TECHNAXX®
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Technische Informationen
Technical Information

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Batterie-Material-Sicherheitsdatenblatt

MSDS - Material Safety Data Sheet

Mit diesem Schreiben erklärt die Firma ... */ With this letter company ... declares ...*
Technaxx Deutschland GmbH & Co.KG, Kruppstr. 105, 60388 Frankfurt a.M.

... dass sich der im Anhang befindliche MSDS-Report auf die Batterie(n)/den Akku (die Akkus) dieses Produktes bezieht: ...
... that the appendix MSDS report refers to the batterie(s) of this product: ...

Gegenstand der Erklärung: **Polymer Lithium-Ion Akku 450mAh 3,7V / 1,665Wh**
Object of declaration: Polymer Lithium-Ion Battery 450mAh 3.7V / 1.665Wh

Zylindrischer Akku für Technaxx® Autoalarm mit Ladefunktion TX-100
Cylindrical Battery for Technaxx® Car Alarm with charging function TX-100

Kein gefährlicher Stoff laut GHS-Klassifikation. / Not a dangerous substance according to GHS classification.

Weitere Informationen / More information

Spannung: 3,7 Volt, Watt: 1,665 Wh	/ Voltage: 3.7 Volt, Watt: 1.665 Wh
Maße: (L) 30 x (B) 25 x (T) 7 mm	/ Dimensions: (L) 30 x (W) 25 x (D) 7 mm
Gewicht Akku: 9,5 g	/ Weight battery: 9.5 g
Aussenhülle: ABS (Acrylnitril-Butadien-Styrol)	/ Outside shell: ABS (Acrylnitril-Butadien-Styrol)
Aufladbarer Akku, Made in China	/ Rechargeable battery, Made in China

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Frankfurt, 01.12.2017
(Ort und Datum */ City and Date*)

(Unterschrift and Stempel */ Signature and Stamp*)

Material Safety Data Sheet

MSDS 报告

MSDS Report

Prepared For : 申请商:	
Address: 地址:	
Product Name: 产品名称:	Li-ion polymer Battery 锂离子聚合物电池
Model : 型号:	702530P
Nominal Voltage: 额定电压:	3.7V
Rated Capacity: 额定容量:	450mAh,1.665Wh
Weight: 重量:	9.5g
Dimension : 尺寸:	30.0mm×25.0mm×7.0mm (L×W×T)
Prepared By : 编制单位:	Shenzhen TCT Testing Technology Co., Ltd. 深圳市通测检测技术有限公司 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China 中国广东省深圳市宝安区福永桥头亿宝来工业城 1 栋 1 层 B
Report No.: **报告编号 :**	TCT171106M004

Written by 编写: Carry Wang 王琴 Approved by 批准:

Inspected by 审核: Amy Zeng 曾宇 Date 日期: 2017. 11. 30

Material Safety Data Sheet 化学品安全技术说明书

Section 1- Chemical Product & Company Identification 第一部分 化学品及企业标识	
Product Name: *产品名称:*	Li-ion polymer Battery 锂离子聚合物电池
Manufacture: *制造商:*	
Address: *地址:*	
Contact Person: *联系人:*	
Tel: *电话:*	
Fax: *传真:*	
Emergency Tel: *应急电话:*	
E-mail: *邮箱:*	
Item Code: *项目号:*	**TCT171106M004**

Section 2- Hazards Identification 第二部分 危险性概述	
Classification of Danger *危险性类别*	See section 14 见第十四部分。
Primary Route(s) of Exposure *浸入途径*	Eye, skin contact, ingestion 眼睛，皮肤，食入。
Health Hazard *健康危害*	The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's risk of rupture, fire, heat, leakage of internal components, with could cause casualty loss. Abuses include but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken. 正常条件下根据制造商的说明使用电池不会产生危害，使用不当的情况下，有破裂、火灾、热、内部成分的漏出的风险，并可能造成意外损失。使用不当的行为包括不限于下列情况：长时间充电、短路，投入火灾，硬物撞击、尖物刺破、破碎、破裂。

Section 3- Composition/Information on Ingredients
第三部分 成分/组成信息

Chemical Name *化学名称*	*Concentration or concentration ranges (%)* *浓度或浓度范围(%)*	*CAS Number* *CAS 号(化学文摘索引登记号)*
Lithium Cobalt Oxide 钴酸锂	15-40	12190-79-3
Graphite 石墨	10-30	7782-42-5
Phosphate(1-), hexafluoro-, lithium 六氟磷酸锂	10-30	21324-40-3
Copper 铜	7-13	7440-50-8
Aluminum foil 铝箔	5-10	7429-90-5
Nickel 镍	1-5	7440-02-0

Labeling according to EC directives.
标签根据 EC 指令。
No symbol and risk phrase are required.
不需要象形符号和风险短语。
Note: CAS number is Chemical Abstract Service Registry Number.
注意: CAS 号 是化学文摘服务注册号码。
N/A=Not apply.
N / A =不适用。

Section 4- First Aid Measures
第四部分 急救措施

Eye *眼睛*	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. 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，直到化学的残留物消失为止，迅速就医。
Skin *皮肤*	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid. 万一接触，用大量水冲洗至少 15 分钟，同时除去污染的衣物和鞋子，迅速就医。
Inhalation *吸入*	Remove from exposure and move to fresh air immediately. Use oxygen if available. 立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。
Ingestion *食入*	Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician. 饮用两杯牛奶或水。如果当事人仍然清晰可以采取催吐的方法，并且立即就医。

Section 5- Fire Fighting Measures 第五部分 消防措施	
Characteristics of Hazard *危险特性*	Toxic fumes; gases or vapors may evolve on burning. 在火灾时可释放有害浓烟、气体或者蒸汽。
Hazardous Combustion Products *燃烧产生的危险物品*	Carbon monoxide, carbon dioxide, lithium oxide fumes. 一氧化碳，二氧化碳，锂氧化物烟气
Fire-extinguishing Methods and Extinguishing Media *灭火方法及灭火剂*	Water, CO_2. Don't use Halon fire extinguisher. May use dry powder, sand, earth. 大量冷水、二氧化碳。不要使用卤化物灭火器。可使用干粉、沙、土。
Attention in Fire-extinguishing *灭火注意事项*	The Firemen should put on antigas masks and full fire-fighting suits. 消防人员须佩戴防毒面具、穿全身消防服。

Section 6- Accidental Release Measures 第六部分 泄露应急处理	
Personal Precautions, protective equipment, and emergency procedures *个人预防措施、防护装备和应急程序*	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8. 限制区域，直到完成清理工作。请勿触摸泄漏的材料。穿戴适当的个人防护设备，如第 8 部分所示
Environmental Precautions *环境保护措施*	Prevent material from contaminating soil and from entering sewers or waterways. 防止物质污染土壤和进入下水道或水道。
Methods and materials for Containment *方法和材料控制*	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately. 出于安全，阻止泄漏，可以用干砂或沙土来遏制液体泄露，立即清理泄漏。
Methods and materials for cleaning up *清理的方法和材料*	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal. 用惰性吸收剂(干砂或沙土)吸收溢出的材料。污染物转移到可吸收废物的容器。收集所有受污染的吸收剂和根据第 13 部分的指令处置。用洗涤剂和水清洁污染区域，收集所有受污染的洗涤水进行适当处置。

Section 7- Handling and Storage 第七部分 操作处置与储存	
Handling *操作*	Don't handing the batteries in manner that allows terminals to short circuit 不要以让接头短路的方式对电池进行操作。
Storage *储存*	Store and used far away from heat, sparks, open flame, or other heat ignition sources, and under room temperature(<30℃) in ventilating and dehumidifying environments. 储存和使用时，要远离热、火花、明火或其他点源热，并处于室温下（<30℃）通风和除湿环境。
Other Precautions *其他要注意的防范措施*	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. 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。

Section 8 - Exposure Controls/Personal Protection 第八部分 接触控制和个体防护	
Engineering Controls *工程控制*	No engineering controls are required for handling batteries that have not been damaged. Personal protective equipments for damaged batteries should include chemical resistant gloves and safety glasses. 操作未破损的电池，没有工程控制要求。对于破损的电池，个人防护用品应包括化学品防护手套和安全眼镜。
Personal Protective Equipment *个人防护设备*	Respiratory Protection: In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use. Not necessary under conditions of normal use. 呼吸保护：当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操作条件下，呼吸保护是不必要的。正常使用条件下不必考虑。 Protective Gloves: Not necessary under conditions of normal use. 防护手套：正常使用条件下不必考虑。 Other Protective Clothing or Equipment: Not necessary under conditions of normal use. 其他防护服装或设备：正常使用条件下不必考虑。 Personal Protection is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields. 电池开阀试验时应做好个人防护：呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。

Section 9- Physical and Chemical Properties
第九部分 理化特性

Physical State *物理状态*	Appearance: Prismatic 外形：棱形
	Color: Silvery 颜色：银色
	Odour: If leaking, smells of medical ether. 气味：泄漏时，有醚的气味。
Change in condition *变化的条件:*	
pH 酸碱度	Not applicable as supplied. 不适用
Flash Point 闪点	Not applicable unless individual components exposed. 针对单个组分暴露情况，其他不适用。
Flammability 易燃度	Not applicable unless individual components exposed. 针对单个组分暴露情况，其他不适用。
Relative density: 相对密度	Not applicable unless individual components exposed. 针对单个组分暴露情况，其他不适用。
Solubility (water) 溶解性（水溶性）	Not applicable unless individual components exposed. 针对单个组分暴露情况，其他不适用。
Solubility (other) 溶解性（其他）	Not applicable unless individual components exposed. 针对单个组分暴露情况，其他不适用。

Section 10 – Stability and Reactivity
第十部分 稳定性和反应性

Stability *稳定性*	Stable under normal temperatures and pressures. 常温常压下稳定。
Conditions to Avoid *应避免的条件*	Heat above 70°C or incinerate. Deform. Mutilate. Crush. Disassemble. Overcharge. Short circuit. Expose over a long period to humid conditions. 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。
Hazardous Decomposition Products *有危害分解物*	Toxic Fumes, and may form peroxides. 有毒烟雾，并可能形成过氧化物。
If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated hydrocarbons. 如果发生泄露，避免与强氧化剂，无机酸，强碱，卤代烃接触。	

Section 11 – Toxicological Information 第十一部分 毒理学信息	
Irritation *刺激*	In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin. 内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤的刺激性。
Sensitization *致敏*	Not Available 无适用
Reproductive Toxicity *再生毒性*	Not Available 无适用
Toxicologically Synergistic Materials *协同材料毒理学*	Not Available 无适用

Section 12-Ecological Information 第十二部分 生态学信息	
General note: *通用信息：*	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. 不允许未稀释或大量的产品到达地下水、水道或污水系统。
Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity *化学产品在环境/可能的环境预期的行为的一种生态毒性*	Not Available 不适用

Section 13 – Disposal Considerations 第十三部分 废弃处置	
Waste Treatment *废弃处置方法*	Recycle or dispose of in accordance with government, stat & local regulations. 建议遵照国家和地方法规处置或再利用。
Attention for Waste Treatment *废弃注意事项*	Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling. 废电池不能被当做普通垃圾。不能扔进火中或置于高温下。不能解体，刺穿，破碎或类似的处理。最好的办法是回收利用。

Section 14 – Transport Information
第十四部分 运输信息

UN number *联合国货物编号（UN 编号）*	3481
UN Proper shipping name *联合国运输专用名称*	Lithium ion Batteries contained in equipments (Including lithium ion polymer batteries) 包含在设备中的锂离子电池(包括锂离子聚合物电池)
Transport hazard class(es) *运输风险级别*	9
Marine pollutant (Yes/No) *海洋污染物(是/否)*	No
Transport in bulk (According to Annex II of MARPOL 73/78 and the IBC Code) *散装运输(根据防污公约 73/78 的附件 II 和国际散化规则代码)*	No information available. 无适用信息。

Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.

用户需注意或遵守在他们的住所室内或室外的运输或传送的特殊预防措施。

Transport information:

运输信息：

The goods can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 967 Section II appropriate of IATA DGR 58th (2017 Edition) for transportation.

货物可根据民用航空组织（ICAO），TI 或国际航空协会（IATA），DGR 58th（2017 年版）包装说明(PI) 967 Section II 相关规定进行空运。

According to the special provision 188 of IMDG CODE (Amdt. 38-16) 2016 Edition, the products are not subject to dangerous goods.

根据 IMDG（Amdt. 38-16）2016 版特殊规定 188，该产品不属于危险品。

Other requirements for the US Department of Transportation (DOT) Subchapter C, Hazardous Materials Regulations if shipped in compliance with 49 CFR 173.185.

美国运输部（DOT）有害物质规则 C 分章中的其他规定，运输符合要求 49 CFR 173.185。

Separate batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport.

电池在单独运输时，应包装牢固，防止短路。

More information concerning shipping, testing, marking and packaging can be obtained from label master at http://www.labelmaster.com/.

更多关于航运、测试、标记和包装的信息可以从 http://www.labelmaster.com/获得。

Transport Fashion: By air, by sea, by railway, by road.

运输方式：空运，海运，铁路，公路。

Section 15 – Regulatory Information
第十五部分 法规信息

Law information
法律信息

《Dangerous Goods Regulations》

《危险物品规则》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《危险货物运输的建议模型规定》

《International Maritime Dangerous Goods》

《国际海上危险货物运输》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物安全运输技术指南》

《Classification and code of dangerous goods 》

《危险货物分类与代码》

《Occupational Safety and Health Act 》(OSHA)

《职业安全与健康法案》(OSHA)

《Toxic Substance Control Act》(TSCA)

《有毒物质控制法》（TSCA）

《Consumer Product Safety Act 》(CPSA)

《消费者产品安全法案》（CPSA）

《Federal Environmental Pollution Control Act》(FEPCA)

《联邦环境污染控制法》（FEPCA）

《The Oil Pollution Act》(OPA)

《石油污染法》（OPA）

《Superfund Amendments and Reauthorization Act TitleIII(302/311/312/313) 》(SARA)

《超级基金修正案和再授权法案 TitleIII(302/311/312/313)》(SARA)

《Resource Conservation and Recovery Act》(RCRA)

《资源保护和恢复法案》（RCRA）

《Safety Drinking Water Act》(CWA)

《安全饮用水法》》（CWA）

《California Proposition 65》

《加州 65 号提案》

《Code of Federal Regulations》(CFR)

《联邦条例》(CFR)

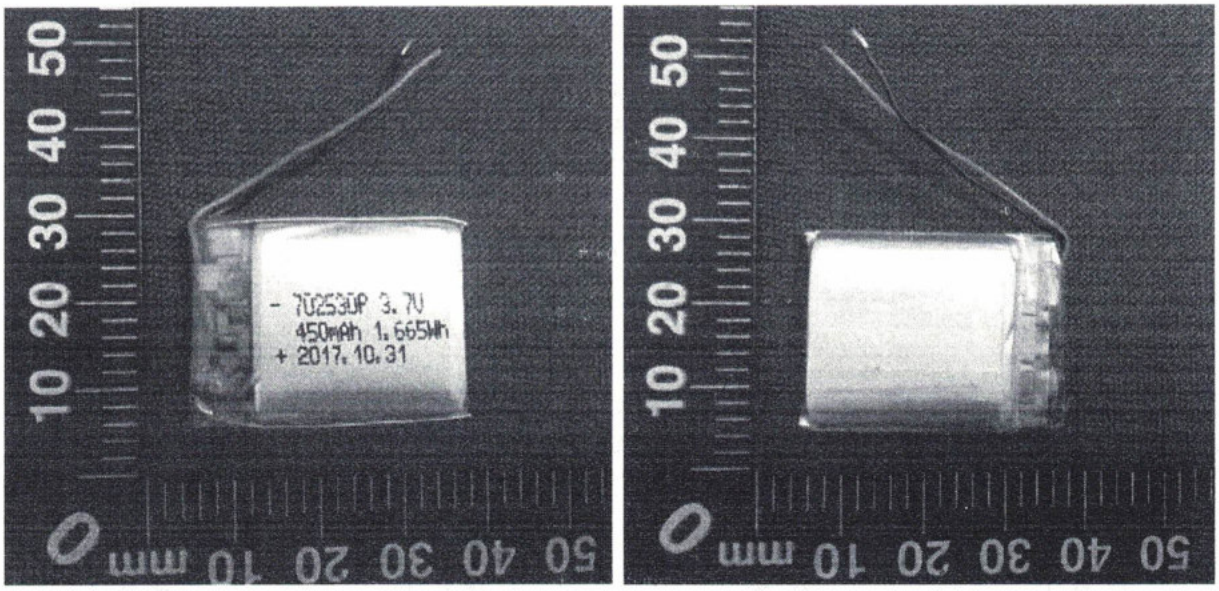
In accordance with all Federal, State and local laws

符合所有联邦、州和地方法律

Section 16 – Additional Information
第十六部分 其他信息

MSDS creation date: 2017/11 Version: 1.0

Sample photo 样品照片:



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.

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，您的具体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 data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

此处所包含的数据/信息在通用版本的基础上已经审核并批准,本文档不包含出口控制信息。

******End of report******

******报告结束******

UN38.3 检测报告

UN38.3 Test Report

Client 委托方	
Add. of Client 委托方地址	
Name of Sample 样品名称	Li-ion polymer Battery 锂离子聚合物电池
Model 型号	702530P
Testing Laboratory 测试机构	Shenzhen TCT Testing Technology Co., Ltd. 深圳市通测检测技术有限公司 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China 中国广东省深圳市宝安区福永桥头亿宝来工业城 1 栋 1 层 B
Report No. 报告编号	TCT171106B011
Report Versions 版本号	V4.0
Issued Date 发行日期	Nov. 30, 2017
Test Conclusion 测试结论: **Shown in the Conclusion of test report.** 见检测报告结论页。	

Tested by 主检人: Carry Wang 王琴 **Approved by** 批准人:

Inspected by 审核人: Amy Zeng 曾仁

Seal of TCT 报告单位（盖章）:

Date of Issue 签发日期: 2017. 11. 30

Hotline: 400-6611-140 Tel: 86-755- 27673339 Fax: 86-755-27673332 http://www.tct-lab.com

Ⅰ、Sample Description 样品描述

Name of Sample 样品名称	Li-ion polymer Battery 锂离子聚合物电池		**Model** 型号	702530P	
Manufacturer 制造商					
Address 地址					
Trade Mark 商标	----	**Shape** 形状	Prismatic 棱形	**Size 尺寸 (L×W×T)**	(30.0×25.0×7.0)mm
Nominal Voltage 标称电压	3.7V	**Rated Capacity** 额定容量	450mAh 1.665Wh	**Limited Charge Voltage** 充电限制电压	4.2V
Standard Charge Current 标准充电电流	225mA	**Maximum Continuous Charge Current** 最大持续充电电流	450mA	**End Charge Current** 结束充电电流	4.5mA
Cut-off Voltage 放电截止电压	2.4V	**Standard Discharge Current** 标准放电电流	225mA	**Maximum Discharge Current** 最大放电电流	900mA
Cell Model 电芯型号	702530P	**Cell Nominal Voltage** 电芯标称电压	3.7V	**Cell Rated Capacity** 电芯额定容量	450mAh
Cells Number 电芯数量	1PCS	**Start Testing Date** 开始测试日期	2017-11-09	**Completing Date** 完成日期	2017-11-17

Ⅱ、Standard 标准

Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6) Sixth revised edition.

联合国《关于危险货物运输的建议书》第六版。

Ⅲ、Test Item 测试项目

T.1. ☒Altitude simulation 高度模拟
T.2. ☒Thermal test 温度试验
T.3. ☒Vibration 振动
T.4. ☒Shock 冲击
T.5. ☒External short circuit 外部短路
T.6. ☐Impact / ☒Crush 重物冲击/挤压
T.7. ☒Overcharge 过充电
T.8. ☒Forced discharge 强制放电

Ⅳ、Test Method and Requirement 测试方法和要求

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells. Test T.7 may be conducted using undamaged batteries previously used in tests T.1 to T.5 for purposes of testing on cycled batteries.

用相同的电芯或电池按照顺序进行试验 T.1 至 T.5。试验 T.6 和 T.8 用没有进行其他试验的电芯。为了测试循环后的电池，试验 T.7 可用试验 T.1 至 T.5 后没有损坏的电池。

Batteries of 1#~14# are full charged after one cycle;

Batteries of 15#~18# are full charged after fifty cycles;

Cells of 19#~23# are 50% charged after one cycle;

Cells of 24#~33# are full discharged after one cycle;

Cells of 34#~43# are full discharged after fifty cycles;

Test environment condition: ambient temperature: 20 ± 5 °C.

电池 1#~14#为一次循环满电状态；

电池 15#~18#为五十次循环满电状态；

电芯 19#~23#为一次循环后 50%充电状态；

电芯 24#~33#为一次循环完全放电状态；

电芯 34#~43#为五十次循环完全放电状态；

试验环境条件：环境温度：20 ± 5 °C。

In order to quantify the mass loss, the following procedure is provided:

Mass loss (%) = (M1-M2)/M1 x 100

质量损失的量化值，可用以下公式计算：

质量损失(%)=(M1-M2)/M1×100

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it shall be considered as "no mass loss".

式中：M1 是试验前的质量，M2 是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
M＜1g	0.5%
1g≤M≤75g	0.2%
M＞75g	0.1%

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table above.

渗漏系指可以看到的电解液或者其他物质从电芯或者电池中漏出，或电芯或电池中的物质损失（不包括电池外壳、搬运装置、或标签），失去的质量超过上表所列的数值。

In test T.1 to T.4, cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

在测试 T.1 至 T.4 中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压要求不适用于测试完全放电状态的电芯和电池。

T.1. Altitude simulation 高度模拟

Test method 测试方法

Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5 °C).

试验电芯和电池被放置在压力等于或低于 11.6 kPa 和环境温度(20±5℃)下存放至少 6 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%，有关电压要求不适用于测试完全放电状态的电芯和电池。

T.2. Thermal test 温度试验

Test method 测试方法

Test Cells and batteries are to be stored for at least six hours at a test temperature equal to 72 ± 2 °C, followed by storage for at least six hours at a test temperature equal to - 40 ± 2 °C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20 ± 5 °C). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

试验电芯和电池放置在试验温度等于 72±2℃的条件下存放至少 6 小时，接着再在试验温度等于-40±2℃的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行，共完成 10 次，接着将所有试验电池在环境温度(20±5℃)下存放 24 小时。对于大型电芯和电池，暴露于极端试验温度的时间应至少为 12 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%，有关电压要求不适用于测试完全放电状态的电芯和电池。

T.3. Vibration 振动

Test method 测试方法

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

For cells and small batteries: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

For large batteries: from 7 Hz to a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the

frequency is increased to 200 Hz.

电芯和电池紧固于振动台台面，但不得造成电池变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在 7 Hz 和 200 Hz 之间，再回到 7 Hz，1 次循环时间为 15 分钟。这一振动过程须对三个互相垂直的电池安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。

做对数频率扫描，对总质量不足 12 千克的电芯和电池（电芯和小型电池），和对 12 千克及更大的电池（大型电池）有所不同。

对电芯和小型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 8 gn（频率约为 50 Hz）。将峰值加速度保持在 8 gn 直到频率增加到 200 Hz。

对于大型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 2 gn（频率约为 25 Hz）。将峰值加速度保持在 2 gn 直到频率增加到 200 Hz。

Requirement 要求

Cells and Batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test Cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压要求不适用于测试完全放电状态的电芯和电池。

T.4. Shock 冲击

Test method 测试方法

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.

Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations.

Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

试验电芯和电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池组的所有安装面。

每个电芯需经受峰值加速度 150 gn 和脉冲持续时间 6 ms 的半正弦波冲击。另外大电芯需要经受峰值加速度 50 gn 和脉冲持续时间 11 毫秒的半正弦波冲击。

每个电池接受半正弦波冲击峰值加速度取决于电池的质量，小型电池脉冲持续时间应为 6 毫秒，大型电池脉冲持续时间为 11 毫秒的半正弦波冲击，下面提供的公式来计算适当的最小峰值加速度。

每个电芯或电池需在三个互相垂直的电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受 18 次冲击。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%，有关电压要求不适用于测试完全放电状态的电芯和电池。

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g_n or result of formula Acceleration(g_n) = $\sqrt{\left(\frac{1000850}{mass^*}\right)}$ whichever is smaller	6 ms
Large batteries	50 g_n or result of formula Acceleration(g_n) = $\sqrt{\left(\frac{30000}{mass^*}\right)}$ whichever is smaller	11 ms

* Mass is expressed in kilograms.

T.5. External short circuit 外部短路

Test method 测试方法

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57 ± 4 °C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57 ± 4 °C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

测试的电芯或电池外壳温度达到恒温 57 ± 4 °C 后，再进行外部短路。短路的时间取决于电芯或电池的尺寸和设计，并需被评估和记录。如果这个评估无法进行，那么小电芯和小电池短路时间至少 6 小时，大电芯和大电池短路时间至少 12 小时。然后电芯或电池在 57±4℃环境下经受一个阻值小于 0.1Ω 的外部电路短路。

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57 ± 4 °C, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.

电芯或电池温度到 57±4℃之后，短路时间需持续 1 小时，大型电池短路温度下降到最大温升的一半或低于 57±4℃。

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

短路和降温阶段至少应在环境温度下进行。

Requirement 要求

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

电芯和电池外壳温度不超过 170℃，并且在试验过程中及试验后 6 小时内无解体、无破裂，无起火。

T.6. Impact / Crush 重物冲击/挤压

Test method – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)

测试方法 – 重物冲击（适用于直径大于等于 18.0 毫米的圆柱形电池）

The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or Channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular

to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

试样电池或电池组放在平坦光滑表面上。一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米±0.1 毫米，长度至少 6 厘米，或电池最长短的尺度，取二者之长者。将一块 9.1 千克±0.1 千克的重锤从 61±2.5 厘米高度跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。

垂直轨道或管道用于引导落锤沿与水平撑表面程 90 度落下。受撞击的试样，纵轴应于平坦表面平行并与横放在试样中心的直径 15.8±0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。

Test method – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

测试方法 – 挤压（适用于棱形，袋，硬币/纽扣电池和圆柱形电池直径小于 18.0 毫米）

A component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

(a) The applied force reaches 13 kN ± 0.78 kN;

(b) The voltage of the cell drops by at least 100 mV; or

(c) The cell is deformed by 50% or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.

Each component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using component cells that have not previously been subjected to other tests.

将电芯放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 cm/s。挤压持续进行，直到出现以下三种情况之一：

(a)施加的力量达到 13 kN ± 0.78 kN；

(b)电芯的电压下降至少 100mV；或

(c)电芯形变达原始厚度的 50%或更多。

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达原厚度的 50%，即可解除压力。

棱柱形或袋装电池须从最宽的面施压。纽扣/硬币形电池须从平坦表面施压。圆柱形电池须从与纵轴垂直的方向施压。

每个试样电芯只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的电芯进行。

Requirement 要求

Cells and component cells meet this requirement if their external temperature does not exceed 170℃ and there is no disassembly and no fire within six hours after the test.

电芯外壳温度不超过 170℃，并且在试验过程中及试验后 6 小时内无解体，无起火。

T.7. Overcharge 过充电

Test method 测试方法

The charge current is twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

(a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test is the lesser of two times the maximum charge voltage of the battery or 22V.

(b) When the manufacturer's recommended charge voltage is more than 18 V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

充电电流为制造商建议的最大持续充电电流的两倍。试验的最小电压如下：

(a) 制造商建议的充电电压不大于 18 伏时，试验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者。

(b) 当制造商建议的充电电压超过 18 伏，试验的最小电压应 1.2 倍的最大充电电压。

试验应在环境温度下进行。进行试验的时间应为 24 小时。

Requirement 要求

Rechargeable Batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

可充电电池在试验过程中和试验后 7 天内无解体，无起火。

T.8. Forced discharge 强制放电

Test method 测试方法

Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

每个电芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

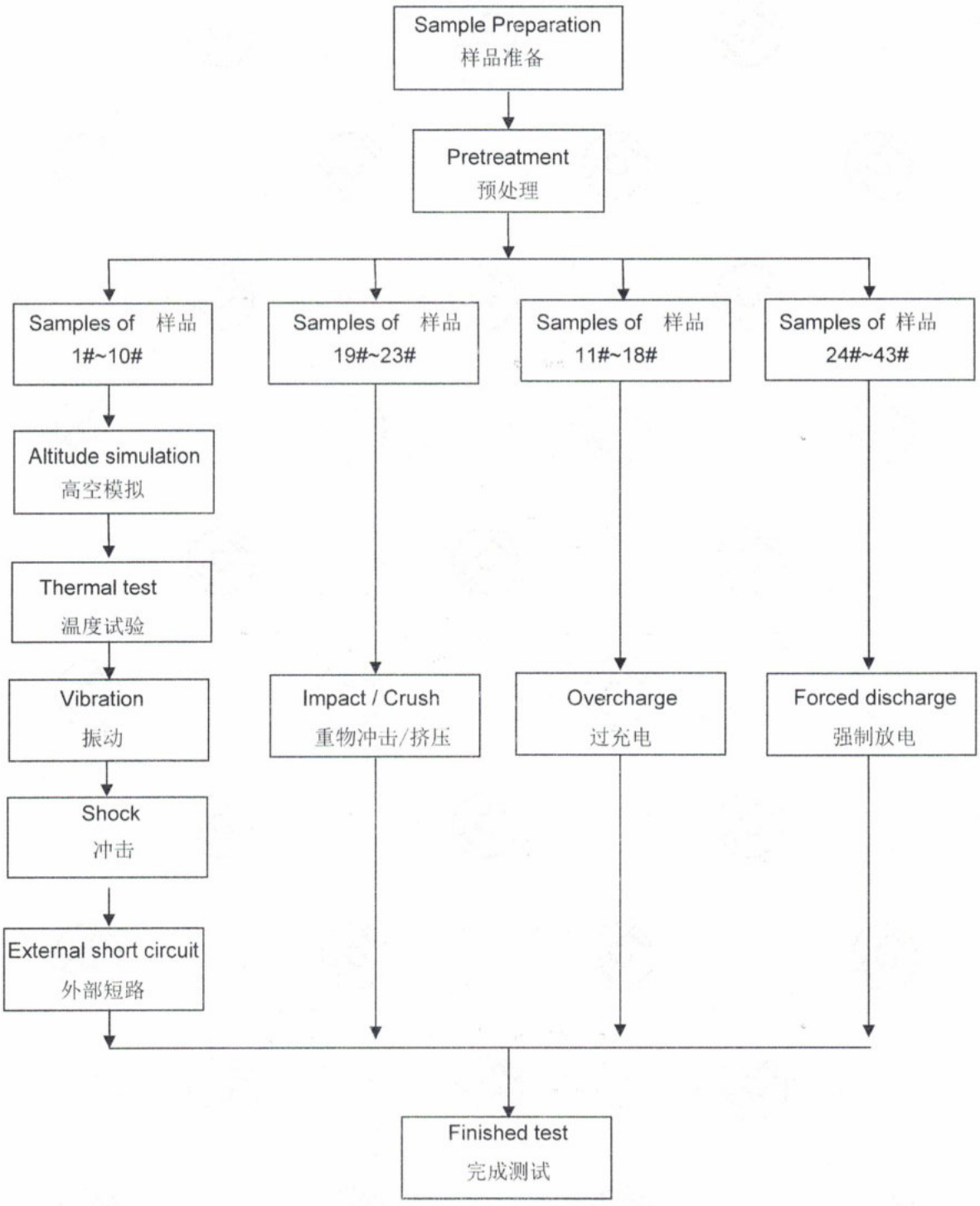
电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每块电芯的放电时间（单位为 h）等于电芯的额定容量除以试验初始放电电流（单位 A）。

Requirement 要求

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

不可充电或可充电的电芯在试验过程中和试验后 7 天内无解体，无起火。

V、Test Procedure 测试流程



Ⅵ、Main Test Apparatus 主要测试仪器

Serial No. 设备编号	Name of Equipment 设备名称	Model 型号	Calibration Date /Due Date 校准日期/到期日
TC-B01	Low Altitude Simulation Tester 低压高空模拟试验箱	GX-3020-Z	2017. 04. 26 2018. 04. 25
TC-B04	Vertical Shock Test Instrument 垂直冲击试验台	SY10-2	2017. 04. 26 2018. 04. 25
TC-B05	Vibration test instrument 振动试验台	ES-3-150	2017. 04. 26 2018. 04. 25
TC-B07	Battery Test System 电池测试系统	CTS 20V/10A	2017. 04. 26 2018. 04. 25
TC-B10	Programmable Temp.& Humi. Chamber 可程式恒温恒湿试验机	BE-TH-150M8-4	2017. 04. 26 2018. 04. 25
TC-B11	Crush Test Instrument 温控型电池挤压试验机	BE-6045T	2017. 04. 26 2018. 04. 25
TC-B13	Battery Short Circuit Tester 电池短路试验机	GX-6055-B	2017. 04. 26 2018. 04. 25
TC-B14	Electronic Balance 电子天平	PTT-A+300	2017. 04. 26 2018. 04. 25
TC-B15	Data Collector 数据采集器	34970A	2017. 04. 26 2018. 04. 25
TC-B18	DC POWER 直流源	PSW 80-27	2017. 04. 26 2018. 04. 25
TC-B21	Battery Impact Testes 电池冲击试验机	BE-5066	2017. 04. 26 2018. 04. 25
TC-B25	Digital Multimeter 数字万用表	15B	2017. 04. 26 2018. 04. 25
TC-B29	Battery Short Circuit Explosion-proof 电池短路防爆箱	BE-1000W	2017. 04. 26 2018. 04. 25

Ⅶ、Test Data 测试数据

T.1. Altitude simulation 高度模拟

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	9.510	4.19	9.509	4.19	0.01	100.0	Pass 合格
	2#	9.267	4.19	9.267	4.18	0.00	99.8	Pass 合格
	3#	9.264	4.18	9.263	4.18	0.01	100.0	Pass 合格
	4#	9.260	4.18	9.260	4.18	0.00	100.0	Pass 合格
	5#	9.235	4.18	9.235	4.18	0.00	100.0	Pass 合格
	6#	9.359	4.18	9.359	4.18	0.00	100.0	Pass 合格
	7#	9.357	4.19	9.357	4.18	0.00	99.8	Pass 合格
	8#	9.289	4.18	9.288	4.18	0.01	100.0	Pass 合格
	9#	9.275	4.19	9.275	4.18	0.00	99.8	Pass 合格
	10#	9.351	4.19	9.351	4.19	0.00	100.0	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.0℃。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.2. Thermal test 温度试验

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	9.509	4.19	9.506	4.15	0.03	99.0	Pass 合格
	2#	9.267	4.18	9.262	4.14	0.05	99.0	Pass 合格
	3#	9.263	4.18	9.260	4.15	0.03	99.3	Pass 合格
	4#	9.260	4.18	9.259	4.15	0.01	99.3	Pass 合格
	5#	9.235	4.18	9.234	4.14	0.01	99.0	Pass 合格
	6#	9.359	4.18	9.357	4.15	0.02	99.3	Pass 合格
	7#	9.357	4.18	9.355	4.14	0.02	99.0	Pass 合格
	8#	9.288	4.18	9.285	4.15	0.03	99.3	Pass 合格
	9#	9.275	4.18	9.272	4.14	0.03	99.0	Pass 合格
	10#	9.351	4.19	9.348	4.15	0.03	99.0	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.2℃。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.3. Vibration 振动

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	9.506	4.15	9.506	4.14	0.00	99.8	Pass 合格
	2#	9.262	4.14	9.262	4.14	0.00	100.0	Pass 合格
	3#	9.260	4.15	9.259	4.15	0.01	100.0	Pass 合格
	4#	9.259	4.15	9.259	4.14	0.00	99.8	Pass 合格
	5#	9.234	4.14	9.234	4.14	0.00	100.0	Pass 合格
	6#	9.357	4.15	9.357	4.15	0.00	100.0	Pass 合格
	7#	9.355	4.14	9.355	4.14	0.00	100.0	Pass 合格
	8#	9.285	4.15	9.284	4.14	0.01	99.8	Pass 合格
	9#	9.272	4.14	9.272	4.14	0.00	100.0	Pass 合格
	10#	9.348	4.15	9.348	4.15	0.00	100.0	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.3℃。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.4. Shock 冲击

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	9.506	4.14	9.506	4.14	0.00	100.0	Pass 合格
	2#	9.262	4.14	9.262	4.13	0.00	99.8	Pass 合格
	3#	9.259	4.15	9.258	4.14	0.01	99.8	Pass 合格
	4#	9.259	4.14	9.259	4.14	0.00	100.0	Pass 合格
	5#	9.234	4.14	9.234	4.14	0.00	100.0	Pass 合格
	6#	9.357	4.15	9.357	4.15	0.00	100.0	Pass 合格
	7#	9.355	4.14	9.355	4.14	0.00	100.0	Pass 合格
	8#	9.284	4.14	9.283	4.14	0.01	100.0	Pass 合格
	9#	9.272	4.14	9.272	4.14	0.00	100.0	Pass 合格
	10#	9.348	4.15	9.348	4.14	0.00	99.8	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.5℃。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.5. External short circuit 外部短路

The state of cells 样品状态	No. 编号	External Peak temperature(℃) 电池表面最高温度(℃)	Status 结果
Full charged after one cycle 一次循环后满电状态	1#	57.3	Pass 合格
	2#	57.4	Pass 合格
	3#	57.3	Pass 合格
	4#	57.3	Pass 合格
	5#	57.3	Pass 合格
	6#	57.1	Pass 合格
	7#	57.2	Pass 合格
	8#	57.1	Pass 合格
	9#	57.3	Pass 合格
	10#	57.3	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.3℃。 There is no disassembly, no rupture and no fire within six hours after test. 电池在测试后 6 小时内未解体、未破裂，未起火。			

T.6. Crush 挤压

The state of cells 样品状态	No. 编号	External Peak temperature(℃) 电池表面最高温度(℃)	Status 结果
50% charged after one cycle 一次循环后 50%充电状态	19#	23.2	Pass 合格
	20#	23.0	Pass 合格
	21#	23.4	Pass 合格
	22#	23.5	Pass 合格
	23#	23.6	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.1℃。 There is no disassembly, no rupture and no fire within six hours after test. 电池在测试后 6 小时内未解体、未起火。			

T.7. Overcharge 过充电

The state of cells 样品状态	No. 编号	Status 结果
Full charged after one cycle 一次循环后满电状态	11#	Pass 合格
	12#	Pass 合格
	13#	Pass 合格
	14#	Pass 合格

Full charged after fifty cycles 50 次循环后满电状态	15#	Pass 合格
	16#	Pass 合格
	17#	Pass 合格
	18#	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.4℃。 There is no disassembly and no fire during the test and within seven days after the test. 电池在测试中和测试测试后 7 天内未解体，未着火。		

T.8. Forced discharge 强制放电

The state of cells 样品状态	No. 编号	Status 结果
Full discharged after one cycle 一次循环完全放电状态	24#	Pass 合格
	25#	Pass 合格
	26#	Pass 合格
	27#	Pass 合格
	28#	Pass 合格
	29#	Pass 合格
	30#	Pass 合格
	31#	Pass 合格
	32#	Pass 合格
	33#	Pass 合格
Full discharged after fifty cycles 50 个循环完全放电状态	34#	Pass 合格
	35#	Pass 合格
	36#	Pass 合格
	37#	Pass 合格
	38#	Pass 合格
	39#	Pass 合格
	40#	Pass 合格
	41#	Pass 合格
	42#	Pass 合格
	43#	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.7℃。 There is no disassembly and no fire during the test and within seven days after the test. 电芯在测试中和测试测试后 7 天内未解体，未着火。		

Ⅷ、Conclusion 结论

No. 编号	Test item 测试项目	Sample number 样品数量	Test reference 测试参考	Conclusion 结论
1	Altitude simulation 高空模拟	1#~10#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.1 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.1 节	Pass 合格
2	Thermal test 温度试验		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.2 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.2 节	Pass 合格
3	Vibration 振动		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.3 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.3 节	Pass 合格
4	Shock 冲击		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.4 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.4 节	Pass 合格
5	External short circuit 外部短路		UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.5 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.5 节	Pass 合格
6	Impact/Crush 重物冲击/挤压	19#~23#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.6 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.6 节	Pass 合格
7	Overcharge 过度充电	11#~18#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.7 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.7 节	Pass 合格
8	Forced discharge 强制放电	24#~43#	UN Manual of Test and Criteria, part Ⅲ, subsection 38.3.4.8 UN 试验和标准手册，第Ⅲ部分，第 38.3.4.8 节	Pass 合格

The submitted samples were complied with the stated requirements of UN manual of test and criteria, part Ⅲ, subsection 38.3.

经检测，提交的测试样品均符合 UN38.3 的要求，测试结论为合格。

Ⅸ、Photo of The Sample 样品图片

Model 型号: 702530P

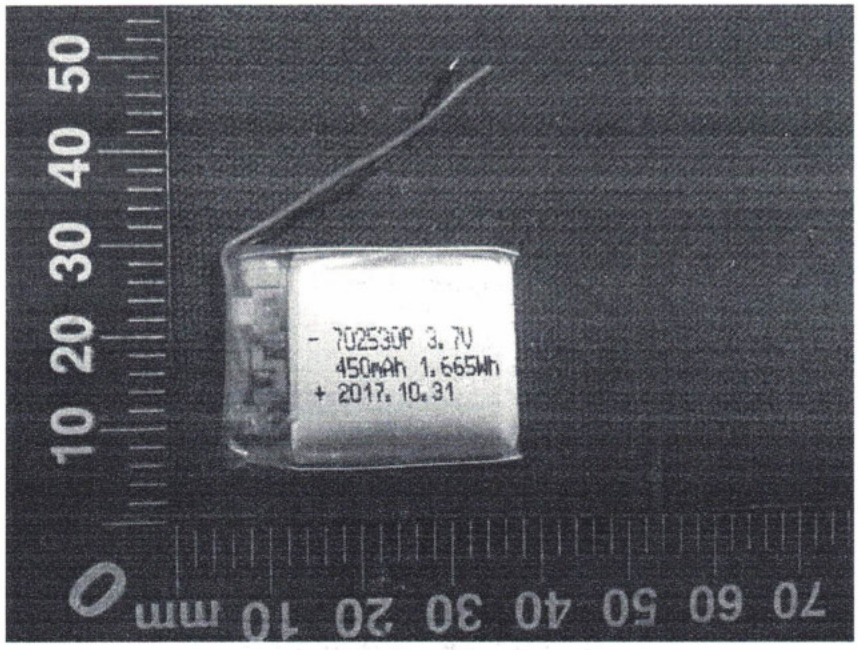


Photo 1 Front 正面

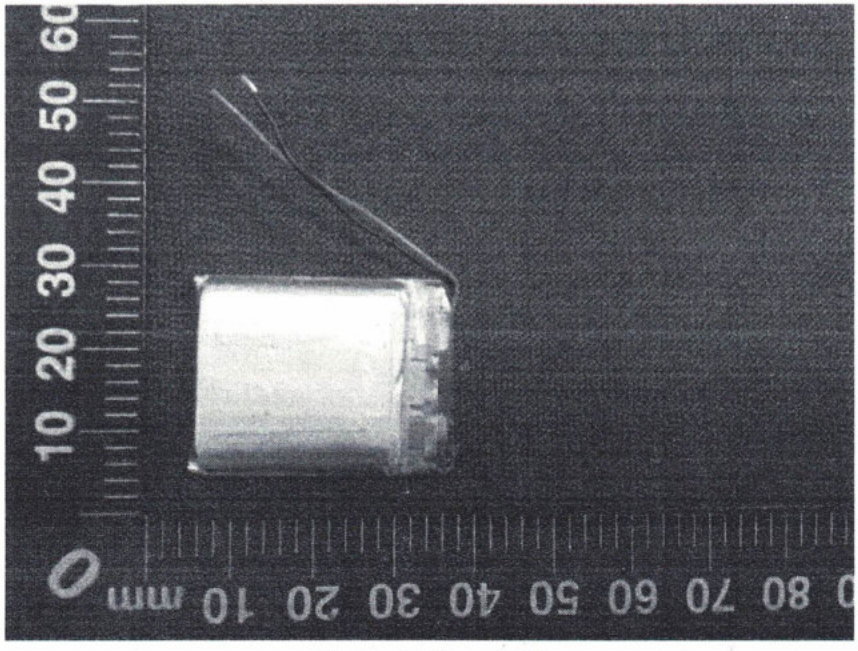


Photo 2 Rear 反面

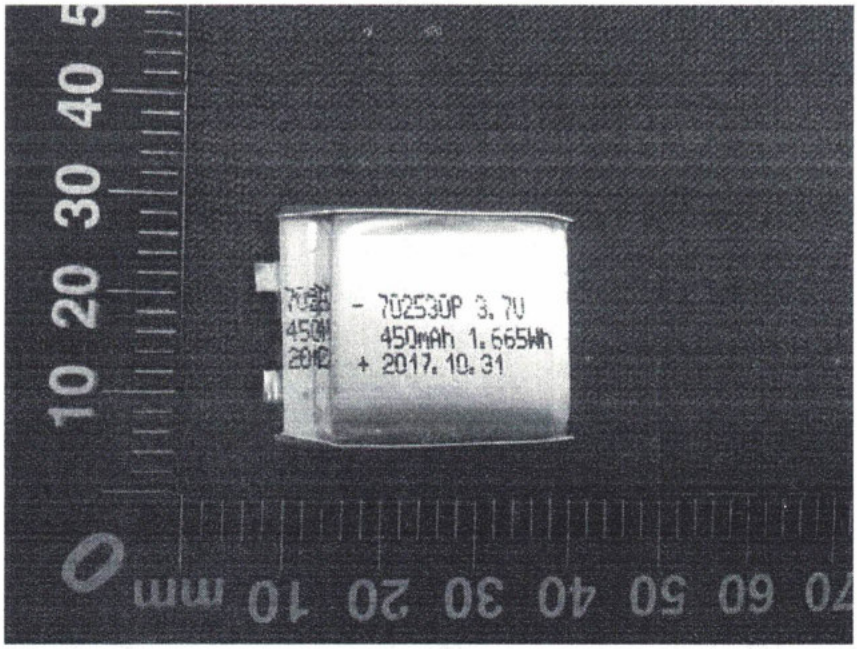


Photo 3 Internal Cell 内部电芯

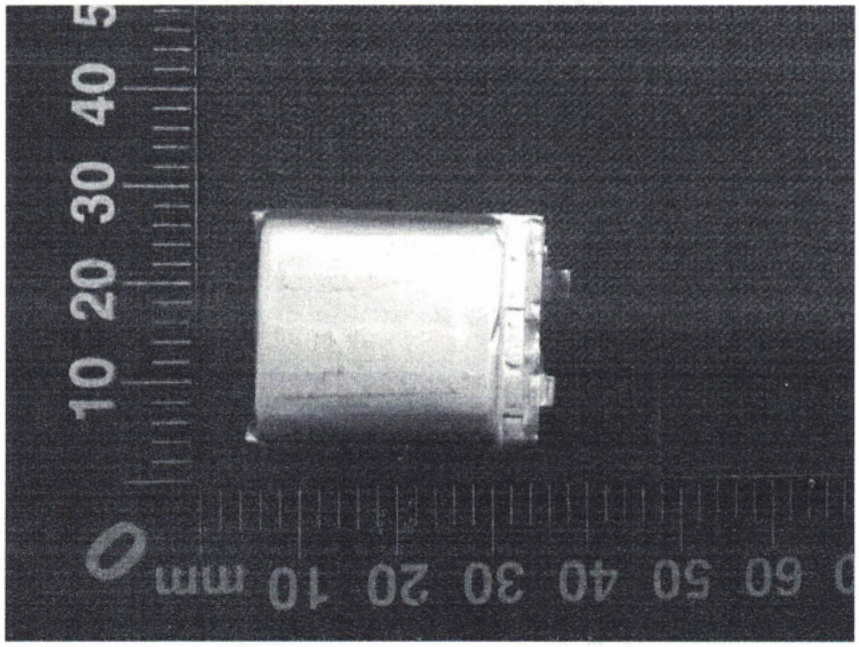


Photo 4 Internal Cell 内部电芯

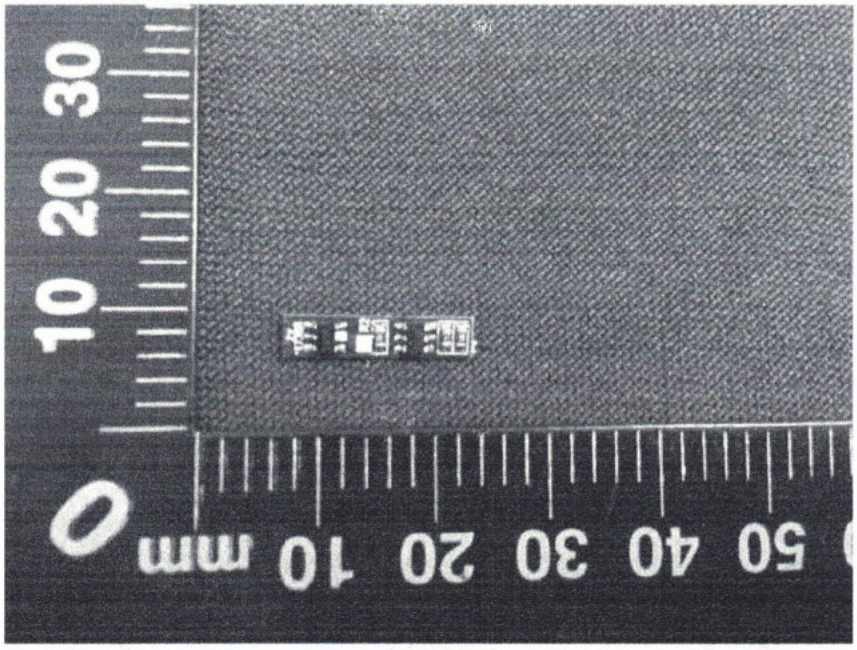


Photo 5 Protection board 保护板

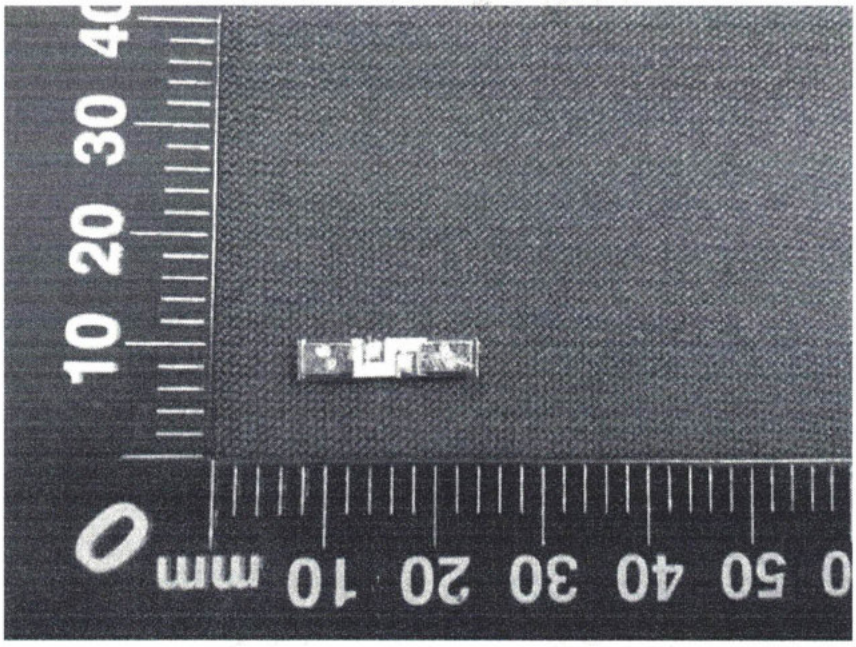


Photo 6 Protection board 保护板

******End of Report 报告结束******

注意事项

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6. The test report is valid for the tested samples only.
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