.2. Test Standard

EN 55032: 2015+A11: 2020 Class B

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

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Limits for Radiated Emission Below 1GHz					
Frequency Distance Field Strengths Limit					
(MHz)	(Meters)	(dBµV/m)			
30 ~ 230	3	40			
230 ~ 1000	47				

<sup>\*\*\*</sup>Note:

<sup>(2)</sup> Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

Limits for Radiated Emission Above 1GHz							
Frequency Distance Peak Limit Average Limit							
(MHz)	(Meters)	(dBµV/m)	(dBµV/m)				
1000 ~ 3000	50						
3000 ~ 6000 3 74 54							
***Note: The lower limit applies at the transition frequency.							

## 5.2.3. EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

## 5.2.4. Operating Condition of EUT

5.2.4.1.Turn on the power.

5.2.4.2.Let the EUT work in the test mode(1) and measure it.

#### 5.2.5. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the EMI test receiver is set at RBW/VBW=120kHz/300kHz.

The frequency range from 30MHz to 1000MHz is checked.

The bandwidth of the Spectrum analyzer is set at RBW/VBW=1MHz/3MHz.

The frequency range from 1GHz to the frequency which about 5th carrier harmonic or 6GHz is checked.

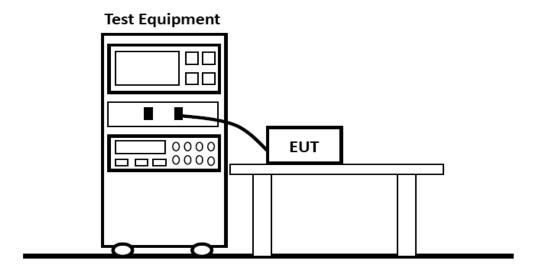
## 5.2.6. Test Results

#### PASS.

<sup>(1)</sup> The smaller limit shall apply at the combination point between two frequency bands.

#### 5.3. HARMONIC CURRENT EMISSION MEASUREMENT

## 5.3.1. Block Diagram of Test Setup



#### 5.3.2. Test Standard

EN IEC 61000-3-2: 2019

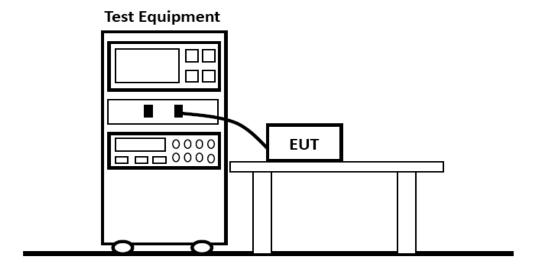
## 5.3.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.3.1.

## 5.3.4. Test Results

## 5.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

## 5.4.1. Block Diagram of Test Setup



## 5.4.2. Test Standard

EN 61000-3-3: 2013+A1: 2019

# 5.4.3. Operating Condition of EUT

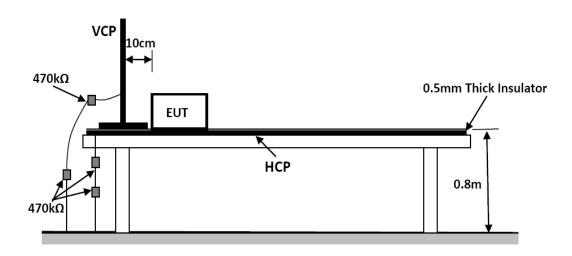
Same as Section 5.2.4, except the test setup replaced as Section 5.4.1.

#### 5.4.4. Test Results

PASS.

#### 5.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST

## 5.5.1. Block Diagram of Test Setup



#### 5.5.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge:

±8KV, Level: 2 / Contact Discharge: ±4KV)

# 5.5.3. Severity Levels and Performance Criterion

5.5.3.1. Severity level

· · · · · · · · · · · · · · · · · · ·				
Level	Test Voltage	Test Voltage		
	Contact Discharge (KV)	Air Discharge (KV)		
1	±2	±2		
2	±4	±4		
3	±6	±8		
4	±8	±15		
X	Special	Special		

5.5.3.2. Performance Criterion

Performance Criterion: B

### 5.5.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.5.1.

# 5.5.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 5.1.4. Except the test set up replaced by Section 5.5.1.

#### 5.5.6. Test Procedure

### 5.2.6.1. Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the Electrostatic Discharge simulator shall be approached as fast as possible then to touch the EUT. After each discharge, the simulator shall be removed from the EUT. The simulator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

## 5.2.6.2. Contact Discharge

All the procedure shall be same as air discharge, except using the acute discharge tip. The top end of the Electrostatic Discharge simulator is touch the EUT all the time when the simulator is re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

## 5.2.6.3. Indirect Discharge For Horizontal Coupling Plane

The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 25 times discharge.

# 5.2.6.4. Indirect Discharge For Vertical Coupling Plane

The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the horizontal coupling plane(HCP). At least 25 times discharge should be done for every pre-selected point around EUT.

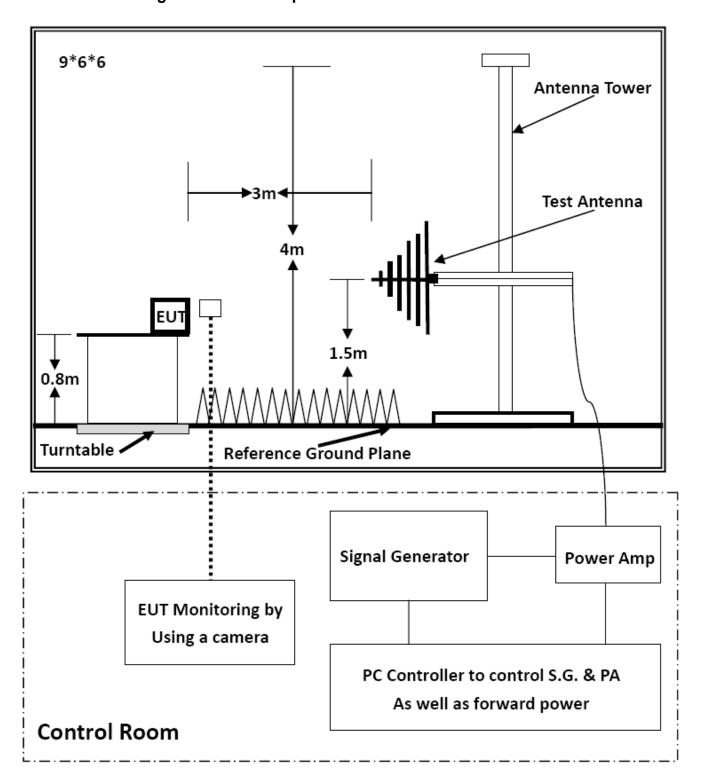
Record any performance degradation of the EUT during the test and judge the test result according to ce criterion.

#### 5.5.7. Test Results

#### PASS.

## 5.6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

# 5.6.1. Block Diagram of Test Setup



#### 5.6.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-3: 2006+A2: 2010 Severity Level: 2, 3V/m)

### 5.6.3. Severity Levels and Performance Criterion

5.6.3.1. Severity level

Level	Field Strength (V/m)		
1	1		
2	3		
3	10		
X	1		

# 5.6.3.2. Performance Criterion Performance Criterion: A

## 5.6.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.6.1.

## 5.6.5. Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 5.2..4, except the test setup replaced as Section 5.6.1.

#### 5.6.6. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD Recording is used to monitor its screen. All the scanning conditions are as following:

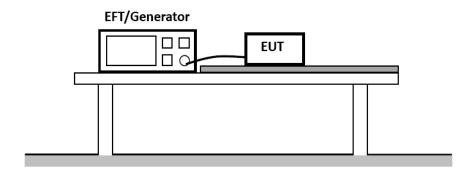
Condition of Test	Remark		
Fielded Strength	3 V/m (Severity Level 2)		
Radiated Signal	Unmodulated		
Test Frequency Range (swept test)	80-1000MHz		
Test Frequency (spot test)	1800MHz, 2600MHz, 3500MHz, 5000MHz		
Dwell time of radiated	0.0015 decade/s		
Waiting Time	3 Sec.		

## 5.6.7. Test Results

#### PASS.

#### 5.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

## 5.7.1. Block Diagram of Test Setup



#### 5.7.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-4: 2012, Severity Level, Level 2: 1KV)

## 5.7.3. Severity Levels and Performance Criterion

5.7.3.1. Severity level

	Open Circuit Output Test Voltage ±10%				
Level	On I/O (Input/Output) Signal data and control lines				
1	0.5 KV	0.25 KV			
2	1 KV	0.5 KV			
3	2 KV	1 KV			
4	4 KV	2 KV			
X	Special	Special			

# 5.7.3.2. Performance Criterion Performance Criterion: B

## 5.7.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.7.1.

## 5.7.5. Operating Condition of EUT

- 5.7.5.1. Setup the EUT as shown in Section 5.7.1.
- 5.7.5.2. Turn on the power of all equipments.
- 5.7.5.3. Let the EUT work in test mode(1) and measure it.

#### 5.7.6. Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

### 5.7.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 mins.

5.7.6.2. For signal lines and control lines ports: It's unnecessary to test.

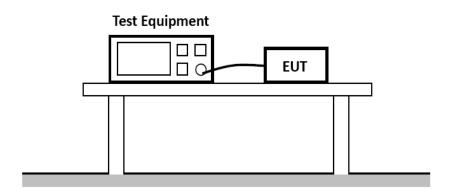
5.7.6.3. For DC output line ports: It's unnecessary to test.

#### 5.7.7. Test Results

PASS.

#### **5.8. SURGE IMMUNITY TEST**

## 5.8.1. Block Diagram of Test Setup



#### 5.8.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-5: 2014+A1: 2017, Severity Level: Line to Line: Level 2, 1.0KV, Line to Earth: Level 3, 2.0KV)

## 5.8.3. Severity Levels and Performance Criterion

5.8.3.1. Severity level

Severity Level	Open-Circuit Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

# 5.8.3.2. Performance Criterion Performance Criterion: B

## 5.8.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.8.1.

## 5.8.5. Operating Condition of EUT

- 5.8.5.1. Setup the EUT as shown in Section 5.8.1.
- 5.8.5.1. Turn on the power of all equipments.
- 5.8.5.1.Let the EUT work in test mode (1) and measure it.

#### 5.8.6. Test Procedure

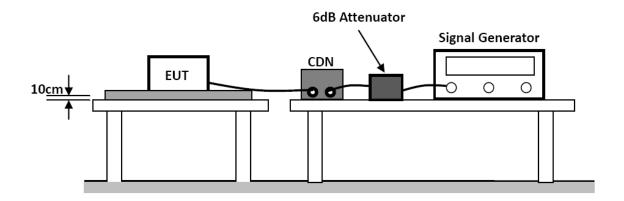
- 5.8.6.1. Set up the EUT and test generator as shown on Section 5.8.1.
- 5.8.6.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 5.8.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 5.8.6.4. Different phase angles are done individually.
- 5.8.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

#### 5.8.7. Test Results

PASS.

#### 5.9. INJECTED CURRENTS SUSCEPTIBILITY TEST

## 5.9.1. Block Diagram of Test Setup



#### 5.9.2. Test Standard

EN 55035: 2017+A11: 2020(EN 61000-4-6: 2014, Severity Level: Level 2, (0.15MHz ~ 80MHz))

## 5.9.3. Severity Levels and Performance Criterion

5.9.3.1. Severity level

Level	Field Strength (V)		
1	1		
2	3		
3	10		
X	Special		

5.9.3.2. Performance Criterion Performance Criterion: A

## 5.9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.9.1.

## 5.9.5. Operating Condition of EUT

- 5.9.5.1. Setup the EUT as shown in Section 5.9.1.
- 5.9.5.2. Turn on the power of all equipments.
- 5.9.5.3.Let the EUT work in test mode(1) and measure it.

#### 5.9.6. Test Procedure

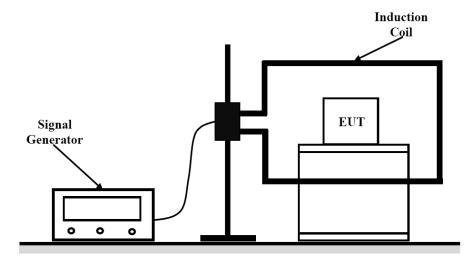
- 5.9.6.1. Set up the EUT, CDN and test generators as shown on Section 5.9.1.
- 5.9.6.2. Let the EUT work in test mode and measure it.
- 5.9.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 5.9.6.4. The disturbance signal described below is injected to EUT through CDN.
- 5.9.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5.9.6.6. The frequency range is swept from 150kHz to 10MHz using 3V signal level,10MHz to 30MHz using 3V to 1V signal level,30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave. 5.9.6.7. The rate of sweep shall not exceed 1.5\*10-3decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 5.9.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

#### 5.9.7. Test Results

#### PASS.

#### 5.10. MAGNETIC FIELD SUSCEPTIBILITY TEST

## 5.10.1. Block Diagram of Test Setup



#### 5.10.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-8: 2010, Severity Level: Level 1, 1A/m)

## 5.10.3. Severity Levels and Performance Criterion

5.10.3.1. Severity level

Level	Field Strength (A/m)		
1	1		
2	3		
3	10		
4	30		
5	100		
X	Special		

5.10.3.2. Performance Criterion

Performance Criterion: A

## 5.10.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.10.1.

## 5.10.5. Test Procedure

EUT is placed on an insulating support of 0.1m high above a table of 0.8m high. There is a minimum 1m\*1m ground metallic plane put on this table. EUT is put in the center of the magnetic coil then two orientations of the magnetic coil, horizontal and vertical, shall be rotated in order to expose the EUT to the difference polarization magnetic field.

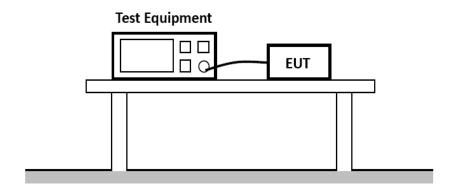
Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

#### 5.10.6. Test Results

#### PASS.

#### 5.11. VOLTAGE DIPS AND INTERRUPTIONS TEST

## 5.11.1. Block Diagram of Test Setup



#### 5.11.2. Test Standard

EN 55035: 2017+A11: 2020 (EN 61000-4-11: 2004+A1: 2017)

## 5.11.3. Severity Levels and Performance Criterion

5.11.3.1. Severity level

Test Level  Voltage Reduction Voltage Dips Duration					
Voltage Reduction	Duration				
%U <sub>T</sub>	% <b>U</b> ⊤	(in Period)			
100	0	0.5			
100	0	1			
30	70	5			
Voltage Reduction	Voltage Dips	Duration			
¯ %U <sub>T</sub>	%U <sub>⊤</sub>	(in Period)			
100	0	250			

5.11.3.2. Performance Criterion Performance Criterion: B&C

## 5.11.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.11.1.

## 5.11.5. Operating Condition of EUT

- 5.11.5.1. Setup the EUT as shown in Section 5.11.1.
- 5.11.5.2. Turn on the power of all equipments.
- 5.11.5.3. Let the EUT work in test mode (1) and measure it.

#### 5.11.6. Test Procedure

- 5.11.6.1. Set up the EUT and test generator as shown on Section 5.11.1.
- 5.11.6.2. The interruptions are introduced at selected phase angles with specified duration.
- 5.11.6.3. Record any degradation of performance.

#### 5.11.7. Test Results

#### PASS.

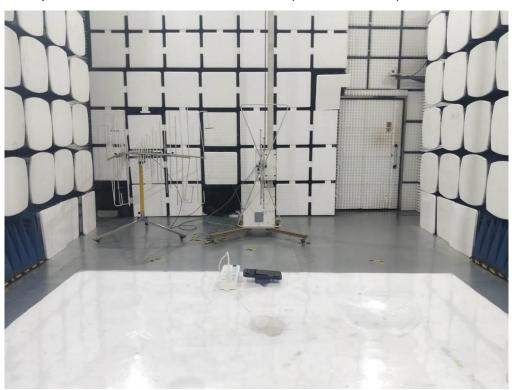
## **ANNEX A**

(Test photograph)

# A.1 Test Setup Photo of Power Line Conducted Measurement



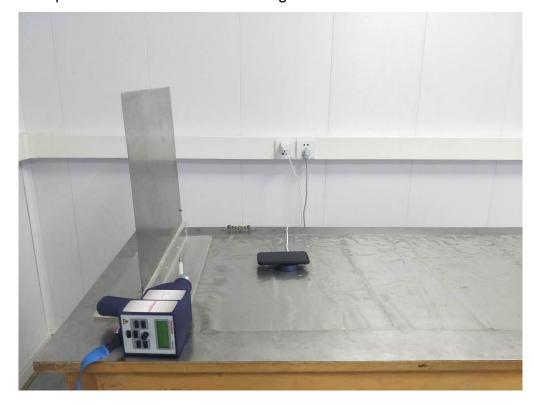
# A.2 Test Setup Photo of Radiated Measurement (30MHz~1GHz)



# A.3 Test Setup Photo of Harmonic & Flicker Measurement



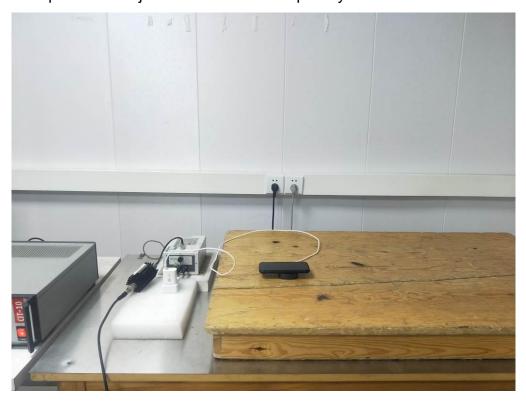
# A.4 Test Setup Photo of Electrostatic Discharge Test



# A.5 Photo of Electrical Fast Transient/Burst Test & Surge Immunity Test



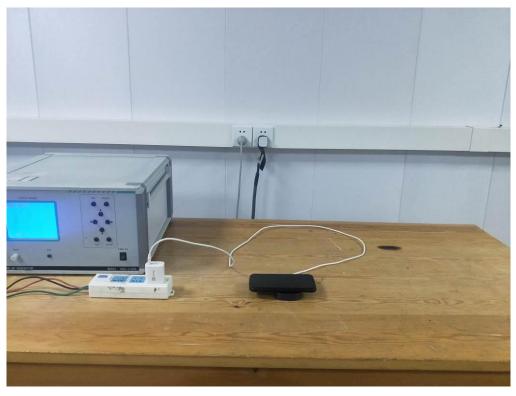
# A.6 Test Setup Photo of Injected Currents Susceptibility Test



# A.7 Test Setup Photo of Magnetic Field Immunity Test



# A.8 Test Setup Photo of Voltage Dips and Interruptions Test



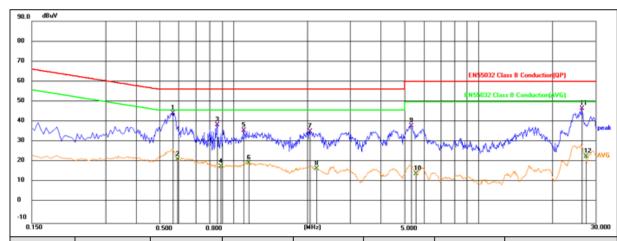
## **ANNEX B**

(Emission and Immunity test results)

## **B.1 POWER LINE CONDUCTED EMISSION MEASUREMENT**

Environmental Conditions:	22.7℃, 53. 7 % RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Line

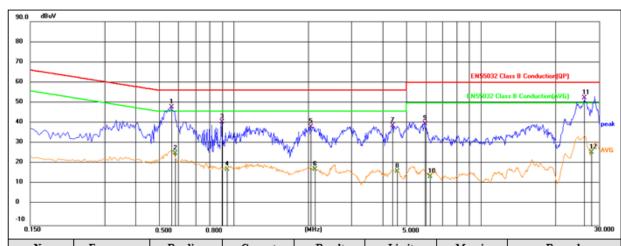
## Detailed results are shown below



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.5641	23.94	20.67	44.61	56.00	-11.39	QP
2	0.5911	0.94	20.64	21.58	46.00	-24.42	AVG
3	0.8566	18.49	20.21	38.70	56.00	-17.30	QP
4	0.8881	-1.78	19.90	18.12	46.00	-27.88	AVG
5	1.0951	16.75	19.26	36.01	56.00	-19.99	QP
6	1.1491	0.55	19.27	19.82	46.00	-26.18	AVG
7	2.0446	16.16	19.40	35.56	56.00	-20.44	QP
8	2.1751	-2.43	19.41	16.98	46.00	-29.02	AVG
9	5.2936	18.71	19.50	38.21	60.00	-21.79	QP
10	5.5861	-5.08	19.52	14.44	50.00	-35.56	AVG
11	26.3311	26.72	20.08	46.80	60.00	-13.20	QP
12	27.3616	2.89	20.11	23.00	50.00	-27.00	AVG

Environmental Conditions:	22.7℃, 53. 7 % RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Neutral

## Detailed results are shown below

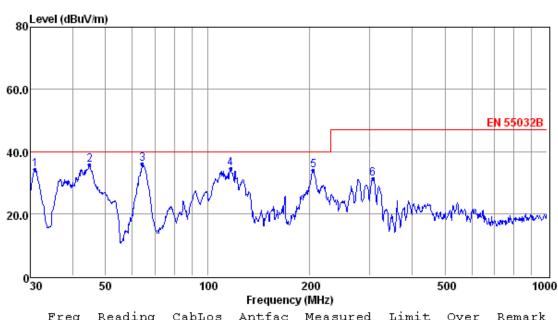


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.5596	27.26	20.68	47.94	56.00	-8.06	QP
2	0.5776	4.63	20.66	25.29	46.00	-20.71	AVG
3	0.8926	20.80	19.85	40.65	56.00	-15.35	QP
4	0.9376	-1.86	19.40	17.54	46.00	-28.46	AVG
5	2.0491	19.19	19.40	38.59	56.00	-17.41	QP
6	2.1301	-1.75	19.41	17.66	46.00	-28.34	AVG
7	4.3891	19.52	19.47	38.99	56.00	-17.01	QP
8	4.5781	-2.96	19.48	16.52	46.00	-29.48	AVG
9	5.9056	20.53	19.53	40.06	60.00	-19.94	QP
10	6.2431	-5.48	19.54	14.06	50.00	-35.94	AVG
11	26.2636	32.42	20.08	52.50	60.00	-7.50	QP
12	27.9421	5.85	20.15	26.00	50.00	-24.00	AVG

#### B.2 Radiated Disturbance Test Results (30MHz to 1000MHz)

Environmental Conditions:	22.1°C, 53.2% RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Vertical

Detailed results are shown below



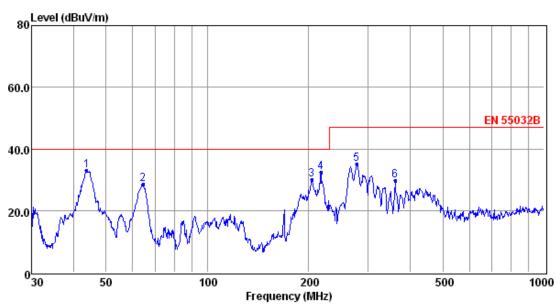
	30	30	100	Frequenc	v (MHz)		300	1000
	Freq	Reading	CabLos		Measured	Limit	Over	Remark
	MHz	dBuV	dВ	dB/m	dBuV/m	dBuV/m	dВ	
1	30.96	51.46	0.39	12.32	34.22	40.00	-5.78	QP
2	44.90	51.76	0.41	13.55	35.73	40.00	-4.27	QP
3	64.21	54.36	0.52	11.02	35.85	40.00	-4.15	QP
4	116.95	52.83	0.68	11.02	34.37	40.00	-5.63	QP
5	204.96	52.49	0.99	10.73	33.85	40.00	-6.15	QP
6	306.75	47.56	1.05	13.15	31.23	47.00	-15.77	QP

Note: 1. All readings are Quasi-peak values.

- 2. Measured= Reading + Antenna Factor + Cable Loss
- 3. The emission that are 20db below the official limit are not reported

Environmental Conditions:	22.1°C, 53.2% RH
Test Voltage:	AC 230V,50Hz
Test Model:	E29B
Test Mode:	Mode 1
Test Engineer:	DAIWEI DAI
Pol:	Horizontal

#### Detailed results are shown below



Freq Reading CabLos Antfac Measured Limit Over Remark

	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	43.81	49.07	0.41	13.56	33.05	40.00	-6.95	
2	64.43	47.15	0.52	10.93	28.55	40.00	-11.45	QP
3	204.24	48.77	0.99	10.70	30.10	40.00	-9.90	QP
4	217.54	50.69	0.88	11.12	32.31	40.00	-7.69	QP
5	278.07	51.91	1.01	12.61	35.06	47.00	-11.94	QP
6	361.71	44.94	1.17	14.44	29.83	47.00	-17.17	QP

Note: 1. All readings are Quasi-peak values.

- 2. Measured= Reading + Antenna Factor + Cable Loss
- 3. The emission that are 20db below the official limit are not reported

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.	Report No.: LCS210310062AE
GHENZITEN EGG GGMI EN INGE TEGTING EN IDGIN (TONT ETD.	Nopoletion Edde 1001000211E
B.3 HARMONIC CURRENT EMISSION MEASUREMENT	
Pass Because the power of EUT is less than 75W, accord harmonic current unnecessary to test.	ing to standard EN 61000-3-2,

# **B.4 VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT**

Test Model	E29B		Test Engineer	DAIWEI DAI
Test Voltage	AC 230V/50H	Ηz		
	Notes:			
PASS	Measurement method	- Voltage		
	Pst	dc (%)	dmax (%)	Tmax(> 3.3%)(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.088	0.005	0.190	0

## **B.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST**

Electrostatic Discharge Test Results					
Standard	☐ IEC 61000-4-2 ☐ EN 61000-	4-2			
Applicant	Shenzhen yanbu technology co. LTD				
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	24.8℃		
M/N	E29B	Humidity	53.8%		
Criterion	B Pressure 1021mbar				
Test Mode	Mode 1	Test Engineer	DAIWEI DAI		

Test Mode	Mode 1			Test Eng	ineer	DAIWEI DAI
		Λ	ir Diochara			
	<u> </u>	Test Levels	ir Discharge	<del>)</del>	Das	
Test Points		Test Levels			Res	Sults
	± 2kV	± 4kV	± 8kV	Passed	Fail	Performance Criterion
Front						□A ⊠B
Back						□A ⊠B
Left	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
Right	$\boxtimes$		$\boxtimes$			□A ⊠B
Тор		$\boxtimes$	$\boxtimes$	$\boxtimes$		□A ⊠B
Bottom		$\boxtimes$	$\boxtimes$	$\boxtimes$		□A ⊠B
		Con	tact Discha	rge		
		Test Levels	3		Res	sults
Test Points	± 2 kV		±4 kV	Passed	Fail	Performance
Front			$\square$			Criterion  □A □B
Back						□A ⊠B
Left						□A ⊠B
Right			$\boxtimes$			□A ⊠B
Top			$\boxtimes$			□A ⊠B
Bottom			$\boxtimes$			□A ⊠B
200000		harge To H		oupling Plane		
	1	Test Levels				sults
Side of EUT						Performance
	± 2 kV		± 4 kV	Passed	Fail	Criterion
Front			$\boxtimes$	$\boxtimes$		□A ⊠B
Back	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
Left	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
Right	$\boxtimes$		$\boxtimes$	$\boxtimes$		□A ⊠B
	Discharge To Vertical Coupling Plane					
011 (5115	Test Levels		3	Results		
Side of EUT	± 2 kV		± 4 kV	Passed	Fail	Performance Criterion
Front			$\boxtimes$			□A ⊠B
Back	$\boxtimes$		$\boxtimes$			□A ⊠B
Left			$\boxtimes$	$\boxtimes$		□A ⊠B
Right			$\boxtimes$	$\boxtimes$		□A ⊠B

## **B.6 RF FIELD STRENGTH SUSCEPTIBILITY TEST**

RF Field Strength Susceptibility Test Results							
Standard	□ IEC 61000-4-3 ☑ EN 61000-4-3						
Applicant	Shenzhen yanbu technology co. L	ΓD					
EUT	Magnetic absorption wireless charging mobile power supply  Temperature 22.8℃						
M/N	E29B	Humidity	53.0%				
Field Strength	3 V/m	Criterion	Α				
Test Mode	Mode 1	Test Engineer	DAIWEI DAI				
Test Frequency	80MHz to 1000MHz (swept test) 1800MHz, 2600MHz, 3500MHz, 5000MHz (spot test)						
Modulation	□None □ Pulse	☑AM 1KHz 80%	)				
Steps	1%						

	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

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- 1.ESG Vector Signal Generator
- 2.RF POWER AMPLIFIER
- 3.RF POWER AMPLIFIER
- 4.Stacked Broadband Log Periodic Antenna
- 5.Electric field probe

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# **B.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST**

Electrical Fast Transient/Burst Test Results					
Standard	□ IEC 61000-4-4 ☑ EN 61000-4-4				
Applicant	Shenzhen yanbu technology co. LTD				
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	22.9℃		
M/N	E29B	Humidity	53.4%		
Test Mode Mode 1		Criterion	В		
Test Engineer DAIWEI DAI					

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			
Note:	1		

Note:

## **B.8 SURGE IMMUNITY TEST**

Surge Immunity Test Result						
Standard	□ IEC 61000-4-5 ☑ EN 61000-4-5					
Applicant	Shenzhen yanbu technology co. LTD	Shenzhen yanbu technology co. LTD				
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	22.9℃			
M/N	E29B	Humidity	53.4%			
Test Mode Mode 1		Criterion	В			
Test Engineer	Test Engineer DAIWEI DAI					

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	90°	5	1.0	PASS
L-IN	-	270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					

## **B.9 INJECTED CURRENTS SUSCEPTIBILITY TEST**

Injected Currents Susceptibility Test Results					
Standard	□ IEC 61000-4-6 ☑ EN 61000-4-6				
Applicant	Shenzhen yanbu technology co. LTD				
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	23.5℃		
M/N	E29B	Humidity	53.2%		
Test Mode Mode 1		Criterion	Α		
Test Engineer DAIWEI DAI					

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 10		3V		
10 ~ 30	AC Mains	3V ~ 1V	Α	PASS
30 ~ 80		1V		

## Remark:

- 1. Modulation Signal:1kHz 80% AM
- 2. Measurement Equipment:

Simulator: CIT-10 (FRANKONIA)

CDN : ☑CDN-M2 (FRANKONIA)

□CDN-M3 (FRANKONIA)

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#### Report No.: LCS210310062AE

#### **B.10 MAGNETIC FIELD SUSCEPTIBILITY TEST**

Magnetic Field Immunity Test Result						
Standard	□ IEC 61000-4-8 ☑ EN 61000-4-8	3				
Applicant	Shenzhen yanbu technology co. LTD					
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	24.4℃			
M/N	E29B	Humidity	54.1%			
Test Mode	Mode 1	Criterion	Α			
Test Engineer	DAIWEI DAI					

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
1	5 mins	X	А	PASS
1	5 mins	Y	А	PASS
1	5 mins	Z	А	PASS

Note:

#### Report No.: LCS210310062AE

#### **B.11 VOLTAGE DIPS AND INTERRUPTIONS TEST**

Voltage Dips And Interruptions Test Results							
Standard	□ IEC 61000-4-11 ☑ EN 61000-4	□ IEC 61000-4-11 ☑ EN 61000-4-11					
Applicant	Shenzhen yanbu technology co. LTD						
EUT	Magnetic absorption wireless charging mobile power supply	Temperature	22.3℃				
M/N	E29B	Humidity	54.4%				
Test Mode	Mode 1 Criterion B&C						
Test Engineer	DAIWEI DAI						

Test Level % U <sub>T</sub>	Voltage Dips & Short Interruptions % U <sub>T</sub>	Duration (in periods)	Criterion	Result
0	100	0.5P	В	PASS
70	30	25P	С	PASS
0	100	250P	С	PASS

Note:

#### **ANNEX C**

(External and internal photos of the EUT)



Fig. 1



Fig. 2

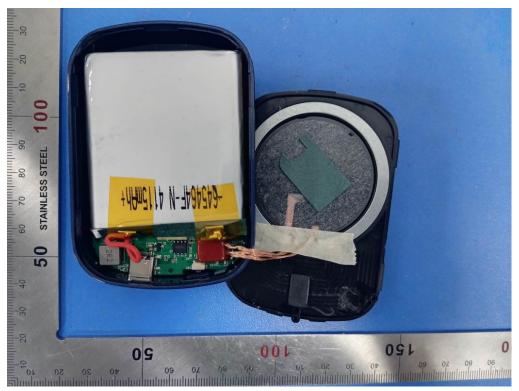


Fig. 3

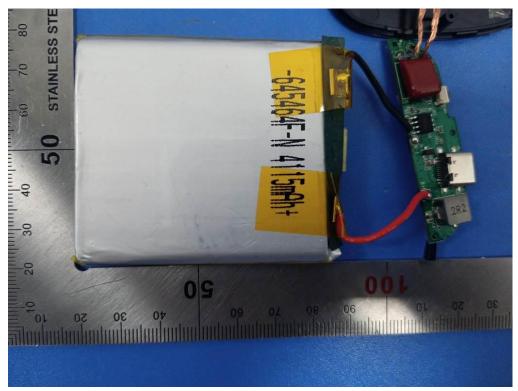


Fig. 4

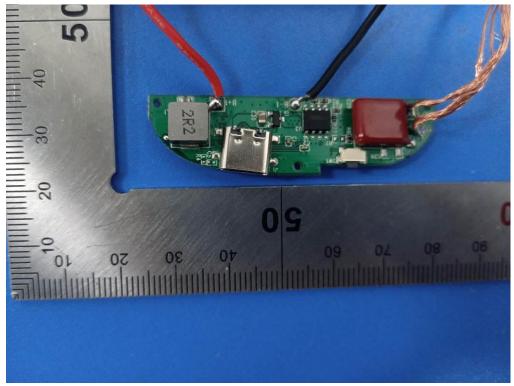


Fig. 5

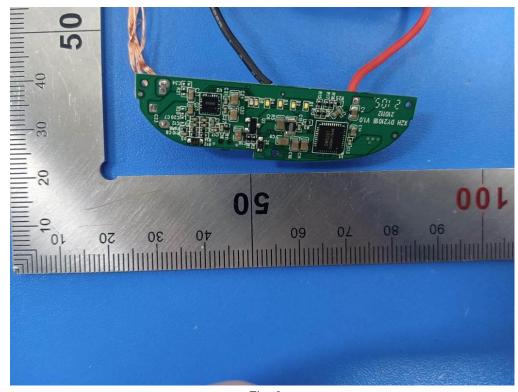


Fig. 6

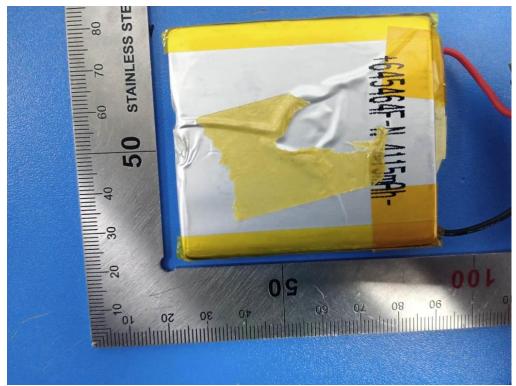


Fig. 7

-----THE END OF TEST REPORT -----





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**Applicant** 

: Shenzhen yanbu technology co. LTD

Address

6/f, building B, xinyongfeng industrial park, lezhujiao village, xixiang,

baoan district, shenzhen

Report on the submitted samples said to be:

Sample Name

: Magnetic absorption wireless charging mobile power supply

**Trade Mark** 

: N/A

Style No.

: E29A, E29B

**Testing Period** 

: February 25, 2021 ~ March 02, 2021

Results

: Please refer to next page(s).

TEST REQUEST	CONCLUSION
According to the customer's request, based on the performed tests on submitted sample, the result of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), PBBs, PBDEs, Dibuyl Phthalate(DBP), Benzylbutyl Phthalate(BBP), Bis(2-ethylhexyl) Phthalate(DEHP), Diispbutyl phthalate(DIBP) content comply with the limit requirement as set of RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.	Pass

Signed for and on behalf of LCS







#### Results:

#### A.EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.		Results						Date of sample
	Tested Part(s)	Cd	Pb	Hg	Cr <sup>▼</sup>	Br <sup>▼</sup>		submission/resu
						PBBs	PBDEs	bmission
1	Blue plastic shell	BL	BL	BL	BL	BL	BL	2021-02-25
2	Black soft plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
3	Black plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
4	Silver metal ring	BL	BL	BL	BL	1	1	2021-02-25
5	White plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
6	Black plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
76	Silver metal shrapnel	BL	BL	BL	BL	100	1	2021-02-25
8	Silver sheet metal	BL	BL	BL	BL	1	0 1	2021-02-25
9	Black plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25
10	Silver metal needle	BL	BL	BL	BL	1	1	2021-02-25
11	Grey ceramics	BL /	BL	BL	BL	BL	BL	2021-02-25
12	Red wire	BL	BL	BL	BL	1	1	2021-02-25
13	Red plastic thread	BL	BL	BL	BL	BL	BL	2021-02-25
14	Silver wire	BL	BL	BL	BL	1	1	2021-02-25
15	Black triode	BL	BL	BL	BL	BL	BL	2021-02-25
16	Black IC	BL	BL	BL	BL	BL	BL	2021-02-25
17	Red capacitor	BL	BL	BL	BL	BL	BL	2021-02-25
18	Black plastic thread	BL	BL	BL	BL	BL	BL	2021-02-25
19	Brown capacitor	BL /	BL	BL	BL	BL	BL	2021-02-25
20	light-emitting diode	BL	BL	BL	BL	BL	BL	2021-02-25
21	Tin solder	BL	BL	BL	BL	1	/	2021-02-25
22	PCB board	BL	BL	BL	BL	BL	BL	2021-02-25
23	Black IC	BL	BL	BL	BL	BL	BL	2021-02-25
24	Chip resistor	BL	BL	BL	BL	BL	BL	2021-02-25
25	Black diode	BL	BL	BL	BL	BL	BL	2021-02-25
26	Silver plastic sheet	BL	BL	BL	BL	BL	BL	2021-02-25

\*\*\*\*\*\*\*\*\*\*\*\*\*





#### Note:

(1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	ma/ka	BL≤70-3σ <x< td=""><td>BL≤70-3σ<x< td=""><td>BL≤50-3σ<x< td=""></x<></td></x<></td></x<>	BL≤70-3σ <x< td=""><td>BL≤50-3σ<x< td=""></x<></td></x<>	BL≤50-3σ <x< td=""></x<>
Cd	mg/kg	<130+3σ≤OL	<130+3σ≤OL	<150+3σ≤OL
Pb	ma/ka	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>
PD	mg/kg	<1300+3σ≤OL	<1300+3σ≤OL	<1500+3σ≤OL
Цa	malka	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>
Hg	mg/kg	<1300+3σ≤OL	<1300+3σ≤OL	<1500+3σ≤OL
Cr	mg/kg	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>
Br	mg/kg	BL≤300-3σ <x< td=""><td></td><td>BL≤250-3σ<x< td=""></x<></td></x<>		BL≤250-3σ <x< td=""></x<>

#### Note:

BL = Below Limit
OL = Over Limit
X = Inconclusive

- (2) The XRF screening test for RoHS elements The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2015/863/EC amending RoHS directive 2011/65/EU:
- (4) ▼=For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr(VI), and the results showed the total Cr content

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)		
Cadmium (Cd)	100		
Lead (Pb)	1000		
Mercury (Hg)	1000		
Hexavalent Chromium (Cr(VI))	1000		
Polybrominated biphenyls (PBBs)	1000		
Polybrominated diphenylethers (PBDEs)	1000		
Dibuyl Phthalate(DBP)	1000		
Benzylbutyl Phthalate(BBP)	1000		
Di-(2-ethylhexyl) Phthalate(DEHP)	1000		
Diispbutyl phthalate(DIBP)	1000		

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#### Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

B. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

#### Test method:

Lead(Pb) & Cadmium(Cd) Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

#### Mercury(Hg) Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

#### Hexavalent Chromium(Cr(VI)) Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

#### PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

#### BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)







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#### Note:

- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm<sup>2</sup>
- = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13ug/cm<sup>2</sup>. The sample coating is considered to contain Cr(VI)

   b. The sample is negative for Cr(VI) if Cr(VI) is N.D.(concentration less than 0.10ug/cm<sup>2</sup>). The

sample coating is considered a non- Cr(VI) based coating

- c. The result between 0.10µg/cm² and 0.13µg/cm² is considered to be inconclusive, unavoidable coating variations may influence the determination
- Information on storage conditions and production date of the tested samples is unavailable and thus Cr(VI) results represent status of the sample at the time of testing
- mg/kg = ppm=parts per million
- N.D.=Not Detected(<MDL or LOQ)</li>
- #1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).
- #3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact is exempted.
- #7 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its Amendments. Lead is exempted in steel for machining purposes and in galvanised steel containing up to 0.35% (3500ppm) by weight.











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#### 1) The test results of DBP, BBP, DEHP & DIBP

Item	l lmi4	MDI	Results	Limit
item	Unit MDL		1+2+3+5+6+9	Limit
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000

lto	limit BAT		Results	1 : : 1
Item	Unit M	MDL	11+13+15+16+17+18	Limit
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000

Item	Unit MDL		Results	- Limit
(GS)			19+20+22+23+24+25+26	- Lilling
Dibuyl Phthalate(DBP)	mg/kg	600	N.D.	1000
Benzylbutyl Phthalate(BBP)	mg/kg	600	N.D.	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	mg/kg	600	N.D.	1000
Diispbutyl phthalate(DIBP)	mg/kg	600	N.D.	1000

#### Remark:

- mg/kg = ppm
- N.D. = Not detected
- MDL=Method detected limited
- Flow chart appendix is included
- Photo appendix is included.







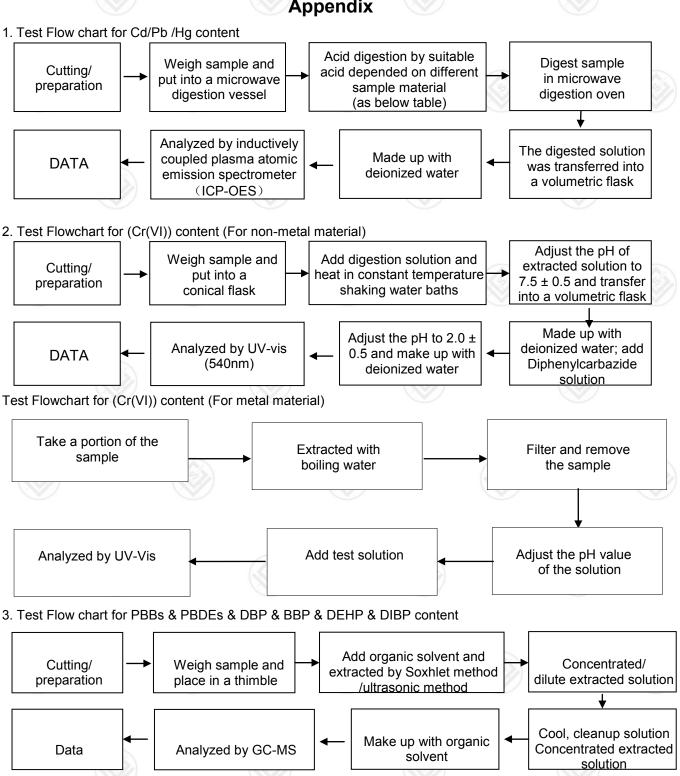








#### **Appendix**

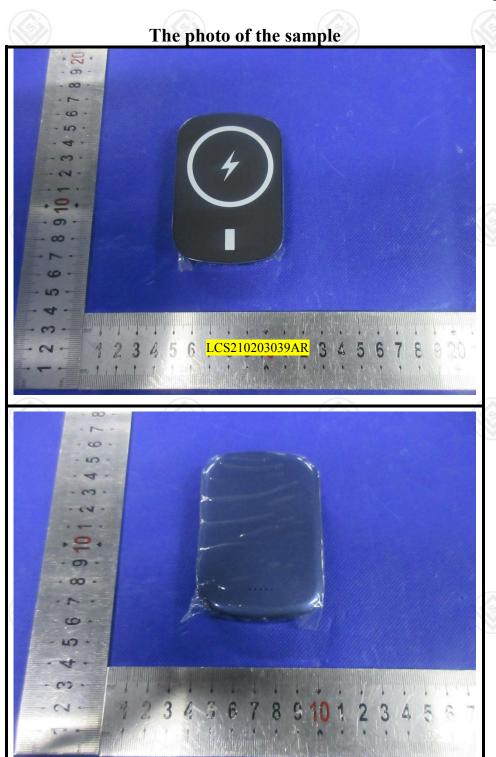


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\*\*\*\*\*\* End of Report \*\*\*\*\*\*\*\*\*







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#### Statement:

- 1. The test report is considered invalidated without approval signature, special seal on the perforation.
- 2. The result(s) shown in this report refer only to the sample(s) tested.
- 3. Without written approval of LCS, this report can't be reproduced except in full.
- 4. The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which LCS hasn't verified.
- 5. In case of any discrepancy between the English version and Chinese version of the testing reports(if generated), the Chinese version shall prevail.

