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| Product Specification  for Polymer Lithium-ion Batteries  聚合物锂离子电芯产品规格书  Model Number: 706386-5000mAh  产品型号：706386-5000mAh   |  |  |  | | --- | --- | --- | | Prepared By  编制 | Verified By  审核 | Approved By  批准 | |  |  |  |  |  |  |  | | --- | --- | --- | | **Customer**  **Approval**  **客户方确认** | **Signature**  **签署** | **Date**  **日期** | |  |  | | **Company name:**  **公司名称** | | | **Company Stamp:**  **盖章** | |     公司电话：0762-8812050 公司传真：0762-8812046  公司地址：广东省河源市蝴蝶岭工业城-水库移民双转移示范基地O栋   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  | | --- | --- | --- | --- | | 版本号 | 内容描述 | 修改人 | 生效日期 | | A.0 | 新版发行 |  | 2025-2-26 | | |

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| 1. SCOPE  范围  This document describes the performance characteristics and testing methods for Polymer Li ion batteries produced by GuangDong YunChuang New Energy Industry CO.,Ltd.  本文件描述了广东云创新能源实业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   1. 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：706386  3. SPECIFICATION  产品基本特性   |  |  |  |  | | --- | --- | --- | --- | | No.  序号 | Item  项目 | Characteristics  特性 | Criteria  备注 | | 3.1 | Nominal Capacity  标称容量 | Minimum：4900mAh  最小：4900mAh  典型：5050mAh  Typical:5050mAh | The nominal capacity means the mini. Capacity of the cell ,which is measured with discharge current of 0.2C5A to 3.0V after the rapid charge at 23℃±2℃.  标称容量是指在23℃±2℃温度下，以0.2C放电到3.0V时的最小容量。 | | 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 | Maximum Constant Charging Current  最大持续充电电流 | 1C |  | | 3.6 | Maximum Continuous Discharging Current  最大持续放电电流 | 3C |  | | 3.7 | Operating Temperature  工作温度范围 | Charging/充电 | 5～15℃：0.5C CC to 4.4V，4.4V CV to 0.02C  16～45℃：1C CC to 4.4V，4.4V CV to 0.02C | | Discharging/放电 | -20～5℃：0.2C to 2.5v，6～55℃：3C to 3v | | 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80g | | | 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.序号 | Item  项目 | Testing Method  测试方法 | Requirements  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 0.02C.  0.2C5A恒流充电至4.4V，再4.4V恒压至0.02C5A | Charge Time ≤6.5hrs  充电时间≤6.5小时 | | 2 | Rapid Charge  快速充电 | 1C constant current charge to4.4V，then constant Voltage until the charge current decrease to 0.02C.  1C5A恒流充电至4.4V，再4.4V恒压至0.02C5A | Charge Time ≤1hrs  充电时间≤1.5小时 | | 3 | Rated Capacity  标称容量 | (per 6.1.1) at room temp. (23±2℃), rest for 0.5-1 hrs then discharge at a constant current of 0.2C to 3.0V, testing will be terminated by either 5 cycles or any one discharge time exceeds 5 hrs  在环境温度为（23±2）℃下，按6.1.1完全充电后静置0.5～1小时，以0.2C5A放电至3.0V，可循环5次，当有一次放电时间达到5小时，即可停止。 | ≥5000mAh | | 4 | Cycle  (23℃)  循环寿命（23℃） | At 23 ± 2 ℃ ambient temperature, With 0.2C charging and 0.2C discharging, between each cycle for 35~45 minutes, in this way for 400C.  在23℃±2℃的环境温度下，用0.2C充电和0.2C放电，每次循环之间搁置35~45分钟，循环400周 | Remaining capacity≥80% Nominal capacity.  剩余容量≥80%标称容量  膨胀率<10% | | 5 | Internal Impedance  内阻 | Internal impedance is measured on a 50% charged battery at 1KHz AC at ambient temperature（23±2）℃。  环境温度（23±2）℃，电池荷电50%状态时以1KHz交流电测得的内部阻抗。 | ≤10mΩ | | 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 to3.0V.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% Nominal capacity.  放电容量≥85%标称容量  recovery capacity≥90% Nominal capacity  恢复容量≥90%标称容量 | | 7 | Discharge Rate Characteristic  倍率放电特性 | |  |  |  |  | | --- | --- | --- | --- | | Charge current/充电电流 | Discharge current/放电电流 | | | | 0.2C | 0.5C | 1.0C | | 0.2C | 100% | 95% | 90 % |   Cell shall be charged according to Per.6.1.1,and discharged with different current respectively to 3.0V. The cells should be performed at 23℃± 2 ℃  电芯按6.1.1充满电，分别以不同的倍率放电到3.0V。电芯必须在 23℃± 2 ℃的温度下进行充放电。 | | | 8 | Temperature Characteristic  温度特性 | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Discharge current/放电电流 | Discharge temperature/放电温度 | | | | | -20℃ | 0℃ | 25℃ | 55℃ | | 0.2C | 60%（截止电压2.5v） | 85% | 100% | 95% |   Cell shall be charged according to Per.6.1.1,and discharged with different temperature respectively to 3.0V at 0.2C.The cells must be stored for two hours at the corresponding 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存2小时。 | | | 9 | The factory voltage  出厂电压 | Check open circuit voltage (OCV) of cells prior to the delivery to customers  出货之后检验 | 3.88V-4.00V |   6.2 Safety characteristic  安全特性   |  |  |  |  | | --- | --- | --- | --- | | 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 0.2C5A, then charge to 4.6V at 3C5A and rest for 7 hours.  电池以0.2C5A电流恒流放电至3.0V，以电流3 C5A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 0.2C5A mA at room temperature, connect with external load of 30Ω for 7hours.  将电池按6.1.1充满电后，在环境温度23±2℃的条件下,以0.2C5A放电至终止电压后,外接30Ω负载电阻放电7h. | No fire  No explosion  不爆炸、不起火 | | 3 | [Acupuncture](http://www.baidu.com/link?url=FDU-n44DDEarC4317pLPIpX4uE735hG_uzOq_e8_UnA-J-FkjSextNICVFi0v_CuG595pTx2H7gfeTfbOk47ze-hHOnur8g6v1emLs4nX4G)  针刺 | Place the standard charged battery in a ventilated kitchen，Pierce the center of the maximum area of the battery with an 5mm stainless steel needle at a speed of 40mm/s，And keep it for 5s.  将标准充电后的电池置于通风厨中，用5mm的无蚀锈钢针以40mm/s的速度刺穿电池最大面积的中心位置，并保持5s. | No fire  No explosion  不爆炸、不起火 | | 4 | 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±2℃,followed by a storage for 6 hour at a test temperature equal to -40±2℃, the maximum time interval between test temperature extremes is 30 min, this procedure is to be repeated for 32 times, after which all test cells are to be stored for 6 hours at ambient temperature (23±2℃)。  将用标准充电方法充满电的电芯放入 75±2℃的环境中搁置 6h,再在-40±2℃条件下搁置 6h，两个极端温度的变化时间间隔最长为30min，如此循环 10 次，试验结束后将电芯取出，在 23±2℃环境中搁置 6h。 | No leakage, no fire and  no explosion  不泄露、不起火、不爆炸 | | 5 | 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 |   6.3 Reliability  环境适应性   |  |  |  |  | | --- | --- | --- | --- | | No.  序号 | Item  项目 | Test Method  测试方法 | Requirements  标准 | | 1 | Humidity Test  恒温恒湿 | Fully charge cells per 6.1.1, stored them at 40±2℃ with 90%～95RH% for 48 hours. Then the cells are placed at room temperature to “dry out” for 2 hours. then discharge the cells to 3.0V at 0.2C5A.  将按6.1.1充满电的电池放入40±2℃、相对湿度为90％～95％的恒温湿箱中搁置48h后，取出电池在环境温度20±5℃的条件下搁置2h。以0.2C5A电流放电至3.0V | No deformation, no corrosion, no leakage, no leakage, no rupture, 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。 | | 2 | Low Pressure  Test  低压测试 | The fully charged cell is to be stored for 6 hours at an absolute pressure 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。 | No explosion, no fire 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 1.2m 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 1.2m 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频方式重复12次，振动3h。  对数扫频方式如下：7Hz～18Hz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。 | No leakage, no fire and  no explosion.  不泄露、不起火、不爆  炸。 |   7. Standard Testing Environment  标准测试环境  Temperature : 23±2℃  温度：23±2℃  Relative humidity : 45±20%（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 advices described in this “Product Specification for Polymer Lithium Ion Batteries published by GuangDong YunChuang New Energy Industry CO.,Ltd In case the battery were overheated or even catch fire or explosion caused by mishandling of the user side, GuangDong YunChuang New Energy Industry CO.,Ltd will not be liable for the lose caused by any of such mishandling.  GuangDong YunChuang New Energy Industry CO.,Ltd . will notify the users in written form if any modifications in specification, raw material, production process control.  您必须严格遵守广东云创新能源实业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，广东云创新能源实业不负担任何责任。  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。  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。  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。  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.  如果电池终端发出异味、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。  附图：单位：mm  Attachment：Unit：mm   |  |  |  | | --- | --- | --- | | **项目**  **Items** | **描述**  **Description** | **技术规格**  **Dimension and Spec** | | **T** | **出货厚度/thickness before shipping** | **7.0+0.3 -1 mm** | | **W** | **宽度/width** | **63+1.0 -1.0mm** | | **H** | **高度(不含极耳胶)/length** | **86+1.0 -1.0 mm** | | **L1** | **极耳胶外露长度/sealant length** | **0.2-2.0 mm** | | **L2** | **极耳外露长度（含极耳胶）/tab length** | **4.0±0.5mm** | | **L3** | **顶封高度/sealing height** | **4.0±0.5 mm** | | **d** | **极耳宽度/ tab width** | **7.0±0.5mm** | | **W** | **极耳中心距/distance between center of 2 tabs** | **33.0±2.0mm** | | **折边** | **单折边** | | | **配组** |  | |   备注：1.正极使用铝转镍极耳；2.负极使用镍极耳；3. 极耳厚度0.15mm。 |